GEOCHEMICAL, GEOPHYSICAL AND GEOLOGICAL

REPORT ON THE

STIKINE MOLY PROPERTY

Liard M. D. N.T.S 104J/1W

58°13′ N 130° 15′W

PN 019

June - August 1979

Falconbridge Nickel Mines Limited
6415 - 64th Street
Delta, B. C.
V4K 4E2

Vancouver, B. C.
November, 1980

B. W. Downing

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STIKINE MOLY - PN 019

1. Introduction

1.1 Location: N.T.S. 104J/1W
Lat. 58^{o} 13', Long. 130^{o} 15'
31 km (20 miles) SSW from Dease Lake
Liard M.D.
airphoto A12067-285

1.2 Claims:

Stikine	Oct. 6, 1977	20
Stikine 2	"	12
3	July 28, 1978	20
4	"	8
5	"	8
		68

--geochemical assessment report submitted August 1977 for Stikine, Stikine 2 claims for one year.

--geochemical assessment report submitted July 26, 1978 for Stikine 3, 4, 5 claims for one year.

1.3 Metal: Mo (porphyry)

1.4 Dates of Work: August - Sept. 1977
June 26 - July 10, Sept. 16-18, 1978
June 16 - August 10, 1979

Line cutting	June 18 - July 3
geology	June 24 - July 6
EM-16, mag. survey (21.9 km)	July 4 - 12
IP survey (22.9 km)	July 18 - August 2
overburden sampling (6 holes)	July 31 - August 3

1.5 Access: helicopter from Dease Lake.

1.6 Topography: The Stikine molybdenum property lies at about 1250 m elevation (4000') on the Tanzilla Plateau, 10 km north of the Grand Canyon of the Stikine. The topography is gentle, Figure 2, with elevation ranging from 1000 m (3300') to 1500 m (4900'). Vegetation consists principally of thick buckbrush, with scattered patches of forest (except above 1400 m, where only grasses are predominant). Much of the property is underlain by swampy ground, with a poorly developed rectilinear drainage system following major joint directions in the intrusive rocks.

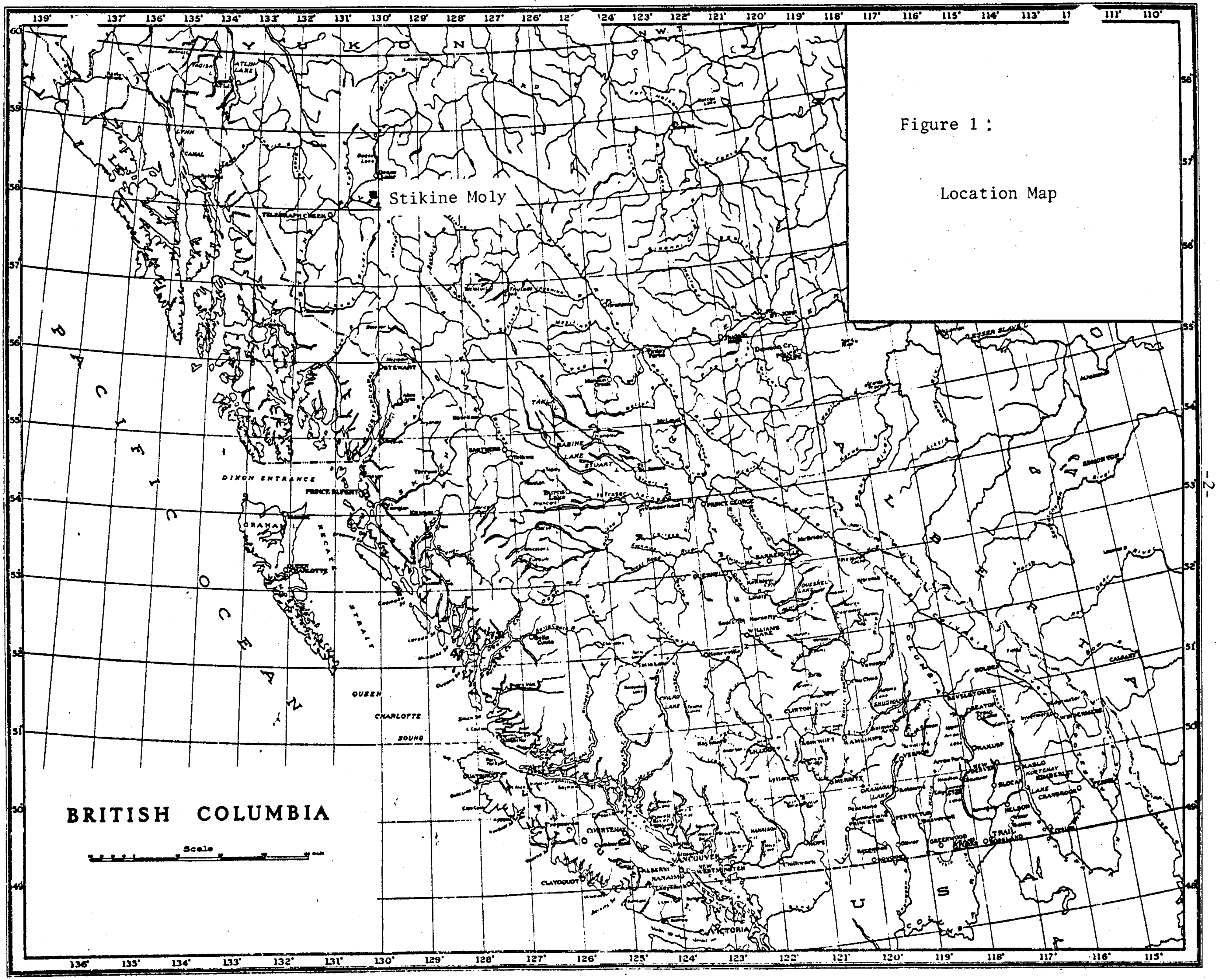
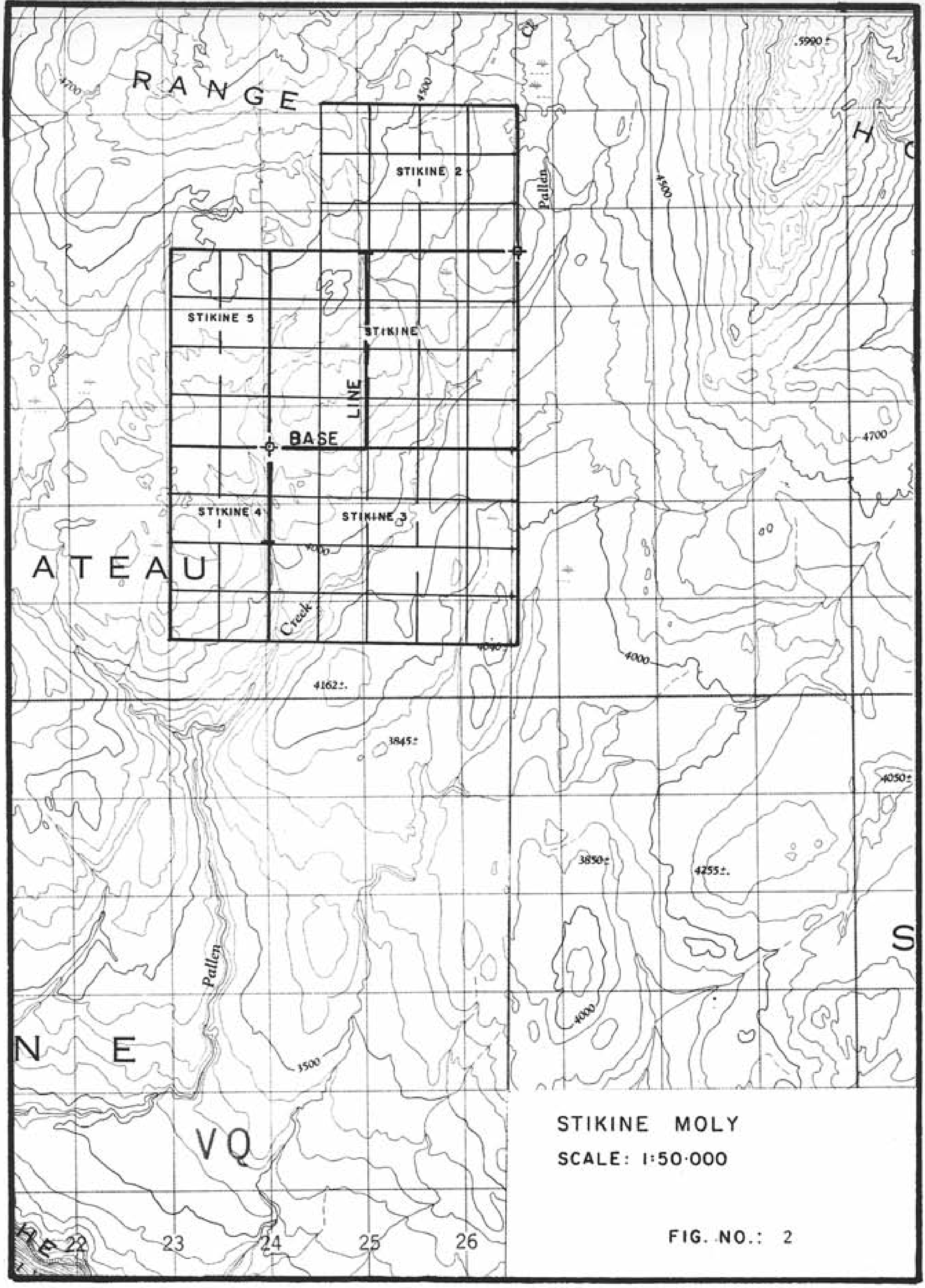


Figure 1 : Location Map



STIKINE MOLY
SCALE: 1:50·000
FIG. NO.: 2

Figure 3: General view of Stikine Moly.

1.7 History: Newmont Exploration conducted a geochemical (soil) and geophysical (magnetometer) survey in 1971 to the southwest of the property (assessment report #3169). Nothing of significance was found.

Two grids (#1-17.450 m, and #2-3850 m), were laid out by chain and compass to cover the anomalous silt and soil samples taken in 1977. Work done on a reconnaissance scale in June 1978 included soil sampling, trenching, mapping and a geophysical survey (EM 16, and magnetometer). Further work was carried out in September to delineate in more detail the anomalous Mo values resulting from the June survey. Further work was necessary in 1979 to delineate zones of molybdenite mineralization.

A grid (25.9 km) was cut, picketed and chained for control for the geochemical and geophysical surveys. A base camp was established approximately in the centre of the property. The claims were mapped on a scale 1:10,000 with regional mapping at 1:50,000 (C. Leitch). The EM.16 and magnetometer survey was conducted by S. Presunka and the IP survey by J. MacNeil (Mertens and MacNeil). The geophysical section of this report was written by Paul Smith. The detail part of the VLF - EM-16 was submitted by S. Presunka. An overburden sampling survey was conducted by Bema Industries, Vancouver, to sample the bedrock surface; however, due to a mechanical failure the survey was halted after three days.

2. Geochemistry (Figure 6)

The anomalous Mo in silts taken in 1977 resulted in staking of the area with subsequent follow-up work.

Soil samples were taken at 50 meter intervals at a depth of 10 to 15 cm, in either the A or B horizon, depending upon which was present. Duplicate samples as well as internal standards were included as an analytical check.

Six soil pits and four trenches were dug in order to get a geochemical profile. The low-lying areas are covered by a glacial till deposit (subangular granodiorite, monzonite, and volcanic boulders

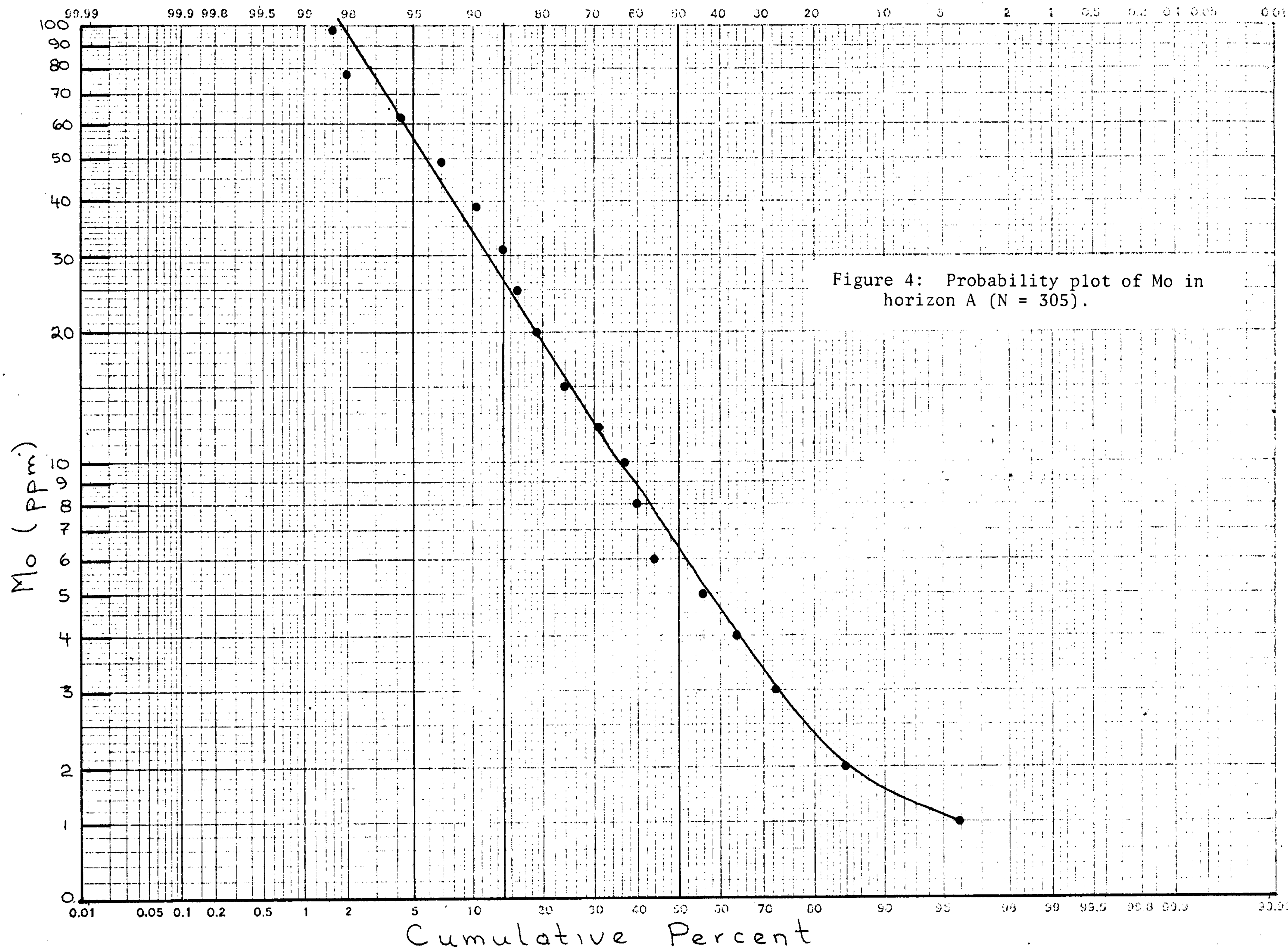


Figure 4: Probability plot of Mo in horizon A (N = 305).

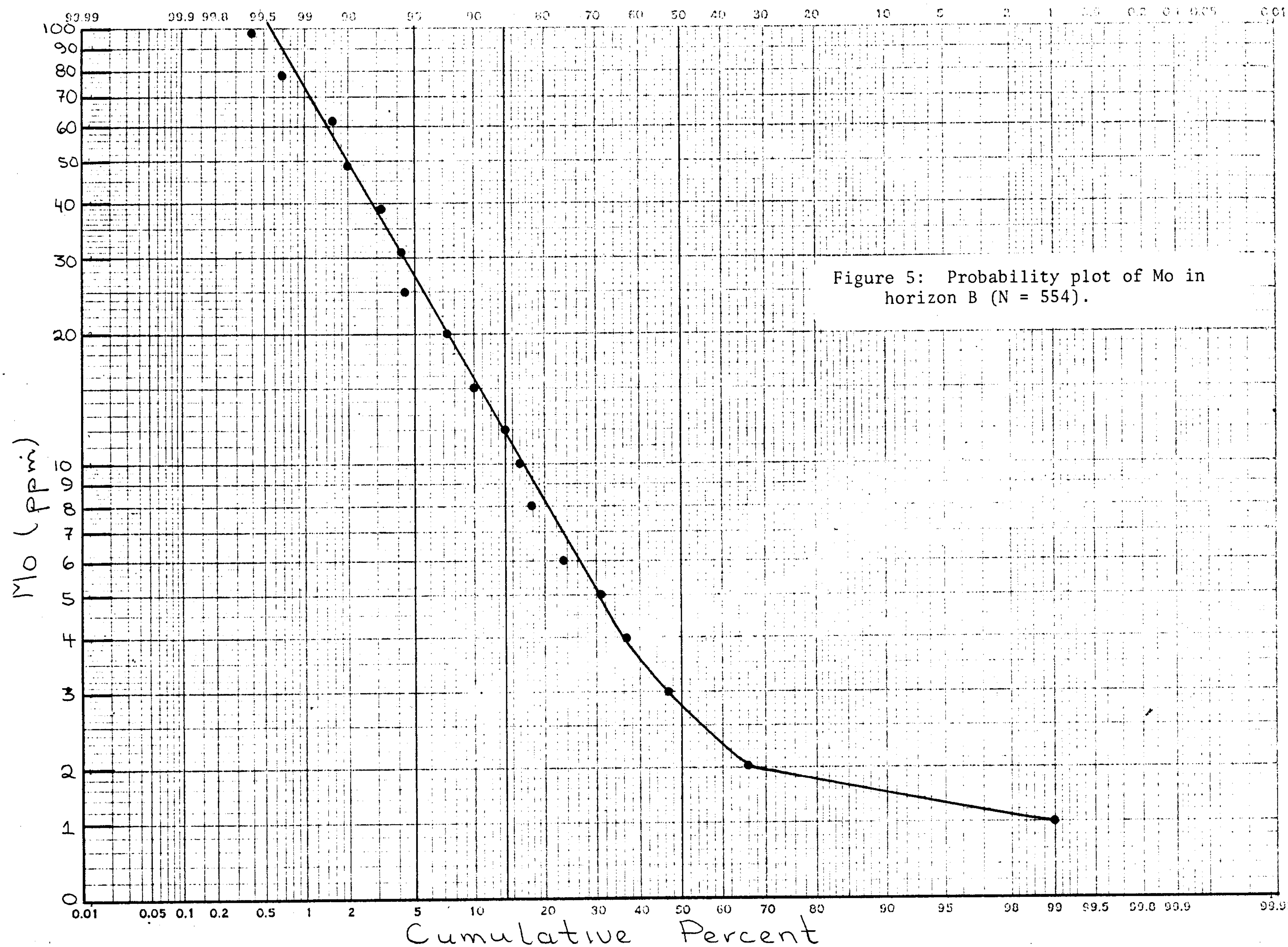


Figure 5: Probability plot of Mo in horizon B (N = 554).

up to 25 cm across, and sand and clay) over which an A horizon up to 30 cm in depth has developed. The lower part of the A horizon is clay-loam. The forested areas are covered by a narrow A horizon ($\lesssim$ 5 cm) over a well developed B horizon derived from either the underlying rock (quartz minzonite) or glacial till. A total of 859 soil samples were taken approximately from 15 to 25 cm in depth from either the A or B horizon depending upon location. Thirty five pit samples were also taken.

A cumulative probability plot of soil Mo values for the A and B horizons (Figures 4and 5) indicates a unimodal distribution for each horizon with the following threshold values (ppm):

Percentile		A	B	
95	(σ_3)	62	25	ppm
86	(σ_2)	31	12	
50	(σ_1)	6	3	
		305	554	samples

The distribution of anomalous values generally occurs in the low-lying areas (topographical depressions) which coincide with the EM-16 anomalies.

A 10% NaOH hot and cold digestion of the anomalous samples, together with a few background value samples, was carried out to determine the amount of loosely bonded Mo. The results indicate that soils with high anomalous Mo values contain strongly bonded Mo compared to those samples with lower Mo values which contain loosely bonded Mo, Table I.

Samples were taken from the A, B, and C horizons (if present) of the soil pits/trenches and analyzed for Cu, Zn and Mo. The Cu and Zn values are generally low throughout while Mo is high in the upper parts of the pits. Zn and Mo decrease with increasing depth. Bedrock was not reached in any of the soil pits. A dense clay horizon approximately 40 cm thick was encountered in a trench overlying mineralized quartz monzonite (Grid 2). If such a clay horizon occurs over the area, it may account for low Mo values since the clay would impede upward migration of Mo from mineralized bedrock. An overburden drill survey conducted by Bema Industries of Vancouver was brief due to a machine breakdown. The IP anomalies were tested by six holes all of which ended in clay which could not be penetrated by this drill. The results are shown in Table 2.

Table I. Results of a 10% NaOH hot and cold digestion of soil samples.

Sample No.	Mo_T ppm	Hot ppm	Cold ppm	Cold/Mo_T %
26111	3	2	1	-
12	94	93	46	49
13	8	5	3	-
26182	11	6	2	-
83	44	25	19	43
84	220	148	94	43
85	24	20	9	38
86	8	25	12	-
26202	2	4	3	-
03	92	63	48	52
04	57	41	27	47
05	110	89	49	45
06	4	5	3	-
26247	2	4	2	-
48	77	72	36	47
49	58	52	50	86
50	101	42	28	28
51	4	4	3	-
26312	2	2	3	-
13	510	198	124	24
14	87	33	18	21
15	21	15	12	57
16	4	3	3	-

- high Cold/Mo total ratio - loosley bond Mo, transported in solution.
- low Cold/Mo total ratio - Mo not bond detrital as MoS_2 or Mo in minerals.

Table 2. Results of the overburden drilling survey.

station	hole no.	depth (metres)	Mo (ppm)
6S/1E	1	2.4	3
"	"	2.6	2
"	"	3.5	2
BL/6S	2	4.0	2
BL/750S	3	1.5	4
BL/8S	4	2.3	3
8S/50E	5	0.6	4
8S/50W	6	1.2	16

3. Geophysics

A magnetic and VLF survey was carried out by S. Presunka of Presunka Geophysical Explorations Ltd. during the month of July 1979 and the IP survey was done by Jack MacNeil of Mertens and MacNeil during July and August, 1979.

Equipment for the surveys consisted of a Scintrex MF-1 Fluxgate magnetometer; a Barringer GM-122 Proton magnetometer; a Geonics EM-16 VLF - EM receiver; and a McPhar/Phoenix frequency domain IP system. Technical specifications for the instruments used are listed in Appendix I.

The theory and mode of operation of each of the geophysical methods employed has been described in numerous scientific publications and reports and no attempt will be made to provide a detailed description within the text of this report. Additional information may be obtained from the manufacturers of the equpment used.

The regional aeromagnetic map of the area is shown in Figure 7.

3. Magnetic Survey

The magnetic survey was carried out in two phases using

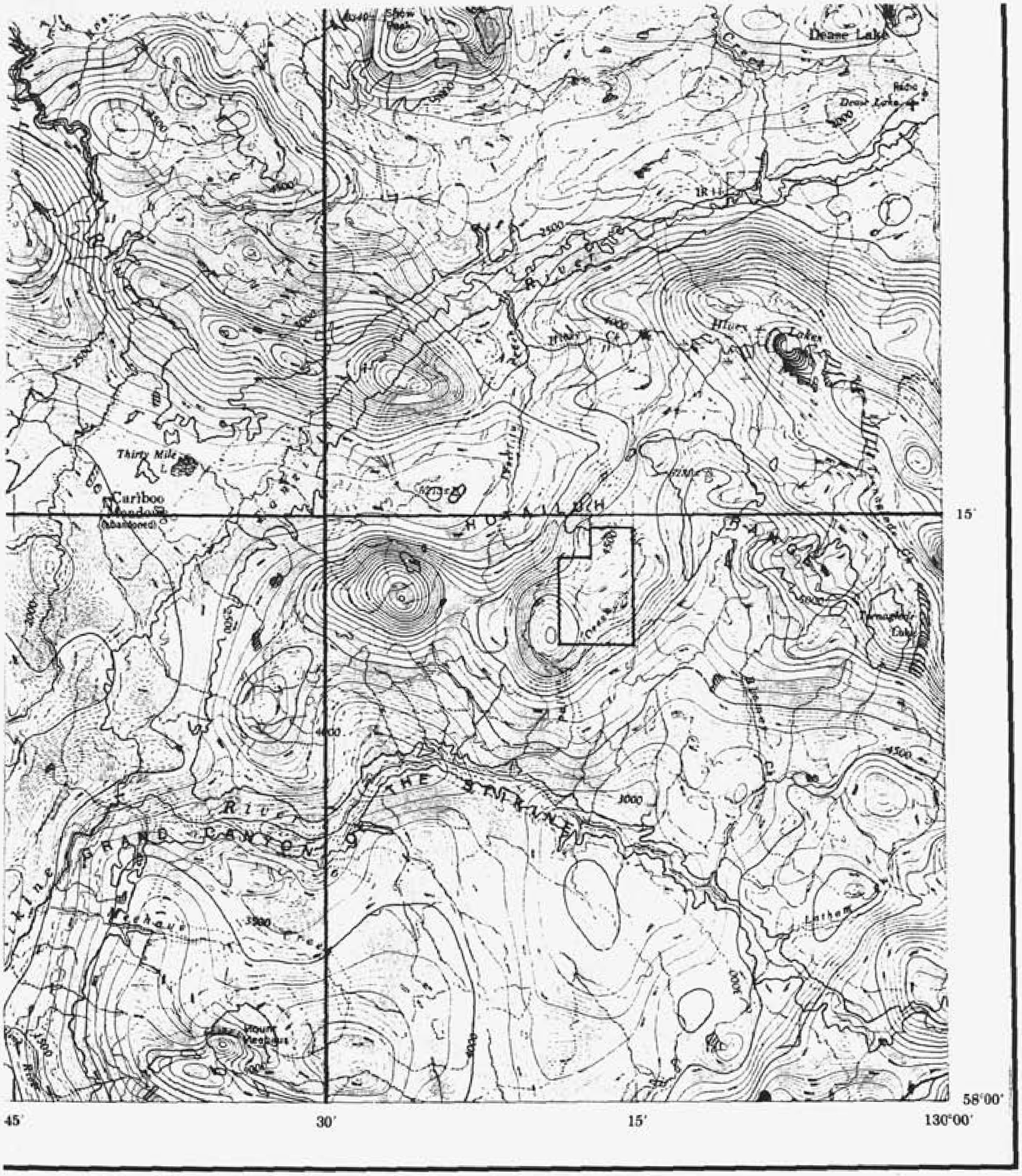


Figure 7: Regional aeromagnetic map (claim boundary drawn on).

two different magnetometers. On lines 0-20N, a Barringer GM-122 Proton Precession unit was used to measure the total magnetic field of the earth. Values are plotted in gammas (nanoteslas) relative to a background of 58,000 gammas. On lines 2S-10S, a Scintrex MF-1 Fluxgate type magnetometer was used to record the vertical component of the earth's magnetic field, relative to a pre-selected background datum.

In this survey, the zero level of the fluxgate unit was adjusted to correspond to the 58,000 gamma level of the proton unit, thereby ensuring all readings were relative to the same base. Standard base station tie-in procedures were used to correct for the effects of diurnal drift. Readings were taken at intervals of 25 metres along the traverse lines and at 50 metre intervals along the baseline.

The corrected results are plotted and contoured at 200 gamma intervals. A 600 gamma contour very likely represents background reading for this area. The results of the magnetic survey are shown in Figures 8 and 9.

The results of the magnetic survey shown in Figure 9, indicate a general N-S trend with values ranging from 0 to 2,500 gammas. Two areas of low magnetic intensity have been observed. Zone A is situated at the southwest portion of the grid and Zone B occurs near the baseline on lines 8N-16N. Both zones occur within a unit mapped as a porphyritic quartz monzonite and may represent areas of intense alteration.

There are several apparent discontinuities in the magnetic trend which have been attributed to narrow cross-cutting dykes or faults. The porphyritic quartz monzonite / granodiorite contact at the south end of the grid is fairly well defined by the 1,000 gamma contour.

3.2 VLF - EM-16 Survey

A Geonics EM-16 VLF receiver was used to record the in-phase and quadrature components of the secondary field. Transmitting stations at Annapolis (21.4 khz) and Hawaii (23.4 khz) were employed as primary field sources to ensure that all conductors would be energized, regardless of orientation. Readings were taken at intervals of 25 metres on traverse lines and baselines. The in-phase and quadrature data are shown in Figures 10 and 11 (Hawaii) and Figures 12 and 13 (Annapolis)

3.2.1 V.L.F. Station 23.4 (Figures 10 and 11)

The long northeast-southwest striking conductive trends shown on Figures 10 and 11 follow the general topographical trend.

The seven conductors shown are alphabetically listed from A to G. Conductor 'A' which is open to the north, crosses line 20 at 125 meters west and striking in S-W direction along the creek to cross line 8 north at 950 meters west joining up with conductor 'B'. The southwest projection of the combined 'A' and 'B' conductors from L-8N very likely extends to L-0 at 500 metres west and continues off the grid. The steep profile of 'A' conductor on line 18 and 16 north indicates the top of the conductor to be near surface and dipping steeply to the south-east. The depth to the conductive zone for drill targeting is approximately 50 meters. The cross-overs of both A and B are in magnetic lows, 600 gammas or less, suggesting that these conductors are caused by a strong faulting pattern. The soutwest striking "C" conductor which extends from L-16 N at 600 meters east to L-0 at 900 west, follows the magnetic low, suggesting another parallel fault. From L-0, this 'C' conductor changes in strike to a south direction, also following a magnetic low to line 4 south at 150 meters east where it is faulted off 50 metres to the east. The conductor resumes its S-W strike, crossing line 0 some 50 meters west and continues off the grid. The N-S striking 'D' conductor, extends from L-2 south to L-8 south 200 meters west of the base line, running through the middle (more or less) of a broad magnetic low zone. This magnetic low is likely due to a change in rock type, low in magnetic minerals. Depth to the conductor 'D' on line 6-south some 250 meters west of the base line is approximately 100 metres, suggesting that this conductor is due to a broad weak conductive rock type. This is a good drill target area.

Conductors 'E', 'F' and 'G' located in the northeast corner of the map, on lines 16, 18 and 20 north, follow the magnetic trend suggesting the rock type to be conductive as well. The southern extensions of these conductors terminate between lines 14 and 16 north although the magnetic trend continues, suggesting the conductors are due to local faulting or shearing. An intense conductor 'H' located on line 4 north at 450 meters west is in a swamp area on a magentic low. This conductor should be surveyed in detail to locate the extent and trend of the conductive zone which at first glance appears to be isolated. Detail lines 6 and 7 north indicates the trend of this strong conductor to be in a northwest direction. This conductor may be due to sulphides in a granitic rock type.

The contoured map indicated a similar conductive trend as shown on Figure 10. This contoured plan clearly defines the northwest striking conductive trend which may be indicating a geolbgical structure.

3.2.2 <u>V.L.F. ST. 21.4</u> (Figures 12 & 13)

The northeast - southwest striking conductor No. 1 and conductor 'C' of Figure 10, correlate closely from line 14N to 4N. Conductor No. 1 is faulted off between lines 2 and 4N, some 900 metres west of the base line. Conductor No. 2 starts on L-0 200 metres west and striking in southern direction, follows the magnetic low trend to L-8S. This conductor parallels more or less, conductor 'D' (Figure 10) confirming a conductive zone in a suspected granitic rock type and may be due to presence of minor amounts of sulphides. Conductor No. 3, located east of the base line on line 6 south, borders the magnetic high, suggesting that the conductor is due to a geological contact. The weak No. 4 conductor located east of the base line and No. '4A' located on lines 10 and 12 north some 550 metres east of the base line, is the same conductive zone which is faulted off by the Conductor No. 1. The numerous short conductors of both V.L.F. stations as well as the magnetic short anomalies, require closer line spacing in order to properly establish their trend.

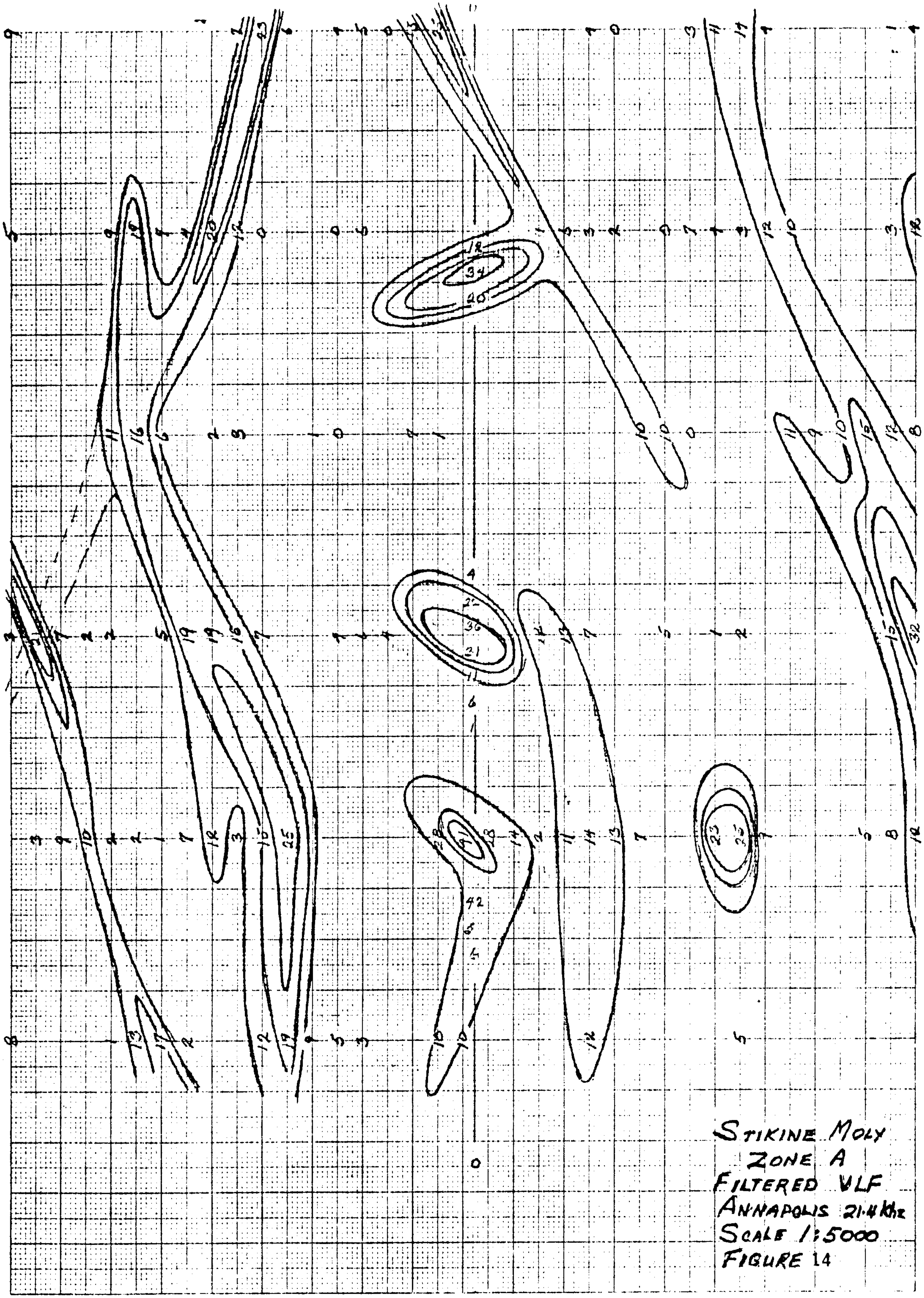
In summary, the V.L.F. results are quite erratic and correlation of trends is difficult due to the number of anomalies and the relatively large line spacing. Portions of the data (Zone A and Zone B) were filtered using the method described by Fraser, 1969, in an attempt to provide a less ambiguous interpretation. The results met with moderate success as evidenced by the contoured filtered values shown in Figures 14 and 15 and the V.L.F. interpreted trends shown in Figures 16 and 18.

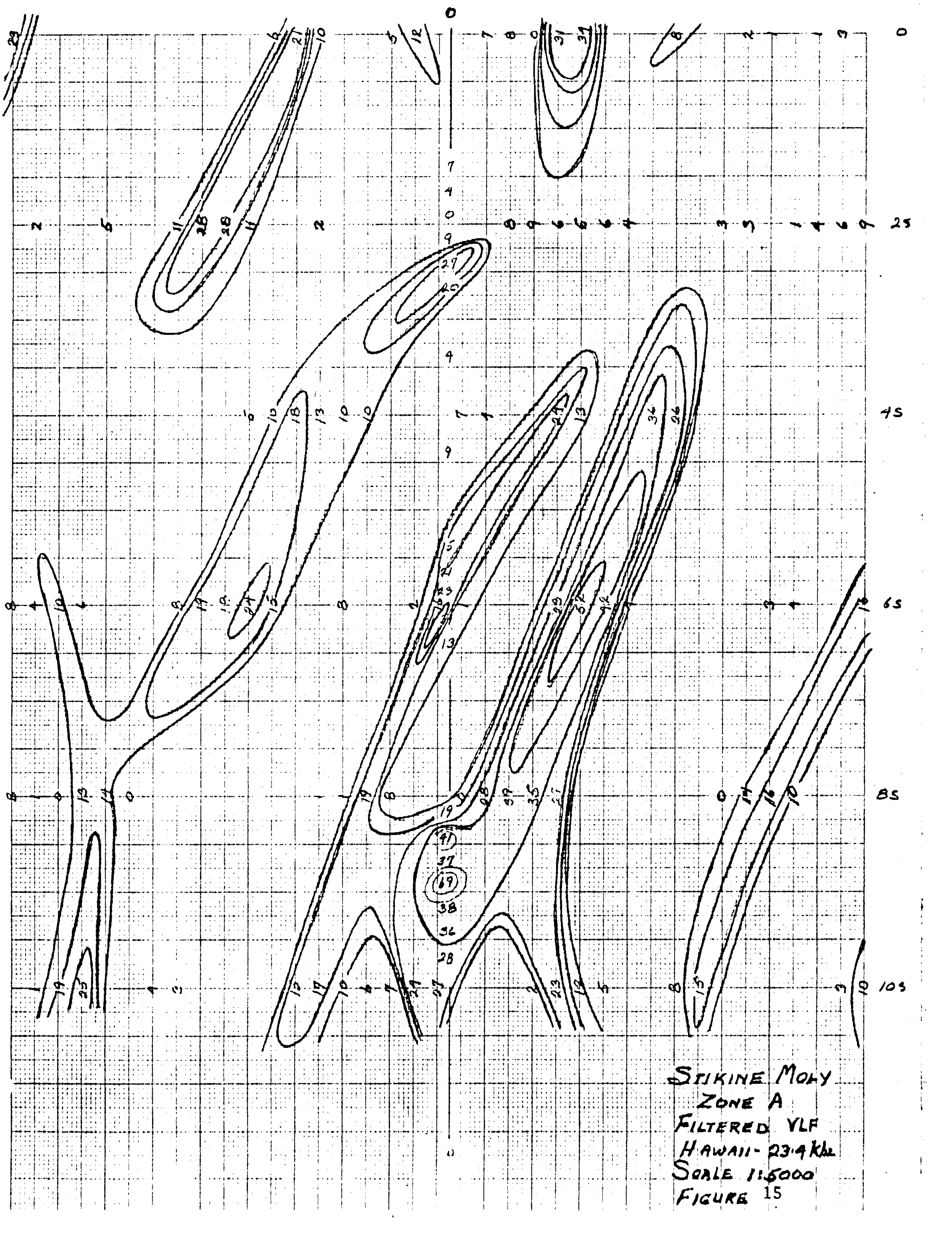
The discrepancies in the position of conductors shown in Figures 14 and 15 are due to the strike of the conductors relative to the energizing sources. Those conductors with a NW-SE orientation would provide a maximum coupled response to the Annapolis transmitter, while NE-SW striking conductors will yield stronger responses from the Hawaii transmitter. A combination of the two sets of data is shown in Figure 16. The dashed lines represent the interpreted conductor axes and the solid dots indicate V.L.F. anomalies which are isolated from the interpreted linears or which occur on one set of V.L.F. data only.

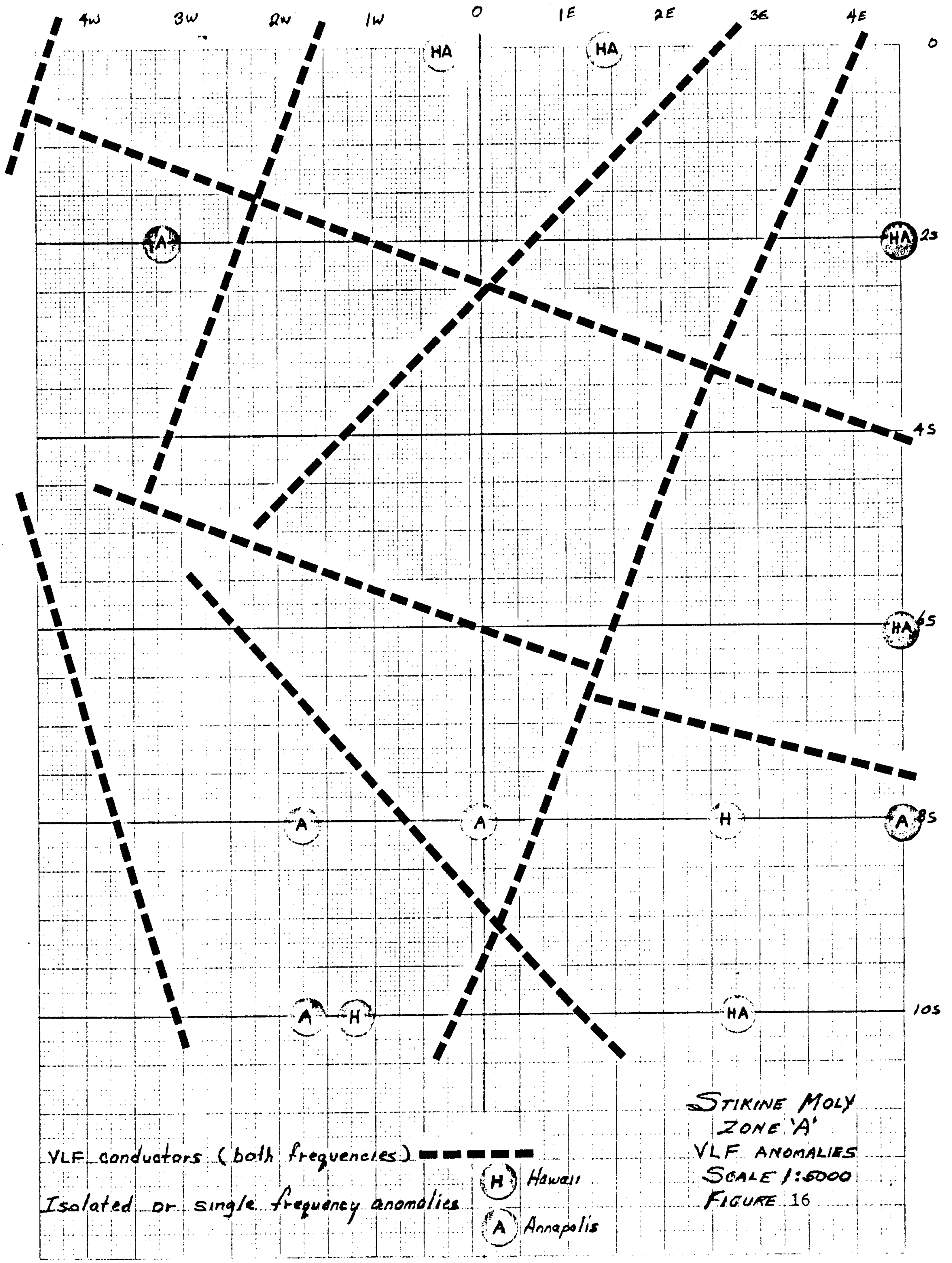
The E.M. linears over most of the grid follow the general NE-SW geological trend with numerous conductors of random orientation forming a complex network within the areas of lower magnetic intensity.

3.3 I.P. SURVEY

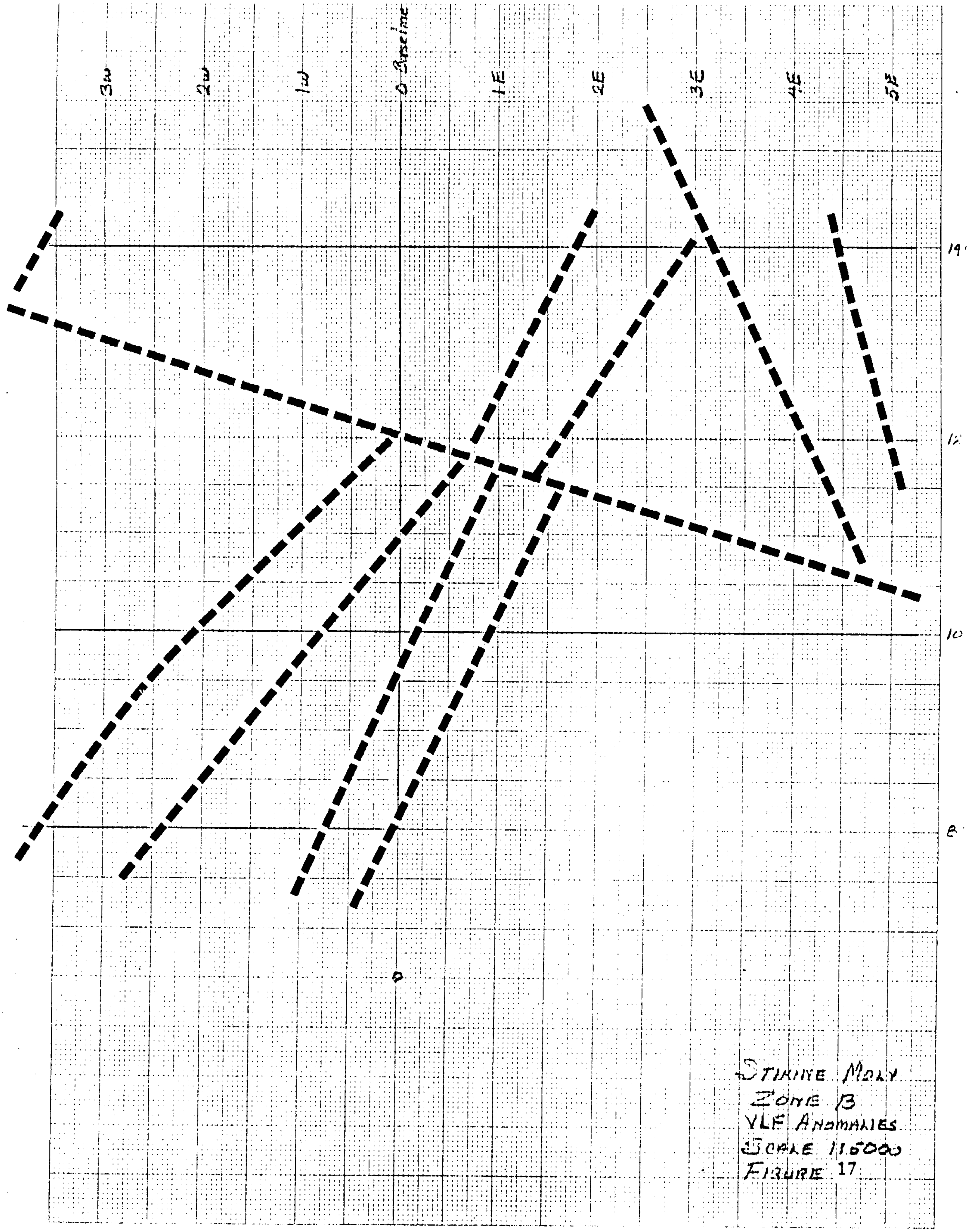
The IP and Resistivity survey carried out by Mertens and MacNeil consisted of 17 lines of 100 metre dipole-dipole coverage and two short lines of detailed work with an electrode spacing of 30 metres. Equipment consisted of a McPhar Model P-660 frequency domain IP transmitter powered by a 2.5 KVA - 120 VAC motor generator in conjunction with a Phoenix IPVI receiver. Frequencies of 0.3 and 5.0 hz. were employed throughout with readings taken to n=4 or n=5 (detail). The results have been plotted in pseudo-section format for each line and are appended to this report as drawings 13 through 30 (Appendix III). The surface projection of anomalous areas is indicated on the pseudo-section plots.


0
25
45
65
85
105
Stikine Moly
Zone A
Filtered VLF
Annapolis 21.4 khz
Scale 1:5000
Figure 14


STIKINE MOLY
ZONE A
FILTERED VLF
HAWAII - 23.4 khz
SCALE 1:5000
FIGURE 15



4W
3W
2W
1W
0
1E
2E
3E
4E
0
HA
HA
A
HA
2S
4S
HA
6S
A
A
H
A
8S
A
H
HA
10S
STIKINE MOLY
ZONE 'A'
VLF ANOMALIES
SCALE 1:5000
FIGURE 16
VLF conductors (both frequencies)
Isolated or single frequency anomalies
H Hawaii
A Annapolis


3w
2w
1w
0 Baseline
1E
2E
3E
4E
5E
14
12
10
8
STIKINE MOLY
ZONE B
VLF ANOMALIES
SCALE 1:5000
FIGURE 17

The original scale has been reduced by about 50% in the process of duplication.

Lines 20N to 16N are essentially non-anomalous with chargeabilities of less than 3%. The weak anomalies seen on lines 14N and 12N increase in amplitude to the south where frequency effects reach 6.0% near the baseline on line 10N. This area of moderately high polarizability (Zone B) is associated with a resistivity and magnetic low. Unfortunately, lines south of line 10N did not extend east of the baseline and coverage of this anomalous area is incomplete. An increase in chargeabilities can be observed at the easterly limits of lines 8N and 6N and additional coverage in this area is warranted.

Lines 4N through 2S are relatively non-anomalous.

The first evidence of Zone A occurs on line 4S, increasing in amplitude to the south. The strongest response occurs on the intermediate detailed line 9S where frequency effects reach a high of 21%. This broad zone of high polarizability is associated with an area of low magnetic intensity (alteration zone?), numerous V.L.F. conductors (faults and/or mineralized fractures) and high Mo geochemical values. A molybdenite showing is located on line 8S at 0+15E.

The sharp resistivity and frequency effect contrast near 2E on lines 8S and 10S indicates a change in rock type which probably represents the contact between the porphyritic quartz monzonite and the granodiorite unit to the east.

3.4 SUMMARY

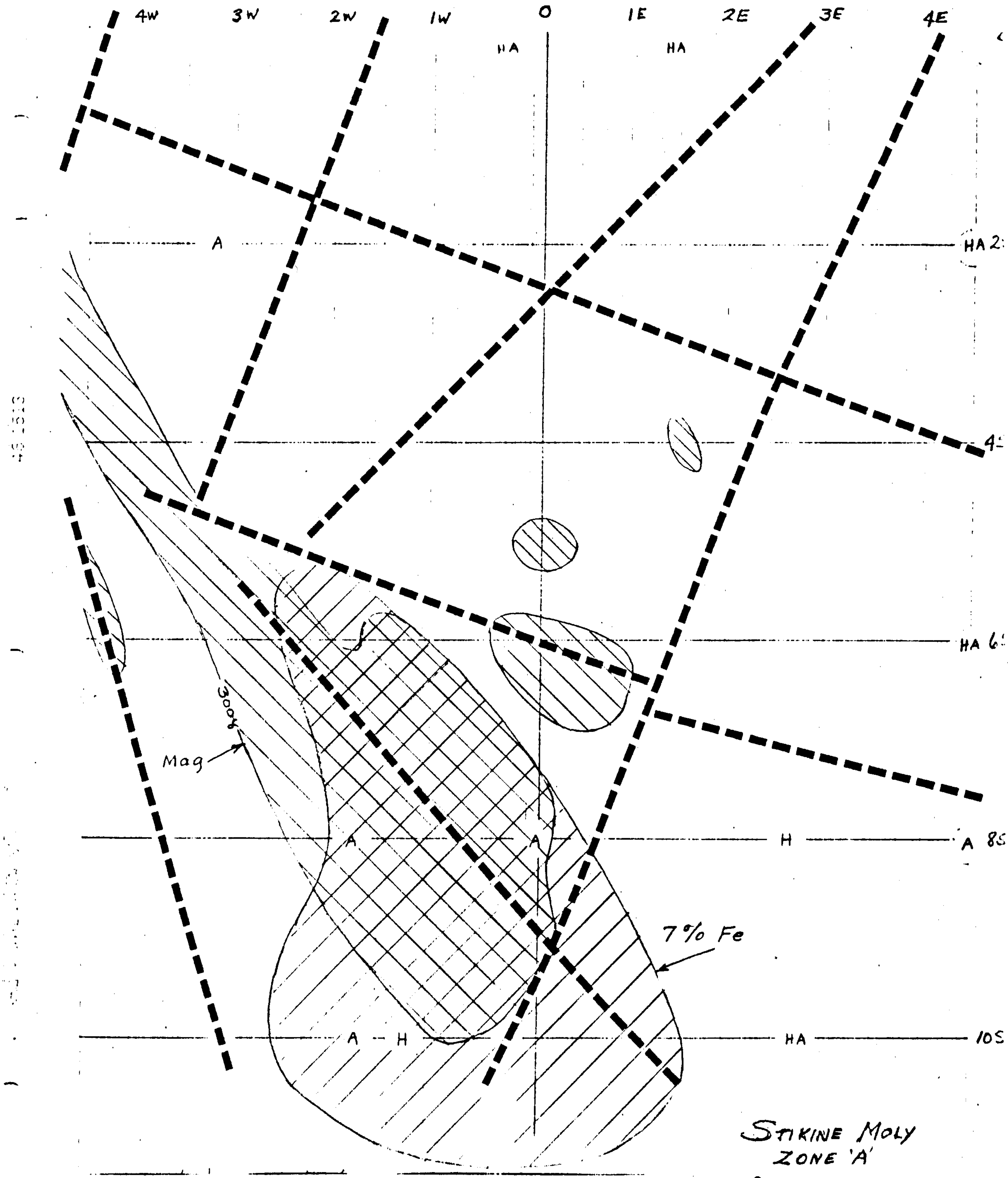
A compilation of the magnetic, V.L.F. and I.P. data for Zones A and B are shown in Figures 19 and 20, respectively.

Of the two areas, Zone B appears to be the more important having several V.L.F. conductors coinciding with a magnetic low and IP anomaly.

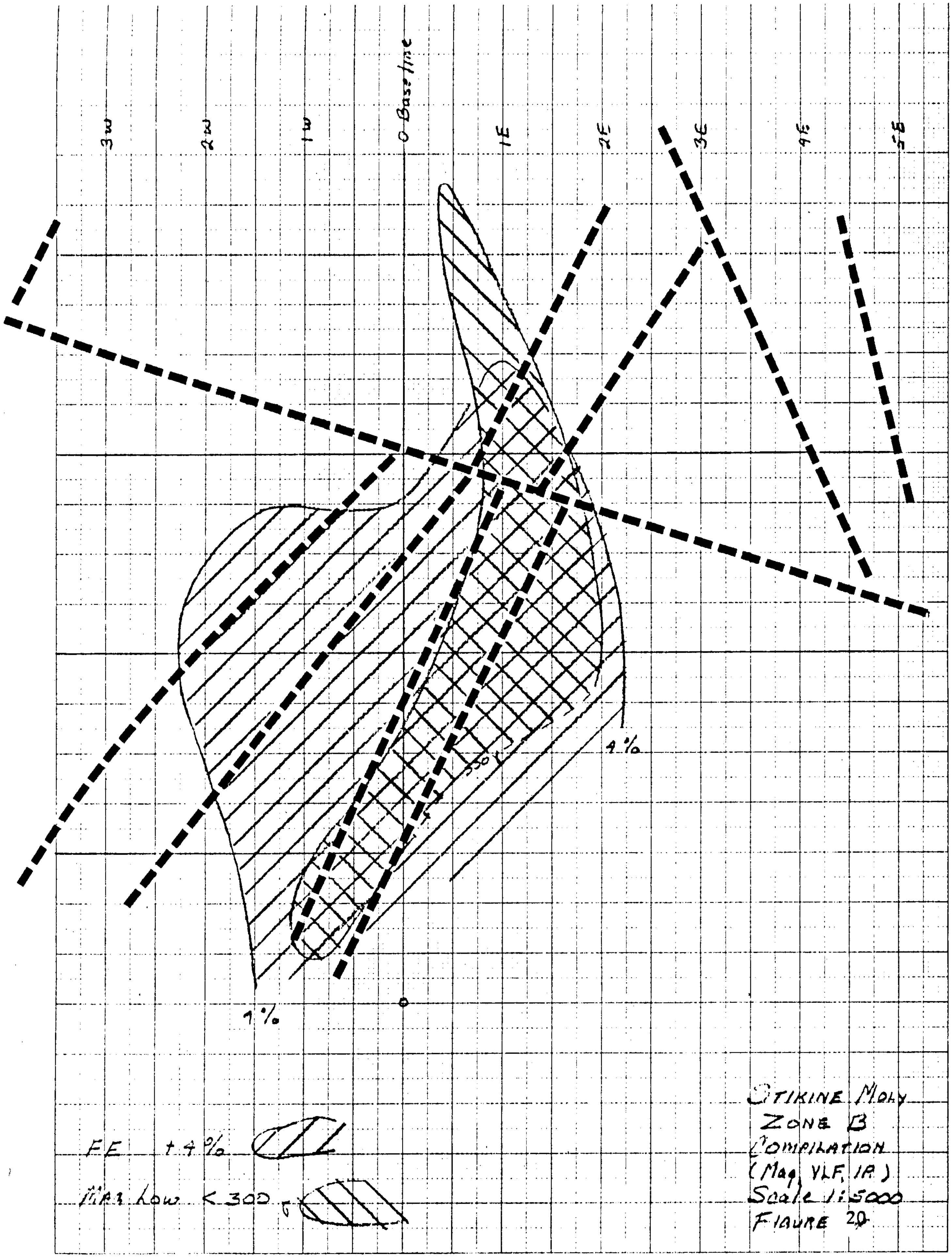
4. GEOLOGY (C. Leitch, Figure 21)

Almost the entire property area is underlain by intrusive rocks composing a boss or large stock measuring 12 km by 5 km, covering approximately 45 km^2. This boss appears to be an unroofed portion of a major batholith that may underly much of the Tanzilla Plateau at depths of less than a kilometer. Thus the environment of the Stikine property is batholithic or "plutonic" (Sutherland-Brown, 1969) so Endako style mineralization would be expected.

The intrusive is made up of two main rock types: a central, coarsely prophyritic quartz monzonite, and a fringing zone of granodiorite (locally diorite). A minor rock type found in both the above phases has been termed "fine porphyry". Although some of the fine porphyry may be in the form of later cross-cutting dykes, much of it is in the form of xenoliths or contaminated patches in the coarse intrusive, derived from the intruded volcanics.



STIKINE MOLY
ZONE 'A'
COMPILATION
Scale 1:5000
FIGURE 19



3w
2w
1w
0 Baseline
1E
2E
3E
4E
5E
14
12
10
8
4%
4%
FE +4%
Mag Low <300
STIKINE MOLY
ZONE B
COMPILATION
(Mag, VLF, IP)
Scale 1:5000
FIGURE 20

461510

The bulk of the intrusive body is composed of the porphyritic quartz monzonite. In hand specimens it is characterized by coarse (1-2 cm) pink to white K-feldspar phenocrysts and smaller (0.5 cm) quartz and biotite phenocrysts set in phaneritic ground mass of anhedral quartz, plagioclase, and K-feldspar. In thin section, the K-feldspar phenocrysts are glomeroblastic, poikilitically enclosing plagioclase laths, quartz, biotite, and hornblende. In the freshest specimens, the biotite can be seen to be replacing original hornblende. Minor accessory magnetite and sphene are present.

In outcrop, the porphyritic quartz monzonite is usually massive, forming rounded smooth "whalebacks". Fracturing is minimal to non-existent (average about 1-2/m). Quartz veins are exceedingly rare (in fact only five veinlets from 1-10 mm thick were seen over the whole intrusive).

The border zone of granodiorite to diorite is much more mafic than the quartz monzonite and somewhat more variable in texture and composition. The colour index is about 35-40. In hand specimen, the rock is usually equigranular and medium to coarse grained, composed of plagioclase, hornblende, and biotite. In thin section, it is composed of 50-60% small plagioclase laths (1-2 mm), up to 20% hornblende, up to 15% brown biotite, 10% interstitial quartz, and traces of interstitial K-feldspar. There is also minor accessory magnetite.

The contact between quartz monzonite and granodiorite is transitional and gradational. In some places the quartz monzonite gradually becomes less porphyritic and more fine-grained, then turns more mafic as it grades into granodiorite. In other locations, an irregular zone of "coarse biotite granodiorite" intervenes. This transitional rock is characterized by large black biotite flakes and books (0.5 cm) and grades through a "biotite granodiorite" to the normal granodiorite. Further outward towards the edge of the pluton the granodiorite becomes more basic and the outer edge is usually a diorite.

The granodiorite-diorite "border phase" may be viewed as a contamination of the quartz monzonite magma by basic volcanics which the intrusive stopped off and digested. The border phase is also massive, forming unfractured, rounded outcrops similar to those of central quartz monzonite.

No thin sections of the fine porphyry were cut, but it is distinctive in outcrop and hand specimen for its fine-grained groundmass compared to the rest of the pluton. Phenocrysts are of quartz eyes and plagioclase (1-2 mm) with or without biotite, that are set in a felsic groundmass (average grain size 0.1 mm). Being finer-grained, the rock fractures better than the coarse intrusives and thus may be readily noted in outcrop. Its colour ranges from pink, as in the cliff-like creek exposures south of camp on the edge of Pallen Creek, to white where it cuts porphyritic quartz monzonite, to grey where it forms xenoliths in granodiorite. It is commonly more felsic than the host rocks, usually more altered, and generally contains more pyrite (1-2%).

The intruded rocks around the pluton form part of a volcano-sedimentary unit of the Triassic Stuhini group. These rocks are predominantly composed of green basic volcanics (flows and tuff-breccias) characterized by black augite phenocrysts and occasional white plagioclase phenocrysts. The volcanics are hornfelsed to a dark green-black felted basic rock near the intrusive, commonly rusty due to the presence of 3-5% pyrrhotite.

Minor sedimentary rocks are included with the volcanics near the southern contact of the pluton, where a thin interbed of cherty quartzite occurs. North of the pluton a laterally continuous bed of limestone of moderate thickness (? 100-200 m) overlies the volcanics. Close to the intrusive it is baked, silicified, and cut by myriads of irregular barren white quartz veinlets. The limestone is locally converted to marble, but no skarn was seen.

4.1 Alteration and Mineralization

There are a very few, small patches of alteration and mineralization within the pluton. The strongest of these is in the southwest corner of the claim block, in the tributary to Pallen Creek that runs south from the camp. What appear to be en-echelon shears strike northwesterly in the creek. The quartz monzonite in the sheared zone is well fractured (30-60/m) and rusty due to introduction of 2-5% pyrite and some pyrrhotite. Very rare quartz veins and hairline fractures contain traces of molybdenite and occasional chalcopyrite is disseminated. Grades over representative widths are less than 100 ppm Cu and Mo. To the west, the outcrop is covered by grey clayey glacial till for several hundred meters. Further west in the granodiorite an area of weak pyritization (1-3%) surrounds the old pits dug by Newmont on their Disco/Chopper claim groups. In the pits, a few quartz-filled fractures contain spots of chalcopyrite, but adjoining outcrops are barren. Chalcopyrite is also reported on fractures in the volcanics further west (pits dug by Newmont) but these were not visited.

Rare flakes of molybdenite and/or chalcopyrite were also found in pits dug by Falconbridge east of camp on the north edge of a large swampy area. There is some quartz filling along these fractures, but virtually no alteration of adjacent quartz monzonite.

Within the porphyritic quartz monzonite, alteration is mainly patchy, weak, and of low-rank mineralogy. The strongest alteration is in the rusty shears in the tributary to Pallen Creek described above. At the center of the shears, the alteration grade is quartz-sericite-pyrite (next to the few veins containing molybdenite). Around this there is weak to moderate silicification, pyrite, and variable albitization/chloritization and epidote.

The albitization results in a characteristic pink to reddish rock with a border, finer-grained texture than the original quartz monzonite. The porphyritic texture is largely destroyed, due to recrystallization of original plagioclase (albite/

oligoclase) to "hematite-stained albite." The red colouration is due to finely divided hematite characteristic of this weak alteration in intrusive rocks in many parts of the world. All stages of albitization are present, from patchwork albite through chequer albite to "irregular albite." In the strongest altered rocks (ST-41, thin section) the latter predominates, grading towards a low-orthoclase K-feldspar. The weakness of the overall alteration is indicated by the low content of the orthoclase molcule in the replacement feldspar, i.e. true secondary K-feldspar would probably be accompanied by more molybdenite.

Mafic minerals are generally chloritized, epidotized, and sericitized in these zones of alteration, fading off to weak chloritization further from the zones. Original plagioclase and secondary albite may be weakly sericitized (in thin section) but primary K-feldspar is untouched. Occasional fractures and veinlets of epidote and chlorite are found scattered throughout the intrusive.

In general, the alteration is weak and patchy, and indicative more of deuteric alteration of a normal pluton rather than of concentrated hydrothermal activity associated with a mineral deposit. Such weak traces of alteration and mineralization are common rather than unusual in intrusives of this type. The Hotailuh batholith, of which the Pallen Creek pluton probably forms an extension, is not considered to have economic mineral potential (Anderson, 1978).

4.2 Regional Geology of the Tanzilla Plateau Area

A period of about a week was spent in traversing accessible portions of the plateau on foot from helicopter drop-off points. In addition, the Hu Group of claims and Tanzilla Group were visited, and the Stikine Group was examined in more detail. Additional geology has been drawn from published and unpublished sources (GSC, 1957; Burgoyne, 1972; Okulitch and Souther, 1971; West Joint Ventures, 1967; Paulus, 1971; Sellmer et al, 1973; Wilson, 1978).

The plateau is mainly underlain by the Triassic Stuhini Group andesitic volcanics, overlain by an extensive limestone (Stikine Group, Premian age) of moderate thickness. A batholith, probably an extension of the Hotailuh Batholith known to the east, may underly the volcanics at shallow depth; it is exposed at several locations on the plateau (see accompanying map at 1:50,000). The batholith is composed of quartz monzonite, probably contaminated near its roof with basic volcanic material to form granodiorite and diorite.

The volcanics and limestone are moderately folded about north-northeast trending axes which plunge southwards to shallow angles (25°). Major faults were not observed while mapping but presumably underly the deeper valleys between peaks on the plateau.

The volcanics of the Stuhini Group are very similar to those of the Hazelton Group in the writer's experience, being much like those exposed south of the Stikine River in the Klastline Plateau down to and west of Kinaskan Lake. Most characteristic of both the Stuhini and Hazelton groups of volcanics is a dark green augite porphyry, presumably a flow rock of andesitic to basaltic composition. It sometimes contains white plagioclase phenocrysts, and grades to tuffs containing plagioclase shards and augite phenocrysts. By far, the most extensive and common unit on the Tanzilla plateau is a coarse green tuff-breccia, with blocks ranging from 5 to 50 cm. Locally, this becomes a lapilli tuff (fragments about 1 cm). There are also local units of crystal tuff of similar composition. Black argillaceous fragments are characteristic, and the unit may grade into a volcanic wacke (as in the Kalstline Plateau to the south). Thus, fragmental volcanics are volumetrically much more important than flows.

These rocks were described by the GSC (operation Stikine, 1957) as "volcanic and sedimentary rocks of pre-Upper Jurassic but otherwise indeterminate age," and as being "typically grey, green, and purplish coarse angular breccias, tuffs, and flows of andesitic, basaltic, and dacitic composition; prophyritic and amygdaloidal flows are present in places; the relatively fresh volcanic breccia is comparatively resistant to erosion, and in much of the heavily drift-covered Hotailuh Range it forms the only outcrops, probably giving a misleading picture of the proportions of various rock types."

Rare, thin acid volcanic units are seen in the Stuhini Group rocks (e.g. at the Tanzilla property, and around the north contact of the Pallen Creek pluton). These appear to be of dacitic composition and are probably thin flows (up to 10 m thick). They are locally pyritic (1-5%) and sometimes associated with cherty sediments.

The only clastic sediments seen interbedded with the volcanics were minor cherts (thin beds). They are sometimes rhythmically interbedded with black argillites on a centimeter scale.

The volcanics are overlain by a laterally continuous bed of grey-white limestone, generally only preserved in major synclines. This limestone may be up to 150 m in thickness. It is commonly brown-weathering along the Tanzilla valley edge, but elsewhere the baking activity of the intrusion has bleached it to a whitish, crystalline limestone, often full of myriads of barren white quartz veins. No fossils were seen in the limestone, and thus no evidence of reefs fringing volcanic edifices could be drawn.

The intrusive rocks of the plateau are similar to each other in composition, being quartz monzonite with contaminated or hybrid border zones of granodiorite. A narrow zone of hornfelsed volcanics usually surrounds the intrusives, with red staining due to introduced pyrite and pyrrhotite (locally 3-5%). The main intrusive of the plateau, the Pallen Creek pluton, is described in detail in the Stikine property report. The other major intrusive, located 10 km to the east, is a stock of about 12 km^2 area. It is mainly a medium grained granodiorite, completely unfractured, unaltered, and unmineralized. A dyke swarm of hornblende-plagioclase porphyry dykes is associated at its southwestern side. Some of these dykes are pyritic (2-4%) but some are barren. The easternmost of these dykes are very similar to late-stage "barren" dykes at Texasgulf's Red-Chris property, on the Klastline Plateau.

Several other small intrusive bodies and dykes are present on the plateau, notably west of the Pallen Creek pluton which are coarse, and barren (Paulus and Sheldon, 1971) and near the Tanzilla and Hu Group properties. These latter intrusives are syenitic, higher-level, and of more interest for mineral exploration. They are well fractured, moderately altered and pyritized, but contain only weak, patchy copper mineralization, e.g. in Stein Creek. Refer to the assessment report for a good description of the geology and mineralization (Sellmer et al, 1973).

In summary, the intrusives of the Tanzilla Plateau look very unpromising for mineral exploration. They are massive, barren, plutons, probably part of the Hotailuh Batholith mapped to the east (Anderson 1979). The feldspar porphyry intrusives associated with the Gnat Lakes deposit, east of the Stewart-Cassiar highway, are much smaller, higher-level, and different in character, and have significant copper mineralization associated with them (Panteleyev, 1977).

The structure of the plateau area seems to be fairly straightforward, dominated by open, moderate folds about north-east to north trending axes, plunging southwards. Intrusives have been emplaced in anticlinal axes, causing doming (doubly plunging anticlines). The limestones are locally complexly folded and standing on edge, but the more massive, competent tuff units seldom exceed dips of 45°. A rectilinear pattern of north-east and north-west trending faults is indicated from the drainage pattern on the plateau, but few of these faults were confirmed on the ground. The dykes and intrusive masses mapped reflect these directions of structural weakness.

5. SUMMARY

The Stikine Moly Property was located by a regional geochemical drainage sampling program in 1977 which resulted in two claims (Stikine, Stikine 2) being staked. Further work in 1978 (soil sampling, geophysical and geological surveys) led to three more claims being staked (Stikine 3,4,5). Several Mo rich soil anomalies were located which necessitated further investigation. During the summer of 1979, detailed geological, EM-16, magnetometer and IP surveys were corried out. A brief overburden drilling program consisting of six holes was also done.

The anomalous Mo silts are a result of the drainage of the anomalous Mo soils which occur in the low-lying glacial fill areas. The six holes that were drilled ended in a dense clay horizon which could not be penetrated. No anomalous Mo values were encountered from the drill program. A 10% NaOH hot and cold digestion of the anomalous soil sample indicate that soils with high Mo values contain detrital Mo as MoS_2 compared to those samples with low Mo values which contain bonded Mo in solution. Cumulative probability plots of Mo for the A and B soil horizons indicate a unimodal distribution for each horizon. It appears that a clay horizon occurs in the area which may account for low Mo values in soil since the clay would impede upward migration of Mo from mineralized bedrock.

The magnetic survey outlined two main areas of low magnetic intensity which may represent zones of intense alteration within the porphyritic quartz monzonite. The VLF results indicate a complex network of randomly orientated conductors throughout most of the grid. Several conductors would probably have escaped detection had only one transmitter station been used. The filtering process eliminated most "noise" of very short or very long wavelength VLF anomalies, including effects due to topography, but did not completely eliminate the ambiguity of strike direction because of the widely spaced lines. The IP results located two zones of moderate to high chargeability and fairly low resistivity which have been attributed to localized increases in metallic sulphide content. Coverage was incomplete and Zone A remains open to the west and Zone B is open to the southeast.

The property is underlain by the Pallen Creek pluton which is composed of a zoned intrusive grading from a prophyritic quartz monzonite core to a granodiorite/diorite margin, intrusive into a volcanic sedimentary unit of the Triassic Stuhini Group. The bulk of the pluton is massive, unfractured, and barren of alteration or mineralization. Rare quartz veins and fractures contain spots of molybdenite and chalcopyrite, and are limited in areal extent to narrow zones of possible fissuring or shearing. Alteration in these zones is patchy and of low grade (albite - chlorite - sericite - epidote - pyrite).

The Stikine Moly Property contains scattered moly mineralization and alteration not approaching that of a porphyry type deposit. The area does not appear to have any economic mineral potential.

References

Anderson, R. G. (1978): Preliminary report on the Hotailuh Batholith. Its distribution, age, and contact relationships in the Cry Lake, Spatsizi and Dease Lake map-areas, north-central British Columbia: Current Research, Part A, Geol. Surv, Can., Paper 78-1A, p. 29-31.

Anderson, R. G. (1979: Distribution and emplacement history of plutons within the Hotailuh Batholith in the Cry Lake and Spatsizi map-areas, north-central British Columbia: Current Research, Part A, Geol. Surv. Can., Paper 79-1A, p. 393-395.

Burgoyne, A. G. (1972): Umegren Joint Venture -- Tahltan Project: Dept. of Mines and Pet. Res., Assessment Report No. 3736.

Gabrielse, H. (1980) Geology of Dease Lake (104J) Map Area, Open File 707.

Geological Survey of Canada Staff (1957): Map 9-1957, Stikine River area, Cassiar District, British Columbia.

Okulitch, A. V. and Souther, J. G. (1971?): Geology of the Iskut River area, British Columbia (compiled by A. V. Okulitch, project coordinated by J. G. Souther; adjacent southeast Alaska geology compiled by D. A. Brew of U.S.G.S.)

Panteleyev, A. (1977): Gnat Pass Deposit, northwest British Columbia: GEM Report, 1977, p. 43-45.

Paulus, G. E., and Sheldon, R. F. (1971): Geophysical and geochemical reports on the Disco and Chopper claim groups, Liard Mining Division: Dept. of Mines and Pet. Res., Assessment Report No. 3169, 21 pp.

Sellmer, H. W., Depaoli, G. M., and Allen, D. G. (1973): Tanzilla property -- HU Claims, Tournigan Mining Explorations Limited, Liard Mining Division: Dept. of Mines and Pet. Resources, Assessment Report No. 4399, 19 pp.

Sutherland-Brown, A. (1969): Mineralization in British Columbia and the copper and molybdenum deposits, CIM Bulletin, 62, No. 681, p. 26-40.

West Joint Venture (1967): Geology and Index Map, West Joint Venture (United States Smelting and Refining Company, Drawing No. 67-1), FNM.

Wilson, J. W. (1978): Project Report, P.N. 119, 1977 (Tanzilla Prospect, p. 10-12).

APPENDIX I

TECHNICAL SPECIFICATIONS

Magnetometer

Make & Model	Barringer GM-122	Scintrex MF-1
Type	Proton precession	Fluxgate
Accuracy	± 1 gamma	0.5% of full scale
Range	20,000-100,000 gammas	± 100,000 gammas
Output	5 digit LED display	Meter readout (5 scales)
Measurement	Total magnetic field	Vertical magnetic component

VLF-EM

Make & Model	Geonics EM-16
Type	Crossed coil vertical loop, infinite transmitter
Accuracy	± 1%
Range	In-phase ± 150%, quadrature ± 40%
Output	Audible output - null by clinometer and vernier
Measurement	In-phase and quadrature components of secondary field in %
Frequencies	Annapolis (21.4 khz) and Hawaii (23.4 khz)

IP

Make & Model	Tx - McPhar P-660, Rx - Phoenix IPVI
Type	Frequency domain
Accuracy	± 0.2%
Range	10v to 0.1mv (meter), 0-1000 calibrated vernier
Frequencies	0.3 and 5.0 hz
Measurement	Apparent resistivity and percent frequency effect
Power	2.5 KVA, 120 VAC
Electrode separation	100 metres (rec), 30 metres (detail) n=4 or 5
Array	Dipole-dipole (in line)

Appendix II

Thin Section Descriptions

ST - 26 — Porphyritic Qtz Monzonite

--Large (8-10 mm) glomeroblastic pink K-spar phenocrysts, poikilitically enclosing plagioclase laths, quartz, biotite, hornblende, Miner sphene.

--Weak chloritization of mafics, minor sericite.

--Plagioclase unaltered, zoned, twinned.

--Magnetic: mineral accessory magnetite.

ST - 38 — Quartz Monzonite (vaguely porphyritic)

--as ST-26, vague glomeroblasts of K-spar (pink) in finer-grained pale green plagioclase, grey quartz, block hornblende. Magnetite accessory.

--more hornblende than St-26, less altered, very fresh.

ST-34 — Porphyritic Quartz Monzonite

--as ST-26, some clay/sericite alteration of plagioclase in areas, which are brownish in hand specimens. Also patches of "patch work albite" after feldspar, moderately sericitized now. Accessory magnetite.

ST-14 — Chloritized Diorite (or granodiorite)

--more basic than ST-26 to 38; about 60-70% small plagioclase laths (1-2 mm), 10% interstitial quartz, 10% chloritized hornblende, minor magnetite.

--traces only of primary K-spar (interstital); maybe a little secondary al-or-bite "anoralbite".

ST-16 — Diorite (or granodiorite)

--very much more mafic than the preceding (CI=35)

--about 20% hornblende, 15% brown biotite, hornblende variably chloritized

--has some interstitial K-spar, quartz. Almost a granodiorite.

ST-42 Quartz Monzonite (Weakly Altered)

Large glomeroblasts of pink K-spar (occasional) in clear, relatively unaltered groundmass of equigranular, smaller plagioclase laths, interstitial K-spar and quartz. Minor vein quartz, accompanied along margins by hematite-stained (salmon-pink) secondary feldspar ("irregular albite", $\sim Or_{30}Ab_{70}$), weak sericite, and alteration of mafics to chlorite/epidote/sericite. Some fine secondary silica near vein also.
Sericitization affects only the original plagioclase, leaving primary K-spar nearby untouched.
Sulphides (3%) mainly pyrite, but may be some pyrrhotite also (both diss. & fractures -- controlled).

ST-41 Altered Quartz Monzonite

Salmon-pink colouration due to hematite-stained albitic alteration feldspar (Or_{30} Ab_{70}), ranging upwards in orthoclase content to weak K-spar.
Stronger sericitization of mafics than in ST-42. Also stronger chloritization.
Texture however is not broken down at all.
Minor vein quartz, traces MoS_2. Some pyrite diss. and along veins.
Some silicification adjacent veins.
All stages of albitization present: some patchwork albite, chequer albite, but mainly "irregular albite: and low-or K-spar.
All the secondary feldspar is dusted with hematite and is sericite altered.

APPENDIX III

STATEMENT OF EXPENSES

Geophysical Survey	
VLF-EM16, Magnetic Survey (July 4-12)	
Presunka Geophysical Explorations Ltd.	
10 days @ $250/day	
2 days @ $150/day	2800.00
IP Survey (July 18 - August 2)	
Mertens & McNeil	7058.30
Geology (June 20-29)	
C. Leitch 10 days @ $90/day	900.00
Transportation	
Helicopter (12E @ $190.00/hr + fuel - 3 hrs, Yukon Airways, Dease Lake)	675.00
Board ($16/man-day)	
geophysics (VLF-Mag) 2 people for 10 days	320.00
geophysics (IP) 4 people for 16 days	1024.00
geology 1 person for 10 days	160.00
Report Preparation	
Drafting 5 days @ $75.00/day	375.00
Writing (BWD - 3 days, PS - 2 days)	550.00
Typing, assembling 4 days @ $65.00/day	260.00
Report reproduction (approx.)	50.00
TOTAL	$14,172.30

APPENDIX IV

FALCONBRIDGE NICKEL MINES LIMITED

6415 - 64th Street, Delta, B.C., Canada V4K 3N3

Tel. (604) 946-0441

Telex 04-53245

November 20, 1980

Dept. of Energy, Mines and Petroleum
Resources
411 Douglas Building
Victoria, B. C.
V8V 1X4

Dear Sir:

This is to certify that the geophysical work was done under the supervision of Mr. P. Smith (statement of qualifications enclosed). The geological mapping was done by Mr. C. Leitch, a graduate of Queen's University (B. Sc.) and of Imperial College, London (M. Sc.).

I, B. W. Downing, am a graduate of Queen's University (B. Sc.) and of the University of Toronto (M. Sc.) and am a member in good standing of the Geological Association of Canada.

Yours truly,

B. W. Downing

B. W. Downing

BWD:ik

APPENDIX IV

STATEMENT OF QUALIFICATIONS

I, Paul A. Smith, of the City of Toronto, Province of Ontario, do hereby certify that:

1. I am a geophysical technician, residing at 65 Dogwood Crescent, Scarborough, Ontario.

2. I have received diplomas from De Vry Technical Institute, Toronto (Electronics - 1962) and Nova Scotia Land Survey Institute, Lawrencetown (Cartographic Drafting - 1966).

3. I have been actively engaged in geophysical exploration since 1962 and have had world-wide experience in surface and underground survey methods and techniques.

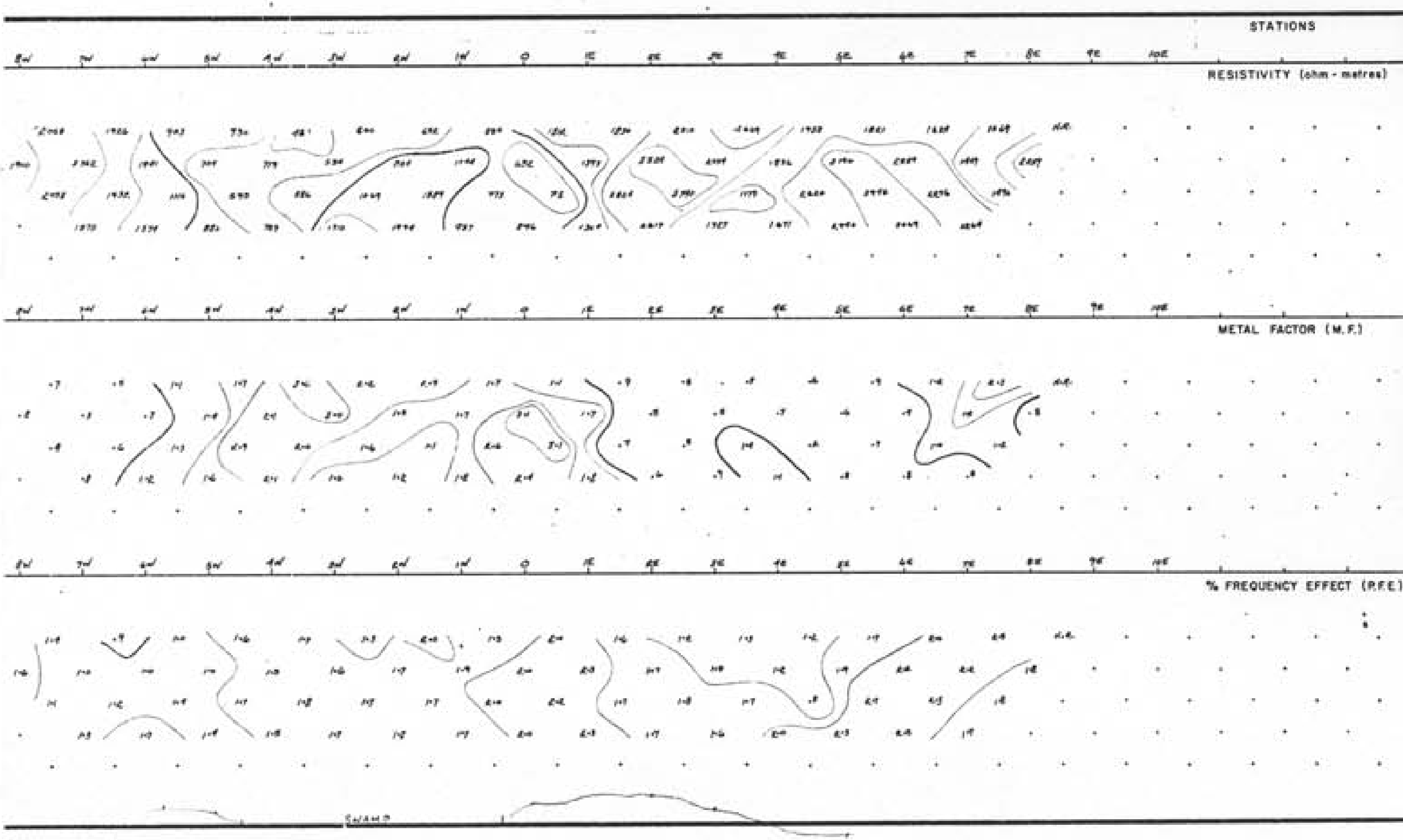
4. I am presently employed as Senior Field Supervisor for Falconbridge Nickel Mines Limited.

5. I have reviewed the data contained in this report and am confident that the geophysical surveys were conducted in a satisfactory manner.

Dated at Toronto this 12th day of September, 1980.

Paul A. Smith,
Senior Field Supervisor.

APPENDIX V



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

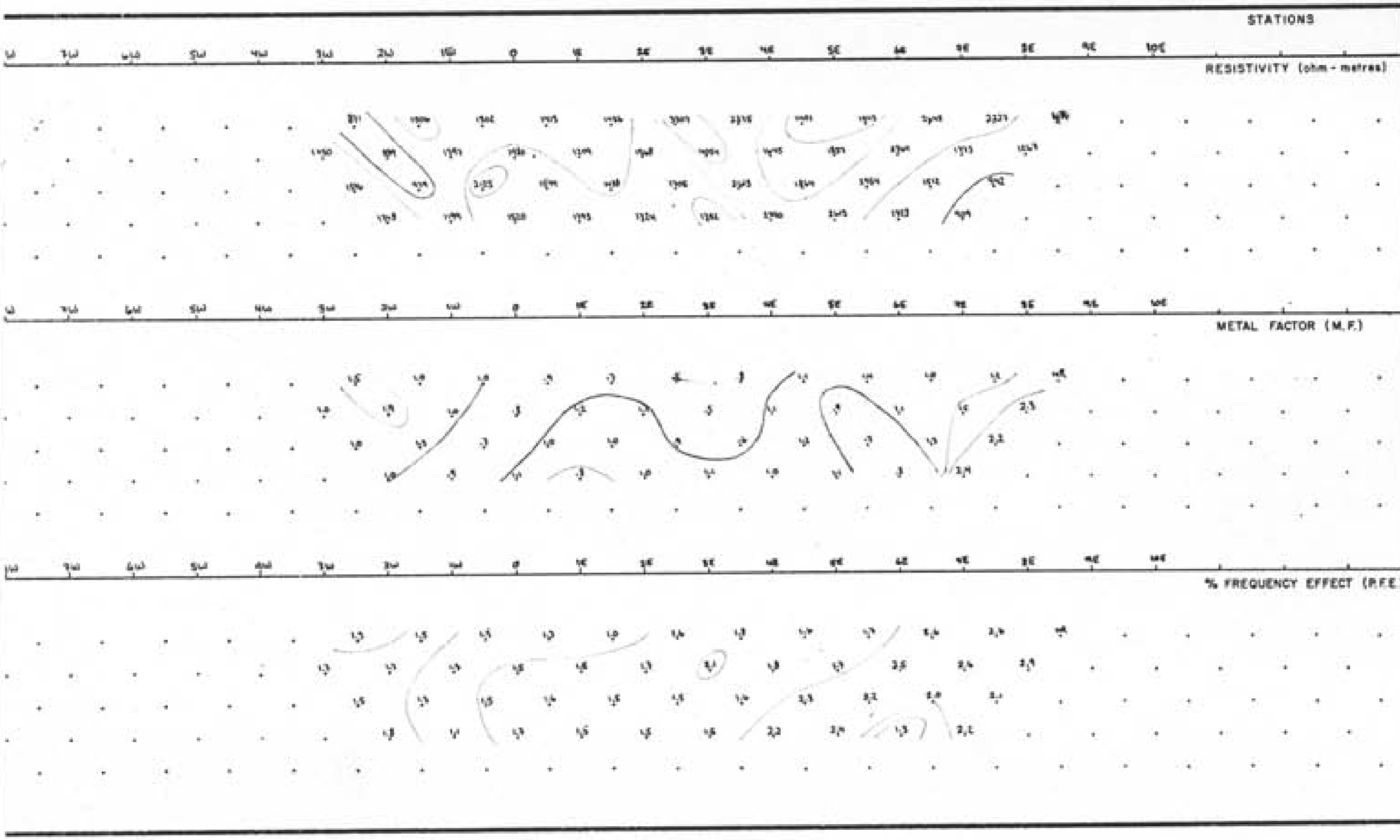
LINE 20N

LEGEND

ARRAY: DIPOLE - DIPOLE
UNIT: P660
FREQUENCIES: 0.3 + 3 HZ
SCALE: 2 CM = 100 M
DATE: JULY 30 1979
DATA BY: J. MacNeil
REMARKS: Scale reduced

LOGARITHMIC CONTOURS - 1·0, 1·5, 2, 3, 5, 7·5
I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 13



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 18N

LEGEND

ARRAY: DIPOLE-DIPOLE

UNIT: P660

FREQUENCIES: 0.3 + 5HZ

SCALE: 2 CM = 100 M

DATE: JULY 29 1979

DATA BY: J. MACNEIL

REMARKS: Scale reduced

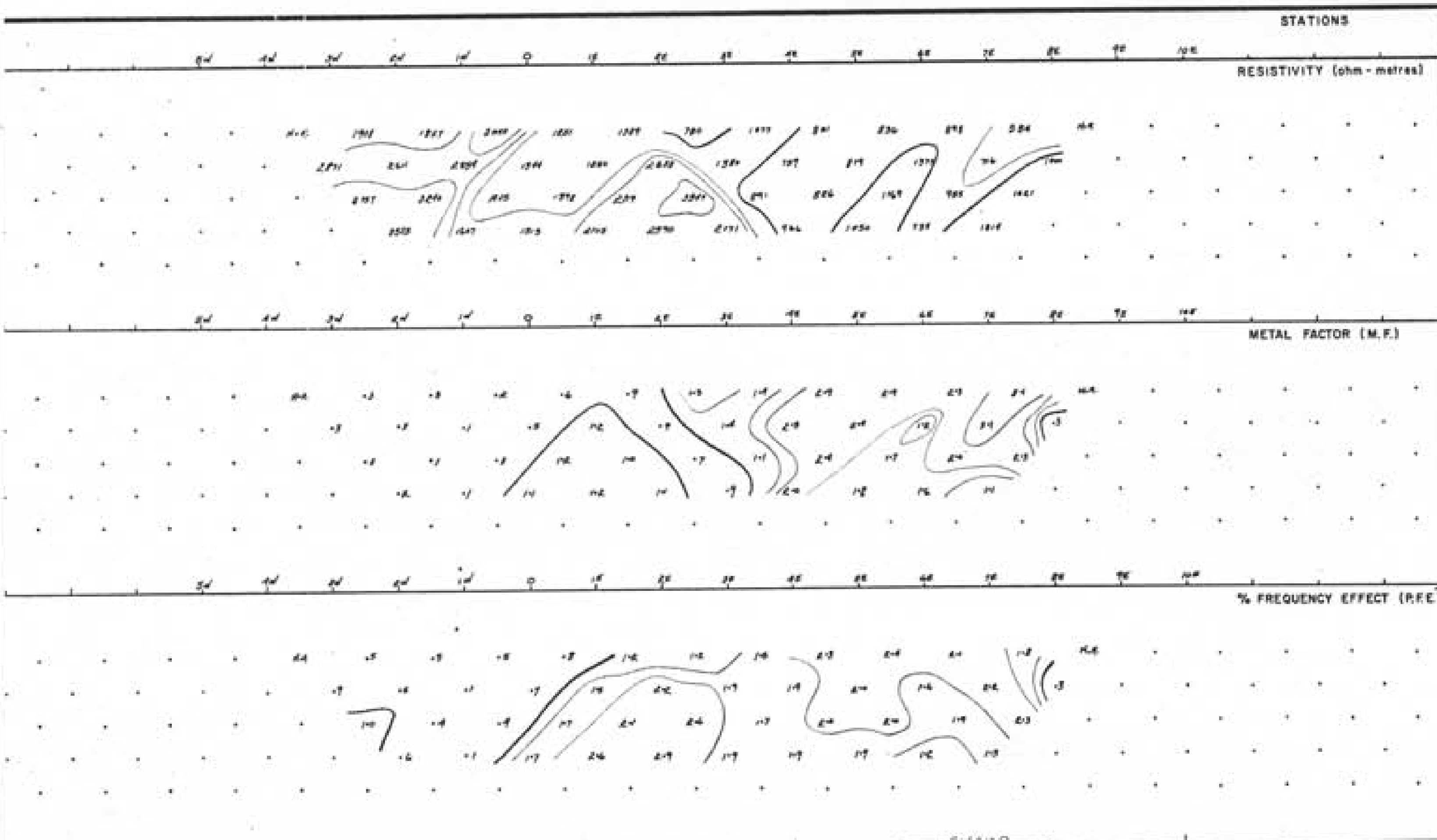
LOGARITHMIC CONTOURS - 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG

MODERATE

WEAK

DWG. No. 19



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 16N

LEGEND

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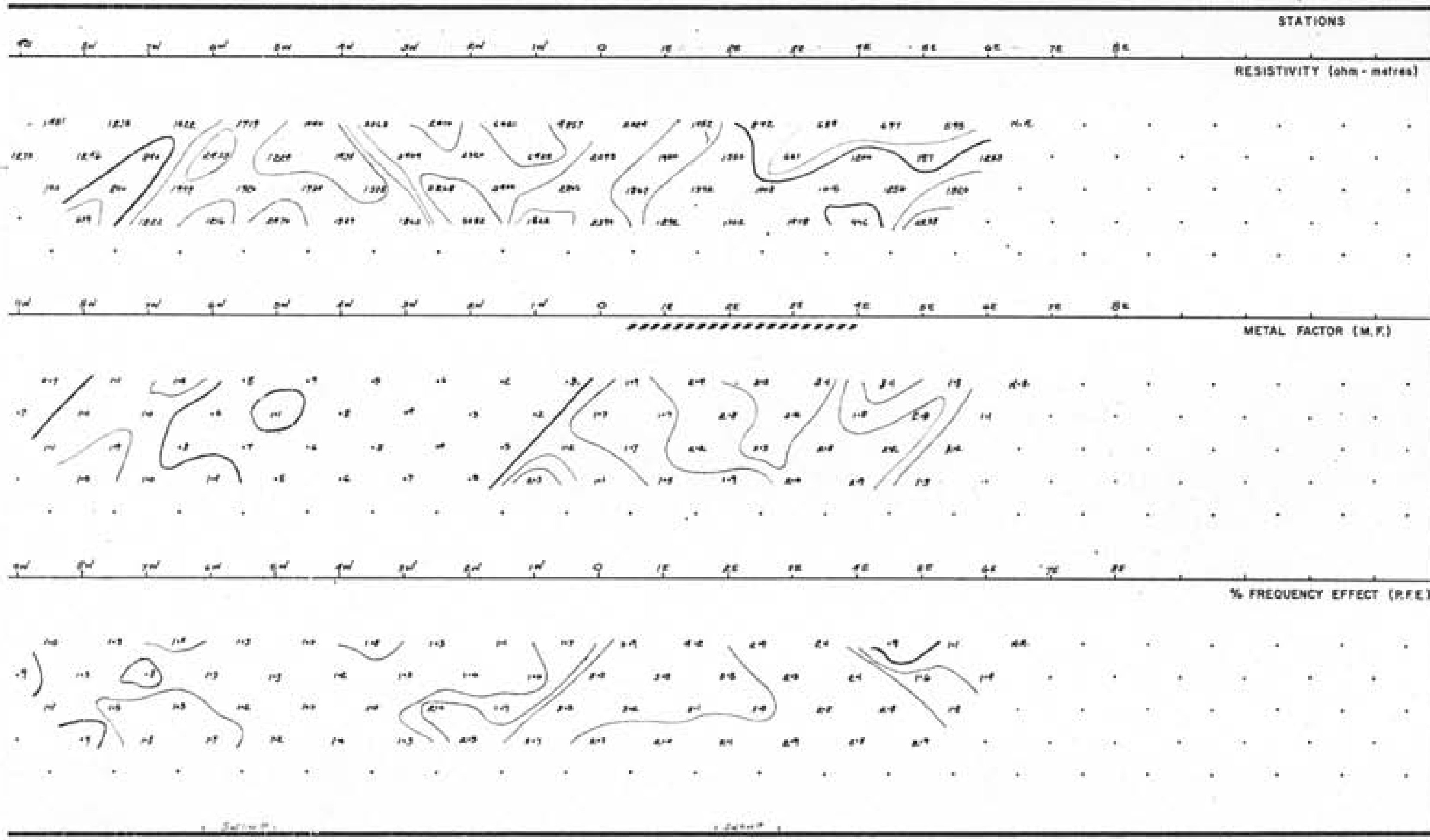
UNIT: P660
FREQUENCIES: 0.3 + 5 HZ
SCALE: 2CM = 100M
DATE: JULY 29 1979
DATA BY: J. MAC NAIL
REMARKS: Scale reduced

LOGARITHMIC CONTOURS - 1·0, 1·5, 2, 3, 5, 7·5

I. P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 15



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 14N

LEGEND

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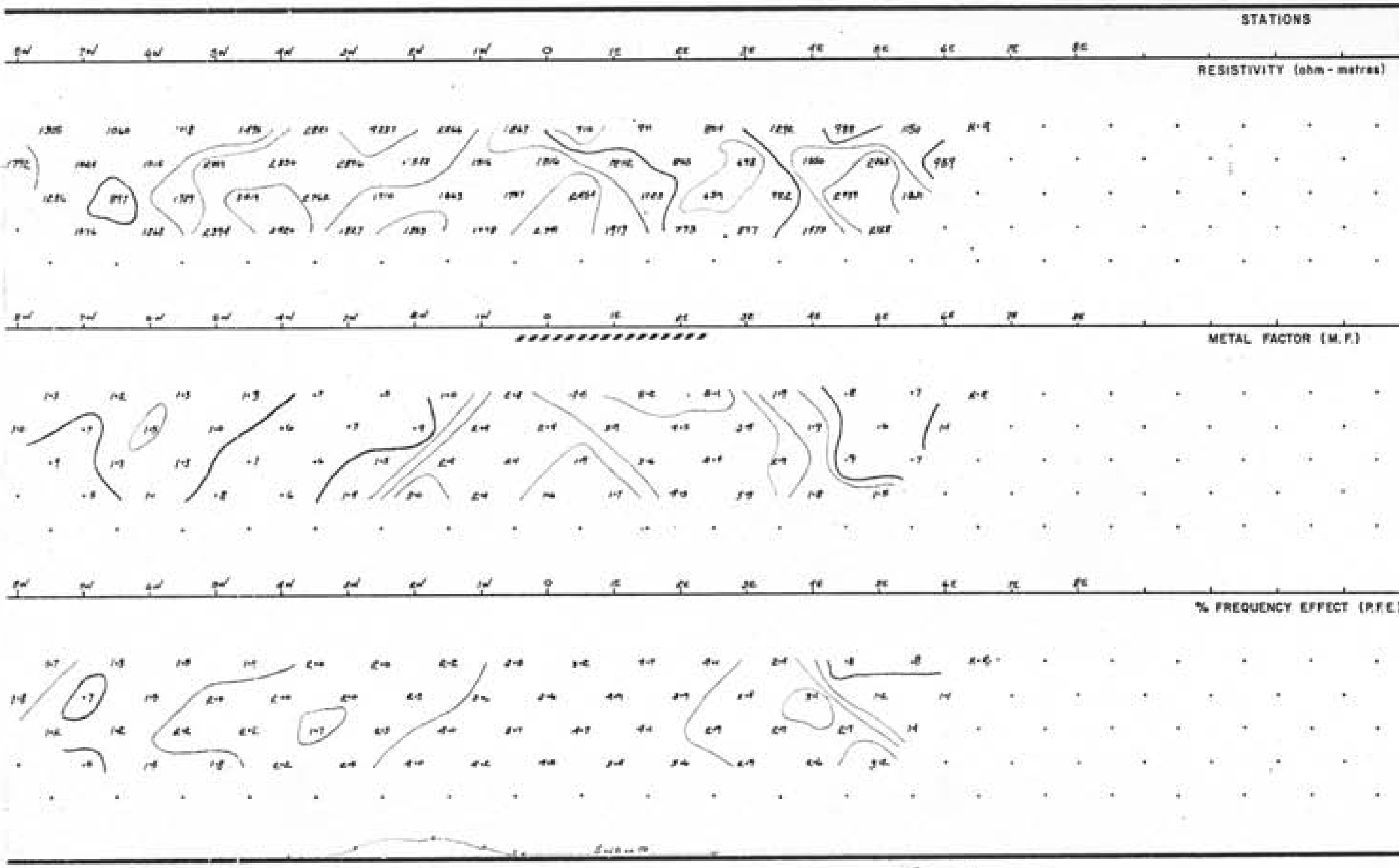
UNIT : P660
FREQUENCIES: 0.3+5 HZ
SCALE: 2CM = 100M
DATE: JULY 28 1977
DATA BY: J. MAC NEIL
REMARKS: Scale reduced

0 — 100 m — 200 m

LOGARITHMIC CONTOURS - 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 16



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 12N

LEGEND

ARRAY: DIPOLE - DIPOLE

UNIT: P660

FREQUENCIES: [illegible]

SCALE: 2cm : 100m

DATE: July 22 1979

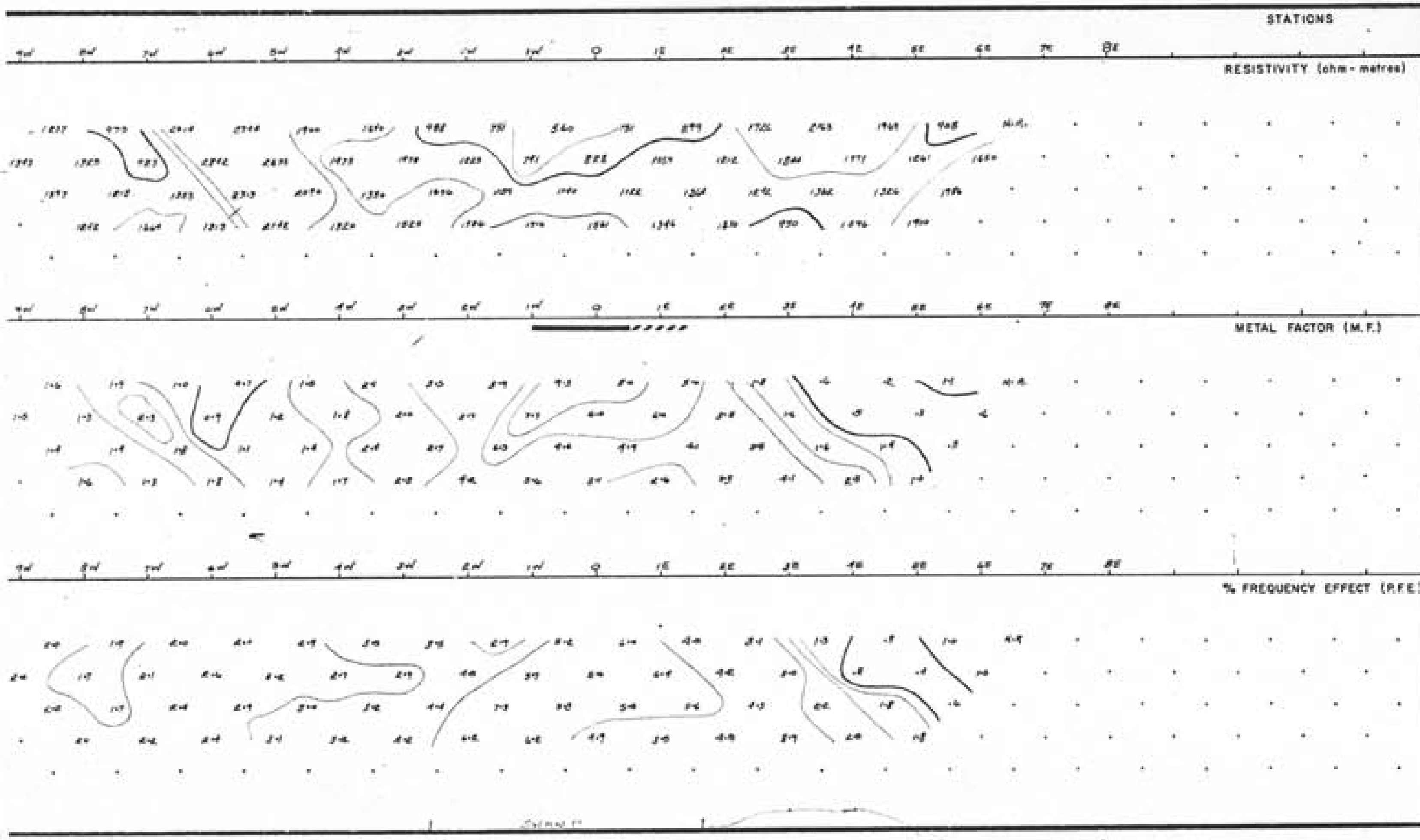
DATA BY: J. MacNeil

REMARKS: Scale [illegible]

LOGARITHMIC CONTOURS - 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 17



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

Stikine Moly PROJECT

LINE 10N

LEGEND

ARRAY: DIPOLE - DIPOLE

UNIT: P660

FREQUENCIES: 0.3-5 HZ

SCALE: 20N = 100M

DATE: July 27, 1979

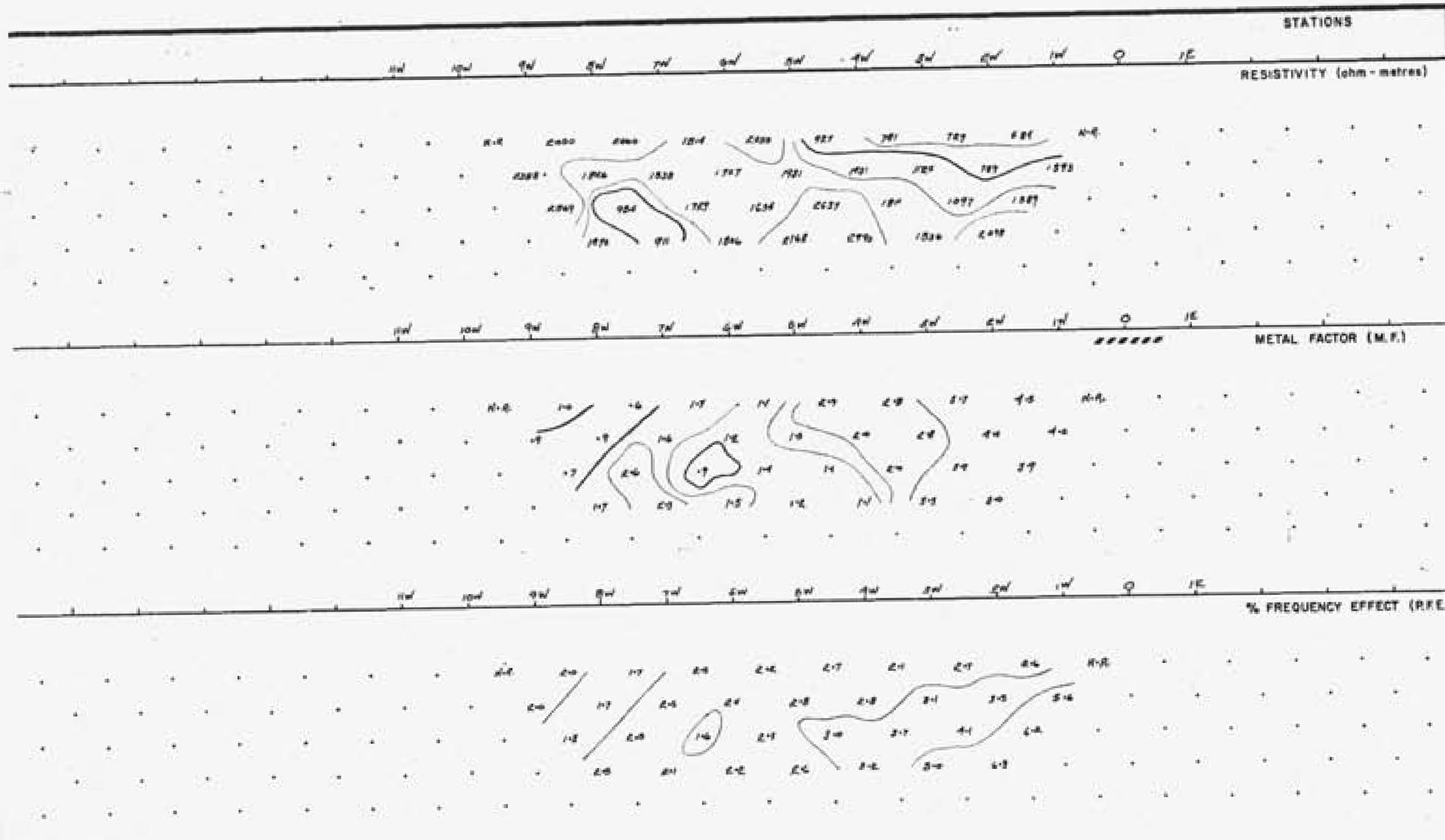
DATA BY: J. MacNeil

REMARKS: Scale reduced

LOGARITHMIC CONTOURS - 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 18



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 8N

LEGEND

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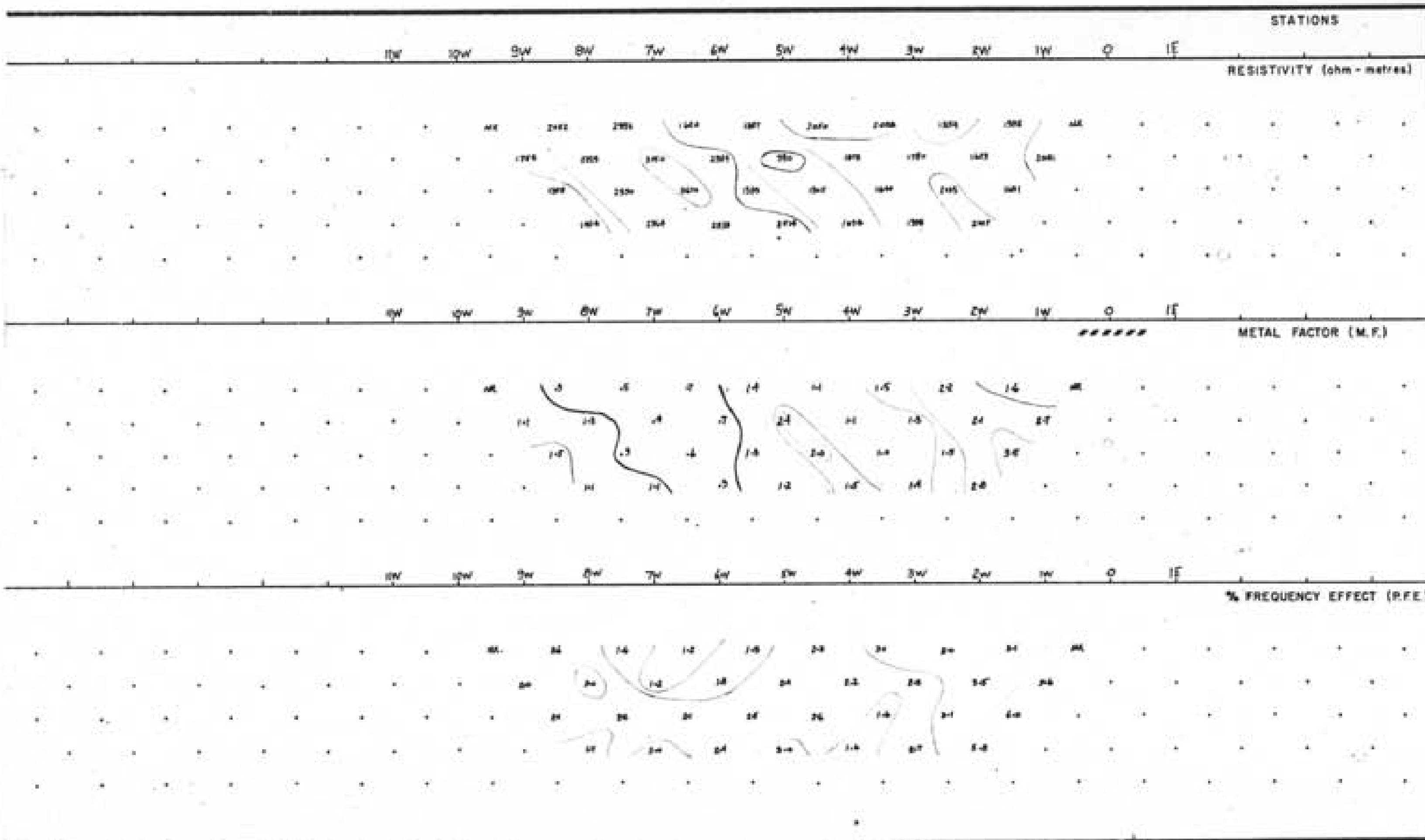
UNIT: P660
FREQUENCIES: 0.3 + 3 HZ
SCALE: 2CM = 100M
DATE: JULY 27, 1979
DATA BY: J. PROVIAS
REMARKS: Scale reduced
0 100 m 200 m

LOGARITHMIC CONTOURS - 1·0, 1·5, 2, 3, 5, 7·5
I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 19



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 6N

LEGEND

ARRAY: DIPOLE - DIPOLE

UNIT: P660

FREQUENCIES: 0.3 HZ & 5 HZ

SCALE: 2CM = 100 M

DATE: JULY 25 1979.

DATA BY: J. MACNEIL
J. PROVIAS

REMARKS: Scale reduced

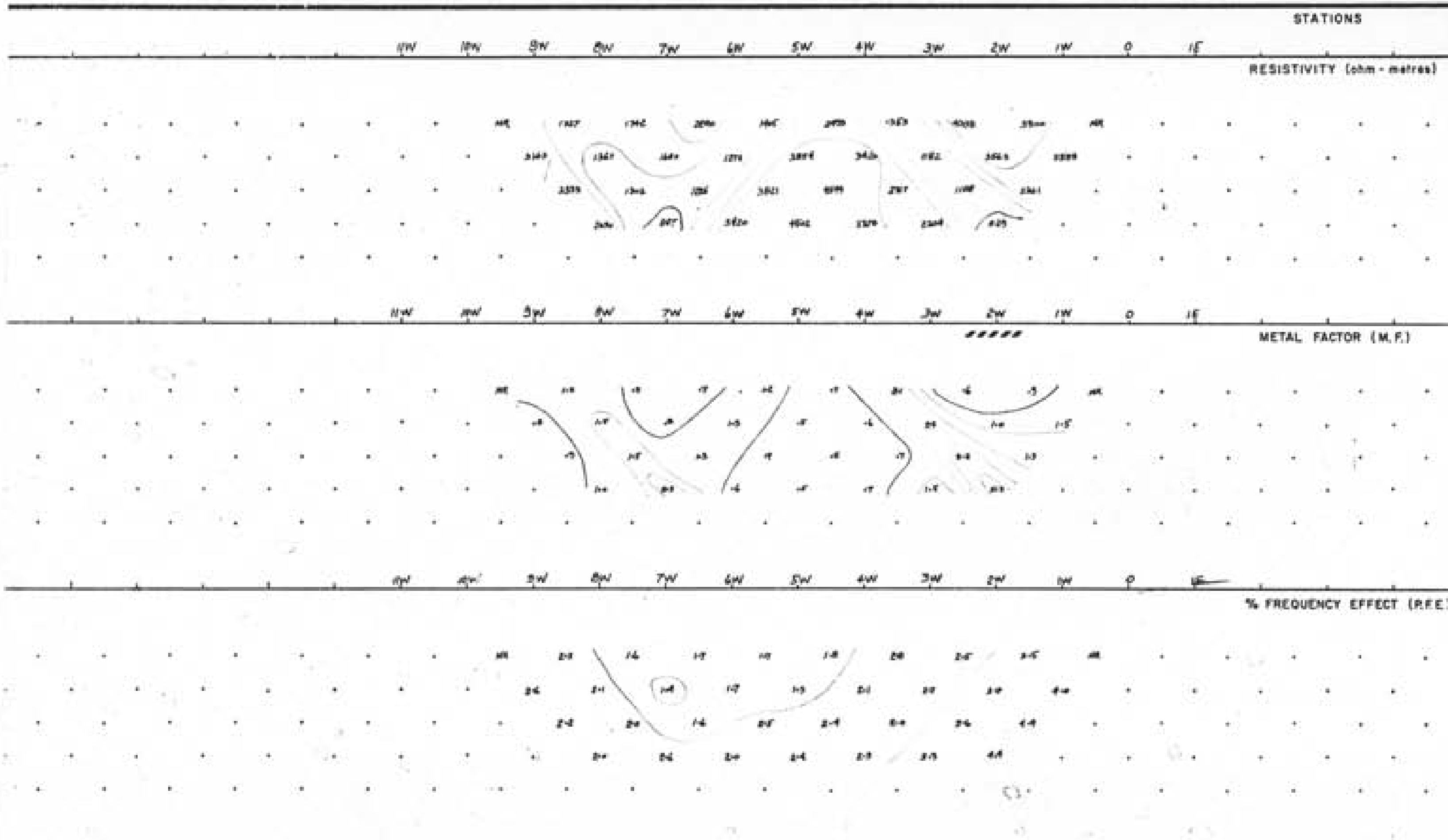
LOGARITHMIC CONTOURS - 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG

MODERATE

WEAK

DWG. No. 80



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 4N

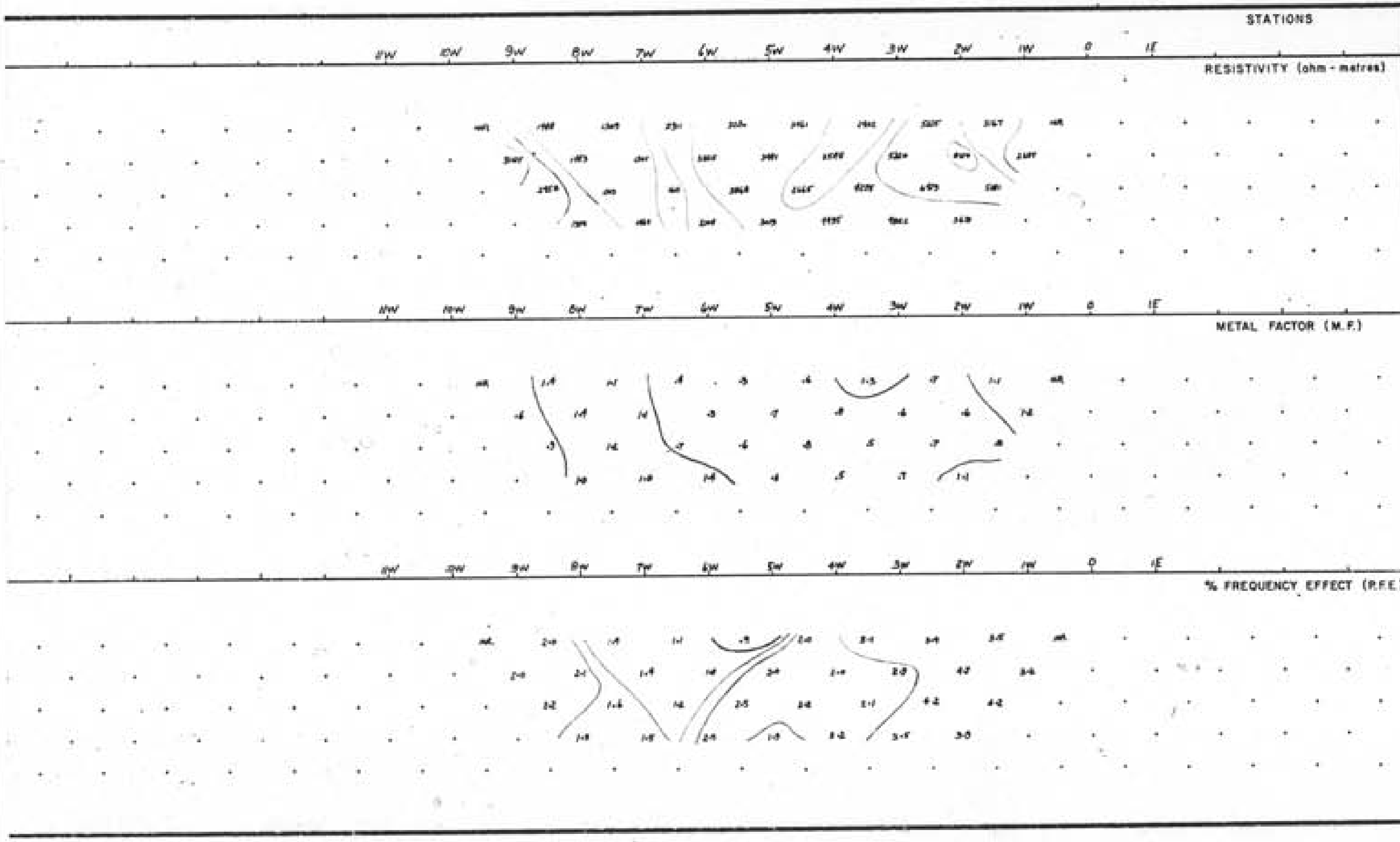
LEGEND

ARRAY: DIPOLE - DIPOLE
UNIT: P 660
FREQUENCIES: 0.3 & 5 HZ
SCALE: 2CM = 100 M
DATE: JULY 24 1978
DATA BY: J. MACNEIL
REMARKS: Scale reduced [illegible]

LOGARITHMIC CONTOURS - 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 21



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

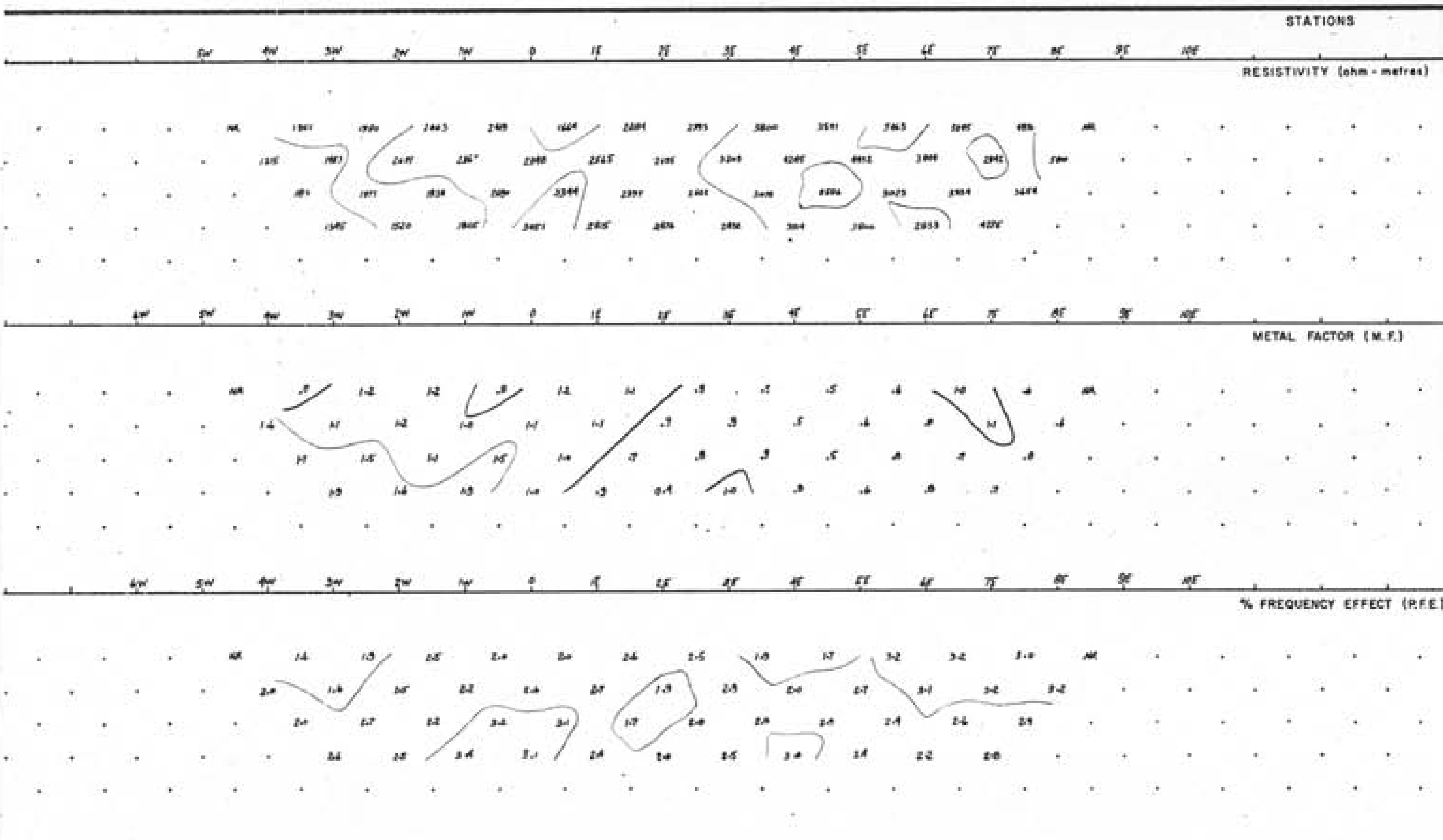
LINE 2N

LEGEND

ARRAY: DIPOLE-DIPOLE
UNIT: P660
FREQUENCIES: 0.3 / 5 HZ
SCALE: 2 CM = 100 M
DATE: JULY 23 1979
DATA BY: J. MACNEIL
REMARKS: Scale reduced

LOGARITHMIC CONTOURS – 1.0, 1.5, 2, 3, 5, 7.5
I.P. ANOMALY – STRONG
MODERATE
WEAK

DWG. No. 22



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 0+00

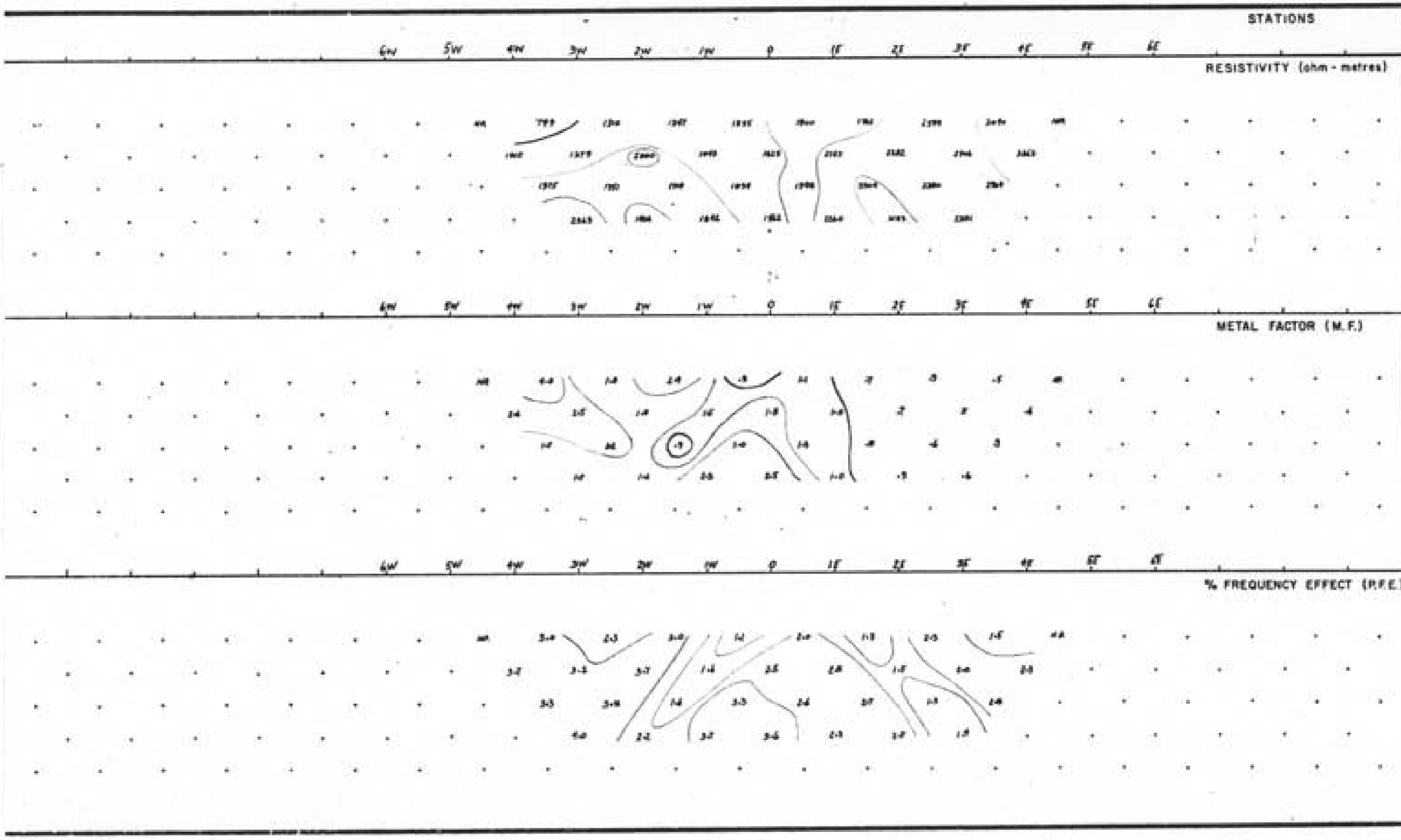
LEGEND

ARRAY: DIPOLE - DIPOLE
UNIT: P660
FREQUENCIES: 0.3 & 5HZ
SCALE: 2CM = 100M
DATE: JULY 22 1975.
DATA BY: J. MACNEIL
REMARKS:

LOGARITHMIC CONTOURS - 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 23



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 2S

LEGEND

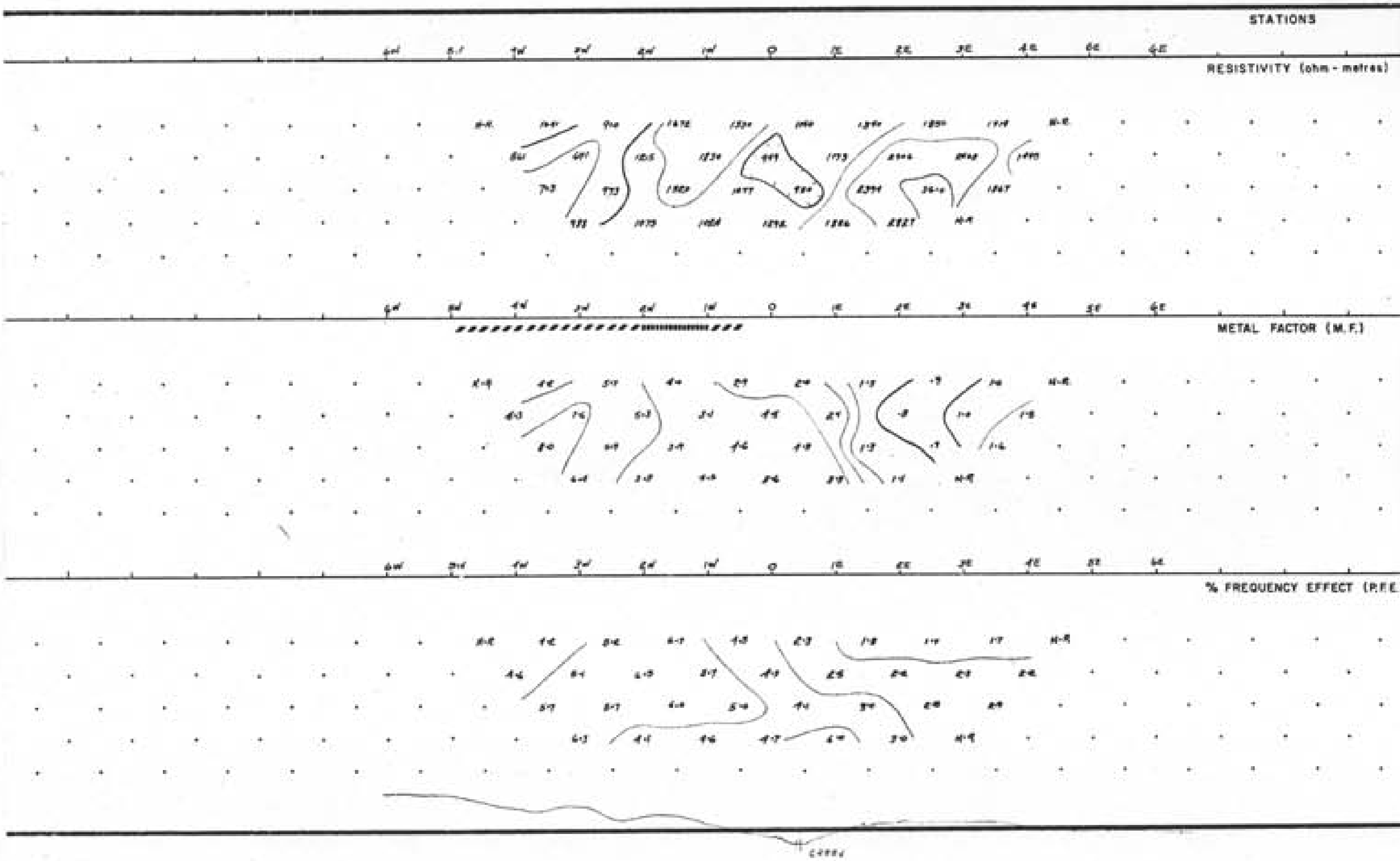
ARRAY: DIPOLE - DIPOLE
UNIT: P660
FREQUENCIES: 0.3 & 5 HZ
SCALE: 2 CM = 100 M*
DATE: JULY 26 1979
DATA BY: J. MACNEIL
REMARKS: Scale reduced

0 100m 200m

LOGARITHMIC CONTOURS = 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG / MODERATE / WEAK

DWG. No. 29



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 4S

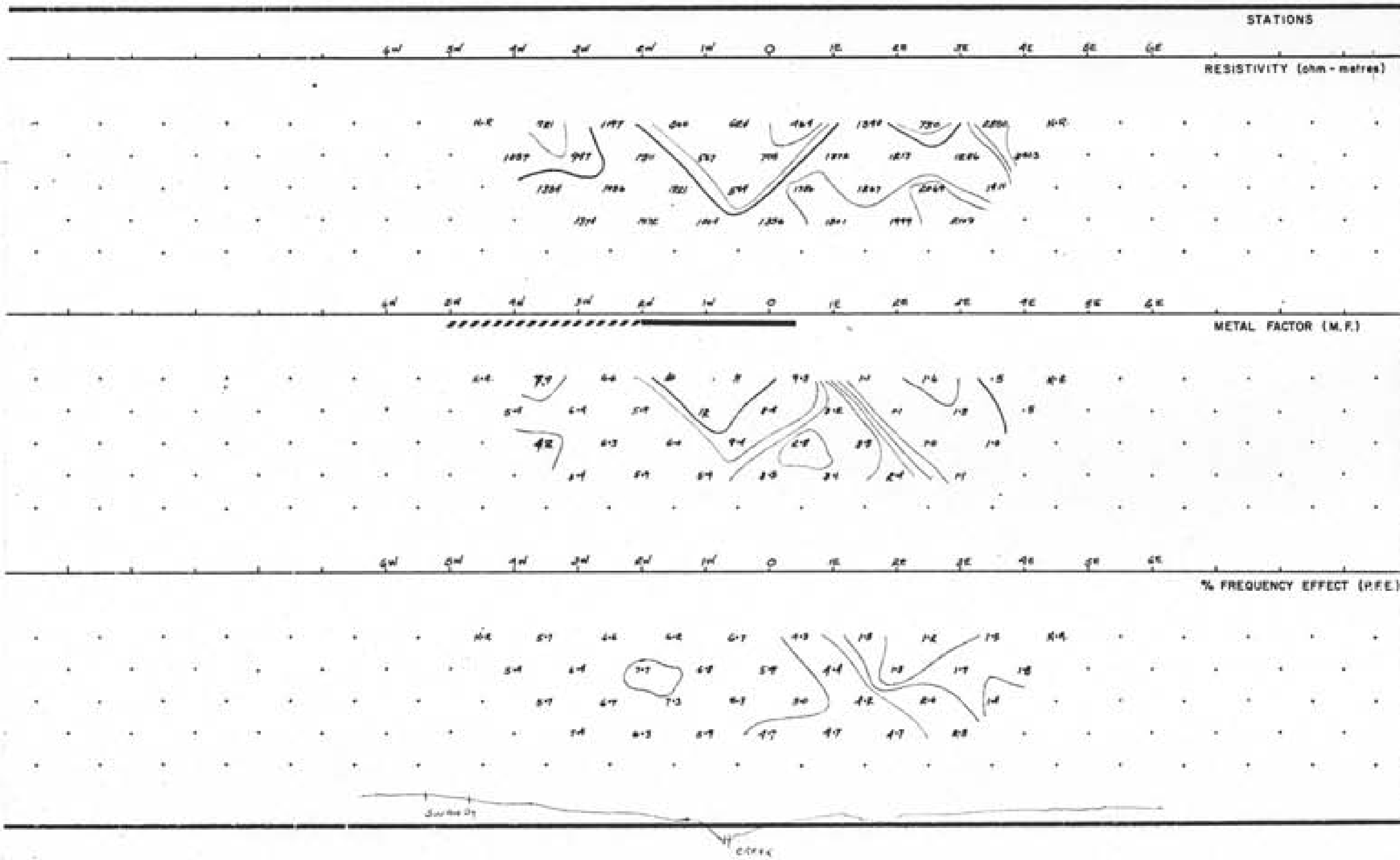
LEGEND

ARRAY: DIPOLE - DIPOLE
UNIT: P660
FREQUENCIES: 0.3-4.0 HZ
SCALE: 2CM = 100M *
DATE: JULY 21 1979
DATA BY: J. MAC NEIL
REMARKS: Scale reduced

LOGARITHMIC CONTOURS - 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 25



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 6S

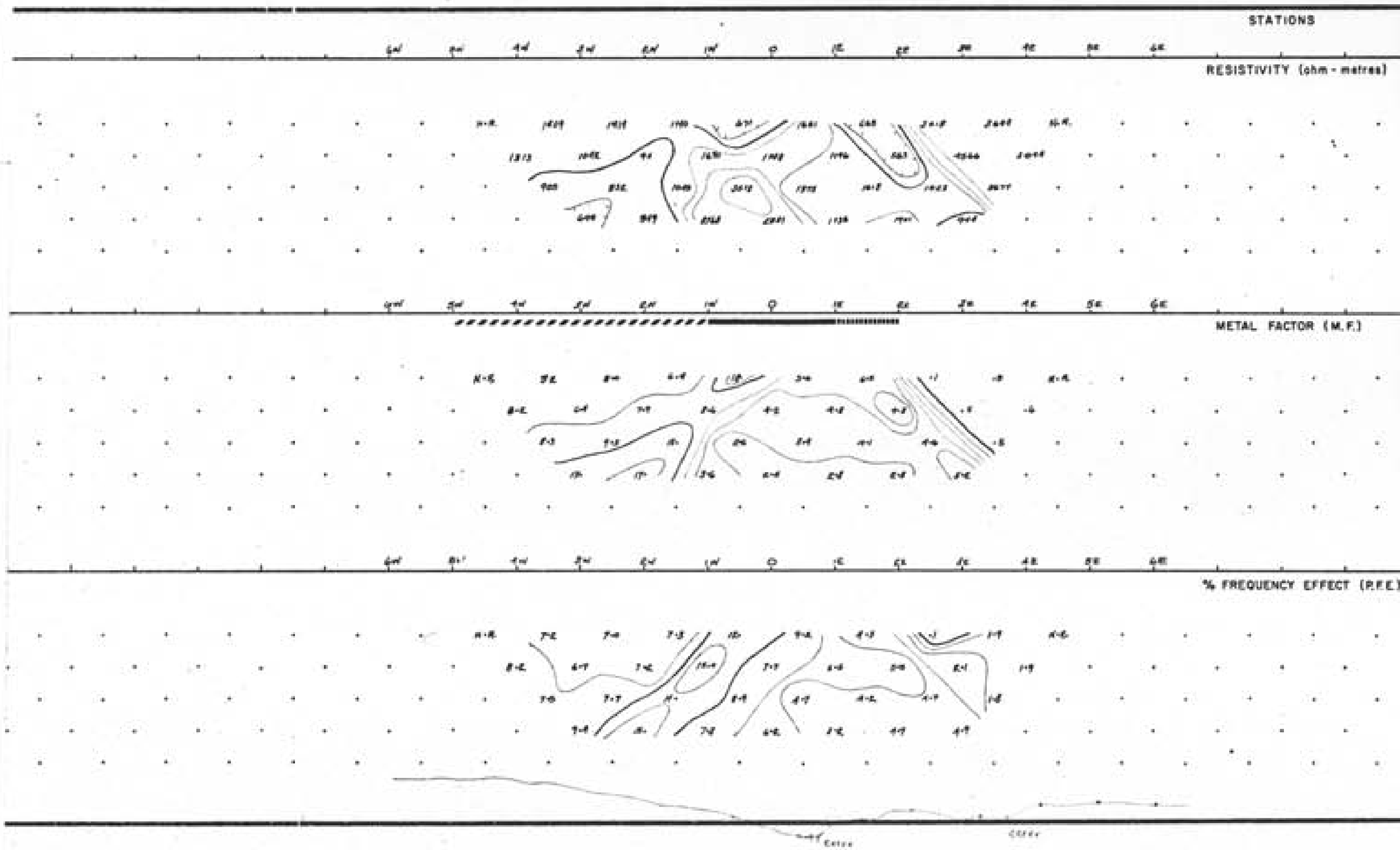
LEGEND

ARRAY: DIPOLE - DIPOLE
UNIT: P660
FREQUENCIES: 0.3-5HZ
SCALE: 2CM = 100M
DATE: JULY 21, 1979
DATA BY: J. MacNeil
REMARKS: Scale reduced

LOGARITHMIC CONTOURS - 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 26



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

STIKINE MOLY PROJECT

LINE 8E

LEGEND

ARRAY: DIPOLE - DIPOLE

UNIT: P660

FREQUENCIES:

SCALE: 2CM = 100M

DATE:

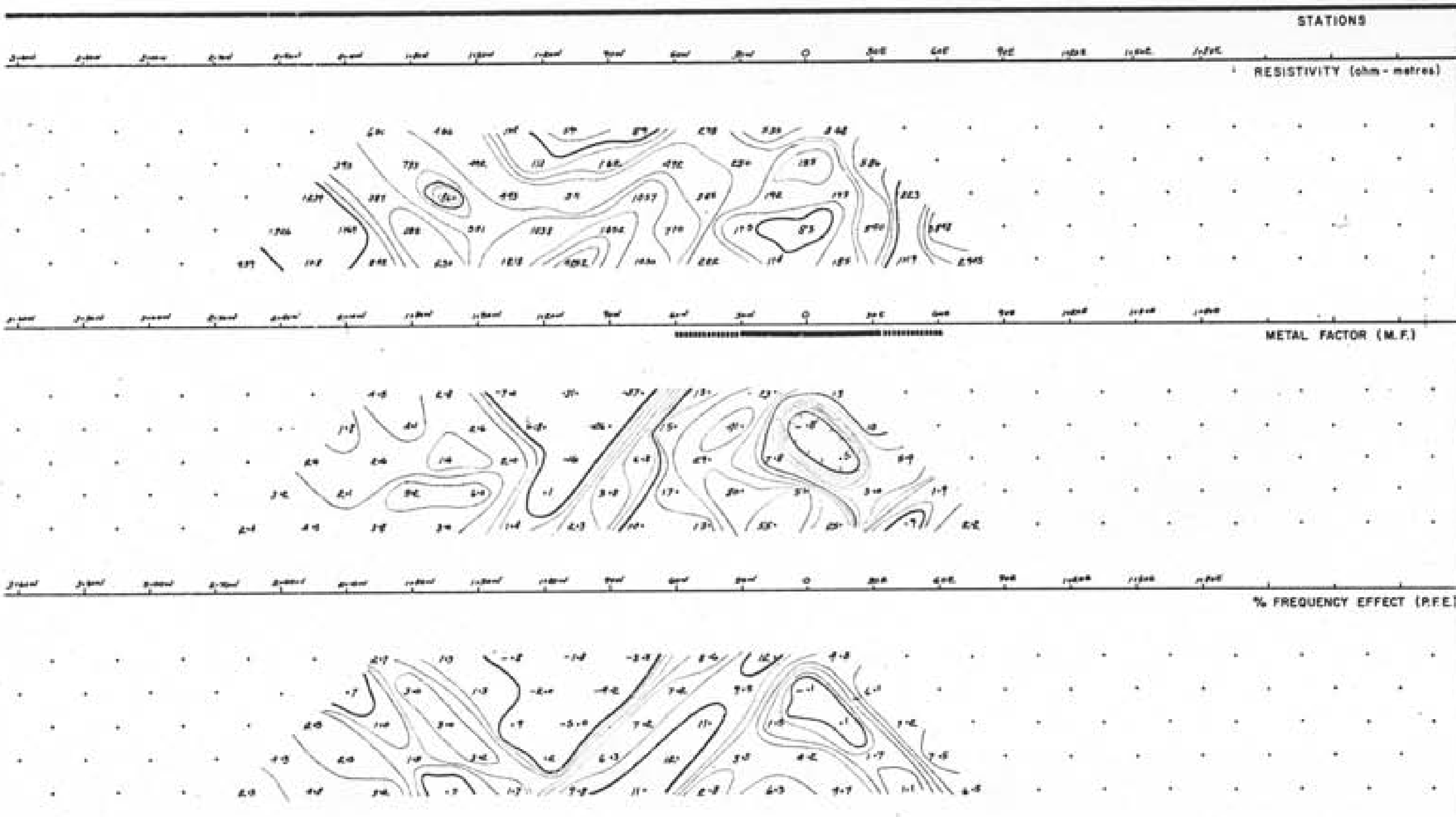
DATA BY: J. MacNeil

REMARKS: Scale reduced

LOGARITHMIC CONTOURS - 1·0, 1·5, 2, 3, 5, 7·5

I.P. ANOMALY - STRONG / MODERATE / WEAK

DWG. No. 27



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

Stikine Moly PROJECT

LINE 85

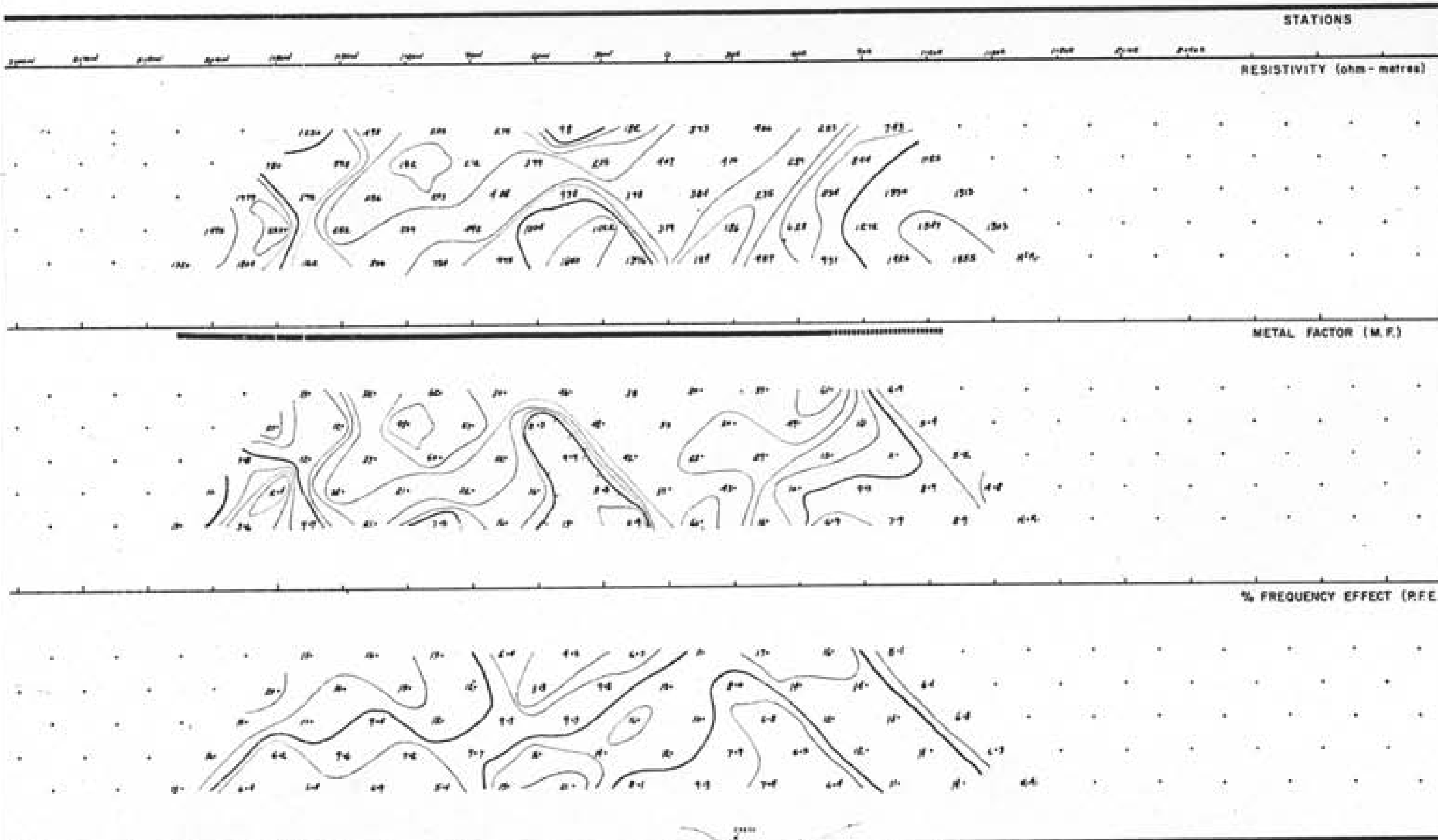
LEGEND

ARRAY: DIPOLE - DIPOLE
UNIT: P660
FREQUENCIES: 0.3+4HZ
SCALE: 2CM = 50M
DATE: Aug 2 1979
DATA BY: J. MacNeil
REMARKS: Scale reduced

LOGARITHMIC CONTOURS - 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 28



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

Stikine Moly PROJECT

LINE 9S

LEGEND

ARRAY: DIPOLE-DIPOLE

UNIT: P660

FREQUENCIES: 0.3/5 HZ.

SCALE: 2 CM : 50M

DATE: Aug 1 1979

DATA BY: J. Mac Neil

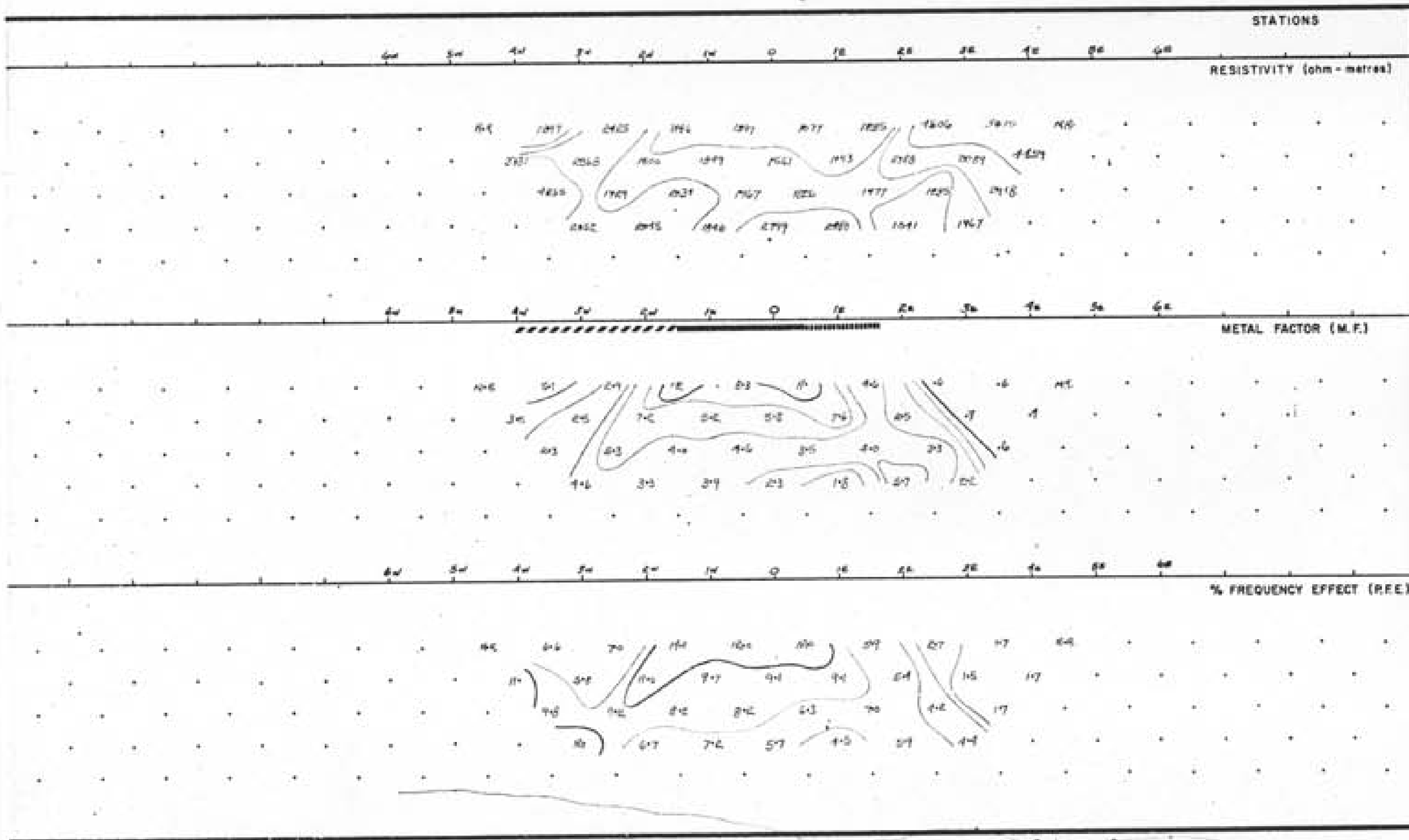
REMARKS: Scale reduced

0 30m 60m

LOGARITHMIC CONTOURS = 1.0, 1.5, 2, 3, 5, 7.5

I.P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 29



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

Stikine Moly PROJECT

LINE 10S

LEGEND

ARRAY : DIPOLE - DIPOLE

UNIT : P660

FREQUENCIES: [illegible]

SCALE: [illegible]

DATE: July 20 1979

DATA BY: J. MacNeil

REMARKS: Scale reduced

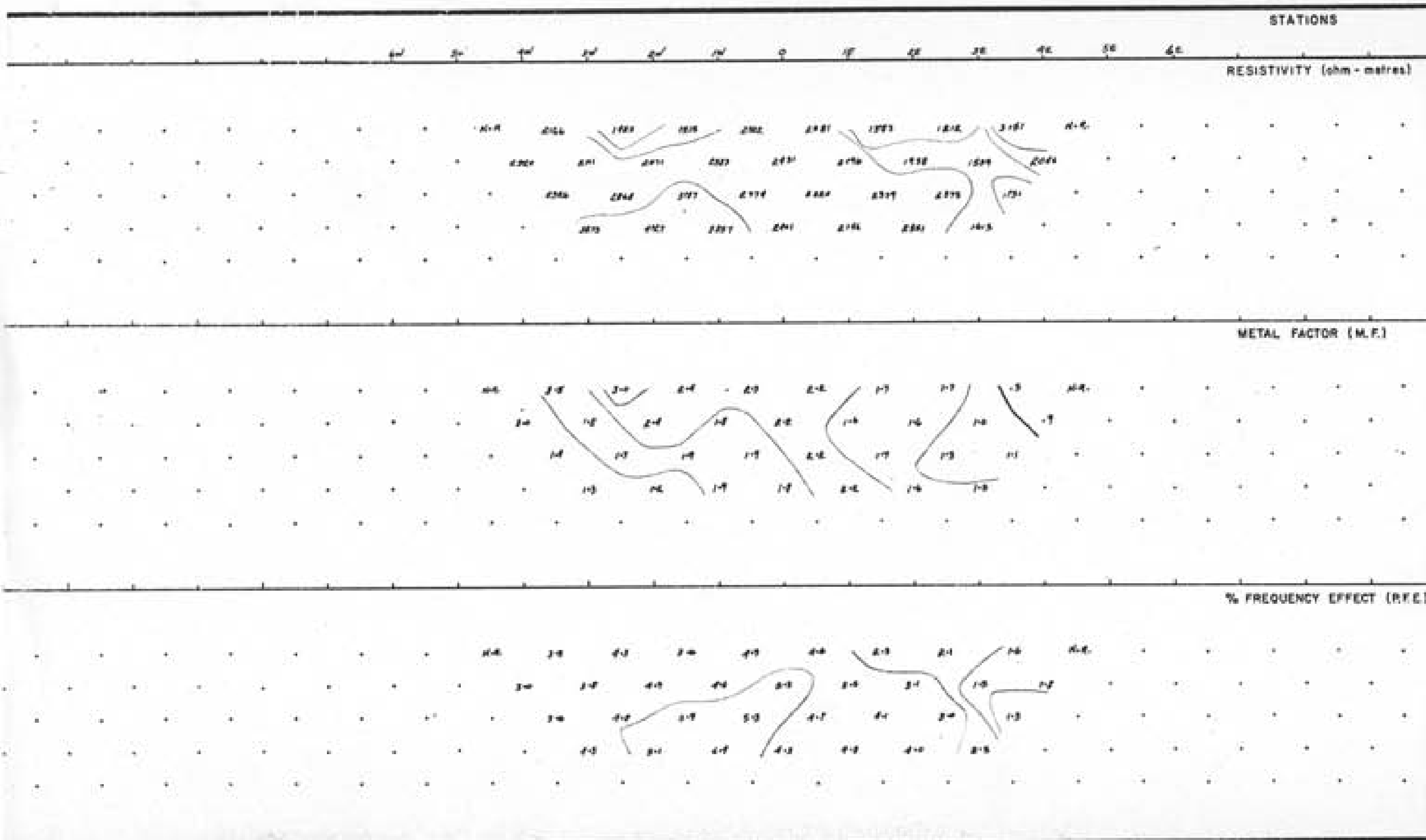
LOGARITHMIC CONTOURS = 1·0, 1·5, 2, 3, 5, 7·5

I.P. ANOMALY - STRONG

MODERATE

WEAK

DWG. No. 30



FALCONBRIDGE NICKEL MINES LIMITED

INDUCED POLARIZATION SURVEY

Stikine Moly PROJECT

LINE 12S

LEGEND

ARRAY: DIPOLE - DIPOLE
UNIT: P660
FREQUENCIES: 0.3 + 5 HZ
SCALE: 1 CM : 100 M
DATE: Aug 1, 1979
DATA BY: J. MacNail
REMARKS: Scale reduced

LOGARITHMIC CONTOURS - 1·0, 1·5, 2, 3, 5, 7·5

I. P. ANOMALY - STRONG
MODERATE
WEAK

DWG. No. 31

HARVEY H. COHEN ENGINEERING LTD.
CONSULTING ENGINEERS

TELEPHONE: BUS.: 684-6711
RES.: 266-8169

1264 WEST PENDER STREET
VANCOUVER 1, B. C.

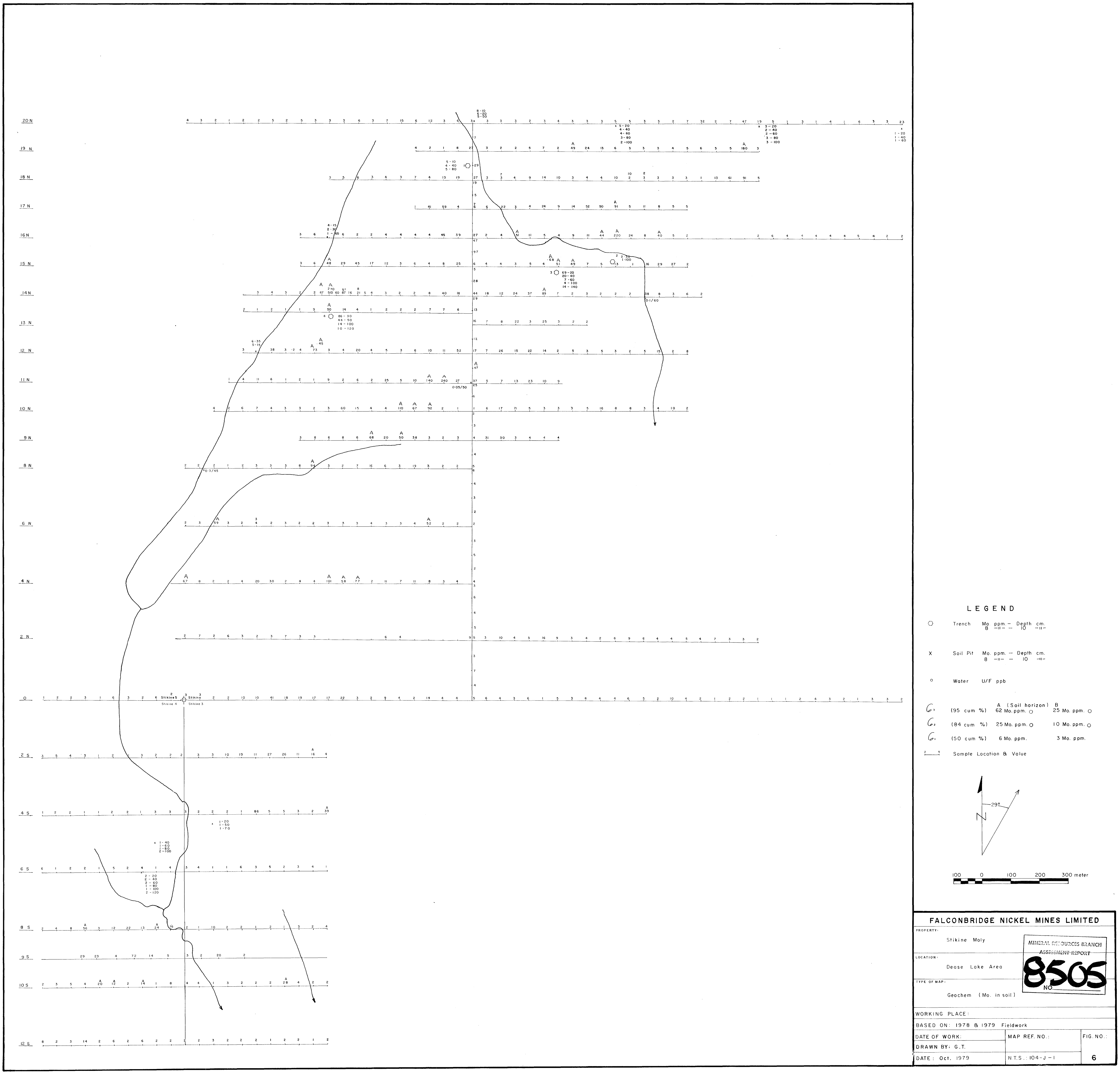
October 29, 1980

Lodestar Energy Inc.
470 Granville Street,
Vancouver, B.C.

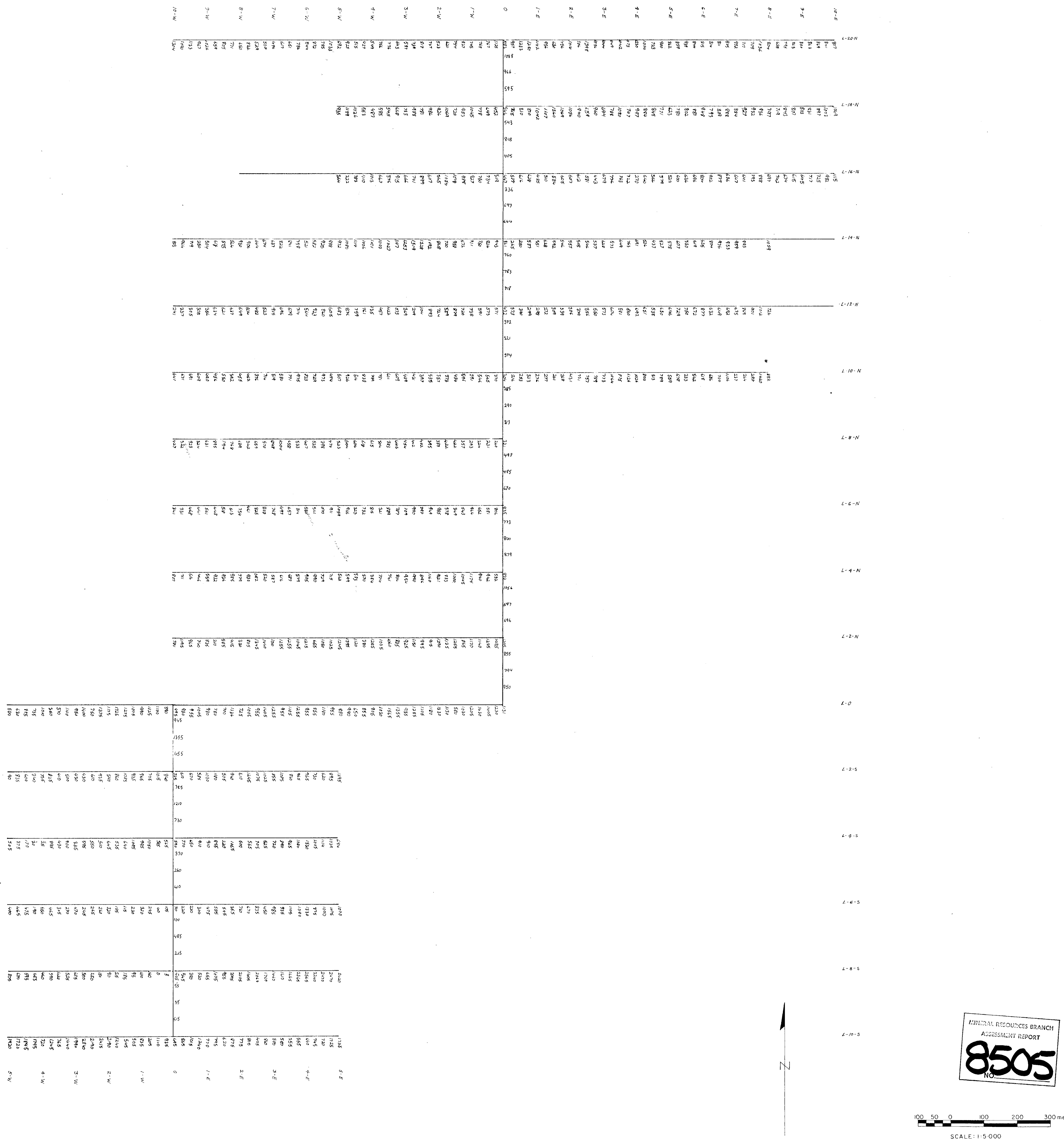
To conducting a combin ed airborne geophysical survey
Nicol 1 (9 units)
Sugarloaf Mountain Area, B.C.
Nicola Mining Division

Preparation of flight lines and grid pattern
Positioning of aircraft and base expense
Mobilization of crew
Aircraft and instrumentation
Conducting of survey: Magnetometer, Electromagnetic
Compilation of data
Data recovery and computer processing
Computer plotting and mapping
Interpretation and reports

Total Cost Nicola 1 $2500.00



20 N
19 N
18 N
17 N
16N
15 N
14N
13 N
12 N
11 N
10 N
9 N
8 N
6 N
4 N
2 N
0
2 S
4 S
6 S
8 S
9 S
10 S
12 S
Stikine 5
Stikine 4
Stikine 3
LEGEND
Trench Mo. ppm. – Depth cm.
8 –"– – 10 –"–
Soil Pit Mo. ppm. – Depth cm.
8 –"– – 10 –"–
Water U/F ppb
A (Soil horizon) B
(95 cum %) 62 Mo. ppm. 25 Mo. ppm.
(84 cum %) 25 Mo. ppm. 10 Mo. ppm.
(50 cum %) 6 Mo. ppm. 3 Mo. ppm.
Sample Location & Value
29°
N
100 0 100 200 300 meter
FALCONBRIDGE NICKEL MINES LIMITED
PROPERTY:
Stikine Moly
LOCATION:
Dease Lake Area
TYPE OF MAP:
Geochem (Mo. in soil)
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
8505
NO.
WORKING PLACE:
BASED ON: 1978 & 1979 Fieldwork
DATE OF WORK:
MAP REF. NO.:
FIG. NO.:
DRAWN BY: G.T.
DATE: Oct. 1979
N.T.S.: 104-J-1
6



Contour interval 200 gammas (Base data 58000 gammas)
Inst. Barringer Pronton Magnetometer
Model G.M. 122 Ser. No. S/N 6282 → Lines 0 to 20N
Scintrex Flux Gate M.F.1 Ser. No. 905-454 → Lines 2 to 10S

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY: Stikine Moly

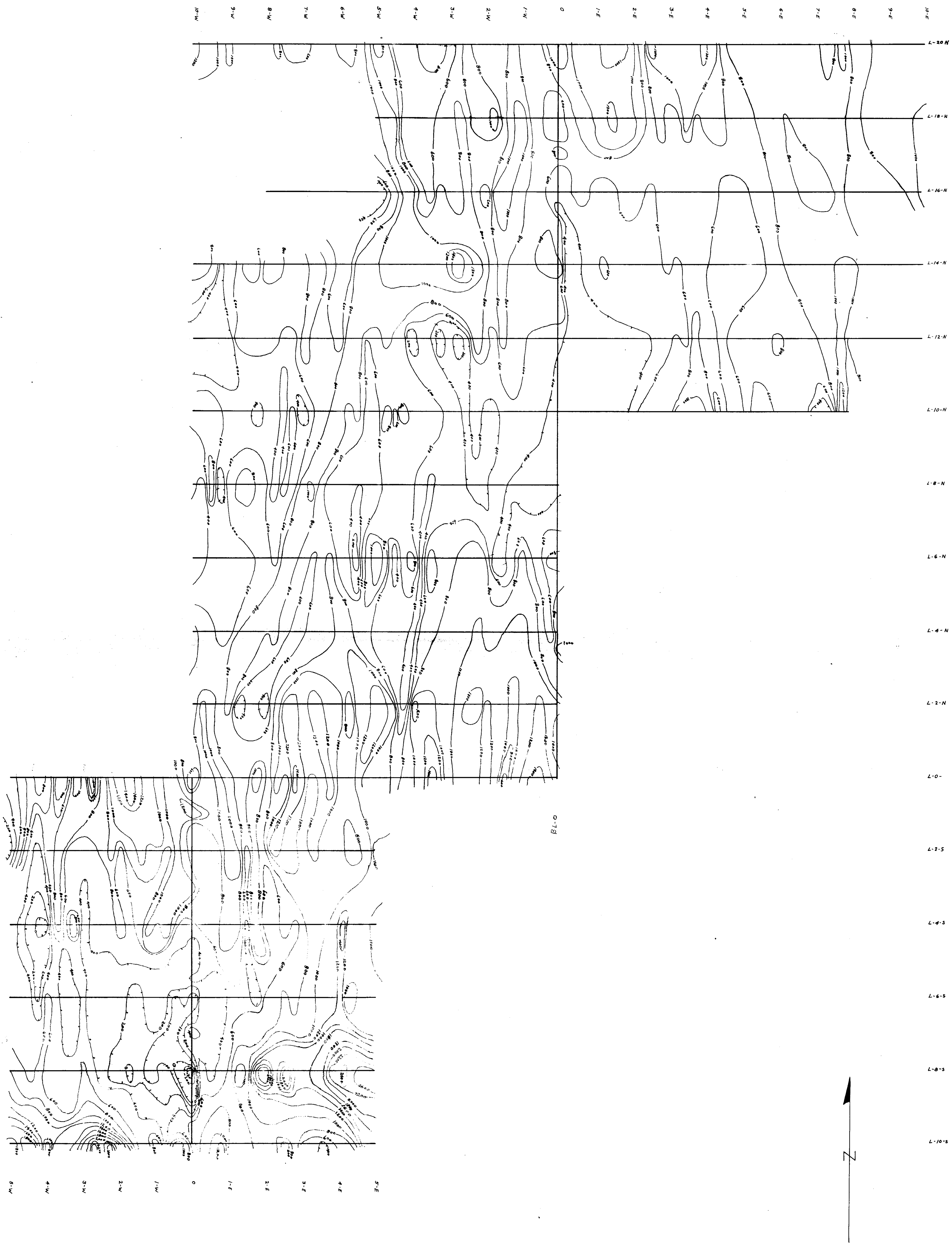
LOCATION: Dease Lake Area

TYPE OF MAP: Geophysical (Magnetometer Survey)

WORKING PLACE:

BASED ON: Fieldwork by S. Presunka

DATE OF WORK: July 1979	MAP REF. NO.:	FIG. NO.:
DRAWN BY: S.P.	Plan No. 4A	8
DATE: Nov. 1979	N.T.S. NO.: 104-J-1	



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 8505

100 50 0 100 200 300 meter

SCALE: 1:5000

Contour interval 200 gammas (Base data 58000 gammas)
Inst. Barringer Pronton Magnetometer Model G.M.122 Ser. No. S/N 6282 → Lines 0 to 20N
Scintrex Flux Gate M.F.I. Ser. No. 905-454 → Lines 2 to 10S

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY: Stikine Moly

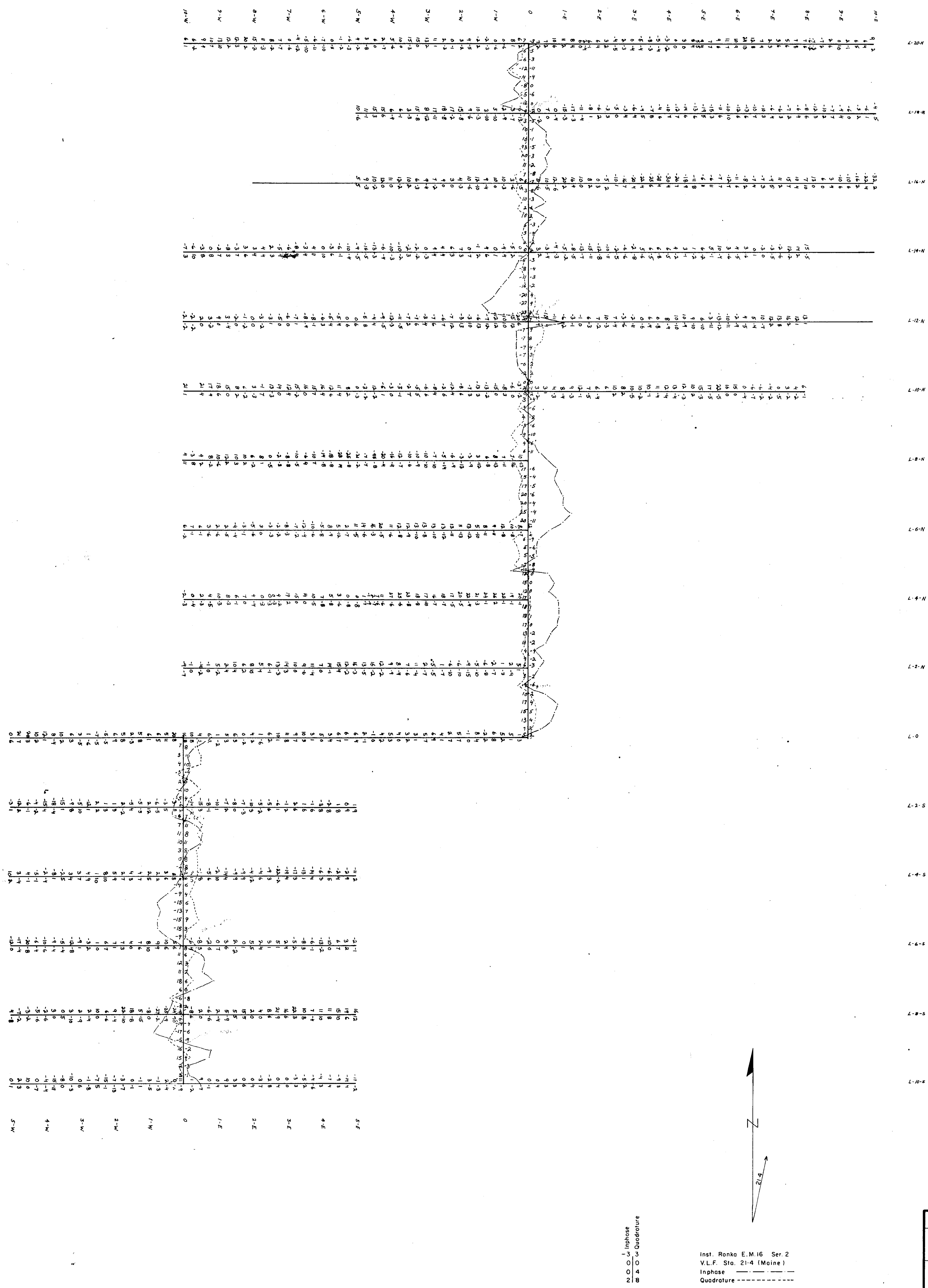
LOCATION: Dease Lake Area

TYPE OF MAP: Geophysical (Magnetometer Survey Contoured data)

WORKING PLACE:

BASED ON: Fieldwork by S. Presunka

DATE OF WORK: July 1979	MAP REF. NO.:	FIG. NO.:
DRAWN BY:	Plan No. 4	
DATE: Nov. 1979	N.T.S. NO.: 104-J-1	9

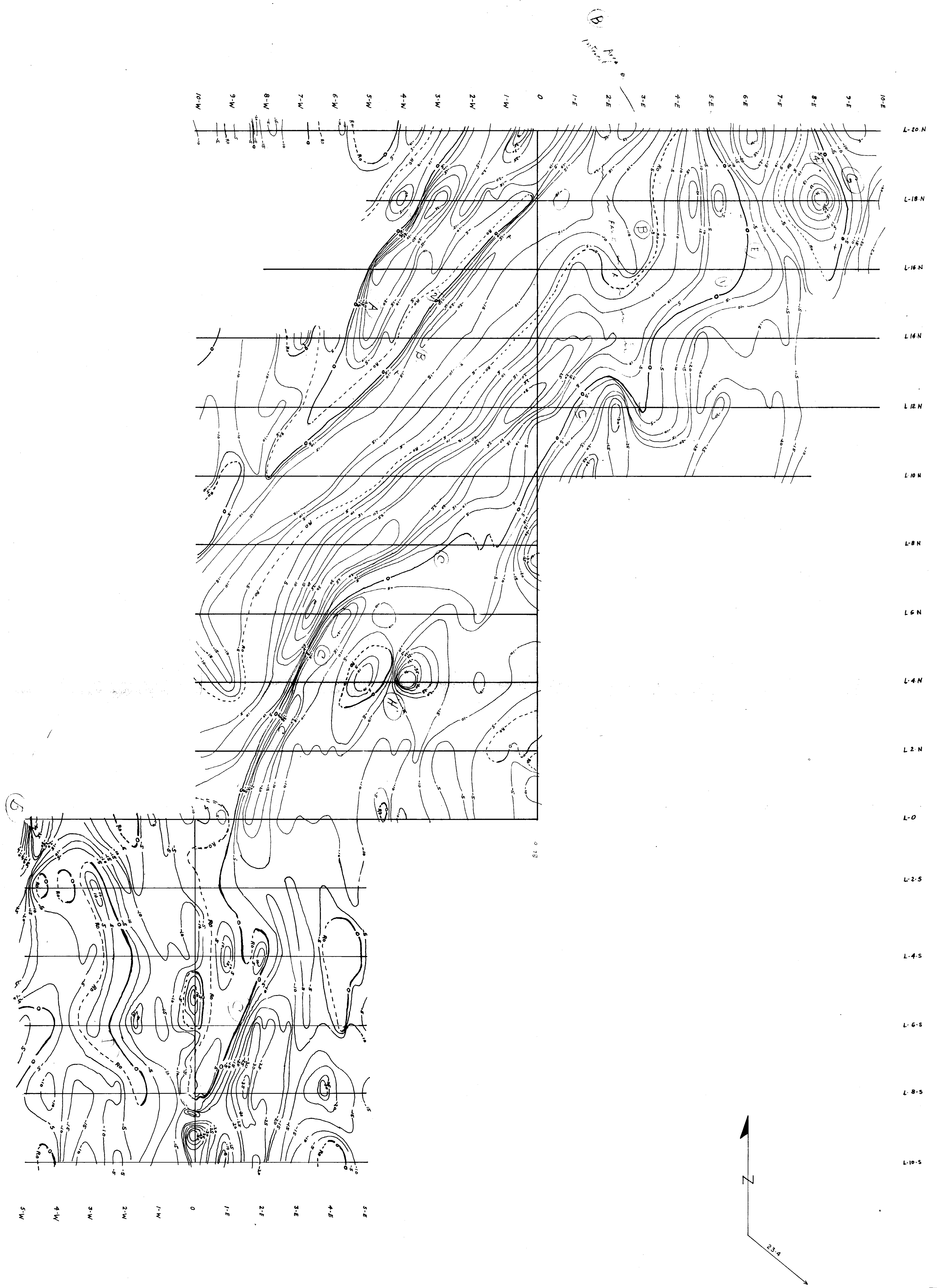


Inst. Ronka E.M.16 Ser. 2
V.L.F. Sta. 21·4 (Maine)
Inphase —·—·—·—
Quadrature - - - - - - - - - - -

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
8505
NO.

100 50 0 100 200 300 meter
SCALE: 1:5 000

FALCONBRIDGE NICKEL MINES LIMITED		
PROPERTY: Stikine Moly		
LOCATION: Dease Lake Area		
TYPE OF MAP: Electromagnetic Survey (E.M.16 Profiled data)		
WORKING PLACE:		
BASED ON: Fieldwork by S. Presunko		
DATE OF WORK: July 1979	MAP REF. NO.:	FIG. NO.:
DRAWN BY: S.P.	Plan No. 3 A	
DATE: July 1979	N.T.S. NO.: 104-J-1	10

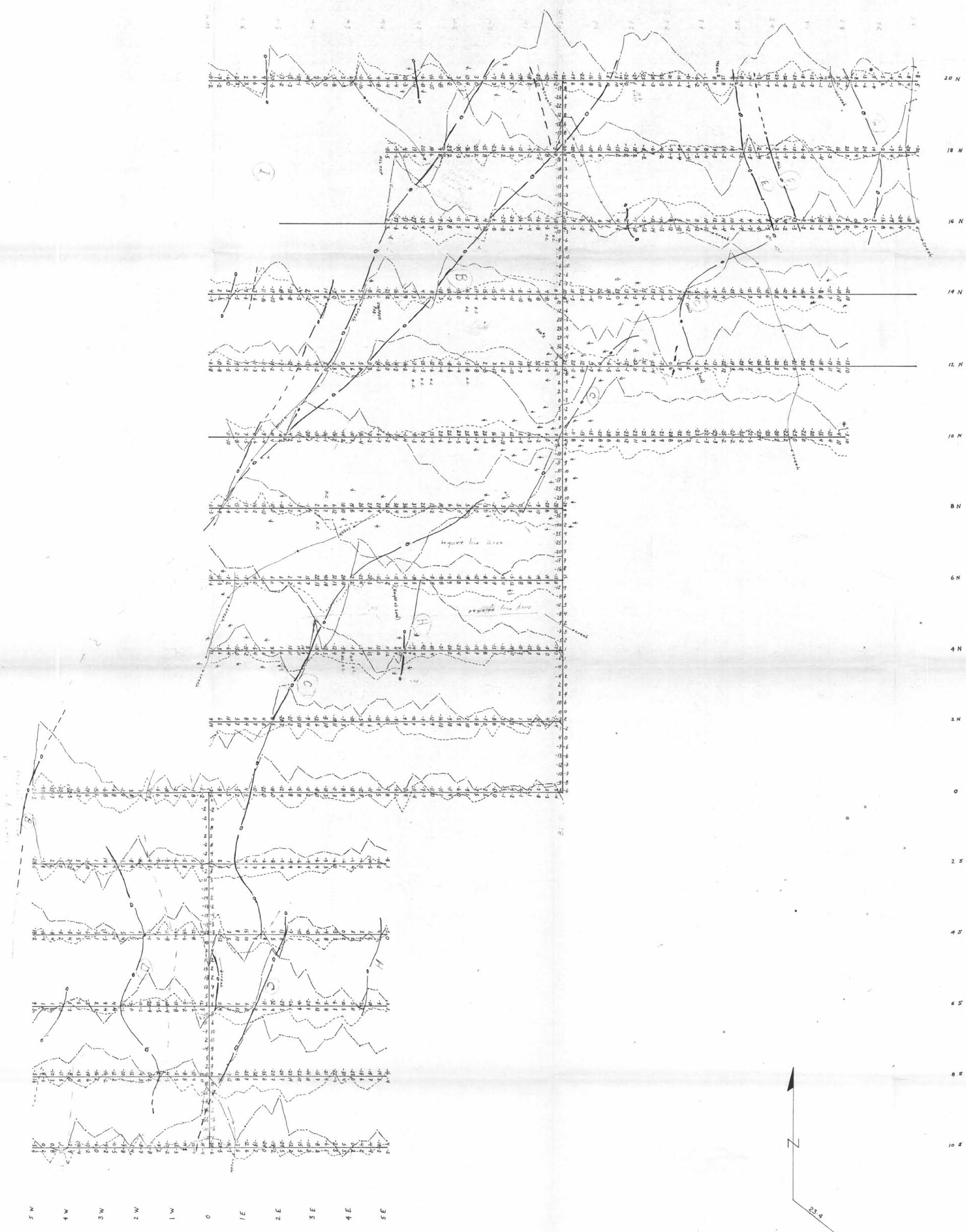


MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
8505
NO.

100 50 0 100 200 300 meter
SCALE: 1:5000

Inst. Ronka E.M.16 Ser. No. 2
V.L.F. Sta. 23.4 (Hawaii)
Conductors ——0——
Reverse Cross-Over---RO----

FALCONBRIDGE NICKEL MINES LIMITED		
PROPERTY: Stikine Moly		
LOCATION: Dease Lake Area		
TYPE OF MAP: Electromagnetic Survey (E.M.16 Contoured data)		
WORKING PLACE:		
BASED ON: Fieldwork by S. Presunka		
DATE OF WORK: July 1979	MAP REF. NO.:	FIG. NO.:
DRAWN BY: S.P.		
DATE: July 1979	N.T.S.: 104-J-1	11.



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

NO. 8505

100 50 0 100 200 300 meter

SCALE: 1:5000

Inphase	Quadrature
-6	-4
-4	-2
0	-2
4	2
5	2

Inst. Ronka E.M.16 Ser. No. 2
V.L.F. Sta. 23.4 (Hawaii)
Inphase Profile —·—·—
Quadrature Profile - - - - - -

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY: Stikine Moly

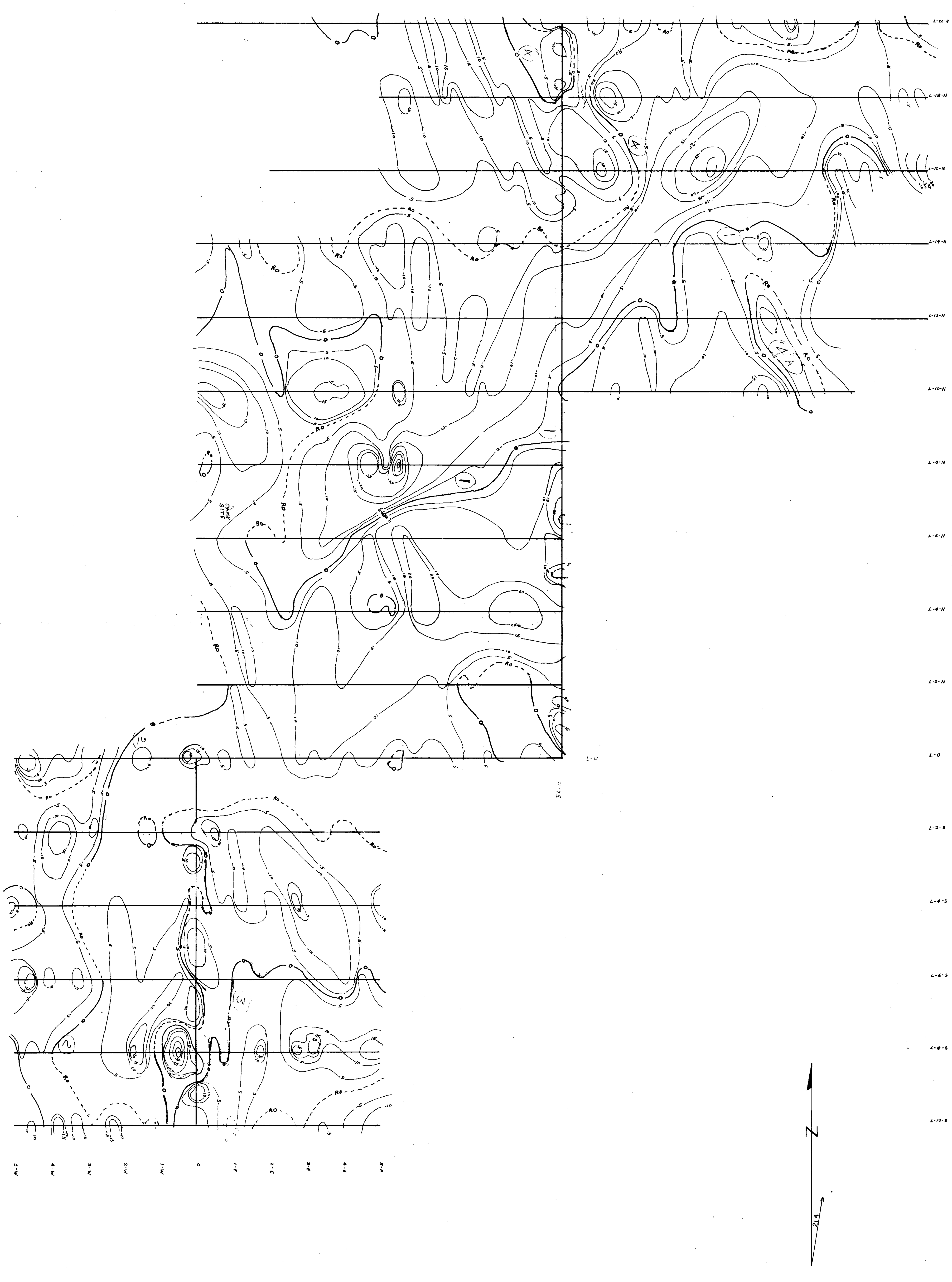
LOCATION: Dease Lake Area

TYPE OF MAP: Electromagnetic Survey (E.M.16 Profiled data)

WORKING PLACE:

BASED ON: Fieldwork by S. Presunka

DATE OF WORK: July 1979	MAP REF. NO.:	FIG. NO.:
DRAWN BY: S.P.		
DATE: July 1979	N.T.S. NO.: 104-J-1	12

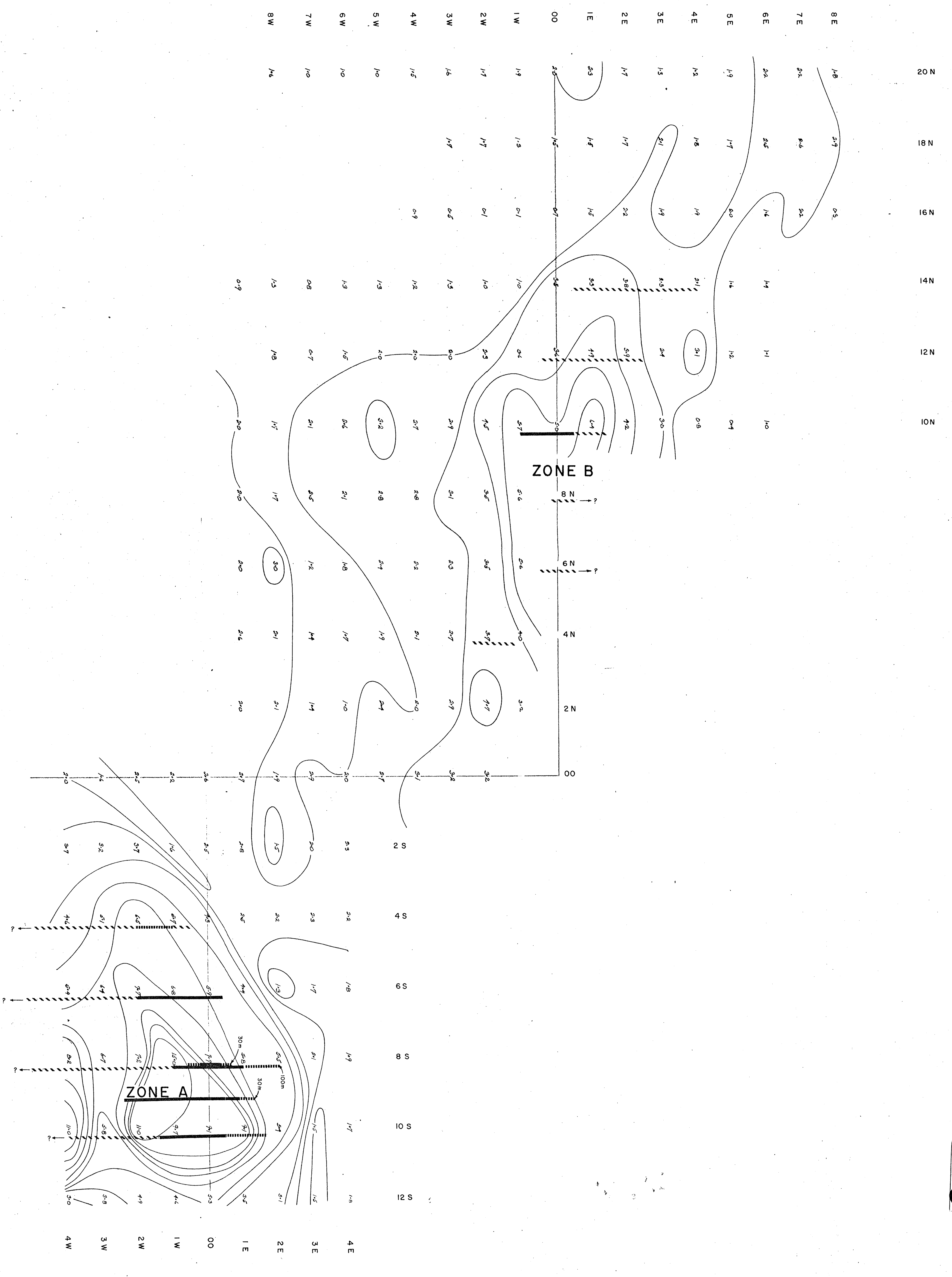


100 50 0 100 200 300 meter

SCALE: 1:5·000

Inst. Ronka E.M.16 Ser. No. 2
V.L.F. Sta. 21·4 (Seattle)
Conductors ——O——
Reverse Cross-Over ---RO---

FALCONBRIDGE NICKEL MINES LIMITED		
PROPERTY: Stikine Moly		
LOCATION: Dease Lake Area		
TYPE OF MAP: Electromagnetic Survey (E.M.16 Contoured data)		
WORKING PLACE:		
BASED ON: Fieldwork by S. Presunka		
DATE OF WORK: July 1979	MAP REF. NO.:	FIG. NO.:
DRAWN BY: S. P.		
DATE: July 1979	N.T.S.: 104-J-1	13



LEGEND

- STRONG
- MODERATE
- WEAK

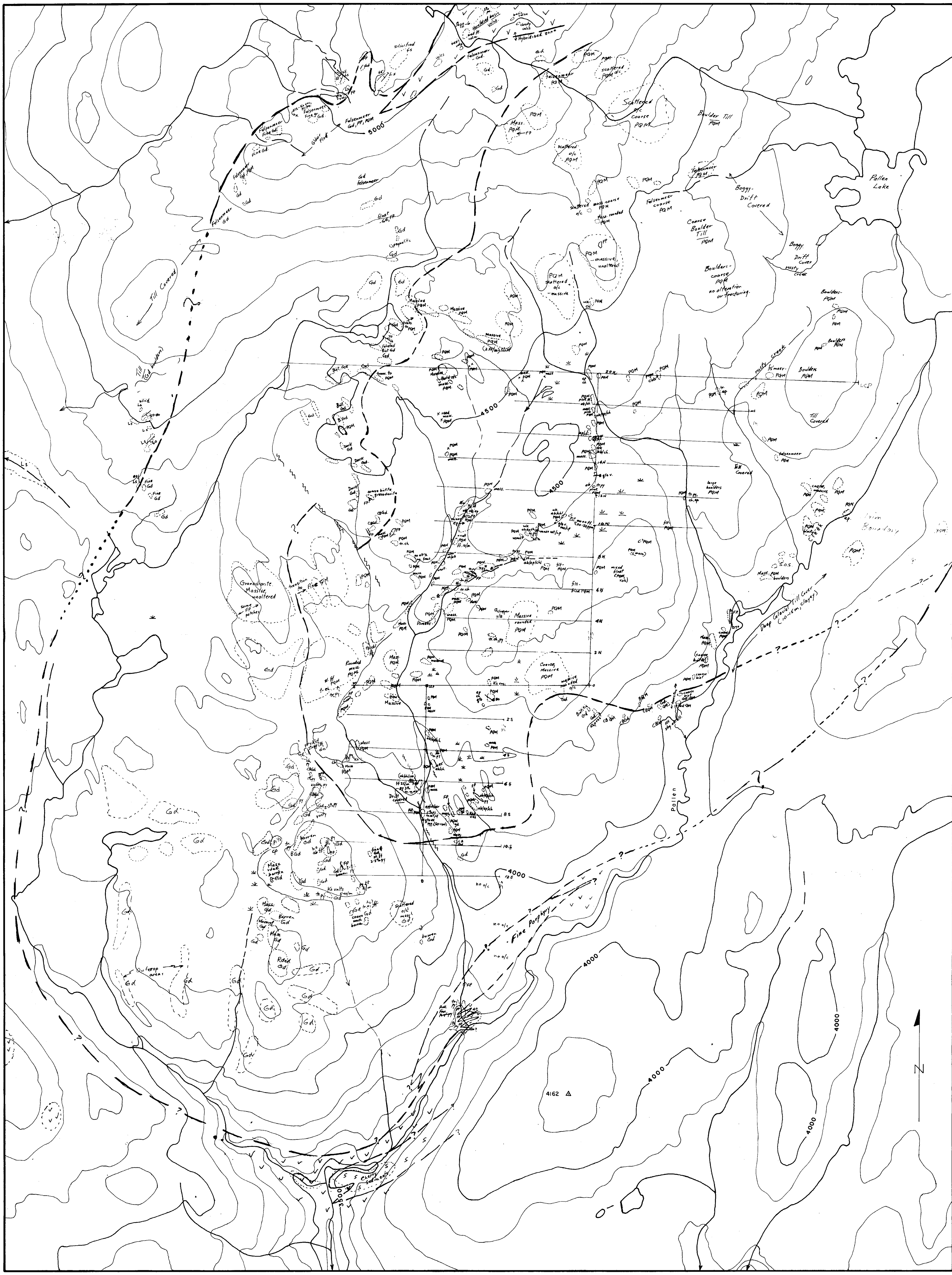
FALCONBRIDGE NICKEL MINES LIMITED

Property: STIKING MOLY PROPERTY
DEASE LAKE AREA B.C.

Plan: IP ANOMALY PLAN
with
contoured frequency effect (n = 2)

Scale: 0 500 1000 Ft. / 0 100 200 300 m

Date: Sept. 1980 | By: P.A.S. | N.T.S. Ref.: 104-J-1 | Fig. 18



LEGEND

Intrusive Rocks (?Jurassic - 155 my.)

FP	Fine Porphyry (dykes, some xenoliths)
PQM	Porphyritic Quartz Monzonite (core phase of Pallen Cr. pluton)
Gd	Granodiorite to diorite (marginal phase)

Upper Triassic

Ls	Limestone

STUHINI GROUP:

Vv	Volcanics - dark green, hornfelsed basic flows, tuffs, breccia.
Ss	Sediments - cherty quartzites, argillite bands.

Symbols:

o/c	Outcrop area	35	Strike and dip of sediments
	Geologic contact		Swamp
	Fault		
py	pyrite	biot	biotite
cp	chalcopyrite	ser	sericite
mo	molybdenite	ff	fractures
ks	secondary k-feldspar	vv, vns.	veins
ab	secondary albite	qtz	quartz
ep	epidote	flt	float
ch	chlorite	fsmeer	felsenmeer

200 0 200 400 600 Meter

SCALE: 1:10 000

N

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY: Stikine Moly

LOCATION: Dease Lake Area

TYPE OF MAP: Geological

MINERAL RESOURCES BRANCH ASSESSMENT REPORT NO. 8505

WORKING PLACE:

BASED ON: Fieldwork by C.L.

DATE OF WORK: July 1979	MAP REF. NO.:	FIG. NO.:
DRAWN BY: C.L.		
DATE: July 1979	N.T.S. NO.: 104-J-1	21