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THE GNAT LAKE PROPERTY OF DEASE LAKE MINES, LIARD M. D., BRITISH COLUMBIA

HISTORY AND STATUS

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Vancouver
February, 1975

II. INTRODUCTION

In 1974 the Company (H.B.E.D.) obtained a substantial interest in Lytton Minerals Ltd. which, in turn, holds a 44% interest in Deas Lake Mines Ltd., a joint venture between Lytton Minerals and Mitsui Mining and Smelting Company of Tokyo, Japan. Deas Lake Mines Ltd. was formed to explore a group of claims in the Dease Lake area, Liard Mining Division, in the Stikine district of British Columbia (see Fig. 1). Interest was first generated in the area through a series of showings of copper mineralisation, principally in volcanic rocks, which occur to the northeast of Lower Gnat Lake (Fig. 2).

The ground was first held by Cassiar Asbestos Co. in 1960, but following minor surface exploration, the claims were allowed to lapse and the property was restaked by Emil Krysko in 1963, and included the June (1-12) and Stikine (1-20) groups.

The following year, the property was investigated by Newconex Ltd., a subsidiary of Gold Fields Ltd., which undertook an extensive surficial study which included geologic mapping, magnetics, Crone EM, trenching and sampling. (N.B. The results of all work carried out are discussed later.)

1964 The work carried out by Newconex was supervised by R. D. Westervelt, who recognised the possibility of a large tonnage low-grade copper deposit existing in the area. However, it appears that Newconex was not sufficiently impressed to continue their interest in the property, and the aforementioned claim groups were optioned to a syndicate headed by Dr. W. H. Gross from the University of Toronto. This consortium, the Gross-Kennedy-Anderson syndicate, brought the

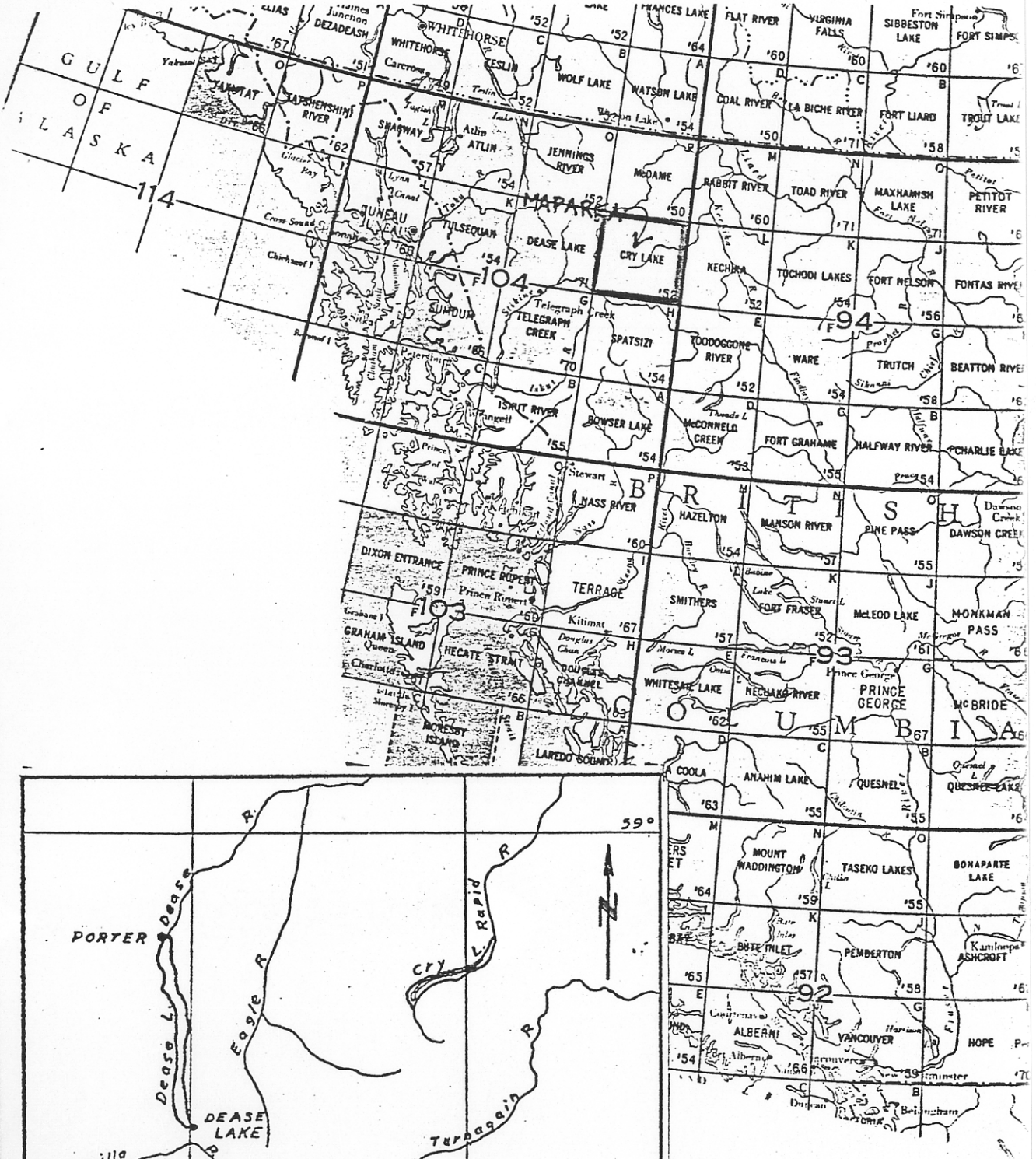
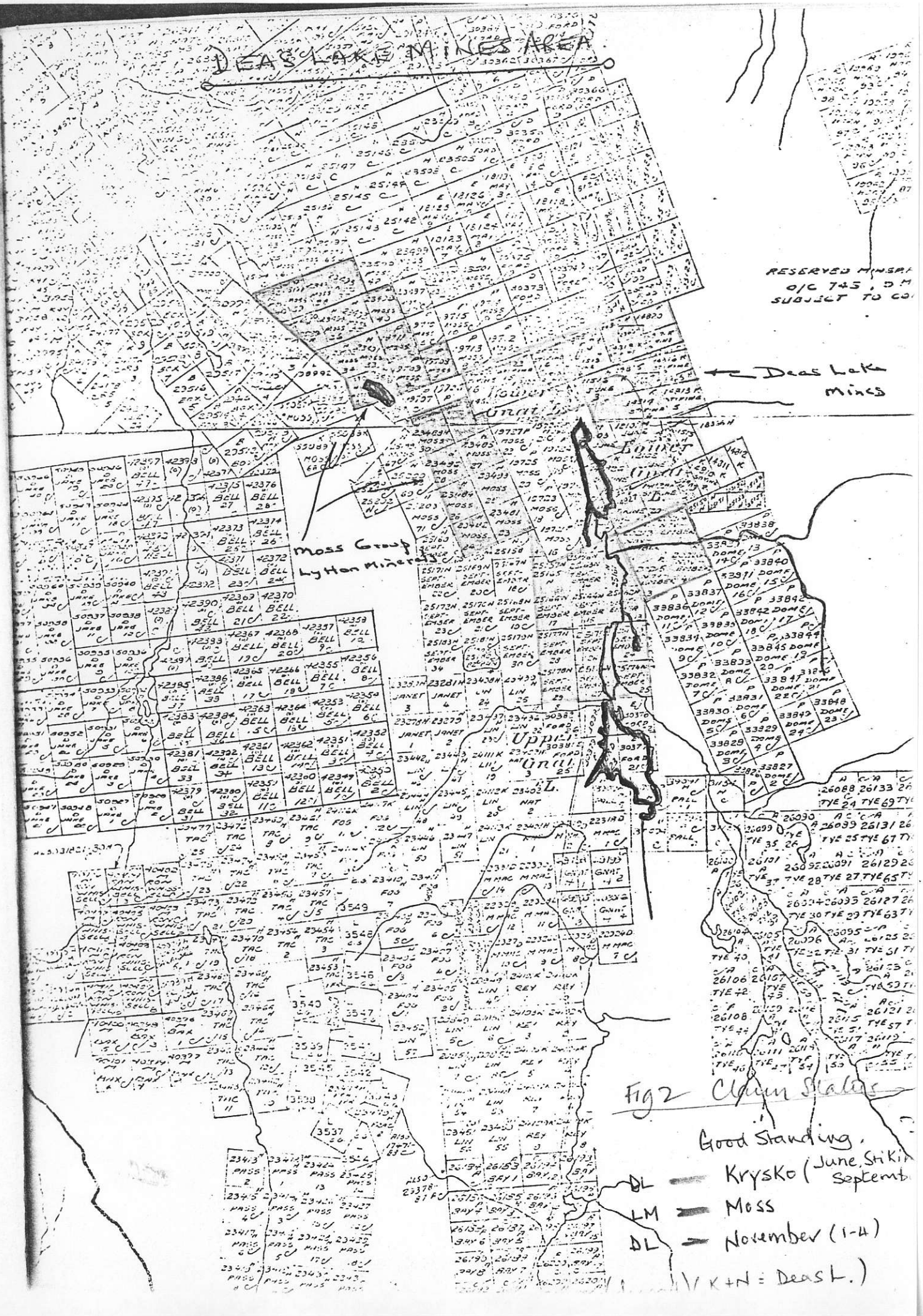


FIGURE 1. LOCATION MAP
SCALE 1"=20 MI.


DEASLAKE MINES AREA
RESERVED MINERAL
O/C 745 , D M
SUBJECT TO CO
← Deas Lake
Mines
Moss Group
LyHon Mineral
Upper
Grull
L.
Fig 2 Claim Status
Good Standing.
DL — Krysko (June, Stikine
September
LM — Moss
DL — November (1-4)
K+N = Deas L.)

property to the attention of Lytton Minerals, which, after a lengthy period of negotiation drew up an agreement whereby the property would be explored by a new company, Deas Lake Mines. The interest in this company was divided 44% Lytton Minerals Ltd, 44% Mitsui Mining Co. Ltd. and the triumviate (G-K-A) retained a 12% interest plus payments totalling $45,000.

1965 Although the original claim groups were not transferred to Deas Lake Mines Ltd. until February, 1967, work on the property began in 1965. This early work included geologic mapping and a McPhar Induced Polarisation and Resistivity survey, supervised by P. G. Hallof. More ground work was acquired in 1965 (and 1966) much of which was transferred to Deas Lake Mines, except for one large block (about 75) of Moss Claims which were retained by Lytton Minerals 25 claims from this group are still in good standing.

Following the IP survey (1965), 10 holes were drilled (BX core-wireline) totalling about 5,000 feet to test the vertical continuity of mineralised outcrops, and to investigate two of the three weak IP responses. Some of the early drilling was very encouraging, with some good grade intersections in holes #3, #6, #8 and #9.

1966 Drilling was restarted in June 1966 and was continued through to November, during which time a further 14 holes were drilled totalling about 9,000 feet. In some holes the mineralisation intersected was still encouraging, although already there were some indications that the distribution of chalcopyrite is both irregular and confined to a fairly small zone. (Hill Zone).

During this period a soil geochemical study was made over the main grid and both magnetometer and soil surveys carried out over the November claim group, and part of the Moss claim group. In all cases the geochemical studies involved the colorimetric determination of total heavy metals (THM) and cold extractible copper (cxCu), although total copper and zinc (hot extractible) were determined for the main grid during the following winter.

A further I.P. survey was contracted out to H. O. Siegil & Associates.

1967 A large drilling program (41 holes, approximately 23,000 feet) was carried out June-December, 1967 during which time most of the Hill Zone was delineated, except to the west. More I.P. work was done by Geoterrex on the main grid using a 3-array (pole-dipole?) and Wenner array.

Soil geochemical studies and a magnetometer survey were completed over the remainder of the Moss group.

1968 The last of the diamond drilling was completed during the period April-July, 1968 and about 22,000 feet of BX core was extracted much of which wa to test continuity between holes and sections.

By the end of the drilling program it was clear that at the prevailing price of copper the Hill Zone alone was of insufficient tonnage and grade (28,000,000 short tons @ .44% Cu) to consider for mining.

69-1971 During the next three years more soil geochemistry, trenching and percussion drilling (47 holes) were carried out over the Moss group, but this work failed to increase the known reserves in the area. (Summary of all work accomplished can be found on Table 2.)

The property has remained dormant since 1971, and although many of the claims are in good standing until 1979, some will come up for re-evaluation as early as July, 1975. It has been considered prudent, therefore, to re-examin all the available data, and set out some guidelines for the decision as to which ground should be retained, if any, and what further work might be considered in the future. If it is considered that the property has been fully evaluated, and the zone of "significant" mineralisation completely outlined, it must be decided whether or not it is conceivable that the deposit may be of economic significance at sometime, bearing in mind possible technological advances in the future.

TABLE 2: SUMMARY OF WORK IN GNAT LAKE AREA, DEAS LAKE MINES LTD: LYTTON MINERALS LTD.

YEAR	G-K-A OPTION	MOSS GROUP	NOVEMBER GROUP
1964	Geology, magnetics, Crone EM, Trenching, Sampling (Newconex)		
1965	I.P. Resistivity (McPhar) Geology Drilling (5,000' 10 holes) (Bx - wireline) Staking		
1966	Geochemical survey-soils (THM, cx Cu, hotex Cu & Zn) Drilling (9,000 ft, 14 holes) (BX - wireline) I.P Survey (Siegel	Geology Magnetics Geochem Survey (THM cx Cu)	Geology Magnetics Geochem Survey (THM cx Cu)
1967	I.P. (Geoterrex) - 3 array and Wenner array Drilling (2,300 ft - 41 holes) (BX wireline)	Geology Magnetics Geochem Survey Minor I.P. Drilling 2000'	
1968	Drilling (22000) - 37 holes (BX wireline)		
1969	Trenching (?)	Trenching	
1970		Trenching	
1971		Stripping Trenching 41 Percussion holes (4600 ft)	
1972	Grade and tonnage calculations		

III. SUMMARY OF RESULTS FROM EXPLORATION

A. GNAT LAKE (G-K-A Option)

1. Property Status

A total of 56 claims and 9 fractions of the June, July, Stikine, September and Gnat groups are held in good standing (Fig. 2), and work commitments have been made on all ground until July 3, 1979.

2. Geology

The writer has been unable to locate any summary or interpretation of the geology, written by the Deas Lake/Lytton staff, subsequent to the diamond drill program. Two reports are available, however,

i. a report by R. D. Westervelt for Newconex, based only on surficial examination and minor trenching.

ii. a report by W. G. Jeffery in the B.C.M.M. Report, 1966, which was written after 15 of the 102 drill holes had been completed.

The D.D.H. logs are complete, although logging by various geologists may have created some cross correlation problems, notable in the sections. The surface mapping is hindered by extensive overburden cover and widespread alteration.

On a regional scale the geologic setting is straightforward; on a local scale highly complex. Volcanic rocks of Upper Triassic age, overlain by clastic sediments, were intruded by a quartzmonzonite to granodiorite

LOCATION - Dease Lake, Liard Mining Div., 58°14 North, 129°50 West

n	Tag No.	Staking Date	Record No.	Recording Date	Grouping & Date	Expiry Date	Staker & License No.	Staked For	Optioned To	Transfered to	Transfer Date
1 FR	719917	8 Nov./66	25657	16 Nov/66	#1 Group 1968	16 Nov/79	M.Bradford 49323	Lytton 42678		Deas Lake Mines	6 Feb./67
2 FR	719918	"	25658	"	"	"	"	"		"	"
1	497501	21 June/63	11514	3 July/63	"	3 July/79	E.Krysko 18079		To WS Kennedy To Lytton	To Lytton To Deas Lake Mines	6 Feb/67
2	02	"	15	"	"	"	"		"	"	"
4	04	"	17	"	"	"	"		"	"	"
7	10	9 Sept/63	12100	13 Sept/63	"	13 Sept/79	"		"	"	"
8	11	"	01	"	"	"	"		"	"	"
9	12	"	02	"	"	"	"		"	"	"
10	13	"	03	"	"	"	"		"	"	"
11 FR	494260	7 Oct/64	15453	8 Oct/64	"	8 Oct/79	E.Krysko 22485		"	"	"
1 FR	583901	19 July/65	18364	28 July/65	"	28 July/79	T.Bilinski 36286	Lytton 36430		Deas Lake Mines	6 Feb/67
2 FR	02	"	65	"	"	"	"	"		"	"
5 FR	05	24 July/65	68	"	"	"	"	"		"	"
EMBER 7	727084	15 Sept/66	25156	8 Oct/66	"	8 Oct/79	M.Bradford 49323	Lytton 42678		"	"
8	85	"	57	"	"	"	"	"		"	"

Claim	Tag No.	Staking Date	Record No.	Recording Date	Grouping & Date	Expiry Date	Staker & License No.	Staked For	Optioned To	Transfered to	Transfer Date
EMBER 12	727089	15 Sept/66	25161	8 Oct/66	#1 Group 1968	8 Oct/79	M.Bradford 49323	Lytton 42678		Deas Lake Mines	6 Feb/67
14	91	"	63	"	"	"	"	"		"	"
16	93	"	65	"	"	"	"	"		"	"
37 FR	775960	19 Nov/67	29192	6 Dec/67	"	6 Dec/79	M.Bradford 50877	Deas Lake Mines 66332			
INE 6	503745	28 Aug/64	14814	31 Aug/64	"	31 Aug/79	E.Krysko 22485	W.H.Gross 23590	Lytton	To Lytton To Deas Lake Mines	6 Feb/67
7	46	"	15	"	"	"	"	"	"	"	"
8	47	"	16	"	"	"	"	"	"	"	"
9	48	28 Aug/64	17	31 Aug/64	"	"	"	"	"	"	"
10	49	"	18	"	"	"	"	"	"	"	"
11	50	"	19	"	"	"	"	"	"	"	"
12	51	"	20	"	"	"	"	"	"	"	"
13	52	29 Aug/64	21	"	"	"	"	"	"	"	"
14	53	"	22	"	"	"	"	"	"	"	"
15	54	"	23	"	"	"	"	"	"	"	"
16	55	"	24	"	"	"	"	"	"	"	"
17	56	"	25	"	"	"	"	"	"	"	"

LOCATION - Dease Lake, Liard Mining Div. 58°14' North, 129° 30W

Claim	Tag No.	Staking Date	Record No.	Recording Date	Grouping & Date	Expiry Date	Staker & License No.	Staked For	Optioned To	Transfered to	Transfer Date
MINE 18	503757	29 Aug/64	14826	31 Aug/64	#1 Group 1968	31 Aug/79	E.Krysko 22485	W.H.Gross 23590	Lytton	To Lytton To Deas Lake Mines	6 Feb/67
19	58	"	27	"	"	"	"	"	"	"	"
20	59	"	28	"	"	"	"	"	"	"	"
al of	34 CLAIMS IN #1 GROUP										
NE 3	497503	21 June/ 63	11516	3 July/63	#2 Group 1968	3 July/79	E.Krysko 18079	To WS Kennedy	To Lytton	To Lytton To Deas Lake Mines	6 Feb/67
5	05	"	18	"	"	"	"		"	"	"
6	06	"	19	"	"	"	"		"	"	"
NE 12 FR	494261	7 Oct/64	15454	8 Oct/64	"	8 Oct/79	E. Krysko 22485		"	"	"
LY 3 FR	583903	19 July/65	18366	28 July/65	"	28 July/79	T.Bilinski 36286	Lytton 36430		Deas Lake Mines	6 Feb/67
4 FR	04	24 July/65	67	"	"	"	"	"		"	"
OVEMBER 1	583080	19 Nov/65	20213	17 Dec/65	"	17 Dec/79	"	"		"	"
2	81	"	14	"	"	"	"	"		"	"
3	82	"	15	"	"	"	"	"		"	"
4	83	"	16	"	"	"	"	"		"	"

LOCATION - Dease Lake, Liard M.D. 58 14 North, 129 58 West

	Tag No.	Staking Date	Record No.	Recording Date	Grouping & Date	Expiry Date	Staker & License No.	Staked For	Optioned To	Transfered to	Transfer Date
EMBER 1	727078	14 Sept/66	25150	8 Oct/66	#2 Group 1968	8 Oct/79	M.Bradford 49323	Lytton 42678		Deas Lake Mines	6 Feb/67
2	79	"	51	"	"	"	"	"		"	"
3	80	"	52	"	"	"	"	"		"	"
4	81	"	53	"	"	"	"	"		"	"
5	82	"	54	"	"	"	"	"		"	"
6	83	"	55	"	"	"	"	"		"	"
13	90	"	62	"	"	"	"	"		"	"
15	92	"	64	"	"	"	"	"		"	"
17	94	"	66	"	"	"	"	"		"	"
24	727101	17 Sept/66	73	"	"	"	"	"		"	"
25	02	"	74	"	"	"	"	"		"	"
26	03	"	75	"	"	"	"	"		"	"
27	04	"	76	"	"	"	"	"		"	"
28	05	"	77	"	"	"	"	"		"	"
29	06	"	78	"	"	"	"	"		"	"
36 FR	775959	19 Nov./67	29191	6 Dec/67	"	6 Dec/79	M.Bradford 50877	Deas Lake Mines 66332			
NE 1	503740	28 Aug/64	14809	31 Aug/64	"	31 Aug/79	E.Krysko 22485	W.H. Gross 23590	Lytton	To Lytton To Deas Lake Mines	6 Feb/67

m	Tag No.	Staking Date	Record No.	Recording Date	Grouping & Date	Expiry Date	Staker & License No.	Staked For	Optioned To	Transfered to	Transfer Date
INE 2	503741	28 Aug/64	14810	31 Aug/64	#2 Group 1968	31 Aug/79	E.Krysko 22485	W.H.Gross 23590	Lytton	To Lytton To Deas Lake Mines	6 Feb/67
3	42	"	11	"	"	"	"	"	"	"	"
4	43	"	12	"	"	"	"	"	"	"	"
5	44	"	13	"	"	"	"	"	"	"	"
L OF	31 CLAIMS IN #2 GROUP										

stock, part of the Hotailuh Batholith, dated Upper Jurassic to Cretaceous. Jeffery (1966), describes the volcanic pile as "volcanic andesite and basalt flows, tuffs and breccias, with some sediments, intruded by small stocks and sills of porphyritic andesite and basalt." The volcanic sequence has apparently been intruded by an irregular mass of fine grained feldspar porphyry which exhibits a great deal of textural variation. Jeffery suggest this ".....leucocratic red-stained Felsite to Alaskite may, in part, be a highly altered version of the volcanic rocks"(??)

In the mineralised areas the rocks are highly altered, with widespread carbonatization and patchy sericitization. Potash feldspar alteratio and silicification are recorded in several of the D.D.H. logs. Abundant chlorite occurs along fractures and dense black veins of tourmaline are ofte present.

The rocks which form the Hill Zone (see Plate 1) are crackled and brecciated and are displaced by numerous small faults and joints. (Note: This may be responsible for the poor correlation of lithologecs between drill holes and sections,) It has also been suggested that the area is traversed by a number of major north-south trending faults.

Several times in the D.D.H. logs, rocks which are described as dykes have gradational contacts, and this, together with the K-spar alteration and tourmalinization, suggests a high temperature environment.

3. Mineralisation

The only abundant sulphides to occur in the area are pyrite and chalcopyrite, in disseminations, vugs and blebs, and in veinlets. There is some evidence of zonation, with chalcopyrite dominant in the centre of the mineralised area, and pyrite in the peripheral zones. Bornite and molybdenite are present but rare, and the precious metal content is low.

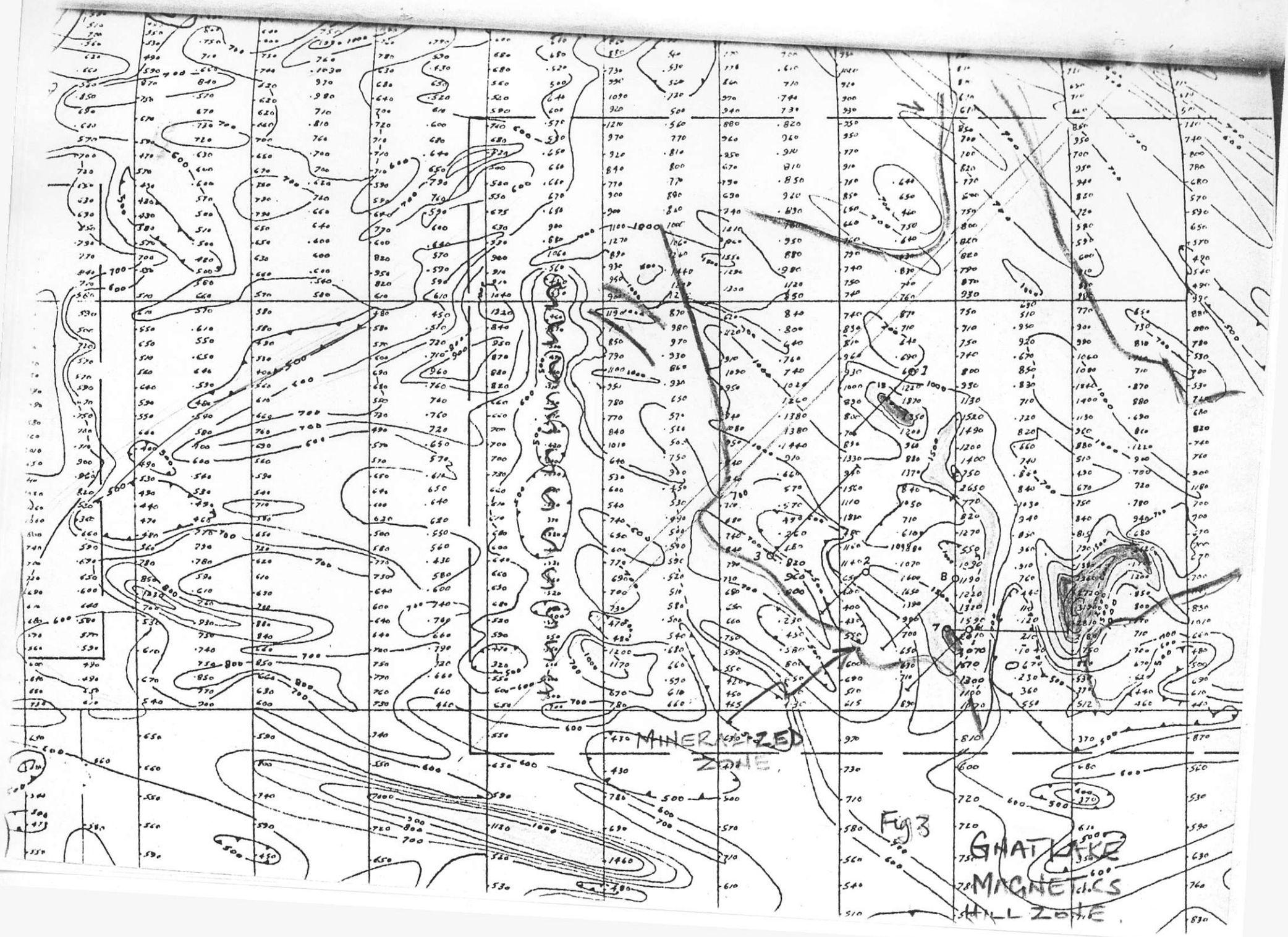
The main body of potentially economic sulphide mineralisation of the Hill Zone occurs for the most part in a belt of andesite and is spatially related to the feldspar porphyry. It would appear, however, that the localisation of sulphide mineral is governed more by structural or tectonic considerations, than by a preference for lithology or mineralogy. There is, however, a marked association of the higher grades of copper, with the veins of tourmaline and occasionally with magnetite.

Exposures of the Hotailuh Batholith in the south end of the property are almost barren with respect to sulphide mineralisation.

4. Geophysics

a. Magnetometric Studies

Two independent magnetometer surveys were carried out over the entire property area (Newconex 1964, Lytton 1965). The results of these surveys correlate very well although Newconex, using a Sharpe MF-1 (fluxgate) instrument, achieved better contrast. In both cases, however, there is a


MINERALIZED
ZONE
Fig 3
GHATLAKE
MAGNETICS
HILL ZONE

clear and obvious relationship between the magnetic response and the mineralisation. Both the Hill Zone and Creek Zone give a positive magnetic response up to 3,200 gammas on a background of 600-700 gammas (Lytton), or 2,400 gammas on a background of 250-300 gammas (Newconex). Fig. 3 shows the Lytton data, where it can be seen that not all the mineralised zone responds. The magnetic high is associated with the basaltic core in which the magnetite-chalcopyrite assemblage is common.

Two other features of interest are apparent from the Lytton data. A north-south zone of low values to the west of the Hill Zone correspond wi a marked lineation on the areal photographs, which has been interpreted as a major fault structure. Also, there is a suggestion of a fold structure with the axis striking E-W and with the nose of the fold in the SW corner of Fig. 3.

It is considered that the magnetic data is of great significance in the further evaluation of this property, but it must be remembered that background readings do not preclude mineralisation.

b. Induced Polarisation and Resistivity Studies

At least three contracting geophysical companies were involved in induced polarisation measurements over the Gnat Lake property.

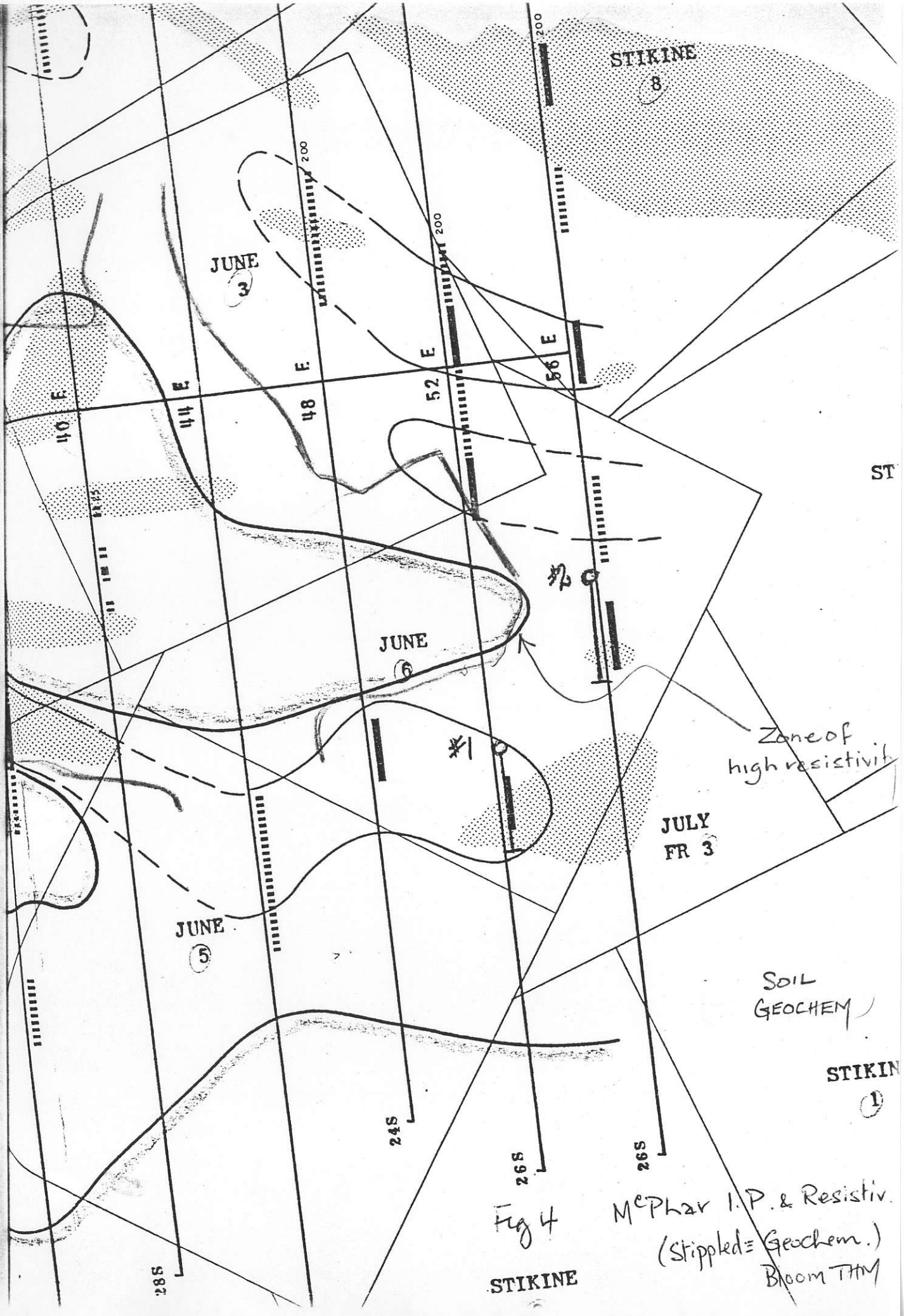


Fig 4 McPhar I.P. & Resistiv.
(Stippled = Geochem.)
Bloom THM

McPhar Geophysics Ltd., under the supervision of Dr. P. G. Hallof, carried out 15 line miles of induced polarisation and resistivity measurements on 200 feet spreads over most of the property. (1965). In Hallof's words the survey "... has not shown any anomalies that suggest broad zones disseminated mineralisation." Three of the "weak IP anomalies" which correlated with anomalous geochemical zones were proffered for testing. Hole #3 intersected three zones of copper mineralisation, the most significant intersection of which was well below the maximum penetration of the survey (> 400 ft.). Interestly, there is a zone of high resistivity which correlates well with the mineralised zone where it is less than 200 feet from surface. Hallof suggested that this is probably due to decreased rock porosity through alteration, and also suggests this as a possible reason for the lack of I. P. effect. Fig. 4 shows Hallof's interpretation in the vicinity of the Hill Zone.

In 1966, however, Seigel and Associates conducted a similar survey over the property after the first years drilling had established the presence of a mineralised body. This time the 2.5% frequency I.P. effect contour all but outlines the Hill Zone. Since no report accompanies the plotted data, the writer is unable to determine what was done differently s that survey I gives little or no indication of the sulphide body, and surve II outlines the then known zone perfectly. The Seigel survey also provides a number of possible targets which are as yet untested. A full evaluation of these two surveys by a qualified geophysicist is warranted, if further work is to be scheduled for this property.

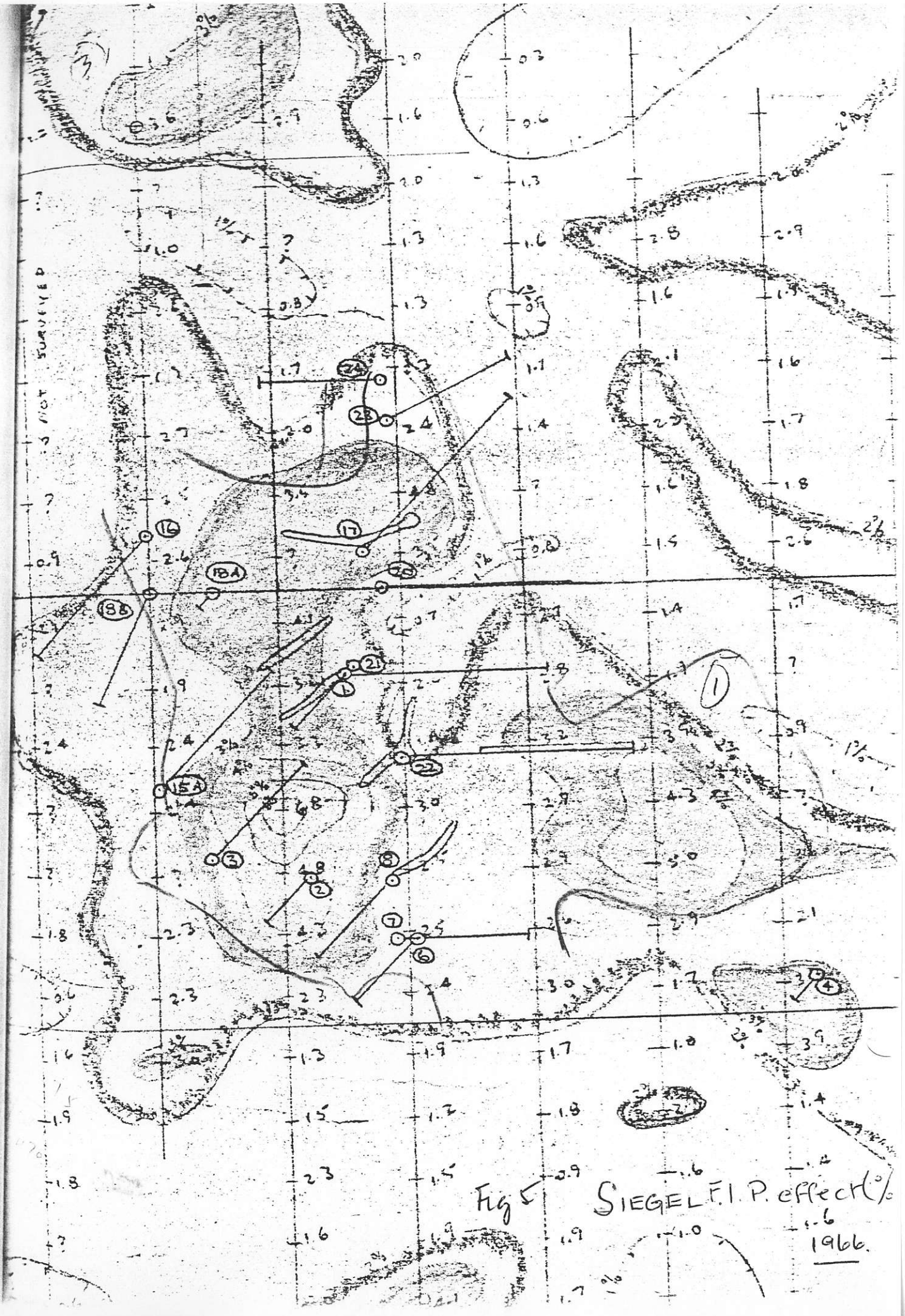


Fig 5 SIEGEL F.I.P. effect (%)
1966.

Geoterrex carried out some check work I.P. in 1967 using a Wenner configuration and 3-array. This work suggests a further possible target at 33N/28E which appears not to have been tested.

A Crone Sr. EM survey was carried out by Newconex in 1964, when 9.5 miles of EM profiling was completed over magnetic highs and exposed mineralisation. No significant EM conductors were encountered. However, the maximum instrument readings (±3 degrees or %?) occur over the Hill Zone.

5. Geochemistry

A soil geochemistry survey was carried out over the entire claim group in the summer of 1965 by the Lytton staff. Originally only THM (total heavy metals) and cxCu (cold extractible Cu) were determined in the field by colorimetric methods. During the following winter the samples were analysed for copper and zinc by atomic absorption spectrophotometry and the close correlation between the colorimetric results and the AA results does credit to the field personnel responsible for the survey.

Since copper mineralisation is exposed in the Hill Zone the soil geochemistry, not surprisingly, responds quite well on the downslope side of the mineralisation. The anomaly over the Hill Zone is quite extensive (1200'x600') and exhibits values as high as 2.56% copper in the soil. No report accompanies the maps for this area but to judge by subsequent reports clastic soils of the B_1 horizon were sought and sieved to -80#.

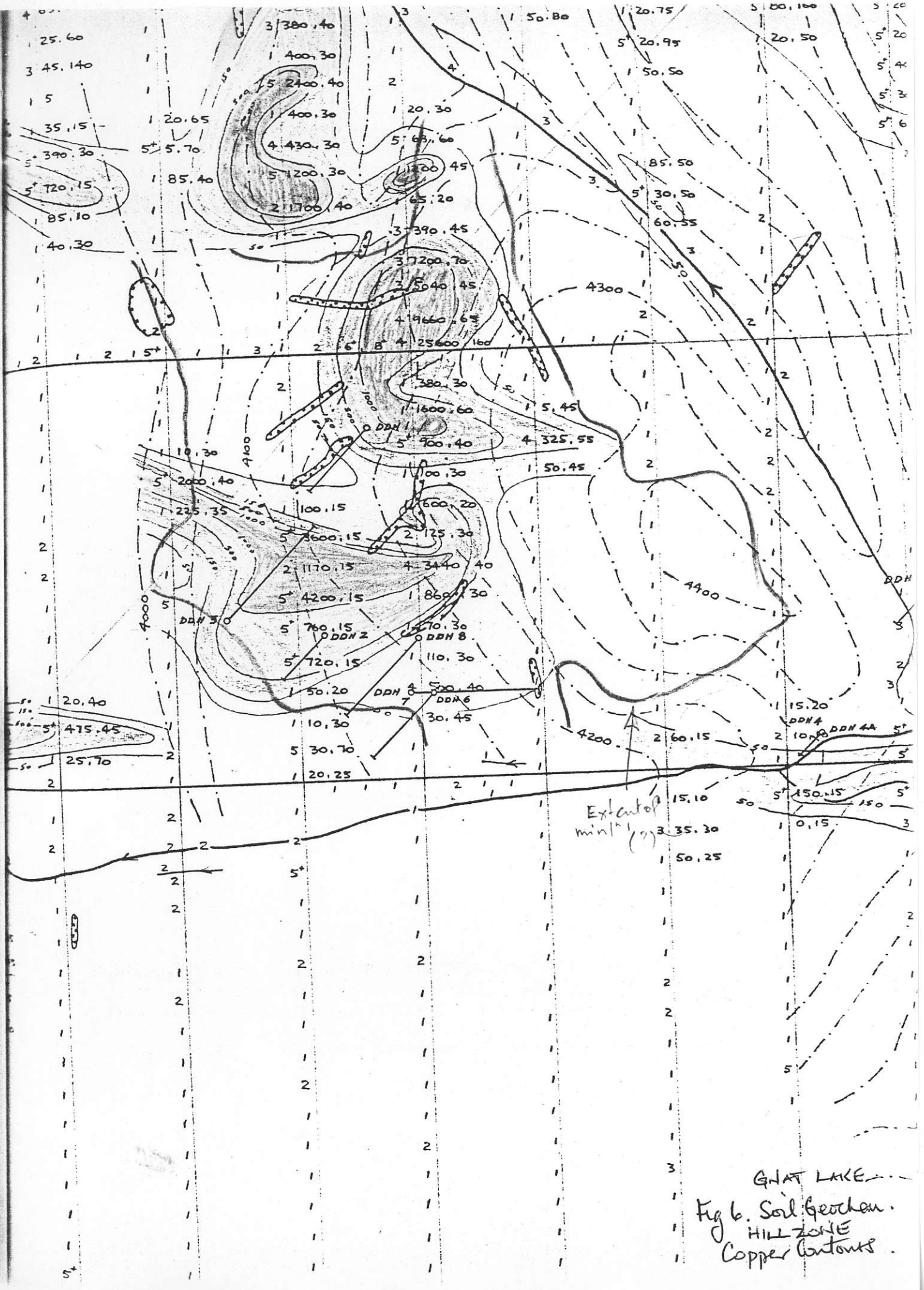


Fig 6. Soil Geochem. HILL ZONE Copper Contours.

(sieving was abandoned on a later project since it was found to be unnecessary (?).The position and extent of the anomaly over the Hill Zone corresponds well to a small downhill displacement of the near surface mineralisation. In the absence of some concentrating mechanism (e.g. swamps etc.) both the geochemical patterns and the magnitude of the values indicate that the dispersion is largely mechanical (soil creep etc.) However, the fact that the area has been overlain to some extent by glacial debris, the extent of the anomaly suggests that some hydromorphic dispersion is present. The Creek Zone is not indicated by the geochemical survey.

The clastic sediments on the east side of the Hill Zone are readily discernable from the patterns of both zinc and THM, and to some extent the copper.

The series of highs on the western edge of the grid are interesting and of possible significance. These anomalies have been contoured on an east-west bias, based, perhaps, on some unrecorded roadside geology. However, as we have seen in the Hill Zone, structure appears to be the dominant control rather than lithology, and the principal fault structures are projected N-S. An alternative contouring of this zone with a N-S bias reveals an almost continuous, albeit narrow, zone of high copper. This zone intersects a magnetic anomaly which was drilled (D.D.H.#14) on the west flank of the geochemical high, and found to contain magnetite but no chalcopyrite. Otherwise, this zone remains untested. Little or no support is given by Siegel's I.P. survey, however, (Note: The peak of this anomalous zone (2550 ppm Cu) lies just outside the claim group on what purports to be open ground.)

6. Trenching

As with most of the work carried out on the Gnat Lake property, there is no in-house report accompanying the plotted data, which describes the object of, modus operendi or conclusions drawn from the trenching programs. In fact the writer is not certain that the trenches plotted on Plate 1 are those of Lytton or Newconex. The documentation of the 1969 trenching shows only the trench locations. The pre-1969 trenching (1965?) consisted of at least 12 excavations, seven of which are sub-parallel NE-SW "en echelon" trenches across the Hill Zone, and vary in length from 200-500 feet. Bedrock was reached in about 50% of the total length of these trenches. The remaining trenches are scattered throughout the rest of the property, but judging from the geologic plans, only the large area stripped over the Creek Zone appears to have been denuded down to bedrock.

The primary objective of the trenching appears to be simply as a geologic aid, since few data are available on chip sampling and none on bulk sampling or rock geochemistry.

7. Drilling

Approximately 59,000 ft. (102 holes) of BX wireline diamond drilling was carried out 1965 through 1968, supervised by one or more of several geologists (M. Bradford, J. A. Boyd, D. W. Asbury, F. L. Wynne and D.G.C., in order of descending frequency). Clearly, the volcanic pile has created problems in the documentation of the logs. Gradational contacts, a wide variety of alteration products from different lithologies of similar original composition, assimilation of intercalations of sediments(?) and the highly

complex structure, have all contributed to produce an immensely complicated picture when these drill holes are viewed in section.

Before any further work is considered for this property, a need exists to re-examine the core from the entire suite of drill holes in an attempt to form a much clearer idea of the geologic environment, and conditions favourable to the deposition of mineralisation. Emphasis should be placed on structure and alteration, the latter requiring some thin section examination. Too often, in the drill logs, alteration is described by colour rather than mineralogy and some inconsistencies exist between the descriptions by the different geologists involved.

75-80% of the drill holes were put down to evaluate and delimit the Hill Zone, which is apparently cut off around 75% of its periphery. Extensions to the northwest, southwest and southeast cannot be discounted, and mineralisation, at depth, beneath the sediments to the east is a possibility, although unlikely to be potential ore value to the stripping requirements.

The Creek Zone, although of low grade and relatively narrow where encountered, has possibilities for a northerly extension.

8. Ore Reserve Calculations

The most recent calculations of tonnage, grade and ore:waste ratio was carried out by D. W. Asbury in 1972. The total reserves are quote (28 million tons @ 0.44% Cu), total reserves including dilution (33 million tons @ 0.39% Cu) and those reserves, including the dilution factor of 20% @ 0.15% Cu, which fall within the "roughly outlined pit limits (28 millio tons @ 0.381% Cu). The proposed pit limits are shown only the E-W sections, but the ore:waste ratio quoted at 1:3, with pit walls at -50°.

The calculations are based on trapezoidal blocks whereby continuity is assumed for 100 feet N-S or E-W. There is little difference in the calculated tonnage or grade whether based on N-S or E-W sections. Asbury's calculations are summarised in Table 3.

9. Conclusion

This deposit is of moderately low grade and small tonnage relative to most of the so-called "porphyry-copper" deposits of the Cordillera. Although the Hill Zone is only 1½ miles from the highway and 160 miles by road to the deep water port of Stewart, it appears very unlikely that thi occurrence could be mined in the foreseeable future.

Prospects for improving the reserves are not encouraging, but cannot be fully discounted. Neither the Hill Zone and Creek Zone are fully delimited. However, the surface exploration over the remainder of the property offer few targets that might be considered to indicate the presence

File 3.4 /
Deas Lake

To: DR. S. P. OGRYZLO

From: D. W. ASBURY

Subject: ORE RESERVES - DEAS LAKE MINES

I recently recalculated these reserves to show a total of 33.5 million tons @ 0.389% copper, as shown on the attached sheet.

Of this amount 28.0 million tons @ 0.381% copper fall within roughly outlined pit limits having a maximum wall slope of -50°. Approximate ore to waste ratio is 1 to 3.

In view of the low grade and tonnage of the deposit, I do not consider it worthwhile to work out more precisely an optimum pit configuration at this time.

D. W. ASBURY

April 28, 1972

Enclosure

DEAS LAKE MINES LIMITED

Total Indicated Ore Reserves in Main Zone Based on all Vertical and Inclined Diamond Drill Holes

Calculated using E-W Sections at 200-ft. Intervals:

Section	UNDILUTED ORE Tons	Grade	T X G	DILUTED WITH 20% WALL ROCK AT 0.15% COPPER Tons	Grade	T X G
620N	554,437	0.391	216,758	665,324	0.351	233,391
400N	2,107,607	0.395	832,726	2,529,128	0.354	895,954
200N	3,475,626	0.412	1,433,860	4,170,751	0.369	1,538,129
0+00	3,935,545	0.387	1,521,581	4,722,654	0.347	1,639,647
200S	2,433,971	0.408	993,723	2,920,765	0.365	1,066,742
400S	3,767,919	0.469	1,767,499	4,521,503	0.416	1,880,537
580S	5,831,123	0.470	2,739,504	6,997,348	0.416	2,914,438
790S	4,666,439	0.455	2,121,457	5,599,727	0.404	2,261,450
1000S	981,069	0.472	462,996	1,177,283	0.418	492,428
1200S	393,339	0.439	172,906	472,007	0.391	184,706
	28,147,075	0.436	12,263,010	33,776,490	0.388	13,107,422

Calculated using N-S Sections at 200-ft. Intervals:

28E	98,324	0.590	58,011	117,989	0.517	60,961
30E	311,699	0.406	126,448	374,039	0.363	135,799
32E	1,482,292	0.541	801,770	1,778,750	0.476	846,239
34E	2,277,421	0.489	1,114,970	2,732,905	0.433	1,183,293
36E	3,840,319	0.450	1,727,803	4,608,383	0.400	1,843,013
38E	5,628,229	0.447	2,517,047	6,753,875	0.398	2,685,894
40E	4,216,448	0.414	1,747,795	5,059,738	0.370	1,874,288
42E	4,172,384	0.402	1,678,842	5,006,861	0.360	1,804,014
44E	3,222,067	0.402	1,295,977	3,866,480	0.360	1,392,639
46E	1,030,475	0.450	463,463	1,236,570	0.400	494,377
48E	1,019,159	0.413	421,080	1,222,991	0.369	451,655
52E	395,102	0.430	169,913	474,122	0.383	181,766
	27,693,919	0.438	12,123,119	33,232,703	0.390	12,953,938

TOTAL RESERVES, including 20% dilution with 0.15% wall rock, are approximately 33.5 million tons at 0.389% Copper.

Outside pitwalls (?), 4,788,107 tons.

April 17, 1972
DWA

∴ Within 23,358,968 0.427% before dilution

of near surface concentrations of copper sulphides.

If it is considered that further work is to be applied to the area certain features require early attention:

a. a geological interpretation of the zones of interest. This would involve, to some extent at least, a re-evaluation of the diamond drill core with particular emphasis placed on structure and alteration.

b. the construction of a genetic model outlining the principal features responsible for the deposition of ore minerals.

c. a complete evaluation of the geophysical surveys carried out to date. Suggestions for extended work in the more promising areas might be considered.

The writer does not feel qualified to estimate additional tonnage requirements for a viable enterprise, but assuming no improvements in grade, R. A. Freberg has suggested as much as 150 million tons might be required in order to exploit this deposit at the present time. In view of the work carried out it would be very optimistic to suggest that this is a possibility.

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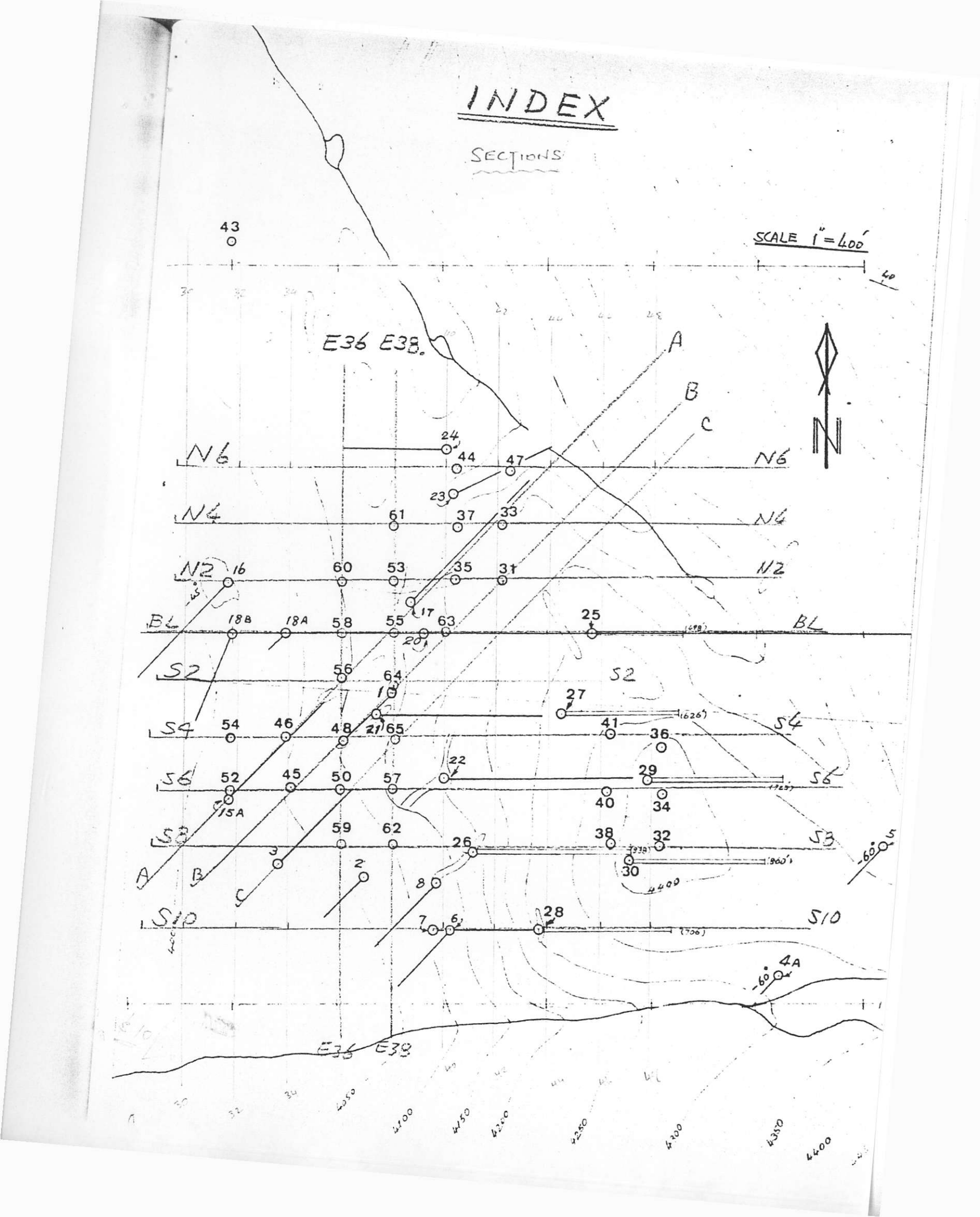
SECTIONS



B. MOSS GROUP

1. Claim Status

Of the original 71 Moss Claims staked and retained by Lytton Minerals Ltd. in 1966, only 25 are still held. The assessment work on Moss 3, 4, 6, 31-34 and 40 is in good standing until 1981. The remainder, Moss 23-30, 35-38, 57-60 expire during the summer of 1975. Fig. 2 shows the location of these claims with respect to the Gnat Lake group (June, Stikine, etc.).

(N.B. Fig. 2 appears to be inaccurate with respect to other available claim maps.)

2. Geology

The writer has been able to locate a geological map for Moss 53-71 claims only, although there is at least one inference that Moss 1-52 had been mapped previously. More than 95% of the area is covered by overburden, much of which is overlain by swamp. Sporadic outcrops indicate a geologic environment similar to the Gnat Lake property to the east, although there is no evidence of the same major structural elements. The mapping shows a volcanic sequence of basalt, andesite and acid volcanics (dacite?) and their altered equivalents, intruded on the western flank by a mafic poor granitoid body. No mention is made of the tourmaline veining intimately associated with the Hill Zone sulphides but the basic members of the volcanic pile often carry in excess of 1% magnetite. Only very minor chalcopyrite mineralisation was noted.

3. Geophysics

a. Magnetics

The plan of the magnetics is dominated by a broad E-W trending high in the central part of the claim group. The pattern is typical for a large basic flow (or sill) and this feature was confirmed by subsequent drilling (pyroxene basalt). Three other magnetic highs occur on the property centred at 29548W, 22S16W and 68 N 16N, these last two still unexplained. In total 62 line miles of magnetometer work was carried out on lines 400 feet apart at stations 100 feet apart. A Sharpe MF-1 Fluxgate magnetometer was used and background appears to be in the range 300-4008.

b. Induced Polarisation

Geoterrex carried out a minor amount of I.P. work in 1967. However, no report accompanies the plotted data and these plots require the attention of the appropriate personnel.

4. Geochemistry

Plots are available for THM, Cu, Zn and soil type, following geochemical surveys in 1966-7. The writer would have considered two areas to be of possible significance:

i. 44N28W roughly central on the magnetic high. Subsequent drilling gave no further encouragement, and the anomaly remains unexplained.

ii. 5N 16W, a large geochemical high occuring close to the highway possibly related to a change in slope. (i.e. source copper may be up slope some distance)

This latter anomaly was drilled with a short angled D.D.H. and the rock beneath the anomaly was barren. The anomaly and the area up slope was covered by claims which have now lapsed. Although this anomaly (and anomaly #1) occurs in soils which are rich in organic material (humic) the writer considers that this anomaly is probably the only surface expression at all likely to lead to a concentration of copper sulphides. (poor magnetics.)

5. Trenching

Approximately 7,700 feet of trenching was accomplished in 1969, concentrated in the area of the pyroxene basalt, but including two trenches directly over the geochemical anomaly at 5N 16W. No mineralisation of any consequence was encountered. Plans of the geology in trenches 1-9 are available.

6. Drilling

Two short diamond drill holes were put down in 1967 under the direction of M. Bradford. M1, at 10N 24W is a little upslope from the principal geochemical high, and M2 at 24N 24+50W on the eastern extremity of the main magnetic high. No values of consequence were encountered.

In 1971 a much larger program of percussion drilling was carried out. 47 holes totalling 4615 holes were put down, mostly into the pyroxene basalt. The results were negative.

7. Conclusions

Although a great deal of time, effort and money has been put into this property (with very limited encouragement) five years of work have failed to produce any increase in the ore reserves of the area. In the writer's opinion, were it not for the assessment work applied, the claims would have been allowed to lapse after 1971.

Of the area once covered by the Moss group the only portion that writer considers to warrant a little low priority attention is the area straddling the road north of Gnat Lake. Many scattered geochemical highs occur in this area with values in excess of 2500 ppm Cu. as yet unexplained. (unless these samples are swamp soils - swamp soils close to Gibraltar often assay up to 3% Cu.)