GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL REPORT ON THE DIAKOW - KENNEDY OPTION (PN 049)

(August, Ben, CD, ZIP 2-5 and Zip 8 Mineral Claims) Lucky Group

Latitude 59°31'   Longitude 131°36'

NTS 104 O/5E

Vancouver, B. C.
December, 1980

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J. Wilson
I. L. Elliott

ABSTRACT

The Diakow - Kennedy Option (P.N. 049) was taken to acquire the area adjoining Falconbridge's Zip 1 claim which was staked to cover an anomalous silver silt sample shown on the government geochemical release of June 8, 1979. The claim area is located approximately 1260 km (780 miles) northwest of Vancouver near the B.C. - Yukon border. Grab samples of mineralized boulders returned assays of 0.06 to 60.0 oz/ton silver.A geological (regional and detail), geochemical (soil) and geophysical (VLF, mag. SP) survey was conducted to define the area(s) of mineralization.

The claim areas lie within the Kedahda formation of Carboniferous to Permian age. The sediments (chert, argillite, siltstone, wackes) are hornfelsed to varying degrees on a regional scale; a possible result of intrusion of the Christmas Creek batholith which outcrops to the west and south of the property. The cherty sediments have a characteristic banded or laminated appearance and contain scattered grains of pyrite. What appear to be gossan zones, are argillite beds up to ten metres across containing disseminated pyrite. A narrow, equigranular non-mineralized granite dyke intrudes the sediments in the north cirque. Quartz veins and gashes containing a few specks of pyrite occur throughout the sediments. Average strike of the sediments is 140^{o} dipping 55^{o} west. The sediments show chevron folding on outcrop scale and are intensely faulted throughout. A major north-westerly trending lineament occurs approximately in the middle of the property.

Mineralized float (pyrite, arsenopyrite, boulangerite) occurs in both the north and south cirques. A narrow (30 cm wide) quartz-pyrite-arsenopyrite-boulangerite vein approximately 150m. long is present in the south cirque. A similar vein, approximately 10 m. in length occurs in the north cirque associated with the granite dyke. Average strike and dip of vein is $140^{o}/25^{o}$ west. Chip samples taken

across the vein returned assays of 0.02 to 5.75 oz/ton silver. No other veins or areas of mineralization were found in either the detail or regional areas of mapping.

The geophysical and geochemical anomalies do not appear to correlate very well and the majority of these anomalies can be explained by observed lithology and mineralization.

The low silver values over the narrow vein and the absence of other veins does not warrant a drill program. It is therefore recommended that no further work be undertaken and that the option be terminated.

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Diakow - Kennedy Option (PN 049)

(August, Ben, CD, Zip 2-6, Zip 8 Mineral Claims - Lucky Group)

1. INTRODUCTION

1.1 Location (Figure 1): N.T.S. 104O/5E
Latitude 59°21' Longitude 131°36'
353500E 6582200N
Atlin Mining Division
180 km. S.W. of Watson Lake
1260 km. N.W. of Vancouver

1.2 Metals: Ag, minor Cu, Pb, Zn.

1.3 Claims (Figure 2):

Claim	
August (12 units)	
Ben (4 units)	
Cd (8 units)	
Zip 2 (6 units)	
Zip 3 (8 units)	Lucky Group
Zip 4(8 units)	(83 units)
Zip 5 (12 units)	
Zip 6 (16 units)	
Zip 8 (9 units)	

Geochemistry/ Geophysical assessment report submitted October, 1980
Claims in good standing to 1983.

1.4 Access:
a) helicopter from Watson Lake (1¼ hours) or Dease Lake (1 hour)
b) float plane to Aconitum Lake, 4 miles north of the claims
c) trail from Alaska Hwy (∿80 km.)

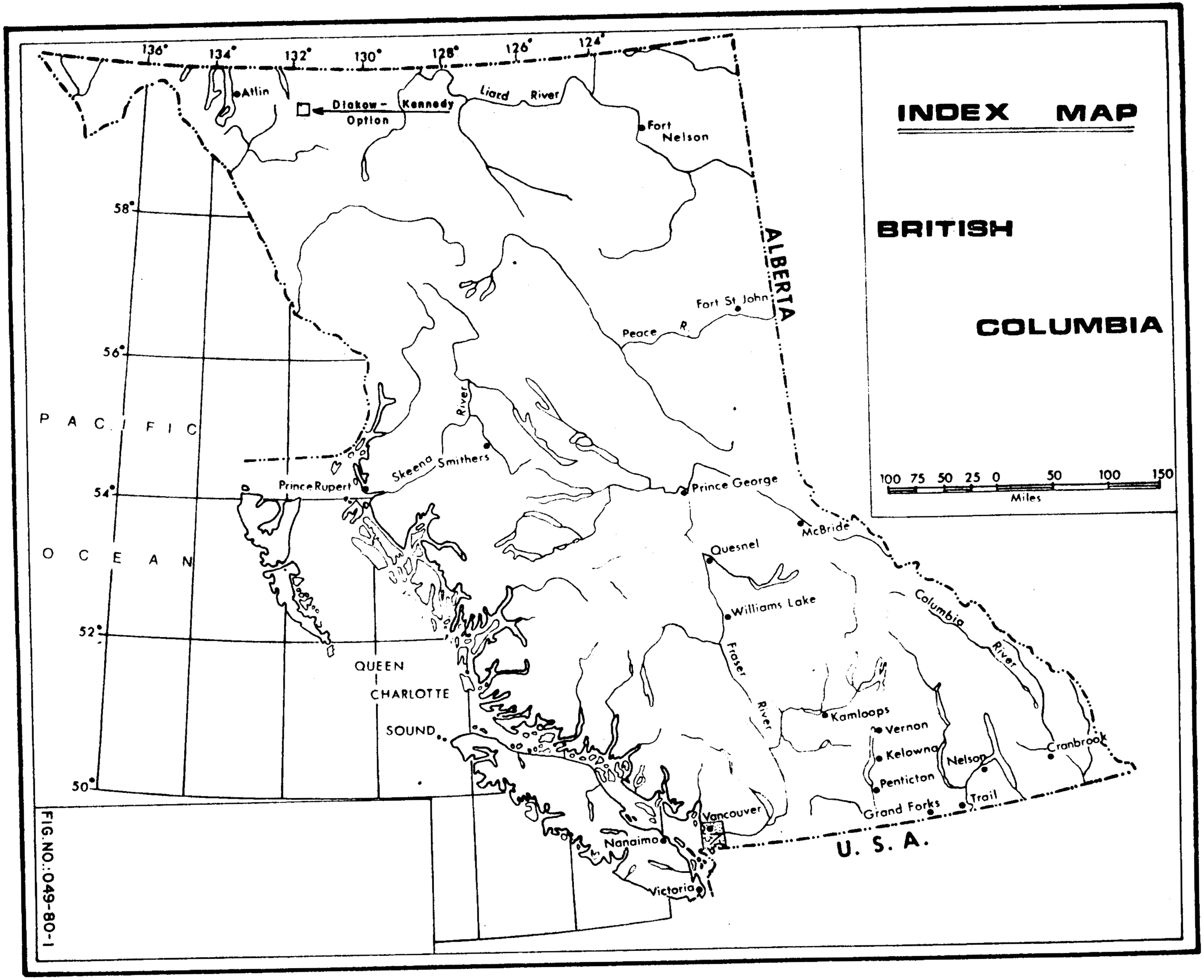
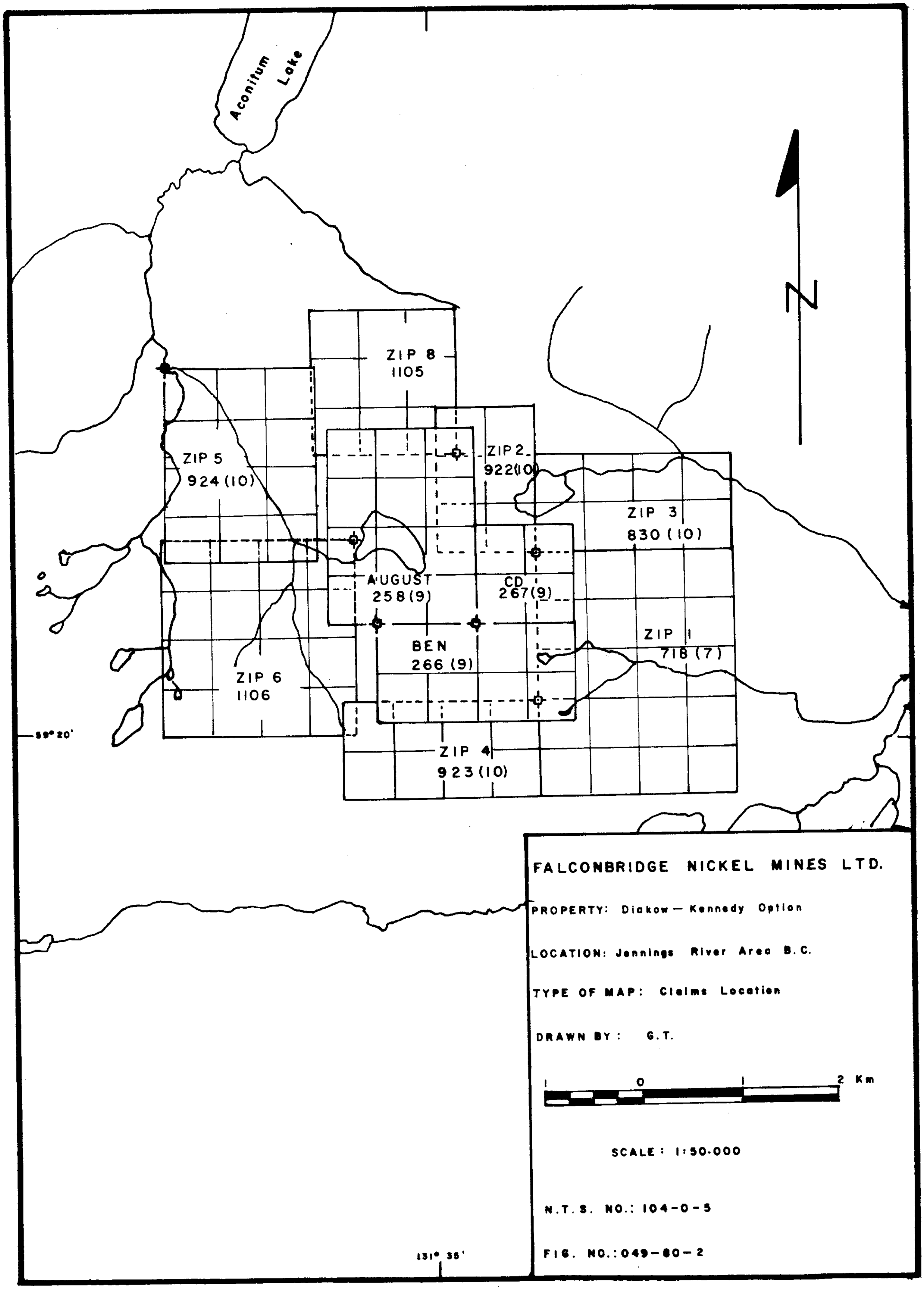


FIG. NO.: 049-80-1


Aconitum Lake
N
ZIP 8
1105
ZIP 5
924 (10)
ZIP 2
922(10)
ZIP 3
830 (10)
AUGUST
258 (9)
CD
267(9)
ZIP 1
718 (7)
BEN
266 (9)
ZIP 6
1106
ZIP 4
923 (10)
59° 20'
131° 35'
FALCONBRIDGE NICKEL MINES LTD.
PROPERTY: Diakow — Kennedy Option
LOCATION: Jennings River Area B.C.
TYPE OF MAP: Claims Location
DRAWN BY: G.T.
1 0 1 2 Km
SCALE: 1:50.000
N.T.S. NO.: 104-0-5
FIG. NO.: 049-80-2

1.5 Topography:

The claims occur in the Atsutla Range immediately above timberline in an area of steep cirques and hills. Elevations on the property range from 1530 to 1875 metres (5000 to 6200 feet). Glacial erratics and moraines occupy the cirque and valleys. Glacial deposits contain subrounded prophyritic granite, granodiorite, vesicular basalt (Tertiary) and other volcanic erratics, a result of continential glaciation. Subangular cobbles of locally derived sedimentary rocks were deposited in-situ by the alpine glaciers. Outcrop is generally limited to the cirques and is largely inaccessible. Total accessible outcrop is approximately 15% of the map-area. Felsenmeer occur along the ridge tops. A small glacier occupies approximately 25% of the northern cirque.

A base map of scale 1:2000 was made by Pacific Survey for the detail mapping. Regional mapping is plotted on 1:10,000 and geophysics and geochemistry on 1:5000 scale. The location of the grid and claims are shown in Figure 3.

In this report, the area has been divided into two cirque areas, North Cirque, Figure 4 , and the South Cirque, Figure 5.

1.6 History:

The Zip 1 claim was staked in 1979 to cover an anomalous silver silt sample shown on the government geochemical release, June 8, 1979. Further staking was carried out around the August, Ben and CD claims owned by B. Kennedy and S. Diakow. An option was taken to acquire the latter claims. The Zip 6 and 8 claims were staked this year to cover possible extensions of a major lineament.

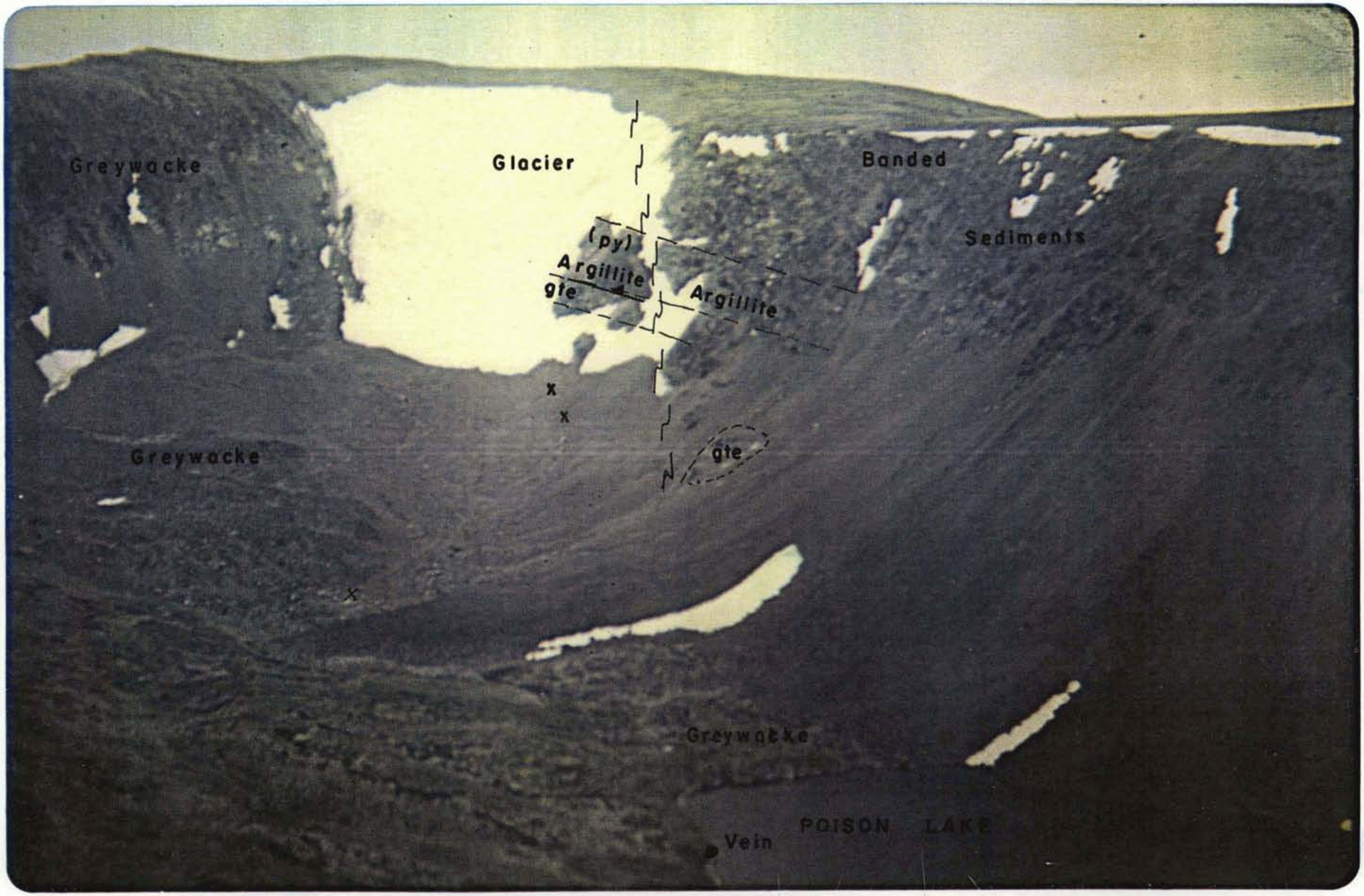


Figure 4: North Cirque

gte - granite
— - Mineralized Vein
▲ - Packsack Hole
x - Mineralized Boulders

Figure 5: South Cirque (Zip I claim in foreground) - Mineralized Vein.

A geological (reconnaissance and detail), geochemical (soil) and geophysical (VLF, Mag.) survey was conducted to define the area(s) of mineralization. Survey stations were established to facilitate the detail mapping.

A detail grid was picketed at 25 metre intervals with 100 metre line spacing along a mineralized lineament. Reconnaissance lines at 500 metre spacings were chained and flagged to cover possible geological contacts and lineaments. Additional detail areas were established to cover geophysical anomalies. A total of 58,575 metres comprises the detail grid and 33,200 metres the reconnaissance lines.

Since the type of mineralization appears to be narrow quartz sulphide veins, a detail geochemical soil and geophysical survey was necessary in order to define the areas of mineralization. The geophysical report was submitted by S. Presunka of Presunka Geophysical Exploration Ltd. who conducted the geophysical survey. Chip sampling was done over the exposed veins in the North and South cirques and a packsack hole was drilled to test the mineralization in the North cirque. Two area were trenched and four soil pits dug.

The total duration of this project was 54 field days (June 26 - August 18). Six days were lost due to bad weather that prevailed most of the summer.

2. GEOLOGY

The area was mapped on a regional and detail scale by J. Wilson and B.W. Downing respectively. The regional mapping was done without the aid of a helicopter, and hence the limits of the area were determined by topography and distance of traverses.

2.1 Regional Geology (J.Wilson)

The area of known mineralization, based on 1979 work, was investigated in detail by B. W. Downing (see sect. 2.2). Claims outside of the mineralized block were examined and mapped at a scale of 1 : 10,000 (see fig. GL-1). Any worthwhile sites discovered could have received detailed examination but no such areas were located.

Geological evaluation consisted of mapping lithologies, mineralization, structures (components of bedding, faults, fractures, schistosity, folds, and shears), quartz veins, and degrees of metamorphism. Special consideration was given to prospecting for mineralization in float or in place.

Air photographs were used for map control and data was plotted on an enlarged photograph 355 stations were established. Outcrops are restricted to less than 5% of the total area and are usually found in cirques, ridges, and creeks.

The mineralized zone (sect. 2.2) lies near the center of a 4 km wide section of Kedaha formation sedimentary rocks (Carboniferous(?) and Permian). The trend of mineralization, the strike of sedimentary bedding, and the trend of contacts with enclosing rock units are all similar (about 135°). Contacts between the sedimentary, volcanic, and intrusive rocks are not exposed.

Southwest of the sedimentary rocks lie quartz diorites, granodiorites and diorites of the Jurassic Christmas Creek Batholith. These rocks appear fresh and unmineralized although Dupont Exploration holds a nearby block of claims along the sedimentary contact. It is believed to be for tungsten but our quick examination failed to locate mineralization.

The Kedaha formation varies slightly from west to east both in lithology and metamorphic grade. In the west quartzites and wackes dominate. Argillites are less important. To the east wackes, argillites, and shale (sometimes graphitic shale) are abundant and chert is locally important. Minor intermediate to basic massive volcanics and quartz-eye porphyry dyke were also seen.

The grade of metamorphism is low throughout the property but is best developed near the western contact with the Christmas Creek Batholith and along the southernmost strip of outcrops on the slope overlooking the Twin Lake tributaries of Shonektaw Creek. This "higher" grade of metamorphism consists of moderate to strong biotite hornsfelsed wackes and recrystallized (?), silicified (?) sericitized quartzites. Towards the center of the Kedaha section metamorphism is weaker. Fresh rocks are most common in the northeast.

Northeast of the Kedaha rocks are Upper Triassic Shonektaw formation volcanics (augiteporphyry, basalts). G.S.C. mapping indicates a fault contact between the sediments and volcanics.

About 2 km northwest from Poison Lake is a small stock of unmineralized, crumbly, coarse grained biotite-hornblende granodiorite. According to the G.S.C. this is probably younger than the Christmas Creek Batholith. Shales close to the stock carry occasional disseminated crystals, possibly brucite.

No encouraging mineralization was found during the mapping. Traces of pyrite and pyrrhotite are disseminated in argillites and wackes throughout the property. Up to 1% disseminated pyrite and pyrrhotite occur in shales over 2 metres in the main creek lying between Poison Lake and the batholith. Strongly graphitic shales outcrop on a ridge immediatly south of Aconitum Lake.

Much structural data was recorded in the Kedaha formation that would have been useful if the project had continued. However, termination of the option has resulted in only minor analysis.

Threehundred twenty bedding attitudes were taken (stereonet Fig.6)

An average orientation is about $140^{\circ}/60^{\circ}$ W. The plot also indicates a range of bedding from 20° W. to 70° E. Similar attitudes were found in a series of small folds east of Poison Lake. Here, fold axes had 0° to 10° SE plunges and axial planes dipped west to 44° to 62°.

Numerous fault zones disrupt the Kedaha rocks. It is believed that the entire sedimentary package is a broad system of multiple near-bedding-plane faults. The Poison Lake fault/lineament is the most visible and perhaps the strongest part of this zone. Fault surfaces have a variety of orientations but the most common is about 140° strike and 60° W to 85° E dip, almost parallelling bedding. Usually the associated slickensides indicate a low angle direction of movement (plunging slickensides of 15° to 30°). Estimates of displacement are impossible due to the limited outcrop and bedding plane style of faulting.

Schistosities in shales parallel bedding attitudes.

Quartz veins (all unmineralized except for occasional very minor pyrite) are usually steep 70° to 90°, have a variety of strikes, and are ubiquitous. A concentration of quartz veins occurs in the northeast facing cirque north of Poison Lake. Barren quartz veins and weakly to moderately hornfelsed wackes are a common regional feature extending throughout the district.

552 fracture orientations were plotted (stereonet Fig. 7) and indicate a broad distribution of attitudes.

No thorough analysis of structural data was attempted due to cancellation of the project.

In conclusion, mapping outside of the "mineralized zone" failed to locate targets worthy of further work.

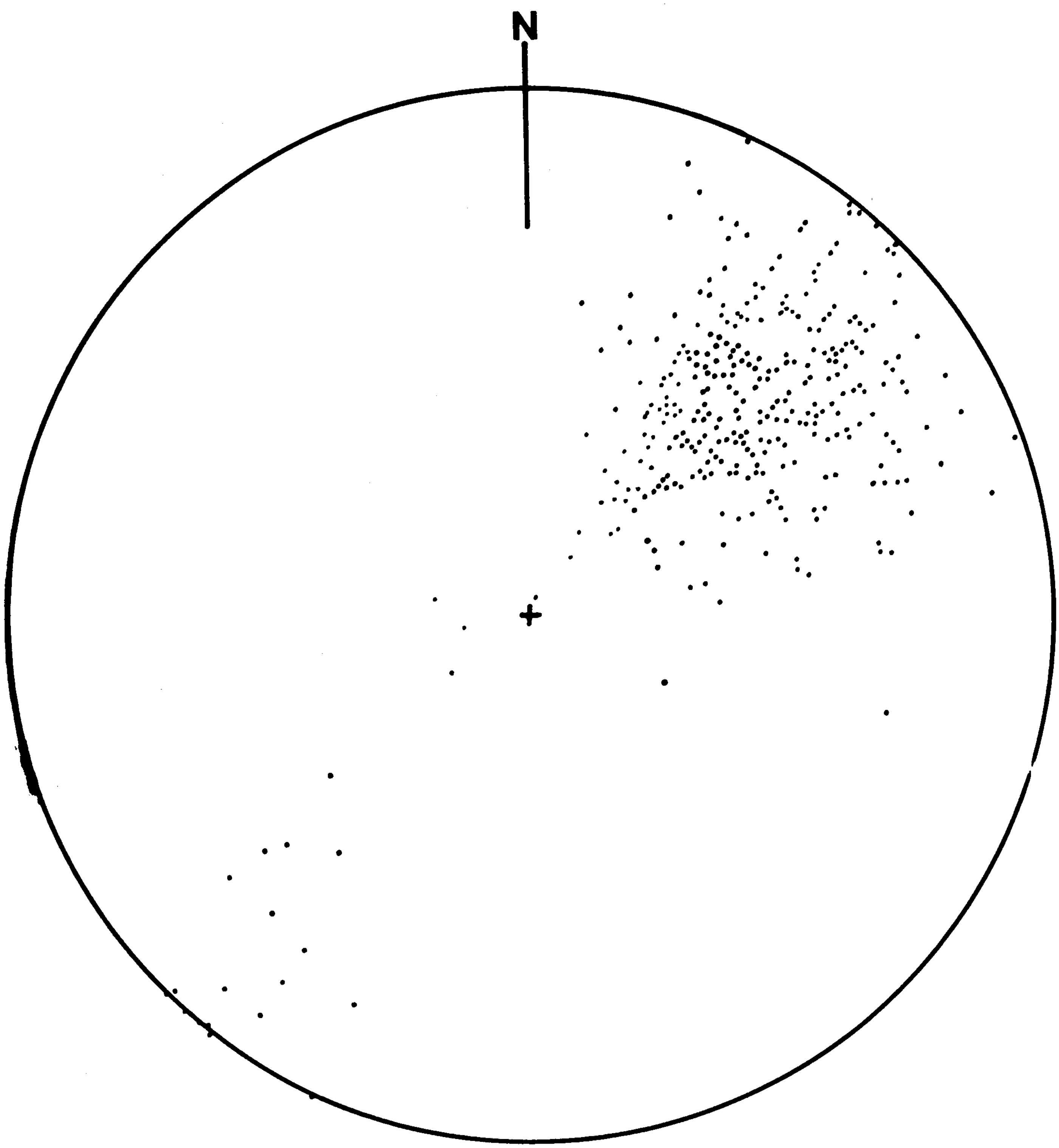


Figure 6 Poles to Bedding n=320

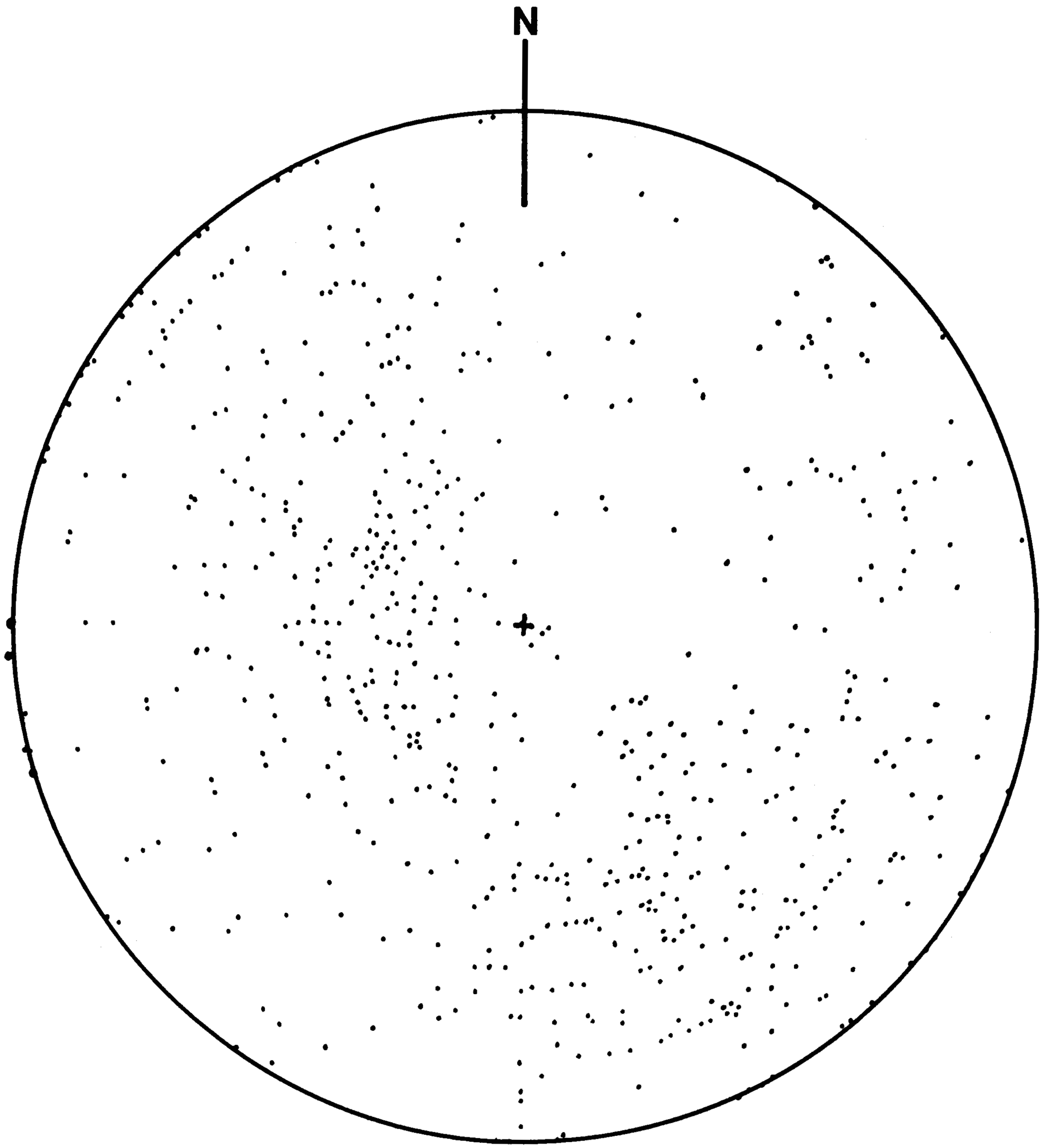


Figure 7 Poles to Fractures n=552

2.2 Detail Geology (B. Downing)

Detailed mapping using transit and stadia assisted by G. Thomassen was conducted on the Poison Lake linear structure (area of detail grid) along which the mineralization occurs. Outcrop is limited to the cirques, much of which is inaccessible. A total of 194 survey stations were taken for the purpose of mapping and plotted on Figure GL-2

Rock units mapped are argillite, chert, greywacke and granite. The cherty sediments have a characteristic banded or laminated texture, comprised of chert, argillite and siltstone (Figure 6). Scattered grains of pyrite occur throughout this unit. What appear to be gossan zones are argillite beds up to ten metres in width containing disseminated pyrite (up to 5%) and minor amount of graphite. These argillite beds occur within the cherty unit. The greywacke occurs below the cherty unit in the south cirque and consists of predominantly volcaniclastic fragments with minor amounts of argillite and other sediments. In places, the greywacke is conglomeratic. Because of deformation, the stratigraphy is virtually impossible to decipher. The sediments within the detail area are hornfelsed (biotite) to varying degrees (weak to strong) depending upon the original rock type. There is no apparent pattern to the degree of hornfelsing as the hornfels is regional due to the intrusion of the Christmas Creek batholith. There is also no strong hornfels zone around the granite dyke. An eight metre wide non-magnetic granite dyke intrudes along the greywacke-cherty sediment contact in the north cirque (Figure 4). The granite is massive, equigranular and non-mineralized with minor chloritic alteration of hornblende and biotite. The dyke is cut by a northeast-southwest trending fault (dextral sense) and disappears into the glacier on the south end and talus on the north end. This dyke does not outcrop in the south cirque. A few non-mineralized quartz veins cut the dyke.

Figure 8: Banded - cherty sediments.

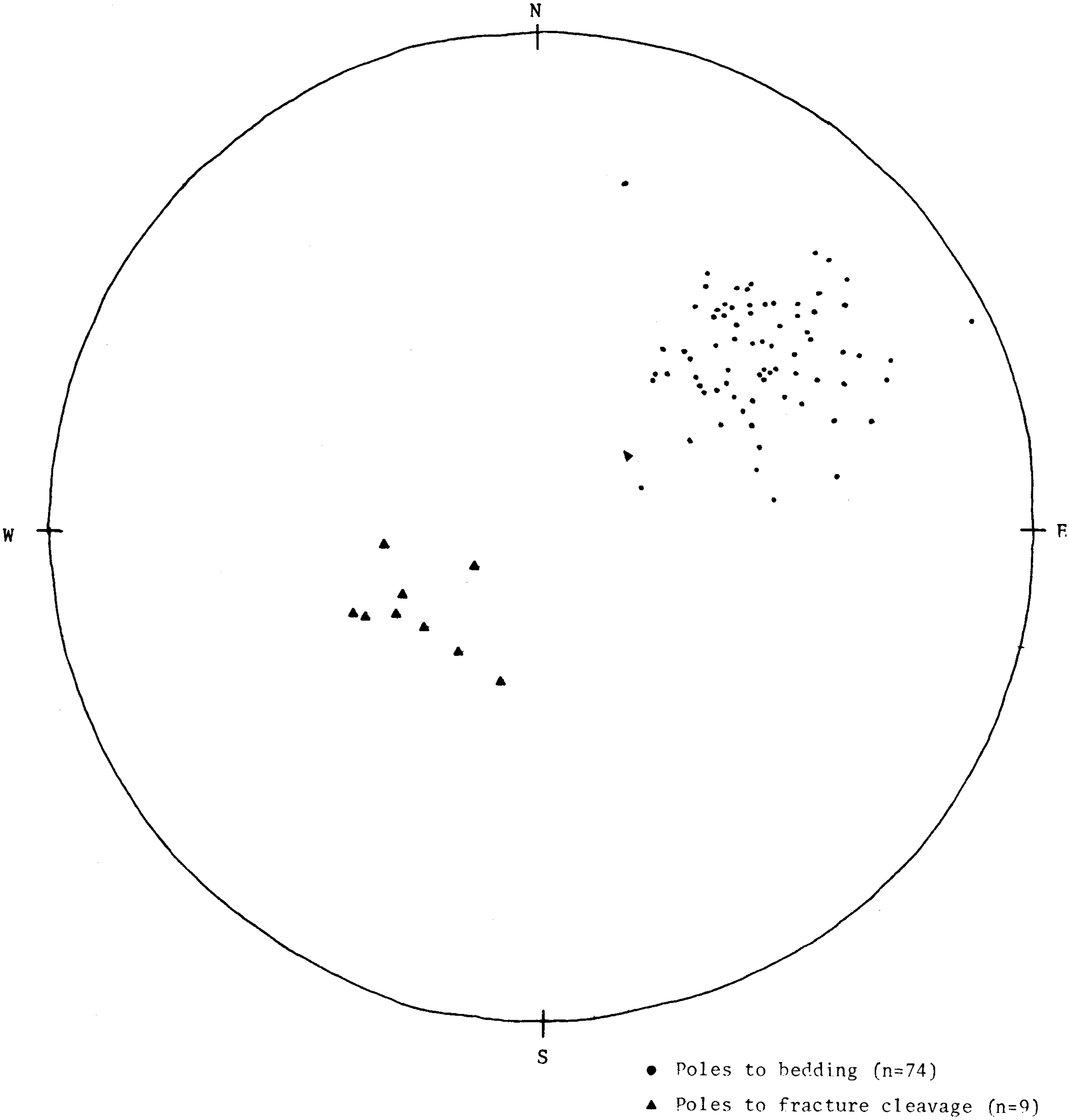


Figure 9: Sterenet plot of poles to bedding and fracture clevage in the detail area.

Scattered non-mineralized quartz porphyry dykes, some with chilled margins, occur in the south cirque. Purple fluorite was noted in one of these dykes; which reach widths of 25 cm.

Irregular quartz veins and gashes containing a few specks of pyrite occur throughout the sediments. A three metre wide quartz vein intrudes the sediments along a probable fault zone in the south cirque. The vein contains fragments of sediments and is weakly mineralized with scattered grains of pyrite.

Structurally, the area has undergone intense folding and faulting. The amount or sense of displacement is unknown except in one or two places. The sediments show tight westerly dipping chevron folds on outcrop scale. A stereo net plot, Figure 7, of poles to bedding indicates an average strike and dip of $142^{o}/60^{o}$ west. A pervasive easterly dipping fracture cleavage occurs in greywacke. An apparently northerly trending lineament occurs through the property. Evidence for the Poison Lake lineament (wrench fault?) is partly topographical and partly geological. Immediately east of the August legal claim post, there is a slight topographic depression with intensely broken-up rock. At the south end of the baseline (00), the sediments are intensely fractured and broken-up. It is along this lineament that mineralization occurs. Faulting is quite prominent in the map-area and is pre and post mineralization. If the mineralized vein is used as a marker horizon and assuming no vein folding, the amount of displacement on the north end of the south cirque is approximately 115 metres and at the south end 60 metres. The amount of displacement along the faulted granite dyke is at least 30 metres.

2.3 Mineralization

Several samples of float found by J.J.McDougall and P. Burns along the talus slopes in the north and south Cirques in 1979 were assayed and contained silver values from 0.06 to 60.0 oz/ton, the average being 13.54 oz/ton. Assay and geochemical results of chip samples taken in 1980 are shown in Table 1. The location of these samples as well as grab samples taken by McDougall and Burns are shown in Figure GL-3. In the south Cirque, mineralization appears to be restricted to a shallow dipping (20 - 25^{o}) vein approximately 500 m. in length with an average thickness of 30 cm, though very short lens-like sections up to one metre wide are present figure 8. The vein occurs either near or along the greywacke,and is faulted off on the north and south ends. This vein appears to occur along a shear or thrust fault zone associated with a few narrow mineralized anastomosing shears. No other veins have been located nor are other faults mineralized. The vein is not exposed in the cliffs on the southern edge of the property. Five chip samples were taken over the vein, the results of which are shown in Table 1. Chip samples taken above and below the vein show no anomalous values, thus indicating that mineralization is confined wholly to the vein and that no disseminated mineralization is present.

In the north cirque, mineralization occurs in a similar type of vein as exposed in the south cirque and intrudes the granite dyke along a strike length of approximately 20 metres. The vein also has a 'pinch and swell' structure with average thickness of 20 cm. This vein is terminated by a fault on the south end and by a glacier on the north end. Chip samples of this chip are shown in Table 1. A ten metre pack-sack hole was drilled to test the mineralized zone, however, due to poor ground, core recovery of the mineralization was only 5 to 10 percent.

Figure 10: Mineralized vein, south cirque.

TABLE 1 Assay and rock geochemical results

No.	Description	Au oz/t	Ag oz/t	Cu %	Pb %	Zn %
	SOUTH CIRQUE					
10604	chip over vein (35 cm) (TP 7-11) L1880S/820W	0.005	0.66	<0.01	0.14	0.04
10605	chip over 2.35 m. - 1 m. above to 1 m. below vein, vein ∿35cm (TP 7-11)	0.003	0.14	<0.01	0.04	0.04
10606	chip over 2.35 m - 1 m above to 1 m below vein, vein ∿35cm (TP 7-12) L1900S/820W	0.002	0.13	<0.01	0.05	0.07
10607	chip over 2.20 m - 1 m above to 1 m below vein, vein ∿20cm (TP 7-12); 2 nd vein 2 m. below main vein (#10606) L1900S/820W	0.002	0.28	<0.01	0.23	0.16
10608	chip over vein (100 cm) (TP 7-13) L1925S/820W	0.010	5.39	0.02	1.54	0.12
10609	chip over vein (35 cm) (TP 7-15) L1990S/810W	0.005	5.75	0.02	1.53	0.16
10610	chip over 2.40 m, 1m above to 1 m below vein, vein ∿40 cm (TP 7-42) L1760S/760W	0.003	1.78	0.01	3.83	0.75
10611	chip over 2.55 m., 1m above to 1 m below vein, vein ∿55 cm (TP 7-40)L2070/715W	0.002	1.16	0.02	0.24	0.37
	NORTH CIRQUE					
10612	chip over 2.05 m, 1 m above to 1 m below vein in granite dyke, vein or 5 cm (TP 8-25) L620S/570W	0.002	0.75			
10613	chip over vein (40 cm) in granite dyke (TP 8-25) L620S/570W)	0.005	0.30			
10614	chip over vein (15 cm) (50 m @ 024° from TP 11-6) L1680S/750W	0.003	2.12	0.02	0.52	0.08

No.	Description	Au	Ag	Cu	Pb	Zn	As
		oz/t	oz/t	%	%	%	
10616	trench, south east end of Poison Lake, chip over weathered part of vein (30 cm) L040S/450W	0.025	5.11	0.04	0.25	<0.02	
10615	trench southeast end of Poison Lake, chip over vein (30 cm) - fresh rock L040S/450W	0.002	0.02	0.01	0.07	0.04	
10617	chip over vein (40 cm) in boulder (L045N/290W)	0.004	0.24	0.02	0.04	0.03	
			ppm	ppm	ppm	ppm	ppm
10601	chip over 5 m of argillite (L700N/1600W)		0.3	48	16	81	10
10602	chip over 1 m rock above vein @ 10 cm intervals (TP 7-11) L 1880S/820W		1.6	102	14	103	40
10603	chip over 1 m rock below vein @ 10 cm intervals (TP 7-11) L1880S/820W		0.4	46	20	372	30

A similar 30 cm wide vein in highly sheared greywacke occurs at the southeast end of Poison Lake. This vein was trenched and sampled, the results of which are shown in Table 1.

Scattered mineralized boulders occur in both cirques. In the south cirque, they are present mainly in the talus below the vein. A few boulders probably occur in the moraine to the east which accounts for the geochemical soil anomalies. In the north cirque, the mineralized boulders occur in the talus immediately below the vein and as erratics along the east side of Poison Lake. These boulders are similar in mineralogy and rock type to the main mineralized vein in both cirques which suggests that they are derived from these veins. The erratics along the east side of Poison Lake may also be derived from outcrop immediately below since a vein does occur in the area, which may be associated with the NNW striking fault.

A suite of five mineralized samples were sent to the Falconbridge Metallurgical Labs in October 1979, for petrologic examination, the report of which is appended (Appendix I). The major sulphides present are pyrite, arsenopyrite and boulangerite with a minor sulphide assemblage of sphalerite, chalcopyrite, galena and tetrahedrite. Trace amounts of pyrrhotite, mackinawite, covellite and stannite are also present. The blue-grey mineral, boulangerite, was often mistaken for tetrahedrite in hand specimen. The style of mineralization appears to be erratic as the mineralized vein has a 'pinch and well' structure along its strike going from 10 cms to 100 cm, respectively with the average being approximately 25 cm. Mineralization occurs as irregular stringers to massive patches in a quartz, sericite, carbonate gangue and is confined wholly to one main vein in both cirques having similar strike and dip ($135^{o}/25^{o}$ W).

The samples taken for assay in 1979 were wholly from mineralized boulders found in the talus and often highgraded to determine the highest silver content that maybe present. Chip samples taken in 1980 over the vein show more realistic values that could be expected. The chip samples were taken over several places by two separate people so as to minimize any bias in sampling. The highest silver grade obtained was 5.75 oz/ton over 35 cm of vein material. The highest silver assay over vein and wall rock (2.40 m) was 1.78 oz/ton. Other elements assayed (Cu, Zn) are very low with no significant amounts. Lead values range from 0.04 to 3.83% which merely indicates the amount of boulangerite, and minor galena present.

3. GEOPHYSICAL SURVEYS

3.1 VLF - EM 16 Survey

The VLF readings were taken every 25 metres along the grid lines with additional readings taken over anomalous zones. Two readings were taken at each station corresponding to VLF stations 18.5 (Jim Creek, Washington) and 17.8 (Maine). The results are plotted on Figures GP1 and 2. The inphase readings are contoured at 10% intervals. The inphase and quarature values on the regional lines are profiled. A compilation of contoured and profiled values are shown on Figures GP3 and 4.

The geophysical equipment used was two Ronka EM-16 units, serial numbers 2 and 20.

3.2 Summary - VLF Station 18.6

The general conductive trends are in a northwest - southeast direction which conform closely to the strike of the argillite beds. Some of these near vertical argillite beds are mineralized, while some are quite graphitic, particularly on lines 10N and 5N, at 600 m. and 800m. east of the base line.

3.2.1 Regional Lines

Conductor "A" - line 20N, 11+25E - this conductor strikes at 160^{o} to cross lines 15N through to line 5N at 7+00E and seems to be interrupted between line 5N and 0, but is open to the north of line 20N. Some sections of this conductor are suspected of being mineralized, because of the reverse inphase quadrature polarity.

The "B" conductor located on line 20N at 6+00E, strikes at 135^{o} through on line 5N at 6+00E. This conductor also is interrupted between lines 5N and 00. The strong E.M. response on lines 5N and 10N is very likely due to the presence of graphite.

The "C" conductor located on line 20N is open to the north trending in a southeast direction through to line 3N at 3+00E where it briefly fades out then resumes again. It then disappears between lines 4S and 5S at 1+50E and resumes its trend in a southeast direction to 8S at 0+50E where it is faulted off.

This "C" conductor could be considered a priority because the quadrature results (reverse of polarity over inphase) is indicative of good sulphide mineralization.

The "D" conductor crosses line 20N at 2+00E, striking in a northwest - southeast direction to line 10N at 1+50E. This conductor dips to the southwest which conforms with the argillite beds.

The "E" conductor, located on line 15N at 15+00E strikes at 180^{o} to line 5N at 11+25E. Depth to this conductor at line 15N is approximately 100 metres and is close to surface on line 5N at 11+25E. This conductor is very likely due to a graphitic argillite bed.

The "F" conductor, strikes in a northwest - southeast direction and extends from line 10N to line 0 at 10+50E. The cross over on line 5N at 10+50E is on outcrop (Water falls) where mineralized rusty argillite is exposed. There is a sufficient amount of mineralization to explain this conductor. The southeastern extension of this conductor continues beyond line 0 to the south (not shown due to the lake).

The "G" conductor on line 5S at 19+00E, extends to line 10S at 19+00E and is barely detectible on line 10S. The northwest extension of this conductor on line 0 is shown as a series of splinter conductors. The quadrature reverse polarity indicates possible sulphide mineralization.

The "H" conductor, located on line 15S at 12+00E, strikes at 150^{o} to line 19S at 10+75E. This conductor is close to surface on line 19S and should carry sufficient amounts of sulphides to be responsive to E.M. The southeastern extension of this conductor possibly extends to line 24S as a series of closely spaced splinter conductors and disappears at line 25S.

The "I" conductor on line 25S at 12+50E is likely due to conductive argillite (graphite - sulphide combination). The E.M. profile shows this conductor to be dipping to the east.

The "J" conductor on lines 24 and 25S at 5+50E is weak because of the depth to the conductor is approximately 100 metres.

The "K" conductor on line 24 south, at 4+25E is a good sulphide conductor as indicated by reverse quadrature polarity. Depth to this conductor is in excess of 100 metres. It may bend in an eastern direction and possibly join up with "J" conductor on line 25S at 5+50E.

The "L" conductor, located on line 15N at 1+12W, strikes at 150^{o} to line 12N at 2+00W. This is a good conductor as indicated by the reverse in quadrature polarity. There is no continuity of this conductor to the northwest from line 15N to 20N. This conductor strikes in a southeast direction and apparently crosses Poison Lake between lines 5N and 0 at 3+50W. This conductor is picked up again on line 1S and 2S at 4+00W and is abruptly terminated between lines 2S and 3S. This is a priority conductor.

The "M" conductor which extends off the grid to the northwest, located on line 20N at 3+50W strikes at 130^{o} to line 15N and continues on to line 12N at 3+50W. This too, is a good conductor which more or less parallels the "L" and "N" conductors. Depth to this conductor on line 15N is approximately 30 metres and it is nearly vertical.

The "N" conductor, on line 20N at 4+75W, strikes in a 130^{o} direction to line 15N at 4+40W, joins with the detail grid at line 12N at 4+80W and continues on to line 9N at 4+75W. The reverse in polarity of quadrature to inphase is indicative of a good sulphide conductor. Depth to this vertical conductor is approximately 25 metres on line 15N at 4+40W. This is a top priority conductor. The secondary conductors to the west of this conductor are due to southwest dipping argillites.

The "P" conductor, located on line 20N at 6+75W, strikes at 155^{o} to line 15N at 8+75W, then changes its strike to 130^{o} crossing line 12N at 8+40W. Dip of this conductive zone is to the southwest.

The conductor is likely to be due to conductive argillite.

The "R" conductor located on line 20N at 9+25W, strikes at 140^{o} to line 15N at 10+00W then continues on to line 12N at 10+25W. This conductor very likely indicates nearly vertically dipping argillites.

The "S" conductor located on line 20N, strikes at 140^{o} to line 15N at 11+25W where it seems to terminate. This conductor, like "R", is likely due to conductive argillite.

The prominent "T" conductor located on line 20N at 13+25W, strikes at 150^{o} to cross line 15N at 14+75W, then continues along its strike crossing line 0 at 17+50W and probably on to line 5S at 16+75W. It apparently is terminated between lines 5S and 10S.

This is a "top priority conductor", not only because of quadrature polarity reversal, but the dip of conductor is to the northeast while the argillites have a southwest dip. Depth to the conductor on line 15N (14+75W) is approximately 60 metres. This is a prime drill target.

The "U" conductor extending from line 10N at 18+75W, strikes in a southeasterly direction on line 5N at 18+50W, where the conductor disappears to the southeast. The northwest extension of this conductor from line 10N divides in three, U#1 crossing line 20N at 15+25W, U#2 at 17+40W and U#3 at 19+00W. This conductor has a fair magnetic correlation which suggests a sufficient amount of pyrrhotite to respond to magnetics and E.M.

Conductor "V", located on line 15N at 20+80W, strikes at 135^{o} to line 5N at 20+80W and extends to line 0 at 20+50W where it appears to terminate. This conductor dips to the southwest and is likely due to a weakly mineralized argillite bed.

The "W" conductor, located on line 15N at 23+75W, strikes at 133^{o} crossing lines 10N, 5N, 0, 5S and 10S at 21+75W and seems to be abruptly terminated between lines 10 and 15S. This conductor has a low quadrature response which suggests that the conductor is due to sulphide mineralization. Depth to this conductor on line 5S at 21+60W is approximately 50 metres.

Conductor "X", located on line 20N at 2+60W, strikes through to line 15N, 10N, 5N, 0 and 5S at 28+80W, but is cut off at line 20S. It is relatively a weak conductor and could be a shear or contact.

The "Y" conductor located on line 15S at 16+00W is a fair conductor and does not extend either to the northwest or southeast. The two weak conductors Z, on line 20S at 17+75W do not extend to the northwest and southeast. Any extension is not established as there were no lines beyond line 20S.

There are numerous other secondary conductors shown on these regional lines. These secondary conductors require more detailed work in order to properly evaluate them.

3.2.2. Detail Grid Area

The detail grid covers an area from 12N to 25S (metric) for a length of 3700 metres. This area is above treeline. The detail grid has two base lines which run in a northwest - southeast direction (315^{o}). Lines were run every 100 metres, from 3E to 11W. Six additional lines were put in, which were 11N, 9N, 8N, 7N, 6N and 4N from 11+00W to 19+00W for detailing the "T" zone. There is very little rock exposure on this detailed grid.

Several conductors were located, all of which extend off the grid to the northwest, but seem to terminate on the southeast end of the grid, around line 22S.

Most of the conductors extend to the regional lines to the northwest. The conductors are alphabetically listed from "A" to "T" which are the extensions from the regional lines.

The "C" conductor, located east of the zero baseline, extends from line 3N to 2+75E and striking at 145^{o} continues in a disrupted manner to line 21S at 1+50W. This conductor is broken by what appears to be a series of folds. This conductor is also broken by a north-south striking fault from line 5S, approximately 500 metres east of the 0 baseline, across the entire detail grid crossing the south baseline (11W) at 22+00S.

The north-south striking conductor C-1, starts on line 7S at the baseline and extends to line 11S at 3+50W. This "C-1" conductor is displaced from the C conductor by the north-south fault. The 17.8 V.L.F. station did not indicate this conductor because of its strike. The C-3 and C-2 conductors, east of "C" conductor, apparently are faulted off splinters of the "C" conductor.

The "L" conductor crosses line 12N at 2+00W and strikes in a southeast direction to line 5N. It likely extends into the lake to cross lines 1S and 2S at 4+15W ending abruptly between lines 2S and 3S.

The second short parallel conductor immediately west of "L" conductor extends from line 10N to about 7+50N. This is a strong conductor. These two conductors could be intercepted by one drill hole. These conductors dip steeply to the west. Depth to the short conductor is approximately 50 metres, and the depth to the "L" conductor is 75 metres on line 10N.

The "M" conductor located at line 12N extends in a southeastern direction through to line 7N at 4+00W. It continues into and likely crosses the lake to link up with the "L" conductor on line 1S at 4+00W. This is a good conductor, particularly at lines 9N and 10N and dips steeply to the southwest. Both M and N are priority conductors.

The "N" conductor, extends from the regional grid located on line 12N at 4+80S just past line 9N at 4+75W. This conductor dips steeply to the southwest. Depth to the conductor is about 50 metres on line 12N.

The long "P" conductor which goes from line 20N to line 12N at 8+50W, extends fairly well across the entire grid to line 21S at 12+25W where it is faulted off. This conductor follows an argillite bed. Depth to this conductor on the south baseline at 18S is about 60 metres and with a nearly vertical dip. This is a priority anomaly. Conductor P-1 is a faulted off section of the P conductor extending from line 11S at 10+60W to line 21S at 12+25W where it is terminated by a north-south fault.

The "R" conductor which also extends from the regional grid, crosses line 12N at 10+50W, strikes across the detail grid to line 3N at 11+60W and is terminated just south of line 3N. The exposed argillite on this conductor carries enough sulphide to respond geophysically. The short R#1 conductor west of "R" maybe due to a local fault or shear. This short R#1 extends from line 8N at 12+75W to line 4N where it too ends abruptly. It is possible that the R and R#1 are the same highly folded conductor.

The "T" conductor crosses line 11N at 15+50W in a southeast direction across the detail grid crossing line 4N at 16+25W and continues on to the regional lines. Depth to this northeast dipping conductor on line 7N at 16+00W is about 50 metres. The dip of this conductive zone is opposite to the general dip of local argillite beds. The reverse in quadrature - inphase polarity is indicative of good sulphide mineralization.

The "U" conductor, located on line 10N at 18+75W, which splays to the northwest into the regional lines, continues as a single feature conductor into the detail grid to line 5N at 18+50W. It appears to terminate between lines 5N and 4N. This conductor has a fair magnetic correlation which sugggests the presence of magnetic and conductive sulphides (pyrrhotite).

The E.M. 16 results of V.L.F. Station 18.6 should be profiled to check for secondary conductors on a 1:2500 scale.

3.3 Summary - VLF Station 17.8

This station is a much less reliable source of information than station 18.6, as it is approximately parallel to the main geological trend of the area and as such does not respond very well (i.e. low readings, background noise).

The general trend of the conductors is in a northwest-southeast direction. The main conductors A' to E', L' to N' and P' to U' on Figure GP-4 are possibly the same conductors shown on Figure GP-3 with similar letter identification. Many of the conductors appear to be segmented, a result of numerous faults in the areas. The weak conductors of V.L.F. station 17.8 did not respond because of tilt direction being in the direction of the conductors. The probable cause of the conductors is as described for the same conductors in section 3.2 (V.L.F. station 18.6).

3.4 Magnetometer Survey

The camp base station was located approximately 50 metres north of the campsite. The total magnetic field established on July 8, 1980 was 58054 gammas. The corrected magnetic base stations were established along the base line for diurnal control which were about 40 minutes. The corrected readings are plotted on Figure GP-5 and contoured on Figure GP-6 at 50 gamma intervals. The magnetic background is established as 58000 gammas. The magnetometer readings were taken every 25 metres with additional readings taken over the E.M. 16 cross-overs.

Throughout the property there are many isolated, unrelated magnetic highs and lows which show no apparent trend. These anomalies vary in magnetic intensity from 250 - 350 gammas above and below the background reading. A possible reason for these magnetic differences are zones of concentrated pyrrhotite and/or magnetite.

Anomaly A begins on line 9N at 18+75W and extends southeast to line 4N at 18+50W. The continuity of the zone southeast of line 4N and northwest of line 10N is unknown as the grid was not extended to cover these areas. The zone has a magnetic low roughly 200 gammas below the average background reading centred on line 9N at 18+65W. A high belonging to the same zone is located roughly 25 metres southeast of line 6N at 17+70W. The strike of this anomaly is parallel to the main strike and the dip is apparently to the southwest. There appears to be direct correlation of this magnetic zone with V.L.F. anomaly (U). The dip and strike of the V.L.F. anomaly is almost identical to that of the magnetic anomaly.

Anomaly B extends from line 10N / 2+50W to line 7N / 3+25W. A magnetic low is located within the anomaly on line 9N at 2+60W. The strike of this zone is roughly 135^{o}. The magnetic anomaly here is supported by a fairly strong V.L.F. conductive zone. Although the magnetic anomaly terminates between lines 6N and 7N, and the V.L.F. zone continues further, the magnetometer may only be responding to the segment of the zone that is mineralized with pyrrhotite and/or magnetite.

On line 2S at 9+90W, the magnetometer indicates a strong magnetic zone, Anomaly C, striking roughly 140^{o}. The centre of this anomaly intersects line 3S at 10+15W then continues to cross line 4S at 10+10W. Termination of this magnetic zone occurs on line 5S at 10W. Within this anomaly a magnetic high is centred on line 4S at 10+15W. A secondary high is situated on line 2S at 9+95W. An area of low magnetic intensity in this zone is found on line 3S at 10+25W. This anomaly which dips to the southwest coincides with V.L.F. conductor (P).

Anomaly D, which parallels that previously mentioned, appears to extend from line 2N / 8+75W to line 2S / 9+25W. Along this zone, there is a possible displacement approximately 25 m southeast of line 1N / 8+75W. This magnetic anomaly conforms reasonably well with a conductive body indicated by the V.L.F. The most prominent segment of the conductive zone is centred on the most intense area of this magnetic anomaly. Both instruments indicate the zone to be at surface.

Anomaly E occurs on line 19S at 11+25W. The readings increase up to 500 gammas above background over this zone. The strike of this anomaly is 140^{o} and it apparently dips to the southwest. This magnetic anomaly relates quite well to a conductive zone having the same approximate dip and strike. The magnetic zone runs from 50 m northwest of line 19S at 11+25W. The continuity of the zone past line 20S is unknown as the lines were not extended to cover this region. The conductive zone that relates to the magnetic anomaly in question continues for a long distance and passes over many seemingly unrelated, isolated magnetic highs and lows.

Although the main strike of the area is in the vicinity of 135^{o} as revealed by the magnetic map, there are several deviations. An apparent change in structure can be observed from line 22 to 25S west of the base line and on lines 10 to 12S on either side of the baseline. In the case of the former-mentioned lines, the E.M. (primarily V.L.F. station 17.8) supports the basis for a possible change in structural orientation. Neither of the V.L.F. stations (18.6 or 17.8) suggest a difference in structure onlines 10 to 12S , as does the magnetometer.

3.5 Self Potential Survey

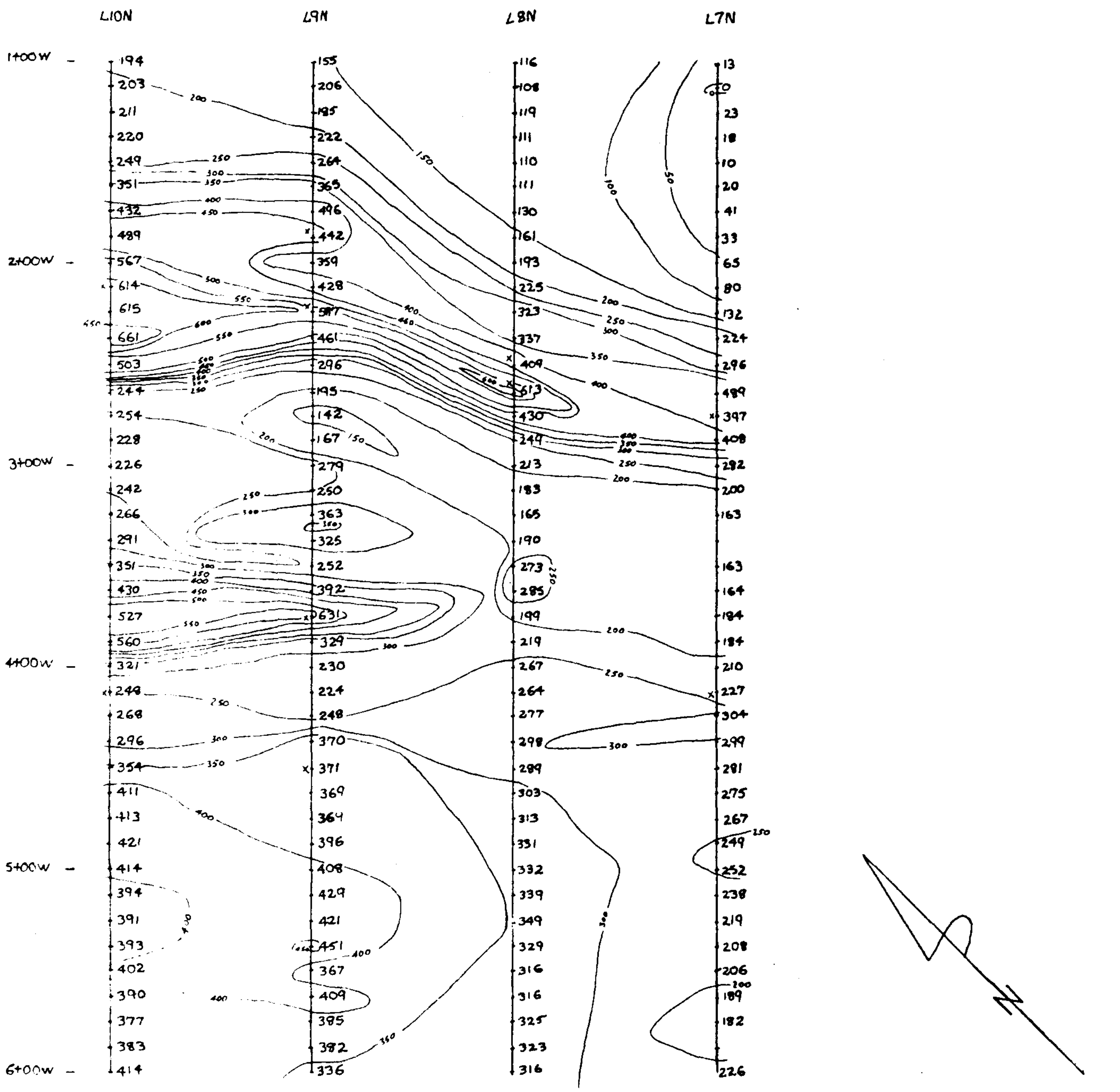
A self potential survey was conducted over three areas on the detail grid to check its response over the V.L.F. conductors. The check is also useful in eliminating conductors due to swamp and clay zones. Readings over 300 millivolts represents a good self potential anomaly.

Area 1 includes lines 10N, 9N, 8N and 7N from 1+00W to 6+00W, Figure GP-7. The E.M. conductor on lines 10N (2+15W) to line 7N (2+50W) responded well, particularly on line 10N. The self potential high of 614 millivolts indicated the anomaly is close to surface. The broad self potential anomaly on lines 10N to 7N, from 4+30W to 6+00W indicates a broad band, likely to be weakly mineralized. This anomaly is coincidental with a V.L.F. anomaly to the west.

The second area, Figure GP-8 covers lines 1S, 2S, 3S and 4S from 2+50W to approximately 5+50W. This is in an area of float mineralization. The readings were profiled and are in millivolts. The cross-overs on lines 1S and 2S at 4+00W responded to self potential. The self potential anomaly on line 4S at 4+25W did not respond to the V.L.F. because it is too narrow.

The third area, Figure GP-9 is located on lines 5N, 6N, 7N and 8N from 11+00W to 19+00W. All readings are plotted in millivolts with 50 mv contours. The V.L.F. cross-overs are indicated on the self potential plan by an X mark for correlation with the self potential results.

There is a correlation of self potential and a V.L.F. conductor on line 8N at 11+25W. The high self potential of 929 mv suggests massive sulphide or graphite. Since massive sulphide was not observed on the property, then the high self potential anomaly is probably due to graphite.



SELF POTENTIAL SURVEY

All Readings in Millivolt

Readings reduced to Negative value

Contour interval 50 Millivolt

x E.M.16. Crossover

40 0 40 80 Meter

SCALE: 1 : 2·000

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Diakow-Kennedy Option

LOCATION: Jennings River B.C.

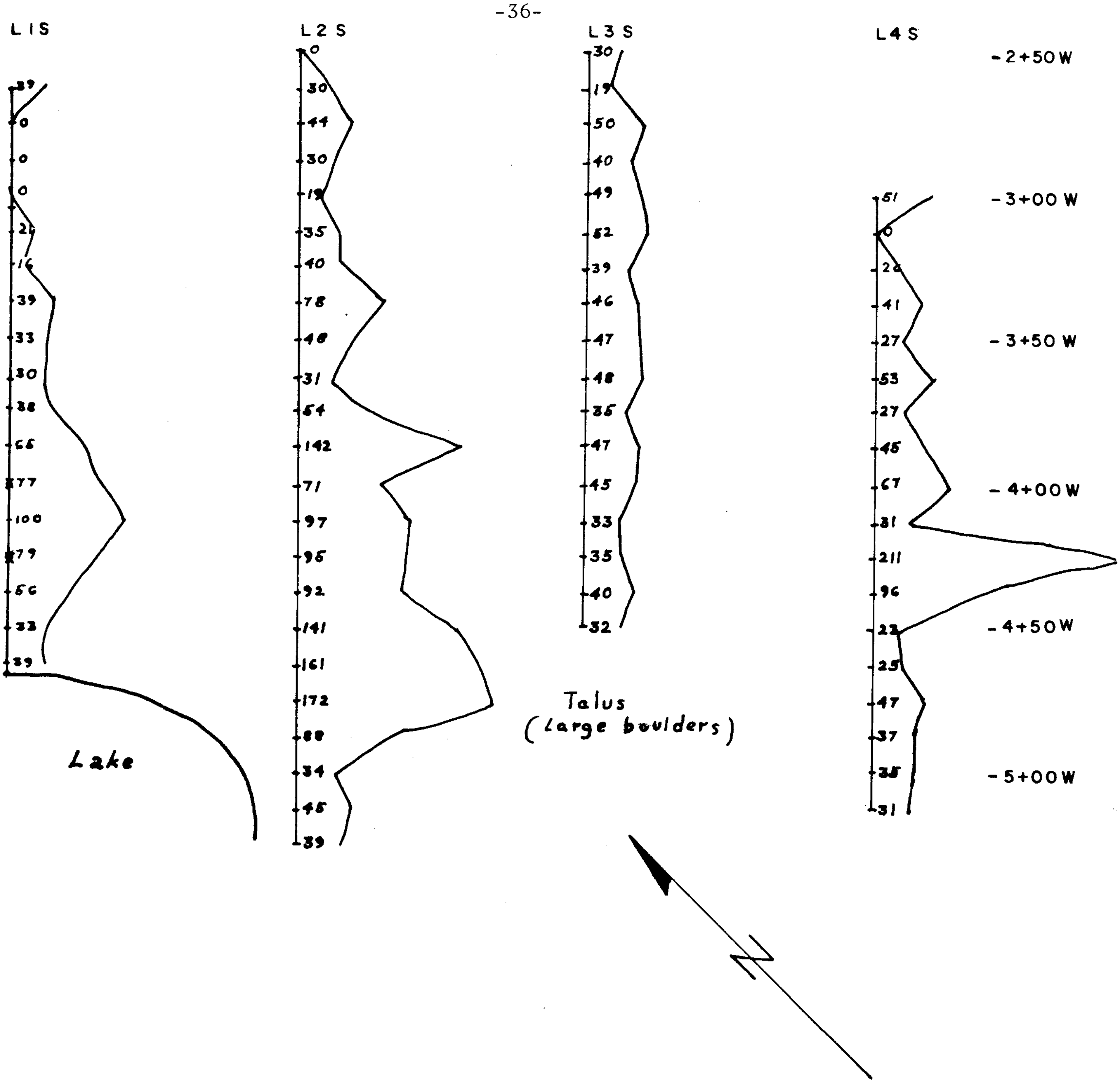
TYPE OF MAP: Geophysical S.P.

BASE ON. Fieldwork by S. Presunka

DATE OF WORK: Aug. 1980

DRAWN BY: S. P. Aug. 1980

N.T.S. NO.: 104-O-5 FIG. NO.: 049-80-GP.7



SELF POTENTIAL SURVEY

All Readings in Millivolts

Readings reduced to Negative value

Profile Scale 1cm : 50 mv.

x - E.M.16 Crossover

40 0 40 80 Meter

SCALE: 1:2.000

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Diakow-Kennedy Option

LOCATION: Jennings River B.C.

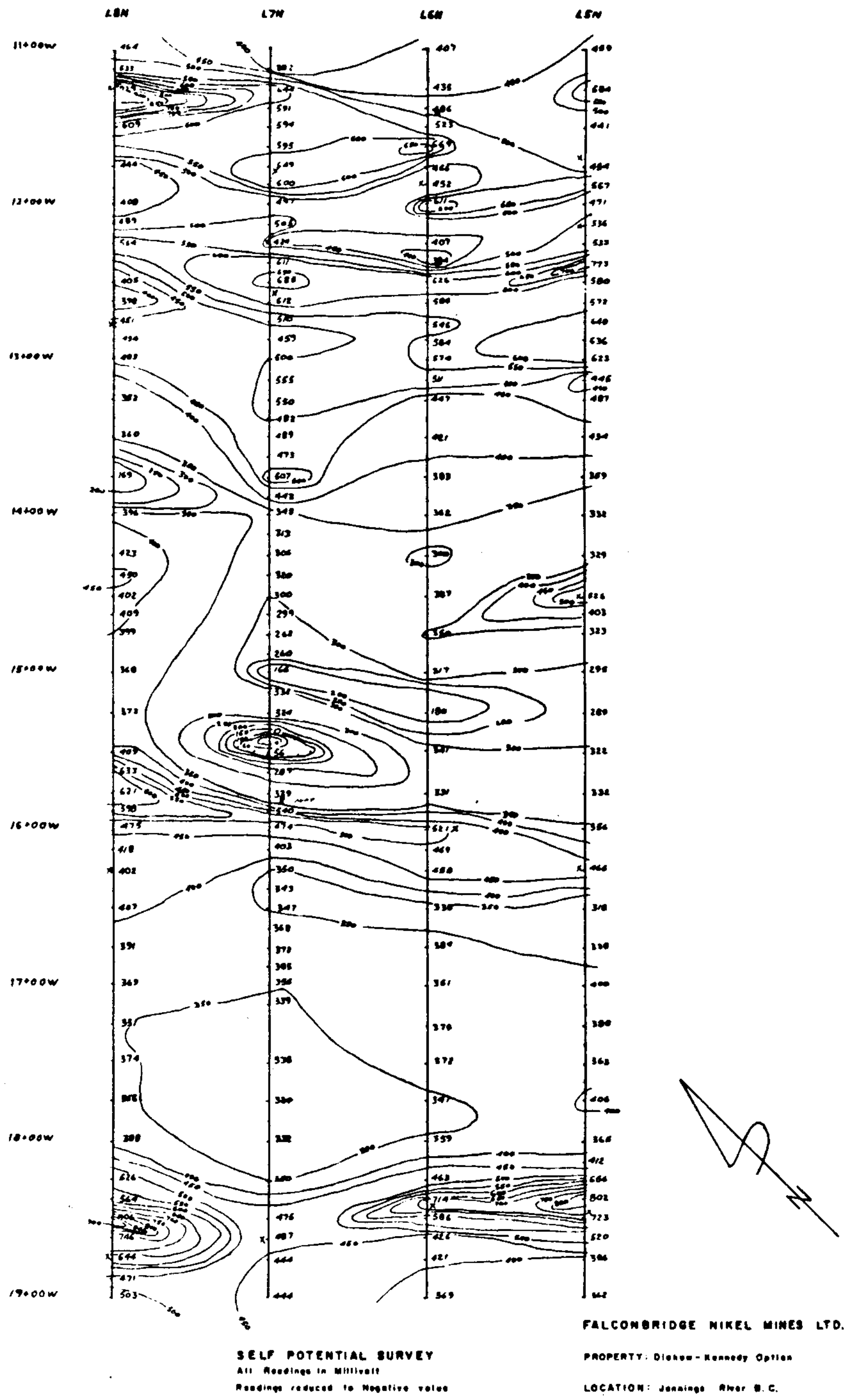
TYPE OF MAP: Geophysical S.P.

BASED ON: Fieldwork by S. Presunka

DATE OF WORK: Aug. 1980

DRAWN BY: G.T. Sept. 1980

N.T.S. NO.: 104-O-5 : FIG. NO.: 049-80- SP, 8



SELF POTENTIAL SURVEY

All Readings in Millivolt

Readings reduced to Negative value

Contour interval 50 Millivolt

x E.M.16 Crossover

40 0 40 80 Meter

SCALE 1:2000

FALCONBRIDGE NIKEL MINES LTD.

PROPERTY: Dickem - Kennedy Option

LOCATION: Jennings River B.C.

TYPE OF MAP: Geophysical S.P

BASED ON: Fieldwork by S. Procunha

DATE OF WORK: Aug. 1980

DRAWN BY: S.P. Aug. 1980

N.T.S. NO.: 104-O-8 1 FIG. NO.: 049-80-gp.9

The moderate self potential anomaly located on lines 7N (12+80W), 6N (12+85W), 5N (12+65W) could be attributed to sulphide mineralization.

The weak self potential response on line 8N (12+80W), 7N (12+60W) and line 5N (12+15W) indicates the V.L.F. anomaly at depth. The broad high self potential on line 8N, from 15+50W to 16+00W is on a secondary V.L.F. conductor. The "T" conductor on line 5N at 16+25W is probably too deep for a self potential survey.

The strong self potential response on lines 8N, 7N, 6N and 5N correlates well with the V.L.F. conductor. The argillites were well mineralized in this area. The anomaly also has a good magnetic response. The mineralization is likely to be pyrrhotite.

3.6 Summary

The majority of the V.L.F. conductors are apparently caused by argillite beds containing disseminated pyrite and minor amounts of graphite as observed in outcrop. The probable cause of other V.L.F. conductors is faulting.

Four priority conductors C, L, N and R are recommended by S. Presunka as possible drill targets, particularly if these conductors correlate with good geochemical results (see geochemical section).

4. GEOCHEMICAL SURVEY (I. L. Elliott)

4.1 Introduction

Soil samples were collected at 25 m. intervals on lines 100 m. apart in the detailed grid area and at 100 m. intervals on lines 500 m. apart in the reconnaissance area. Samples were taken with mattocks at 10 - 15 cm. depth. At higher elevations little soil is developed. Most of the ground is covered with rock rubble supporting a thin growth of grass in places. No distinct horizons are developed and the finer frost broken rock fragments were sampled (C horizon). On lower slopes and the floors of the cirques very rudimentary horizons are developed, a thin A horizon overlies a poorly developed B horizon or a C horizon which could be rocky fragments or glacial overburden. In these areas the soil samples can be expected to closely reflect bedrock values. In a few instances where drainage was poor a thicker A horizon is developed and this was the most convenient sample material. These sites are noted on the sample location map. There is no evidence to suggest that organic material significantly concentrates any of the elements determined by analysis. A total of 2345 samples were collected of which 59 were from the A horizon. Five soil pits averaging one metre in depth were dug on the detailed grid to check the vertical distribution of the elements in the vicinity of geophysical and geochemical anomalies.

4.2 Analytical Techniques

The samples were sent to the Bondar - Clegg laboratories in Vancouver for analysis by standard geochemical procedures (Appendix III). Analysis was carried out on the minus 80 mesh fraction of the air dried sample.

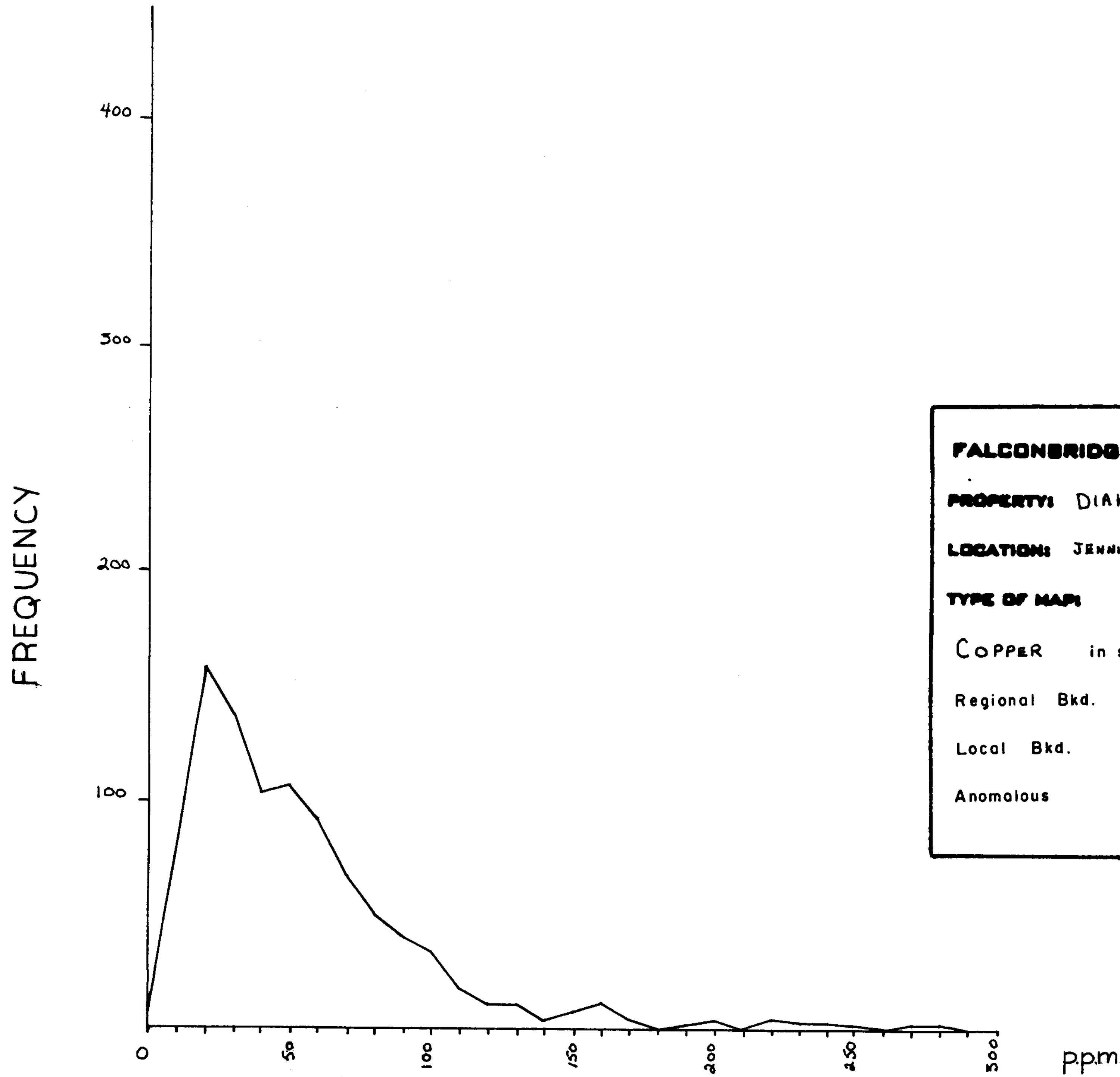
4.3 Results of the Survey

A simple statistical examination of the results (Table 1; Figures 4,5,6,7 and 8) indicates that lead, zinc and copper consist mainly of a single dominant background population whilst both silver and arsenic have multimodal background populations. All the elements have a number of anomalous populations at differing levels. Most of this variation can be explained in terms of mineralogy. Whereas Pb, Zn and Cu occur mainly as their principal sulphides, both silver and arsenic are partitioned amongst pyrite , sphalerite, galena, arsenopyrite, tetrahedrite and boulangerite. Much of the silver-grey mineralization observed in the veins is arsenopyrite or boulangerite (J. E. Muir Company Report, Appendix IV).

The results of analysis of the soil samples are presented on Figures GC 4,5,6,7 and 8 showing the areal distribution of Cu/Zn, Pb/Ag and As values respectively. No attempt has been made to contour these values but the distribution of the higher values is clear.

TABLE : 2 GEOCHEMICAL STATISTICS - Soils

	n	Range ppm	Mode ppm	Reg Bkd ppm	Local Bkd (90 Percentile) ppm	Anomalous (95 Percentile) ppm
Cu	2345	10-280	10-20	10- 99	100-149	>150
Pb	2345	5-1030	10-20	5- 49	50-79	> 80
Zn	2345	20-1650	70-80	20-149	150-199	>200
Ag	2345	0.2-29.0	0.2	0.2-1.4	1.5-1.9	>2.0
As	2345	2- 1000	50-60 80-90 200-210	2-199	200-229	>230



FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: DIAKOW - KENNEDY OPTION

LOCATION: JENNINGS RIVER, AREA

TYPE OF MAP:

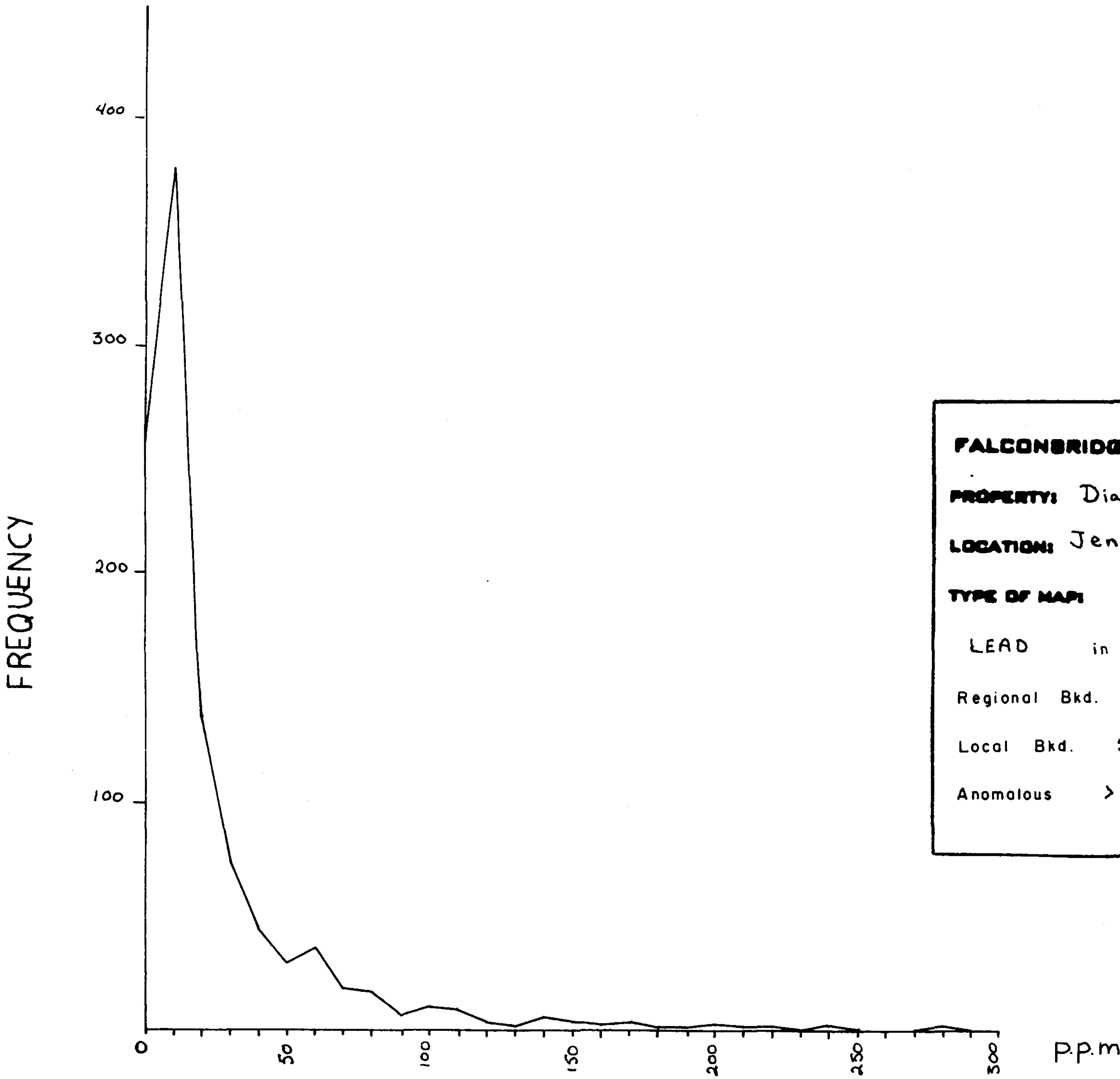
COPPER in soil ppm.

Regional Bkd. 10 - 99

Local Bkd. 100 - 149

Anomalous >150

FIG. NO. 11



FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Diakow - Kennedy Option

LOCATION: Jennings River, Area

TYPE OF MAP:

LEAD in soil ppm.

Regional Bkd. 5 - 49

Local Bkd. 50 - 79

Anomalous > 80

FIG. NO. 12

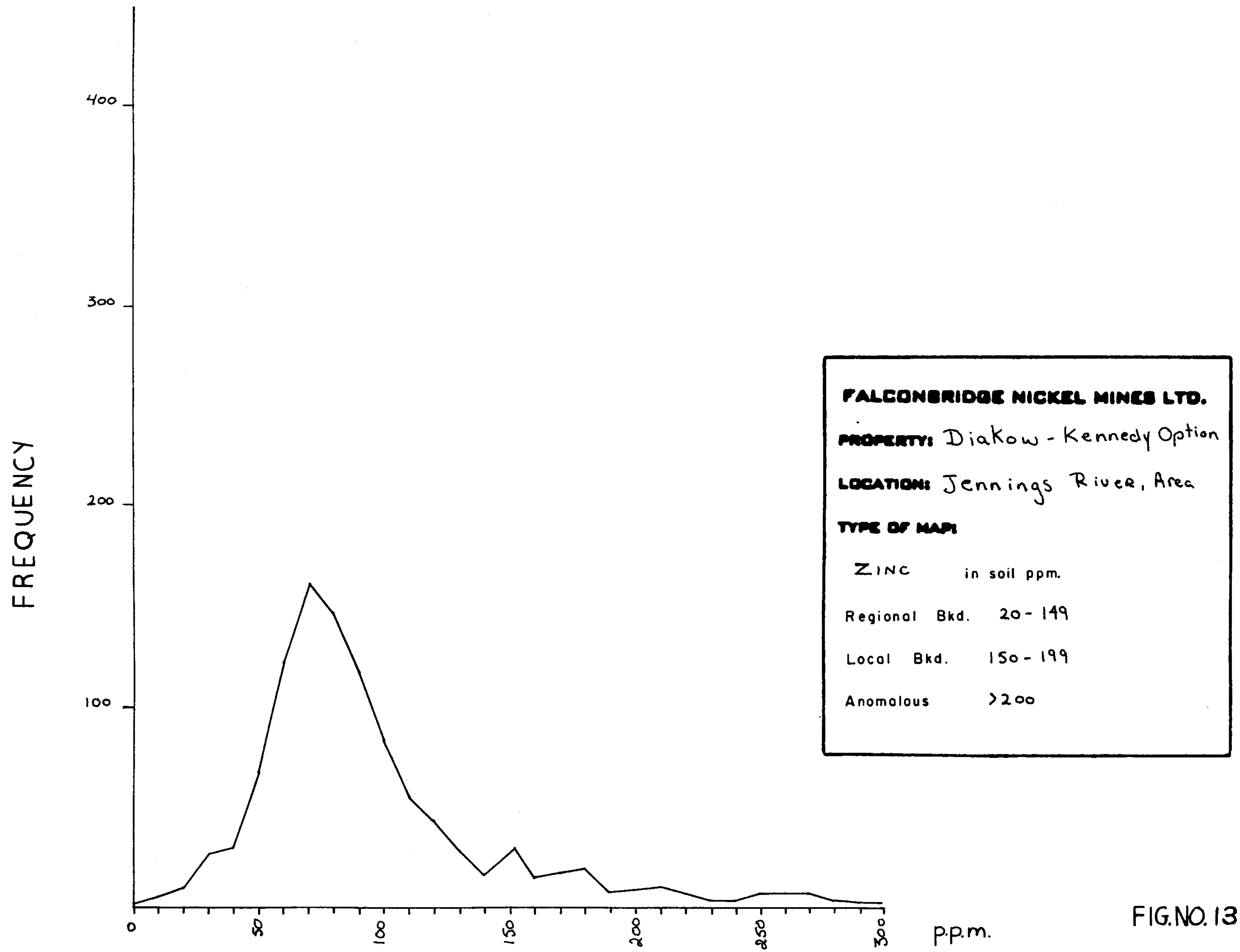
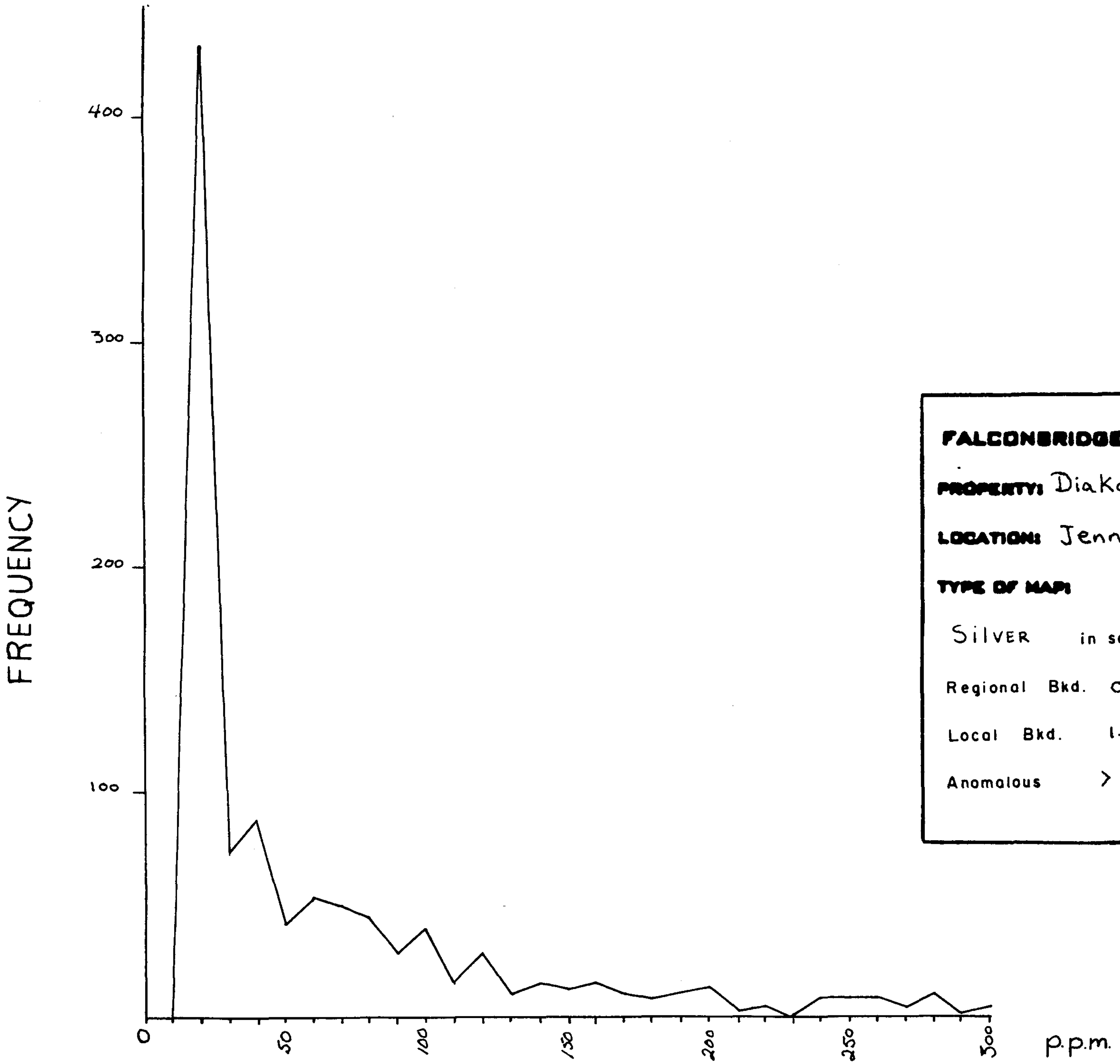

FREQUENCY
400
300
200
100
0
50
100
150
200
250
300
p.p.m.
FALCONBRIDGE NICKEL MINES LTD.
PROPERTY: Diakow - Kennedy Option
LOCATION: Jennings River, Area
TYPE OF MAP:
ZINC in soil ppm.
Regional Bkd. 20 - 149
Local Bkd. 150 - 199
Anomalous >200

FIG. NO. 13



FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Diakow-Kennedy Option

LOCATION: Jennings River, Area

TYPE OF MAP:

Silver in soil ppm.

Regional Bkd. 0.2 - 1.4

Local Bkd. 1.5 - 1.9

Anomalous > 2.0

FIG. NO. 14

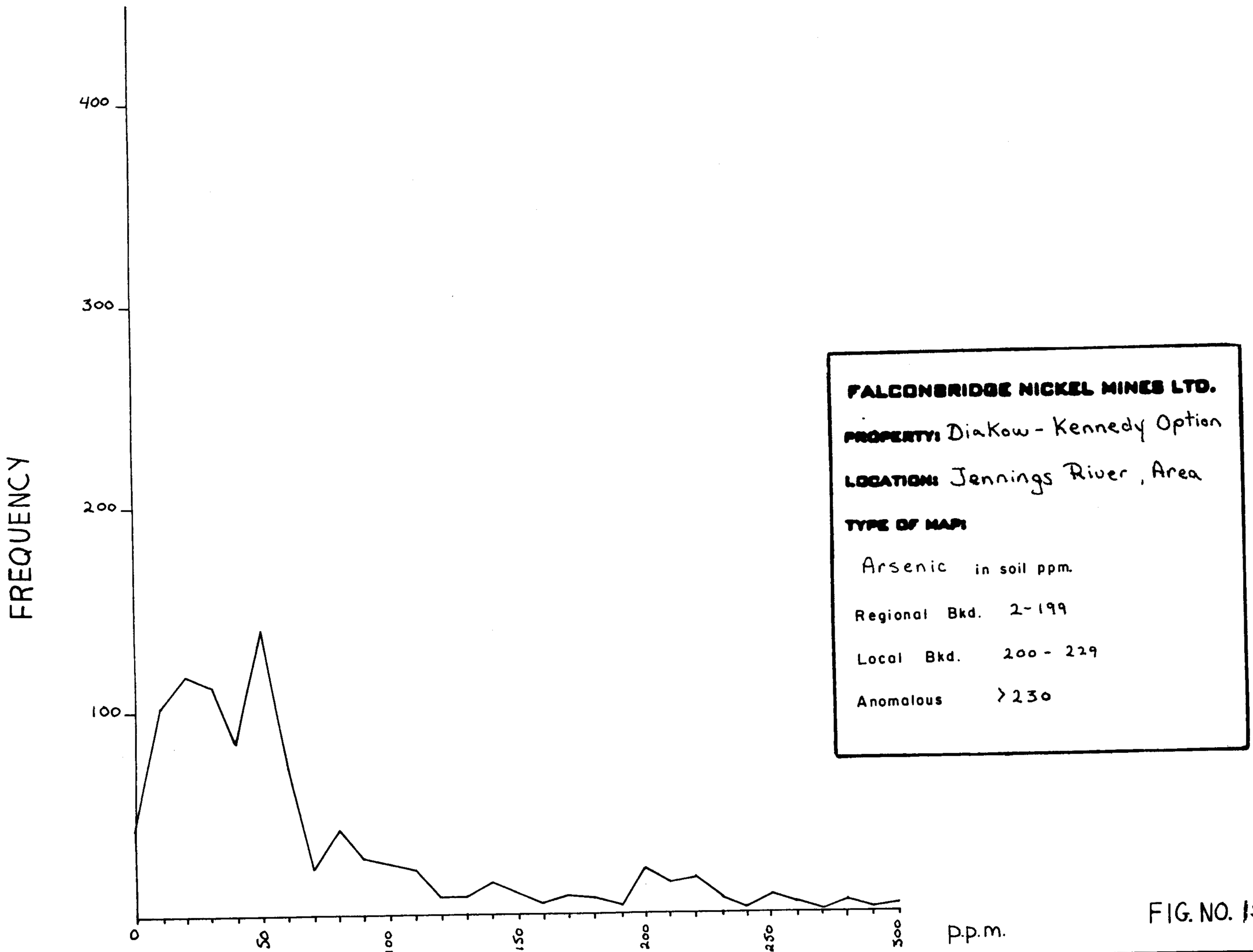

FREQUENCY
400
300
200
100
0
50
100
150
200
250
300
p.p.m.
FALCONBRIDGE NICKEL MINES LTD.
PROPERTY: Diakow - Kennedy Option
LOCATION: Jennings River, Area
TYPE OF MAP:
Arsenic in soil ppm.
Regional Bkd. 2-199
Local Bkd. 200 - 229
Anomalous >230

FIG. NO. 15

4.3.1 Regional Survey

Three distinctive topographic features will be used to describe the location of various geochemical features, Poison Lake, North Cirque and South Cirque.

Initial interest centred on high silver values (up to 60 oz/t Ag) in small veins and float found on the south eastern margin of Poison Lake and in the talus and vein structure exposed in the South Cirque.

The reconnaissance soil lines covering all the claims indicate that the mineralization found around Poison Lake and the South Cirque is the only occurrence of any interest. No indications of additional mineralized structures were found between the showings and the margin of the Christmas Creek intrusive to the west.

4.3.2 Detailed Survey

The detailed soil sampling reveals some very interesting elemental distributions. The eastern side of the South Cirque is the principal locus of silver values which occur in conjunction with very anomalous lead values and high zinc values. Copper and arsenic are of negligible importance. This is a fact of some significance because it suggests that silver occurs principally in galena rather than in tetrahedrite.

The source of these high soil values is the vein structure exposed in the face of the South Cirque and, presumed from its flat dip of about 25-30^{o} to sub-outcrop somewhere on the felsenmeer covered hillside to the east. There is also a possibility that a second flat-lying mineralized structure occurs above that observed in the Cirque face and that this contributes to the numerous high values east of the cirque. A further possibility is a concentration of mineralization at the junction of the cirque vein and an assumed NE trending fault represented by the creek at that point.

The principal area of arsenic concentration is confined to the south east and north west quadrants of the shores of Poison Lake mostly in association with silver and lead and to a lesser extent zinc. Except on the south east side of Poison Lake copper values are negligible. This suggests that around the lake the principal mineralization is in the form of arsenopyrite and boulangerite.

The source of the high soil geochemical values occurring around Poison Lake is possibly (a) the numerous float blocks and boulders found along the eastern shore of the lake derived from mineralization exposed in the walls of the northern cirque and also (b) from the mineralization contained in a presumed sub-vertical regional structure. This structure, a photographically well defined regionally (NW) trending break, has been postulated to run through Poison Lake and between the two cirques although it is difficult to identify on the ground. Soil geochemistry, however, clearly defines a zone of very high and discrete silver, lead, arsenic and zinc values with more scattered copper values in the presumed location of this structure between the cirques. One other notable feature is the wide area of moderately high copper values covering the ridge slopes east of Poison Lake. No mineralization was observed in this area and this grouping of moderately high copper values is still unexplained. The presence of a fault running NE-SW through the western lobe of Poison Lake has been suggested. If present, it appears from the soil sample values to be unmineralized.

Five pits were sunk, to check geophysical anomalies (5,4), float occurrences (2 & 3) and one for background information (1). The analytical results for the pit samples are given in the right hand margin of the geochemical maps. It can be seen that only pit 2 in the floor of the south cirque returned anomalous metal values. These values are attributed to material eroded from the vein in the wall of the cirque.

It is of some importance that the strong geophysical anomalies (L),(N),(P),(R),(T) and (V) are not supported by geochemical values either from surficial material or from pits sunk on them to obtain profile samples. They are due to conductive argillite containing minor amounts of pyrite. Geochemical support is present for conductor M (As, Zn and perhaps Pb, Ag) and conductor C1 (As, Zn, Cu, Pb, Ag),the latter is probably related to a cross fault observed at line 10S. Conductor C extends through the area of moderate to strong copper values east of Poison Lake.

Summary of Geochemical Results

The geochemical anomalies found on the claims can be explained as being derived from the narrow mineralized veins observed in the cirque walls and in the southern margin of Poison Lake.

5. SUMMARY/RECOMMENDATION

In general, the geophysical and geochemical anomalies do not appear to correlate very well, and the majority of these anomalies have been explained by observed lithology and mineralization.

The narrow width and low average silver content of the observed vein structure is most disappointing. The absence of mineralisation in the enclosing rocks precludes the idea of a large low grade mining operation. The viability of an underground mining operation based on such a narrow flat lying structure, with its attendant high operating costs (cf United Keno, values) seems to be dubious. The cost of road construction to the Alaska highway would also be a substantial burden on the profitability of the property.

REFERENCES

Gabrielse, H., 1969, Geology of Jennings River Map Area, B.C., G.S.C. Paper 68 - 55, Map 18 - 1968.

Downing, B.W., and Elliott, I.L., October 1980, Geophysical and Geochemical Report on the August, Ben, CD, Zip 2-5 and Zip 8 M.C. (assessment report).

APPENDIX I

FALCONBRIDGE NICKEL MINES LIMITED
METALLURGICAL LABORATORIES
THORNHILL, ONTARIO

FALCONBRIDGE METALLURGICAL LABORATORIES

Mineralogical Examination of
a Suite of Five Samples from
the Jennings River Silver
Property, B.C.

by
J.E. Muir
November 29, 1979

KEYWORDS: Tin, Arsenopyrite, Tetrahedrite

COPIES TO: RAB, AMC/WDH/JCC, RB/Min File

PROJECT: 302

FALCONBRIDGE METALLURGICAL LABORATORIES

MR#1131

TO: J.J. McDougall

PROJECT No. 302-791129 (JO#2606)

FROM: J.E. Muir

SAMPLE No. L#79-698

DATE: November 29, 1979

SUBJECT: Mineralogical Examination of a Suite of Five Samples from the Jennings River Silver Property, B.C.

KEYWORDS: Tin, Arsenopyrite, Tetrahedrite

DISTRIBUTION: RAB, AMC/WDH/JCC, RB/Min File

DESCRIPTION OF SAMPLE: INFORMATION REQUESTED

A suite of 5 mineralized samples (A, B, C, D and E) from the Jennings River Silver Property was received on October 25th for examination. They were submitted primarily to determine the source of Ag. It was also reported that Ag:Pb ratios and Ag:Zn ratios are extremely erratic and that identification of some sulphides/arsenides present in the hand specimens was uncertain.

PROCEDURES:

- [X] Spectrochem. Analysis
- [ ] Chemical Analysis
- [X] X.R.D.
- [X] Optical Microscopy
- [X] Electron Probe
- [ ]

RESULTS:

Results of qualitative spectrographic analyses of the 5 samples are given in Table I attached. Of particular interest are the ubiquitously high As, Pb, Sb, Sn, Ag, Cu and Zn contents of the samples. Sulphides identified in polished sections or pol-thin sections, and described in detail on accompanying pages, are listed as follows:

Major Sulphides

Arsenopyrite
Pyrite
±Boulangerite [$5PbS.2Sb_2S_3$]

Minor Sulphides

Sphalerite
Chalcopyrite
Galena
Tetrahedrite* [$(Cu,Ag)_{2.5}(Fe,Zn)_{0.5}SbS_{3.25}$]

Trace Sulphides

Pyrrhotite
Mackinawite
Covellite
Stannite* [$Cu_2(Fe,Zn)SnS_4$]

* Note: The optical identification of tetrahedrite and stannite was confirmed by electron-probe analysis. (see attached memo from G. Springer)

The fact that several of the sulphides carry Pb or Zn and/or Cu, combined with variable relative and absolute modal proportions of these and other sulphides in the 5 samples adequately accounts for the erratic metal ratios observed. Arsenopyrite in hand specimen can be characterized by its steel-grey colour, its brittleness and commonly by its crystal morphology. Boulangerite, another grey mineral, is characterized by its blue-grey colour, extreme softness and, in contrast to galena, by its lack of cleavage faces.

J.E. Muir

JEM:dek
Attch.

Location	Jennings River Property, B.C.	Lab. No. 79-698
Sample Description	"A"	PS No. 6735

MINERALS	Est. % by Vol.	Grain Size Max.	(m.m.) Avg.
Pyrite	55-60	Massive	--
Arsenopyrite	10-15	1.0	0.60
Galena	1-2	0.08	0.04
Tetrahedrite	<1	0.05	0.03
Stannite	tr	0.08	0.06
Sphalerite	<1	0.30	0.20
Chalcopyrite	tr	0.02	0.01
Mackinawite	tr	0.01	0.01
Pyrrhotite	tr	0.02	0.02
Gangue	25-30	----	----

DESCRIPTION

The sulphide assemblage consists mainly of a highly fractured mass of predominantly coarse, blocky pyrite grains with lesser, smaller scattered euhedral grains of arsenopyrite. The latter occurs interlocked with, and poikilitically enclosed within pyrite grains. Relatively abundant subhedral grains of galena together with minor to trace amounts of tetrahedrite, sphalerite, stannite, chalcopyrite, mackinawite and pyrrhotite are found as inclusions within coarse pyrite grains. Arsenopyrite grains appear to have fractured more extensively than pyrite and are in addition, partly pseudomorphed by gangue.

CLASSIFICATION

Location	Jennings River Property, B.C.	Lab. No.	79-698
Sample Description	"B"	PS No.	6736

MINERALS	Est. % by Vol.	Grain Size Max.	(m.m.) Avg.
Pyrite	3-4	4.0	0.35
Arsenopyrite	4-5	2.0	0.40
Boulangerite	7-8	Massive	----
Sphalerite	<1	0.90	0.35
Chalcopyrite	tr	0.02	0.01
Tetrahedrite	<1	0.05	0.03
Gangue	75-80	----	----

DESCRIPTION

In contrast to the previous polished section, sulphides in this polished section are much less abundant* and occur for the most part as scattered coarse euhedral grains of pyrite, arsenopyrite and sphalerite (±chalcopyrite inclusions). Instead of galena, boulangerite is the major Pb-bearing phase and is found as irregular fibrous masses partly corroding pyrite and as micro-inclusions in pyrite grains. Again, tetrahedrite occurs in minor amounts and arsenopyrite grains are partly pseudomorphed by gangue.

*Note: the polished section was prepared from a relatively sulphide-poor portion of the hand sample which actually consists of >90% massive boulangerite.

CLASSIFICATION

Location: Jennings River Property, B.C. — Lab. No. 79-698

Sample Description: "C" — PS No. 5530

MINERALS	Est. % by Vol.	Grain Size (m.m.) Max.	Avg.
Quartz	60-65		
Sericite	10		
Chlorite	1-2		
Carbonate	<5		
Pyrite	15-20	2.0	0.70
Arsenopyrite	2-3	0.50	0.30
Boulangerite	5-10	2.0	0.80
Sphalerite	3-4	1.0	0.40
Chalcopyrite	tr	0.02	0.01
Tetrahedrite	tr	0.05	0.03

DESCRIPTION

The sulphide assemblage in this sample is similar to that found in "B" and consists of disseminations of coarse grained pyrite, euhedral arsenopyrite, subhedral sphalerite (partly replaced by carbonate) and irregular masses and stringers of boulangerite. The host rock is a mosaic of variably sized, subangular quartz grains containing a few scattered coarse (several mm) angular sericite-rich rock fragments. In general, sulphides are intergranular and are occasionally found penetrating quartz grains along micro-fractures (especially boulangerite).

CLASSIFICATION

Location Jennings River Property, B.C. **Lab. No.** 79-698

Sample Description "D" **PTS No.** 5531

MINERALS	Est. % by Vol.	Grain Size Max.	(m.m.) Avg.
Quartz	>95		
Clay (±carbonate)	2-3		
Muscovite	tr		
Arsenopyrite	2-3	1.0	0.60
Covellite	tr	0.02	0.01

DESCRIPTION

Sulphide mineralization consists of fractured, euhedral arsenopyrite grains, partly to completely pseudomorphed by a fine grained clay/carbonate/muscovite mixture, weakly disseminated throughout a mosaic of coarse interlocking subhedral to euhedral quartz grains. Under crossed nicols grains of quartz exhibit highly strained extinction. Traces of covellite (after tetrahedrite?) occur within the shattered arsenopyrite grains.

CLASSIFICATION

Location	Jennings River Property, B.C.	Lab. No. 79-698
Sample Description	"E"	PTS No. 5532

MINERALS	Est. % by Vol.	Grain Size Max.	(m.m.) Avg.
Quartz	30-35		
Sericite	2-3		
Clay } Carbonate	35-40		
Arsenopyrite	15-20	2.0	0.80
Pyrite	1-2	2.0	0.80
Tetrahedrite	1-2	0.15	0.07
Chalcopyrite	<1	0.35	0.05
Covellite	tr	0.02	0.01
Sphalerite	1	1.5	0.80
Galena	2-3	1.0	1.0

DESCRIPTION

Amongst the sulphide assemblage present, arsenopyrite is the most abundant followed by galena, pyrite, tetrahedrite, sphalerite, chalcopyrite and covellite in that order. With the exception of tetrahedrite in shattered arsenopyrite grains and chalcopyrite inclusions in sphalerite, sulphide grains are for the most part coarse and monomineralic. In addition, sulphides are partly to completely pseudomorphed by a fine grained clay/carbonate mixture. The host rock is highly granulated and consists of medium to fine grained anhedral quartz grains with scattered interstitial sericite. Quartz grains "trapped" between coarse sulphides appear unusually coarse themselves.

CLASSIFICATION

TABLE I

FALCONBRIDGE METALLURGICAL LABORATORIES
QUALITATIVE SPECTROGRAPHIC ANALYSIS

DISTRIBUTION: REPORT No.

ANALYTICAL METHOD:

REQUESTED BY: DATE:

RECEIVED FROM: CHARGE:

SAMPLE No.: L#79-698 No. of SAMPLES: 4

SAMPLE DESCRIPTION: Jennings River, B.C.

	"A"	"B"
10 – 100%	Fe,Si	Si
3 – 30%		Fe
1 – 10%	As	
0.3 – 3%		As
0.1 – 1%	Mg,Sn	Mg,Al
0.03 – 0.3%	Al	Sn
0.01 – 0.1%	Cu,Zn,Sb	Cu,Ti,Zn,Ag
0.003 – 0.03%	Ti,Ag	
0.001 – 0.01%	Ca,Cr,Ni,Co,Cd	Ca,Cr,Ni,Cd
0.0003 – 0.003%	Mn	
0.0001 – 0.001%		
< 0.0003%		Mn,Co
I	P	P
S	Pb	Pb,Sb

I = Interference prevents positive identification.
S = Strong spectral lines, unable to estimate amount.
Unless specified above, the following were not detected at the approx. ppm lower limits of 0.5 Cu,Ag; 1 Mn; 5 Mg, Cr; 10 Ba, Be, Bi, Ca, Co, Ni, V; 25 Ge, Fe, Pb, Mo, Si, Sr, Sn, Ti, Zr, Tl, Pd; 50 Al, Sb, B, Cd, Ga, In, Li, Zn; 100 As, Au, Na; 200 Rh, Re, Ir, Pt, Ru, Sc; 300 Te, Os; 1000 K, U, Th; 2000 P.

FML-1017 Analyst

FALCONBRIDGE METALLURGICAL LABORATORIES
QUALITATIVE SPECTROGRAPHIC ANALYSIS

DISTRIBUTION: ______ REPORT No. ______

ANALYTICAL METHOD: ______

REQUESTED BY: ______ DATE: ______

RECEIVED FROM: ______ CHARGE: ______

SAMPLE No.: L#79-698 No. of SAMPLES: 4

SAMPLE DESCRIPTION: Jennings River, B.C.

	"C"	"E"
10 – 100%	Si	Si
3 – 30%	Fe	Fe
1 – 10%		
0.3 – 3%	Zn, As	Al, Zn, As
0.1 – 1%	Mg, Al	Mg, Sb
0.03 – 0.3%	Sn	Cu, Ti, Sn, Ag
0.01 – 0.1%	Cu, Ti, Ag	
0.003 – 0.03%	Cd	
0.001 – 0.01%	Ca, Cr, Ni	Ca, Cr, Ni, Cd
0.0003 – 0.003%		
0.0001 – 0.001%		Ba, Be
< 0.0003%	Mn, Co	Mn, Co, V
I	P	P
S	Pb, Sb	Pb

I = Interference prevents positive identification.
S = Strong spectral lines, unable to estimate amount.
Unless specified above, the following were not detected at the approx. ppm lower limits of 0.5 Cu, Ag; 1 Mn; 5 Mg, Cr; 10 Ba, Be, Bi, Ca, Co, Ni, V; 25 Ge, Fe, Pb, Mo, Si, Sr, Sn, Ti, Zr, Tl, Pd; 50 Al, Sb, B, Cd, Ga, In, Li, Zn; 100 As, Au, Na; 200 Rh, Re, Ir, Pt, Ru, Sc; 300 Te, Os; 1000 K, U, Th; 2000 P.

FML-1017 Analyst ______

FALCONBRIDGE NICKEL MINES LIMITED

INTER OFFICE MEMORANDUM

MEMO TO: J.E. Muir

FROM: G. Springer/L.M.P. Chan

DATE: November 26, 1979

SUBJECT: Silver, Tin and Antimony Distribution in Jennings River Property, B.C.

PROJECT No. 302-791126 (JO#2606)

KEYWORDS: Stannite, Tetrahedrite, Electron-Probe

COPIES TO: RAB, File

Polished Section PS6735 of sample A, Jennings River Property, B.C., was submitted with a request to determine the distribution of silver, tin and antimony. The sample has bulk contents of 0.1-1% Sn, 0.003-0.03% Ag, and 0.01-0.1% Sb.

Two inclusions in pyrite resembling stannite and three inclusions resembling tetrahedrite were analyzed by electron-probe with the following results (average Wt %):

	Cu	Ag	Zn	Fe	Sb	Sn	S	Total
Stannite	27.1	0.26	7.07	11.7	<0.02	26.3	30.3	102.7
Tetrahedrite	23.7	17.3	3.04	4.11	27.1	0.43	23.1	98.9

This corresponds to the formulae $Cu_{1.81} Ag_{0.01} Zn_{0.46} Fe_{0.89} Sn_{0.94} S_4$ and $Cu_{1.69} Ag_{0.72} Zn_{0.21} Fe_{0.33} Sb_{1.01} Sn_{0.02} S_{3.25}$. The ideal formulae of stannite and tetrahedrite are $Cu_2(Fe,Zn) SnS_4$ and $(Cu,Ag)_{2.5} (Fe,Zn)_{0.5} Sb S_{3.25}$ respectively.

The small size of the inclusions (mostly <30 µm) and their close intergrowth with pyrite and galena appear to have affected the analytical accuracy somewhat, leading to deviations from ideality.

G. Springer

GS:dek

6415 - 64th Street, Delta, B.C.

INTER-OFFICE MEMORANDUM

DATE: November 13, 1979

TO: Van. Office

COPIES TO:

FROM: J. J. McDougall

SUBJECT: Specimens sent to Thornhill (Jennings Ag - Diakow)

A) 30% py. 30% grey mineral -- pitted and oxidized 30% qtz -- mid slide.

B) Massive S_2 cut from large piece on mid slide (minor pyrite, major - banded dense black soft H-3 yellow oxidizing S_2).

C) 10% diss. py - 10% grey mineral -- gobs in grey qtz from mid slide.

D) Tet in Qtz -- Gunnar's + JJM's (reject)(396) -- (large)

E) Split of 388 - 60 oz.