CORPORATION FALCONBRIDGE COPPER

U M E X O P T I O N

PN 043

1982 SUMMARY REPORT

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Thunder Bay, Ont.
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SUMMARY

In 1982 work was carried out on two blocks of claims optioned from Umex, namely Area C and the Marchington Road area.

The Marchington Road sulphide deposit is concluded to be a vein-type accumulation of sulphides in a dacitic to rhyodacitic, sub-volcanic intrusive complex. This complex is intruded into sediments and epiclastic rocks. True volcanic material is limited in extent, consists of basaltic and rhyolitic flows and pyroclastics, and occurs well to the south of the known mineralization.

Area C, 5 km west of the Marchington Road deposit, is mainly underlain by intrusive material. Volcanics probably underlie some of the northern claims, but outcrop is scarce and those that are present are often hornfelsed beyond recognition. Evidence from outwith the property suggests subaerial deposition.

Sulphide occurrences in Area C are generally vein-type. An Input anomaly located on the ground using DEEPEM and subsequently drilled proved to be barren sulphides of uncertain origin in a hornfelsed block.

Little potential is envisaged for expanding the numerous vein-type sulphide occurrences on both claim blocks into economic tonnages. Nor is there any indication that precious metal content might improve sufficiently to be significant.

Since the Umex Option agreement depended upon expansion of known sulphides to economic tonnages, and this potential has been largely eliminated, it is recommended that the agreement be terminated.

INTRODUCTION

In an agreement dated June 1, 1982, Corporation Falconbridge Copper optioned two blocks of claims in the Savant lake area from Umex Inc. of Toronto.

Previous work by Umex had delineated a small sulphide zone (Marchinston Road deposit) consisting of approximately 150,000 tons at 0.98% Cu, 3.11% Zn, 1.16% Pb, 1.97 oz/t Ag and traces of Au. Since most of their work was of a geophysical nature it was felt that a CFC style approach might assist in identifying geological environment and unraveling possible structural complications. This could result in expansion of reserves to economic proportions and the identification of other targets.

LOCATION AND ACCESS

The town of Savant Lake is situated at the junction of Ontario highway 599 and the CN northern rail line, approximately 140 kilometres north of Ignace. Access to the properties from there is by highway 599, north for 12 kilometres and thence west on the Marchinston Lake Road. See Figures 1 and 6 for the specific locations of the individual claim blocks.

UMEX-MARCHINGTON ROAD AREA

GENERAL

The Marchington Road area consists of 146 contiguous claims situated around and to the south of the Marchington Road, immediately west of it's intersection with highway 599. Figure 1 shows these claims along with their numbers.

WORK DONE IN 1982

Exploration efforts during 1982 were directed towards gaining an understanding of the geology of the area, identifying the nature and style of mineralization present and assessing the potential for extending and adding to known mineralization.

To effect this, a program of linecutting, magnetometer surveys, lithogeochemical sampling and geological mapping was carried out. In addition, 3060 lineal feet of diamond drilling tested 4 geological-geophysical targets.

GEOPHYSICS

General

In early 1982 twenty (20) line miles of magnetic survey were run over and adjacent to the detail grid covering the Marchington Road sulphide zone. The purpose of this was twofold:

1) to test the suitability of magnetic surveys for picking up similar sulphide zones

2) to supplement detailed geological work aimed at identifying and unraveling local structural complications.

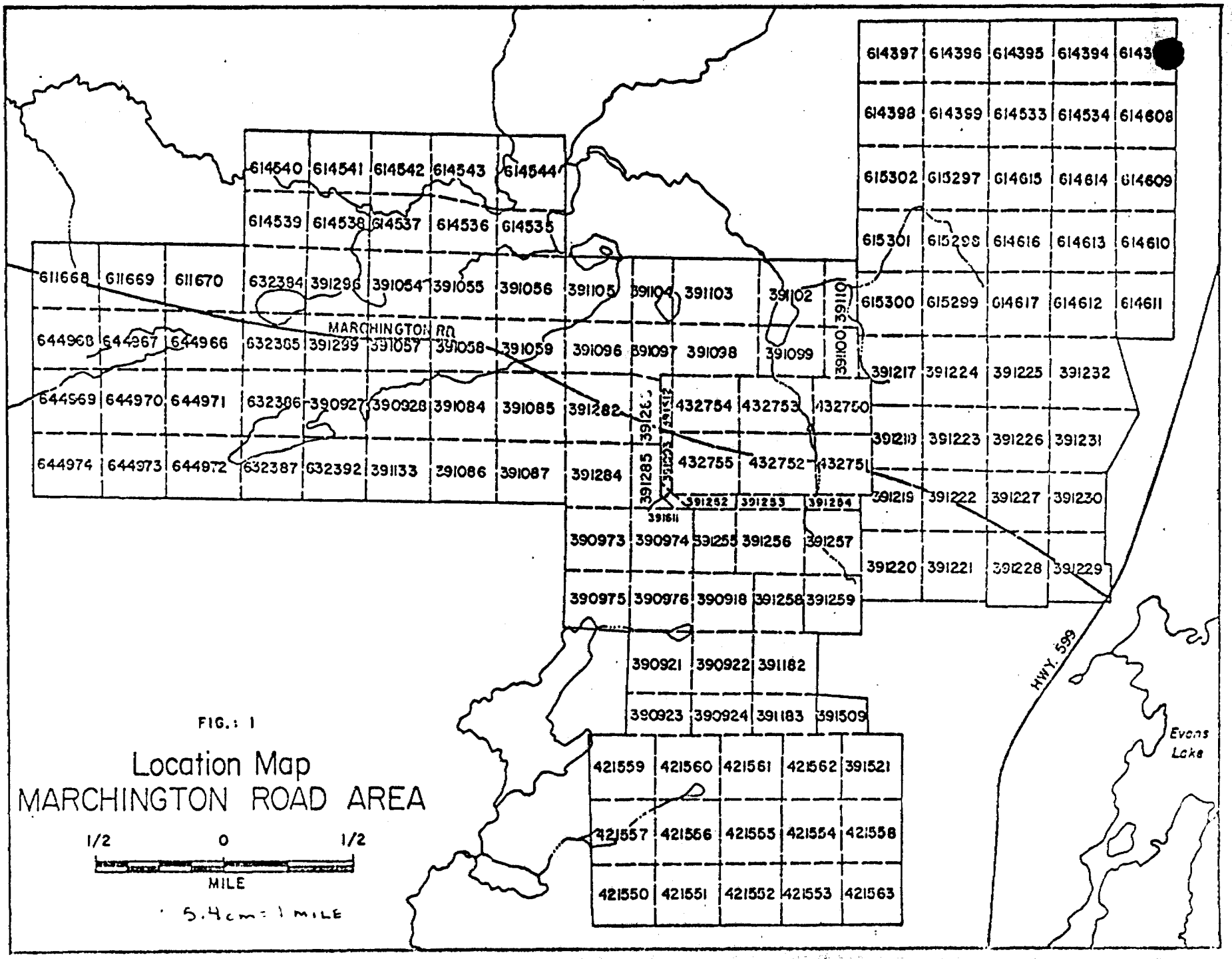


FIG.: 1

Location Map
MARCHINGTON ROAD AREA

1/2 0 1/2

MILE

· 5.4cm = 1 MILE

The results of the survey are shown in Maps 1A and B.

Interpretation

The NE-SW trending mag high in the centre of Map 1A is largely due to disseminated pyrrhotite in the wallrocks to the sulphide zone. Since the more concentrated sulphides contain very little pyrrhotite there is no direct correspondence with base metal values. The cross-cutting E-W trending 200-400 gamma anomaly is due to a magnetite bearing intrusion. The relationship between these anomalies suggests that the sulphide zone crosses and disrupts the intrusion indicating post-intrusion deposition. No obvious major folding of the sulphide zone is apparent.

Map 1B covers the area of the '23-zone' sulphides (Umex's S2-23 anomaly). Since the lines are spaced at 400' intervals there can be less confidence in the interpretation of the magnetic patterns. However, the large anomaly just north of TL20S corresponds rather closely with the sulphides intersected in drilling and there is some evidence to suggest that the zone may be folded and hence repeated to the south.

GEOLOGY

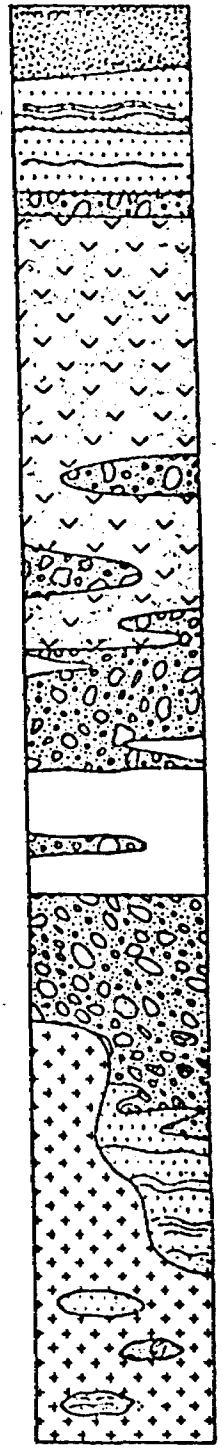
General

Only that portion of the Marchinston Road grid indicated on Map 2 was actually mapped in detail, although an understanding of geological processes recorded in the area was only gained through examination of countless outcrops in the Savant Lake region.

Sediments

Figure 2 shows an idealized stratigraphic section along line A-B on Map 2. The oldest rocks in the sequence are sediments.

A



B

LITHOLOGY

DIORITE TO QUARTZ DIORITE, FG TO CG GENERALLY MASSIVE SLIGHTLY MORE HETEROGENEOUS TOWARDS EDGES

WELL BEDDED REWORKED FELSIC TUFFS DISPLAYING SLUMPING, CHANNEL FILLING, SCOURING ECT. ZONES OF INTERBEDDED LAMINATED ARGILLITES AND CHERT

DEBRIS FLOW, GENERALLY <5 CM FELSIC FRAGMENTS IN MAFIC MATRIX. FAIRLY DISTAL

VESICULAR PILLOWED AND MASSIVE FLOWS WITH PILLOW BRECCIAS AND LOCAL INTRUSIONS. BECOMES INTERBEDDED WITH DEBRIS FLOWS TOWARDS BASE.

DEBRIS FLOWS COMPRISED MAINLY OF FELSIC FRAGMENTS AND MATRIX RIP-UPS IN QUARTZ - BIOTITE RICH MATRIX. THIN SYNCHRONOUS RHYOLITE FLOWS AND INTRUSIONS MARKED BY PARTIALLY ASSIMILATED CONTACT ZONES WHERE DEBRIS FLOW MATRIX HAS BEEN EATEN INTO.

MASSIVE TO FLOW BANDED RHYOLITE. OFTEN PINK, LOCAL IRON CARBONATE.

DEBRIS FLOWS AS DESCRIBED JUST ABOVE GRADING DOWNWARDS INTO SEDIMENTARY DEBRIS FLOWS COMPRISED LARGELY OF SEDIMENTARY FRAGMENTS UP TO 50 CM.+ DIAMETER.

SEDIMENTS MASSIVE GREYWACKES GRADING TO TURBIDITES WITH WELL BEDDED MUDS AND SILTSTONES. COMMON ALUMINO - SILICATE MINERALS.

DACITE - RHYODACITE INTRUSIONS. AT LEAST 7 PHASES COMPLICATED BY LOCAL ASSIMILATION OF SEDIMENTS AND SEDIMENTARY DEBRIS FLOW. NUMEROUS PARTIALLY ASSIMILATED PENDANTS OF COUNTRY ROCK.

FIG. 2

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UMEX - MARCHINGTON ROAD AREA

STRATIGRAPHIC COLUMN ALONG SECTION A-B

SEE GEOLOGY MAP - 1" = 400'

400 0 400

feet

(VERTICAL SCALE)

3.3 cm = 800'

These are best exposed along the Marchington Road in the eastern part of the property (not mapped in detail). There they consist of turbidites and greywackes varying from well bedded to massive and are locally fragmental. Metamorphism to amphibolite facies has resulted in the muddier sediments recrystallizing to quartz-amphibole - plagioclase - garnet ± staurolite ± magnetite while the siltier layers are more commonly quartz - biotite - staurolite ± magnetite ± muscovite.

Debris Flows

Overlying and interbedded with the sediments are sedimentary debris flows. Clast abundance ranges from 0 to 80%, as is characteristic of such rocks. These are 80 to 100% sedimentary in origin and 0 to 20% volcanically derived. Clast size ranges from 1-2 mm up to in excess of 50 cm with little or no sorting or grading. They may be angular or rounded and not uncommonly display a weathered rim. Metamorphic overprint locally results in a recrystallization of matrix and/or some fragments to quartz - amphibole ± garnet.

Higher in this sequence of debris flows the proportion of volcanically derived fragments increases to almost 100%. These then become quite difficult to distinguish from pyroclastic rocks such as block and ash flows, although, as a rule, they tend to have more biotite in their matrix than do the latter.

Volcanics

Felsic volcanic rocks form a domal sequence towards the top of the debris flows. Rocks are mainly laminated, pink to cream coloured rhyolites with local subaqueous pod lavas, possibly with hyaloclastite. Fragmental varieties include block and ash flows, talus breccias and flow front breccias. These rhyolites appear to have been extruded synchronously with debris flow deposition as indicated by the complex contact zones where flow material

surrounds fragments like toothpaste.

Mafic volcanics are the next youngest lithology in the stratigraphy. Abundant vesicles indicate relatively shallow deposition. The lack of well formed pillows and abundance of breccia points to a fairly active environment. Debris flows are found interbedded with both the top and the bottom of the sequence. Metamorphism has not greatly changed these mafic rocks, at least megascopically. Original textures are still readily visible. It is unlikely that this area has been elevated to more than upper greenschist facies.

Immediately overlying the debris flows in the upper part of the mafic volcanics is a sequence of well bedded, reworked felsic tuffs displaying excellent sedimentary features such as slumping, channel filling and scouring. Laminated argillites, locally cherty, are interbedded with these.

Intrusives

The most abundant of the rock types recognized in the Marchington Road area are the intrusive rocks.

Mafic intrusive rocks are largely confined to the south part of the grid where a quartz-diorite to, locally, gabbroic mass has intruded the volcanics. It is generally massive and fairly uniform although a weak banding was discerned locally near its northern contact. Elsewhere mafic intrusions are limited to thin dykes within the volcanics and debris flows.

Intermediate to felsic intrusives are abundant throughout the area. They are usually dacite to rhyodacite in composition with minor amounts of andesite and rhyolitic material. They are generally fine to medium grained and similar in overall composition. However, individual intrusions within the main mass may be quartz and/or feldspar porphyritic, magnetite bearing, amphibole

bearing, micaceous, garnetiferous, xenolithic, laminated, contain polygonal cooling fractures or almost any combination of these features.

Two reasons are proposed for this variability,

a) changes in the primary magma

b) assimilation of country rock.

The second of these is considered to be particularly important. The main mass of the intrusion, situated around and to the south of the Marchinston Road, has been emplaced into sediments and sedimentary debris flows. Especially near the margins, it appears to have assimilated considerable quantities of the country rock. Where it has intruded bedded sediments it often takes on a bedded appearance. Where it has intruded debris flows assimilation is often incomplete and blocks of original country rock are preserved in various stages of assimilation. These features point to a passive mode of emplacement more typical of plutonic intrusions rather than these obviously fairly shallow, subvolcanic ones.

Structure

No direct top indicators were recognized on the property but the overall distribution of the various rock types strongly suggests south facing stratigraphy south of the Marchinston Road. Since tops are north, north of the Marchinston Road this would imply that the intermediate to felsic intrusions occupy the core of an anticline.

Superimposed upon, and clearly divergent with, the sediments, debris flows and intrusions is a well developed 070° cleavage. Together with local minor folds it indicates a later folding episode about an ENE trending axis. This conforms well with the variations in regional strikes apparent on government maps of the area. Mineral and fragment lineations measured

suggest a shallow but variable (5 - 60°) easterly plunge.

Economic Geology

Sulphide occurrences in the area are strictly confined to the intrusions, sediments and debris flows. There is a notable lack of sulphide noise in the volcanic areas.

In every case checked sulphides appear related to fractures paralleling the major cleavage. Within the more competent intrusive phases fracturing was locally accompanied by a dilatancy which allowed deposition of quartz with pockets of chalcopyrite, sphalerite, galena, pyrite and pyrrhotite. Within less competent intrusives and sediments the fracturing seems to have been much 'tighter' and is usually marked only by sericitic alteration with disseminated sulphides. These are now manifest as the numerous gossan zones in the area. At least some the of unusual mineralogy in the intrusions (staurolite, andalusite, etc.) may be related to these fracture zones as well.

GEOCHEMISTRY

General

Approximately 700 lithogeochemical samples were taken during the field program. Each was analyzed for copper, zinc and soda and a selection were sent for whole rock analysis to assist in characterizing rock units (Table 1).

A major interpretational problem arises from the fact that the sampling covers a much larger area than there is geological control for. However, broad inferences can be made based on areas for which there is good control.

Interpretation

Both Na2O and Zn patterns show distinct NE-SW trends para-

lleling inferred fault directions and largely independent of rock type. To the north and east a broad zone of Na2O depletion is due to sediments. Copper contents are rarely statistically anomalous.

The structure associated with the Marchinston Road sulphide zone is clearly marked by a long linear Na2O depletion zone and a broad positive Zn anomaly. Elsewhere within the intrusive complex similar but smaller zones can been seen.

Whole Rock Geochemistry

Table 1 (a and b) summarizes the results of whole rock analyses of selected samples from the Marchinston Road area. Inferences drawn from these include:

- mafic volcanics and intrusions are almost identical suggesting a comagmatic origin.

- analysis of the felsic volcanics and the sediments stratigraphically above the mafic volcanics are consistent with the geological interpretation that the latter are partially reworked felsic pyroclastics.

- average composition of the intermediate to felsic intrusions around the Marchinston Road is roughly midway between that of the mafic and felsic volcanics for most elements. This is compatible with the suggestion that the volcanics formed by differentiation from a magma of similar composition to the intrusions.

DIAMOND DRILLING

A diamond drilling program was designed to test plunge potential of the Marchinston Road sulphide zone and the potential of other sulphide zones indicated by previous drilling south of the main zone.

TABLE 1a WHOLE ROCK ANALYSES - Majors

LITHOLOGY		SiO2	Al2O3	CaO	MgO	Na2O	K2O	Fe2O3	MnO	TiO2
MAFIC (4) VOLCS	mean	54.3	17.6	6.72	5.36	3.27	0.36	9.24	0.17	0.85
	range	49.6-58.3	16.6-19.4	3.59-11.1	4.52-5.97	1.75-4.95	0.23-0.48	8.39-10.2	0.13-0.22	0.80-0.90
FELSIC (1) VOLCS	mean	79.4	11.8	0.66	0.47	4.14	2.05	1.26	0.05	0.10
	range									
MAFIC (2) INTRUS.	mean	54.0	16.2	6.63	5.92	2.84	1.02	10.3	0.13	1.08
	range	53.8-54.1	15.8-16.6	5.51-7.75	5.78-6.05	2.12-3.57	0.28-1.76	9.71-10.9	0.12-0.14	1.02-1.15
FELSIC (99) INTRUS.	mean	69.0	15.45	3.55	1.29	2.72	2.40	4.04	0.1	0.38
	range	57.1-81.5	9.82-18.6	0.15-7.99	0.28-4.11	0.43-6.34	0.75-4.46	1.01-7.99	0-0.4	0.19-0.72
REWORKED FELSIC (4) VOLCS.	mean	76.2	12.9	1.06	0.71	2.26	3.99	1.31	0.05	0.10
	range	75.3-76.9	12.6-13.3	0.42-1.79	0.29 1.29	0.87-3.32	3.42-4.88	1.19-1.58	0.02-0.12	0.07-0.15

All Values in Percent (%)

TABLE 1b MINOR & TRACES

		P205	Cr203	Rb	Sr	Zr	Cu	Zn
MAFIC (4) VOLCS	mean	0.16	0.005	28	260	120	20 (1 only)	34 (1 only)
	range	0.14-0.17	0-0.01	0-90	40-460	100-140		
FELSIC (1) VOLCS	mean	0.02	0.01	80	100	150	4	13
	range							
MAFIC (2) INTRUS	mean	0.26	0.02	30	265	120	26	43
	range	0.25-0.28	0.02-0.02	10-50	160-370	110-130	5-47	20-66
FELSIC (99) INTRUS	mean	0.08	0.02	58	160	125	29	106
	range	0.03-0.17	0.002-0.035	20-110	0-300	50-270	4-120	14-200
REWORKED FELSIC (4) VOLCS	mean	0.02	0.01	120	79	90	7.5 (1 only)	52 (1 only)
	range	0.02-0.03	0.01-0.01	100-130	30-99	80-120		

All Values in ppm Except P205, Cr203 (%)

Reinterpretation of the geology and a shift of priorities resulted in only 4 holes being drilled in the area. These were:

UM-1	9+50S,4E	-70° N (335°)	800'
UM-2	3+20S,5+20E	-55° N	600'
UM-3	10+20S,2E	-80° N	760'
UM-4	11+20S,6E	-80° N	900'
		TOTAL:	3,060'

Hole locations are shown on Figure 3. complete drill logs are in Appendix 1.

Three of the holes (UM-1, 3 and 4) were drilled to test a mineralized zone indicated in Umex holes Sa47 and Sa50. These holes returned assays of 0.72% Cu, 1.50% Zn, 0.72% Pb, 4.19 oz/t Ag and 0.02 oz/t Au over 19' and 4.71% Cu, 2.18% Zn, 0.9% Pb, 4.22 oz/t Ag and 0.01 oz/t Au over 7.9' respectively.

Although mineralized intersections were obtained in two of the three holes (Figure 4) the grades and widths did not correlate with the earlier holes. UM-4 failed to intersect any significant values.

The other hole was drilled to test down plunge potential on the main sulphide zone (Figure 5). Plunge is indicated on surface to be at variable, but generally shallow, angles to the ENE. The mineralized intersection obtained (on Figure 5), although of similar width to that in holes 'up plunge' from it, was considerably lower in grade.

Interpretation of the local geology inferred from detailed surface mapping was largely borne out in the drilling. All lithologies intersected are interpreted to be intrusive. Mineralization is distinctly vein-like, the sulphides being

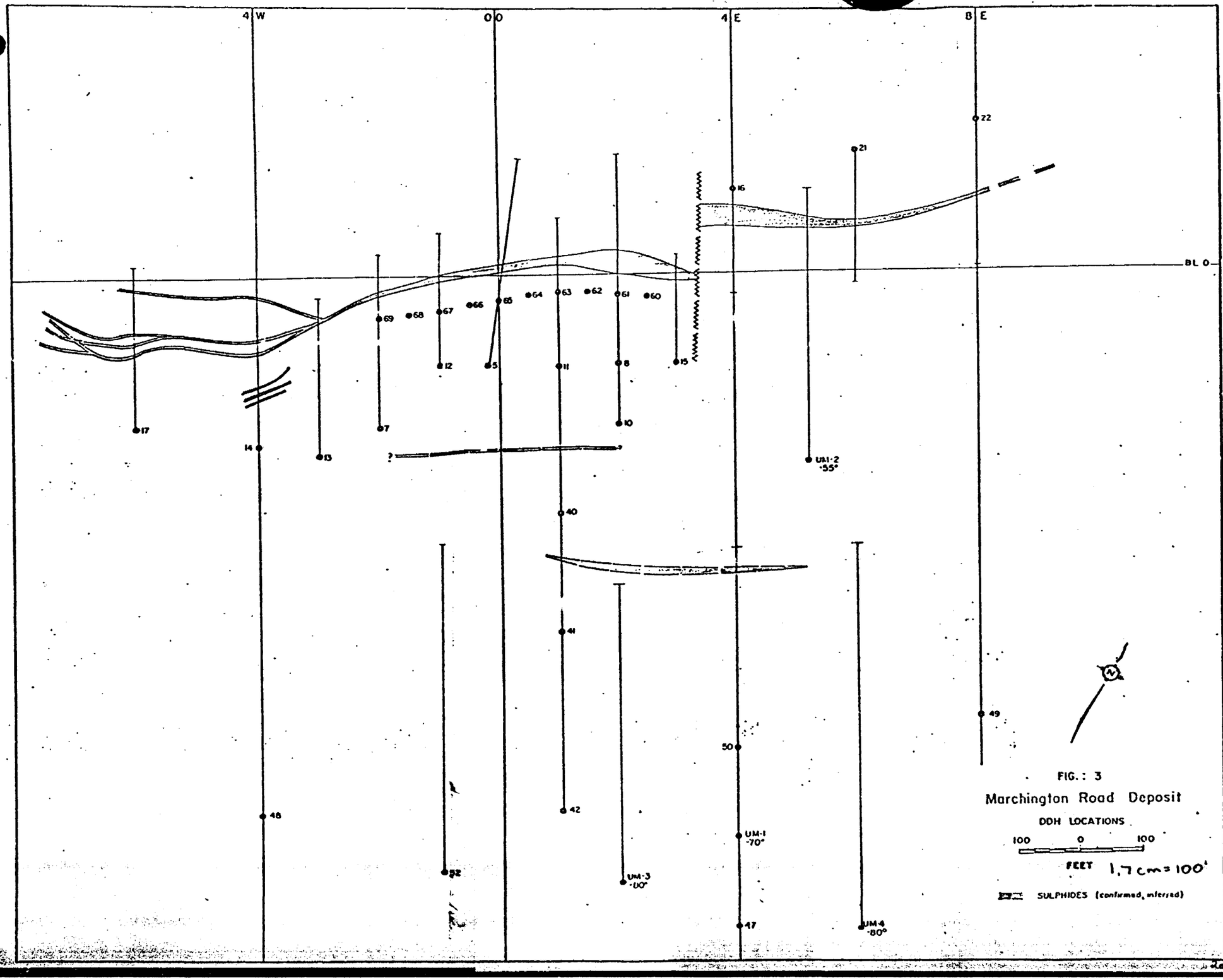

FIG.: 3

Marchington Road Deposit

DDH LOCATIONS

100 0 100

FEET 1.7 cm = 100'

SULPHIDES (confirmed, inferred)

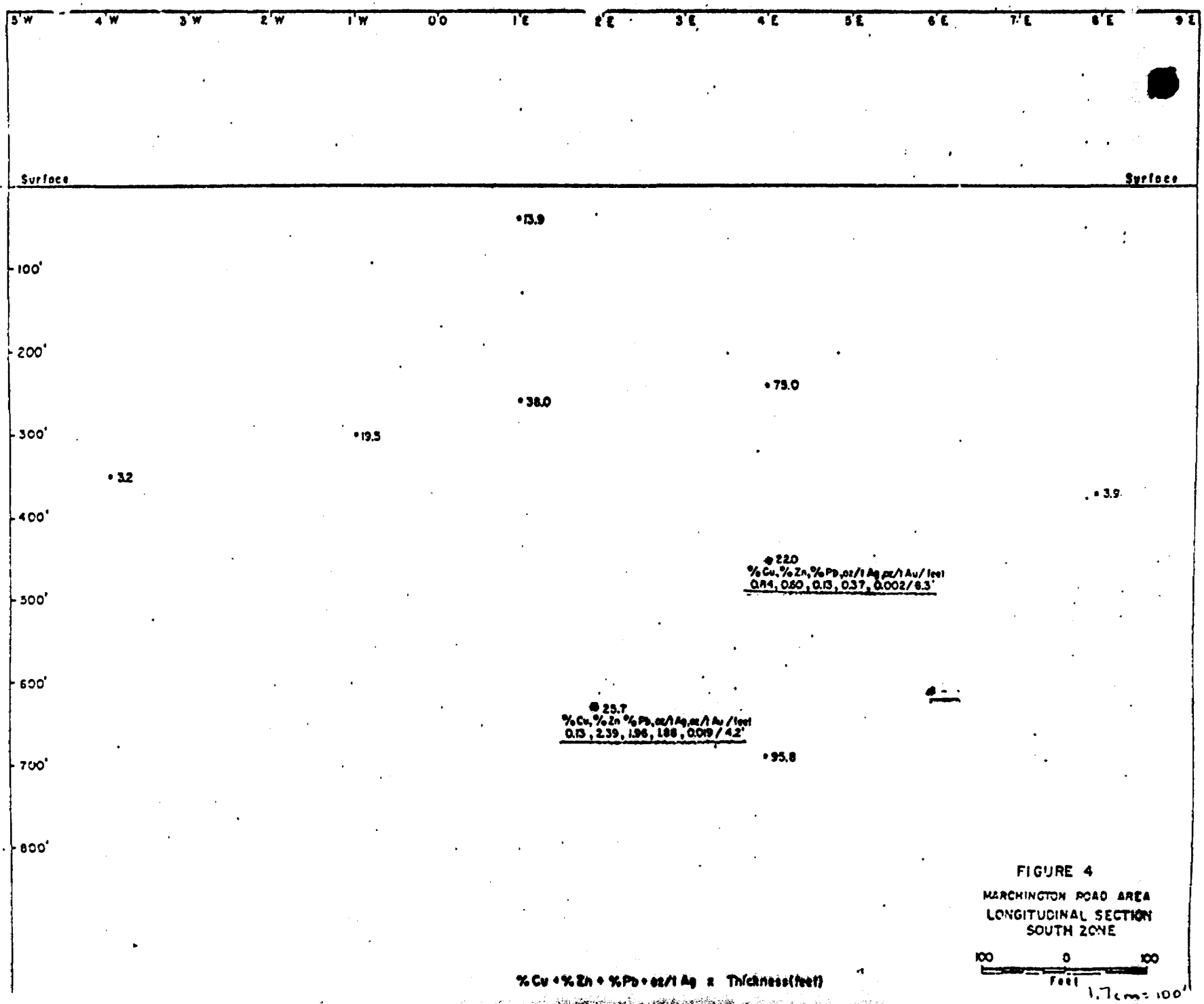

FIGURE 4

MARCHINGTON ROAD AREA

LONGITUDINAL SECTION

SOUTH ZONE

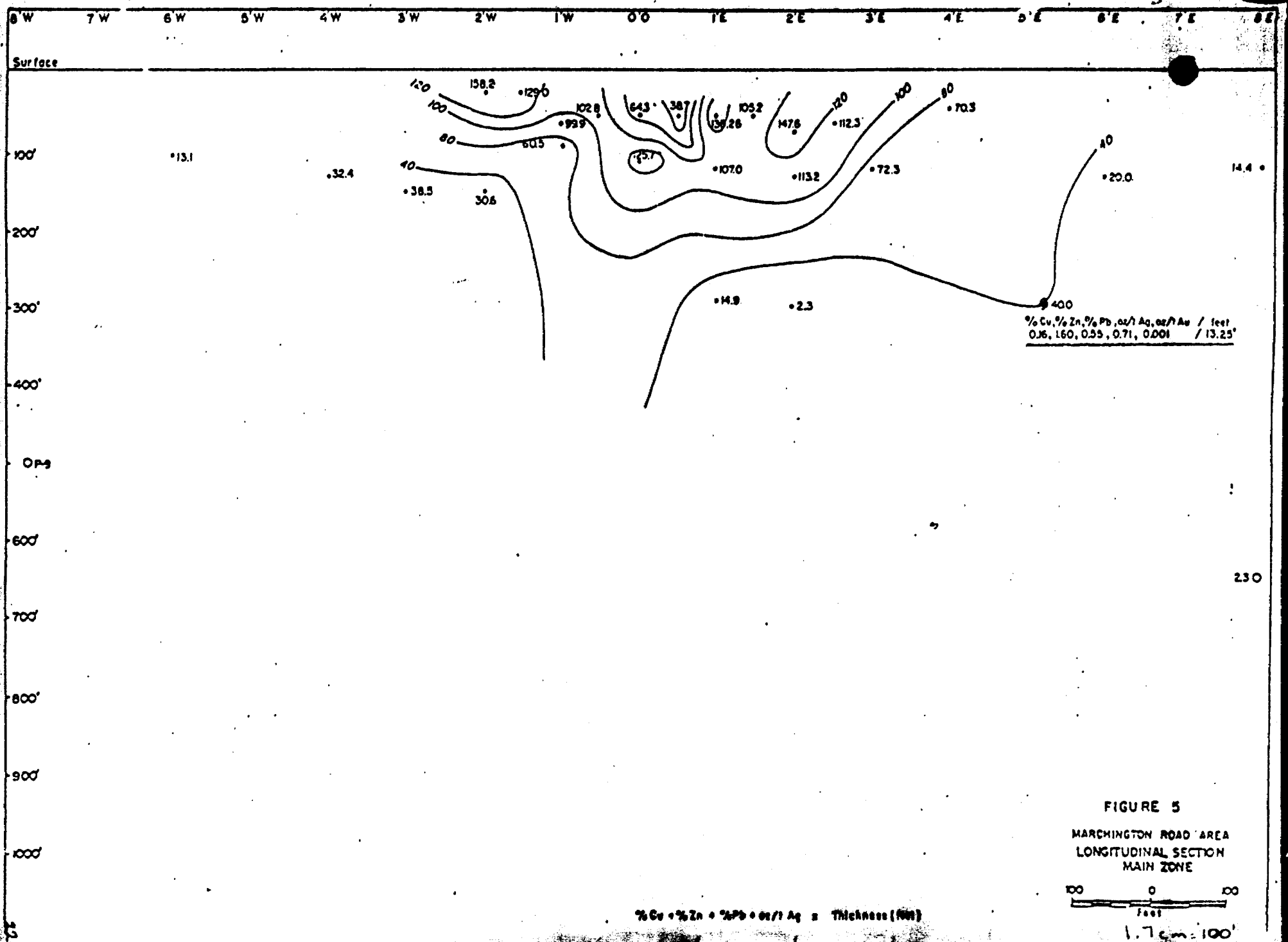

FIGURE 5

MARCHINGTON ROAD AREA
LONGITUDINAL SECTION
MAIN ZONE

1.7cm : 100'

associated with quartz vein material and enveloped by a sericitic (± tourmaline) alteration halo.

CONCLUSIONS

The Marchington Road area of the Umex Option is underlain mainly by intrusions, sediments and epiclastic rocks with only limited volcanics.

The sediments are interpreted to have been deposited in a marine environment whilst a major volcanic edifice somewhere to the west contributed considerable quantities of epiclastics. Slope direction was to the east.

From time to time, faulting related to the rising volcanic edifice provided conduits through which both basaltic and rhyolitic lavas rose to the surface. These lavas, upon eruption, pooled in fault bounded basins.

The subvolcanic magma chamber appears to have been fairly shallow and contained large quantities of a quite liquid dacitic magma. This moved rapidly upwards and laterally, mainly by a process of passive assimilation.

Geological evidence suggests that this magma intruded still 'wet' sediments. This would have produced considerable hydrothermal activity as the pore fluids heated up, leached trace metals from the sediments and redeposited them where pressure-temperature factors allowed. Much of this appears to have been within the cooling intrusion itself. Such is the Marchington Road sulphide zone and other sulphide zones in that area.

RECOMMENDATIONS

No further work is recommended on the Marchington Road deposit and area.

UMEX AREA C

GENERAL

Umex Area C encompasses those 57 claims straddling the Marchington Road adjacent to Houghton Lake. Figure 6 shows the block, including the claim numbers.

WORK DONE IN 1982

Exploration in this area in 1982 concentrated on two main aspects;

1) gaining an understanding of the geological environment

2) following up the Input/DEEPEM anomaly located in 1981.

To this end, 42.6 miles of line were cut or brushed out, duplicating and extending an original Umex grid. The baseline extended ENE from Champagne Lake and pickets were placed at 100' intervals on the grid lines, which are 400' apart.

Six weeks of geological mapping was carried out by B. Kite and E. Salm under the supervision of the author. Contemporaneous lithogeochemical sampling was carried out by junior assistants. A magnetometer survey was run on part of the grid to assist geological interpretation. Finally two holes were drilled to test a DEEPEM conductor.

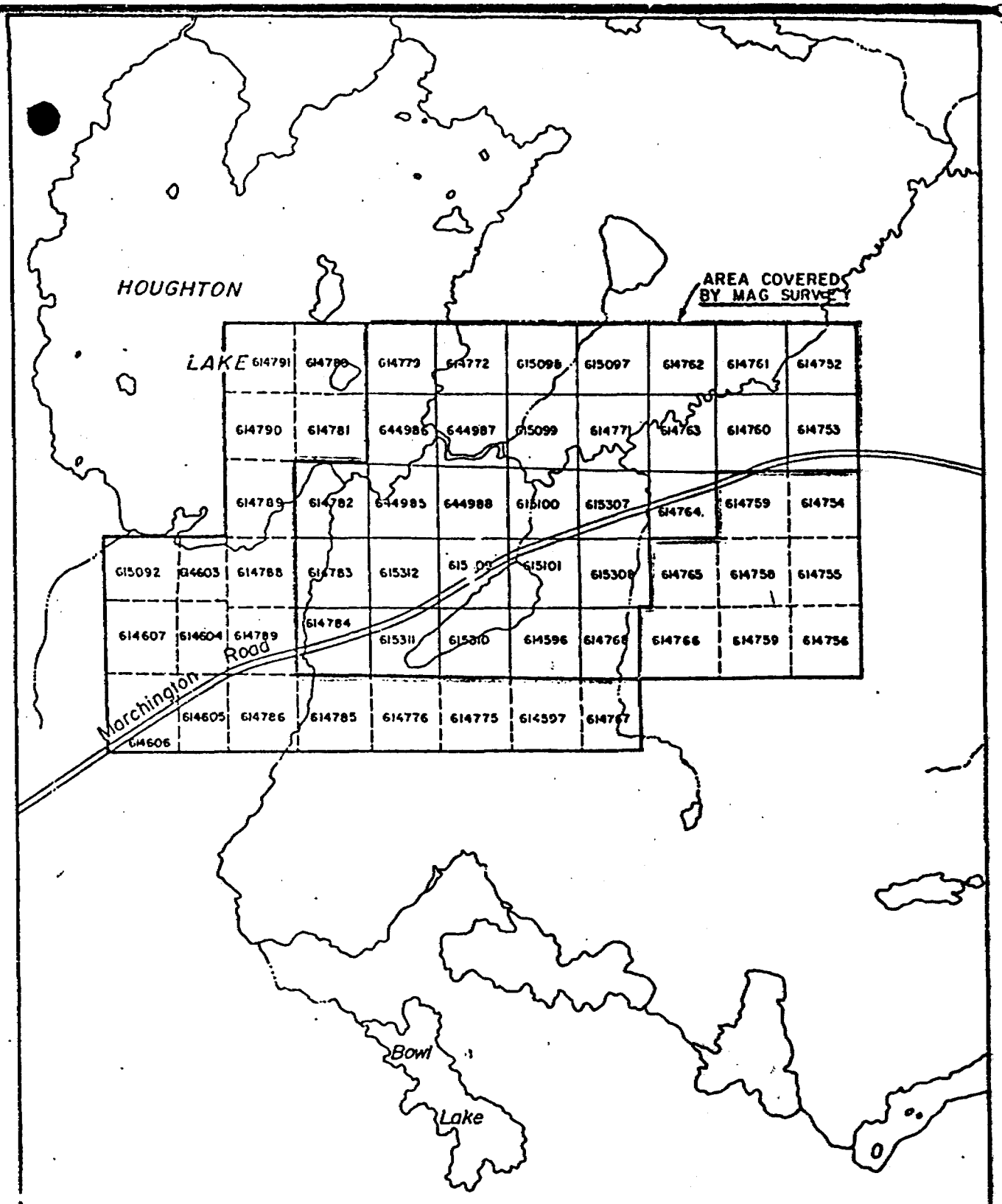

FIG.: 6

Location Map
UMEX AREA "C"

GEOPHYSICS

A limited amount of geophysics was done on Area C during 1982.

In April approximately 3 line miles of Max-Min II was run in the area of Champagne Lake (see Map 6). This was done to detail an area where several anomalies had been outlined by previous Umex geophysics. Comparison of 1777 Hz and 444 Hz profiles indicates that the anomalies are mainly due to lake bottom sediments. Additional fluctuation is probably also caused by rapid elevation variations at the south side of the lake. No significant conductors are interpreted to be present.

At the same time 3 lines were also run across the DEEPEM conductor north of the Marchington Road crossing lines 36E and 40E. No response was obtained. This would suggest that the conductor is beyond the depth capabilities of the Max-Min II.

In July, 16.7 miles of magnetometer survey were run over a portion of the grid (Map 7). The principal objective was to aid in geological interpretation. The main conclusion that can be reached is that the intrusive phases around and to the south of the Marchington Road, characterized by relatively low values of magnetic susceptibility and little relief, give way to more magnetic and noisier volcanics and/or sediments along an E-W contact in the vicinity of the Houghton Creek. NE-SW trending features cutting both intrusive and extrusive rocks are interpreted as late (mafic?) dykes. A slight magnetic high on line 36E at 9N coincides well with the pyrrhotite-pyrite zone drilled by UMC-1 and 2.

GEOCHEMISTRY (Maps 8, 9 and 10)

General

Bedrock sampling for geochemical purposes was carried out on all grid lines, samples being taken every 100' where outcrop was available. These data were supplemented by samples taken in 1981. All samples were analysed for copper, zinc and soda and the values plotted at 1" = 400' to overlie the geology map.

Interpretation

No attempt was made to contour or statistically analyze the data due to poor distribution, lack of extrusive rock types and problems of positive identification of hornfelsed rock. Consequently the choice of 'normal' and 'anomalous' as descriptive terms is somewhat subjective. However, it may be surmized that the abundance of trace metal values greater than 100 ppm and soda values less than 2% which occur around the northern and western margin of the quartz-feldspar porphyry (NE of Champagne Lake) is anomalous.

Elsewhere, within the various intrusive rocks, occasional single point anomalies can be noted, but overall there are considered to be no significant patterns.

GEOLOGY (Map 11)

General

The geology of Area C is extremely complex due to the assimilative nature of the several intrusive phases and due to a lack of outcrop throughout a large portion of the area.

Approximately 50% of the area mapped is underlain by mafic to felsic batholithic phases, 10-20% by porphyritic phases interpreted to be subvolcanic and only 30% by volcanic rocks and associated sediments.

Extrusive Rocks

Most of the non-intrusive rocks lie in the north and central parts of the claim block. To a large extent these are interpreted from mag. data since outcrop is almost totally lacking. Of the available outcrops the majority are hornfels lying at, or close to, the contact with intrusions. In these, primary textures and even primary composition are usually difficult to determine, which probably accounts for the apparent heterogeneity. Those textures that were observed indicated mainly pyroclastic flows, often with pumice fragments, and associated debris flows. A crowding of welded juvenile (pumice) fragments at the base of flows in one outcrop at the side of a logging road infers a subaerial deposition. This is supported by evidence found north and east of the property.

Intrusive Rocks

The oldest of the intrusive phases is quartz-feldspar and felspar porphyry. (In places where shearing has destroyed the feldspar this also appears as purely quartz-porphyry.) Due to the relationships with other rocks in the area and the general appearance, it is interpreted to be subvolcanic in nature. It is generally massive, often partially granitized and may contain xenoliths of original country rock. The similarity to porphyritic rocks of extrusive nature in the area suggests this as their source.

Batholithic phases range from granite to gabbro/diorite in composition. At least in part, this heterogeneity is attributed

to assimilation of country rock.

Structure

Because of the lack of outcrop and intrusive relationships of many of the rock types, little can be said about the structure of the area. Where apparent, strikes varied from NE-SW and ESE-WNW and dips from 70°S to 70°N. Foliations are quite variable with an overall E-W trend. Most evidence in the region indicates that stratigraphic tops are north.

Economic Geology

Numerous occurrences of copper (± silver) mineralization have been found in the map area. Invariably, these appear to be vein type. Host rocks are usually the intrusive phases which presumably fractured more readily than the volcanic rocks during formation. There is no evidence to suggest that any may be continuous enough to develop economic tonnages.

One possible exception to the vein-type scenario is the semi-massive pyrite-pyrrhotite intersected in drill holes UMC-1,2 (cf. Diamond Drilling). Although hornfelsed beyond recognition of primary nature, it is possible that this was an original sulphide horizon.

No evidence of alteration which might be related to an ore-forming system was found on the property.

DIAMOND DRILLING

A total of 1011' of diamond drilling in two holes was carried out in Area C during 1982. This was designed to test a DEEPEM conductor discovered during a survey to follow up a previously unlocated Input anomaly.

The locations of the drill holes were as follows:

UMC-1	6+20N 36+00E	-45° Grid N (335°)	410'
UMC-2	5+00N 38+00E	-60° Grid N	601'

[see Map 11, sections (Figures 7 and 8) and logs;(Appendix 2)]

In both cases sulphides were intersected within hornfels. Both holes started in granite and ended in granitized rock. The intersection in UMC-1 consisted of 30% po, 5% py and a trace of cp as a semi-massive zone over 0.8 feet. That in UMC-2 was very similar with 12% po, 3% py and trace of cp spread over 12.7'.

The primary nature of the hornfelsed block is very hard to determine. Some was undoubtedly original quartz porphyry, but in other parts an almost sediment-like bedding could be discerned. It is thus quite possible that the sulphides represent some relict horizon, but other possibilities such as a vein or a mineralized shear zone cannot be ruled out.

CONCLUSIONS

The potential for volcanogenic massive sulphide mineralization in Area C is obviously limited by the abundance of intrusive rock present. Outwith the intrusive complex the evidence indicates a volcanic environment which was probably, at least locally, subaerial in nature.

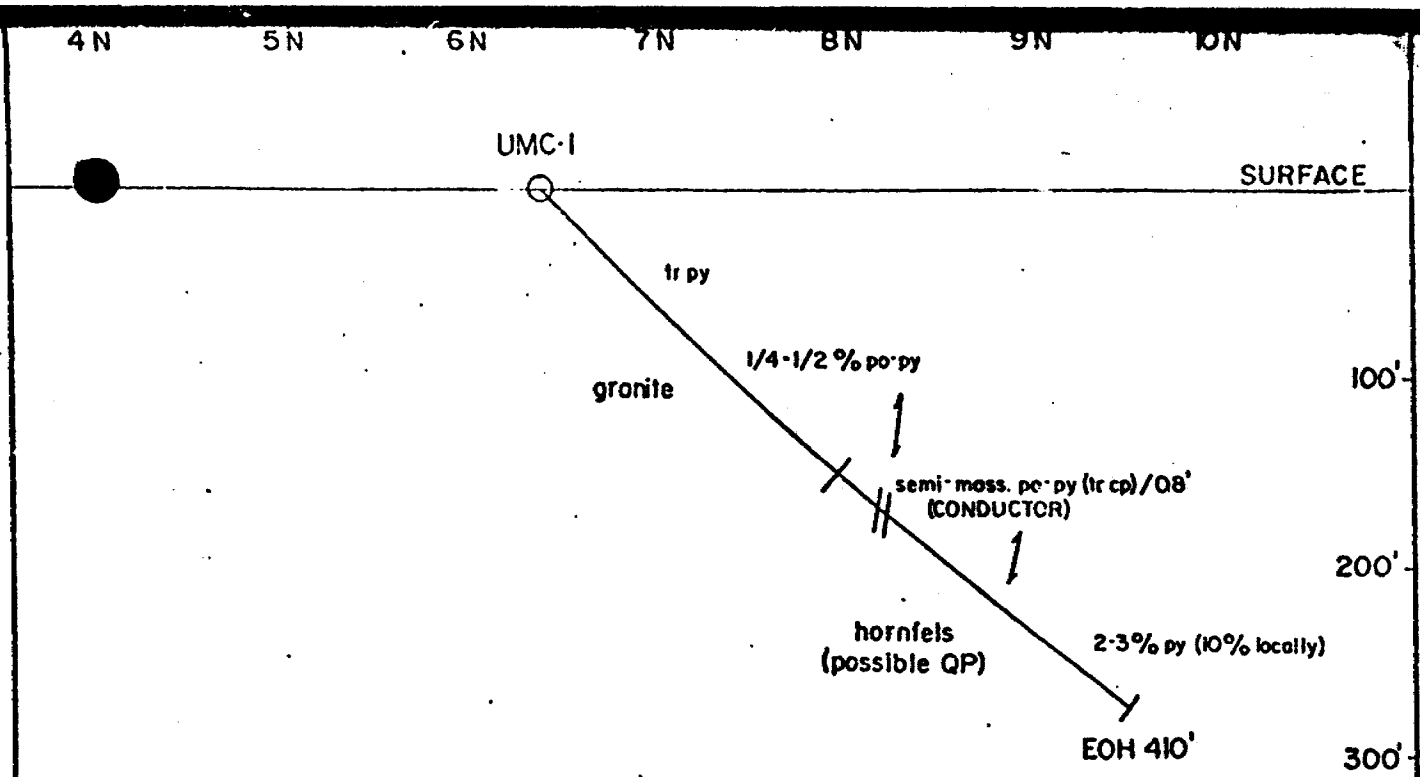

FIG. : 7

CORPORATION FALCONBRIDGE COPPER	
UMEX AREA "C" LINE 36 E 0 1:1200 100 feet	
DATE: NOV. 1982	NTS REF: 52/G-7

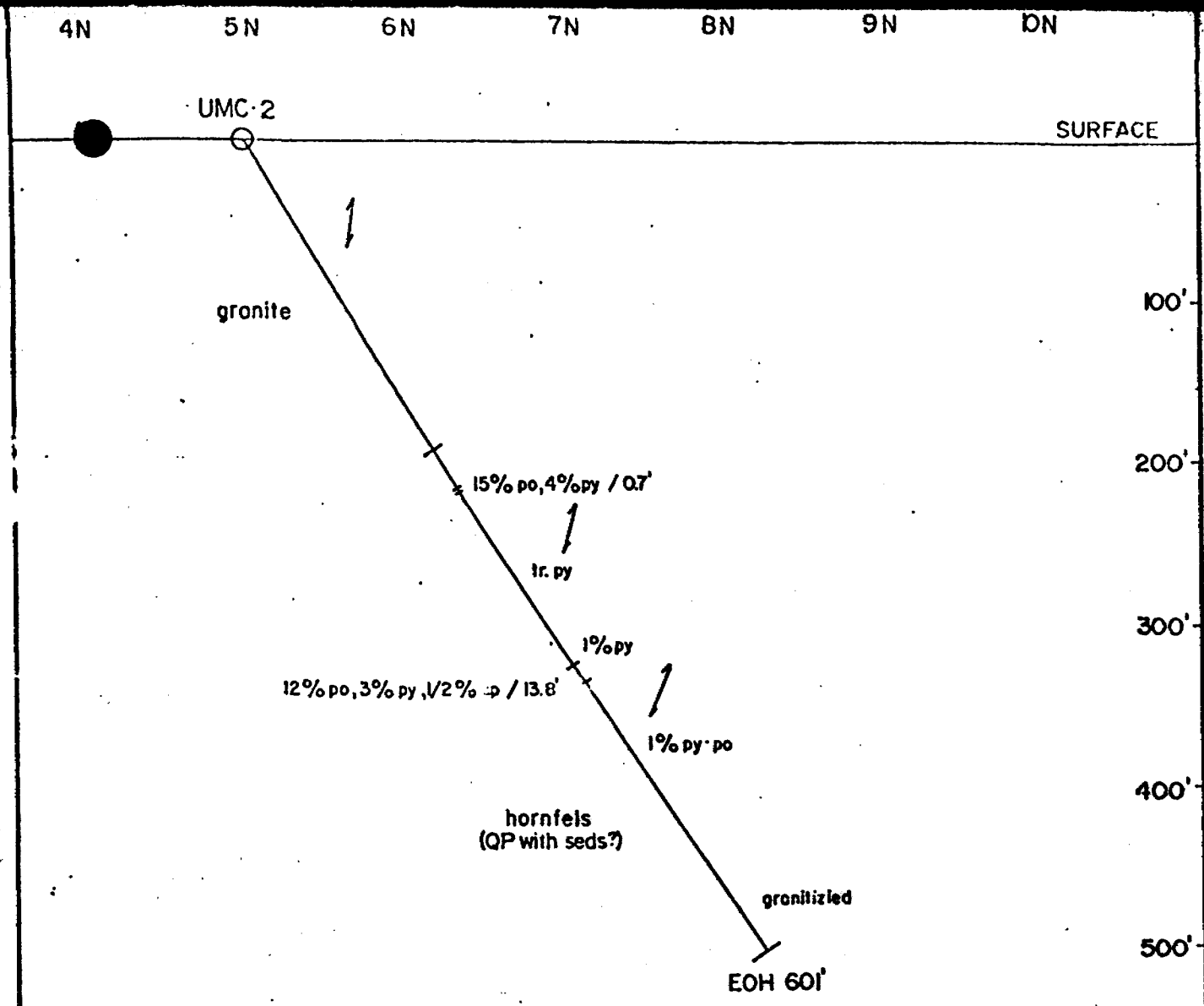

FIG.: 8

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UMEX AREA "C"
LINE 38 E

0 1:1200 100
feet

DATE: NOV. 1982

NTS REF: 52/G-7

A geochemically anomalous zone surrounding the QFP in the east-central part of the area was examined closely on the ground. It is concluded that the anomaly results from metasomatic activity on the margins of the intrusion which caused local concentration of sulphides and breakdown of feldspar. Although such a process is likely to occur in the root zone or base of a hydrothermal system, no evidence was found to indicate that such a system existed.

Numerous vein-type sulphide occurrences have been noted during the exploration of this property. These, too, are probably related to metasomatic activity during intrusion and tectonism. No evidence has been found to suggest that these might prove extensive enough to be economic, nor is there any indication that precious metal values (specifically Au) might be significant. Thus there is considered to be little or no potential for vein type deposits.

There remains limited potential in the northern part of the property where extensive overburden cover precludes adequate geological interpretation. An airborne (Input) survey flown by Umex failed to produce any bona fide bedrock conductors, therefore any further ground geophysics would be on a blind basis and should be assigned very low priority.

RECOMMENDATIONS

No further work is recommended for Umex Area C.

APPENDIX I

DIAMOND DRILL LOGS UM-1 TO UM-4

CORPORATION FALCONBRIDGE COPPER

CLAIM 391285/391003

DRILL HOLE RECORD

☐ METRIC UNITS ☒ IMPERIAL UNITS

HOLE NUMBER	LAT.	DEP	ELEV.	COLLAR BRNG.	COLLAR DIP	HOLE SIZE	FINAL DEPTH
UM-1-82	9 + 50S *	1E	Surface	335°T	-70°	AQ	800'

PROJECT	LOCATION	PURPOSE	DATE STARTED / DATE COMPLETED	CONTRACTOR / CORE STORAGE	CASING
PN043	Marchington Road - South Zone	Extend South Zone	Aug. 3/82 / Aug. 10/82	St. Lambert / S.L.M.	Left in hole.

ACID TESTS 100' = 66°; 200' = 65½°; 300' = 63°; 400' = 62½°; 500' = 59°; 600' = 56½°; 700' = 55½°; 800' = 53°

TROPARI TESTS 785' 334½T, -56°

MAGNETIC SURVEY ☐ MULTISHOT SURVEY ☐

FROM / TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
0 to 6	Casing			Overburden	(foliations)			
6 to 117.3	Dacitic Intrusive	Light-dark grey	fg-mg	Uniform, homogeneous fine to locally medium grained intrusive consisting of quartz, feldspar, biotite and garnet. Biotite pervasively finely disseminated with occasional clots or flecks up to ¼". Garnet up to ¼" and pervasive 1-2%	28 = 35° 52 = 40° 75 = 35S°	Local zones of predominantly sericitic alteration as described below: 22.3-30.1: weak to moderate sericite - staurolite 30.1-48: Local zones of sil-ep(-chl-ser) alteration ~80-117.3: Diffuse patches and bands of ser-sil alteration. Only weakly-moderately developed. Bio-garnet do not disappear 93-94: staurolite present with bio-garnet-ser.	Occasional trace py-po associated with biotite. 22.3-30.1: ~1% py-(po) diss'd and in thin seams. Occ. py-po.	

* On UMEX original grid (by which the sections are plotted) 9 + 30S

HOLE NO. UM-1-82

APPROVED BY Ian D. Pirie

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
117.3 to 133.2	Andesitic intrusive (cg amphibole bearing)	Grey to green	fg-cg	Contact sharp, slightly irregular @ 68-70° to CA. Qtz-feldspar-biotite-amphibole bearing phase. Amphibole 'spots' are pervasive but show up best in local quartzose zones. These were probably quartz-chlorite zones originally (veins?)		--	None	
133.2 to 134.4	Mixed zone of dacitic & andesitic intrusives	Grey-green	fg-mg	Mixture of previous two intrusive phases with several weak possible contacts				
134.4 to 138.5	Dacitic intrusive			As 6 - 117.3		Moderate diss'd staurolite	Trace-1% py with biotite	
138.5 to 155	Andesitic intrusive (cg amph-bearing)			As 117.3 - 133.2 Bottom contact marked by two qtz-amph-diopside veins.				
155 to E.O.H.	Dacitic intrusive			As 6 - 117.3 but not quite so homogeneous. Garnets vary from 1/10" up to 1/2" across and locally up to 25% over short (3-4") sections. (avg = 3-4%) Some are surrounded by bleached halos. Sericite is almost pervasive though rarely very strong. (biotite-garnet is pervasive also)	174-42° 193-41°	159-161: 4-5% fine staurolite 172-174: Silicified fractured zone	159.5: thin veinlet of po-py-cp	187.4-187.9: qtz-actinolite-diop-biotite vein.

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
155 to E.O.H. (cont'd)					219-44°	206-207: 1-2% fine staurolite	199.5-199.8: 3-4% finely diss'd po-py (cp-sp) in garnetiferous zone.	
					240-45°		248.1-257.0: MINERALIZED ZONE Weakly disseminated to semi-massive (over <1") stringer like sulphides. Best sections invariably have accompanying quartz vein material. Core angles vary from 20 - 60° Broken Down Thus: 248.1-249.2: 5% cp, 2% py-po, trace sp. 249.2-250.8: ½% cp, ½% py-po, ½% sp. 250.8-252.6: 5.4% cp, 2.9% py-po, 0.75% sp. 252.6-253.25: trace-½% cp-sp-py-po. 253.25-256.95: 9.35% cp, 5.6% py-po, 1.7% sp, 0.34% gn. (2.8') 1% cp, 1% py-po, trace sp, trace gn (0.9') (2 samples accidently combined during splitting) AVERAGE: / 8.9' 4.91 cp, 0.75% sp, 0.1% gn	
					262-40°			

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	[illegible]	[illegible]
155 to E.O.H. (cont'd)				From ≈ 315' intrusive becomes more uniform again with only very weak sericite pervasive 1-2% gt, diss'd and small flecks of biotite Foliation very weak 347-450: (approx. gradual changes) Vague feldspar porphyritic zones (sillimanite?). Fsp usually about 1/10" diameter. Intrusive very dark, biotitic. Occ. ½% magnetite. Few if any garnets in many parts. 389-391: Silicified-epidotized (-sericitic) fracture zone with minor tectonic breccia. Thin sil-ep fractures surround this as do a few qtz-amph (light green) zones. 477.5-503.35: MINERALIZED ZONE Strongly sericitic zone associated with recrystallized sugary, quartz-muscovite (sericite) veins	342-52° 361-55° 466-50°	445: Diopside epidote assoc. with a fracture. Becomes gradually more sericitic towards mineralized zone. Extreme sericite associated with mineralization except 492.4-495 which has only wea' ser.	257.[illegible]: Occ. isolated veinlets of py+po+cp+sp+gn, (not concentrated sufficiently to warrant assaying) Occ. py-po. 352.8-353.3: 20% cp, 5% sp, 2% gn, 15% po in 3 thin veins ∅ ≈60° to CA. 477.5-478.6: tr cp, 3/4% sp, 3/4% py-po 478.6-479.65: tr cp, 5.8% sp, 3.8% gn, 0.4% py-po 479.65-483.05: 10% cp, 8% sp, 1.6% gn, 0.4% py-po 483.05-486.50: 1% cp, tr sp, 1% gn 486.50-489.35: 0.6% cp, 0.45% sp, 0.15% gn, 0.3% po-py	
	Dacite (-rhyod.) intrusive							

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
155 to E.O.H. (cont'd)					509-30° (sericitic band) 545-54° 579-45°	Bands of moderate sericite are common to ~570'. Most notably 547-549.5	489.35-492.40: 0.1% cp, 0.5% sp, 0.4% py-po 492.40-495.0: Nil Sulphides 495.0-497.8: 1.5% cp, 0.16% sp, 0.42% py-po 497.8-501.05: 3% cp, 0.05% sp, 2% py-po 501.05-503.35: 2.72% cp, 0.2% sp, tr gn, 1% py-po AVERAGE: 1.33% cp, 0.79% sp, 0.39% gn Best mineralization is generally in the quartz veins but thin bands may occur in sericitic zones. No one zone is massive enough to be a good conductor but many of the veins may be consistent enough to produce weak anomalies.	

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
155 to E.O.H. (cont'd)				Beyond 570 to the end of the hole, the intrusive is once again quite homogeneous, mainly qtz-feldspar, biotite, the latter occasionally occuring as small lenses. Foliation is weak to moderate. Garnet is a common accessory though less prevalent than higher in the hole. Sericitic zones occur as indicated under alteration. Very occasional weak zones of feldspar phenocrysts occur.	618-53°	607-621: Moderate sericite but biotite preserved as flecks and lenses. Contacts gradational. No well developed qtz vein associated but several thin veinlets.	Occ. trace py associated with qtz-amph veinlets or as thin seams.	Average of one qtz-amph (± biot veinlet or thin vein every 10'. Usually has slight bleaching (ser-qtz) around it emulating mineralized veins. Occ. trace py (-cp).
						Mod-strong sericite. Upper contact is gradational. Lower one sharp but irregular	685.85-689.5: Weakly mineralized qtz-veins in sericitic zone ≈3% sulph overall (1.8% sp, 0.3% cp, 0.9% py) est. 0.7-1% Zn, 0.1% Cu.	
					697-62°			
						734.5-735: Mod-strong sericite.		
					766-63°			
						780-E.O.H.: Several zones of weak to moderate sericite		
					798-50-55° (sericitic zone)		799.5: Trace-1% py in qtz veinlet.	
800	END OF HOLE							

Cu Zn %Cu Zn PB AG Au

ASSAY SHEET

Sample Number	From	To	Estimate Cu	Estimate Zn	Length	% Cu	% Zn	% Pb	oz Ag	oz Au	% SO_4	% CO_3	% MnO	% MgO	% Fe	ppm Cu	ppm Zn	ppm Pb	ppm Ni				
TBD 1572	243.1	248.1	NIL		5.0	.01	.019	.004	.03	.001													
1573	248.1	249.2	1.5	tr	1.1	.993	.189	.127	2.58	.028													
1574	249.2	250.8	.15	.1	1.6	.225	.089	.078	.52	.005													
1575	250.8	252.6	1.8	0.3	1.8	2.10	.69	.059	3.02	.028													
1576	252.6	253.25	tr	tr	0.65	.121	.077	.025	.41	.001													
* 1577	253.25	256.95			3.7	1.23	.53	.10	.40	.045													
1578	256.95	261.95	NIL		5.0	.071	.035	.081	.93	.020													
1579	352.8	353.3	$\beta_{(1)}$ - $\beta_{(2)}$		0.5	2.12	.92	1.76	2.09	.013													
1580	472.5	477.5	NIL		5.0	.026	.066	.13	.72	.001													
1581	477.5	478.6	tr	0.3	1.1	.016	.17	.022	.05	.001													
1582	478.6	479.65	tr	3	1.05	.018	1.48	.47	.33	.001													
1583	479.65	483.05	-	0.6	3.4	.009	.054	.033	.04	.001													
1584	483.05	484.05	4	4	1.0	1.63	0.36	.65	.50	.007													
1585	484.05	486.50	.35	tr	2.45	.071	.049	.031	.30	.001													
1586	486.50	489.35	.2	.2	2.85	1.22	.10	.036	.38	.001													
1587	489.35	492.4	.03	.2	3.05	0.18	.27	.045	.34	.001													
1588	492.4	495.0	NIL		2.6	.016	.046	.010	.03	.001													
1589	495.0	497.8	.5	.07	2.8	.21	.10	.018	.29	.001													
* See log for estimates. Actually two samples combined.																							

HOLE NO UM-1-82

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% Cu Zn Pb Ag Au ASSAY SHEET

Sample Number	From	To	Estimate Cu	Estimate Zn	Length	% Cu	% Zn	% Pb	oz. Ag	oz. Au	% SiO_2	% TiO_2	% MnO	% MgO	% Fe	PPM Cu	PPM Zn	PPM Pb	PPM Mn				
TBD 1590	497.8	501.5	1	tr	3.25	0.68	0.083	0.006	0.80	0.002													
1591	501.5	503.35	.9	.1	2.3	1.20	0.18	0.004	1.03	0.003													
1592	503.35	508.35	mi		5.0	0.011	0.022	0.004	0.02	0.001													
AVERAGES:																							
	248.1	256.95			8.85	1.11	0.41	0.09	1.23	0.029													
	483.05	489.35			6.30	0.84	0.60	0.13	0.37	0.002													
	483.05	503.35			20.3	0.56	0.28	0.05	0.45	0.0017													
TBD 1600	93	103			10																		
1601	196	206			10																		
1602	295	305			10																		
1603	393	403			10																		
1604	511	521			10																		
1605	594	604			10																		
1606	692	702			10																		
1607	790	800			10																		

HOLE NO. UM-1-82

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CLAIM 391283

DRILL HOLE RECORD

☐ METRIC UNITS ☒ IMPERIAL UNITS

HOLE NUMBER	LAT.	DEP.	ELEV.	COLLAR BRNG.	COLLAR DIP	HOLE SIZE	FINAL DEPTH
UM-2-82	3 + 20S *	5 + 20E *	Surface	335°T	-55°	AQ	600'

PROJECT	LOCATION	PURPOSE	DATE STARTED / COMPLETED	CONTRACTOR / CORE STORAGE
PN043	Adjacent to Marchington Road	Test for split in main & down dip Sal6	Aug. 6/82 / Aug. 10/82	St. Lambert / S.L.H. Casing Left in hole.

ACID TESTS 100' = 50°; 200' = 47°; 300' = 46°; 400' = 46°; 500' = 43½°; 600' = 41°.

PROPANE TESTS None

PLANE OF SURVEY & MAGNETIC SURVEYS

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
0 to 4	Casing							
4 to 55.5	Intrusion or sediment	Light grey generally	fg-cg	Heterogeneous qtz-fp-bio rock with numerous qtz-amphibole veinlets and zones, some with diopside. Biotite varies in content, generally defining a moderate foliation. Occ fine white speckling (feldspar?). Occ. zones almost in situ breccia like. (similar seen on surface)	25'=60° 50'=60°	Qtz-amph-diop develops along fractures.	Pervasive py (tr po, cp rarely) varying from <1% up to 5% locally, averaging 1-2%. Variation best seen in outcrop by degree of rusting.	No direct evidence for a sedimentary origin. Probably just a very dirty intrusive, i.e. one which has assimilated considerable quantities of country rock. Dacitic in composition.
55.5 to 66.5	CG Amphibole rich intrusion or sediment	Grey-green (mottled)	fg-cg	More pervasively cg amphibole bearing but otherwise identical to above.		As above.	¼-1% py (po, cp rarely)	
66.5 to 86.0	Dacitic intrusion or sediment			As 6-55.5. Numerous quartzose zones which might indicate original sedimentary bedding or may just be remnant veins	74'=55°		Pervasive 2-5% py (occ po-cp) 84': Trace sp with py-po in dark qtz vein.	

* 3 + 00S, 5 + 00E on UMEX original grid

UM-2-82

Ian D. Pirie

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
				84.4-85.0: Diffuse qtz-fp-tourmaline? zone				
85.0 to 102.3	CG Amphibole bearing intrusion or sed.			As 55.5-66.5	94°-57°		Pervasive 2% py.	
102.3 to 189	Dacitic intrusion or sediment			As 6-55.5				
				110-140: Numerous fracture zones where core is badly broken. Usually associated with pale pink, qtzose (± hm) alteration. Probably minor fault zones	121°-57°			
				Overall becoming more homogeneous, still with occasional qtz-amphibole± bio veins and veinlets but less numerous than before.	149.5-59°	Occ. thin sericitic zones	Still pervasive and as thin seams. Almost entirely pyrite. Average 2-3% but locally 4-5%.	
				Becoming increasingly biotitic though garnets are rare.	173°-57°			
189 to 195	Sericitic, weakly qtz-porphyritic intrusive	Light grey-cream	fg-mg	Vague zone but contacts reasonably sharp at 63° and 64° (top and bottom).				Possibly equivalent of banded dyke on surface ??
				Bands of more and less sericitic content with very small (½mm - 1mm) vague qtz-eyes up to 30% of rock. (May just be recrystallized quartz) Biotite still present defining a weak foliation.	194°-62°			

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
195 to 202.9	Dacitic intrusion or sediment			As 102.3 - 189 Fairly strong, qtz-ep-diop-amph vein from ≈ 196-197				
202.9 to 204.5	Fault zone			Core badly broken and ground. Weak limonitic weathering. Fractured more or less at right angles to core axis.			NIL	
204.5 to E.O.H.	Dacite intrusion			Homogeneous biotitic dacite intrusion occasionally cut by weak quartz veins with sericitic envelopes	205'=50°		208.7-209.2: tr cp, 4% sp, 4% gn, 3% py, tr po in qtz vein	
				Foliation weak to very weak	238'=52°		Pervasive 2-3% disseminated py-po	
				258.5-260: qtz-amph-gt-diop vein with pyrite (3-4% overall)	260'=68°		3-4% py as veinlets within qtz vein.	
				262-263: qtz vein			Trace sp-gn-py	
				Becoming more garnetiferous with depth				
				275-280: Blocky ground				
				Homogeneous, bio-garnet intrusion	302'=59°	290-320: Bands of moderate to strong sericite locally with staurolite and magnetite, associated with qtz-bio-amph-ep (diop?) veins Above zone marks the end of the pervasive py-po. Now only trace locally.	Local veinlets of py-po	

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
					355'=50°	335-387: Numerous moderately sericitic bands		
				388-390: blocky ground.				
					412'=67°			
					422'=70° (fol'n)			
				423.3-446.55:			433.3-434.45: 4½% sp, 2½% gn, 3/4% py-po, tr cp	
				MINERALIZED ZONE	434'=70-80°	Associated bands of moderate sericite, but not as intense as other barren areas.	434.45-439.20: ½% po-py only	
				Veinlets and bands of py-po-sp-cp-gn up to ¼" wide generally in or adjacent to quartz vein material.	(sp-gn veinlet)		439.20-441.85: 1-3/4% cp, 6½% sp, 2% gn, 15% py-po.	
					441'=55-60°	Small zones of biotite-garnet stil preserved.	441.85-444.65: ½% cp, 2.75% sp, 1.75% py-po.	
					446'=60° (sulph bands)		444.65-446.55: 2.2% cp, 8.8% sp, 2.2% gn, 8.8% py-po	
							Average: 433.3 - 446.55 = 0.9% cp, 3.9% sp, 1.06% gn.	
					452'=66°			
					(fol'n)	465-485: Several zones of strong-extreme sericite ± tourmaline seperated by bio-gt bands.	Nil	
				509-511.5: Strong diopside-garnet associated with qtz vein				
							514.8-515.2: 20% py-po, ½% cp, in qtz vein	
					532'=60°			

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
					557'=60°			
						570-E.O.H.: Several wk-moderate sericitic zones with occ. qtz-veins.		
					596'=62°			
600	END OF HOLE							

Cu Zn Pb Ag Au ASSAY SHEET

Sample Number	From	To	Visible Cu	Visible Zn	Width (ft)	% Cu	% Zn	% Pb	oz Ag	oz Au	% SiO_2	% TiO_2	% MnO	% H_2O	% Fe	ppm Cu	ppm Zn	ppm Pb	ppm Ag				
TBD 1595	433.3	434.45		2-2½%	1.15	0.016	3.68	0.52	0.44	0.001													
1596	434.45	439.20			4.75	0.012	0.042	0.02	0.029	0.001													
1597	439.2	441.85	½%	3½%	2.65	0.35	3.45	2.08	1.97	0.003						13.25' / 0.16% Cu, 1.60% Zn, 0.55% Pb, 0.71 oz Ag							
1598	441.85	444.65	.1	1%	2.8	0.13	1.37	0.075	0.40	0.001	7.35' / 0.28%Cu, 2.29% Zn, 0.9%Pb, 1.19 oz Ag												
1599	444.65	446.55	.7	4%	1.9	0.40	2.03	0.47	1.28	0.001													
1626	428.3	433.3			5	0.012	0.024	0.021	0.035	0.001													
1627	446.55	451.55			5	0.012	0.08	0.017	0.035	0.001													
TBD 1608	24	34			10																		
1609	55	65			10																		
1610	156	166			10																		
1611	295	305			10																		
1612	395	405			10																		
1613	498	508			10																		

HOLE NO UM-2-82

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CLAIM 391285

DRILL HOLE RECORD

☐ METRIC UNITS ☒ IMPERIAL UNITS

HOLE NUMBER	LAT.	DEP.	ELEV.	COLLAR BRNG	COLLAR DIP	HOLE SIZE	FINAL DEPTH
UM-3-82	10 + 20S *	L2E	Surface	335°	-80°	AQ	760'

PROJECT	LOCATION	PURPOSE	DATE STARTED / COMPLETED	CONTRACTOR / CORE STORAGE	CASING
PN043	Marchington Road - South Zone	Test South Zone	Aug. 10/82 / Aug. 16/82	St. Lambert / S.L.M.	Left in hole.

ACID TESTS 100' = 78½°; 200' = 76°; 300' = 75°; 400' = 74°; 500' = 73½°; 600' = 71°; 700' = 72°

TROPARI TESTS None

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
0 to 3	Casing							
3 to 121.8	Dacitic intrusive	Dark grey	fg-mg	Quite homogeneous bio-garnet rich intrusive. Garnets up to 3/4" locally and 5-10%. Sometimes accompanied by staurolite. Occasionally cut by qtz±amph ±diopside±garnet veins. Massive to weakly foliated	39'=44° 104'=37°	Occasional thin zones of weak-moderate sericite	Nil - trace	
121.8 to 139	CG amphibole bearing intrusive	grey green	fg-cg	Essentially as above but with pervasive coarse grained amphibole and several qtz-amph veinlets				
139 to 277.5	Dacitic intrusive	Dark-grey to light grey	fg-mg	As 3-121.8, with zones of sil±ser alteration. Staurolite is not uncommon with or instead of garnet	165'=30°	Zones of sil-ser alteration quite common but not individually extensive	Rare trace 250.25-260.8: 6% po, 5% cp, 1% sp, in qtz veins.	

* 10 + 00S on UMEX original grid.

UM-3-82

Ian D. Pirie

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
277.5 to 323	CG amphibole bearing intrusive	Dark grey - green	fg-cg	Still probably dacitic in composition but with vague porphyroblasts of amphibole pervasively disseminated throughout (Note: less obvious than other zones but definitely present) Homogenecus.				
				Top contact sharp @ & marked by qtz vein.	55°			
				Bottom contact sharp @	58°			
				291.5-295.5 and 309-310: non amph-bearing dacite.				
323 to 427	Dacite-rhyodecite intrusive	Light grey	fg	Fairly homogeneous qtz-fp-bio-gt rock although biotite is locally quite concentrated as diffuse zones a few inches or less in diameter (xenoliths?)		Very little. Associated with qtz veinlets where present (sil-ser)		
				Garnet ½-1%, more with stronger bio.				
				Numerous muscovite filled tension gashes	363'=45°			
							383.6: 3/4" vein of semi-massive chalcopyrite	
				Maybe slightly more felsic than intrusious higher in the hole.				
							405-406.1: (B) 2% cp, 3% po in garnet-amph-quartz (diopside) vein	
				Contact marked by qtz-vein @	~30°			

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
427 to 452	Weakly quartz porphyritic rhyodacite intrusive	Light grey	fg-mg	Massive homogeneous phase consisting of angular (squarish) quartz-eyes less than 1/10" dia., occ. feldspar phenocrysts and biotite flecks in a fine grained quartz-feldspar matrix. Occ garnet. Bottom contact sharp @	35°	Weakly to moderately sericitic throughout.	Nil	
452 to E.O.H	Dacitic intrusive	Dark grey - light grey	fg-mg	Less biotite than before. 460-470: Several individual dykes containing various proportions of saussuritized feldspar. Contacts very sharp @ Still very similar to main body of intrusive. 487-517: Fairly fractured zone with numerous qtz±amph ±garnet± diopside veins and alteration patches. From ~480-590 intrusive grades in and out of feldspar prophyritic zones, often exhibiting a mg, granular texture. 556.5-557.5: Strong qtz-diop-amph vein with fg, chloritic, mafic dykelet or fragment.	30-40°	Local siliceous zones	488-490.6: (C) 1.2% cp, 0.8% po assoc. with quartz veins 505: 25% py-cp over ¼" in biotitic/amphibole zone.	

UM-3-82

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FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
452 to E.O.H. (cont'd)				580-675: Quite homogeneous dacite with pervasive bio-garnet 675-693: quartz vein / sericite zone 693.5-E.O.H.: Homogeneous dacite	594'=32° 668'=40° 680'=30° sulph. vlt) 747'=37° NOTE: foliation very weak throughout.	Sharp qtz-sericite. Local light green ?actinolite?	679.15-683.35: (E) ½% cp. 1% sp. 2% gn. ½% py-po. in qtz vein. 683.35-688.5: (F) tr cp. 0.1% sp. 0.4% py-po in sericitic zone 688.5-693.7: (G) 0.15% cp. 0.1% py-po in qtz-amph veins within sericitic zone.	
760	END OF HOLE							

UH-3-82

Cu Zn Pb Ag Au ASSAY SHEET

Sample Number	From	To	Estimate Cu	Estimate Zn	Length (FT)	% Cu	% Zn	% Pb	oz Ag	oz Au													
A) TBD 1621	260.25	260.8	1½	½	0.55	0.51	0.26	0.017	0.64	0.015													
B) 1629	405.0	406.1	0.7		1.1	0.53	0.039	0.008	0.70	0.008													
C) 1630	483.0	490.6	0.4		2.6	0.81	0.059	0.016	0.43	0.003													
D) 1622	675.0	679.15	n	1	4.15	0.012	0.024	0.012	0.035	0.001													
E) 1623	679.15	683.35	0.15	Pb-1½ Zn-3½	4.2	0.13	2.39	1.96	1.88	0.019													
F) 1624	683.35	688.50	tr	0.05	5.15	0.009	0.028	0.025	0.052	0.001													
G) 1625	688.50	693.7	0.05	-	5.2	0.074	0.061	0.016	0.27	0.001													
TBD 1614	92	102			10																		
1615	195	205			10																		
1616	298	308			10																		
1617	391	401			10																		
1618	495	505			10																		
1619	592	602			10																		
1620	695	705			10																		

Hole No. UM-3-82

Page 5

CORPORATION FALCONBRIDGE COPPER

CLAIM Pa391003

DRILL HOLE RECORD

☐ METRIC UNITS
☒ IMPERIAL UNITS

HOLE NUMBER	LAT.	DEP.	ELEV	COLLAR BRNG.	COLLAR DIP	HOLE SIZE	FINAL DEPTH
UM-4-82	11 + 20S *	L6E	Surface	335°T	-80°	AW	900'

PROJECT	LOCATION	PURPOSE	DATE STARTED / COMPLETED	CONTRACTOR / CORE STORAGE	CASING
PH043	Marchington Road - South Zone	Test South Zone	Aug. 11/82 / Aug. 19/82	St. Lambert / S.L.M.	Left in hole.

ACID TESTS 100'=77½°; 200'=76°; 300'=74½°; 400'=73½°; 500'=73°; 600'=72½°; 700'=72°; 800'=71°; 900'=71°.

TROPARI TESTS 500': 330T -76°

FLUXGATE SURVEY ☐ MULTISHOT SURVEY ☐

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
0 to 5	Casing							
5 to 6.5	Boulders			Various exotic boulders. Mainly granitic.				
6.5 to 8.5	CG amphibole bearing intrusive	Dark grey-green	fg-cg	Andesitic to dacitic, as described in UM-1 & 3. Massive.				
8.5 to 169.4	Quartz (feldspar) porphyritic dacite intrusion	Dark grey	fg-mg	Massive to weakly foliated biotite-garnet rich dacite intrusion with distinct pale blue milky quartz eyes up to 1/8" diameter and up to 3% locally (average ~1%) 99.5-101.5: qtz-diopside-amph vein 119: grades into a crowded feldspar porphyritic phase with, in places, greater than 50% feld. phenos. up to 1/4" across. Quartz phenos still locally present.	82°=55°	8.5-31: Moderate fracturing with sil-ep alteration obscuring qtz-eyes. 127-162: Moderate qtz-ep-amph (chl) alteration assoc. with numerous fractures.	Rare cube of pyrite Trace pyrite	

* 11 + 00S on UMEX original grid.

UM-4-82

Ian D. Pirie

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FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
313 to 420	Dacitic intrusion	Light grey - dark grey	fg	Less homogeneous without obvious feldspar or quartz phenocrysts except locally. Numerous quartz ± amph ± diop veins and veinlets with accompanying sericitic alteration. Locally biotite flecked with pervasive 1% garnet up to 3/8". Weakly foliated. 383.5-386.5: Strong, barren, qtz-diopside vein. About 420' feldspar phenos begin to be apparent (ccc. qtz)	375'=34°	Local weak-moderate sericite-silica.		
420 to 583	F(Q)P dacite intrusion			Gradual increase in amount of feldspar and quartz phenos up to ~30% (<1% qtz) In areas these fade out to almost nothing and in other areas they are very pronounced. One feldspar is 1" long. Eventually, between about 570 and 583, the phenocrysts fade out and don't reappear.		433-458: Diffuse siliceous zone associated with fracturing. Other short siliceous zones occur	433-458: Less than 1% sulphides overall, locally up to 3%. Traces of very finely disseminated sphalerite and galena but majority is py-po (sampled geochem style)	467-488: Broken core Hematite on fracture planes. Fractures @ 55° 520-521: Badly broken core. Fault zone.

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
169.4 to 181.8	CG amphibole bearing intrusive	Dark grey - green	fg-cg	Distinct dyke. Cuts Q(F)P. Contacts very sharp at 40° to CA. Massive, unaltered.				
181.8 to 185	F(Q)P intrusion			As previously described.				
185 to 188	CG amphibole bearing intrusion			As 169.4 to 181.8 Contacts sharp at 65° (top) and 70° (bottom)				
188 to 234	F(Q)P intrusion			Still occasional qtz ± amph ± diop veins but intrusion is "tight" with little wallrock alteration. Massive Contact diffuse			Trace py in veins.	
234 to 253	CG amphibole bearing intrusion			As 185 to 188 Bottom contact sharp at 65° to CA.				
253 to 313	F(Q)P			Still massive, crowded with feldspar phenos. Contact gradational over ~3'		Weak sil ± ep (± ser) along fracture	Occ.-trace cubic py.	

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
583 to E.O.H.	Dacite - rhyodacite intrusion	Medium grey	fg	Homogeneous dacite. Massive to weakly foliated with biotite flecks and local lenses and up to 3% garnet (average 1%).	592'=27°	Local sericitic and/or siliceous zones.		
				Typical intrusion found in UM-1 & UM-3.	669'=28°		675.0-675.5: 3% disseminated cp in qtz-diopside vein.	
				737-738.5: strong qtz-amph-diop-garnet vein. Barren.		Slight increase in sericite from ~815 to end of hole.		
				Occ vague feldspar phenocrysts are present but insufficient to call it FP.	792'=28°			
				848.2-850.0: strong qtz-diop vein @ ———	27°		848.2-850.0: trace sphalerite in strong qtz-diopside vein.	
					861'=30°			Porphyritic phase is distinctly different from anything found in UM-1 or 3.
900	END OF HOLE							

UM-4-82

%Cu Zn Pb Ag Au ASSAY SHEET

Sample Number	From	To	Estimate Cu	Estimate Zn	Length (ft.)	% Cu	% Zn	% Pb	oz Ag	oz Au	% SiO_2	% Fe_2O_3	% CaO	% MgO	% P_2O_5	ppm Cu	ppm Zn	ppm Pb	ppm Ag	COMMENTS
TBD 1631	433	458	-	tr	25.0	0.008	0.008	0.006	0.017	0.001										← Sampled geochem style. 2" every 2'
1632	675.0	675.5	1%		0.5	0.38	0.031	0.008	0.46	0.008										
1633	848.2	850.0	-	tr	1.8	0.008	0.093	0.008	0.014	0.001										
TBD 1634	101	111			10															
1635	294	304			10															
1636	493	503			10															
1637	596	606			10															
1638	693	703			10															
1639	791	801			10															
1640	890	900			10															

UM-4-82

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SAMPLE	SIO2	AL203	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
TBD1600	70.0	15.9	2.63	0.95	2.79	2.29	3.78	0.07	0.36	0.09	0.01	1.08	99.9
TBD1601	66.1	17.0	2.59	1.46	2.92	2.44	6.02	0.13	0.42	0.09	0.01	1.16	100.3
TBD1602	67.8	15.4	3.08	1.49	3.38	1.87	4.75	0.13	0.39	0.08	0.01	0.93	99.4
TBD1603	64.7	16.4	3.92	2.14	4.49	1.28	4.75	0.10	0.40	0.08	0.01	1.54	99.8
TBD1604	67.4	15.4	3.54	1.76	3.02	2.07	4.86	0.20	0.36	0.08	0.01	0.93	99.7
TBD1605	66.2	16.6	4.34	1.59	3.46	2.07	4.49	0.11	0.40	0.09	0.01	0.54	100.0
TBD1606	66.0	16.3	5.26	1.72	1.29	2.99	4.73	0.11	0.43	0.08	0.01	0.85	99.8
TBD1607	68.1	16.6	3.74	0.99	1.97	3.12	3.90	0.11	0.38	0.09	0.01	1.39	100.5
TBD1608	63.0	17.2	5.52	2.27	2.26	2.46	5.19	0.10	0.53	0.10	0.01	0.85	99.5
TBD1609	55.2	16.5	8.79	4.54	2.50	1.41	8.77	0.18	0.75	0.18	0.02	0.85	99.7
TBD1610	64.3	15.8	4.13	2.52	2.76	2.01	5.68	0.05	0.44	0.08	0.01	2.16	100.0
TBD1611	72.6	14.8	1.21	1.00	0.93	3.32	3.49	0.04	0.42	0.08	0.01	1.85	99.8
TBD1612	65.9	15.9	4.40	2.16	2.73	2.20	4.72	0.22	0.44	0.08	0.01	1.00	99.8
TBD1613	64.8	16.6	5.56	2.32	1.55	2.79	4.56	0.17	[illegible]39	0.08	0.01	0.85	99.8
TBD1614	68.2	16.9	2.31	1.20	3.04	2.57	3.66	0.07	0.41	0.09	0.01	1.47	99.5
TBD1615	67.4	16.7	3.04	1.38	4.34	1.87	3.52	0.08	0.38	0.08	0.01	1.16	100.0
TBD1616	56.7	16.3	6.31	5.07	3.36	1.12	8.44	0.13	0.75	0.18	0.02	1.00	99.3
TBD1617	66.3	15.4	3.30	2.19	2.94	2.19	6.21	0.16	0.37	0.08	0.01	0.70	99.5
TBD1618	74.1	12.5	2.10	0.68	3.74	1.83	3.29	0.05	0.24	0.04	0.01	0.62	99.2
TBD1619	66.8	17.4	2.69	1.02	4.01	2.52	4.45	0.06	0.39	0.08	0.01	0.93	100.4
TBD1620	66.1	15.5	4.68	2.18	1.51	2.59	5.09	0.17	0.44	0.08	0.01	1.31	99.7
TBD1634	64.8	16.8	5.60	2.24	2.81	1.74	4.38	0.09	0.39	0.07	0.01	1.08	100.1
TBD1635	63.9	17.2	4.52	2.13	4.42	1.83	4.28	0.06	0.39	0.07	0.01	0.93	99.8
TBD1636	65.0	16.8	4.50	2.03	4.13	1.68	4.48	0.06	0.37	0.06	0.01	0.85	100.0
TBD1637	64.0	17.1	5.58	2.18	2.79	1.98	4.50	0.06	0.38	0.07	0.01	0.85	99.4
TBD1638	64.7	16.3	3.65	2.45	3.22	2.06	5.78	0.15	0.41	0.07	0.01	0.85	99.4
TBD1639	68.6	15.4	3.69	1.66	3.69	1.59	3.55	0.12	0.35	0.08	0.01	0.85	99.
TBD1640	67.5	16.0	4.07	1.07	2.03	2.64	4.04	0.10	0.38	0.08	0.01	1.31	100.

SAMPLE	RB	SR	ZR
TBD1600	50	250	80
TBD1601	60	180	90
TBD1602	30	160	90
TBD1603	20	250	110
TBD1604	50	150	90
TBD1605	60	140	110
TBD1606	80	170	90
TBD1607	60	160	90
TBD1608	70	220	90
TBD1609	30	220	110
TBD1610	70	170	90
TBD1611	100	90	80
TBD1612	50	130	70
TBD1613	80	190	90
TBD1614	[illegible]	210	100
TBD1[illegible]	40	210	90
TBD1616	10	240	120
TBD1617	40	190	90
TBD1618	40	150	240
TBD1619	70	250	100
TBD1620	60	190	90
TBD1634	40	330	90
TBD1635	40	260	70
TBD1636	30	280	100
TBD1637	60	220	100
TBD1638	50	200	90
TBD1639	30	200	90
TBD1640	60	170	100

X-RAY ASSAY LABORATORIES 24-SEP-82 REPORT 15954 REF. FILE 11596-B4 PA

SAMPLE	CU PPM	ZN PPM
TBD16C0	43	38
TBD16C1	24	60
TBD16C2	130	190
TBD16C3	28	120
TBD16C4	63	25C
TBD16C5	30	190
TBD16C6	45	450
TBD16C7	20	10C
TBD16C8	41	76
TBD16C9	16	23C
TBD161C	51	52
TBD1611	48	100
TBD1612	24	160
TBD1613	28	160
TBD1614	10	31
TBD1615	13	78
TBD1616	10	58
TBD1617	120	24C
TBD1618	94	110
TBD1619	50	130
TBD162C	41	320
TBD1634	27	98
TBD1635	31	10C
TBD1636	34	60
TBD1637	31	14C
TBD1638	67	18C
TBD1639	61	27C
TBD164C	30	140

APPENDIX 2

DIAMOND DRILL LOGS UMC-1 TO UMC-2

Core 61763

CORPORATION FALCONBRIDGE COPPER

DRILL HOLE RECORD

☐ METRIC UNITS ☒ IMPERIAL UNITS

HOLE NUMBER	LAT.	DEP.	ELEV.	COLLAR BRNG.	COLLAR DIP	HOLE SIZE	FINAL DEPTH
UM-C-1-82	6 + 20N	36 + 00E		335° (Grid north)	-45°	BQ	410'

PROJECT	LOCATION	PURPOSE	DATE STARTED / DATE COMPLETED	CONTRACTOR / CORE STORAGE	CASING
PN 043	UMEX-C PROPERTY	Test PEM anomaly	July 24/82 / July 28/82	St. Lambert Drilling / S.L.M.	In hole

ACID TESTS 100' = 43°; 200' = 40½°; 300' = 38½°; 400' = 3.°

TROPARI TESTS

PLANE OF SURVEY ☐ VERTICAL SURVEY ☐

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
0 to 8.95	Casing							
8.95 to 83.4	Granite	Pink	mg-cg up to 3/8"	Granoblastic, massive, 20-30% blue-grey qtz, 20-35% green to black hornblende, 50-60% pink-white Kspar, 5% euhedral ≤ ½" phenocrysts-zoned. Rare patches and segregations of amphibole up to 1" in diameter. Variable along core -% qtz, fsp & amphibole. Minor leucocratic sections (& melanocratic sections) Rare 1-2% amphibolite xenoliths -mg, amphibole 60%, fspar 40% (origin of amphibole patches ?) - partially digested in places. 34.5 - 35.25: Diorite dyke f.g., black qtz diorite, 30% plag, 60-70% amphibole (± biotite), tr-5% qtz. Sharp upper and lower contacts, slightly irregular to minor rafting of adjacent wall rock.	37°	Minor yellow-brown spotting in hornblende	Patches of tr-½% fg diss py associated with hornblende. Average % sulphides = tr.	Hematite &/or siderite staining along late fractures & water seams associated with sulphides

HOLE NO. UM-C-1-82

LOGGED BY David M. Rigg

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FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
				75.0 - 80.0: Granite - grey Similar to main text but with decrease in pink colouration & decrease in grain size of amphibole (to mg<1/8"). Slight increase in blue-grey quartz. Gradational contacts. Patchy.				
83.4 to 132.8	Granite	Light grey	mg	Similar to 8.95 to 83.4 but with only minor pink coloured feldspar. Massive to fg-mg hornblende ≤ 40% disposed evenly throughout. Very weak foliation. Rare qtz veins ¼" barren	@ 41°, 90°, 70° 60°.	Slight saolinitization of fsp & alt'n of hornblende	Minor localized patches, average = tr.	
				87.5 to 88.3: quartz porphyry fg, 40% blue grey quartz, + amph + fsp, mod fol'n. Gradational contacts (?). Lacks much obvious fsp, digested QP. xenolith ?	Fol'n variable -crenulated?		87.0 - 89.6: ¼-½% Po ± Py	
					@ 47-50° →		106.5 - 132.8: fg-mg Po-Py along late hairline fractures in streaks & patches. Locally core up to 3% Py, 1% Po over maximum 3" with minor chlorite associated. Average = ¼ - ½% combined sulphides. Locally in fractures Po>Py	

UM-C-1-82

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
132.8 to 218.0	Granite	Pink	mg-cg	Same as 8.95 to 83.4. Gradational contacts with minor short section of grey granite @ 144.6 to 148.2 195.9: Quartz vein. Massive milky quartz in folded 1" vein with 1% py (-quartz fragment?)	25-30° → 60° → 47° & 124°	→ Minor epidote (green cherty) alt'n of fsp in patches and along late fractures. 30-45% epidote, 70-55% qtz →	Minor dissem Py ± po and minor late fractures with py ± po - rarely with assoc chlorite Average = tr-½%	Minor hematite/± siderite stained fractures
218.0 to 410.0	Hornfels	Dark blue grey to light grey	fg-vfg massive	Predominately, 1-10% blue to milky quartz and milky fspar phenocrysts ? 1/8" to rarely 1/4". Proportions of fsp & qtz vary greatly. In places phenocrysts appear to be rounded to ghostly and may be resorbed into fg, glassy siliceous matrix or alternatively (granitization) growths matrix. Within matrix 5-30% fg ± biot ± hornblende also quite variable along core. Upper contact and towards lower part of hole numerous 2" to 2' dykes of granite similar to above text with associated contacts and patches slightly to strongly granitized - development of larger grain size of alkali fsp, plagioclase & quartz. Some granitized sections with noticeable pink fspar.	Foliation 275' 70° 328' 65° 355' 70° Hematite Veins: 15° 45° 60°, 70° Sulphide Veins: 70°	Granitization near upper contact and near toe of hole (see text) Noticeable silicification possibly throughout. Hematite: occurs along late water seams, very fine fractures and associated in places with disseminated pyrite. Often in 6" to 1" sections up to 3-5% imparting characteristic red colour to core. Also as minor tails (pressure shadow infill) to pyrite crystals with tails extending along foliation.	Sulphide % greater near to granitized contacts of whole unit. ½-3% pyrite, fg-cg, disseminated throughout commonly elongate along foliation or in hairline to 1/8" veins. ½-1% pyrrhotite associated to py. Higher sulphide % appear to coincide with areas of more buff alt'n. Average py & po = ½-1%	Possibly original QP???

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
				Weak to very weak foliation with locally moderate to well-developed fol'n in areas of less intense silicification and slight to moderate buff coloured sericitization (? - similar to QP in HL-10-82)		Sericitization/Recrystallization? Light grey bonded to to massive alt'n of groundmass & in places almost total look of phenocrysts. Gradational contacts. Epidote: minor epidote patches and alt'n along sulphide/hematite veins		
				218.0 - 221.9: granitized gradational contacts & patches of granitic material, 30% unaltered hornfels.	221.9-50°			
				222.1 - 223.0: granite dyke same as 8.95 to 83.4	35°			
				224.1 - 224.4: granite dyke similar to 83.4 - 132.8, minor Q-epidote veining parallel contacts	47°			Several ¼" to 1" fingers of grey granite between 224.4 to 228.1
				228.1 - 228.7: granitized similar to 224.1 to 224.4	35°			QFP noticably biotitic (vfg) and with locally 2% vfg po.
				229.6 - 233.9: granitized patchy to pervasive, similar to 224.1 to 224.4 but with ¼" to 1" veins of epidote alt'n. Gradational contacts.				
				233.9 - 236.0: granite dyke same as 8.95 - 83.4	50°			
				239.8 - 244.0: granitized 40% granite similar to 224. to 224.4				

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
				246.6 - 248.0: granitized 5% patchy granitization, similar to 224.1 to 224.4	60°		249.3 - 250.1: 30% fg Po, 5% fg Py, tr cp. Semi-massive with vein like disseminations along foliation	Conductor Rare milky blue quartz eyes - deformed veins?
				250.1 - 257.8: granitized 60% (grey) granitized similar to 224.1 to 224.4 with 1-2" Q-epidote clots				
				282.6 - 282.8: granitized same as 224.1 to 224.4				
				285.5 - 285.7: mafic dyke fg medium, green, chloritic with biot defining moderate fol'n @ 70° CA	70°		1% dissem py, fg-mg.	
				289.9 - 291.0: mafic dyke similar to 285.5 to 285.7 but with more chlorite & patches of buff alt'n.	70°			
				301.1 - 302.0: mafic dyke similar to 285.5 to 285.7	65°			
				303.0 - 305.1: mafic dyke same as 285.5 to 285.7	60°			
				313.0 - 313.4: quartz vein - milky massive quartz - minor inclusion of epidotized rocks - weakly gradational contacts	55° upper 70° lower			Indicates silic'n of wall rock ?

UM-C-1-82

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FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
				340.1 - 340.6: granitized similar to 8.95 to 83.4 344.7 - 348.1: chloritic breccia, chlorite matr x and bands with angular granitized fragments & buff coloured hornfels. Upper contact gradational. Lower contact possibly faulted in 3" badly brecciated zone. Minor mg amphibole in matrix 348.1 - 349.6: mafic dyke similar to 285.5 to 285.7 349.6 - 355.2: slightly granitized. 30% grey granitized hornfels, similar to 245.6 to 248.0 359.6 - 368.0: slightly granitized. <15% (grey) granitized. Numerous 3-6" sections of mod foliated quartz porphyry- gradational with fg, buff coloured, amorphous, siliceous hornfels 368.0 - 368.9: mafic dyke - v. chloritic, folded, similar to 285.5 to 285.7	30° 60° CA		368.9 - 385.3: 2-3% pyrite, locally 10% as fg disseminations and clots along fol'n. tr-1% Po. 369.7: 1½" Py 'vein' - 80-90% fg mg Py in assoc	Quartz porphyry origin of hornfels ?

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
							with 3% Po, tr cpy. Not clear vein with wall rock contacts irregular & numerous. Q, mafics in 'vein'.	
				383.0 - 383.8: granite dyke same as 8.95 to 83.4	30°			
				384.3 - 386.2: granitized 30% grey/pink granitized hornfels, same as 224.1 to 224.4				
				393.4 - 394.4: granite dyke same as 83.4 to 132.8	70°			
				396.0 - 400.1: slightly granitized. <10% fsp & qtz. mg. similar to 246.6 to 248.0				
				400.3 - 401.5: granite dyke similar to 8.95 to 83.4	30° upper 65° lower			Approaching main northern contact.
				405.9 - 406.5: granite dyke similar to 8.95 to 83.4	80°			
				406.7 - 409.5: granite dyke similar to 8.95 to 83.4	55°			
410.0	END OF HOLE							

ASSAY SHEET

Sample Number	From	To	Elements Cu	Elements Zn	Length ft	% Cu	SiO_2	Al_2O_3	CaO	MgO	Na_2O	K_2O	Fe_2O_3	MnO	TiO_2	P_2O_5	Cr_2O_3	LOI	Rb	Sr	Zr	PPM Cu	PPM Zn	PPM Pb
TBD 1554	249.3	250.1	tr	-	0.8	0.053																		
1555	260	270	GEO		10'		66.7	16.3	3.06	1.22	3.92	2.50	4.23	0.03	0.27	0.07	0.01	1.39	70	340	100	41.0	92.0	18
1555	355	365	GEO		10'		67.1	15.5	3.83	1.34	3.74	2.20	3.40	0.06	0.28	0.07	0.00	0.77	50	500	110	29.0	54.0	4

WORK NO UM-C-1-82

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CORPORATION FALCONBRIDGE COPPER

DRILL HOLE RECORD

○ METRIC UNITS ● IMPERIAL UNITS

Grid 6W 7+3

HOLE NUMBER	LAT.	DEP.	ELEV.	COLLAR BRNG	COLLAR DIP	HOLE SIZE	FINAL DEPTH
UM-C-2-82	5 + 00N	38E	Surface	335°	-60°	AQ	601.0 ft.

PROJECT	LOCATION	PURPOSE	DATE STARTED / DATE COMPLETED	CONTRACTOR / CORE STORAGE
PN 043	UMEX C GRID	Test PEM anomaly	July 29/82 / Aug. 2/82	St. Lambert Drilling / S.L.H. CASING in hole

ACID TESTS 100' = 59°; 200' = 57°; 300' = 56½°; 400' = 56°; 500' = 57°; 600' = 56½°

TOPOAIR TESTS

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
0 to 10.7	Casing							
10.7 to 223.7	Granite	Grey to pink locally variable	mg-cg (locally fg)	Generally massive with 20-40% amph, 20-30% locally 40% quartz and 30-50% pink to grey fsp. Minor cg(zoned?) fspar phenocrysts up to 3/8", euhedral. Common ½" to 1½" amphibole clots, rounded, crystalline mg amphibole. Locally wk-mod fol'n defined by aligned amphibole - better developed in localized fg sections. Minor ¼" to 1" milky Q veins spacing of several feet. Minor fg amphibole veinlets chl-amph, fg mafic xenoliths, med green to dark grey occur in upper 5.0' (possibly drilled through boulders) and thence rarely. 3"-9" wide in core xenoliths contain mod developed fol'n. Lower contect gradational over ½"	35-40° @ 50' 40° @ 120' 30° @ 170' 55-65° CA 30-40° CA 114'-117' 30-40° @ 15° CA	Minor light coloured spotting with amphibole ± chlori.. Minor epidote patches + thin vein like seams	Tr-½% fg Po, tr Py associated with amphibole Very rare ½" Py fg (cpy?) aggregates assoc with fg amph zones & veins	Minor grephic texture - poorly developed Minor hematite staining along fractures ± limonite

HOLE NO. UM-C-2-82

LOGGED BY: David H. Rigg

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
223.7 to 601.0	Hornfels	Blue grey to medium light grey with minor light brown mottled green sections up to several feet	fg (rarely vfg & mg)	Quite variable locally massive to weakly bedded on scale of inches to feet. Predominantly fspar 40-60% + amph & biotite 60-40% with some sections containing minor quartz as possible phenocrysts/fragments of veins 1/8-1/4". Minor needle-like, euhedral amphibole and common fspar phenocrysts. Fspar & qtz ∠10%, sl irregular, rounded outlines partially resorped phenocrysts. Patchy grain size variations and numerous 2-6" sections very similar to typical QP with weakly to well developed Q eyes and gradational contacts over 1" to ½". (QP see: 322.7 to 337.5) often in assoc with fg massive siliceous blue grey hornfels. Moderate to weak fol'n - aligned biotite, and minor shearing in QP dykes Minor (1%) 1/8" to 1" light green epidote (20-60%) qtz veins & patches. Rarely as pseudomorphs after fspar. Minor milky qtz veins and milky dolomite veins although locally are up to 3" wide	278' 60° 423' 65° 435' 65° 270' 40° 385' 55° 480' 70° Variable: 40°,80° 90°,60°. Variable: Q- 500-520' 70-85° C- 55-80°, 20° 120°	**Granitization:** Overprints contact area and occurs in several locations throughout hole - weak to moderate with fsp & qtz ± amphibole recrystallization generally fg to mg. Grey coloured with very minor pink colouration. Rock becomes more massive with loss of bedding structures in case of sediments, quartz porphyries in case of QP. Poor fol'n developed and glassy patches. Mg sections look similar to granite in 10.7 to 223.7	Tr-1% fg dissem Py ± Po Avg = tr-½%. Local patches & seams rarely assoc with Q veins & amph-chl seams Rare cubic metamorphic pyrite	Hornfelsed sediment with quartz porphyry sills. Silts & minor sands with rare mud horizons Greywackes Minor hematite staining along late fractures and in small patches. Minor specular hematite veins ofter assoc with pyrite

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
						Chloritization: Rare up to 1' patches of fg chlorite ± amphibole - massive with (sharp to) gradational contacts. Commonly as thin irregular vein-like seams - partially retrograde alt'n. Post dates granitization.		
				223.7 - 315.5: sl-mod granitization. See main text. Gradational upper contact over ½". Gradational lower contact over several feet. Composed predominantly of sediments with local patches of strongly granitized rocks.				Some excellent bedding preserved 276.0 to 280
				- 261.3 - 262.5: chlorite alt'n zone. See main text. Common 1/8" calcite blebs, 3-5% with minor blue grey Q eyes? + fspar. Overprints granitic alt'n. Common hematite veins up to 1/8"	45°, 60°, 70°.			
				Gradational contacts				
				- 263.6 - 265.5: quartz porphyry? 4-5% rounded, irregular milky blue quartz eyes in mg mottled fsp Q amph granitized area. Patches of buff white moderately	@ 40-45°			What proportion of QP may be unidentifiable?

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FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE and STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
				foliated fg material similar to groundmass of sheared CP seen in other areas (eg: HL-10-82)				
				Contacts sharp but subtle	@ 45°			312.0': 4" milky Q vein @ 45° CA
				322.7 to 337.5: quartz porphyry. 5-15% mg (≤3/8") blue quartz eyes, avg = 10% in mod foliated buff to milky white - lt brownish matrix. Minor possibly milky fsp phenocrysts, <1% mafic minerals.	65-70°		Tr Py. Locally ¼-½" clots of fg Py.	Minor hematite films on fractures.
				Massive with sharp, subtle contacts	50°			
				340.7 - 343.9: mafic dyke fg, medium green, feldspar phyric dyke with 3-4% mg fsp phenocrysts 1/8" to 1/4" euhedral to angular in fg, massive amph + fsp matrix.				
				Minor C ± Q thin veining.				
				Upper & lower contacts sharp Textural change to mg fsp + amp + biot = seds	68°			
				350.3 - 352.3: quartz prophyry. Similar to 340.7 to 343.9 in lower part with blue Q eyes rounded, up to 3/8". In upper part becomes more massive with med grey colour, loss of Q eyes & minor biot lenses. Contacts sharp-less Q eyes, textural change.			Increase in Py + Po upwards - tr to 1%, Avg = ½%	
					50°			

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
							352.3 - 353.0: Avg = 15%Po, 3-4% Py disseminated fg with rare mg-cg pyrite cubes in fg Py. Also as stringer zones up to 60% Po, Py with Q, fsp, amph gangue. Moderately foliated with stringers parallel fol'n.	353.7: 3" Q vein with blob of po, irregular ½" x 1" @ 40°
					50° →		Rare possible Q eyes? Minor lt green-med green banding parallel fol'n - bedding?	
					60° →		Minor disseminated po, py above & below.	
							Relatively sharp contacts.	
				386.1 - 398.9: quartz porphyry Similar to 322.7 to 337.5. Sl granitized with med-str granitization from 393.1 to 394.2. Up to 40% of section medium bluish grey, fg massive with Q eye ghosts and small, irregular milky grey QP matrix preserved (?)			386.1 - 398.9: Up to 30% fg Po, 10% fg-mg Py, T-3% cpy. Avg = 12% po, 3% py, ½% cpy.	
					70° →		Sulphides as fg disseminations and irregular fg anastomosing networks generally parallel fol'n.	
				Upper & lower contacts generally sharp, subtle with textural change marked.			Only minor <1% sulphides adjacent to QP.	
				401.8 - 410.5: Quartz porphyry. Similar to 386.1 to 398.9 but with obvious Q eyes, QP buff matrix less clearly developed. Grey massive to mod foliated sections contain minor fspar porphyroblasts (a°	65°-70°		Fg disseminated & fg-mg clots of py, po. Tr-½% Po, ½%-2% Py. Avg = 1%	

UM-C-2-82

5

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FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
				401.8 - 410.5:(cont'd) Layering in QP matrix is more multicoloured with brown & green, almost resembling bedding in places!				
				Contacts sharp, internal contacts gradational	62°			
					65°			Diffuse or hazy "QP" intrusive material common between 425.0 & approx. 480.0..
								Several pink Q veins ± 2'.of 440'. ¼" - ½"
							460.8 - 481.0: 1-10% fg-mg dissem Py, rarely cg cubic crystals; in some sections up to 30% over 2" in irregular foliation parallel aggregates-vugs in association, mg.	Host: mixed QP & blue grey massive hornfels. Whole section difficult to identify rock types-very siliceous
							Tr-5% Po, fg dissem & stringers	
				476.5 - 528.8: Si granitization. See main text. Gradational increase over whole section with patches of buff alteration and fspar porphyroblasts up to ¼". Hornfels, fg massive and very siliceous, medium grey.			Avg = 3% Py, ¼-½% Po.	
							481.0 - 498.1: ½-3% disseminated Py, tr-1% Po. Avg = 3/4% combined. Locally up to 5%.	
				Noticeable number of 1-3" Q veins, possibly correlate with buff patches?				505.5 - 507.1: Massive Q vein. Milky Q with 5% gangue minerals, e.g. amphibole, epidotized wall fragments, 1-2% fg-mg Po, Py.
				Locally mod granitizat'on. Grades into mod granitization				

FROM TO	ROCK TYPE	COLOUR	GRAIN SIZE	TEXTURE AND STRUCTURE	ANGLE TO CORE AXIS	ALTERATION	SULPHIDES	REMARKS
						510.2 - 512.1: Chlorite-amph. Similar to 261.3 to 262.5 but with relatively sharp contacts although highly irregular. Central 4" unaltered hornfels. 3% mg euhedral pyrite.		
						504.6-505.3: Chlorite-amph. Same as 5.3.2 to 512.1 with rose quartz along contacts. No sulphides.		
				528.8 - 60..3: Granitization Similar to main text, wkly to mod developed, locally well developed. Porphyroblasts up to ½" subeuhedral.				
				Weak to moderate hematite staining particularly along fractures. Locally micaceous pink coloured.		539.2 - 541.7: Chlorite amph. Similar to 510.2 to 512.1 but with ½-½% sulphides, gradational contacts and 3-4% fine Q-C filled fractures.		
				573.9 - 575.0: fault, slight brecciation and movement over ½" to 1" zone with calcite matrix.	10°			
601.0	END OF HOLE							

ASSAY SHEET

Sample Number	From	To	Evidence Cu	Evidence Zn	Length	SiO_2	Al_2O_3	CaO	MgO	Na_2O	K_2O	Fe_2O_3	MnO	TiO_2	P_2O_5	Cr_2O_3	LOI	Rb	Sr	Zr			
TBD 1565	270	280			10	65.7	16.2	4.09	1.47	3.74	2.03	4.22	0.04	0.43	0.10	0.01	0.93	60	260	140			
1566	325	335			10	71.9	14.3	2.02	1.29	2.42	2.64	2.43	0.02	0.24	0.07	0.01	1.16	80	160	100			
1567	370	380			10	56.9	17.8	7.60	3.78	3.48	1.48	6.87	0.09	0.56	0.14	0.02	0.70	40	280	130			
1568	470	480			10	64.9	14.4	2.47	1.14	3.92	1.87	8.47	0.03	0.25	0.06	0.01	2.39	50	320	80			
1569	580	590			10	66.6	15.7	4.41	1.51	4.20	1.50	3.31	0.06	0.38	0.09	0.01	0.70	30	370	110			
Assays:						% Cu	% Zn	% Pb	oz Ag	oz Au	% Co												
TBD 1570	387.0	390.0	.5%	-	3.0	0.054	0.055	0.003	0.04	0.001	0.004												
1571	394.1	397.0	.5%	-	2.9	0.063	0.011	0.001	0.04	0.001	0.004												

HOLE NO. TT1-C-2-82

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Ministry of Natural Resources
Ontario

Geotechnical Report Approval

52J07SW0018 52J07SW0024 HOUGHTON LAKE

900

File 2.5628

Mining Lands Comments

☐ To: Geophysics

Comments

☐ Approved ☐ Wish to see again with corrections | Date | Signature

☑ To: Geology - Expenditures Mr. Kustra.

Comments

☑ Approved ☐ Wish to see again with corrections | Date Aug 15/83 | Signature Kustra

☑ To: Geochemistry Mr. Fortescue.

Comments

L.D.

☑ Approved ☐ Wish to see again with corrections | Date Feb 10th 1984 | Signature

☐ To: Mining Lands Section, Room 6462, Whitney Block. (Tel: 5-1380)

1593 (81/10)

77

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.5628

Date 1984 06 20

Mining Recorder's Report of Work No. 83-66

Recorded Holder
UMEX INC

Township or Area
HOUGHTON LAKE AREA

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	PA 614596 614603 to 07 inclusive 614753-54 614758 to 60 inclusive 614763 to 66 inclusive 614768 614775-76 614782 614785-86 615092 615097 615100-01 615307 to 10 inclusive
Electromagnetic _____ days	
Magnetometer _____ days	
Radiometric _____ days	
Induced polarization _____ days	
Other _____ days	
Section 77 (19) See "Mining Claims Assessed" column	
Geological _____ days	
Geochemical 13 days	
Man days ☐ Airborne ☐	
Special provision ☒ Ground ☒	
☒ Credits ha e been reduced because of partial coverage of claims.	
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 77(19) — 60.

0828 (83/6)

9c

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.5628

Date 1984 06 20

Mining Recorder's Report of Work No. 83-66,69

Recorded Holder
UMEX INC

Township or Area
EVANS LAKE AND HOUGHTON LAKE AREAS

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical Electromagnetic _____ days Magnetometer _____ days Radiometric _____ _____ days Induced polarization _____ _____ days Other _____ days Section 77 (19) See "Mining Claims Assessed" column Geological _____ days Geochemical _____ days Man days ☐ Airborne ☐ Special provision ☐ Ground ☐ ☐ Credits have been reduced because of partial coverage of claims. ☐ Credits have been reduced because of corrections to work dates and figures of applicant.	$11,676.11 spent on sample assays on Mining Claims: PA 390918 390921 to 24 inclusive 390927-28 390936 391054-55 391057 391084 391086 391096 to 100 inclusive 391102 to 05 inclusive 391133 391182-83 391217 to 21 inclusive 391223 391227-28 391257 to 59 inclusive 391296 391299 391509 391521 421550 to 63 inclusive 614596 614603 to 07 inclusive 614753-54 614758 to 60 inclusive 614763 to 66 inclusive 614768 614775-76 614782 614785-86 615092 615097 615100-01 615307 to 10 inclusive 632385 to 87 inclusive 632392 644966 to 74 inclusive 778 assessment work days are allowed which may be grouped in accordance with Section 76(6) of the Mining Act.

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 77(19) — 60:

828 (83/6)

81

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.5628

Date 1984 06 20

Mining Recorder's Report of Work No. 83-67

Recorded Holder
UMEX INC

Township or Area
HOUGHTON LAKE AREA

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	PA 614596 614603 to 07 inclusive 614752 to 54 inclusive 614757 to 66 inclusive 614768 614771-72 614776 614782 to 88 inclusive 615092 615097 to 101 inclusive 615307 to 09 inclusive 615311-12 644984-85 644987
Electromagnetic _____ days	
Magnetometer _____ days	
Radiometric _____ days	
Induced polarization _____ days	
Other _____ days	
Section 77 (19) See "Mining Claims Assessed" column	
Geological 40 days	
Geochemical _____ days	
Man days ☐ Airborne ☐	
Special provision ☒ Ground ☒	
☐ Credits have been reduced because of partial coverage of claims.	
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 77 (16) for the following mining claims

20 DAYS GEOLOGICAL

PA 614775
615310
644986

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ Insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 77(19)—60:

0828 (83/6)

82

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.5628

Date 1984 06 20

Mining Recorder's Report of Work No. 83-69

Recorded Holder: UMEX INC

Township or Area: EVANS LAKE AREA

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	PA 390918
Electromagnetic ____ days	390927-28
Magnetometer ____ days	390936
Radiometric ____ days	391054-55
Induced polarization ____ days	391057
Other ____ days	391084
Section 77 (19) See "Mining Claims Assessed" column	391086
Geological ____ days	391097-98
Geochemical 24 days	391100
Man days ☐ Airborne ☐	391102-03
Special provision ☒ Ground ☒	391105
☒ Credits have been reduced because of partial coverage of claims.	391133
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	391217 to 21 inclusive
	391223
	391227-28
	391257 to 59 inclusive
	391296
	391299
	391509
	391521
	421558
	421563
	632385 to 87 inclusive
	632392
	644966 to 74 inclusive

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

☒ not sufficiently covered by the survey ☐ Insufficient technical data filed

PA 391101
391222
632384

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 77(19)—60.

0228 (83/6)

83

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.5628

Date 1984 06 20

Mining Recorder's Report of Work No. 83-69

Recorded Holder: UMEX INC

Township or Area: EVANS LAKE AREA

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	PA 390921 to 24 inclusive 391096 391099 391104 391182-83 421550 to 57 inclusive 421559 to 62 inclusive
Electromagnetic _____ days	
Magnetometer _____ days	
Radiometric _____ days	
Induced polarization _____ days	
Other _____ days	
Section 77 (19) See "Mining Claims Assessed" column	
Geological _____ days	
Geochemical 13 days	
Man days ☐ Airborne ☐	
Special provision ☒ Ground ☒	
☒ Credits have been reduced because of partial coverage of claims.	
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ insufficient technical data filed

The linecutting credits for the above-mentioned claims are included with the geological survey.

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment d s recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 77(19)—80:

828 (83/6)

BH

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.5628

Date 1984 06 20

Mining Recorder's Report of Work No. 83-70

Recorded Holder: UMEX INC

Township or Area: EVANS LAKE AREA

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	PA 390922 to 24 inclusive 391099 391104 391182-83 421550 to 57 inclusive 421559 to 62 inclusive
Electromagnetic ____ days	
Magnetometer ____ days	
Radiometric ____ days	
Induced polarization ____ days	
Other ____ days	
Section 77 (19) See "Mining Claims Assessed" column	
Geological 40 days	
Geochemical ____ days	
Man days ☐ Airborne ☐	
Special provision ☒ Ground ☒	
☐ Credits have been reduced because of partial coverage of claims.	
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 77 (16) for the following mining claims

20 DAYS GEOLOGICAL

PA 390921
391096

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ Insufficient technical data filed

- The linecutting credits are included with the Geological Survey.

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 77(19)—60:

828 (83/6)

Ontario Ministry of Natural Resources

Report of Work

The Mining Act

Instructions – Supply required data on a separate form for each type of work to be recorded (see table below).
– For Geo-technical work use form no. 13a2 "Report of Work (Geological, Geophysical, Geochemical and ... expenditures)".

Name and Postal Address of Recorded Holder	Prospector's Licence No.
UMEX Inc. 1935 Leslie Street, Don Mills, Ontario, M3B 2M3	T-133

Summary of Work Performance and Distribution of Credits

Total Work Days Cr. claimed	Mining Claim Prefix	Mining Claim Number	Work Days Cr.	Mining Claim Prefix	Mining Claim Number	Work Days Cr.	Mining Claim Prefix	Mining Claim Number	Work Days Cr.
131									
For Performance of the following work. (Check one only)	Pa	614597	40						
☐ Manual Work		614755	40						
☐ Shaft Sinking Drifting or other Lateral Work.		614756	40						
☐ Compressed Air, other Power driven or mechanical equip.		614767	11						
☐ Power Stripping									
☒ Diamond or other Core drilling									
☐ Land Survey									

All the work was performed on Mining Claim(s): Pa 614763

Required Information eg: type of equipment, Names, Addresses, etc. (See Table Below)

Previous balance of 131 days, report of Work # 82-122,
from work performed by: St. Lambert Drilling Company Ltd., P.O. Box 473
Valleyfield, Quebec J6S 4V7

during the period: July 24th, 1982 to August 2nd, 1982.

Core Size: AQ
Hole Number: UM-C-1-82
UM-C-2-82

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JUN 13 1983
MINING LANDS SECTION

Date of Report	Recorded Holder or Agent (Signature)
May 25, 1983	T. Verbeek

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying	Date Certified	Certified by (Signature)
T. Verbeek, UMEX Inc., 1935 Leslie Street, Don Mills, Ontario, M3B 2M3	May 25, 1983	T. Verbeek

Table of Information/Attachments Required by the Mining Recorder

Type of Work	Specific Information per type	Other Information (Common to 2 or more types)	Attachments
Manual Work	Nil	Names and addresses of men who performed manual work / operated equipment, together with dates and hours of employment.	Work Sketch: these are required to show the location and extent of work in relation to the nearest claim post.
Shaft Sinking, Drifting or other Lateral Work			
Compressed air, other power driven or mechanical equip.	Type of equipment		
Power Stripping	Type of equipment and amount expended. Note: Proof of actual cost must be submitted within 30 days of recording.	Names and addresses of owner or operator together with dates when drilling/stripping done.	
Diamond or other core drilling	Signed core log showing; footage, diameter of core, number and angles of holes.		Work Sketch (as above) in duplicate
Land Survey	Name and address of Ontario land surveyor.	Nil	Nil

7GB (81/3)

Ministry of Natural Resources
Ontario

Report of Work

The Mining Act

Instructions – Supply required data on a separate form for each type of work to be recorded (see table below).
– For Geo-technical work use form no. 1362 "Report of Work (Geological, Geophysical, Geochemical and Expenditures)".

Name and Postal Address of Recorded Holder	Prospector's Licence No.
UMEX Inc. 1935 Leslie Street, Don Mills, Ontario, M3B 2M3	T-133

Summary of Work Performance and Distribution of Credits

Total Work Days Cr. claimed	Mining Claim Prefix	Mining Claim Number	Work Days Cr.	Mining Claim Prefix	Mining Claim Number	Work Days Cr.	Mining Claim Prefix	Mining Claim Number	Work Days Cr.
318	Pa	391056	40						
for Performance of the following work. (Check one only)		391224	40						
☐ Manual Work		391225	40						
☐ Shaft Sinking Drifting or other Lateral Work.		391226	40						
☐ Compressed Air, other Power driven or mechanical equip.		391229	40						
☐ Power Stripping		391230	40						
☐ Diamond or other Core drilling		391231	40						
☐ Land Survey		391232	38						

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MINING LANDS SECTION

All the work was performed on Mining Claim(s): Pa 391003, Pa 391283, Pa 391285, Pa 486787, Pa 557773, Pa 447[illegible]

Required Information eg: type of equipment, Names, Addresses, etc. (See Table Below)

Previous balance of 318 days, banked on claim Pa 486787. Report of Work #82-123.
from work performed by: St. Lambert Drilling Company Ltd., P.O. Box 473
Valleyfield, Quebec, J6S 4V7
during the period: July 19th to August 16th, 1982.

Core Size: AQ

Hole Number: UM-1-82, UM-2-82, UM-3-82, UM-4-82, HL-9-82, HL-10-82, HL-11-82, HL-12-82, HL-13-82

Date of Report	Recorded Holder or Agent (Signature)
May 25, 1983	T. Verbeek

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying	Date Certified	Certified by (Signature)
T. Verbeek, UMEX Inc, 1935 Leslie Street, Don Mills, Ontario, M3B 2M3	May 25, 1983	T. Verbeek

Table of Information/Attachments Required by the Mining Recorder

Type of Work	Specific Information per type	Other Information (Common to 2 or more types)	Attachments
Manual Work	Nil	Names and addresses of men who performed manual work / operated equipment, together with dates and hours of employment.	Work Sketch: these are required to show the location and extent of work in relation to the nearest claim post.
Shaft Sinking, Drifting or other Lateral Work			
Compressed air, other power driven or mechanical equip.	Type of equipment		
Power Stripping	Type of equipment and amount expended. Note: Proof of actual cost must be submitted within 30 days of recording.	Names and addresses of owner or operator together with dates when drilling/stripping done.	
Diamond or other core drilling	Signed core log showing: footage, diameter of core, number and angles of holes.		Work Sketch (as above) in duplicate
Land Survey	Name and address of Ontario land surveyer.	Nil	Nil

7568 (81/3)

F.W.M.

Ministry of Natural Resources
Ontario

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

2.5628
#83-67

Aug. 5

Instructions: – Please type or print
– If number of mining claims traversed exceeds space on this form, attach a list.
Note. – Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
– Do not use shaded areas below.

Mining Lands

The Mining Act

Type of Survey(s)	Township or Area
Geological Survey	Houghton Lake Area M-2165
Claim Holder(s)	**Prospector's Licence No.**
UMEX Inc.	T-133
Address	
1935 Leslie Street, Don Mills, Ontario, M3B 2M3	
Survey Company	**Date of Survey (from & to)** Day / Mo. / Yr. — Day / Mo. / Yr.	**Total Miles of line Cut**
Corporation Falconbridge Copper	01 / 05 / 82 — 31 / 08 / 82	42.6 miles
Name and Address of Author (of Geo-Technical report)	
Ian D. Pirie, c/o Corporation Falconbridge Copper, 2606 Victoria Ave. E., Thunder Bay, O	

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	40
	Geochemical	
Man Days		**Days per Claim**
Complete reverse side and enter total(s) here	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - Other	
	Geochemical	
Airborne Credits		**Days per Claim**
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Radiometric	

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MINING LANDS SECTION

Mining Claims Traversed (List in numerical sequence) P7C 1E7

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
Pa	614596, etc.	40
	See attached Appendix "A"	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

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A.M. 7 8 9 10 11 12 1 2 3 4 5 6 P.M.

See revised work statement

Pa. 614393

Total number of mining claims covered by this report of work: 47

Expenditures (excludes power stripping)

Type of Work Performed: Geological Survey

Performed on Claim(s):

Calculation of Expenditure Days Credits

Total Expenditures: $ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Date	Recorded Holder or Agent (Signature)
May 25, 1983	

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Total Days Cr. Recorded	Date Recorded	Mining Recorder
1880	June 6, 1983	
	Date Approved as Recorded	Branch Director

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying
T. Verbeek, UMEX Inc., 1935 Leslie Street, Don Mills, Ontario, M3B 2M3

Date Certified	Certified by (Signature)
May 31, 1983	

APPENDIX "A"

Geological Survey

HOUGHTON LAKE AREA

Pa 614596	40 days	Pa [illegible]	40 days
		614783	40 days
Pa 614603	40 days	614784	40 days
614604	40 days	614785	40 days
614605	40 days	614786	40 days
614606	40 days	614787	40 days
614607	40 days	614788	40 days
Pa 614752	40 days	Pa 615092	40 days
614753	40 days		
614754	40 days	Pa 615097	40 days
		615098	40 days
Pa 614757	40 days	615099	40 days
614758	40 days	615100	40 days
614759	40 days	615101	40 days
614760	40 days		
614761	40 days	Pa 615307	40 days
614762	40 days	615308	40 days
614763	40 days	615309	40 days
614764	40 days	615310	40 days
614765	40 days	615311	40 days
614766	40 days	615312	40 days
Pa 614768	40 days	Pa 644984	40 days
		644985	40 days
Pa 614771	40 days	644986	40 days
614772	40 days	644987	40 days
Pa 614775	40 days		
614776	40 days		

Ontario

Evans Lake M-1994 #83-69

Mining Lands

The Mining Act

Report of Work (Geophysical, Geological, Geochemical and Expenditures)

Instructions - Please type or print. If number of mining claims traversed exceeds space on this form, attach a list. Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns. Do not use shaded areas below.

Note: -

Type of Survey(s)	Township or Area
Geochemical Survey	Evans Lake Area M-1994

Claim Holder(s)	Prospector's Licence No.
UMEX Inc.	T-133

Address: 1935 Leslie Street, Don Mills, Ontario, M3B 2N3

Survey Company	Date of Survey (from & to) Day / Mo. / Yr.	Total Miles of line Cut
Corporation Falconbridge Copper	01 05 82 — 31 08 82	

Name and Address of Author (of Geo-Technical report): Ian D. Pirie, c/o Corporation Falconbridge Copper, 2606 Victoria Ave. E., Thunder Bay, Ont.

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical	
	- Electromagnetic	
	- Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	- Radiometric	
	- Other	
	Geological	
	Geochemical	40

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical	
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	

Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Radiometric	

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MINING LANDS SECTION

Mining Claims Traversed (List in numerical sequence) P7C 1E7

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
Pa	390918 etc	..
		40
	See attached	
	Appendix "C"	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

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JUN - 6 1983
A.M. 7 8 9 10 11 12 1 2 3 4 5 6 P.M.

See Journal for Instructions

Expenditures (excludes power stripping)

Type of Work Performed: Geochemical Survey

Performed on Claim(s):

Calculation of Expenditure Days Credits

Total Expenditures: $ ÷ 15 = Total Days Credits

Instructions: Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Pa. 390918

Total number of mining claims covered by this report of work: 70

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
2800	June 6, 1983	A. Bamson
	Date Approved as Recorded	Branch Director

Date	Recorded Holder or Agent (Signature)
May 25, 1983	T. Verbeek

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: T. Verbeek, UMEX Inc., 1935 Leslie Street, Don Mills, Ontario, M3B 2M3

Date Certified	Certified by (Signature)
May 11, 1983	T. Verbeek

1362 (81/9)

APPENDIX "C"

Geochemical Survey

EVANS LAKE AREA

Pa 390918	40 days	Pa 391217	40 days
		391218	40 days
Pa 390921	40 days	391219	40 days
390922	40 days	391220	40 days
390923	40 days	391221	40 days
390924	40 days	391222	40 days
		391223	40 days
Pa 390927	40 days		
390928	40 days	Pa 391227	40 days
		391228	40 days
Pa 390936	40 days		
		Pa 391257	40 days
Pa 391054	40 days	391258	40 days
391055	40 days	391259	40 days
Pa 391057	40 days	Pa 391296	40 days
Pa 391084	40 days	Pa 391299	40 days
Pa 391086	40 days	Pa 391509	40 days
Pa 391096	40 days	Pa 391521	40 days
391097	40 days		
391098	40 days	Pa 421550	40 days
391099	40 days	421551	40 days
391100	40 days	421552	40 days
391101	40 days	421553	40 days
391102	40 days	421554	40 days
391103	40 days	421555	40 days
391104	40 days	421556	40 days
391105	40 days	421557	40 days
		421558	40 days
Pa 391133	40 days	421559	40 days
		421560	40 days
Pa 391182	40 days	421561	40 days
391183	40 days	421562	40 days
		421563	40 days

Evans Lake Area

Pa 632384	40 days	Pa 644966	40 days
632385	40 days	644967	40 days
632386	40 days	644968	40 days
632387	40 days	644969	40 days
		644970	40 days
Pa 632392	40 days	644971	40 days
		644972	40 days
		644973	40 days
		644974	40 days

Fw.M.

Ontario Ministry of Natural Resources

Mining Lands

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

The Mining Act

#83-70 Aug 5th

Instructions: – Please type or print.
– If number of mining claims traversed exceeds space on this form, attach a list.
Note: – Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
– Do not use shaded areas below.

Type of Survey(s)	Township or Area
Geological Survey	Evans Lake Area M-1794

Claim Holder(s)	Prospector's Licence No.
UMEX Inc.	T-133

Address: 1935 Leslie Street, Don Mills, Ontario, M3B 2M3

Survey Company	Date of Survey (from & to)	Total Miles of line Cut
Corporation Falconbridge Copper	01 05 82 (Day / Mo. / Yr.) 31 08 82 (Day / Mo. / Yr.)	

Name and Address of Author (of Geo-Technical report): Ian D. Pirie, c/o Corporation Falconbridge Copper, 2606 Victoria Ave. E., Thunder Bay, Ont.

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical	
	· Electromagnetic	
	· Magnetometer	
	· Radiometric	
For each additional survey: using the same grid: Enter 20 days (for each)	· Other	
	Geological (linecutting)	40 20
	Geochemical	

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical	
	· Electromagnetic	
	· Magnetometer	
	· Radiometric	
	· Other	
	Geological	
	Geochemical	

Airborne Credits		Days per Claim
Note: Special provisions ~~MINING LANDS~~ SECTION to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Radiometric	

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MINING LANDS SECTION

Mining Claims Traversed (List in numerical sequence) P7C 1E7

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
Pa	390921, etc...	
		20
	See attached	
	Appendix "D"	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

PATRICIA MINING DIV. RECEIVED JUN - 6 1983 A.M. 8 9 10 11 12 1 2 3 4 5 6 P.M.

Expenditures (excludes power stripping)

Type of Work Performed: Geological Survey

Performed on Claim(s):

Calculation of Expenditure Days Credits

Total Expenditures $ ____ + 15 = Total Days Credits ____

Instructions: Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Pa. 390918

Total number of mining claims covered by this report of work: 21

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
420	June 6, 1983	
	Date Approved as Recorded	Branch Director

Date	Recorded Holder or Agent (Signature)
May 25, 1983	

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: T. Verbeek, UMEX Inc., 1935 Leslie Street, Don Mills, Ontario, M3B 2M3

Date Certified	Certified by (Signature)
May 31 1983	

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APPENDIX "D"

Geological Survey

EVANS LAKE AREA

Pa	390921	20 days	Pa	421550	20 days
	390922	20 days		421551	20 days
	390923	20 days		421552	20 days
	390924	20 days		421553	20 days
				421554	20 days
Pa	391096	20 days		421555	20 days
				421556	20 days
Pa	391099	20 days		421557	20 days
Pa	391104	20 days	Pa	421559	20 days
				421560	20 days
Pa	391182	20 days		421561	20 days
	391183	20 days		421562	20 days

F.W.M.

Ontario Ministry of Natural Resources

Report of Work (Geophysical, Geochemical and Expenditures)

2.5628

#83-66

Aug 5th

Instructions – Please type or print
– If number of mining claims traversed exceeds space on this form, attach a list.
Note – Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
– Do not use shaded areas below.

Mining Lands

The Mining Act

Type of Survey(s)
Geochemical Survey

Township or Area
Houghton Lake Area M-2165

Claim Holder(s)
UMEX Inc.

Prospector's Licence No.
T-133

Address
1935 Leslie Street, Don Mills, Ontario, M3B 2M3

Survey Company
Corporation Falconbridge Copper

Date of Survey (from & to) Day / Mo. / Yr.
01 05 82 — 31 08 82

Total Miles of line Cut
42.6 miles

Name and Address of Author (of Geo-Technical report)
Ian D. Pirie, c/o Corporation Falconbridge Copper, 2606 Victoria Ave. E., Thunder Bay, Ont.

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical	
	- Electromagnetic	
	- Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	- Radiometric	
	- Other	
	Geological	
	Geochemical	20

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical	
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	

Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Radiometric	

RECEIVED
JUL 21 1983
MINING LANDS SECTION

Mining Claims Traversed (List in numerical sequence) P7C 1E7

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
Pa	614596, etc...	
		20
	See attached	
	Appendix "B"	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

See Journal Work Statement

PATRICIA MINING DIV.
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JUN - 6 1983
A.M. 7 8 9 10 11 12 1 2 3 4 5 6 P.M.

Expenditures (excludes power stripping)

Type of Work Performed
Geochemical Survey

Performed on Claim(s)

Calculation of Expenditure Days Credits
Total Expenditures $ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Pa. 614393

Total number of mining claims covered by this report of work. 29

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
580	June 6, 1983	
	Date Approved as Recorded	Branch Director

Date	Recorded Holder or Agent (Signature)
May 25, 1983	

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying
T. Verbeek, UMEX Inc., 1935 Leslie Street, Don Mills, Ontario, M3B 2M3

Date Certified	Certified by (Signature)
May 31, 1983	

APPENDIX "B"

Geochemical Survey

HOUGHTON LAKE AREA

Pa 614596	20 days
Pa 614603	20 days
614604	20 days
614605	20 days
614606	20 days
614607	20 days
Pa 614753	20 days
614754	20 days
Pa 614758	20 days
614759	20 days
614760	20 days
Pa 614763	20 days
614764	20 days
614765	20 days
614766	20 days
Pa 614768	20 days
Pa 614775	20 days
614776	20 days
Pa 614782	20 days
Pa 614785	20 days
614786	20 days
Pa 615092	20 days
Pa 615097	20 days
Pa 615100	20 days
615101	20 days
Pa 615307	20 days
615308	20 days
615309	20 days
615310	20 days

Ministry of Natural Resources
Ontario

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

#84-97

The Mining Act 2.5628

Instructions: – Please type or print.
– If number of mining claims traversed exceeds space on this form, attach a list.
Note: – Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
– Do not use shaded areas below.

Type of Survey(s): Geochemical Analyses

Township or Area: M-1994 & M-2166 Evans Lake & Houghton L.ard

Claim Holder(s): UMEX Inc

Prospector's Licence No.: T-133

Address: 1935 Leslie Street, Don Mills, Ontario, M3B 2M3

Survey Company: Corporation Falconbridge Copper

Date of Survey (from & to): Day | Mo. | Yr. | Day | Mo. | Yr.

Total Miles of line Cut:

Name and Address of Author (of Geo-Technical report): F. Felder, c/o UMEX Inc, 1935 Leslie Street, Don Mills, Ontario, M3B 2M3

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical	
	- Electromagnetic	
	- Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	- Radiometric	
	- Other	
	Geological	
	Geochemical	

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical	
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	

Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Radiometric	

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
Pa	390928, etc...	
	See attached Appendix.	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

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SEP 14 1984
MINING LANDS SECTION

PATRICIA MINING DIV.
RECEIVED
JUL 16 1984
A.M. 7 8 9 10 11 12 1 2 3 4 5 6 P.M.

SEE REVISED WORK STATEMENT

Pa. 390925

Total number of mining claims covered by this report of work.

Expenditures (excludes power stripping)

Type of Work Performed: Section 77-19 Geochemical Analyses

Performed on Claim(s): Pa 390928, etc...

Calculation of Expenditure Days Credits

Total Expenditures			=	Total Days Credits
$ 11,676.11	+	15	=	778

Instructions: Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
778	July 16, 1984	[signature]
	Date Approved as Recorded	Branch Director

Date: July 13, 1984

Recorded Holder or Agent (Signature): [signature]

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: Mr. F. Felder, c/o UMEX Inc, 1935 Leslie St., Don Mills, Ont. M3B 2M3

Date Certified: July 11th 1984

Certified by (Signature): [signature]

1362 (81/9)

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APPENDIX "A"

EVANS LAKE & HOUGHTON LAKE AREA

GEOCHEMICAL ANALYSES

Claim No.	Requested days
Pa 390928	16
390936	16
391057	16
391084	16
391086	16
391102	16
391103	16
391105	16
391133	16
391217	16
218	16
219	16
220	16
221	16
391223	16
391227	16
228	16
391257	16
391259	16
391296	16
391299	16
391509	16
391521	16
391222	19

Claim No.	Requested days
Pa 614596	7
614603	7
604	7
605	7
606	7
607	7
614753	7
754	7
614758	7
759	7
760	7
614763	7
764	7
765	7
766	7
614768	7
- 614775	27
776	7
614782	7
614785	7
786	7
615092	7
615097	7
615308	7
- 615310	27
632385	16
632392	16
644966	16
967	16
968	16
969	16
970	16
971	16
972	16
973	16
974	16

778

March 22, 1984

Our File: 2.5628
Your File: 66, 67, 68, 69 & 83

Umex Inc
1935 Leslie Street
Don Mills, Ontario
M3B 2M3

Dear Sirs:

RE: Geological and Geochemical survey submitted on Mining Claims PA 390918 et al in the Areas of Evans Lake and Houghton Lake

---

Enclosed are the plans for the above-mentioned survey. Please indicate the claim numbers and lines on the Lithogeochemistry Sample Location plan for the Marchington Road claims, in duplicate.

In addition, please have the author of the report sign each map and return them to this office.

The geochemical survey will not be accepted for special provision credits as many of theclaims do not have substantial and systematic coverage, and because the average number of readings per claim is less than forty. Please provide a man-days breakdown listing the names and addresses of the employees and the dates that each man worked on the various phases of the geochemical survey. The survey will then be assessed under the provisions of sub-section (12) of Section 77 of the Mining Act.

For further information, please contact Mr. F.W. Matthews at (416)965-6918.

Yours sincerely,

Called Mgr. 29 but Going to Africa; will attempt to send portion to us. Asked for 2 months D. K

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: (416)965-6918

D. Kinvig:

Encls:

cc: Mining Recorder
Sioux Lookout, Ontario

cc: Ian D. Pirie
c/o Corporation Falconbridge Copper
2606 Victoria Avenue East
Thunder Bay, Ontario

CORPORATION FALCONBRIDGE COPPER

2606 Victoria Avenue East
Thunder Bay, Ontario P7C 1E7
Telephone 807/623-1511

ANNEX 1

March 30, 1984

UMEX Inc.
1935 Leslie Street
DON MILLS, Ontario
M3B 2M3

Attn: Frederick Felder

Dear Frederick:

The following expenditures were incurred by Corporation Falconbridge Copper (CFC) for a lithogeochemical survey over the UMEX claims at Savant Lake during 1982.

Salaries	$ 8,424.67
Transportation	97.75
Field Expenses	3,151.20
Analyses	11,676.11
TOTAL:	$ 23,349.73

At the time of the survey, the claims were held by CFC under an agreement with UMEX Inc. The agreement has since been terminated. The survey was conducted by CFC personnel under my supervision. The data and maps provided to UMEX by CFC are, to the best of my knowledge, valid and accurate. The expenditures quoted above fairly reflect the cost of the survey.

I hope this information may be of assistance.

Yours sincerely,

CORPORATION FALCONBRIDGE COPPER

B. D. Simmons
Exploration Manager - Eastern Canada

BDS:cs

UMEX INC.
1935 Leslie Street, Don Mills, (Toronto) Canada M3B 2M3
Cable Address UMEXCOR.P. TORONTO
Telephone (416) 445-8832 Telex 06-966679

2.5628

May 22, 1984

G. 4149

Mr. S. E. Yundt
Director
Land Management Branch
Ministry of Natural Resources
Whitney Bloc, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3

Dear Mr. Yundt:

Re: Geochemical Survey submitted for Mining Claims PA 390918 et al, in the areas of Evans and Houghton Lakes (Ministry file 2,5628), and your letter of March 22, 1984

We are including duly signed maps on the Lithogeochemical and geological surveys from the Houghton and Evans Lake areas. Also, the claim posts have been plotted on the Lithogeochemistry Sample location plans, as requested in your letter.

Since the work on the claim was performed by Corporation Falconbridge Copper, we do not have the necessary detailed information to present an assessment and breakdown. However, we have obtained a statement of expenditures which could serve as a basis for calculating the possible credit for the assessment work (Annex 1). In a telephone conversation with Mr. D. Kinvig on the 29th of March, we explained our difficulties in obtaining the necessary support documents for calculating the assessment credits as per sub section 12 of Section 86 of the Mining Act of Ontario (1970).

Basing ourselves on the statement provided by Corporation Falconbridge Copper, it should be possible to determine assessment work credits as follows:

Analytical Costs (Sect. 86-18 of Law 1970)

11,676.11 ÷ 15/days = 778 days

Survey Costs (Sect. 86-12 of Law 1970)

If we assume a daily cost of $90.00/day for a sampler, the amount of assessment credit for the survey would be as follows:

8,424.67 ÷ $90 x 7 days = 655 days.

.../2

Under the foregoing assumptions, the total assessment credits that could be credited for the work performed by Corporation Falconbridge Copper is 1,433 days for the Lithogeochemical Survey.

As to the manner of calculation of assessment credits for line cutting, we are of the opinion that since the coverage has been systematic, the line cutting could fall under the provision of the special credits of section 86-10 of the 1970 Mining Law, even though the accompanying lithogeochemical survey does not meet the sample density specifications.

In the event that the above assumed interpretation is in contradiction to the regulations of the Mining Law, we would like the Ministry to consider that portion of the line cutting that covers the geological survey submitted in our submission 83-70 of the 25th of May 1983 to be included with the latter survey. The claims that would be covered by 40 days' assessment for geology would be (as per Sect. 86-10):

390921	391182	421555
390922	391183	421556
390923	421550	421557
390924	421551	421559
391096	421552	421560
391099	421553	421561
391104	421554	421562

In the latter case, it would then be necessary for UMEX to obtain a cost breakdown on the line cutting from Corporation Falconbridge Copper to establish a detailed breakdown of costs in conformity with Section 86-12.

Yours truly,

F. Felder
Exploration Manager

UMEX INC.

1935 Leslie Street, Don Mills, (Toronto) Canada M3B 2M3
Cable Address UMEXCORP, TORONTO
Telephone (416) 445-8832 Telex 06-966679

C.K. 77,2

June 10, 1983

Ontario Ministry of Natural Resources
Mining Lands Branch
Whitney Block, Queen's Park
Toronto, Ontario
M7A 1X1

Attention: Mr. F.W. Matthews

Re: Submission of geological and geochemical surveys for Assessment Work on 173 claims in the Patricia Mining Division: Pa 614596, etc...

Dear Mr. Matthews,

Enclosed, please find two copies of each of the following documents from geological and geochemical surveys by UMEX over two claim blocks in the Houghton Lake and Savant Lake area:

1. Report on geological and Geochemical surveys in the Houghton Lake (Area C) and Savant Lake Area (Marchington road area).

2. Geological and geochemical map on the above areas, 1" = 125 m.

We are hereby respectfully requesting that the submitted work be recorded as assessment work on those 173 claims.

Thank you for your consideration in this matter.

Yours truly,

T. Verbeek

JJL/tn
encl.

1984 06 20

Your File: 83-66, 83-69
Our File: 2.5628

Mr. Albert Hanson
Mining Recorder
Ministry of Natural Resources
P.O. Box 669
Sioux Lookout, Ontario
P0V 2T0

Dear Sir:

RE: Notice of Intent for Geological and Geochemical Survey submitted on Mining Claims PA 390918 et al in the Areas of Evans Lake and Houghton Lake

---

Assay costs in relation to the Geochemical Survey has been assessed under Section 77(19).

Please inform the claim holder that these credits are available if he/she elects to file a new report of work.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone:(416)965-4888

D. Kinvig:mc

cc: Umex Inc
1935 Leslie Street
Don Mills, Ontario
M3B 2M3

Ministry of Natural Resources

Ontario

July 5/84

Your file: 83-66, 83-69

Our file: 2.5628

1984 06 20

Mr. Albert Hanson
Mining Recorder
Ministry of Natural Resources
P.O. Box 669
Sioux Lookout, Ontario
P0V 2T0

Dear Sir:

Enclosed are two copies of a Notice of Intent with statements listing a reduced rate of assessment work credits to be allowed for a technical survey. Please forward one copy to the recorded holder of the claims and retain the other. In approximately fifteen days from the above date, a final letter of approval of these credits will be sent to you. On receipt of the approval letter, you may then change the work entries on the claim record sheets.

For further information, if required, please contact Mr. F.W. Matthews at 416/965-6918.

Yours very truly,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: 416/965-1316

R D.K. D. Kinvig:mc

Encls.

cc: Umex Inc
1935 Leslie Street
Don Mills, Ontario
M3B 2M3

cc: Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

845

101

1983 06 26 2.5628

Mining Recorder
Ministry of Natural Resources
P.O. Box 669
Sioux Lookout, Ontario
P0V 2T0

Dear Sir:

We have received reports and maps for a Geological and Geochemical Survey submitted under Special Provisions (credit for Performance and Coverage) on Mining Claims PA 614596 et al in the Area of Houghton Lake.

This material will be examined and assessed and a statement of assessment work credits will be issued.

We do not have a copy of the report of work which is normally filed with you prior to the submission of this technical data. Please forward a copy as soon as possible.

Yours very truly,

E.F. Anderson
Director
Land Management Branch

Whitney Block, Room 6450
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: 416/965-1380

A. Barr:sc

cc: Umex Incorporated
Don Mills, Ontario
Attn: Mr. T. Verboek.

106

2.5628

1984 07 16

Your File: 83-66, 83-67, 83-69, 83-70
Our File: 2.5628

Mr. Albert Hanson
Mining Recorder
Ministry of Natural Resources
P.O. Box 309
Sioux Lookout, Ontario
P0V 2T0

Dear Sir:

RE: Notice of Intent dated June 20, 1984
Geological and Geochemical Survey and
Data for Assaying on Mining Claims
PA 390918 et al in the Areas of Evans
Lake and Houghton Lake

The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone:(416)965-4888

O. Kinvig:mc

cc: Umex Inc
1935 Leslie Street
Don Mills, Ontario
M3B 2M3

cc: Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

Encl.

cc: Resident Geolggist
Sioux Lookout, Ontario

107

FOR ADDITIONAL

INFORMATION

SEE MAPS:

52J/07SW-0024 #1-9

EXPLORATION LAKE

EXPLORATION LAKE
TL 20 N
TL 40 N
TL 60 N
TL 70 N
TL 20 S
TL 40 S
BL 0
ROSE

EXPLORATION LAKE
TL 20 S
TL 40 S
TL 60 S
TL 80 S
TL 20 N
TL 40 N
TL 60 N
TL 70 N
BL O
BL O 56W
72E
52E
36E
32E
28E
24E
20E
16E
12E
8E
4E
32W
36W
40W
44W
48W
52W
56W
60W
64W
68W
72W
76W
80W
84W
88W
92W
96W
100W
104W
108W
112W


LAKE
EXPLORATION

CORPORATION FALCONBRIDGE COPPER

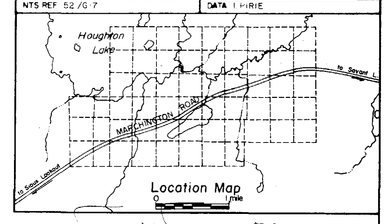
UMEX OPTION - AREA "C"

GEOLOGY

PN 043 — 400 0 400 feet — 1:4800

DATE SEPT 1982 — DRAWN J.L.L.

NTS REF 52/07 — DATA THIRIE



HOUGHTON LAKE

CHAMPAGNE LAKE

MARCHINGTON

ROCK TYPES

- 8 INTERMEDIATE FELSIC INTRUSIVE
  - a granite
  - b granodiorite
  - c trondhjemite
  - d quartz diorite
  - e aplite
  - f felsite
- 7 MAFIC INTRUSIVE
  - a diorite
  - b gabbro
  - e undefined dykes & sills
- 5 SUBVOLCANIC INTRUSIVE
  - a quartz porphyry
  - b feldspar porphyry
  - c quartz-feldspar porphyry
- 3 FELSIC METAVOLCANIC
  - a flow
  - b tuff
  - c lapilli tuff
  - d agglomerate
  - e debris flow
- 2 INTERMEDIATE METAVOLCANIC
  - a flow
  - b tuff
  - c lapilli tuff
  - d agglomerate
- 1 MAFIC METAVOLCANICS
  - a flow
  - b debris flow

SYMBOLS

- Outcrop
- Geological Contact (defined, inferred)
- Bedding (vertical, inclined)
- Foliation
- Lineation
- Shear Zone
- Diamond Drill Hole
- Claim Post (located, assumed)
- Base of Slope
- Road (paved, bush road)
- Swamp

ABBREVIATIONS

bio	biotite flecks or lenses
BR	brecciated
chl	chlorite
cp	chalcopyrite
ep	epidote
feld	feldspar
G	granitizied
gar	garnet
hem	hematite
hfls	hornfelsed
mt	magnetite
py	pyrite
qtz	quartz
QE	quartz eye
rhy	rhyolite
ser	sericite
staur	staurolite
xeno	xenolith

CORPORATION FALCONBRIDGE COPPER

UMEX OPTION - AREA "C"

LITHOGEOCHEMISTRY

Na_2O %

PN 043 — 400 0 400 feet — 1:4800

DATE NOV. 1982 | DRAWN J.L.L.

NTS REF 52 J/7 | DATA I. PIRIE

52J/07SW-0024, #7

25628

HOUGHTON LAKE

MARCHINGTON LAKE ROAD

614791 614780 614779 614772 615098 615097 614762 614761 614752

614790 614781 644996 644987 615099 614771 614763 614760 614753

644985 644988 615100 615307 614764 614759 614754

614788 614778 615312 615309 615101 615308 614765 614755

614787 614784 615310 614596 614768 614757 614756

614786 614785 614776 614775 614797 614767

614606 614605 614604 614603 614607 615092

0 4E 8E 12E 16E 20E 24E 28E 32E 36E 40E 44E 48E 52E 56E 60E

4W 8W 12W 16W 20W 24W 28W 32W 36W 40W 44W 48W 52W 55W 60W 64W 68W 72W 76W 80W

260

MEX OPTION AREA "C"

LITHOGEOCHEMISTRY

Zn ppm

1:4800

NOV 1982

52J/07SW-0024,#8

25428

HOUGHTON

LAKE

WESTERN ALLIANCE COPPER

UMEX OPTION : AREA "C"

LITHOGEOCHEMISTRY

Cu ppm

1:4800 400 feet

DATE: NOV 1982 DRAWN: JL

DATA FILE:

52J/07SW-0024,#9

25628

HOUGHTON LAKE

MARSHINGTON RIVER


CORPORATION FALCONBRIDGE COPPER
UMEX OPTION
Marchington Road Claims
LITHOGEOCHEMISTRY
Na_2O %
LEGEND
< 1 %
1-2 %
2-3 %
3-4 %
> 4 %
MONTROSE LAKE
52J/07SW-0024 #2


CORPORATION FALCONBRIDGE COPPER
UMEX OPTION
Marchington Road Claims
LITHOGEOCHEMISTRY
Zn ppm.
DATE NOV 1982
NTS REF 52J/7
LEGEND
< 40 ppm
40 - 60 ppm
60 - 80 ppm
80 - 100 ppm
> 100 ppm
MONTROSE LAKE
52J/07SW-0024,#3
52J/07SW-0024#3


CORPORATION FALCONBRIDGE COPPER
UMEX OPTION
Marchington Road Claims
LITHOGEOCHEMISTRY
Cu ppm.
LEGEND
< 20 ppm
20-65 ppm
65-100 ppm
100-135 ppm
> 135 ppm
MONTROSE LAKE
TL 70 N
TL 40 N
TL 20 N
BL 0
TL 20 S
TL 60 S
TL 80 S
TL 100 S
52J/07SW-0024 #4
23628

CORPORATION FALCONBRIDGE COPPER
UMEX OPTION
Marchington Road Claims
LITHOGEOCHEMISTRY
Sample Location

PN 043
DATE NOV 1982
DRAWN J.L.
NTS REF 52J/07
DATA CP

52J/07SW-0024,#5

52J/07SW-0024,#5

CORPORATION FALCONBRIDGE COPPER
UMEX OPTION
Marchington Road Claims
LITHOGEOCHEMISTRY
Sample Location

240