

014338

NORCEN ENERGY RESOURCES LIMITED
NEW MOON OPTION
1978 YEAR END REPORT

1978 September

G.L. Garratt
T.B. Bojczyszyn

~~934/4~~ 93E/13

PROPERTY FILE

93E011-075OW
PC (Monie Lake)

NORCEN ENERGY RESOURCES LIMITED

New Moon Option
1978 Yearend Report

Location:	Latitude:	53°55' N
	Longitude:	127°45' W
N.T.S.:		93E/13 E&W
Owner:		Norcen Energy Resources Limited
Worked by:		Norcen Energy Resources Limited
Dates Worked:		June 28 to July 15, 1978

1978 September

G.L. Garratt, P. Geol.
T.B. Bojczyszyn.

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A. SUMMARY

The New Moon prospect was optioned from Silver Standard Mines Ltd., in the spring of 1978, for its volcanogenic massive sulphide potential. Boulder trains carrying well mineralized float and an outcrop of massive sulphides were reported and documented by the owner Charles Kowall, an ex-Silver Standard geologist.

A program of geological mapping, geophysical surveying, geochemical sampling and prospecting began on June 28, 1978 and was completed on July 25. This work was designed to identify possible sources for the float mineralization, define the glaciology and geologic environment and to find the reported outcrop of massive sulphide mineralization.

The float mineralization was traced to a source covered by a glacier and massive sulphides were not found in place anywhere on the property. The geologic environment was defined as that of a volcanic centre in a subaqueous (possibly fresh water) environment, tentatively assigned to the Telkwa Formation of the Hazelton Group. Severe logistical problems in testing the postulated source of mineralization resulted in a culmination of the field program and subsequently the New Moon option.

B. INTRODUCTION

1. History and Ownership:

Table 1 outlines the exploration history of the New Moon prospect. Early work concentrated on mineralization exposed in suboutcrop on the plateau in the northern part of the property. Prospecting by Charles Kowall in 1969 indicated interesting float occurrences in the valley bottom which led him to restake the property in 1977.

The property is presently under the joint ownership of Great Plains Development Company of Canada Ltd. and Aquitaine Company of Canada Ltd. via an option agreement with Silver Standard Mines Ltd. Relevant data concerning the claims is as follows:

<u>Claim Name</u>	<u>Record Number</u>	<u>No. of Units</u>	<u>Date of Record</u>
Misty Day	832	12	1977, October
Copper Cliff	833	12	1977, October
New Moon	834	20	1977, October
Half Moon		8	1978, July

TOTAL 52 contiguous units.

WORK HISTORY

1967-68	Phelps Dodge Corp Geologist P.G. PC Claims 36 Geology and chip 9 trenches 500 f 6 men employed for weeks.	ion of Canada Ltd. is
1969	Silver Star Island Geologist Charles Kowal Prospecting and staking PC claims	claims southeast of
1970	JOW 1-20 claims taken by Mining Ltd.	Dunsford for Aggressive
1971	August 1-21 R. Phen Ltd.) and geology (Atled exploration on Mo J.E.M. two frequency Ltd. lines total 50 feet inter, co Assessment P. 32	(Cannon-Hicks Associates 400") while P.P. Neilson ment Ltd.) ran a Crone urvey for Aggressive Mining 5,000' were surveyed at eparation 200 feet) 252.
1972	Aggressive Mining Ltd. JOW 1-20 claims Mag. survey geoc traverse line, surface feet on JOW	survey - 101 samples, 150 feet and drilling totalling 1,025
1977	Charles Kowal Prospecting, staking	
	Misty Bay Copper Cliff New Moon	<u>Units</u> 12 12 20
1978	Great Plains Develop Aquiline Company of Prospecting scale Detailed Map 1:2,000 EM Min II survey - 17 kilometres Fluxgate Magnetometer Survey - 16 kilometres Secanting of lines: topographical Survey - (Scale 1:2,000) Staking of:	<u>Units</u> 8
	Half Moon	

2. Location and Physiography

The New Moon prospect, consisting of four claims totalling 52 contiguous units, is located on the eastern margin of the Coast Range approximately one hundred kilometres south-southwest of Smithers and eighty-five kilometres southwest of Houston. Access is by a 74 kilometre all weather gravel road from Houston to the northeastern end of Morice Lake and from this point, a 27 kilometre helicopter ferry to the property.

The property is located in alpine terrain, in a glacial valley, at the 1500 to 1600 metre elevation. Morice Lake lies 790 metres above sea level. A glacial till filled valley bottom leads up to talus covered slopes and steep cliffs. A relatively flat plateau-like ridge circles the valley. Vegetation is sparse and consists of a variety of alpine flowers, heather and stunted conifers. Animal life is represented by whistlers (marmots) and bears.

The area receives approximately twenty feet of snow annually and year-round snow pack exists in north facing bowls and slopes. A small glacier exists on the property in a northeast facing compound cirque.

3. ECONOMIC CONSIDERATIONS

Access to the property could be gained by barge from the Morice Lake road to Atna Bay and from there a road could be built up the main valley. Power would likely have to be derived locally although facilities could easily be brought to Morice Lake. Little environmental damage would be incurred by mining or milling processes. Mine and mill wastes would have to be isolated from the Morice River drainage system, however, as this is a major salmon spawning system.

4. PREVIOUS EXPLORATION

Exploration by Phelps Dodge and Aggressive Mining centred on fault controlled vein mineralization on the plateau area at the north end of the property. The vein system carries quartz networks with mineralized veins and patches that averaged 0.15% copper; 1.75% lead; 5.5% zinc and 0.59 ounces/ton silver over a thirty-five foot width defined by four diamond drill intersections. The zone dips at approximately 65 degrees and a feldspar porphyry dyke parallels the system. The mineralization was trenched and showed an interpolated strike length of 1000 feet. The drill holes were spaced along 600 feet of this length.



Although this mineralization gave interesting assays, the nature of the occurrence would imply a sub-economic deposit that would likely yield erratic results on closely spaced drilling. For this reason the plateau mineralization was not extensively worked during the 1978 field season.

5. OBJECTIVES AND APPROACH

A report by Charles Kowall, and rock samples collected by him, indicated that the New Moon prospect enclosed a volcanogenic massive sulphide environment. Economic grade mineralization was reported to occur in float and outcrop. The 1978 field program was designed to test the property with the objective of finding the source of mineralized boulder trains and the reported massive sulphide outcrop.

To achieve the above objectives a program consisting of an airborne geophysical survey, geological mapping and prospecting was undertaken. A ground geophysical survey followed this work in an effort to gain definition in the overburden covered valley. The prospecting and geologic mapping were directed at defining the geologic environment and the glacial history and involved both outcrop and float mapping. From this work it was hoped that sources for the mineralization could be postulated and subsequently tested by geophysical techniques.

C. EXPLORATION

1. Research

Prior to the field program, the relevant assessment reports and government geologic surveys were reviewed. The assessment reports are attached as an appendix. Of particular interest was a paper published in 1976 by H.W. Tipper and T.A. Richards entitled "Jurassic Stratigraphy and History of North-Central British Columbia". In this paper the New Moon prospect area is indicated to be in the region of the Howson Subareal Facies of the Hazelton Group. Prospecting by C. Kowal indicated a subaqueous environment and this in turn indicated a good exploration potential in a relatively untested region.

A research study of the region by the authors included a lineament study utilizing landsat imagery. It was observed that the New Moon prospect occurs at the juncture of major lineaments and this combined with the possibility of a subaqueous volcanic centre environment to enhance the potential for exploration.

2. Prospecting

G.L. Garratt and C. Kowall spent approximately thirty-five man days prospecting on the New Moon group of claims. This work was directed at defining all visible outcrop mineralization and defining geologic trends and structural attitudes. The results of this work are presented on Map number 4.

Due to heavy overburden cover in the valley, prospecting was restricted to the talus, cliff and ridge areas where outcrop exposure is very good. No significant showings were found although a large number of mineral occurrences were located. These showings are generally of limited extent and consist of chalcopyrite and malachite disseminated along shear zones. Silicification and dyke activity are often associated with these zones.

Geologic data gained by this work will be dealt with in Section D.

3. Geochemical Surveys

Soils are poorly developed on the New Moon prospect but one area of sandy soil cover on a glacial terrace was chosen for surveying. Samples were obtained where snow cover and soil development allowed. The area surveyed lies south of the baseline between lines 11 & 50W and 15 & 50W. Thirty-two samples were obtained and these were analysed for lead, zinc, copper, silver and gold. Figures 32 through 39 show the sample locations and plots of the geochemical analyses. Analytical procedures and analyses sheets are located in Appendix 2. Only three samples showed anomalous values and these are located at:

Baseline and line 15 & 50W (Station 32)
12 & 50W and 18 & 005 (Station 5)
12 & 80W and 16 & 40S (Station 6).

These sites carried anomalous values in zinc, lead and copper. Silver geochemistry shows a weak anomaly between lines 11 & 50W and 12 & 50W as well as east of line 11 & 50W. A negative correlation appears to exist between the silver and base metal values. No explanation of this phenomenon could be found. The general dispersion of the base metal values shows a moderate correlation with the dispersion train of mineralized andesite breccia (marked with a dashed line). Because of the limited extent of the survey few conclusions can be made.

Samples CK 1 to 25 were obtained from the plateau area, along the mineralized and trenched zone. Soil development is very poor and the high values obtained indicate the juvenile nature of the material sampled. Figure 9 shows the sample locations. The geochemical analyses are located in Appendix 2. These results are felt to be inconclusive.

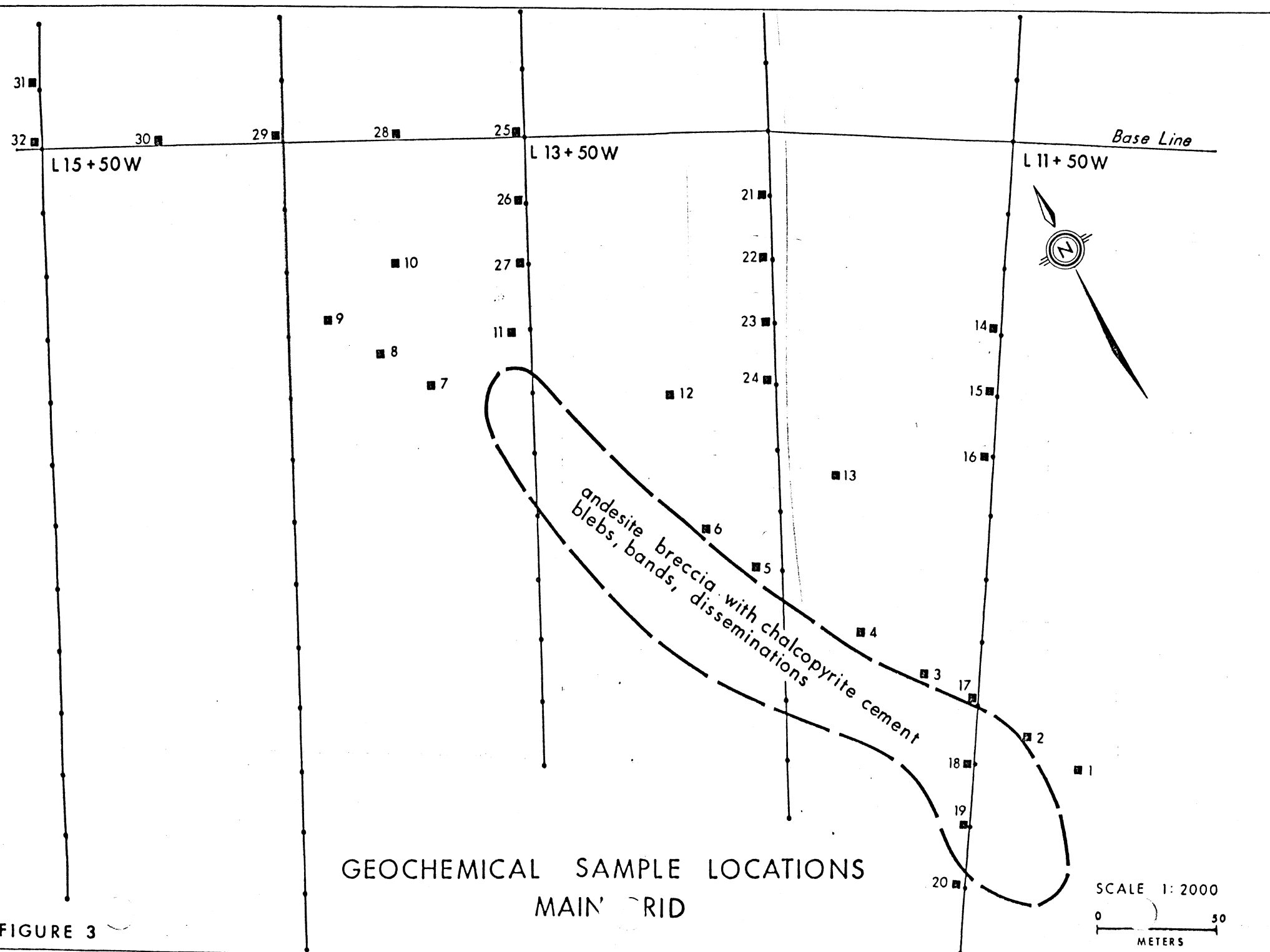
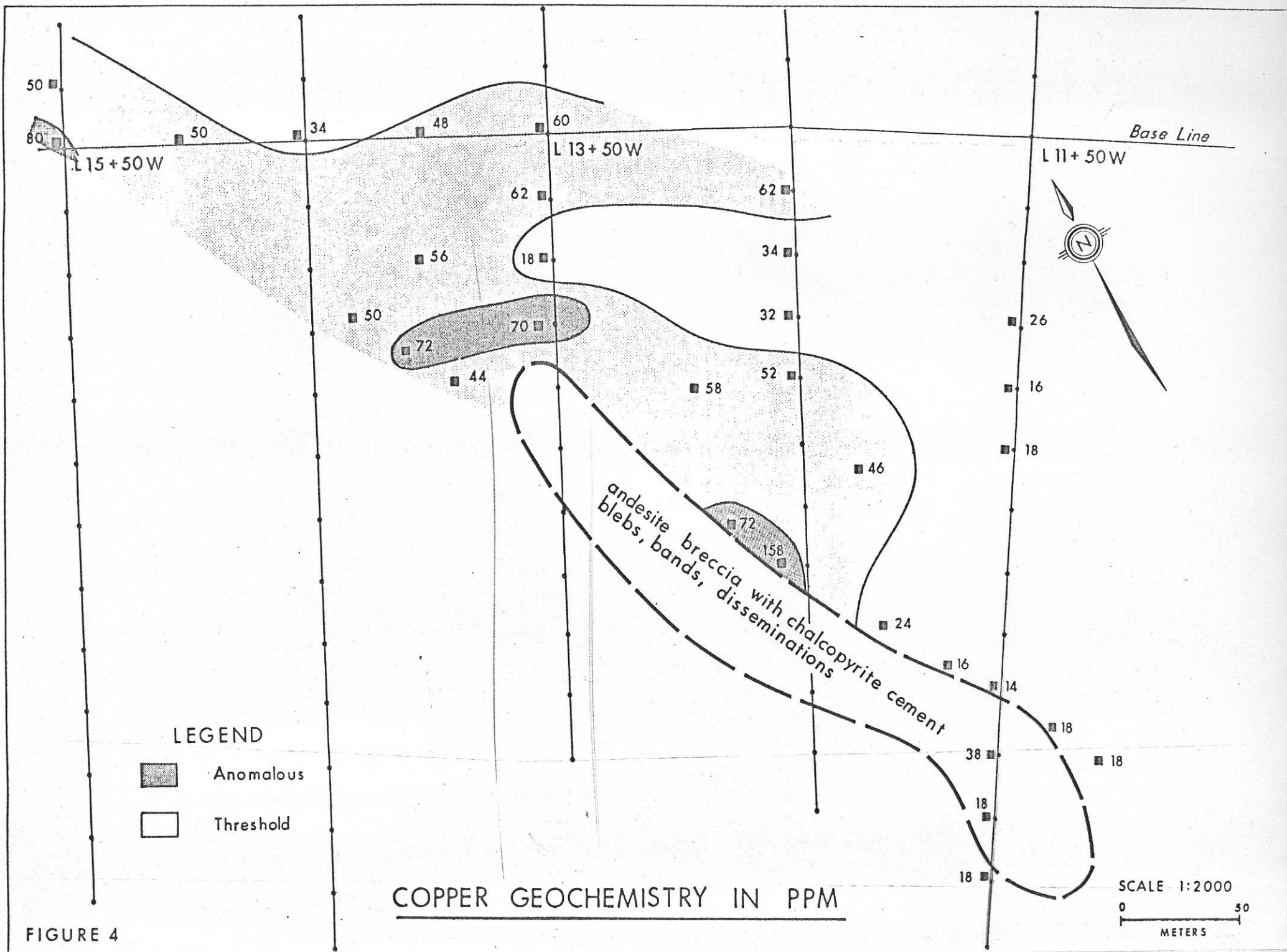


FIGURE 3



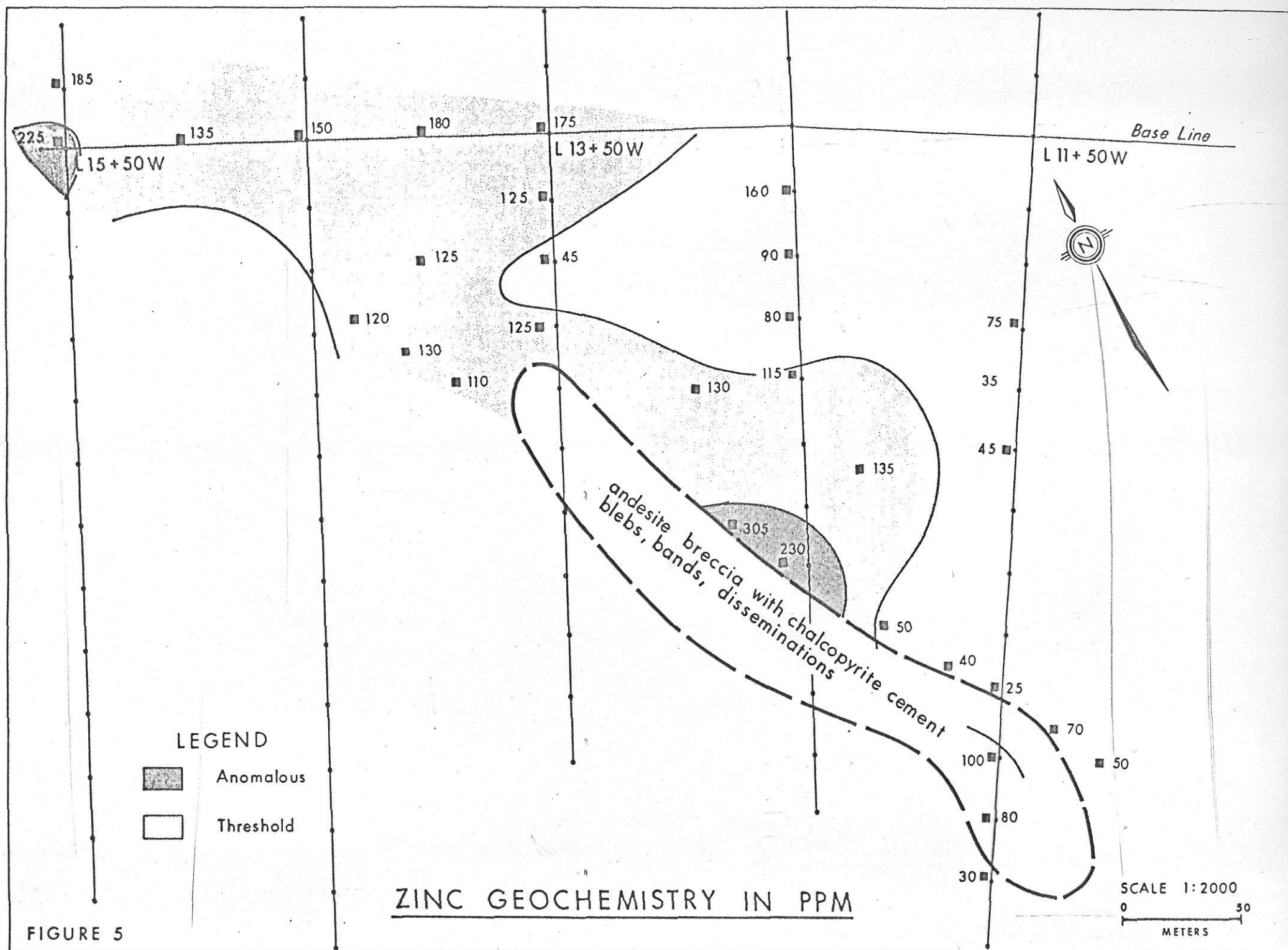


FIGURE 5

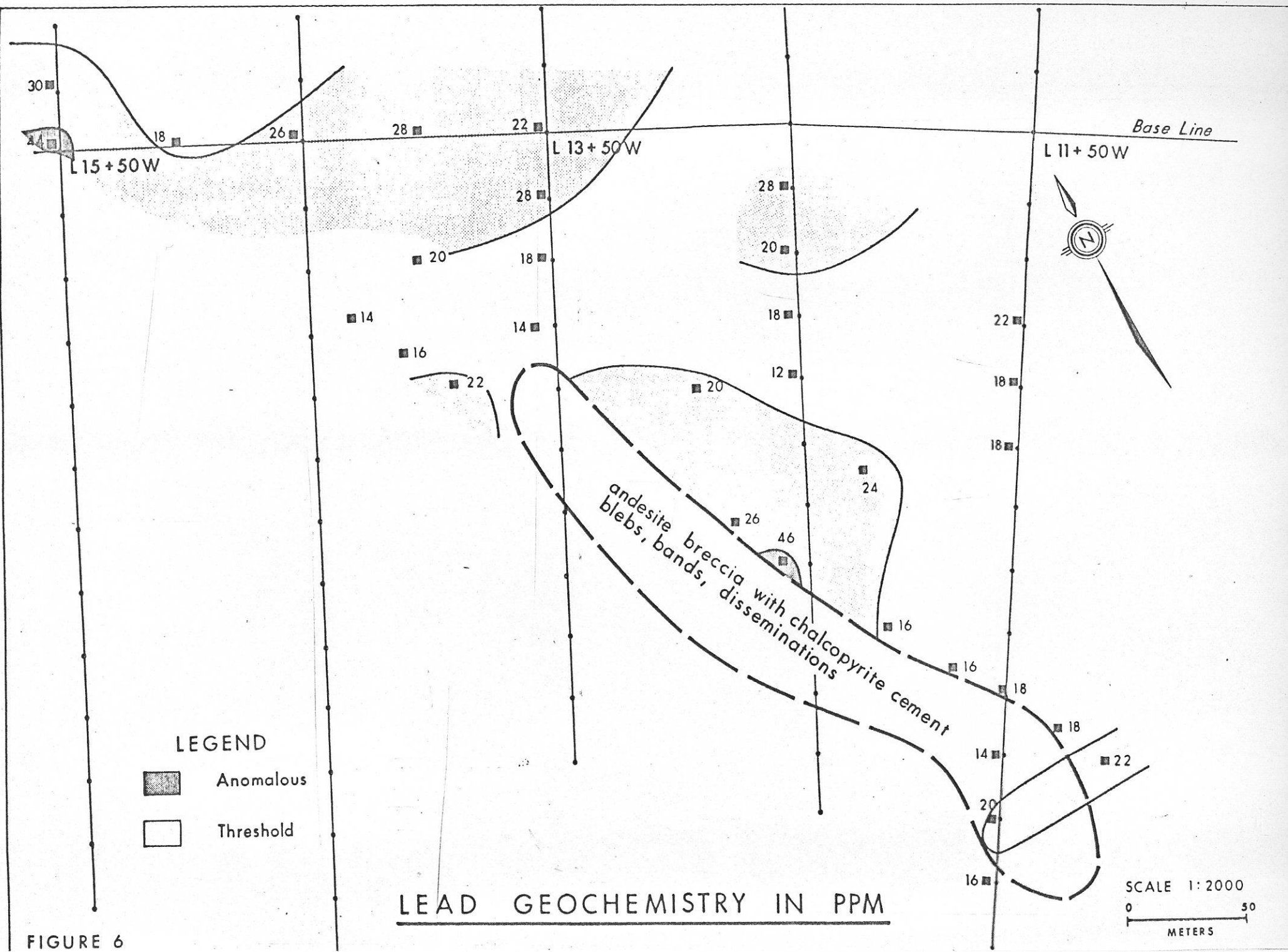


FIGURE 6

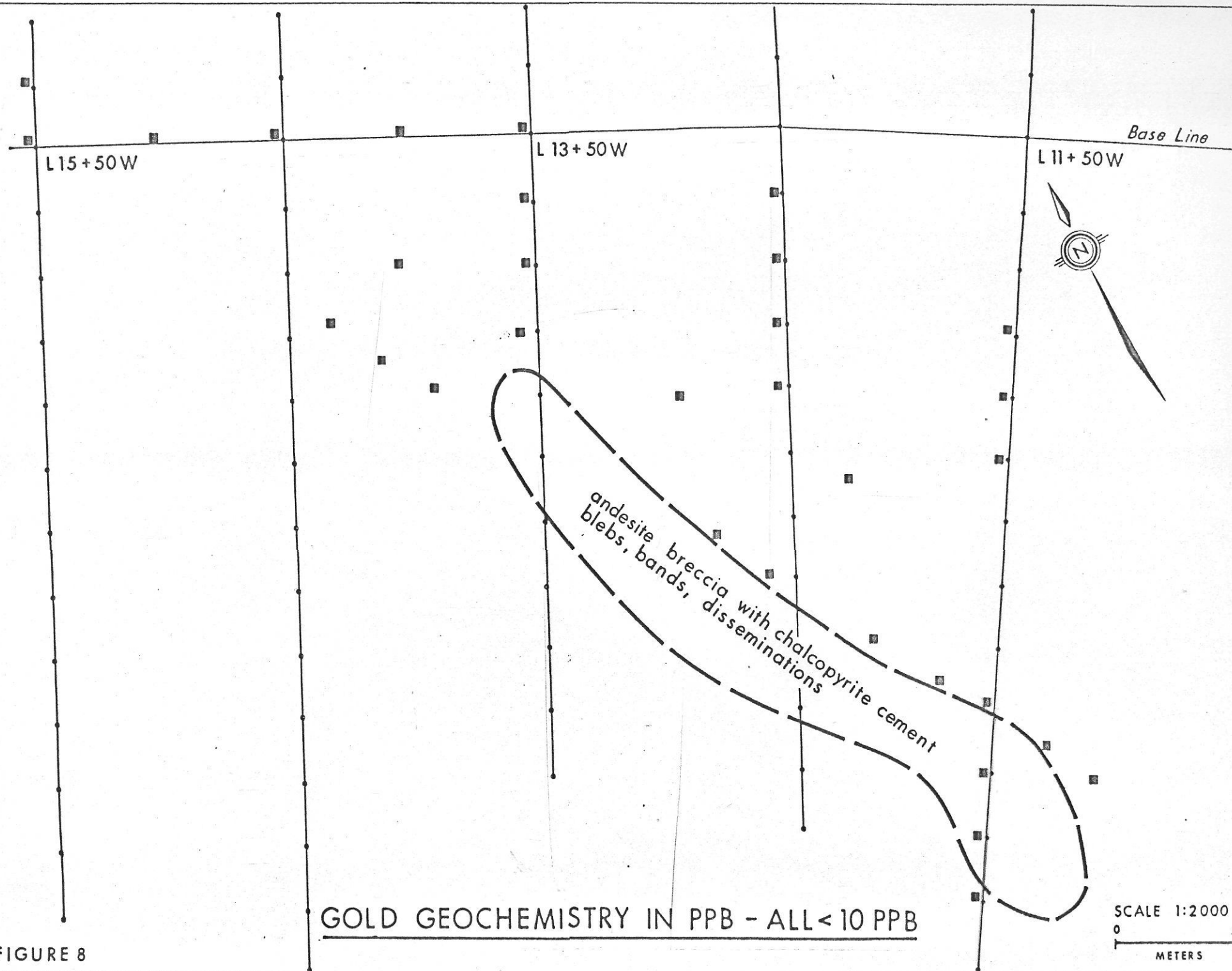
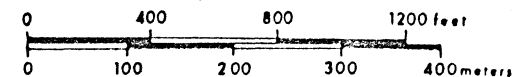


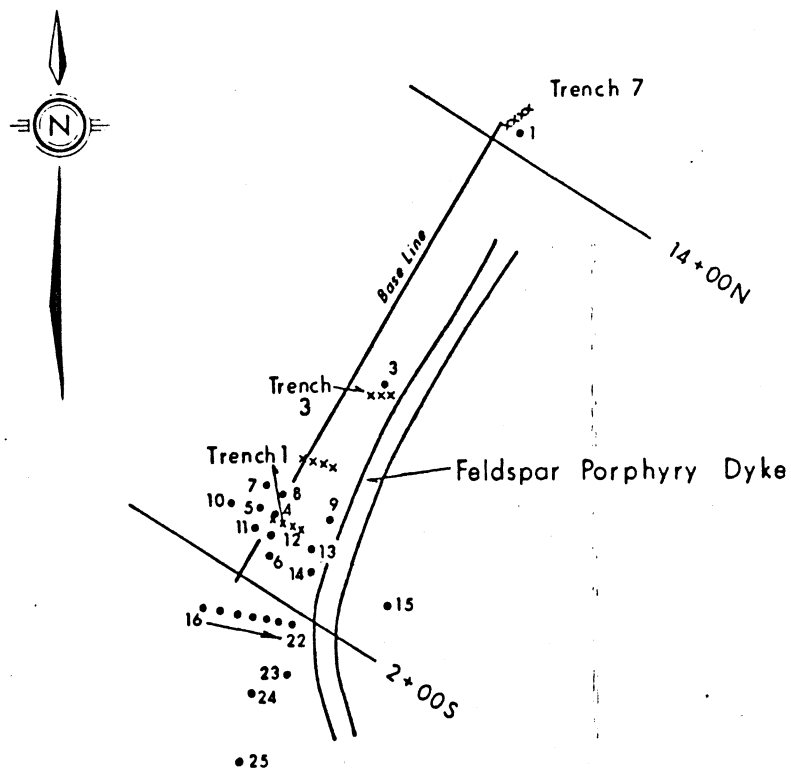
FIGURE 8

SYMBOLS

- xxxx Trench
- 14 Sample location and number (prefix CK)
(After Map 2 Assessment Report 3251)



• 2



PLATEAU GEOCHEMICAL SAMPLE LOCATION

4. Geological Mapping

Approximately thirty man days were spent on geologic mapping. This work was directed primarily at the valley floor and lower reaches of the slopes. Outcrop exposures were mapped and tied to the grid, where possible, and glacial features were noted. An effort was made to map glacial trains to define the distribution of mineralized float boulders and aid the prospecting program. The reader is referred to Map number 6 for a presentation of the data accumulated and Section D for a dissertation on the geology.

Outcrop mapping in the valley floor at the south end of the grid was hoped to indicate the potential for finding mineralization on the till covered valley bottom as well as aiding in the definition of the geologic environment of the property. Because the outcrop-till interface is exposed in this region, some definition of glacial action was hoped for by this mapping.

5. Geophysical Surveys

a) Grid Work

A grid was established in the valley bottom and lines were run to the highest accessible points on the slopes. A base line was marked out at an orientation of 300 degrees and eighteen lines were put in at a 100 metre spacing along this base line. The lines were at 90 degrees to the base line and were located with the use of a turning board to alleviate magnetic deviations. Approximately 16 kilometres of lines were marked out. Stations were marked on the lines at 25 metre spacings and all lines, including the baseline were secant chained. Elevations were established utilizing a known elevation point at the south end of the grid, and the secant chaining. From this work a topographic map was derived. Map 1 shows the grid location and Map 3 depicts the elevations at individual stations. Approximately thirty-four man days were expended establishing the grid.

b) Magnetometer Survey

The grid was surveyed using an MF-1 Fluxgate Magnetometer. Control stations were established to record diurnal variations. The magnetometer results are presented on Map number 5.

A long, linear magnetic anomaly was observed to occur across the length of the grid and is interpreted as a major fault zone and associated magnetite bearing dykes. The orientation of the anomaly is 325 degrees and has dimensions of 1300 metres by 100 metres. Dioritic intrusives are locally exposed in the vicinity of the anomaly and are known to carry magnetite.

Magnetic low anomalies are indicated and these are briefly described as follows:

1. Between - 0 & 5W and - 4 & 50W in the vicinity of the baseline - underlain by silicified epiclastic and fragmental volcanic rocks.
2. Between - 11 & 50W and - 13 & 50W - talus area made up of quartz-feldspar porphyry and andesite debris.
3. West of - 10 & 50W and south of the baseline - underlain by blocky red and greentuff. Just to the south, off the grid, outcrops of these same units are cut by dyke swarms.

c) Electromagnetic Survey

A horizontal loop electromagnetic survey was carried out on the grid using an Apex Parameters MaxMin III E.M. system. Grant Hendrickson, a geophysicist with Aquitaine Company of Canada Ltd., supervised this work. A report by Mr. Hendrickson, detailing the geophysical survey, is located in the appendix. In addition to the main grid survey, two lines were surveyed on the plateau area in an effort to delineate known, fault controlled mineralization in that area. No conductors were located by the E.M. survey.

D. GEOLOGY

1. Regional Geology

The New Moon prospect lies in the extreme northwestern corner of the Whitesail Mapsheet (93E). Mapping by Tipper and Richards (1976) on the Smithers Map Sheet (93L) to the immediate north, indicated that the property lies within the Howson Subareal Facies of the Telkwa Formation of the Hazelton Group (Lower Jurassic). Initial prospecting on the New Moon prospect indicated that thin limestone beds were intercalated with the volcanics and a marine succession was implied. During the 1978 field season the property was visited by Dr. J.W.H. Monger of the Geological Survey of Canada, who sampled a limestone unit north of the baseline between lines 2 & 50W and 3 & 50W. Dr. Monger's tentative conclusion was that the limestones, some of them marls, were part of an intravolcanic sedimentary sequence likely the result of fresh water deposition related to the Telkwa Formation. Mr. Monger indicated that thin-section study would be necessary to confirm this conclusion. Waterlain tuffs are in evidence on the property, and bedded, lensial limestone or lime-mud units are exposed at several localities, indicating that shallow basins of unknown size were present at various stages in the volcanism.

Lineaments, visible on landsat imagery, prolific dyke activity, coarse pyroclastic build-up and rhyolitic laccoliths combine to strongly indicate a volcanic centre environment on the New Moon prospect.

The Hazelton volcanics, exposed in the Morice Lake area, are truncated by the Coast Plutonic Complex to the west, along which are exposed rocks of the Paleozoic Gamsby Group. (See Figure 2). Topley intrusives (176 - 206 m.y.) intrude the Hazelton volcanics and mark the "core" of the northeast trending Skeena Arch.

2. Local Geology

Maps 4 and 6 display the detailed and general geology of the New Moon prospect. Detailed mapping was only carried out on a part of the stratigraphic section near the south end of the grid with the objective of defining the geology of the overburden covered valley. Prospecting and reconnaissance mapping including a definition of glacial features was carried out on most of the property.

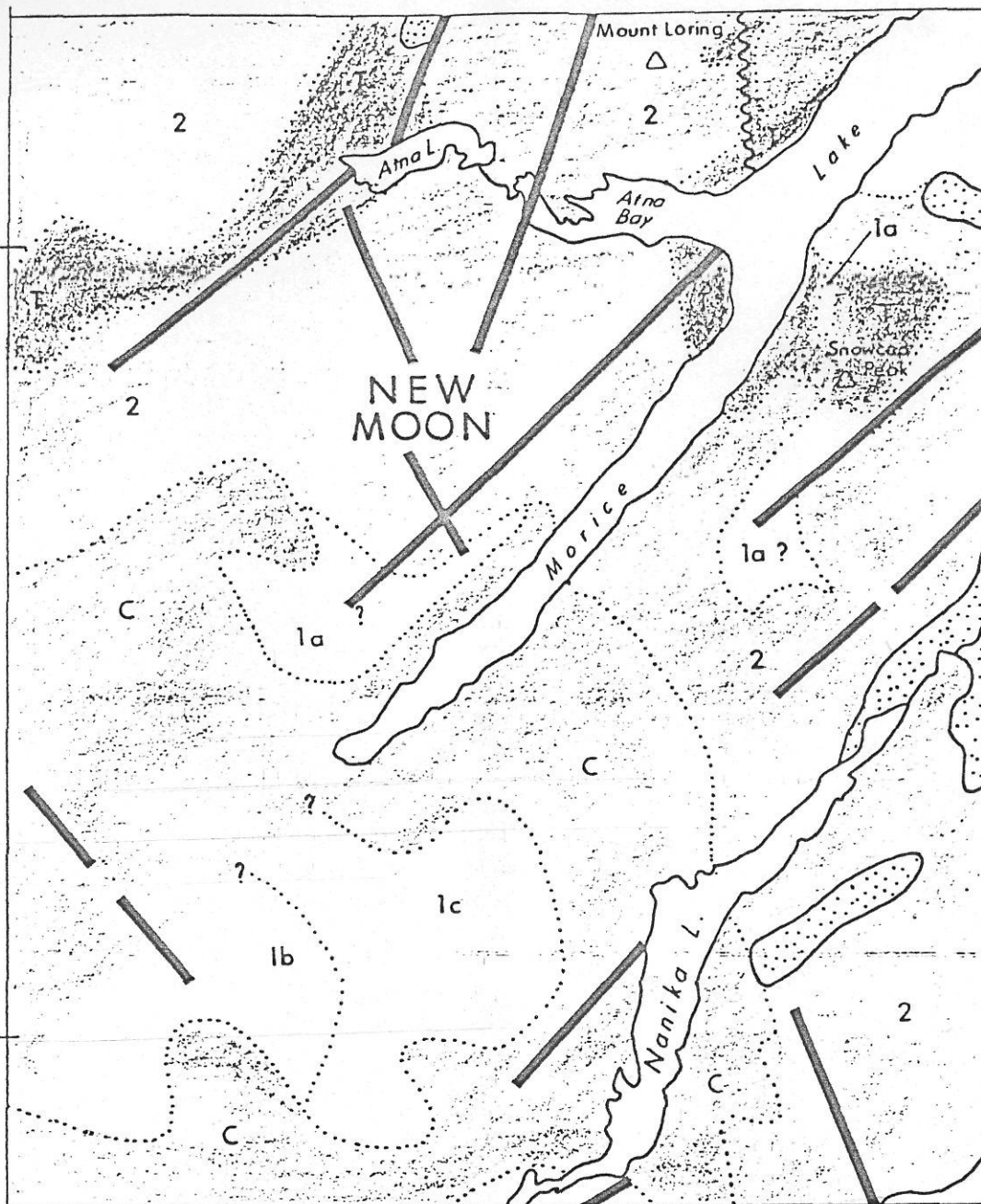
The New Moon prospect is characterized by a thick succession of volcanic flows and pyroclastic rocks in a volcanic centre environment. Local basins are defined by impure limestone and limy sedimentary units which occur interbedded with tuffs at various levels in the section. These basins are tentatively believed to be small lacustrine accumulations and no fossils have been observed in these units. The area is also characterized by intense faulting and dyke activity associated with the faulting. Rotation of small fault blocks, producing irregular local dips has been observed but bedding attitudes are generally quite regular over considerable distances. Regional deformation is evidenced by broad warping and minor drag folds can be observed in soft sediments adjacent to some faults.

As very little detailed mapping was carried out it was not possible to delineate vent areas or direction to source for the pyroclastic rocks. It is quite evident that a subaqueous environment was present and this is documented by the presence of normally graded tuffs, limestone and pillow breccias. A great variety of pyroclastic material is present and varies from thinly bedded, sorted, fine grained tuffs to heterolithologic, moderately sorted subaqueous breccias and coarse, unsorted volcanic breccias. It is apparent that subareal environments were also present during volcanism and it is likely that the source of the volcanism was subareal with both terrestrial and subaqueous deposition taking place.

128°00'

54°00'

54°45'



LEGEND

INTRUSIVES	T	Topley
	C	Coast Plutonic Complex (40-51 m.y.)
JURASSIC	2	Hazelton Gp.
	1a	Gambsy Gp.
PALEOZOIC	1b	Gneiss Complex
	1c	Tahtsa Complex

SYMBOLS

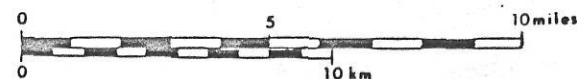
	Lineaments
	Geological contact
	Overburden



DEVELOPMENT COMPANY
OF CANADA, LTD.

FIGURE 2

GEOLOGICAL COMPILATION NEW MOON OPTION



Omineca M.D.
NTS 93E/13E+W

SCALE 1:250,000

T. Bojczyzyn
Sept. 1978

Compositions of the rocks range from basalt to rhyolite with a predominance of andesitic material. Rhyolitic intrusive bodies cross-at the section and were observed as laccoliths in the cliffs on the south facing valley wall. These rhyolites are generally porphyritic and are light green in colour.

Dykes and dyke swarms are prolific in their occurrence and are intimately associated with the major fault zones. The dykes range from basalt to feldspar porphyry and generally show northwest and northeast orientations with steep to vertical dips.

A large quartz monzonite intrusive occurs at the southeast corner of Map 4. This body is distinctive in that a great number of mafic segregation lenses occur within the intrusive. It is believed that the intrusive was controlled in its emplacement by a large north to northwest trending fault. This fault is interpreted as coinciding with the creek fault north of the intrusive on the opposite side of the valley.

Alteration in the volcanic rocks notably consists of silicification along shear and fault zones and epidotization along dykes. Mafic constituents are often chloritized and feldspars often show moderate clay alteration in the form of kaolinitization.

3. Glaciology

The locale of the New Moon prospect is defined by a u-shaped glacial valley. In the area of the claims it is evident that two major glacial elements have defined the geomorphology of the terrain, with smaller glaciers adding to this development. The valley itself is believed to have originated through fault displacements and was subsequently eroded to its present form by glacial and fluvial action. The reader is referred to Map 2.

It is apparent that the valley was originally glaciated by a glacier formed at the northwest (highest) end of the valley and moved southeasterly. This glacier was joined by others originating on northerly facing slopes and a complex pattern of glacial and fluvial deposition arose. Just below Great Plains' camp, the lateral moraine of the large, presently existing glacier to the south, is cut by fluvial erosion of the main creek. This indicates that the major side glacier is younger than the main valley glaciation. The onlap of the terminal moraine of this side glacier on an east trending lateral moraine and terraces (kames?) of the main valley glacier also indicate this age relationship. An interesting feature is visible in the southeastern part of Map 2 where the hanging valley is occupied by the quartz monzonite intrusive. Here, lateral moraines are seen to curve inward to form a poorly developed terminal or end moraine.

Because the important float mineralization was traced to a source beneath the major side glacier in the south-central part of Map 2, a more detailed description of this feature will be given. It is easily observed that a compound cirque has formed at the head of the glacier and a large basin/bowl has developed below this. A threshold zone is marked on Map 2 and this point marks the present edge of the glacier. Here, the ice has flowed around the outcrop exposures and considerable crevassing is evident. At the threshold, the ice was estimated to be 5 to 10 metres thick and indicates the possibility of considerable thickness in the basin above. (Perhaps in excess of 75 metres). On the northwestern side of the glacier a well developed lateral moraine exists. This moraine has been cut by fluvial activity in two places, the most notable of which is in the main valley drainage. This moraine can be traced on the upslope northern side of the main valley where it merges with its end or terminal moraine. The terminal or end morrainal zone is characterized by several moraines of great lateral extent which mark regressive boundaries of the retreating glacier. Medial moraines are surprisingly well preserved except where the main creek cuts a 5 metre gouge through them. Mineralized boulders are located throughout the end and medial moraines and have been observed in the threshold zone as well. A further description of these occurrences will be discussed in the next section.

4. Mineralization

For the purpose of this report, mineral occurrences will be discussed under two categories: 1) shear zone-dyke associated mineralization and 2) float mineralization. Maps 4 and 6 should be referred to.

Shear zone and dyke mineralization is generally confined to small structurally oriented zones. The mineralization usually consists of minor amounts of chalcopryrite and malachite disseminated along shear zones and fracture surfaces or associated with thin quartz veins. Shear zone mineralization is usually less than 5 metres in length but may occur locally along structures of much greater length. Silicification is common. Alteration along shear zones usually obliterate the host rock textures and represents hydrothermal mineralogy, (quartz, chlorite, sericite, kaolinite). Dyke associated mineralization in the main creek area north of camp occurs as clots and disseminations of chalcopryrite along fractures along the edge of a chlorite rich alteration zone. The chlorite zone appears to grade into a grey-green siliceous zone. Individual hand specimens of the mineralization are quite flashy but the overall grade and size of the showing is very limited. Shear zone and dyke mineralization, although wide spread, are generally of limited extent and low grade. These mineral occurrences indicate a metal rich volcanic system but are not worthy of further work.

Float mineralization in glacial moraines in the valley floor and lower slopes is widespread but has been interpreted to have a relatively small source area. The mineralization is usually associated with a grey-white to grey-black siliceous material which is often brecciated and healed with sulphides. Metallic minerals are comprised of: chalcopryite, specularite, sphalerite, pyrite, galena, silver (unknown mineralogy), magnetite and minor gold. Epidote is a common accessory mineral. Sphalerite mineralization was noted in limy clastic rocks which are made up of recrystallized limestone and fragments of tuffs which invariably are rimmed with quartz. The sulphides generally occur as a matrix in siliceous fragmentals but may form thin discontinuous masses or veins. Pyrite-chalcopryite mineralization has been observed in a brecciated form in a fine grained matrix of quartz, epidote and altered volcanic fragments.

Mineralized float boulders are relatively easy to locate as they tend to oxidize to a red-brown hematite-rich outer covering. Younger boulders in the medial moraines are somewhat fresher looking. The float boulders were mapped in order to determine their source location and some degree of sorting was observed. This sorting may indicate a metal segregation in the source deposit as chalcopryite rich and sphalerite rich zones were defined. The greatest accumulation of float mineralization occurs in the terminal and medial moraines of the large side glacier on the north-facing slope of the valley. Map 6 outlines the variations in the dispersion of mineralization types in the moraines. The terminal moraine, oriented roughly parallel to the baseline, is divided into two zones. The eastern zone, between lines 0 & 50W and 6 & 50W, is made up of a mixture of mineralized boulders of varying metal ratios and associations. The western zone shows a segregation of chalcopryite-pyrite rich boulders. The medial moraines mapped between lines 4 & 50W and 7 & 50W show a greater segregation of mineralized boulders. The stippling indicates the degree of dispersion in these moraines. Three categories of mineralized boulders have been designated:

1. chalcopryite, specularite, magnetite.
2. chalcopryite, magnetite, minor sphalerite.
3. sphalerite, galena.

It is apparent that the segregation is likely due to a primary metal differentiation in the source (host) rock. The mineralization is genetically related and derived from a source interpreted to be located under present glacier cover. It was originally thought that two sources were possible. In addition to the glacier source, it was thought that mineralized boulders might have been scoured from the valley bottom and deposited in the terminal moraine. The electromagnetic survey failed to delineate any anomalies however, and this source was discredited.

Economic grades of mineralization are indicated by the float mineralization but the size of deposit underlying the glacier can only be guessed at. It is certain that a large volume of mineralization has been eroded out and the breadth of dispersion would indicate a sizeable source.

5. Discussion

The New Moon prospect displays a high potential for locating a volcanogenic massive sulphide deposit. A subaqueous volcanic centre environment and metallic enrichment are well documented. The problem in carrying out further exploration to locate and test the deposit is one of logistics. It is evident that the deposit underlies the glacier. Access to the glacier is severely restricted by a great number of large crevasses and ground geophysical surveys cannot be carried out. It might be possible to fly an airborne geophysical survey over the glacier but the probable thickness of the ice would inhibit good data recovery. If a survey of this sort was successful in delineating a conductive body, the logistics of drilling would entail a high cost, helicopter supported program. It is not even certain that a drilling program could successfully be completed.

It is extremely unfortunate that further work cannot be carried out on the New Moon prospect. The discovery does indicate, however, that the western edge of the Howson subareal Facies warrants further exploration activity, based upon the presence of a metalliferous, subaqueous volcanic centre regime on the New Moon prospect.

E. FINANCE1. Expenditures

The following list generally conforms to the computer data sheets but corrections have been made for salaries not yet included in those sheets.

Accommodation	\$ 720.58
Camp costs-food	\$ 1 236.49
- supplies, camp fuel and misc.	\$ 2 182.55
Fuel	\$ 46.40
Freight and shipping costs	\$ 1 375.10
Maps and publications	\$ 1 325.20
Salaries	\$ 9 041.68
Claim recording fees	\$ 40.00
Contractors and consultants	\$ 1 666.50
Geophysical Survey (Aquitaine)	\$ 2 794.00
Air Transportation - commercial	\$ 623.60
Air transportaiton - charter	\$ 7 257.77
Vehicle rentals and maintenance	\$ 685.00
Equipment rentals	\$ 796.12
Assays	\$ 343.71
Travel Expenses	\$ 1 078.18
	<hr/>
SUBTOTAL	\$ 31 212.88
OVERHEAD	\$ 1 630.56
	<hr/>
TOTAL	\$ 32 843.44

F. CONCLUSIONS

1. A subaqueous/terrestrial volcanic centre environment was defined on the New Moon prospect.
2. Mineralization was observed to be of two general types:
 - a) Shear and dyke associated copper mineralization of limited extent.
 - b) Economic grade copper, zinc, silver (lead, gold) mineralization in float occurrences traceable to a source beneath the glacier.
3. Structural implications, defined by fault activity, are important on both a regional and local sense. Regional structures are postulated to be of importance in the location of the volcanic centre; and local faults have exerted controls on dyke activity, geomorphic features and mineralization.
4. The magnetic data showed a long, linear anomaly that is interpreted to represent a structural zone with dyke and magnetite associations.
5. Electromagnetic surveys failed to delineate any conductors.

G. RECOMMENDATIONS

As previously discussed, a good potential exists for finding a volcanogenic massive sulphide deposit on the New Moon prospect. Logistical hindrances severely hamper the exploration approach and it is therefore recommended that no further work be carried out by the company.

H.

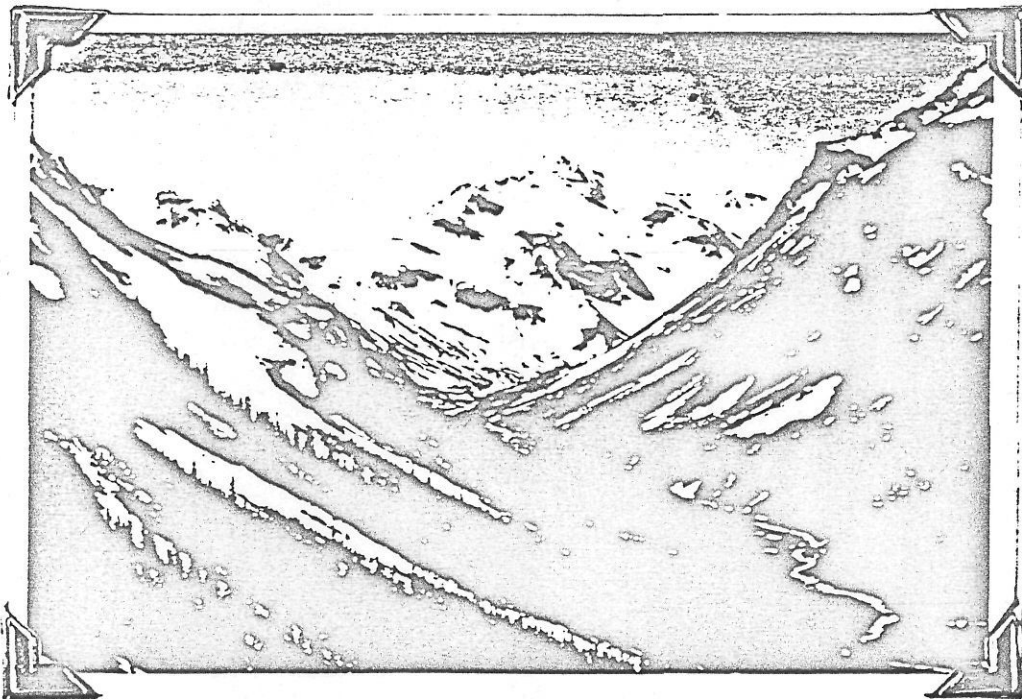
PHOTOGRAPHS

H. Photographs

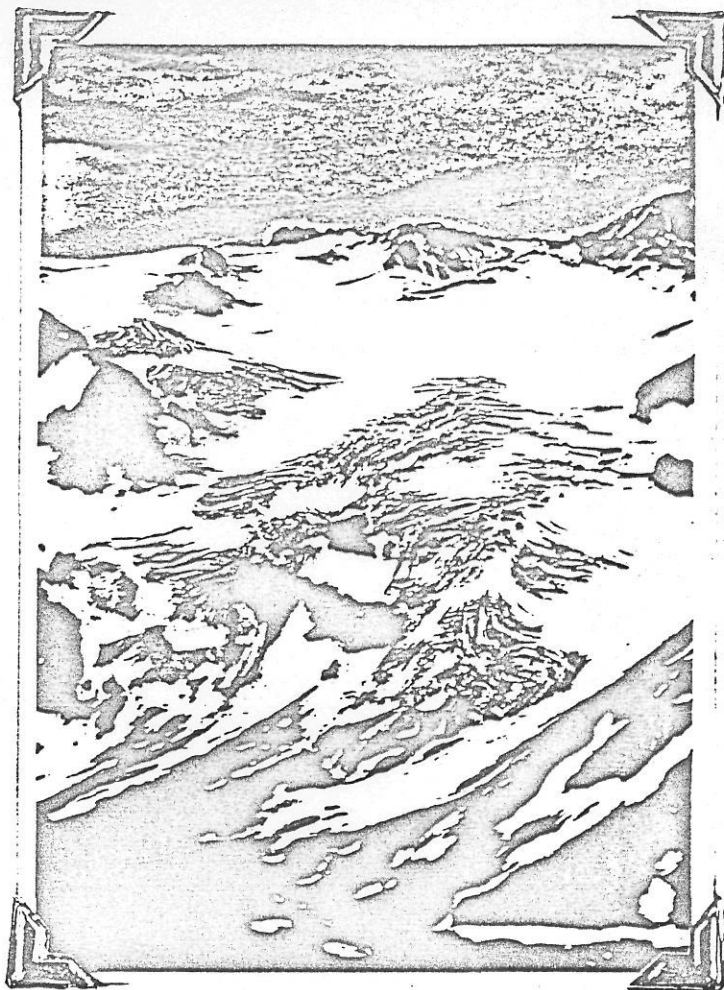
1. Snow conditions - July 23, 1978. Great Plains' camp is just below the centre of the photograph. (looking S.W.).



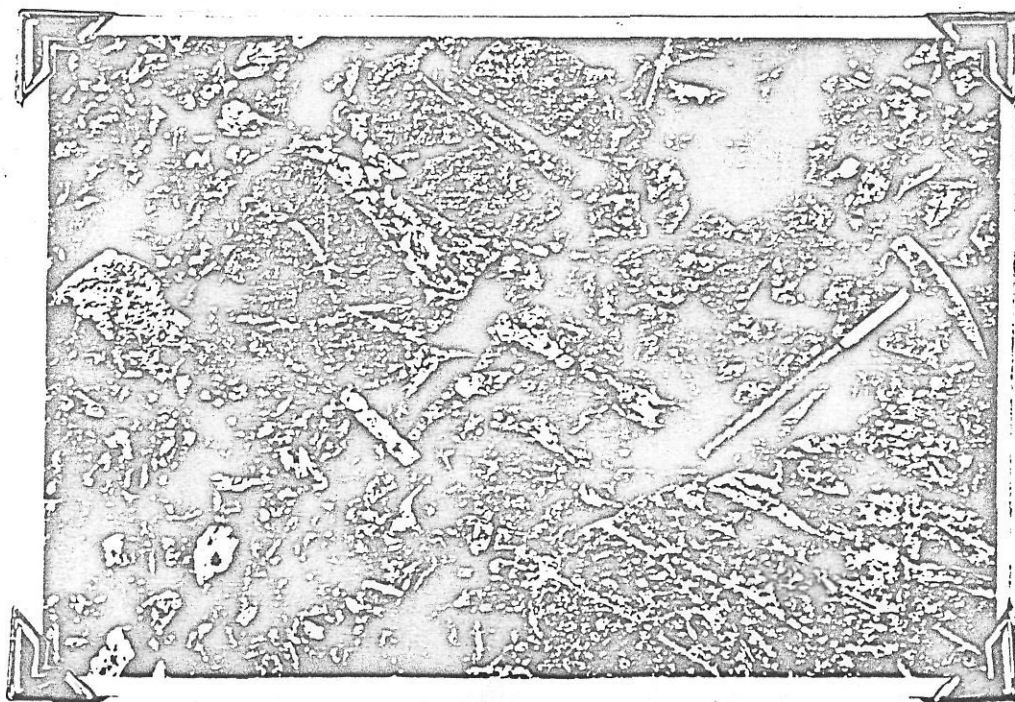
2. Approach to the property along the valley draining into Atna Bay. (looking S.W.)



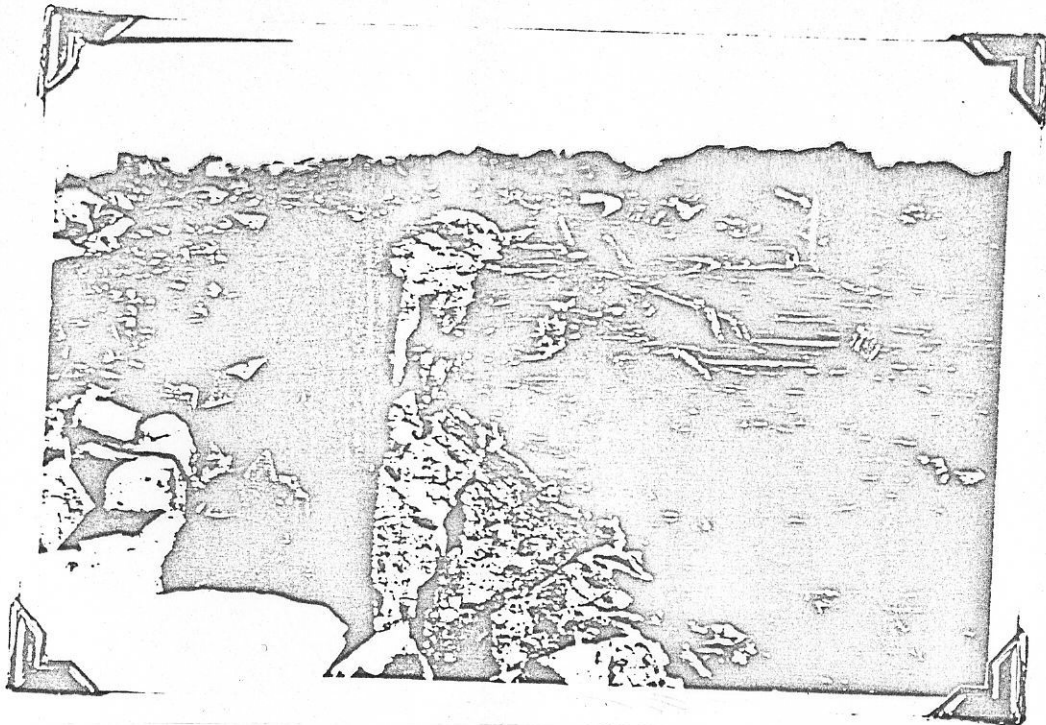
3. Glacier covering the source of mineralization. Camp is visible in the bottom right hand corner.



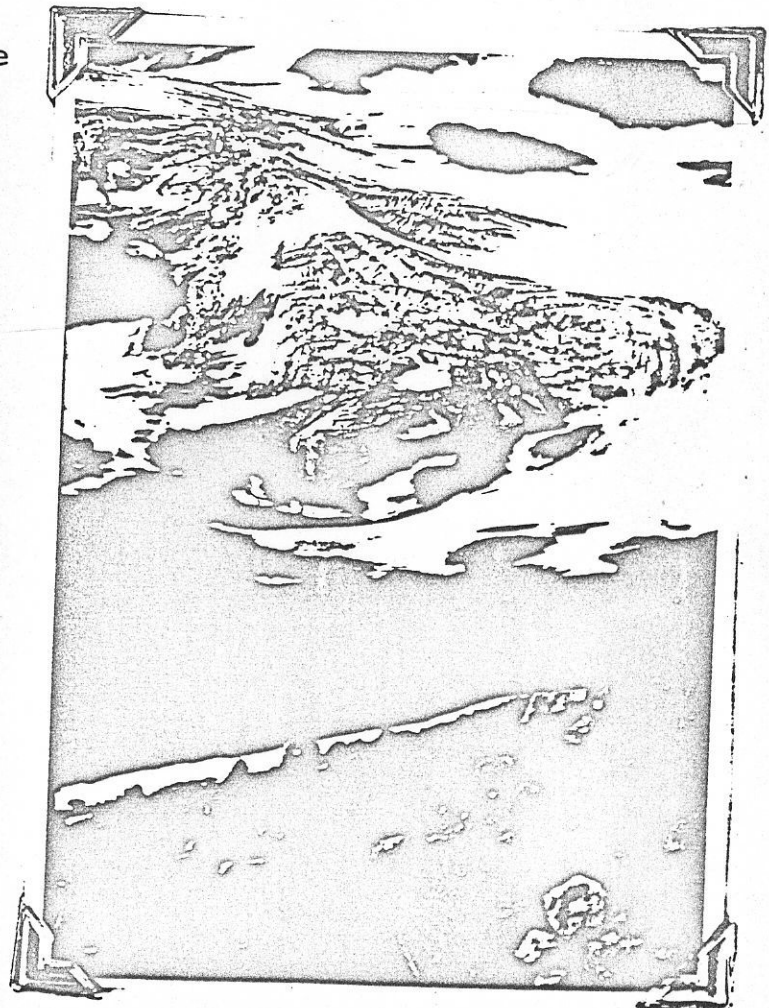
4. Quartz veining on the plateau, adjacent to mineralized zone.



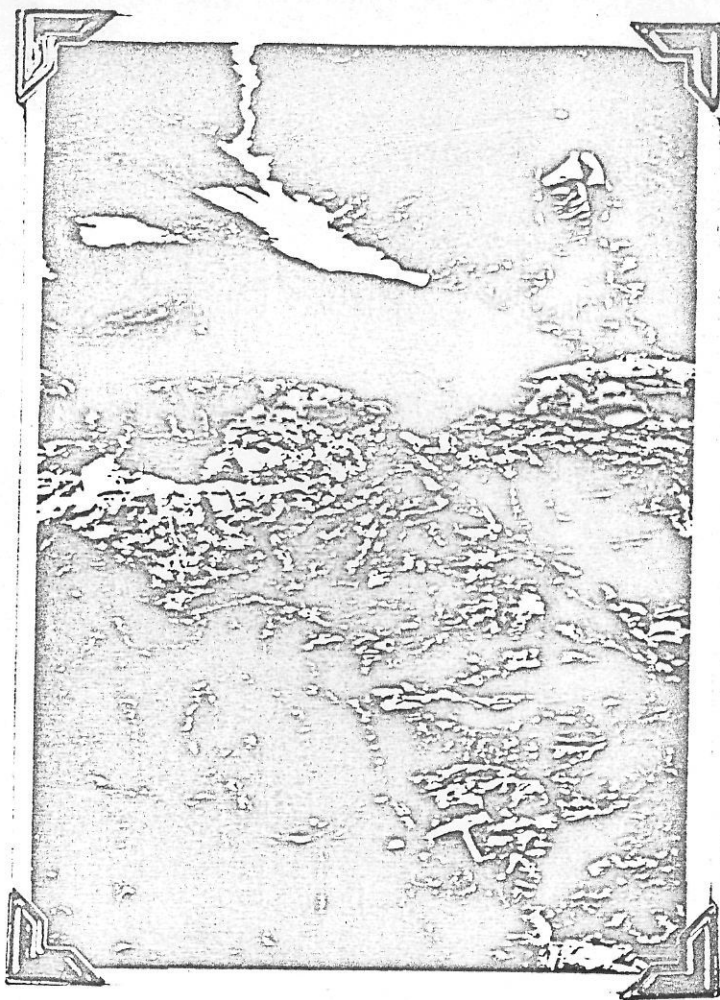
5. Dyke and feldspar porphyry intrusive cutting volcanics on the plateau.



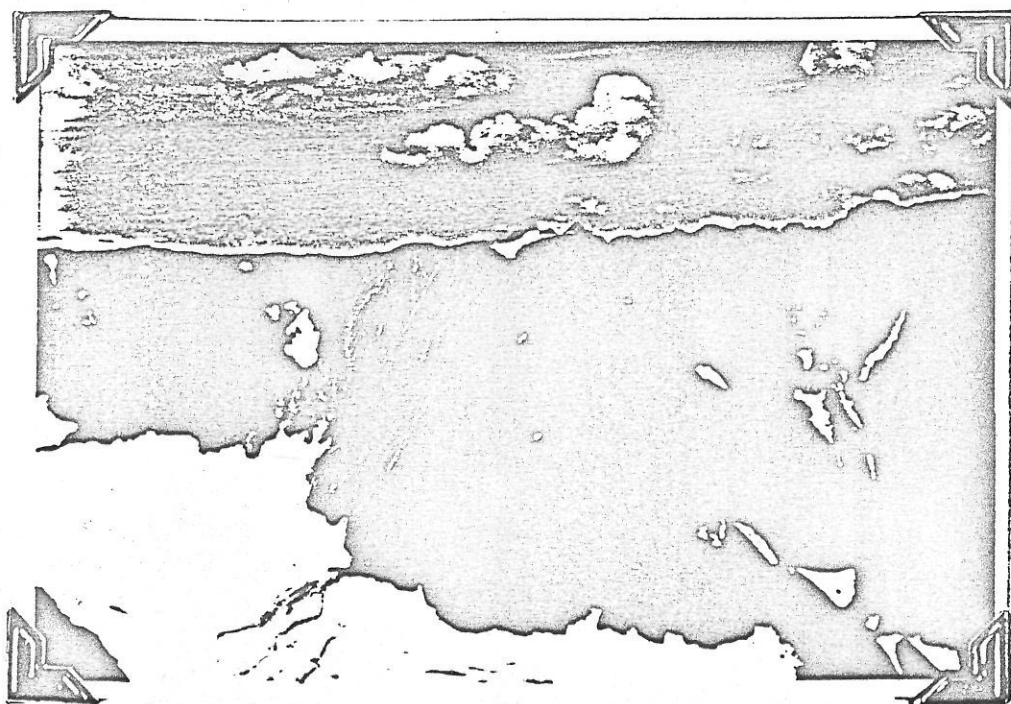
6. View of the glacier from the terminal moraine. Note fluvial channel cut through till.



7. Basalt dyke with
epidote stringers.



8. North end of the valley, looking north. Note intense,
steep dipping faults and dyke swarm cutting the section.



9. Feldspar porphyry intrusive cutting Telkwa volcanics
(W.N.W. of property).



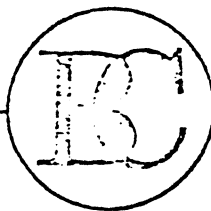
I. STATEMENT OF QUALIFICATIONS

1. I completed a B.Sc. degree program in geology at the University of British Columbia in 1972.
2. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta.
3. I have been involved in mineral exploration since 1969.
4. I spent approximately two weeks on the New Moon prospect and supervised the work documented in this report.

1978 October 05



G.L. Garratt, P. Geol.



BACON & CROWHURST LTD.

1720-1055 West Hastings Street
Vancouver 1, B.C.

REPORT

on the

DIAMOND DRILLING PROGRAM

MORICE LAKE PROPERTY

OMINECA MINING DIVISION, B.C.

for

AGGRESSIVE MINING LIMITED

by

D.W. BURNS, B.Sc., P.Eng.

Vancouver, B.C.

August 11th, 1972.

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INTRODUCTION

Bacon & Crowhurst Ltd. were retained by Aggressive Mining Limited to supervise a 1000-foot diamond drill program on Aggressive's mineral showings near Morice Lake in the Omineca Mining Division of British Columbia.

The writer, who was in charge of the work, left Vancouver July 18th, accompanied by Mr. Frank Polkosnik of Mid-West Diamond Drilling Ltd. In order to check the water availability (Dr. Bacon had previously checked snow conditions), a small helicopter was obtained that evening and, after a 55-minute flight from Houston, B.C., landed on the showings. Water was found in ample supply and, after a short reconnaissance of the exploration trenches, we returned to Houston. The diamond drill equipment arrived the following day and was trucked to the head of Morice Lake to a landing some 22 miles from the showings. The equipment and 6 men were airlifted in 14 hours by a Jet Ranger helicopter. Drilling started on the afternoon of July 21st and was completed July 31st.

In the following report, in addition to the drill results, the writer has included information on the location and access to the property. The isolated location and the climatic conditions are items that would definitely require consideration in any future plans for the property.

LOCATION

The property is located on a narrow plateau at an elevation of approximately 6500 feet, some 4000 feet above Morice Lake. This plateau, about 1000 feet wide by $1\frac{1}{2}$ miles long, is located in the central core of a very rugged mountain complex, some 8 miles in diameter, that borders a portion of the westerly side of Morice Lake. The northerly side of the plateau contains several small glaciers and snowfields whereas the south and east sides are bordered by a narrow, deeply incised valley. This valley is the main access fly-route to the plateau. It is occupied by a stream that flows east at the base of the plateau, then swings to a near-north direction, discharging on the south side of Atna Bay. The precipitous nature of the plateau area is demonstrated by the fact that the writer could find only one small area, just south of the trenches, in which he could safely descend to the valley floor some 800 feet below.

ACCESS

Access to the property, other than by helicopter, is from Houston, B.C., where a good Forestry road some 50 miles in length terminates at the discharge end of Morice Lake. A boat would be required to travel 15 miles down-lake and to the south side of Atna Bay. The access valley, previously mentioned, leads directly to the showings. This particular valley is timbered for about three miles with the remaining 6 miles being precipitous rock slopes and steep talus adjoining the creek bottom.

WEATHER

The Forestry Department informed the writer that a normal five feet of snow is found at the 2600 foot elevation around Morice Lake. The snowpack will obviously increase at the higher elevations towards the property. In the opinion of the writer, the untimbered slopes of the access valley will be one continuous snow-slide belt for approximately six miles.

SHOWINGS

The surface geology and pertinent details regarding the trenches have been covered by previous reports. To recap, a northerly-striking, fracture-filled quartz zone containing lead, zinc and copper mineralization has been traced by a series of trenches across a plateau. The width of fracturing is about 40-50 feet and has been traced definitely for 550 feet. The main trenches are numbered 1, 4, 5 and 3 with #3 being the most northerly trench. A snowfield obscures the continuation of the fracture zone north of #3, but a caved trench some 600 feet north of #3 and at the edge of the plateau is said to show a fractured pyritic zone. South of #1 trench, the ground drops steeply into the valley below. One trench, about 200 feet south of #1 and presently covered, showed noticeable copper stain on the dump rock.

The dip of the fractured zone is not clear. A narrow shear in trench #1 and also the general surface vein trace indicate a possible easterly dip whereas the E.M. survey suggested a westerly dip.

DIAMOND DRILLING

Five 1-5/16 inch 'BQ' drill holes, having a combined length of 1025 feet, were placed along a 450-foot length of the mineralized fracture zone. They varied in length from 163 to 287 feet. One hole was collared to the west of the trenches, while the remaining four were located to the east. The easterly holes all intersected the principal fracture zone.

No. 1 hole was collared to the west of Trench No. 1 and was drilled to test the westerly dip interpretation of the E.M. survey. The core was barren of mineralization and showed no evidence of the quartz network found in the exploration trenches.

The remaining four holes intersected the principal fractured zone and confirmed its easterly dip. They also indicated that the main structure is confined to a volcanic member that has been fractured and filled with varying amounts of quartz and calcite to produce a network structure.

There are no definite walls to the network. The main silicified zone would appear to be about 25-30 feet wide; however, scattered mineralization is found in isolated quartz veinlets up to 100 feet into the hangingwall.

Hole No. 2 intersected 17 feet of mineralized quartz veinlets in the hangingwall zone. This footage was sampled and assayed to illustrate the character of mineralization that does occur outside the main zone.

Holes 4 and 5 were the most interesting ones of the program. They were drilled from the same setup to intersect the network below No. 3 Trench. No. 4 was drilled at -45° while No. 5 was at -60° , to intersect the central portion of the network at 90 and 140 feet respectively, below the outcrop. Both holes intersected strong quartz-veining with galena and sphalerite occurring in veinlets and patches. Several sections showed 2-4 inch patches of solid lead and zinc mineralization.

SAMPLING

Mineralized core from Holes 2 and 3 was sampled on the property. The core was split - one half being returned to the core box. The ore sections from Holes 4 and 5 were sealed in their boxes and shipped to Vancouver for the inspection of Dr. W.R. Bacon. In consultation with him, the writer marked out the sections and removed the entire mineralized core for assay.

ASSAYS

The assays were performed by Chemex Labs Ltd. of North Vancouver, B.C.

Hole No. 2 indicated a weighted average assay value of 6.3% Zn, less than 1% Pb and less than $\frac{1}{2}$ oz. silver to the ton, over a true width of 25 feet. An isolated mineralized network was assayed from the hangingwall area in Hole 2 and averaged 2.2% Zn and less than 1% Pb, over 17 feet.

Hole No. 3 indicated an average assay of 4.9% Zn and 1% Pb over a probable width of 25 feet. Again, the silver values were less than 0.5 oz. to the ton.

Hole No. 4 intersected 38 feet of mineralized core; however, the quartz zone steepens in this area so that the true width is between 30-35 feet. This hole averaged 3.3% Zn, 1.5% Pb and less than 0.5 oz. silver to the ton. One eight-foot section at the footwall assayed 10.1% Zn, 3.9% Pb and 0.84 oz. silver per ton.

Hole No. 5 indicated an assay of 6.5% Zn, 2.9% Pb and less than 1 oz. silver per ton, over a core length of 54.5 feet (true width 30-35 feet). A 31.5 foot section of this core (true width 20 feet) had a weighted average of 9.4% Zn, 4.1% Pb and 0.77 oz. silver to the ton.

Gold assays run mainly trace to low with four samples out of 27 assaying .06 - 0.13 oz. per ton. Copper is a minor accessory metal and averages less than 0.20%.

SUMMARY

During the period July 18 - 31, 1972 the writer supervised a diamond drill program for Aggressive Mining Ltd. on their Morice Lake property in the Omineca Mining Division.

The purpose of the drilling was to investigate a mineralized quartz network that had been explored, in part, over a length of some 1,000 feet. The drilling was restricted to a portion of the vein that had been previously explored by four deep trenches.

Five holes were drilled for a combined total of 1,025 feet. Four of the holes intersected the easterly dipping principal zone of fracturing and indicated a width of mineralization varying from 25 - 35 feet.

Mineralization consists of sphalerite, galena, chalcopryrite and pyrite. These minerals occur as blebs, disseminations and veinlets within the quartz. Occasionally there are solid patches of 2 - 4 inches of lead and zinc mineralization.

The calculated weighted average of the drill core assays indicate values of between 5-6.5% Zn., less than 1 to 2.9% Pb. and silver less than one oz. per ton. Copper values average less than 0.20% while gold is mainly in the trace to low range.

- 8 -

CONCLUSIONS

The writer, in no way, believes that the four shallow exploration holes have told the full story on the lead-zinc mineralization on this property. These stockwork structures are good exploration targets and have provided pleasant surprises in a number of developments. The one characteristic that is disappointing at Morice Lake, however, is the consistently low silver values regardless of the lead or zinc content. In our opinion, this property must have higher values in the precious metals to compensate for its difficult location, because this prospect appears to be a low-grade base metal deposit carrying insignificant values in the precious metals.

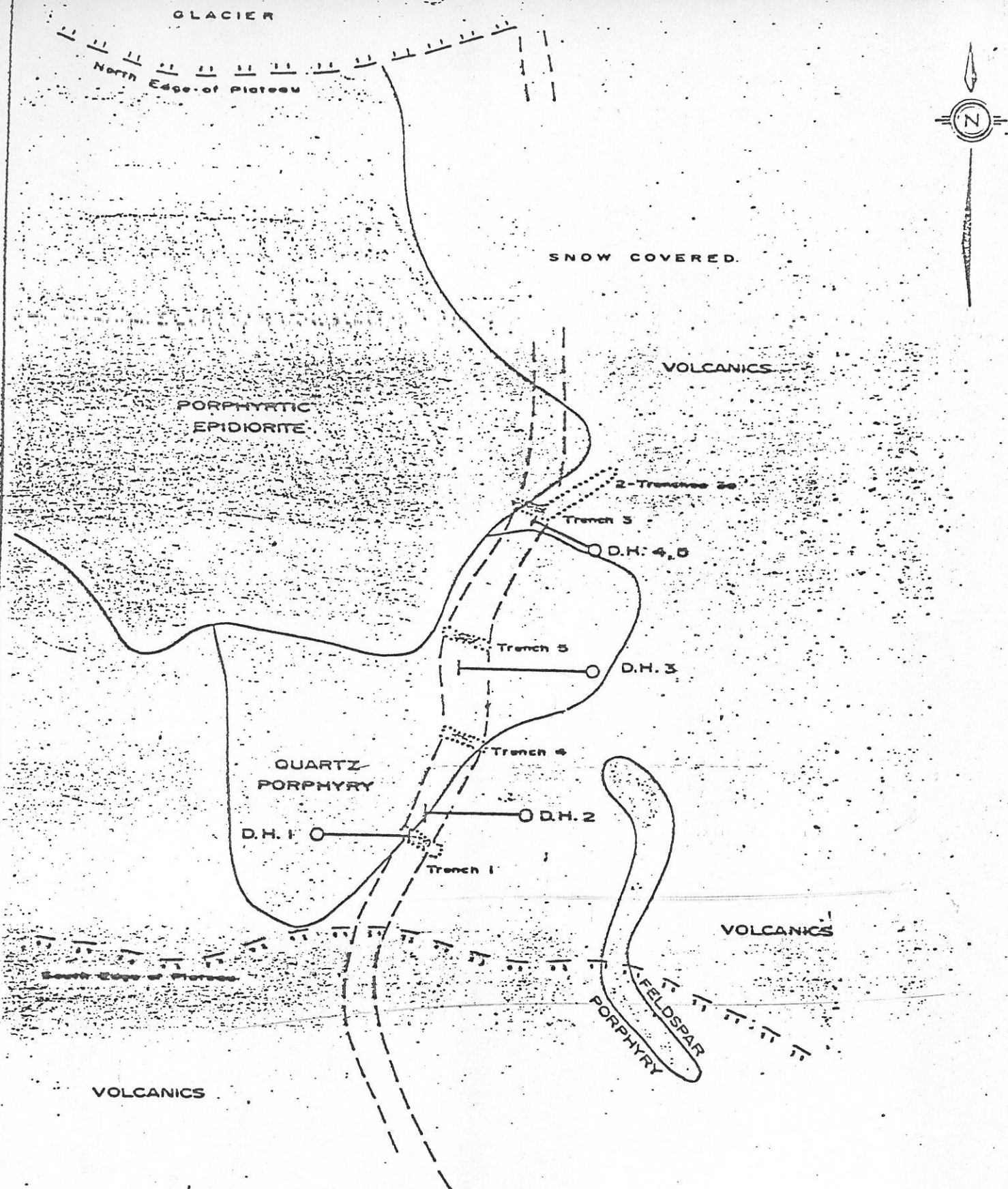
Respectfully submitted,

BACON & CROWHURST LTD.

D.W. Burns

D.W. Burns, B.Sc., P.Eng.

Cur. 0. 10 1-2-76 10 1-2-76 10 1-2-76



NOTE: Geology by Phelps Dodge Corporation

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DRILL-HOLE PLAN

OMINECA M.D., B.C.
SCALE
FEET 200 0 200 FEET

DIAMOND DRILL HOLE #1

Location	- 140' west of Trench #1	Depth	- 252.0'
Strike	- East	Recovery	- 90%
Dip	- -40°		
Start	- July 21/72		
Complete	- July 23/72		

0 - 7'	Overburden - talus rock.
7 - 40	Quartz porphyry.
40 - 68	Volcanic breccia.
68 - 73	Fine-grained dyke.
73 - 89	Volcanic breccia.
89 - 93	Tuff - red coloured and banded.
93 - 116	Volcanic breccia - red groundmass and green fragments.
116 - 140	Volcanic breccia - greenish groundmass, red fragments.
140 - 170	Purple basalt - tuffaceous 163-170
170 - 185.5	Volcanic breccia - green groundmass, red fragments.
185.5-193	Volcanic breccia - red groundmass, green fragments.
193 - 198	Fine-grained tuffaceous rock.
198 - 210	Volcanic breccia - red groundmass, red fragments.
210 - 230	Green to red volcanic breccia.
230 - 242	Quartz porphyry.
242 - 252	Red volcanic breccia.

END OF HOLE

DIAMOND DRILL HOLE #2

Location	- 50' north - 155' west of #1 Trench	Depth	- 163.0'
Strike	- West	Recovery	- +90%
Dip	- 45°		
Start	- July 24/72		
Complete	- July 26/72		

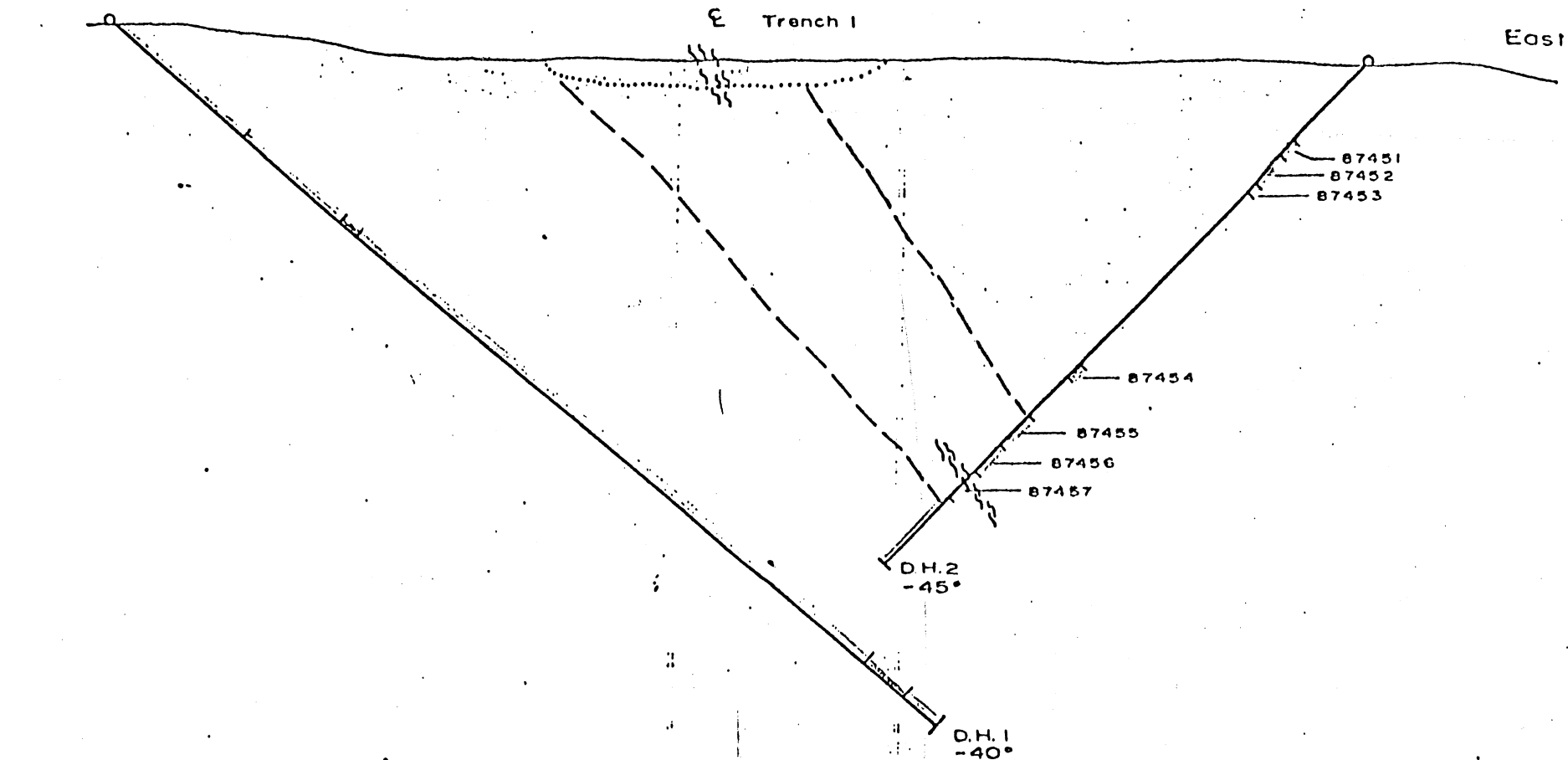
0 - 3'	Casing.
3 - 12	Purple basalt.
12 - 23	Light green volcanics - probably tuff - small $\frac{1}{2}$ " stringer of ZnS at 14'.
23 - 29	Brecciated volcanics with much quartz filling - core partly oxidized - sparse mineralization in narrow stringers PbS, ZnS.
29 - 37	Same - much quartz - sparse mineralization.
37 - 40	Same - several patches of PbS and ZnS - partly oxidized core.
40 - 47	Core solid showing some fracturing - one 4" patch of mineral at 43.0' and at 45' - one small veinlet of ZnS.
47 - 72	Massive volcanics - minor fracturing with quartz filling - mineralization sparse in the fracturing.
72 - 97	Solid volcanics - minor fracturing - one 4" patch of ZnS and chalco in quartz vein.
97 - 100	Some oxidation of the volcanics with visible mineralization - chalco, PbS and ZnS - one 2" patch of ZnS at 97.0'.
100 - 114 $\frac{1}{2}$	Fractured volcanics - fine veinlets of quartz - mineralization sparse.
114 $\frac{1}{2}$ - 124	Well fractured - chalco notable this section - PbS and ZnS scattered but weak.
124 - 133	Brecciated and quartz-filled patches and disseminations of PbS and ZnS (no veining 128-130).
133 - 140	Bleached and oxidized volcanics - medium amounts of PbS and ZnS - gouge at 137.0'.
140 - 145	Fractured volcanics - quartz-filled but sparse mineralization.
145 - 163	Definite colour change from grey fractured volcanics to red and green brecciated volcanics.

END OF HOLE

ASSAYS - D.D.H. #2

<u>Sample No.</u>	<u>Feet</u>	<u>Cu %</u>	<u>Pb %</u>	<u>Zn %</u>	<u>Au</u> <u>Oz./ton</u>	<u>Ag</u> <u>Oz./ton</u>
87451	23-29 6	0.05	0.58	1.89	* 0.003	0.12
87452	29-37 3	0.07	0.53	1.61	* 0.003	0.15
87453	37-40 3	0.10	0.36	4.55	* 0.003	0.15
Total	17.0'					
87454	97-100	1.87	0.77	6.80	*0.003	0.90
Total	3.0'					
87455	114.5-124 3	0.50	0.23	2.30	* 0.003	0.42
87456	124-133 3	0.18	0.46	5.31	* 0.003	0.30
87457	133-140 3	0.16	1.65	13.20	0.13	0.61
Total	25.5'	0.29	0.30	5.75		0.43
		28.30 = 53.28	35.24 = 4.40	51.4 = 30.72		15.00 = 2.15

* Less than



QUARTZ PORPHYRY

VOLCANICS

NOTE: D.D.H. 2 - 50 FEET NORTH OF D.D.H. 1

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 DRILL HOLE SECTION
 182
 OMINECA M.D., B.C.

SCALE
 FEET 40 0 40 FEET

DIAMOND DRILL HOLE #3

Location	- 200' east centreline trenches, 200' north #2 D.D.H.	Depth	- 287'
Strike	- West	Recovery	- +90%
Dip	- -45°		
Start	- July 27/72		
Complete	- July 28/72		

0 - 2'	Casing.
2 - 24.5	Green to reddish tuff.
24.5-51	Mainly banded light green tuff - banding indicated near flat bedding - minor pyrite disseminations.
51 - 93	Brecciated volcanics in part - sections of green-coloured andesite volcanics.
93 - 117	Brecciated volcanics - some quartz veining - sparse grains of chalcopyrite, several veinlets - up to 1" calcite. Pyrite distributed throughout.
117 - 139	Fine-grained andesitic volcanics - five small quartz and calcite stringers with PbS and ZnS and chalcopyrite - mineralization sparse.
139 - 163	Light grey fine-grained volcanics - a number of 1" quartz and calcite stringers carrying sparse chalco, PbS and ZnS.
163 - 170	Volcanics with increase in quartz-calcite stringers ½" to 2" - minor mineralization.
170 - 175	Increase in fracturing - quartz-filled - mineralization scattered.
175 - 185	Same.
185 - 187	Fine-grained, volcanic - no fracturing - no mineral.
187 - 191	Brecciated volcanics - fractured with quartz-calcite. Several stringers of ZnS and PbS.
191 - 195.5	Brecciated volcanics - broken core and oxidized in part - patchy mineralization - oxidized and shared 194-195.
195.5-217	Volcanics - fine-grained and solid core, fracturing ends at 195.5.
217 - 287	Footwall quartz-porphyry - solid core - unmineralized.

END OF HOLE :

ASSAYS - D.D.H. #3

<u>Sample No.</u>	<u>Feet</u>	<u>Cu %</u>	<u>Pb %</u>	<u>Zn %</u>	<u>Au</u> <u>Oz./ton</u>	<u>Ag</u> <u>Oz./ton</u>
87458	170-175 5	0.11	0.43	4.40	* 0.003	0.23
87459	175-185 10	0.07	0.66	2.71	* 0.003	0.22
87460	187-191 4	0.16	1.00	5.31	* 0.003	0.39
87461	191-195.5 4.5	0.26	3.35	12.30	0.033	0.82
Total	23.5'			5.1		0.37

* Less than

West

East

Trench 5

QUARTZ PORPHYRY

VOLCANICS

87458

87459

87460

87461

D.H. 3
-45°

BACON & CROWHURST LTD.

AGGRESSIVE MINING LTD.

DRILL HOLE SECTION

.3

OMINECA M.D., B.C.

SCALE

DIAMOND DRILL HOLE #4

Location	- 115' east of #3 Trench, 200' north of D.D.H. #3	Depth	- 135.0'
Strike	- N65°W	Recovery	- +90%
Dip	- -45°		
Start	- July 29/72		
Complete	- July 30/72		

0 - 45.5 Mainly banded grey to red tuff.

45.5-93 Fine-grained tuff, grey, much fractured, quartz-calcite filled - mineral sparse - few blebs of PbS noted.

93 - 98 Fractured volcanics - quartz veining increasing - scattered PbS and ZnS, considered minor.

98 - 103 Medium amount of quartz and calcite stringers - typical thin bandings of PbS and ZnS (up to 1/8" thickness).

103 - 109 Much quartz and notable calcite - similar mineralization as last section.

109 - 114 Much quartz (over 80% of core), fine blebs and thin veinlets of PbS and ZnS.

114 - 119 Same.

119 - 127 Much quartz - several 2 to 3" patches of solid PbS and ZnS.

127 - 131 Some mineralization - decreasing amount of quartz, slip at 131', bleached.

131 - 135 Much less fracturing, tuff darker and barren.

END OF HOLE

ASSAYS - D.D.H. #4

<u>Sample No.</u>	<u>Feet</u>	<u>Cu %</u>	<u>Pb %</u>	<u>Zn %</u>	<u>Au</u> <u>Oz./ton</u>	<u>Ag</u> <u>Oz./ton</u>
87462	93-98 5	.01	0.14	1.00	* 0.003	0.11
87463	98-103 5	.03	0.29	0.98	* 0.003	0.16
87464	103-109 5	.04	0.36	1.40	* 0.003	0.22
87465	109-114 5	.01	0.31	1.06	* 0.003	0.11
87466	114-119 5	.39	0.54	1.62	* 0.003	2.66
87467	119-127	.07	3.90	10.10	0.061	0.84
87468	127-131	.04	1.22	3.20	0.026	0.32
Total	38.0'					0.65

50.0

52.0

100.0

3.2

552.00

* Less than

DIAMOND DRILL HOLE #5

Location	- (at #4) 200' north D.D.H. #3.	Depth	- 188.0'
Strike	- N65°W	Recovery	- 90%
Dip	- -60°		
Start	- July 30/72		
Complete	- July 31/72		

0 - 30.5 Partly banded tuff.

30.5-80 Light-coloured tuff - minor network of quartz veinlets.

80 - 106 Same.

106 - 116.5 Fine-grained tuff, some brecciated volcanics.

116.5-124 Mainly grey tuff - several small quartz sections 2" to 3".

124 - 131 Much quartz (80% of core) with patches and blebs of PbS and ZnS. Also fine banding of PbS.

131 - 136 Same.

136 - 142 Same.

142 - 147 Same - some oxidation of seams - PbS and ZnS - fresh appearance and fine-grained.

147 - 153 Much quartz - several solid patches of PbS. General appearance is fair mineral.

153 - 161 Mainly broken and fractured volcanics - few 1" quartz sections - considered poorly mineralized.

161 - 166 Heavy quartz section - typical blebs, patches and veinlets of mineralization.

166 - 171 Same, core little more broken, oxidized along seams.

171 - 178.5 Core solid but rusty appearance, quartz vuggy - typical mineralization - possible footwall shearing at 178.5.

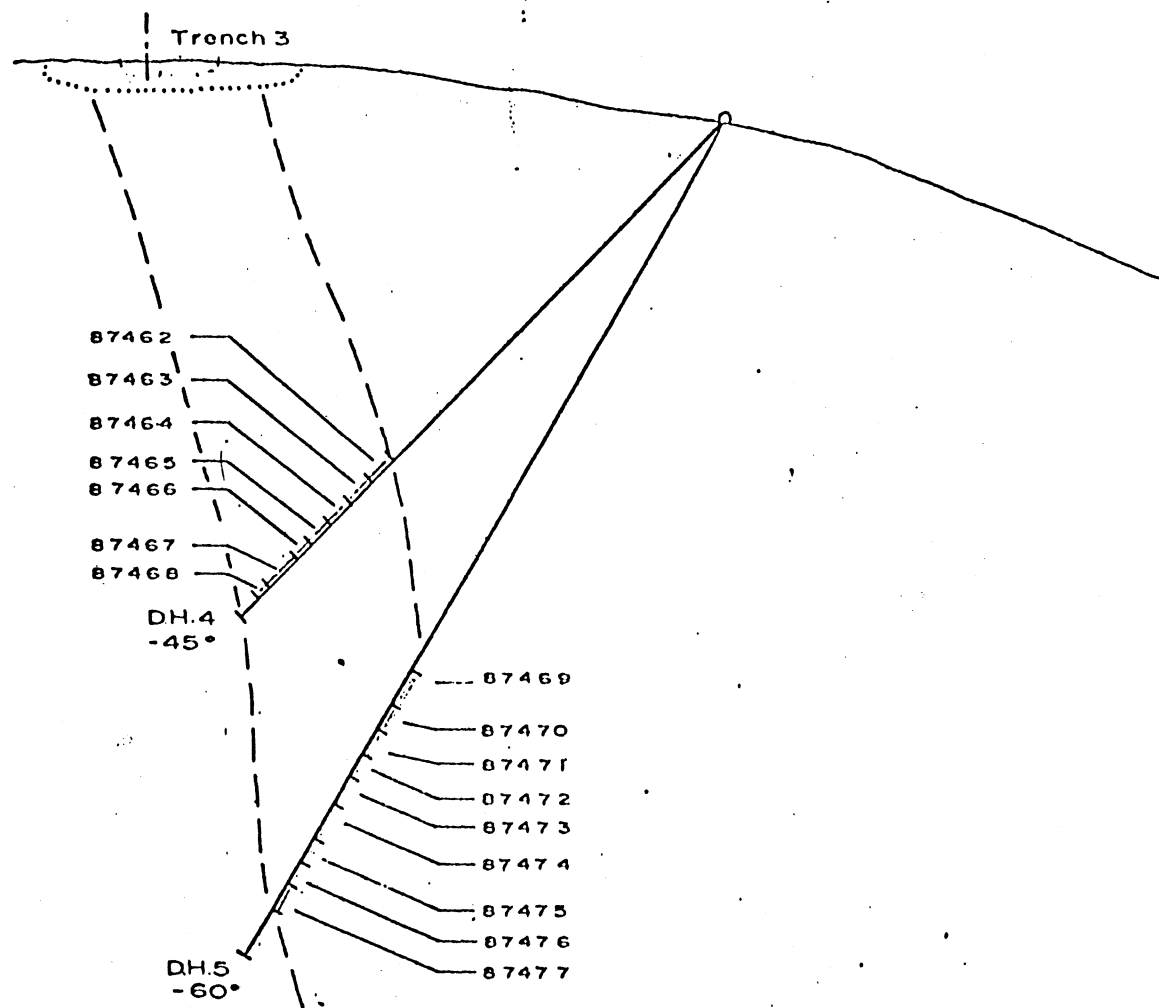
178.5 - 188 Quartz veining minor - change in colour to reddish basaltic colouring, no mineral. Considered footwall rock.

END OF HOLE

ASSAYS - D.D.H. #5

<u>Sample No.</u>	<u>Feet</u>	<u>Cu %</u>	<u>Pb %</u>	<u>Zn %</u>	<u>Au Oz./ton</u>	<u>Ag Oz./ton</u>
87469	124-131 7	0.05	2.15	4.48	* 0.003	1.02
87470	131-136 5	0.06	0.92	1.78	0.011	0.93
87471	136-142 2	0.11	0.96	3.44	* 0.003	0.34
87472	142-147 2	0.02	0.40	1.82	* 0.003	0.09
87473	147-153 2	0.21	11.00	14.00	0.078	1.60
87474	153-161 2	0.10	2.44	6.16	0.015	0.63
87475	161-166 2	0.14	4.64	7.28	0.11	0.55
87476	166-171 5	0.35	1.68	10.70	0.024	0.54
87477	171-178.5 2.5	0.31	1.97	9.68	0.016	0.57
Total	54.5'	0.15	2.7	12.2		0.21

* Less than



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**DRILL HOLE SECTION
485**

OVINECA M.D., BC.

SCALE

FEET 40

0

40 FEET

CERTIFICATE OF QUALIFICATIONS

I, David W. Burns, of Suite 203 - 5976 Tisdall Street, City of Vancouver, Province of British Columbia, DO HEREBY CERTIFY THAT:

1. I am a graduate geological engineer from the University of British Columbia, 1944.
2. I am a member of the Association of Professional Engineers of British Columbia.
3. I have been associated with exploration, property development and production in the mining profession for the past twenty-eight years.
4. This report is based on the writer's on-site supervision of the exploration from July 18th - July 31st, 1972.
5. I have no interest, directly or indirectly, in the securities of Aggressive Mining Limited, nor do I expect to acquire any such interest.

David W. Burns.

David W. Burns, B.Sc., P.Eng.

Vancouver, Canada.
August 11th, 1972.

NEW MOON
MASSIVE SULFIDE PROSPECT
OMINECA MINING DIVISION
93E/13W

Charles Kowall

NEW MOON
MASSIVE SULFIDE
PROSPECT
OMINECA MINING DIVISION
93E/13W

Charles Kowall
Geologist

Bowen Island B. C.
November 9th, 1977

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ILLUSTRATIONS

- 1) Topographic Map ($1\frac{1}{4}" = 1$ mile)
- 2) Geology and Mineral Occurences
- 3) Phelps Dodge Geological Map

SUMMARY

The New Moon massive sulfide prospect consists of 44 units and is located about 50 miles southwest of Smithers B.C. Access at present is via helicopter but if development proceeded about five miles of road could be constructed down to the shore of Morice Lake, where a barge could transport supplies up from the north end of the lake, where a good gravel road connects with the town of Houston B.C. The property is located in alpine country ranging in elevation from 4000 to 7000 feet about two miles west of Morice Lake. The property was staked by the author during October of 1977 to cover a northwesterly trending zone at least two miles in length along which occurrences of massive sulfide mineralization were found in trenches and as float in rock talus and moraine. Chalcopyrite, sphalerite, galena, bornite and pyrite occur in a complex interfingering zone of Hazelton volcanics consisting of rhyolites and andesites with limestones, all of which are locally intruded by feldspar porphyries. The rocks are often well brecciated and propylitic alteration consisting of chlorite and much epidote, which may be accompanied by silicification, is both widespread and locally intense. Faulting has also played a part in the mineralization process as some of the showings appear to be fault breccia replacements, while others show distinct banding of a syngenetic appearance particularly in cherty limestone.

The northwest part of the area was originally mapped and trenched by Phelps Dodge personnel during 1968, and this company subsequently dropped their claims shortly afterwards. During 1971 Aggressive Mining Co. (Fred Jowsey), conducted a small Crone

geophysical survey followed by a series of five diamond drill holes totaling about 1000' during the 1972 field season to test a zone of lead-zinc-silver mineralization after which they also dropped the ground.

The writer prospected the area in 1969 while working for Silver Standard Mines and additional mineralization to the southeast of the Phelps Dodge property was located mostly as float. The author staked claims and recommended a work program to his company for the following year over these new occurrences but the company did not do any further work and these claims also lapsed. The writer has always felt that the area merited further study as a massive sulfide prospect with interesting volcanogenic affinities and this interest finally resulted in the restaking of the prospects during this past October, 1977.

GEOLOGY

The property is underlain largely by Hazelton volcanics which are interfingered with beds of limestone, cherty limestone, and limestone breccias. The volcanics consist of a wide variety of rhyolites, andesites, porphyritic flows, tuffs and breccias which may represent a differentiated volcanic center. This assemblage is locally intruded by acid to basic dykes as well as small plutons of quartz porphyry, quartz monzonite, and diorite. The Hazelton rocks dip gently to the east at about 10 degrees, but locally dips increase to 20-30 degrees in the valley towards the east end of the claim block.

Lineaments which trend E-W, NE, and NW are visible on air photos and can often be traced out on the ground as systems of faults and dykes. The attitudes of the faults and dikes are usually steep to vertical.

The Hazelton volcanics and sediments are hydrothermally altered, often in a pervasive manner, consisting of much epidote and considerable chlorite and quartz. Breccia fragments often consist entirely of epidote which is thought to represent altered limestone and andesite. Most of the limey beds are located in the rough topography towards the southern end of the property where they are interbedded with andesites and tuffs. Considerable amounts of epidotized limestone is found in the cirque over the divide immediately south of the property.

Volcanics predominate on the northern half of the prospect and outcrop as a 2000' high escarpment. Between the volcanic escarpment and the area of mixed limestone and andesite to the south lies an area that is largely overburden covered

along a fairly wide valley floor.

The high plateau area at the NW end of the property was mapped by Phelps Dodge personnel however no other detailed mapping has been done.

In overview then we have a thick gently dipping assemblage of acid to basic volcanics composed of flows, tuffs, and breccias which are intruded by small quartz porphyry plutons over the northern half of the property merging to the south with an area where andesite and limestone that is often brecciated predominates. Between these two rock assemblages lies a largely overburden covered valley. This general structure suggests the possibility an island arc type of volcanic center may have existed at the edge of and intermingling with a limey marine environment. This type of structure is generally considered to be one of the classic environments for the formation of massive sulfide volcanogenic deposits.

A program of detailed mapping would shed more light on this theory and should help future exploration work to proceed on an intelligent basis.

MINERALIZATION

Several varieties of mineral assemblages have been noted across the property and are listed below as follows:

- 1) galena-sphalerite-pyrite This mineralization occurs in rhyolite, andesite and quartz porphyry on the plateau where the previous owners conducted their exploration work.
- 2) chalcopyrite-pyrite and minor galena These minerals occur in silicified, often vuggy, andesite breccia which occurs on the volcanic scarp where it is found in the talus below the slope where it is locally abundant.
- 3) chalcopyrite-pyrite This mineralization is found in brecciated but unsilicified andesite which was found as float near the campsite in the center of the valley floor.
- 4) bornite This mineral occurs as stringers and disseminations in acid tuff. Found as float in glacial moraine where it is locally abundant in an area about 100' in diameter.
- 5) chalcopyrite-pyrite-sphalerite-magnetite Occurs in cherty epidotized and chloritized breccia. Found in moraine along the west edge of the main stream where it is locally abundant over a distance of 2000'.
- 6) chalcopyrite-hematite Occurs as bands and blebs in yellowish limestone and andesite. Found as float in moraine over a distance of 1000'.
- 7) chalcopyrite-sphalerite-galena Occurs as bands and disseminations in andesite and limestone and their associated breccias.
- 8) sphalerite Metallic colored sphalerite occurs cementing silicified andesite breccia. It is also found as honey colored disseminations in brownish limestone. Found as float in the glacial moraines.

9) pyrite-chalcopyrite Bands of pyrite with accessory chalcopyrite as stringers and blebs occurs in a forty foot wide zone in outcrops near the east end of the volcanic scarp

DESCRIPTION OF MINERALIZED AREAS

1) Plateau Zone This is the area worked on by previous owners. A northeast trending zone of quartz stringers (80' wide) was trenched over a distance of 500' where galena, sphalerite and pyrite carry low to moderate silver values. Ten to twenty foot wide richer zones occur within the mineralized zone that average five to fifteen per cent combined lead-zinc values and from two to ten ozs. silver and ^{also} averaging .03 oz gold. Other similarly mineralized trenches are present 700' to the north and 1200' to the southeast and may lie along the same trend. A fifty foot wide porphyry dyke parallels the zone immediately to the east.

The writer visited the trenches in 1969 and they were filled in by slumping soil but hand specimens which are well mineralized with sphalerite and galena were found around most of the cuts. In addition, five soil samples taken near the trenches assayed from 20-250 ppm. silver. This area should be geochemed on a grid to see if there is potential for the full width of the quartz stringer zone (which averages 80' in width) to carry silver and gold values. If anomalous values are encountered, this area may contain a large low grade precious metal deposit. The main 500' long zone was drilled by Aggressive Mining Co. in 1972, but results of this drilling are not known. Perhaps the drill core is still on the property.

2) Cliff Breccia Zones Immediately to the south of the Plateau Zone an E-W trending scarp drops over 2000' to the valley floor. The lower half of the slope is largely talus covered, while the upper half is composed of steep cliffs and rocky gullies where outcrops are abundant. Silicified, brecciated andesite carrying considerable chalcopryrite and malachite occurs as float over a considerable area in the talus at the base of the cliffs and it is locally quite abundant. The writer made a quick traverse over a part of this zone in 1969 and saw at least three mineralized areas which were about 50' wide and of unknown length, which were not examined thoroughly due to lack of time. Several soil samples taken across the zone showed locally very high copper values of up to 15000 ppm copper.

About half way down the scarp and towards its eastern end occurs an outcrop of banded pyrite with chalcopryrite that is about forty feet in width. In 1969 the author came upon this outcrop at dusk on the last day of camp. It was a smooth, slightly rusty outcrop that was not shedding any float down slope and from which no rock samples could be easily taken. The zone appeared to lens out about 100' uphill, to extend into overburden down hill and appeared to strike to the south. An attempt was made to re-examine this outcrop during the recent staking but poor weather conditions in the form of snow and fog as well as its inexact location prevented its re-discovery.

3) Valley Camp Occurrence Several pieces of brecciated andesite float carrying considerable chalcopryite were found in 1969 near the Silver Standard camp by the author. The host rock was a dark green andesite breccia cemented with $\frac{1}{4}$ " to $\frac{1}{2}$ " seams of solid chalcopryite. Specimens of this float assayed 9.5% copper and about 2 ozs. of silver. The andesite breccia was not vuggy and silicified as is the material found on the Cliff showings one half mile to the northwest, and probably has a different origin.

4) Glacial Moraine Occurrences Most of the mineral assemblages listed in the previous section are found in boulders of float, both scattered and as distinct linear zones, on the glacial moraines covering the wide valley floor at the east end of the claims near a prominent northward trending bend in the main stream. This float is found on both sides of the stream and appears to have originated either on the ice covered cliffs to the south or from the bedrock underlying the overburden covered valley floor. The boulders are often quite numerous over distances of hundreds of feet. Unless one has a very sharp eye many of the mineralized boulders are easy to miss as a thin coating of gray glacial rock flour often covers their surfaces and apart from some iron stain they appear quite similar superficially to the nearby unmineralized boulders. Sulfide boulders were found up to three or four feet in diameter and are generally well mineralized with minerals containing copper, iron, lead, and zinc.

Most float is found after a person has spent an hour or two becoming familiar with the various rock types and areas where nothing was found initially can often be reprospected

by the same person who will then find all sorts of mineralization. As an example, the writer and his assistant were traversing over well mineralized boulders for three days before finally recognizing their potential.

An interesting aspect of the boulders is that they usually are of "ore grade" in mineral content and visually appear to carry in excess of 1% copper and or several per cent of zinc and lead. This is encouraging as the source areas should definitely carry a good grade of mineral which is generally a problem with many prospects initially. A second major concern, that of size, can only be answered by finding and exploring the deposit, however an initial favorable factor is the relative abundance of float which may be indicative of a considerable tonnage in place.

These mineral showings and float occurrences extend across the property from northwest to southeast for a distance of approximately two miles and appear to be overlain by glacial ice at either end.

RECOMMENDATIONS

A work program, probably extending over two field seasons, should be carried out in two phases as follows:

PHASE I

- 1) A geologic map should be prepared on a scale of 1"=200'. Areas of mineralization should be mapped in detail on a scale of 1"=100'.
- 2) The geologic mapping should be oriented towards understanding the possible volcanogenic relationships to areas of mineralization.
- 3) An attempt should be made to find out the results of diamond drilling conducted by Aggressive Mining Co. Perhaps the split core still remains on the property.
- 4) Consideration should be given to using airborne magnetometer or EM surveys or other geophysical methods to enable one to better understand the geological structure and controls of mineralization. In particular, the extremities of the mineralized trend extend into very rough, ice covered, mountainous terrain.
- 5) Ground geophysical surveys should be carried out along the covered trend of the mineralized occurrences in the central part of the claim group along the valley floor to search for buried extensions of the known sulfide bearing zones.
- 6) A program of soil sampling should be carried out over the Plateau and Cliff zones as well as the valley floor and the samples should be analyzed for copper, zinc, lead, gold, and silver.
- 7) Results of the geological mapping, geochemical survey.

and the geophysical surveys should be compiled and studied to ascertain if worthwhile targets exist that should be diamond drilled.

The first phase is estimated to cost in the neighborhood of fifty thousand dollars.

PHASE II

A second phase of about 3000' of diamond drilling should be implemented as a followup to a successful preliminary study. This program would cost in the neighborhood of seventy five thousand dollars.

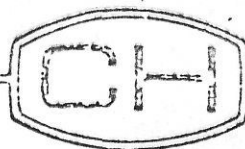
CONCLUSION

The New Moon massive sulfide prospect has several favorable features that indicate that the property is worthy of further exploration.

Mineralization occurs, both in place and as float boulders, over a distance of two miles in an interfingering assemblage of Hazelton volcanics and limestone. Only a small part of this zone has been tested by detailed work and the property is largely unexplored. The local relative abundance of well mineralized float together with the good grade of the known showings indicates the possibility that one or more orebodies of considerable size and of a relatively good grade may be found by further exploration.

A two phase program extending over two field seasons would be necessary to adequately explore the property. The first phase would essentially gather more geological, geochemical, and geophysical information. The second phase would consist of analyzing the data obtained from the first part of the program and then carrying out a diamond drill program if warranted.

The Hazelton Formation has been suspected of being a possible host for massive sulfide deposits for several years now. Several major companies have engaged in exploration programs along these lines in the Smithers-Hazelton area with this in mind. The New Moon prospect occurs in the kind of environment these companies have been searching for and is well worth pursuing with further programs of exploration. This prospect also has important implications for further prospecting in the Morice Lake area, as massive sulfide deposits often occur in clusters, and further prospecting may reveal other such occurrences in the future.



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GEOLOGICAL REPORT

ON THE

JOW CLAIMS, MORICE LAKE

OMINECA MINING DIVISION

BY

R. W. PHENDLER, B. SC., P. ENG.

FOR

AGGRESSIVE MINING LTD.

SEPTEMBER 15, 1971.

VANCOUVER, B.C.

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MAPS

FIG. 1 - LOCATION MAP - 1" = 120 MILES

FIG. 2 - GEOLOGICAL MAP OF JOW GROUP, MORICE LAKE.

APPENDIX

A. LIST OF CLAIMS

PART "A"

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS:

In June, 1971, the writer examined the Morice Lake property of Aggressive Mining Ltd., which is located at an elevation of 7000' about 50 miles southwest of Smithers in central B.C.

At that time the writer was impressed with the width and strength of the quartz veining that had been positively traced for 600' with indications along strike extending for an additional 1600', with somewhat less assurance. Although strong leaching has taken place on surface, sampling by personnel of Phelps Dodge Corporation in 1968 and the writer indicated a grade of 5% Pb., 9% Zn. and 2.0 oz. Ag. across 15.0'. Recommendations were that detailed geological mapping and an electromagnetic survey be carried out. Diamond drilling was to follow if results were favourable. Between Aug. 18 and 21, the above work was carried out and results showed that a flat lying lens-type conductor existed on only one of the cross lines, which were spaced at 200'. This gives a possible length to the zone of 200'.

It appears that the mineralization is confined to a small portion of the structure, where it crosses the south part of a quartz porphyry intrusive.

In view of the results of the electro-magnetic survey, on which a report will follow in a few days, diamond drilling is not recommended.

Respectfully submitted,

R. E. McEwen
R. E. MCEWEN, B.Sc., P.E.

R. / 100

PART "B"INTRODUCTION:

Between August 18 and August 21, 1971, the writer carried out detailed geological mapping in the vicinity of the lead-zinc silver vein on the Morice Lake property of Aggressive Mining Ltd. During this period, an electromagnetic survey was conducted by Mr. P.P. Neilson, B.Sc., of Atled Exploration Management Ltd. of Vancouver. A Crone J.E.M. two frequency electromagnetic instrument was used.

The work carried out was part of the recommendations made by the writer in his report of June 30, 1971 following an examination of the property on June 23.

LOCATION AND ACCESS:

The property is located at an elevation of 7000' about 50 miles southwest of Smithers in the Omineca Mining Division of central British Columbia. It is accessible by helicopter from Smithers or Houston in about 35 minutes. Access by land would be difficult, although a good gravel road from Houston reaches the north end of Morice Lake, a few miles from the claims. They are located at the headwaters of an unnamed creek which flows into the south side of Atna Bay.

Heavy equipment can be brought by road to Morice Lake, then by boat to a beach on Atna Bay. A helicopter would be required for the lift from the beach at 3000' up to the showings at 7000'.

PROPERTY AND OWNERSHIP:

The property consists of twenty full size mineral claims, five claims by four claims, the long dimension striking N 80° W. (Jow 1-20, Record Nos. 93844-93863).

The claims were staked on September 30, 1970 by P. Dunsford as agent for Mr. F. H. Jowsey and were recorded in Vancouver on Oct. 2, 1970.

HISTORY:

In 1967-68, claims held by Phelps-Dodge Corporation, covered the Morice Lake showings. Geological mapping, trenching and sampling was carried out. The work was done by a crew headed by Peter Curtis under the direction of Mr. R. Cunningham.

GEOLOGY AND MINERALIZATION:

The area in which the Morice Lake showings of Aggressive Mining Ltd. are located is underlain by Lower and Middle Jurassic volcanics of the Hazelton Group. These are predominantly grey and green andesitic to rhyolitic tuffs, breccias and flows with minor intercalated sediments and some reddish basalt. Minor granitic intrusives of Jurassic and Cretaceous age are also present.

Geological mapping by personnel of Phelps-Dodge Corporation showed undifferentiated tuffs and volcanics intruded by

quartz and feldspar porphyry plugs and dykes. Recent mapping by the writer showed the volcanics to be gently-dipping rhyolite and andesite with thin basaltic flows.

The mineralized zone is composed of a network of quartz stringers across an average width of 80 feet in quartz porphyry close to a contact with tuffaceous rhyolite. Although the four trenches which showed lead-zinc-silver mineralization are in a host rock of quartz porphyry, strong quartz veining continues northward into mixed andesite and rhyolite. General strike of the mineralized zone is N 30° E and observed dip is 60° to the east.

Galena, pyrite and sphalerite mineralization is scattered across the mineral zone but in most trenches appears to be concentrated in 10 - 20 foot wide richer zones. Some leaching has taken place.

The structure has been explored by four trenches (#1, 3, 4 and 5) along a strike length of 500'. To the north the quartz veining is present for 700' where a trench (#7) shows 15' of pyritic material. Eight hundred feet south of the trenches a malachite-stained pyrite zone exists (trench #8). It may be related to the principal structure although the direct extension of this structure along strike is talus covered.

The following table shows samples taken by the writer on June 23, 1971 and those taken by Phelps Dodge personnel.

at the same locations. Widths of samples could not be measured by the writer due to slumpage of trench walls.

SAMPLES BY R. W. PHENDLER

<u>Sample No.</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>Oz. Ag</u>	<u>Location</u>
1	--	5.60	13.0	0.50	200' S of Trench 1 - flat
2	--	3.35	11.0	0.35	300' S of Trench 1 - flat
3	0.72	--	--	0.32	Trench #8
4		2.68	2.50	0.41	Trench #1
5		37.0	5.40	3.65	Trench #4
6		0.85	11.5	0.93	Trench #5
-		Snow-covered			Trench #3

Composite of Samples - 0.038 oz. Au. per ton

SAMPLES BY PHELPS-DODGE

<u>Sample No.</u>	<u>% Cu.</u>	<u>% Pb.</u>	<u>% Zn.</u>	<u>Oz. Ag.</u>	<u>Location</u>	<u>Width</u>
91	0.41	--	--	0.20	Trench #8	10.0'
41:42	0.26	7.25	0.98	2.00	Trench #1	20.0'
71	0.29	5.75	--	1.52	Trench #4	8.0'
77	0.07	8.15	--	1.18	Trench #5	10.0'
50	0.18	2.55	4.00	1.72	Trench #3	20.0'
59	0.22	2.72	--	9.80	Trench #3A	10.0'
50	0.41	11.50	6.00	0.23	Trench #2	20.0'

Trench #2 lies 1200' southeast of trench #8 and appears to lie along strike. This is difficult to ascertain as the area is drift covered.

Samples taken by the writer were assayed by Chemex Labs Ltd., North Vancouver on June 29, 1971.

GEOPHYSICAL:

Poor weather conditions (continuous wet snow, rain and strong gusty wind) made the EM survey difficult. However, six lines across the mineral zone were completed. A conductor was found to exist on one line only (Line Zero) across trench #1. Anomalous conditions were found at a depth of 100' and 150' indicating a flat lying lensy conductor, possibly 70-80' below the surface. Leaching was found to extend to a depth of about 40 - 50'.

All other lines (2 + 00 S, 2 + 00 N, 4 + 00 N, 8 + 00 N, 10 + 00 N) were found to have no metallic conductors.

All lines were carried for 400' on either side of the structure except line 10. On this line, the west side could be carried only to the glacier at 3 + 00 W.

CONCLUSIONS:

It appears that the mineralized structure is confined to the intrusive quartz porphyry and only the quartz veining continues in both directions into the enclosing volcanic rocks.

RW/100

Respectfully submitted,
R. W. J. ROYER, B.Sc., P. ENG.

WEST-CENTRAL AND NORTHWEST BRITISH COLUMBIA

By T. G. Schroeter

CAPTAIN SWANNELL (93E/11W)

The Captain Swannell lead-zinc-silver prospect, owned by Clifford McNeill, is situated approximately 130 kilometres south of Smithers on the northeast slope of Swing Peak. During 1978, McNeill constructed a 7.5-kilometre caterpillar road from a landing on Tahtsa Reach to the property and constructed a camp at an elevation of 1 300 metres in the creek valley below the showings.

At an elevation of 1 500 metres, galena, sphalerite, pyrite, and smaller amounts of chalcopyrite, arsenopyrite, and tetrahedrite occur within a 3-metre-wide, 90-metre-long shear zone replacement in Kasalka Group (?) intermediate to acid porphyritic volcanic rocks. The shear zone strikes 150 degrees and dips steeply to the southwest cutting the bedding planes of the country rock which have a trend of 140/75 degrees northeast. In 1929 a tunnel about 120 metres in length was driven at an elevation of 1 470 metres to test the showing.

Above the tunnel, near the top of the mountain, a 1.5-metre quartz vein with galena, sphalerite, and abundant manganese occurs within Kaketsa Group (?) grey rhyolite.

NEW MOON (93E/13W)

The New Moon massive sulphide prospect is located 80 kilometres southwest of Smithers and west of Morice Lake. In 1968 Phelps Dodge Corporation of Canada, Limited first explored the ground and during 1971-72 Agressive Mining Ltd. conducted an electromagnetic survey and completed five diamond-drill holes to test a 150-metre-long, 25-metre-wide shear zone which carried galena, sphalerite, and pyrite in a quartz gangue.

Over the past two years Charles Kowall found occurrences of sulphides in trenches and glacial moraines over a length of 3 kilometres.

A thick sequence (>900 metres) of Hazelton Group (Telkwa Formation) rocks, consisting of green and red andesitic to rhyolitic flows, breccias, and volcanic wackes and interfingering bands of limestone and limy chert, has been intruded by feldspar porphyry dykes and a quartz porphyry pluton to the east. The general attitude of the layered rocks is 120/10 degrees northeast. The volcanic rocks have undergone extensive chloritization and epidotization and the limestone has locally been converted to skarn. Mineralization occurs in shear zones and as distinct bands and consists of chalcopyrite, bornite, sphalerite, galena, pyrite, and specular hematite.

Four main areas of mineralization have been observed:

(1) Plateau Zone

Galena, sphalerite, and pyrite occur in quartz stringers in a northeasterly trending (030/60 degrees east) zone trended over a 25-metre width and a length of 150 metres in quartz porphyry close to a contact with tuffaceous rhyolite. The results of a five-drill-hole program are not known.

(2) Cliff Breccia Zone

Chalcopyrite, pyrite, and galena occur in a silicified and brecciated andesite in an east/west fault zone immediately south of the Plateau Zone and is exposed over a vertical interval of 610 metres.

(3) Valley Camp Occurrence

Brecciated dark green andesite float with a chalcopyrite 'cement' occurs on the valley floor of the upper part of locally named Dogleg Creek.

(4) Glacial Moraine Occurrence

Scattered and distinct linear zones of massive sulphide float occur on lateral and terminal moraines at the east end of the property. Numerous boulders up to 1.5 metres in diameter with varying amounts of banded chalcopyrite-pyrite-sphalerite-galena-bornite-hematite-magnetite occur in andesite and limy chert. Local lenses of limestone crop out near the base of the succession. The origin of the mineralization is assumed to be either on the ice-covered cliffs to the south or in bedrock underlying the overburden-covered valley floor.

During 1978 Great Plains Development Company of Canada, Ltd. conducted geological, geochemical, and geophysical (ground electromagnetic) surveys on the property.

BOB CREEK (93L/7W)

The Bob Creek prospect is located approximately 12 kilometres south of Houston. During the winter and spring of 1978 DuPont of Canada Exploration Limited, under an option agreement with Mid Mountain Mining Limited, conducted geophysical, geochemical, and geological surveys and completed six diamond-drill holes, totalling approximately 425 metres, on this massive sulphide prospect.

Gold, zinc, silver, and copper values have been obtained from acid volcanic rocks associated with widespread pyritization. Mineralized acid volcanic tuffs and breccias crop out in a 610-metre-long gossan in a gorge in Bob Creek and in trenches to the west of Bob Creek. Intermediate volcanic rocks of andesitic composition crop out on the west side of the property.