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1189	
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GEOCHEMICAL, GEOPHYSICAL and GEOLOGICAL

ASSESSMENT REPORT

ON

THE PICK CLAIMS 1 - 4 and 5 Fraction

and

THE CLIFF CLAIMS 1 - 3, 7, 8, 78 and 81

NANAIMO MINING DIVISION

BRITISH COLUMBIA

N.T.S. - 92L11W and 12E

Latitude 50 37'

Longitude 127 25'

OWNER AND OPERATOR

John M. Mc Andrew, Prospector - Consulting Geologist

8961 Ursus Crescent, Surrey

British Columbia, V3V 6L3

BY

JOHN M. Mc ANDREW, P. ENGR.

Field Examination Period:

November 19 - December 14, 1987

Submitted: February 1, 1988

FILMED

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

17,029

ARIS SUMMARY SHEET

District Geologist, Victoria

Off Confidential: 89.01.06

ASSESSMENT REPORT 17029

MINING DIVISION: Nanaimo

PROPERTY: Cliff-Pick  
LOCATION: LAT 50 37 30 LONG 127 30 54  
UTM 09 5608958 605040  
NTS 092L12E 092L11W  
CLAIM(S): Pick 1-4, Pick 5 Fr., Cliff 2-3, Cliff 78  
OPERATOR(S): McAndrew, J.M.  
AUTHOR(S): McAndrew, J.M.  
REPORT YEAR: 1988, 44 Pages

COMMODITIES

SEARCHED FOR: Copper, Zinc, Lead, Silver, Gold

GEOLOGICAL

SUMMARY:

Upper Triassic Karmutsen Formation basalt and andesite flows, massive Quatsino Formation limestone, Parsons Bay Formation argillaceous and carbonaceous sedimentary rocks, and Lower Jurassic Bonanza Group andesitic flows and breccias are intruded by Jurassic-Tertiary granodiorite, diorite and andesite. Skarn mineralization containing chalcopyrite, bornite, sphalerite, galena, pyrite, magnetite and specularite occurs along limestone contacts for over 2 kilometres. The mineralization strikes northeasterly, usually has a shallow dip to the southeast and has been block faulted. Some faults may have served as channelways for mineralizing solutions.

OK  
DONE:

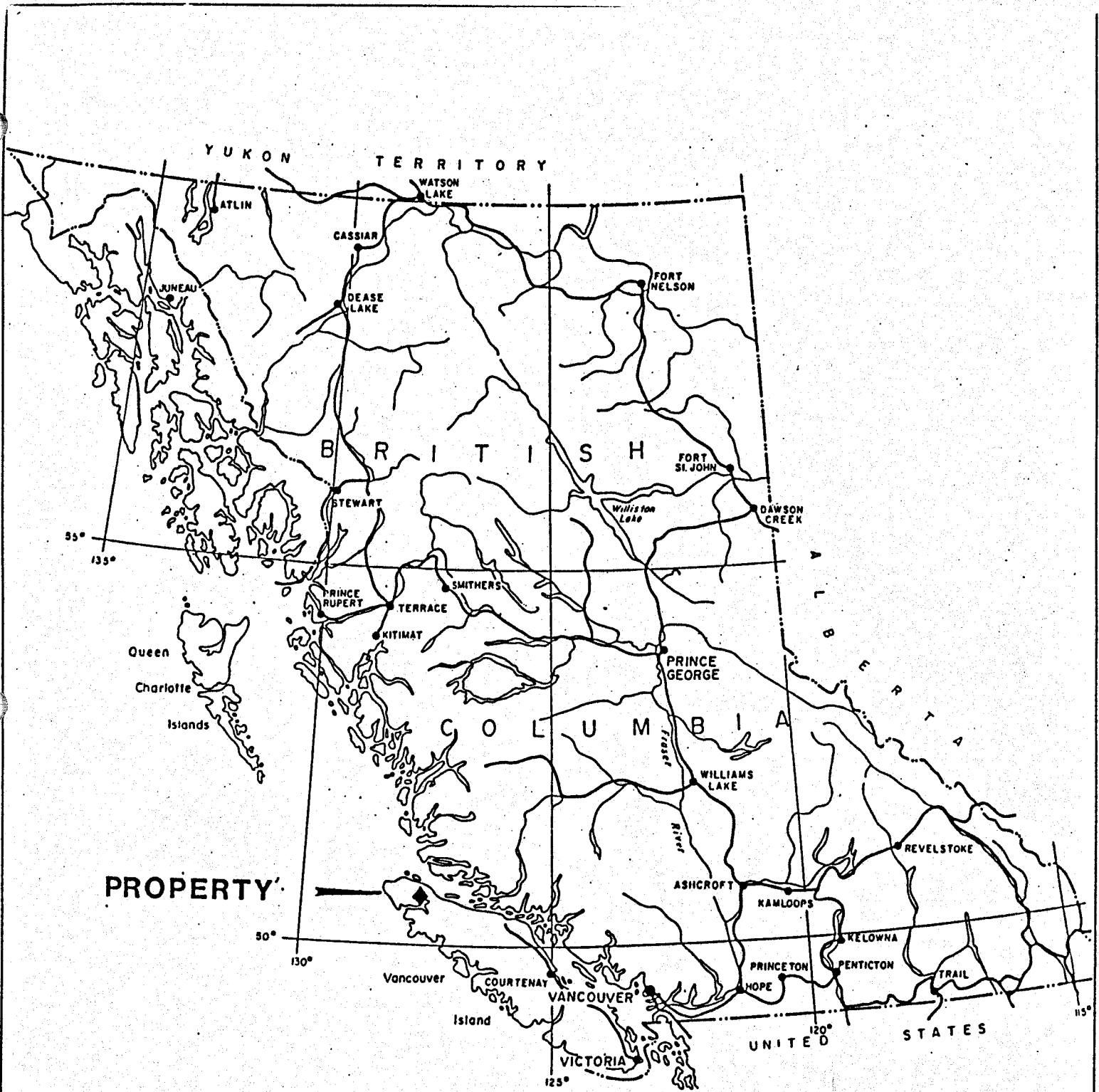
Geochemical, Geophysical, Geological  
GEOL 250.0 ha  
Map(s) - 1; Scale(s) - 1:2500  
MAGG 10.6 km  
SOIL 170 sample(s) ; CU, ZN  
Map(s) - 1; Scale(s) - 1:2500

RELATED

REPORTS: 08284, 09853

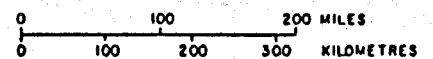
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**PICK & CLIFF**

**MINERAL CLAIMS  
PROPERTY LOCATION MAP**



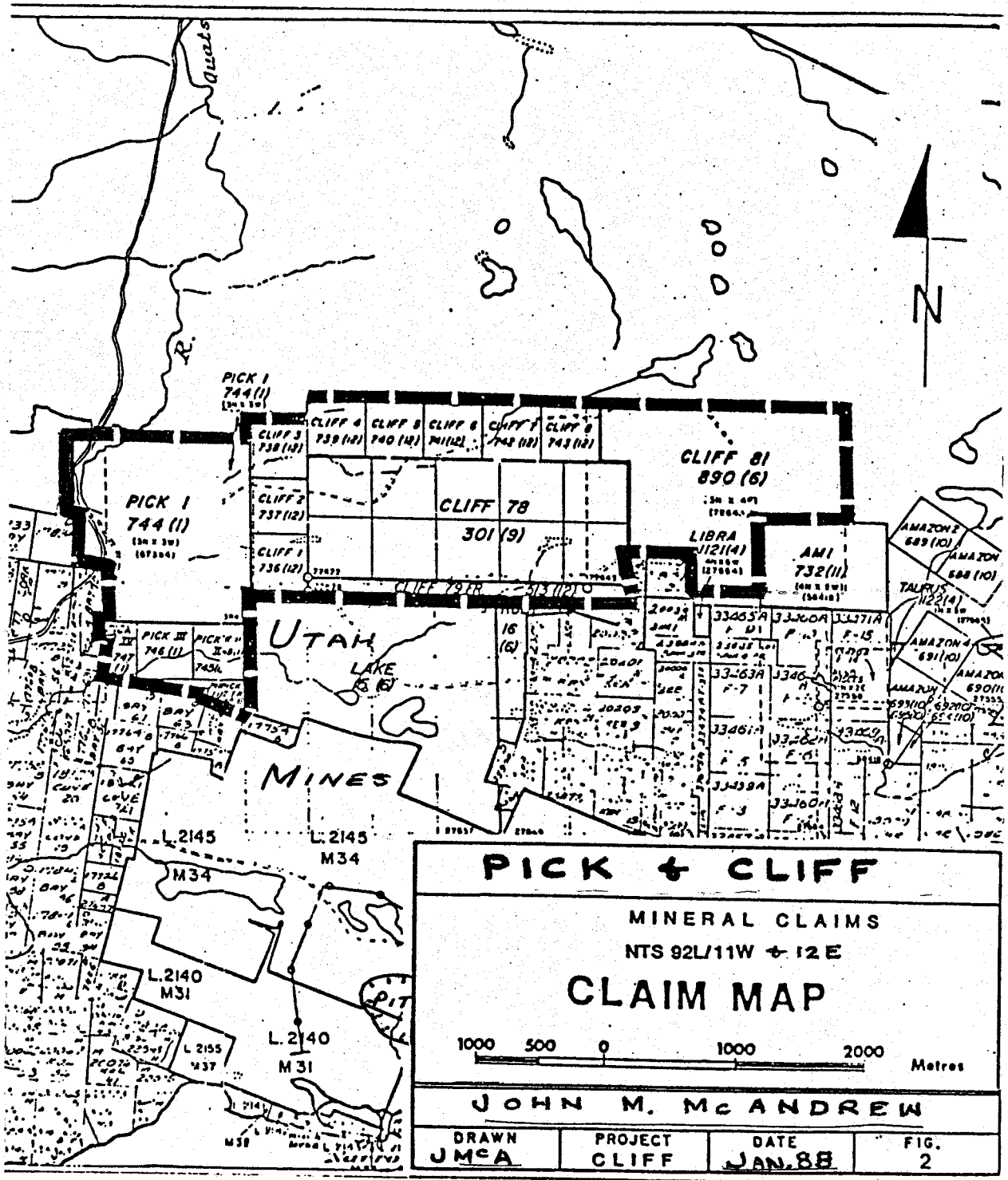
NTS 92/11W:  
+12E

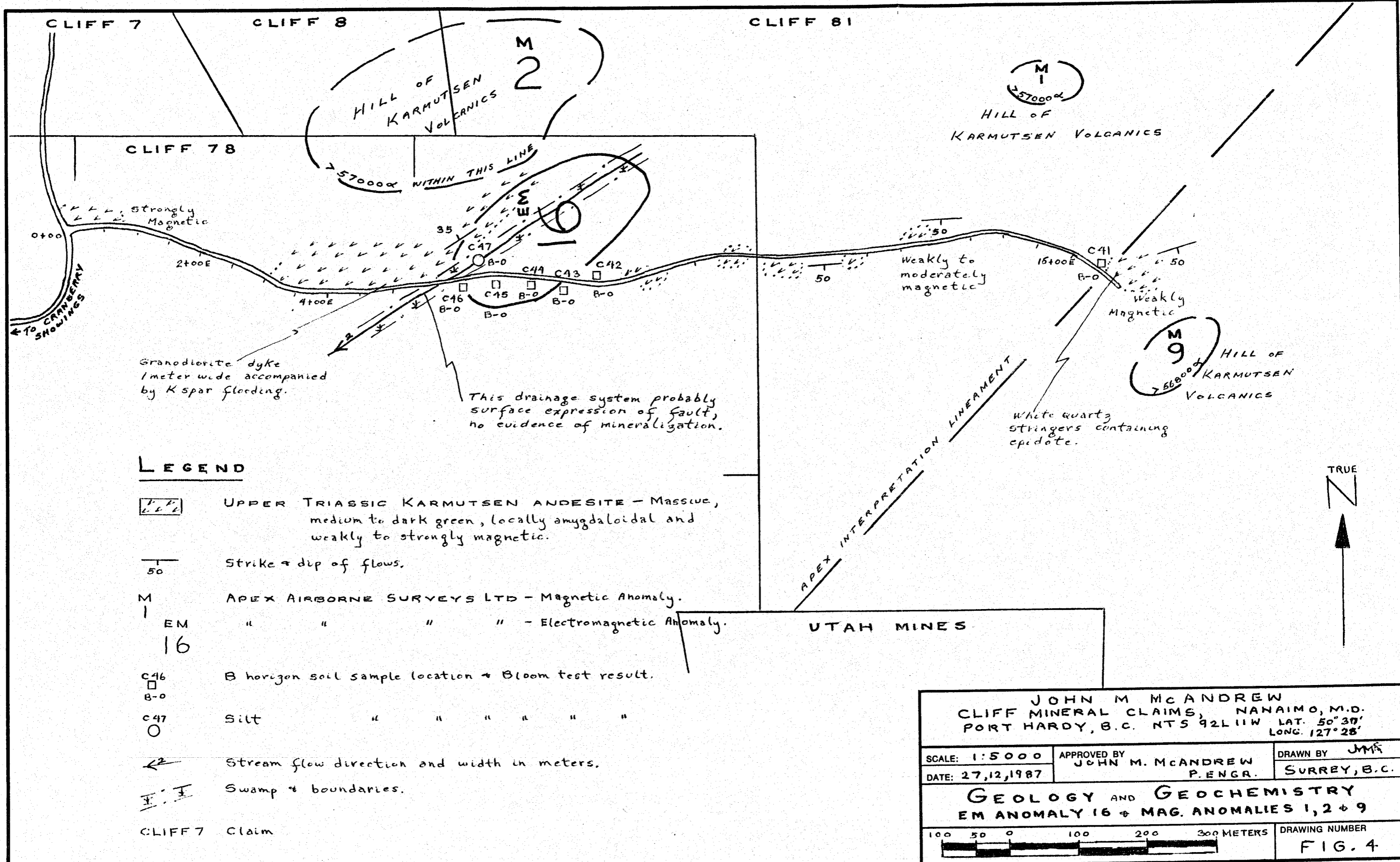
DRAWN  
JMCA

PROJECT  
CLIFF

DATE  
JAN. 88

FIG.  
1





**LEGEND**

- UPPER TRIASSIC KARMUTSEN ANDESITE - Massive, medium to dark green, locally amygdaloidal and weakly to strongly magnetic.
- Strike & dip of flows.
- APEX AIRBORNE SURVEYS LTD - Magnetic Anomaly.
- " " " " - Electromagnetic Anomaly.
- B horizon soil sample location & Bloom test result.
- Silt " " " " " "
- Stream flow direction and width in meters.
- Swamp & boundaries.
- CLIFF 7 Claim

**JOHN M McANDREW**  
 CLIFF MINERAL CLAIMS, NANAIMO, M.D.  
 PORT HARDY, B.C. NTS 92L11W LAT. 50°37' LONG. 127°28'

SCALE: 1:5000	APPROVED BY JOHN M. McANDREW P. ENGR.	DRAWN BY JMM SURREY, B.C.
DATE: 27,12,1987		
<b>GEOLOGY AND GEOCHEMISTRY</b> EM ANOMALY 16 & MAG. ANOMALIES 1, 2 & 9		
100 50 0 100 200 300 METERS		DRAWING NUMBER <b>FIG. 4</b>





CLIFF AND PICK CLAIMS	
INTERPRETATION MAP	
N.T.S. 92L 11,12	MINING DIV. NANAIMO, B.C.
LATITUDE 50°37' N	LONGITUDE 127°25' W
SCALE 1:20,000	PLATE II
INSTRUMENTATION	MAGNETOMETER G-223 ELECTROMAGNETOMETER EM-23; FREQ. 918 HERTZ
BY R. Sheldrick	DATE August, 1981
APEX AIRBORNE SURVEYS LTD.	

LEGEND

- GEOPHYSICAL LINEAMENT
- INTRUSIVE ROCKS ?
- INTERPRETED CONTACT
- CONDUCTIVE ZONE

1 2 3 4

93  
MAGNETIC ANOMALY

16  
ELECTROMAGNETIC ANOMALY

N

JOHN M. McANDREW PICK + CLIFF CLAIMS, NANAIMO, M.D. PORT HARDY, B.C. NTS 92L 11W+12E 50°37'N 127°25'W		
SCALE: 1:20000	APPROVED BY JOHN M. McANDREW P. ENGR.	DRAWN BY JMA
DATE: 5, 1, 1988		SURREY, B.C.
INDEX MAP OF APEX'S MAGNETIC + ELECTROMAGNETIC ANOMALIES		
		DRAWING NUMBER FIG. 3

## INTRODUCTION

During the period November 19 to December 14, 1987 geochemical, geophysical and geological surveys were conducted on the Pick and Cliff claims.

The purpose of these surveys was to examine specific magnetic and electromagnetic anomalies outlined by Apex Airborne Surveys Ltd in 1981, which had not been evaluated on the ground and to conduct geosurveys on Pick claims 1 - 4 and 5FR, thought to be underlain by Quatsino limestone and Bonanza volcanics and sediments, favourable hosts for mineralization in this area.

## LOCATION AND ACCESS

The Pick and Cliff claims are 9.5 kilometers due south of Port Hardy, Vancouver Island, British Columbia in the Nanaimo Mining Division ( Refer to Property Location Map Fig. 1 ).

The claims are along the north boundary of Utah Mines Ltd., currently milling 50,000 tons per day of copper - gold - molybdenum ore.

One travels on excellent paved roads to the claims where gravel logging roads provide access to all parts of the property.

## PHYSIOGRAPHY

The claims lie at elevations ranging from 60 to 320 meters.

Vegetation is typical temperate zone rain forest and once off



PHYSIOGRAPHY ( cont )

the ridge tops and logging roads the undergrowth is often so thick that traversing becomes tedious and hazardous. According to the B.C. Forestry Services, at Port Mc Neill, logging terminated " a couple of years ago " on the Pick 2 - 4 and 5FR. claims and many years ago on the rest of the property. Logging debris adds to the difficulty of traversing and is so thick in places soil samples could not be collected. Some of the second growth conifers are large enough to be used for camp construction and mining timber. Portions of the logging roads are heavily overgrown by alder.

Numerous streams, ponds and swamps provide adequate water for drilling.

Outcrops occur mainly along ridges and in the vicinity of logging roads but occasionally in major drainage systems.

Due to the lateness of the season it rained most of the time. Two days before field work terminated there were 2 inches of snow. Although working conditions would not be pleasant in the late fall and winter this area could be worked year around.

## HISTORY

For a complete history of the area now occupied by the Pick and Cliff claims the reader is referred to Mc Andrew's Assessment Report on the Cliff Claims submitted September, 1980.

Exploration in the area of the claims has been carried out intermittently since 1959. In spite of expenditures exceeding \$600,000 there are still many unexplained geochemical and geophysical anomalies and little was known about the potential of claims Cliff 81, Pick 1 - 4 and 5FR.

There have been three drilling programs. One program by Port Hardy Copper Mines, during 1963, consisted of excessive stepouts and some footwall and down dip drilling. The 1970 drilling results of Yellowknife Bear were unavailable. In the spring of 1983 Energex Minerals drilled the Swamp Showing and intersected mineralization ranging from 2 to 5.4 meters wide that assayed as high as 5.0% copper, 1.34% lead, 11.33% zinc, 2.65ounces/ton silver and 0.032ounces/ton gold. This zone remains open to the northeast and south.

Copper, silver and zinc mineralization exposed in trenches in the Rainbow and Cranberry Showings could have been selectively mined in 1979 to produce ore grading 2-4% copper, 1-2ounces/ton silver and up to 4% zinc but neither Utah or Westmin would accept custom ore.

CLAIM STATUS ( Refer to Claim Map - Fig. 2 )

The claims are owned by John M. Mc Andrew, prospector - consulting geologist, of 8961 Ursus Crescent, Surrey, British Columbia, V3V 6L3, phone: 591 - 6512.

The claims were grouped September 9, 1983.

The following tabulation describes the status of the individual claims:

<u>Claim</u>	<u>Number</u> of <u>units</u>	<u>Record Numbers</u>	<u>Expiry Date</u>
Cliff 78	10	301	September 21, 1991
Cliff 79FR.	1	513	December 19, 1991
Cliff 1 - 8	8	736 - 743	December 15, 1991
Cliff 81	12	890	June 2, 1988
Pick 1 - 4	12	744 - 747	January 9, 1990
Pick 5FR.	<u>1</u>	748	January 9, 1990
	44		

During the period November 16, 1987 to January 8, 1988 \$ 17,504.94 was spent on the Pick and Cliff claims and \$ 16,600.00 was applied to put all the Cliff claims, except 81, in good standing till 1991 and all the Pick claims in good standing till 1990.

## DETAILS OF THE SURVEYS

5

Mapping was done at a scale of 1:2500 or 1:5000. Where feasible and particularly in the case of the H 100 logging road system on Picks 1 - 4 and 5FR. stations were established along the roads and used as part of the control. Lines 28 + 00 W to 34 + 00 W at 200 meter intervals were blazed and stations established at 25 meter intervals from Branch Road 7 to Mac Millan - Bloedel's main gravel road. Stations at 12.5 and 25 meter intervals on lines from 70 to 200 meters apart were established using a topolite belt chain in the portions of Picks 1 - 4 and 5FR. where all the trees have been logged or knocked down.

A total of 170 soil and silt samples were brought in for geochemical analysis for copper and zinc. Spectrographic analysis was done on a composite of samples P 124, 134 and 147, all of which Bloom tested 10+. All soil and silt samples were field tested using a Bloom kit. Three rock chips were assayed for gold.

The total meters of line surveyed with the proton magnetometer was 10,586.

The approximate area of geological mapping would be 10 units.

The following tabulation lists the types of surveys performed on the various claims.

DETAILS OF THE SURVEYS ( contd )Schedule of Surveys on Pick, Cliff and Marie Claims

The field work for the surveys was done by John M. Mc Andrew, P. Engr. assisted by draftsman Clifford M. Mc Andrew until December 3, 1987.

Nov. 16\* Drove to Property

" 17\* Staked Cliff 87

" 18\* " Marie 87

	<u>Claims</u>	<u>Type of Survey</u>
Nov. 19	Pick 1	Geochemical Sampling, Air Mag. Anomaly 8
" 20	" "	" " " "
" 21	" "	" " " "
" 22	" 1-4, 5FR.	Geological Mapping
" 23	" " "	Geochemical Sampling
" 24	" " "	Geological Mapping
" 25	Pick 1	" " & Geochemical Sampling Air Mag. 7
" 26	" 3&4	" " " " "
" 27*	Cliff 87	" " " " " Air EM. 18
" 28*	" "	" " " " " " " "
" 29	" 7,8,78,81	" " " " " Air Mag. 1, 2 & 9, EM. 16
" 30	Pick 1	" " " Geochemical Sampling, Air Mag. 6
Dec. 1	" "	" " " " " " " 7
" 2	" 1&2	" " " " "
" 3*	Marie 87	Geochemical Sampling, Air Mag. Anomaly 4
" 4	Pick 1&2	" "
" 5	Cliff 2,3&78	" " & Geological Mapping, Air EM. 9
" 6	Pick 1,2&3	" "
" 7	" 1,3&4	" "
" 8	" 2&5FR.	" "
" 9	" 1	Geological Mapping, Air EM. Anomaly 9
" 10	" 1-4	Magnetometer Survey
" 11	" 1,2&3	" "
" 12	" 1,2,3&5FR.	" "
" 13	" 1,3&4	" "
" 14	" 2,3&5FR.	" "
" 15*	Attempted	" " , Downpour All Day
Dec. 16*	Drove to Surrey.	<u>NOTE:</u> * Days Not Applicable to Assessment.

## GEOLOGY

General - The Property lies within a series of Upper Triassic to Lower Jurassic eugeosynclinal rocks consisting of the Karmutsen and Quatsino Formations and the Bonanza Subgroup of the Vancouver Group. These rocks have been intruded by late Jurassic to Tertiary ( ? ) predominately granodiorite and diorite plutons and andesite dikes.

Rocks of the Karmutsen Formation consist largely of massive basalt, andesite flows and minor tuff. A large stock of diorite intrudes this formation in the west portion of the property.

Conformably overlying the Karmutsen is approximately 150 meters of Quatsino limestone. This slightly argillaceous, dark grey weathering, massive limestone exhibits skarnification, recrystallization to marble or silicification along granodiorite, diorite, intrusive andesite and Karmutsen contacts. Copper ( chalcopyrite, bornite ), zinc ( sphalerite ), lead ( galena ), silver, gold and magnetite mineralization commonly occurs in these skarn zones.

Structurally, this is a region of block faulting with northwesterly and northeasterly trends being the most prominent. Although the literature mentions displacements of hundreds of meters none of the faults observed on the Property to date have lateral displacements exceeding 50 meters or vertical ones exceeding 15 meters. Some faults appear to have been channelways for mineralized solutions.



## GEOLOGY ( contd )

Specific Rock Types - Since it was believed a belt of Quatsino limestone and Bonanza rocks, favourable hosts for mineralization in this area, underlies Picks 1 -4 and 5FR. geosurveys were concentrated in this portion of the claims. Dr. Ken Northcote in Fig. 13 from " Lode Metals In British Columbia, 1968 " shows an intrusive contact going through the south portion of Pick 1 and the northeast section of Pick 2. If the Quatsino limestone is intruded by this pluton mineralized deposits may occur on the Pick claims. Outcrop is very sparse in this area.

### Sedimentary Rocks

Limestone ( Specimens JM 3 & 8 ) - Quatsino limestone occurs at 4 sites on the Pick claims. It is medium to dark grey, slightly argillaceous, very fine to medium grained, locally irregular siliceous nodules stand in relief on weathered surfaces. In Little Joe Creek a 20'+ thickness strikes north 50 west and dips 20 degrees southwest.

### Volcanic Rocks

Andesite ( Specimens JM 5 & 6 ) - A medium to dark green - grey Karmutsen andesite outcrops along the logging road through claims Cliff 78 and 81 ( Refer to Fig. 4, page 9 ). It is massive, locally amygdaloidal and weakly to strongly magnetic ( as per pull on free swinging hand magnet ). Amygdules contain quartz and chlorite. Some of the chlorite amygdules contain minute disseminations of chalcopyrite and bornite as well as the host rock.

In the Pick claims 5 small outcrops of Bonanza andesite ( Specimens 1, 7 & 9 ) occur. This rock is medium to dark green, massive, competent and differs from the Karmutsen in being non magnetic.

VOLCANIC ROCKS ( contd )

Tuff ( Specimen 2 ) - A white to light tan, black banded tuff appears to cap limestone at the east end of Road 3 ( Mc Andrew's numbering ) of the Mac Millan - Bloedel H 100 logging road system in Pick 3 claim. This road occupies a prominent ridge. The black aphanitic bands up to 1 centimeter thick are probably carbonate ( recrystallized limestone relics which effervesce with 5N hydrochloric acid ). The tuff strikes north 40 degrees west and dips 45 degrees southwest.

INTRUSIVE ROCKS

Andesite ( Specimen 3A ) - A dark green, aphanitic dyke of andesite, 1 meter wide, striking north 15 east and dipping 75 degrees northwest intrudes an outcrop of limestone due west of station 4+00 south on Road 9 on Pick 1. This dyke contains disseminations and seams of pyrite along its margins; unlike similar dykes further to the northeast on the Cliff claims which contain chalcopyrite and malachite.

Quartz - diorite ( Specimen JM 4 ) - Leucocratic, fine to medium grained, equigranular, weakly to moderately magnetic, competent, generally fresh quartz - diorite outcrops along Branch Road 6 between stations 25 + 50 and 28 + 00 west.

Granodiorite ( determined by Kspar staining, Specimen JM 10 ) - Granodiorite outcrops intermittently along the access road to the Swamp Showing. It is little coloured, medium grained, moderately magnetic and fresh looking.

FLOAT - In and under the roots of overturned stumps throughout the recently logged Pick claims float of pyritic, quartz rich andesite ( dacite ? ) and porphyritic ( hornblende ) andesite was observed. Near the tuff outcrop on

FLOAT ( contd )

Road 3 siliceous, pyritic tuff float containing disseminations and seams of magnetite was collected.

STRUCTURE - Due west of the bridge over Little Joe Creek ( Road 2, Pick 3 ) a major fault ( gouge, rock flour and fragments ) strikes north 60 degrees west and dips 20 degrees south. It cuts dark green, siliceous, fractured Bonanza andesite which contains disseminations and seams of pyrite and arsenopyrite ( ? ).

The drainage system through the center of Electromagnetic Anomaly 16 ( Refer to Figures 3 and 4 ) is probably the surface expression of an underlying fault zone.

Edith Creek, which flows through the center of Electromagnetic Anomaly 9, is probably a similar situation.

The photo linears in the southwest portion of Pick 1 may represent structural breaks.

ALTERATION - Other than the pyritic and silicified nature of some of rocks on the Pick claims the scarcity of alteration minerals ie. sericite, epidote, chlorite and montmorillonite is a negative aspect of the Pick claims.

MINERALIZATION

Grab samples of the pyritic - faulted Bonanza andesite flow ( JM 1 ), magnetic tuff float ( JM 2 ) and andesite dyke ( JM 3A ) on the Pick claims were all assayed for gold and ran .01, .04 and .03 grams / tonne respectively.

## GEOCHEMICAL SURVEY

Soil and silt sampling was undertaken on the Cliff and Pick claims since from past experience it had proved effective in locating copper, zinc and lead mineralization.

Not all samples were brought in for analysis but all were field tested using a Bloom kit. Print outs describing their geochemical analysis method for copper and zinc and the procedure for using the Bloom kit to locate soluble copper, zinc and lead was supplied by Min - En Laboratories Ltd. of North Vancouver and are on the following pages.

During soil sampling an attempt was made to sample the top of the BF horizon but in swampy areas it was often necessary to take the black organic AH horizon and at some sites because of thick logging debris no sample could be obtained.

The stream sediments collected were always from the finest silt.

In Pick 4 some rather unusual samples were taken from a swampy basin of stratified dark grey, fine to coarse sand at least 6 feet thick ( as noted in the bank of Little Joe Creek ). At some sites the swamp vegetation is rooted in this sand. Prior to logging this area was occupied by cedars up to 8 feet in diameter.

The BF horizon, which ranges from 15 to 45 centimeters thick occurs at a depth of from 10 centimeters to 1 meter. It has a characteristic pale yellow to orange brown to maroon colour due to the presence of earthy limonite and hematite; locally it can contain a high percentage of clay and usually has a earthy - sandy texture.

Overburden on hills and ridges is probably less than 2 meters thick and soil samples in these areas should reflect bedrock mineralization. In valleys and swamps overburden thicknesses could exceed the upward migration limit for metal ions in this area ie. 7 meters approximately.

*MIN-EN Laboratories Ltd.**Specialists in Mineral Environments*Corner 15th Street and Bewicke  
705 WEST 15th STREET  
NORTH VANCOUVER, B.C.  
CANADAANALYTICAL PROCEDURE REPORTS FOR ASSESSMENT WORKPROCEDURES FOR Mo, Cu, Cd, Pb, Mn, Ni, Ag, Zn, As, F

Samples are processed by Min-En Laboratories Ltd., at 705 W. 15th St., North Vancouver Laboratory employing the following procedures.

After drying the samples at 95°C soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed by a jaw crusher and pulverized by ceramic plated pulverizer.

1.0 gram of the samples are digested for 6 hours with  $\text{HNO}_3$  and  $\text{HClO}_4$  mixture.

After cooling samples are diluted to standard volume. The solutions are analyzed by Atomic Absorption Spectrophotometers.

Copper, Lead, Zinc, Silver, Cadmium, Cobalt, Nickel and Manganese are analysed using the  $\text{CH}_2\text{H}_2$ -Air flame combination but the Molybdenum determination is carried out by  $\text{C}_2\text{H}_2$ - $\text{N}_2\text{O}$  gas mixture directly or indirectly (depending on the sensitivity and detection limit required) on these sample solutions.

For Arsenic analysis a suitable aliquote is taken from the above 1 gram sample solution and the test is carried out by Gutzeit method using  $\text{Ag CS}_2\text{N} (\text{C}_2\text{H}_5)_2$  as a reagent. The detection limit obtained is 1. ppm.

Fluorine analysis is carried out on a 200 milligram sample. After fusion and suitable dilutions the fluoride ion concentration in rocks or soil samples are measured quantitatively by using fluorine specific ion electrode. Detection limit of this test is 10 ppm F.

*MIN-EN Laboratories Ltd.**Specialists in Mineral Environments*Corner 15th Street and Bewicke  
705 WEST 15TH STREET  
NORTH VANCOUVER, B.C.  
CANADA V7M 1T2GEOCHEMICAL ANALYSIS PROCEDURE FOR  
Pb, Zn and Ag:

Samples are dried at 95°C. Soils and stream sediments are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis.

All rock samples are crushed by jaw crusher and pulverized by ceramic plated pulverizer.

1. 1.000 gram sample is weighed into 25x200 test tube.
2. Add 2 ml of  $\text{HNO}_3$  and let it set for 15 minutes and then add 5 ml of  $\text{HClO}_4$ .
3. Place test tubes on sandbath for 6 hours and elevate temperature to 200°C.
4. Take the test tubes off cool and dilute to 25 ml.
5. Read samples on Atomic Absorption Spectrophotometer.
6. Background correction can be carried out on Pb and Silver if it is requested.
7. Standards are digested along with each set of samples and calibrations checked.



## *MIN-EN Laboratories Ltd.*

*Specialists in Mineral Environments*

Corner 15th Street and Bewicke  
705 WEST 15TH STREET  
NORTH VANCOUVER, B.C.  
CANADA V7M 1T2

### BLOOM TEST

November, 1980.

### EXCHANGEABLE HEAVY METALS IN SEDIMENTS

### COLD AMMONIUM CITRATE TEST

#### Preparation of Field Solutions:

Stock Dithizone Solution (0.01%): with graduate measure 100 ml of Toluene into 8-oz. polyethylene screw-topped bottle, and mark bottle at this level with china marking pencil for future reference; shake in contents of one vial of dithizone; shake, wrap bottle in aluminum foil to keep out light, and allow to stand for at least 1 hour before using.

Field Dithizone Solution (0.001%): add one part of stock dithizone solution and nine parts of toluene to polyethylene wash bottle, shake to mix, wrap with aluminum foil to keep out light. These liquids may be measured in the field with one of the marked culture tubes; a supply of toluene may be carried in the field in a 32-oz. polyethylene screw-topped bottle.

Field Buffer Solution: with graduated cylinder, measure one part of 5X Buffer and four parts of metal-free water into 32-oz. polyethylene screw-topped bottle; shake to mix as needed; transfer portions of this reserve supply to polyethylene wash bottle for field use.

#### PROCEDURE:

1. Measure out one scoopful of sample, (approx 0.25 gm) leveled with spatula or pen-knife, and tap into marked culture tube.
2. Add Field Buffer Solution to 3 ml mark.
3. Add 1 ml of Field Dithizone Solution, bringing level to 4 ml mark.
4. Insert a polyethylene stopper from one of the vials into the end of the culture tube, and shake briskly fifty times (15 seconds).

5. Allow Dithizone Solution to collect at surface of liquid and observe color. If green, record 0; if blue green, record  $\frac{1}{2}$ ; if blue, record 1; if purple or red, proceed with Step 6.
6. Add 1 ml more of Field Dithizone Solution, bringing level to 5 ml mark, and shake briskly 20 times (five seconds). If color is blue, record 2; if purple or red, repeat the shake-out adding Dithizone Solution in increments of 2, 4, 4 and 4 until blue end-point is reached; record total volume of Dithizone Solution needed to reach blue end-point; if the blue end-point is over-shot, the recorded value may be interpolated.

NOTES:

1. Although this procedure does not differentiate between zinc, lead or copper, it is considerably more sensitive to zinc than to the other metals. Thus in general, a high heavy-metal value indicates a high zinc content.
2. For a 0.25 gm sample in this test, one ml of dithizone at the blue end-point is roughly equivalent to 1 part per million of exchangeable heavy metals expressed as zinc, this factor will vary with the texture of the sample and the timing of the shake-out.
3. It is important to standardize the timing of the shake-out in the procedure, as increasing the time of the sequence will give higher values.
4. Serious contamination in the course of the procedure is possible by inadvertent contact with the fingers or contaminated objects; all high values should be checked by repeating the entire procedure.
5. Dithizone solution decomposes in light to a yellow solution; this effect may be minimized by keeping all dithizone solutions in the dark, either under cover or in bottles wrapped in aluminum foil.

EQUIPMENT:

- 4 250 ml. SQUEEZE BOTTLES & CAPS (REAGENTS)
- 1 graduated cylinder 100 ml.
- 1 Deeminac
- 1 wash bottle 250 ml.
- 10 -20x150 mm culture tubes & stoppers
- 2 aluminum scoops
- 1 test tube brush
- aluminum foil

REAGENTS:

- 2x500 ml Toluene <sup>500ml</sup> (AMBER GLASS BTL)
- 1x200 ml 5X Buffer
- 3x10 mg Dithizone

GEOCHEMICAL SURVEY ( contd )EVALUATION OF APEX AIRBORNE'S ANOMALIES ( Refer to Figures 3, 4 and Map 1 )

Magnetic Anomaly 6 ( Mc Andrew's number, less than 56,700 gammas ) - M 1 a silt sample from a stream through the center of this anomaly tested zero with the Bloom kit.

Magnetic Anomaly 7 ( greater than 57,000 gammas ) - Most of this anomaly coincides with an inaccessible swamp. One line of soil samples was collected across the anomaly, only P 73 was anomalous in copper ( 135 ppm ) and it may have been salted by the anomalous stream that drains copper and zinc mineralization to the southwest on Utah's ground.

A line of soil samples through the area of the photo linears south of the aforementioned stream all Bloomed zero.

Magnetic Anomaly 8 ( greater than 57,000 gammas ) - The main portion of this anomaly ( southeast corner of Pick 1 ), as far as the author could determine, had never received any ground geosurveys, so it became part of the concentrated exploration effort on the Picks 1 - 4 and 5FR. This area lies between Branch Road 7 and Mac Millan - Bloedel's main gravel road and is occupied by a ridge, the crest of which, parallels the roads approximately half way between them. Overburden along the ridge top is probably less than 2 meters thick.

Only soil sample P 47, which ran 108 parts per million copper, was anomalous. Silt P 48 Bloomed 2 but was not anomalous in copper, although down slope from P 47. P 48 ran 80 ppm zinc, which would be considered a threshold value.

Electromagnetic Anomaly 9 ( Apex number ) - Silt samples from Edith Creek and a parallel tributary, which flow through the eastern half of this anomaly, all Bloomed zero. Samples C 48 and 53, brought in for analysis as an additional check of the tributary, were not anomalous.

Electromagnetic Anomaly 9 ( contd )

In 1968 Brett Explorations Ltd. defined 2 anomalies where soil samples range from 100 to 195 ppm copper. These lie to the north, and in part, overlie the western half of EM 9. Although unmineralized quartz - diorite occurs due south of Edith Creek, on the access road, no outcrop has been found in the area of the anomalies. This area, in part, heavily overgrown by salal.

Electromagnetic Anomaly 16 - A line of soil samples were collected across this anomaly and all Bloomed zero. The stream that flows through the center of the anomaly was thoroughly silt sampled ( 3 different sites ) with negative results.

GEOCHEMICAL RESULTS ON THE PICK 1 - 4 and 5FR. CLAIMS

( Refer to Geochemical Survey - Map 1 )

Statistical analysis of geochemical results carried out by Barringer Magenta Ltd. of Calgary for Emergex during 1981 established that samples greater than 100 parts per million copper and or zinc were anomalous on the Cliff and Pick claims. Based on this some highly anomalous samples were collected during the 1987 Survey, a description of these follows:

P 134 - 93 ppm Cu, 1250 ppm Zn - From a clay rich BF horizon in a wet depression due north of Road 3. This sample Bloom tested 10+ in the field.

P 138 & 139 - 730 & 650 ppm Zn respectively - due south of the east end of Road 3.

P 95 - 132 ppm Cu, 630 ppm Zn - due south of the east end of Road 5. In the field, the Bloom kit gave no indication that this sample or the 2 above were anomalous.

GEOCHEMICAL RESULTS ( contd )

P 147 - 65 ppm Cu, 360 ppm - clay rich BF from a wet depression, 250 meters northwest of P 134. This sample also Bloomed 10+.

P 124 & 142 - 113 & 51 ppm Cu and 255 & 330 ppm Zn respectively - organic AH and silt, from a wet gully, 230 meters southeast of P 134. These samples Bloomed 10+. AH samples, not brought in, 30 meters down and 13 meters up the gully, <sup>from P 124</sup> Bloomed 10+ and 15+ respectively.

P 120, 121, 167 & 168 - Cu 118, 58, 38 & 26 ppm, Zn 77, 305, 325 and 275 ppm - these soils and silts were collected around the east end of Road 4.

Other weakly anomalous samples are scattered throughout the claims, without knowing overburden thicknesses at the various sites it is difficult to evaluate their significance.

All the samples, except P 84, from the basin of grey, stratified sand in Pick 4 were greater than 100 ppm zinc.

All the samples, except P 53, from the stream due south of and paralleling the Mac - Blo. Road are anomalous in zinc. The stream south of Road 8 is also anomalous in zinc.

P 143 & 146 between Roads 1 & 7 ran 110 & 116 ppm copper respectively.

Silt P 52 ran 150 ppm zinc, which could be expected, since it is just downstream from zinc highs P 138 & 139. P 111, also a silt from Little Joe Creek, may indicate another zinc source further to the east.

P 118, north of Road 5, ran 134 ppm copper and 235 ppm zinc, a few other samples north of and along this road were also weakly anomalous in zinc.

MAGNETOMETER SURVEY ( Refer to Magnetometer Survey & Geology - Map 2 )

Since magnetite is often associated with copper, zinc and lead mineralization on the Cliff claims, a magnetometer survey seemed appropriate to attempt to locate similar mineralization on the Pick claims.

Type of Magnetometer - A fluxgate magnetometer was rented in Vancouver but malfunctioned the first day. Utah Mines Ltd. lent the author a Scintrex proton magnetometer Model MP - 2, model number 767010, serial number 8110784. This instrument measures the total magnetic field and it's press button digital readouts speeded up the survey.

Field Procedure - Professional engineer John M. Mc Andrew conducted the survey from December 10 to 14, 1987. Due to adverse weather conditions, rather than risk damaging the borrowed instrument, the survey was terminated December 15.

Three base stations were established at the following sites - 2 + 50 West, Road 1; 8 + 00 South, Road 2 and 29 + 00 West, Mac - Blo.'s Main gravel road. Survey loops were planned so returns to the base stations were accomplished in periods of less than 2 hours. During the survey magnetic conditions were very stable and diurnal variations minor. Corrections were treated linearly in respect to elapsed time.

Readings were taken along roads and control lines every 25 meters, but in areas of particular interest ie. high Bloom kit test results or where there was a marked increase in magnetometer readings, at 12.5 meter intervals.

A tabulation of the details of the magnetometer survey is on the following page.



Field Procedure ( contd ) - Details of Magnetometer Survey

<u>Date</u>	<u>Claims</u>	<u>Line</u>	<u>From</u>	<u>To</u>	<u>Distance (M)</u>
Dec. 10	Pick 1,3,4	Road 2	8+00S	0+00S	800
"	" 1	" 1	1+00S	0+00S	100
"	" 3,4	" 4	0+25E	2+85E	260
"	" 3	" 8	0+25S	1+30S	105
"	" 3	" 3	0+25E	2+00E	175
"	" 1,3,4	" 1	1+25W	5+00W	375
"	" 3,4	" 7	0+25S	1+90E	165
"	" 1	Mac - Blo. Main Road	34+00W	27+50W	650
"	" 1,2	Road 9	0+25S	1+75S	150
"	" 1	Cat. Rd E from 4+50S Rd 9	0+12.5E	0+62.5E	50
"	" 1	Mac - Blo. Road	34+00W	39+50W	550
"	" 1	Rd S. of 39+50W	0+25S	1+00S	75
"	" 1,4	Utah Mines Road	0+00S	5+00S	500
"	" 4	Rd at 4+00S U. M. Rd	0+25S	0+50S	25
"	" 1	" " 2+00S " " "	0+25E	0+30E	5
"	" 1	Cat. Rd 62.5mE of 4+50S Rd 9	4+50S	3+75S	75
"	" 2	" " " " " " "	4+75S	6+50S	175
Dec. 11	Pick 1,3	Line 32 + 50 West	4+75S	3+25S	150
"	" 1,3	" 31 + 50 "	3+25S	4+62.5S	138
"	" 1	" 35 + 50 "	4+00S	3+25S	75
"	" 1,2	" 36 + 25 "	3+00S	4+12.5S	113
Dec. 12	Pick 2,3	Line 29 + 50 West	5+00S	6+10S	110
"	" 2	Cat. Rd W. of above line	0+25W	1+75W	150
"	" 1,2	Line 30 + 50 West	5+12.5S	3+12.5	200
"	" 2,3,5FR.	Road 5	0+25S	1+35S	110
"	" 2,3,5FR.	Cat. road 5	0+25E	7+40E	715
"	" 5FR.	Road 10	0+25S	1+00S	75
"	" "	" "	0+25E	1+50E	125
"	" "	" "	0+25W	2+00W	175
"	" "	N20W from 2+00W Road 10	0+25N	1+50N	125
"	" "	Cat. Rd SW of 2+00E Cat. Rd 5	0+25S	1+40S	115
"	" 1,3	Line 33 + 00 West	4+75S	3+25S	150
"	" 1,3	" 36 + 50 West	3+00S	5+75S	275
Dec. 13	Pick 4	Line 36 + 50 West	6+25S	9+25S	300
"	" 3	" 35 + 50 "	7+00S	4+50S	250
"	" 1	" 30 + 00 "	2+75S	0+00S	275
"	" "	" 32 + 00 "	0+25S	3+00S	300
"	" "	" 34 + 00 "	2+75S	0+00S	275
"	" "	" 36 + 00 "	0+25S	2+75S	250
"	" "	Branch Road 7	30+00W	36+00W	600
Dec. 14	Pick 2	Line 29 + 00 West	8+25S	6+75S	150
"	" "	S bank of L.J.Crk from above	0+25W	3+00W	275
"	" "	Line 31 + 00 West	5+75S	7+75S	200
"	" 2,5FR.	" 32 + 50 "	9+25S	5+75S	350
"	" 3	Cat. road 8	32+75W		25
"	" "	S bank L.J.Crk from L32+50W	32+25W	32+00W	50
"	" "	Line 31 + 50 West	5+75S	8+25S	250

10,586 meters

MAGNETOMETER SURVEY ( contd )

Magnetometer Results - The corrected magnetometer readings, which range from 55,732 to 58,401 gammas, have been plotted on Map 2 ( in back pocket ) and contoured at 500 gamma intervals.

Referring to " Magnetometer Survey & Geology - Map 2 ", there are 2 strong anomalies, which exceed 58,000 gammas, one at the south end of Road 9 and the other, as yet not delimited to the east, due south of Little Joe Creek. 6 areas exceed 57,500 gammas, the largest of these, extends north and south of Little Joe Creek.

Geological Interpretation Based On Magnetometer Results - Since only the quartz - diorite and granodiorite on the Pick claims were weakly to moderately magnetic, the area enclosed by the 57,000 contour north and south of the Mac - Blo. Road and the other area exceeding 57,000 gammas, undefined to the east, south of this road are probably underlain by one or the other of this type of intrusive.

The 57,000 gamma contour also seems to define the approximate contact of the Quatsino limestone, which lies between the 2 aforementioned intrusive masses and flanks them to the west and south.

The 56,500 gamma contour coincides with the approximate contact of the Quatsino limestone and the overlying Bonanza andesite. This contact trends northwest, paralleling the strike of the limestone in Little Joe Creek.

The author concurs with Apex Airborne's interpretation that a major fault strikes north - south through Pick 1 and 4. It is defined by magnetometer readings of less than 56,000 gammas. The fault west of the Little Joe Creek Bridge seems to be a branch of this fault system.

## CONCLUSIONS

Results of the 1987 geosurveys on the Pick and Cliff claims are encouraging. Significant geochemical and magnetic anomalies have been located and the geological environment of the Pick claims seems favourable for the discovery of additional zones of mineralization.

Based On Geology - If the geological interpretation on the Pick claims is correct there is a limestone - intrusive contact exceeding 1.5 kilometers south of Mac. - Blo.'s Main Road. The Quatsino limestone between the 2 assumed intrusives, according to Dr. K. Northcote and based on the dip of the limestone in Little Joe Creek, is approximately 150 meters thick. Therefore vertically and horizontally there is sufficient limestone - intrusive contact to have produced contact metasomatic deposits of significant tonnage.

Based on the strikes and dips of the outcrops at Roads 3 and 9, the axis of an anticlinal fold, plunging to the southeast, lies between them.

The gold content of the Cliff showings increases to the southwest ie. West Showing - rock grab sample .09 ounce/ton, Swamp Showing - chip sample across 1 meter .11 ounce/ton and hopefully will continue to increase in any deposits on the Pick claims, further to the southwest.

The grab samples JM 1, 2 and 3A ( .01, .04 and .03 gram/tonne of gold ), of pyritic specimens, do not qualify as the type of mineralization being sought and were assayed as a precaution against missing any auriferous rock type.

The lack of alteration, other than silicification and pyritization, in the rocks of the Pick claims might be considered a rather

CONCLUSIONS ( contd )Based On Geology ( contd )

negative feature but on the access road to the Swamp Showing the granodiorite is fresh in appearance until one gets very close to the granodiorite - limestone contact and the polymetallic mineralization along said contact.

Referring to Figure 4, page 9, the radical change in strike and dip of the Karmutsen andesite flows, east and west of Electromagnetic Anomaly 16, supports the earlier contention, based on the geochemical evaluation, that this anomaly is indicating a fault zone. The lack of mineralization in the outcrop, due north of this assumed fault, also negates it's economic potential.

Apex's Magnetic Anomalies M 1, 2 and 9, north and east of EM 16, correspond to hills of extensive outcrops of magnetic Karmutsen volcanics.

Based On Geochemistry

The following Pick samples, highly anomalous in zinc and, or copper ( greater than 200 parts per million ), are comparable in magnitude to those taken on and around the Cliff Showings, in previous years, and some are probably indicating concealed bedrock mineralization of a similar type:

P 134	-	93 ppm Cu,	1250 ppm Zn	-	Due north of Road 3.
P 138	-	730	" "	"	south " " 3.
P 139	-	650	" "	"	" " " " "
P 95	-	132	" "	630	" " " " 5.
P 142	-	330	" "		Wet gully west of Road 9.
P 124	-	113	" "	255	" " " " " ". This

anomalous copper value might be attributed to the few bornite and chalcopyrite stringers in the Road 9 fill " salting " the gully but not the anomalous zinc in P 142 and 124.

CONCLUSIONS ( contd )Based On Geochemistry ( contd )

P 120 -	118 ppm Cu,		East end of Road 4.
P 121 -	305 ppm Zn	" " " "	" " " "
P 167 -	325 " "	" " " "	" " " "
P 168 -	275 " "	" " " "	" " " "
P 147 -	360 " "		Due north of Road 1.

The streams draining the areas of the aforementioned highs are anomalous in zinc, which could be expected. Since most of these streams flow into Little Joe Creek, which flows through the basin of stratified sand in Pick 4, there has probably been an enrichment of the basin with zinc over the years.

Anomalous samples due south of Road 1 ie. P 54 and 146 may be due to the same source as that producing P 147.

Some of the other weakly anomalous sites scattered throughout the Pick claims, ex. P 47 and 143, might be evaluated by hand trenching due to thin overburden.

The 2 copper anomalies ( outlined by Brett Explorations in 1968 ) in Cliff 3 and Pick 1, which lie adjacent to and overlap Electromagnetic Anomaly 9, are worthwhile exploration targets. The author was unable to ascertain if they had ever been physically tested. These are not strong anomalies but if the overburden is thick they could still be indicating significant bedrock copper mineralization.

The spectrographic analysis of a composite of highly anomalous soil samples P 124, 134 and 147 is attached to the back of this report. Results confirmed the opinion that P 134 and 147 are rich in clay and iron ( Al 38,430ppm, Fe 54,240ppm ) and that the samples were anomalous

## CONCLUSIONS ( contd )

### Based On Geochemistry ( contd )

in copper and zinc ( 84 and 460ppm respectively ). The anomalous silver ( 1.9ppm ) and lead ( 53ppm ) values could be expected, since these metals usually accompany copper and zinc in the other showings on the claims. High magnesium ( 5,580ppm ) and manganese ( 4,764ppm ) are usually associated with mineralized zones. The high phosphorous ( 2,610ppm ) may have come from nearby intrusive and, or metamorphic ( skarn ? ) rocks. The vanadium ( 122ppm ) could be from an altered lead deposit.

### Based On Magnetometer Survey

The magnetic anomaly, in Pick claim 2, exceeding 58,000 gammas is 50 meters wide and 100+ meters long ( still open to east ) may be due to a concealed contact metasomatic deposit containing magnetite. The anomaly, of similar intensity, at the south end of Road 9, based on 2 road site readings, may indicate a similar deposit but the possibility that the road fill contains magnetite cannot be ruled out.

Most of the 11 zones of mineralization previously located on the Cliff claims occur within areas where the total magnetic intensity exceeds 57,000 gammas so the 2 large areas of this intensity ( one of which is still not delimited to the east ) located by the ground survey on the Pick claims indicate ample room for deposits of worthwhile dimensions. These areas are assumed to be underlain by intrusives but to what extent these intrusives may be capped by limestone is unknown and

would have a direct bearing on the potential for contact deposits. Local areas of impervious limestone capping may also account for the spotty nature of the geochemical highs, located during the 1987 survey, and the lack of highs in areas where they could be expected ie. inferred limestone - intrusive contacts, areas of magnetic highs.



## CONCLUSIONS ( contd )

### Based On Magnetometer Survey ( contd )

When the Geochemical Survey - Map 1 is placed over the Magnetometer Survey & Geology - Map 2 it will be noted that all the highly anomalous soil samples, with the exception of P 139 and 139, overlie or are near limestone - intrusive contacts, inferred by Northcote and, or Mc Andrew.

If the assumed mineralization giving rise to anomalous samples P 124, 134 and 147 is continuous between these samples there could be a zone at least 480 meters long.

Except for anomalous soil P 143 ( 110ppm Cu, 170ppm Zn ), near the " branch " fault, west of the Little Joe Creek Bridge, there is little data to suggest that the interpreted fault system in Picks 1,3 and 4 served as a channelway for mineralizing solutions.

## RECOMMENDATIONS

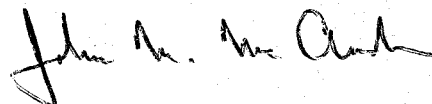
Due to the scarcity of outcrop, particularly on the Pick claims, many assumptions have been made in interpreting the results of the 1987 geosurveys. The following program is recommended to ascertain the validity of these assumptions.

- 1 ) Trench geochemical highs P 124, 134, 138, 139 and 147. One might reach bedrock by hand trenching but a backhoe will probably be necessary and if this fails diamond drilling will be required.
- 2 ) Attempt to hand trench second rank anomalies P 47, 54, 143 and 146; proceed to more expensive physical testing ( if necessary ) only if the testing in 1 ) uncovers significant mineralization.

RECOMMENDATIONS ( contd )

- 3 ) Complete geosurveys in the east portions of Picks 1, 2 and 5FR. south of Mac - Blo.'s Main Road and more precisely define the geochemical anomaly, at the east end of Road 4 and the 58,000 gamma anomaly, south of Little Joe Creek, by geochemical sampling and magnetometer readings on Lines 29 + 50 and 30 + 50 West, south from the Creek to Road 5. Then select the most anomalous areas for physical testing.
- 4 ) Map the area west of the Swamp Showing as far as Line 30 + 00 West and south to Branch Road 7. Energex in 1981 defined areas anomalous in copper, zinc, lead, silver, arsenic and mercury ( on file ) in this area but little is known about the geology. Since most of this area is occupied by ridges, shallow trenches might expose bedrock in covered areas.
- 5 ) Examine the areas of the 2 copper anomalies, north of Edith Creek, for any signs of trenching or drilling; at the same time, collect check soil samples over the anomalies. If the anomalies are confirmed and no signs of physical testing are found, some testing would be merited.
- 6 ) Although previous operators sampled the area occupied by Air Magnetic Anomaly 5, the fact that it is flanked by one of the above copper anomalies, suggests some check sampling and mapping, in spite of their negative findings. The 3 coincident anomalies may indicate a contact deposit.
- 7 ) Complete geosurveys between Branch Roads 6 and 7 west from Line 32 + 00 West to Mac - Blo.'s Main Road, if possible in this swampy area.

Respectively submitted by



John M. Mc Andrew, P. Engr.

8961 Ursus Crescent

Surrey, B. C.

February 1, 1988

Prospector - Consulting Geologist

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CERTIFICATION OF JOHN M. Mc ANDREW

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1. Registered as a Professional Engineer by the Association of Professional Engineers of British Columbia, Canada.
2. B. Sc. in Geology from the University of Alberta, Edmonton, Alberta; post graduate courses in surveying, McGill University, Montreal, Quebec.
3. Prior to consulting the author spent seventeen years in exploration, property evaluation, mine geology and production with the following companies:
  - Anaconda American Brass Limited - Copper, Molybdenum, Tungsten.
  - Silver Titan Mines - Silver, Lead, Zinc.
  - Columbia Iron Mining Co. - Coal.
  - Newmont Exploration Ltd. - Nickel, Copper.
  - Iron Ore Company of Canada Ltd. - Direct Shipping Iron Ore.
  - N. W. Byrne Company - Gold.
  - Quebec Cartier Mining Co. Ltd. - Concentrating Iron Ore.
  - Elderade Mining and Refining Co. - Uranium.
  - International Nickle Co. - Nickel, Copper.
  - Risby Tungsten Mines Ltd. - Tungsten.

Addendum:

1977, 79, 81, 82 Instructing at British Columbia School for Advanced Prospectors.

Dated this 1 day of FEBRUARY, 1988, in SURREY, British Columbia



JOHN M. McANDREW, P. Engr.

Prospector - Consulting Geologist



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Specialists in Mineral Environments

705 West 15th Street North Vancouver, B.C. Canada V7M 1T2

PHONE: (604)980-5814 OR (604)988-4524

TELEX: VIA USA 7601067 UC

Analytical Report

Company: JOHN MCANDREW  
Project: PICKS 1-5  
Attention: JOHN MCANDREW

File: 7-2118  
Date: JAN 5/88  
Type: SOIL GEOCHEM

Date Samples Received : DEC 29/87  
Samples Submitted by : JOHN MCANDREW

Report on .....1 COMPOSITE ; ...170 SOILS ..... Geochem Samples  
.....  
.....3..... Assay Samples  
.....

Copies sent to:  
1. JOHN MCANDREW, SURREY, B.C.  
2.  
3.

Samples: Sieved to mesh .....-80..... Ground to mesh .....-150.....

Prepared samples stored: .....X..... discarded: .....  
rejects stored: .....X..... discarded: .....X.....

Methods of analysis:  
  
CU ZN - MULTI ACID.A.A.  
AU-FIRE ASSAY.  
31 ELEMENT TRACE ICP

Remarks

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Certificate of ASSAY

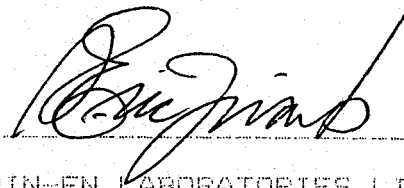
Company: JOHN M. MCANDREW  
Project: PICKS 1-5  
Attention: J. M. MCANDREW

File: 7-2118/P1  
Date: DEC 29/87  
Type: ROCK ASSAY

We hereby certify the following results for samples submitted.

Sample Number	AU G/TONNE	AU OZ/TON
JM-1	.01	0.001
JM-2	.04	0.001
JM-3A	.03	0.001

Certified by



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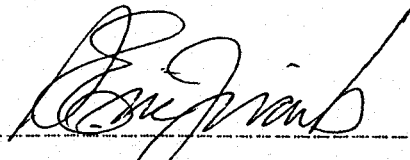
Certificate of GEOCHEM

Company: JOHN M. MCANDREW  
 Project: PICKS 1-5  
 Attention: J. M. MCANDREW

File: 7-2118/P1  
 Date: JAN 5/88  
 Type: SOIL GEOCHEM

We hereby certify the following results for samples submitted.

Sample Number	CU PPM	ZN PPM	
P-001	56	35	
P-002	67	36	
P-003	64	33	
P-004	38	36	
P-005	43	32	
P-006	53	37	
P-007	48	34	
P-008	34	23	
P-009	12	14	
P-010	39	35	
P-011	46	47	
P-012	68	34	
P-013	54	36	
P-014	47	26	40MESH
P-015	9	15	
P-016	31	22	
P-017	95	43	
P-018	50	38	
P-019	37	37	20MESH
P-020	45	26	
P-021	52	29	
P-022	49	42	
P-023	53	39	
P-024	44	28	
P-025	51	31	
P-026	66	45	
P-027	53	38	
P-028	58	36	
P-029	62	30	
P-030	37	34	

Certified by 

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TELEX: VIA USA 7601067 UC

Certificate of Geochem

Company: JOHN M. MCANDREW  
 Project: PICKS 1-5  
 Attention: J.M. MCANDREW

File: 7-2118/P2  
 Date: JAN 5/88  
 Type: SOIL GEOCHEM

We hereby certify the following results for samples submitted.

Sample Number	CU PPM	ZN PPM	
P-031	8	14	
P-032	56	42	
P-033	53	37	
P-034	54	40	
P-035	40	31	
P-036	48	34	
P-037	57	33	
P-038	47	25	
P-039	76	37	
P-040	84	62	
P-041	49	34	
P-042	43	28	
P-043	44	25	
P-044	66	47	
P-045	63	54	
P-046	67	39	
P-047	108	32	
P-048	38	80	40MESH
P-049	41	28	
P-050	64	44	
P-051	31	82	
P-052	39	150	40MESH
P-053	50	96	
P-054	80	105	
P-055	46	47	
P-056	40	37	
P-057	33	46	
P-058	48	39	
P-059	57	52	40MESH
P-060	23	33	

Certified by \_\_\_\_\_

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*Specialists in Mineral Environments*

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TELEX: VIA USA 7601067 UC

Certificate of Geochem

Company: JOHN M. MCANDREW  
Project: PICKS 1-5  
Attention: J. M. MCANDREW

File: 7-2118/P3  
Date: JAN 5/88  
Type: SOIL GEOCHEM

We hereby certify the following results for samples submitted.

Sample Number	CU PPM	ZN PPM	
P-061	40	148	
P-062	46	56	40MESH
P-063	21	58	
P-064	34	70	
P-065	73	116	
P-066	58	93	
P-067	42	74	
P-068	39	41	
P-069	82	125	
P-070	50	58	
P-071	63	77	
P-072	106	185	
P-073	135	76	
P-074	27	40	
P-075	47	38	
P-076	48	28	
P-077	47	43	
P-078	61	36	
P-079	60	112	20MESH
P-080	38	127	
P-081	55	132	
P-082	41	145	40MESH
P-083	33	102	
P-084	28	33	
P-085	20	13	40MESH
P-086	29	38	
P-087	18	50	
P-088	34	57	40MESH
P-089	36	42	
P-090	47	163	40MESH

Certified by \_\_\_\_\_

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Specialists in Mineral Environments

705 West 15th Street North Vancouver, B.C. Canada V7M 1T2

PHONE: (604)980-5814 OR (604)988-4524

TELEX: VIA USA 7601067 U

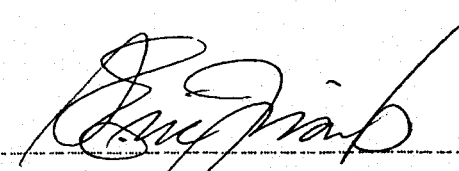
## Certificate of Geochem

Company: JOHN M. MCANDREW  
Project: PICKS 1-5  
Attention: JOHN MCANDREW

File: 7-2118/P4  
Date: JAN 5/88  
Type: SOIL GEOCHEM

We hereby certify the following results for samples submitted.

Sample Number	CU PPM	ZN PPM	
P-091	64	180	
P-092	33	34	
P-093	24	33	
P-094	57	53	
P-095	132	630	
P-096	17	118	
P-097	46	112	
P-098	54	65	
P-099	40	35	40MESH
P-100	55	67	
P-101	43	102	
P-102	38	75	
P-103	67	64	
P-104	46	128	20MESH
P-105	71	74	
P-106	28	42	
P-107	52	36	
P-108	49	32	
P-109	43	80	
P-110	35	41	
P-111	44	107	
P-112	31	76	
P-113	47	89	
P-114	20	46	40MESH
P-115	26	103	
P-116	54	87	40MESH
P-117	37	106	
P-118	134	235	
P-119	27	39	
P-120	118	77	

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705 West 15th Street North Vancouver, B.C. Canada V7M 1T2

PHONE: (604)980-5814 OR (604)988-4524

TELEX: VIA USA 7601067 UC

**Certificate of Geochem**

Company: JOHN M. MCANDREW  
 Project: PICKS 1-5  
 Attention: JOHN MCANDREW

File: 7-2118/P5  
 Date: JAN 5/88  
 Type: SOIL GEOCHEM

We hereby certify the following results for samples submitted.

Sample Number	CU PPM	ZN PPM	
P-121	58	305	
P-122	52	54	
P-123	38	39	
P-124	113	255	
P-125	55	54	
P-126	51	38	
P-127	56	136	20MESH
P-128	49	60	
P-129	37	32	
P-130	45	56	
P-131	80	27	
P-132	64	210	
P-133	39	112	20MESH
P-134	93	1250	
P-135	65	102	
P-136	50	30	
P-137	72	86	
P-138	33	730	
P-139	48	650	
P-140	62	53	
P-141	56	95	
P-142	51	330	
P-143	110	170	
P-144	34	33	
P-145	62	73	
P-146	116	91	
P-147	65	360	
P-148	36	132	40MESH
P-149	34	110	
P-150	70	67	

Certified by \_\_\_\_\_

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TELEX: VIA USA 7601067 UC


**Certificate of Geochem**

Company: JOHN M. MCANDREW  
Project: PICKS 1-5  
Attention: JOHN MCANDREW

File: 7-2118/P6  
Date: JAN 5/88  
Type: SOIL GEOCHEM

We hereby certify the following results for samples submitted.

Sample Number	CU PPM	ZN PPM	
P-151	46	54	
P-152	37	54	20MESH
P-153	21	90	20MESH
P-154	28	11	
P-155	65	49	
P-156	39	40	
P-157	53	46	
P-158	38	100	20MESH
P-159	85	92	
P-160	44	113	
P-161	40	84	
P-162	24	17	
P-163	41	128	
P-164	27	155	
P-165	25	148	40MESH
P-166	37	45	
P-167	38	325	
P-168	26	275	
C-48	43	78	
C-53	36	13	

Certified by 

MIN-EN LABORATORIES LTD.

40

COMPANY: JOHN MCANDREW  
PROJECT NO: PICKS 1-5  
ATTENTION: J.MCANDREW

MIN-EN LABSICP REPORT  
705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2  
(604)980-5814 OR (604)988-4524

(ACT:F31) PAGE 1 OF 1  
FILE NO: 7-2118  
\* TYPE SOIL GEOCHEM \* DATE: JAN 6, 1988

( PPM ) COMP 124  
/134/147

AG 1.9  
AL 38430  
AS 15  
B 60  
BA 95

BE 1.8  
BI 7  
CA 9870  
CD 2.8  
CO 11

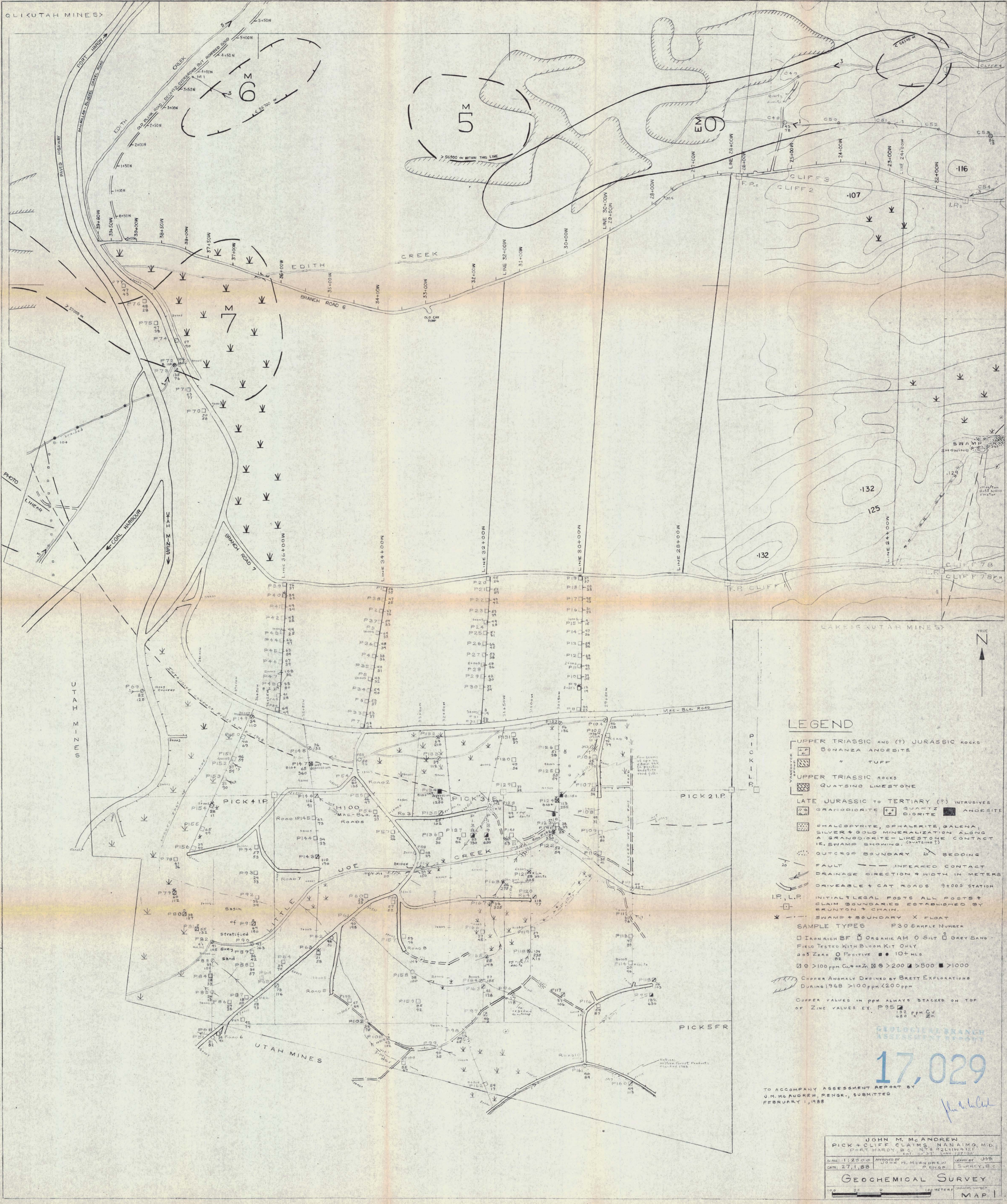
CU 84  
FE 54240  
K 290  
LI 13  
MG 5580

MN 4764  
MO 3  
NA 200  
NI 22  
P 2610

PB 53  
SB 11  
SR 3  
TH 1  
U 1

V 122.0  
ZN 460  
GA 1  
SN 1  
W 3  
CR 14





LEGEND

- UPPER TRIASSIC AND (?) JURASSIC ROCKS
- BONANZA ANDESITE
- TUFF
- UPPER TRIASSIC ROCKS
- QUARTZITE LIMESTONE
- LATE JURASSIC TO TERTIARY (?) INTRUSIVES
- GRANODIORITE
- QUARTZ ANDESITE
- DIORITE
- CHALCOPYRITE, SPHALERITE, GALENA, SILVER & GOLD MINERALIZATION ALONG A GRANODIORITE-LIMESTONE CONTACT
- SWAMP SHOWING (SWAMPING?)
- OUTCROP BOUNDARY
- BEDDING
- FAULT
- INFERRED CONTACT
- DRAINAGE DIRECTION & WIDTH IN METERS
- DRIVEABLE & CAT ROADS 9+005 STATION
- I.P., L.P. INITIAL & LEGAL POSTS ALL POSTS & CLAIM BOUNDARIES ESTABLISHED BY BRUNTON & CHAIN.
- SWAMP & BOUNDARY X FLOAT
- SAMPLE TYPES P30 SAMPLE NUMBER
- IRON RICH BF ORGANIC AH O SILT GREY SAND
- FIELD TESTED WITH BLOOM KIT ONLY
- 005 ZERO 0 POSITIVE 10+ MLS
- 10 >100ppm Cu+Pb 20 >200 30 >500 40 >1000
- COPPER ANOMALY DEFINED BY BRETTE EXPLORATIONS DURING 1968 >100ppm <200ppm
- COPPER VALUES IN PPM ALWAYS STACKED ON TOP OF ZINC VALUES EX. P95 133 PPM CU 430 PPM ZN

17,029

TO ACCOMPANY ASSESSMENT REPORT BY J.M. McANDREW, P. ENGR., SUBMITTED FEBRUARY 1, 1988

JOHN M. McANDREW  
PICK + CLIFF CLAIMS NANAIMO, B.C.  
SCALE: 1:2500 APPROVED BY JOHN M. McANDREW, P. ENGR., SURREY, B.C.  
DATE: 27, 1, 88  
GEOCHEMICAL SURVEY  
MAP 1



