

GEOLOGICAL REPORT ON THE ART CLAIM

PENDER HARBOUR AREA, SECHELT PENINSULA  
VANCOUVER MINING DIVISION, B.C.

Long. 124°00' W, Lat. 49°40' N.  
- NTS: 92 F/9E and 92 G/12W -

BY

S. S. TAN, P.Eng. (Geological)

November 6th. 1978

Claim Owner & Operator: MR. ART HEWITSON

Consultant and Author: S. S. TAN, P.Eng.



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**SIAM S. TAN, P.Eng.**  
**CONSULTING & MANAGEMENT ENGINEER**

310-1965 WEST EIGHTH AVENUE, VANCOUVER, CANADA. V6J 1W2. Phone (604) 736-0848

November 6th. 1978.

SUMMARY:

The Art Claim consisting of 20 contiguous claim units is sited in the Pender Harbour area, Sechart Peninsula, Vancouver Mining Division; approximately 77 Km. northwest of Vancouver. It is easily accessible via 70 Km. road miles from the Landale ferry terminal.

Four lithological units were classified for the property area through recent geological mapping by the writer. These are: 1 Basalt-Andesite (undifferentiated), 2 Limestone, 3 Quartz diorite and 4 Granodiorite. The major part of the property is underlain by the Jurassic quartz diorite and granodiorite. The younger phase granodiorite is often fractured and contain quartz stockwork. At the main showing it hosts porphyry copper style chalcopyrite mineralization. The quartz diorite is massive, unaltered and do not appear to carry any sulphide mineralization. The 100 meters wide limestone stratum strike northeasterly and occupy the approximate centre of the property. At the main showing its contact with the granodiorite resulted in a 5 meters wide calc-silicate hornfels (skarn) aureole. The volcanic unit occupies a small segment of the southwestern area. It is barren of copper mineralization.

TING  
MIDAS

Copper mineralization at the main showing consists of chalcopyrite, with lesser native copper, disseminations and stockworks in hydrothermally altered granodiorite and as higher grade replacement narrow lenses and stringers in the adjacent skarn. A 95 tons shipment grading 2.72% Cu and 1.0 oz. Ag/ton, was made from the surface workings in 1940.

Based on data known to date the property is inferred to be favourable for the occurrence of both the replacement type copper deposit and the copper porphyry type deposit. The proximity of the property to tide water and the accompanied by-product silver content makes this an attractive exploration target.

Based on the foregoing discussions it is recommended that the northwest half of the property be soil geochemically surveyed and a concurrent magnetometer survey be implemented. Such surveys would aid in locating overburden covered copper mineralization, if any, in this extensively overburdened area.

INTRODUCTION:

The ensuing report is based upon the results of a geological mapping and prospecting programme conducted on the Art Claim situated in the Pender Harbour area, Sechelt Peninsula, Vancouver Mining Division. The writer performed the work at the request of Mr. Art Hewitson, owner of the property. Field work was carried out during the period of May 11th. 1978 to May 17th. 1978. The purpose of this survey is to fulfill assessment work requirement and to prospect for the occurrence of possible mineralization that may be of economic interest.

The mapping results are presented in the form of a 1:6,000 scale geological plan of the property and a 1:500 scale detail plan of the main showing.

LOCATION AND ACCESS:

NTS: 92 F/9E	Approximate Co-ordinate: Long. 124° 00' W.
& 92 G/12W	(property centre) Lat. 49° 40' N.

The Art claim is located in the Sechelt Peninsula approximately 48 air miles (77 Km) northwest of Vancouver. It is easily accessible by travelling 70 Km. northerly on Highway 101 from the Langdale ferry terminal towards the settlement of Irvines Landing and Pender Harbour. At approximately 2.4 Km. from the turn-off on Highway 101 into Irvines Landing a gravel road provides access to the centre of the property. This road is in fair condition and passable with a pick-up truck.

PHYSICAL FEATURES:

Elevations on the property range from sea level to 800 feet. The terrain is moderately steep to flat, however the western quarter is steep and rugged. Overburden is extensive in the lowlands. The vegetation is characterized by dense secondary undergrowth amongst good sized coast type conifers that are suitable for mining purposes.

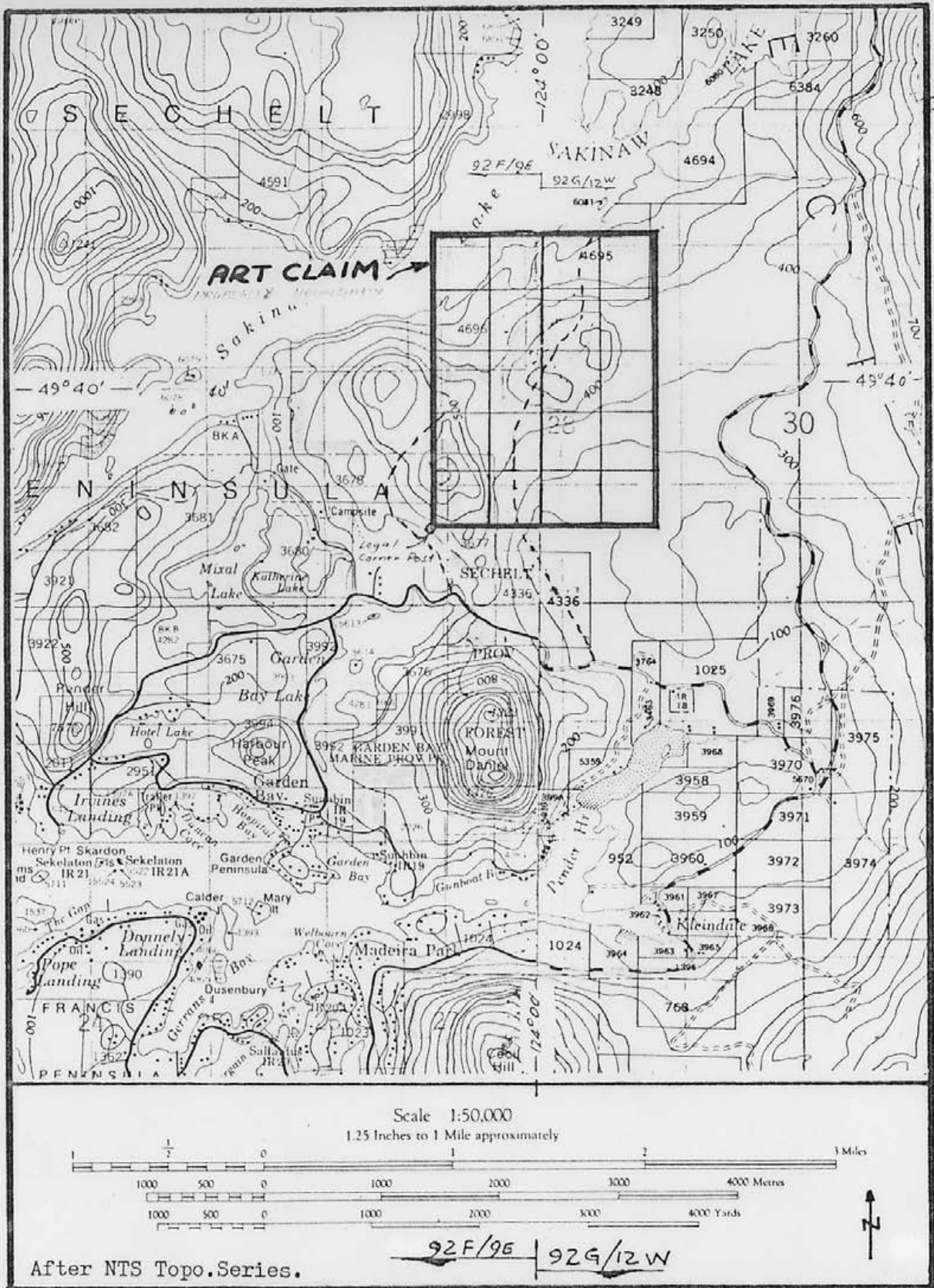
PROPERTY:

The property consists of 20 contiguous claim units in a rectangular block measuring 4 units east to west and 5 units north to south. The three units at the northwest corner of the block are partly in Sakinaw Lake.

Mr. Art Hewitson of Vancouver, B.C. is the present registered owner of the claim. The relative claim unit locations is illustrated in Drawing 1.

HISTORY AND PREVIOUS WORK:

The main showing in the property is known as the King Midas. According to the B. C. Minister of Mines Annual Report for 1937, page F 31, four open cuts were sunk to expose copper mineralization in the skarn and



INDEX MAP - ART CLAIM  
SECHELT PENINSULA, VANCOUVER M.D.

the adjoining granodiorite. The exposures were selectively sampled and assayed by the B.C. Department of Mines staff. A shipment of 95 tons returning 5,166 lbs. copper and 93 oz. silver, for an average grade of 2.72% Cu and 1.0 oz. Ag/ton, was reported shipped in 1940 from these surface workings (B.C.D.M. Bull. 39, p. 38).

Numerous old claim posts indicate the showing area had been staked several times in the past few years. Furthermore, trenches in the main showing had been cleaned out indicating recent years' activities.

#### PRESENT WORK - SUMMARY:

The writer's field work consisted of geological mapping and prospecting. Initially, claim posts were located and the property boundary pace and compass surveyed. Subsequently a pace and compass survey was completed on the main access road. Using the surveyed access road and boundary as controls a base map was constructed for the geological mapping. Air-photos and government topographic map of the area were used in guiding survey controls.

The geological mapping and prospecting was carried out at 150 meters line interval spacing on east-west traverse lines and employing the pace and compass survey procedure. A pocket altimeter was used to determine elevation controls. The resultant geological plan is at a scale of 1:6,000 and a detailed plan of the main showing illustrated in a 1:500 scale plan.

The geological mapping traverse totalled 27 line kilometers which covers an 18 claim units area.

#### REGIONAL GEOLOGY:

According to published government geological map (B.C.D.M. Bull. 39) Jurassic Coast Batholith consisting of granodiorite and quartz diorite underlie the major parts of the Sechelt Peninsula. The intrusive rocks are often fractured and recemented by quartz. Pink aplite dykes are locally abundant. Locally, some of the intrusive rocks had been hydrothermally altered. Older volcanic rocks and minor sediments of the Jarvis Group occur to the west of the property and caps the top of Carmen Range about 2 miles east of the property.

#### PROPERTY GEOLOGY:

Four lithological units were classified for the property area through the field mapping: 1 Basalt-Andesite (undifferentiated), 2 Limestone, 3. Quartz diorite and 4. Granodiorite. The 100 meters wide limestone stratum striking about northeasterly underlie the approximate property center. The volcanics outcrop along the southwest corner of the property. The older intrusive quartz diorite phase occupy about a one third segment of the property at the southeast while the younger phase granodiorite is northwest of the quartz diorite. Two normal fault and a thrust fault were mapped. The main showing consists of a skarn hosted chalcopyrite-magnetite replacement and a porphyry copper affinity type mineralization within the adjoining granodiorite.

### Lithology:

The Jarvis Group Volcanics consist of basalt and andesite. Field observations preclude their separation into individual rock units. The volcanics are massive, fine grained, some are amygdaloidal. Fresh surface are from greenish grey to black while the oxidized weathered surface is from cream to light brown. Their observed contact with the granodiorite is vertical.

The 100 meter wide limestone band was based on mapping three outcrops and limestone exposed in trenches at the main showing. The limestone is grey and thinly bedded. At the main showing the contact of the limestone with the granodiorite resulted in a 5 meter wide skarn zone rich in epidote.

Two intrusive phases have been recognized. The older quartz diorite is more massive and equigranular. It is fine to medium grained spotted with the predominantly hornblende mafic mineral. It is unaltered. In contrast the granodiorite are hydrothermally altered to varying degrees, the effect being most pervasive near the main showing. Additionally, it is often highly fractured and locally contain much quartz healed fractures - stockwork. Xenolith of quartz diorite, some up to two feet wide, occur at its contact with the quartz diorite indicating that the granodiorite is the younger phase.

### Structural Geology:

Omnidirectional fractures are common in all granodiorite outcrops. The limestone strikes  $45^{\circ}$  to  $55^{\circ}$  Az. and dips from  $80^{\circ}$  to  $82^{\circ}$  to the northwest. Fissile limestone was observed in one outcrop. Two normal faults occur in the southwest corner of the property. The fault scarps are expressed as steep cliff faces whose slickensided surfaces allowed determination of relative fault plane movements. The normal faults are subparallel striking about  $N27^{\circ}W$ . One dips  $80^{\circ}$  east and the other  $76^{\circ}$  west. A thrust fault striking  $N67^{\circ}E$  and dipping  $78^{\circ}$  north traverse across the upper one fourth of the property. The fault plane in both outcrops are steep cliff-like faces.

### Mineralization:

The main showing is known as the King Midas. It is sited along the east end of the boundary line between unit No.14 and 15 of the modified grid unit numbering system. The workings are on top of a ridge, from 425 feet to 500 feet in elevation and are about 1 Km. from the southeastern shore of Sakinaw Lake. Five trenches exposed the showing along a strike length of 80 meters.

Copper mineralization observed in the trenches consists of chalcopyrite with lesser native copper occurring in streaks and dissemination, within easterly and northeasterly, steeply dipping, fractures in the skarn and adjoining granodiorite. Locally, replacement chalcopyrite lenses are found in the skarn.

The main trench displayed the most intense mineralization. The skarn at the inner part of this trench contains both replacement chalcopyrite in massive but narrow lenses and fracture filling accompanied by lesser native copper in a gangue of quartz, epidote, garnet chlorite and magnetite.

The contact aureole (skarn) is from 4 meters to 5 meters wide. Limestone, in part marbelized, at N45°E strike and dipping 82°NW, to the northwest of the skarn is barren of copper mineralization. The hydrothermally altered granodiorite, adjoining to the southeast, carries stringers of quartz with chalcopyrite and chalcopyrite-pyrite dissemination. Three smaller trenches to the northeast of the main trench displayed similar but weaker mineralization. The West Trench was sunk in granodiorite. It disclosed quartz-chalcopyrite-pyrite stockwork and chalcopyrite-pyrite dissemination. Selected better grade samples taken by the B.C. Department of Mines during 1937 returned very high copper values in three samples at 10.5% Cu, 17.2%Cu & 11.0 oz.Ag/ton, and 16.8%Cu & 6.0 oz.Ag/ton. The fourth sample returned 0.6%Cu. Obviously, such high grade selected samples are not representative of the average grade.

A 95 tons shipment from these workings was made in 1940. The average grade from this shipment was 2.72%Cu and 1.0 oz.Ag/ton. The foregoing assays were from sorted samples to determine the grade of the better mineralization. However, during that time little was done to investigate for the potential occurrence of the low grade large tonnage open-pit type copper porphyry deposits in British Columbia.

The showing indicates a geologic setting that is conducive to the formation of both the high grade type replacement copper deposit and the copper porphyry type deposit. The mode of copper mineralization and host rock hydrothermal alteration are similar in many respect to some of the known copper porphyry deposits of the Western Cordillera.

#### CONCLUSIONS AND RECOMMENDATIONS:

The property area is mostly underlain by Jurassic granodiorite and quartz diorite. A 100 meter wide stratum of limestone striking northeasterly occupy the central segment of the property. The granodiorite is locally hydrothermally altered to varying degrees, the effect being strongest at the main showing area. It is often fairly densely fractured resulting in development of quartz stockwork locally. The quartz diorite is unaltered and do not carry any sulphide mineralization. The observed granodiorite and limestone contact consists of a 5 meter wide calc-silicate hornfel (skarn) that is rich in epidote and garnet.

Copper mineralization at the main showing consists of chalcopyrite and lesser native copper occurring as disseminations and fracture fillings in the hydrothermally altered granodiorite and skarn. Narrow chalcopyrite replacement lenses are irregularly distributed in the skarn. The geologic setting and copper mineralization is reminiscent in many respects to the known copper porphyry of the Western Cordillera. Based on data known to date the property is inferred to be geologically favourable for the occurrence of both the replacement type copper deposit and the porphyry copper deposit.

The area to the northwest of the limestone stratum is judged to be a suitable target area for the search of the porphyry copper type deposit. The contact along the limestone and granodiorite would be favourable for the deposition of the replacement type copper deposit. It is therefore




recommended that these locations be soil geochemically surveyed. Concurrently, a magneometer survey should be carried out since the magnetic highs may indicate the presence of magnetite, which mineral is known to be associated with skarn mineralization. Magnetic depression may indicate strong hydrothermal alteration - a phenomenon observed in most copper porphyry deposits. The recommended survey area is extensively overburdened and it is felt that the preceding recommended surveys may reveal overburden covered copper mineralization.

The proximity of the property to tide-water coupled with the types of known copper mineralization carrying important silver value makes this an attractive exploration target..

BIBLIOGRAPHY:

1. Bacon, W. R.                      Geology of Lower Jervis Inlet, British Columbia.  
    1957                              B.C.Dept.Mines, Bull.39.
2. O'Grady, B.T.                    Annual Report of the Minister of Mines, British  
    1937                              Columbia for 1937. pp. F28-31.
3. Bostock, H.H.                    Geology - Squamish (Vancouver, West Half), B.C.  
    1963                              Geol.Surv. Can. Map 42-1963.

Respectfully Submitted,



S. S. Tan, P.Eng.(Geological)

November 6th. 1978.  
Vancouver, B.C.

A P P E N D I X

ITEMIZED COST STATEMENT ..... Page A-1

CERTIFICATE OF QUALIFICATIONS ..... Page A-2

ITEMIZED COST STATEMENT

(ART CLAIM, VANCOUVER M.D.)

The following expenditure was incurred by Mr. Art Hewitson, in carrying out a geological mapping and prospecting programme on the ART CLAIM, Vancouver Mining Division.

1. ENGINEERING FEES:

- Field Time: May 11 to 17, 1978 = 7 days .....	\$1,400
- Report Preparation:	
June 14 to 15, 1978 = 2 days } .....	800
Nov. 5 to 6, 1978 = 2 days } .....	800
TOTAL FEE per S.S. Tan, P.Eng. ....	\$2,200.00

2. MOTEL & MEALS

- Motel: May 11 to 17, 1978 = 6 nights .....	\$126.00
- Meals: May 11 to 17, 1978 = 7 man days .....	<u>116.75</u>
TOTAL ACCOMODATION AND MEALS, per S. S. Tan .....	242.75

3. TRANSPORTATION:

- Car Rental: May 11 to 17, 1978 = 7 days .....	\$126.00
- Gas and milage charges .....	128.90
- B. C. Ferry: to and from Landale .....	<u>12.00</u>
TOTAL TRANSPORTATION .....	266.90

4. OTHER DISBURSEMENTS:

- Field Supplies: flagging tapes, markers etc. \$	28.51
- Report Services & supplies: typing, xerox, etc. ....	<u>53.50</u>
TOTAL OTHER DISBURSEMENTS .....	82.01

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1 - 4 = TOTAL COSTS INCURRED ..... \$2,791.66

CERTIFIED CORRECT




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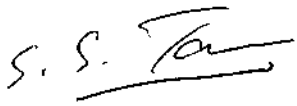
S. S. Tan, P.Eng. (Geological)

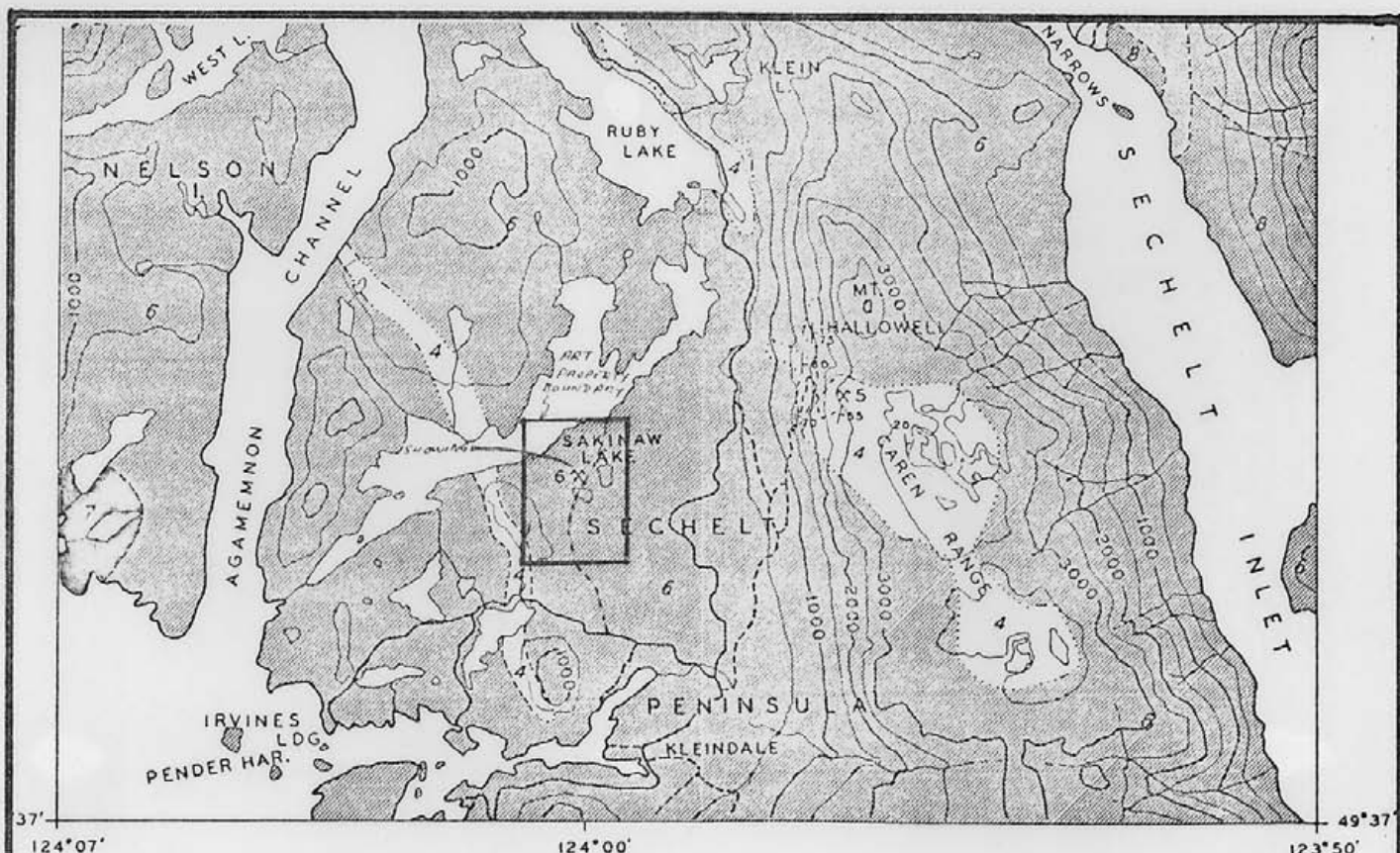
CERTIFICATE OF QUALIFICATIONS

I, Siak S. Tan, residing in the City of Vancouver, Province of British Columbia, hereby certify that:-

1. I am a consulting Geological Engineer with offices at 310 - 1965 West 8th. Ave., Vancouver, B.C., V6J 1W2.
2. I am a graduate of Carleton University, Ottawa, Ontario; with a B.Sc.(Geology) in 1964 and has been practicing my profession since that date.
3. I am a registered member of the Association of Professional Engineers of the Province of British Columbia in the Geological Engineering Division.
4. I have been engaged in my profession for the past 14 years having been employed by mining companies and consulting engineer firms in my capacity as a geological engineer and geologist.
5. The attached geological report on the Art Claim, Vancouver Mining Division, is based on my personal field work conducted during the period of May 11th. 1978 to May 17th. 1978.

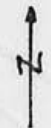
Dated at Vancouver this 6th. day of November 1978.

  
S. S. Tan, P.Eng.



- 6 Main batholithic mass; mainly quartz diorite, granodiorite
- 5 Quartz-feldspar porphyry
- AGE UNKNOWN**
- JARVIS GROUP**
- 4 Basalt, andesite and associated pyroclastic rocks; minor limestone, dolomitic limestone, chert, argillite

Scale 1 0 1 2 3 4 5 Miles



*S.S. Taylor*

NOTE: GEOLOGY AFTER W.R. BACON, B.C.D.M. Bull. 39

GENERAL GEOLOGY

ART CLAIM PROPERTY.  
Sechelt Peninsula  
Vancouver M.D.

Drawing No. 2

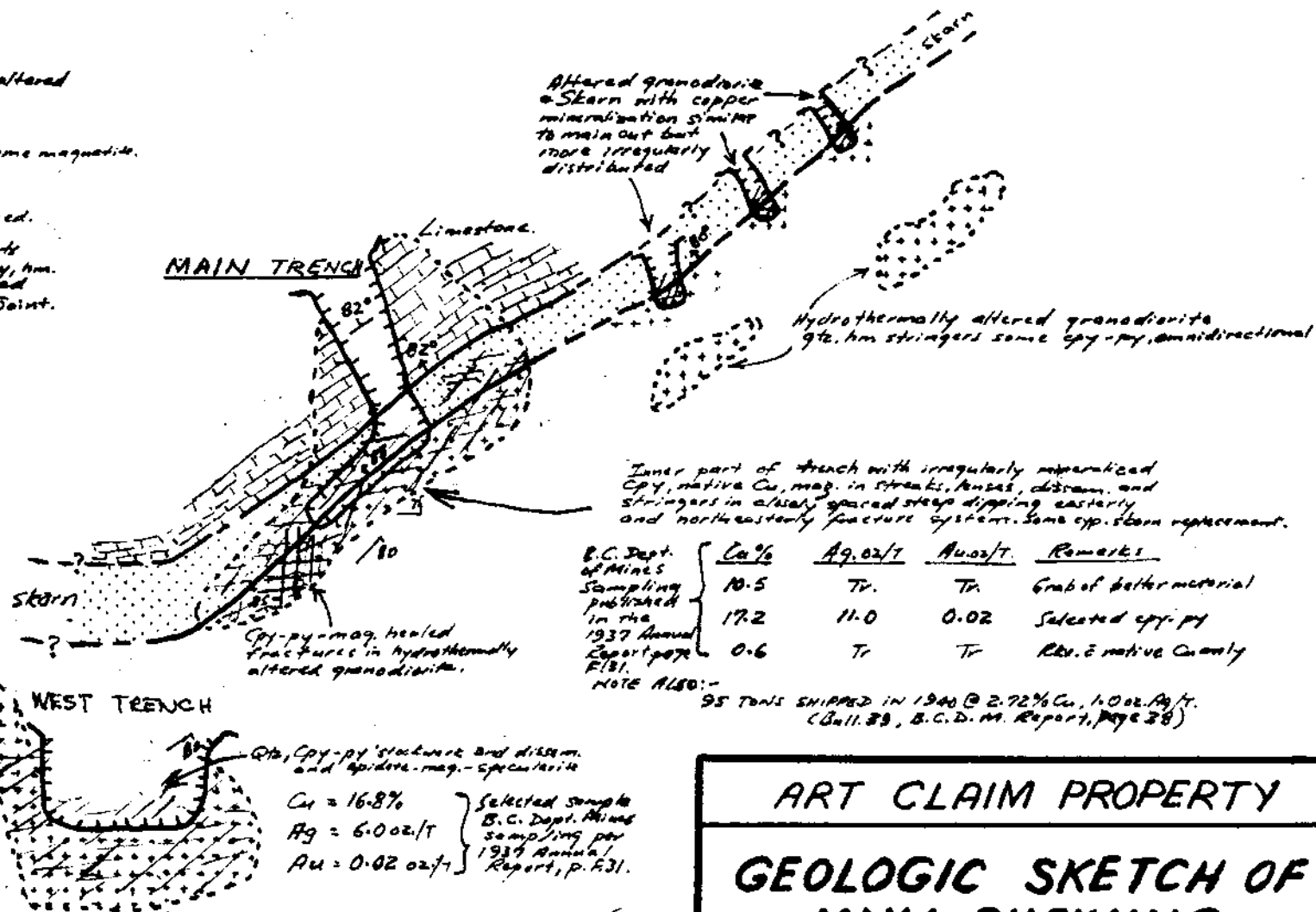
**LEGEND**

GRANODIORITE  
-Hydrothermally altered

SKARN  
-epidote rich, some magnetite.

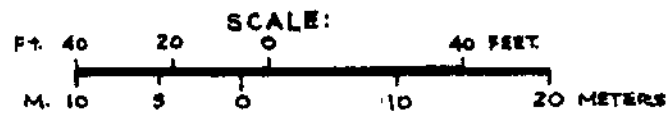
LIMESTONE  
-in part marbleized.

Fractures or joints  
mineralized cpy, py, hm.  
often quartz healed  
Bedding, L<sub>70</sub> = Joint.



B.C. Dept. of Mines Sampling published in the 1937 Annual Report p. F31.	Ca%	Ag.oz/t	Au.oz/t.	Remarks
	10.5	Tr.	Tr.	Grab of better material
	17.2	11.0	0.02	Selected cpy-py
	0.6	Tr	Tr	Rev. E native Cu only

NOTE ALSO:-  
95 TONS SHIPPED IN 1940 @ 2.72% Cu, 1.002 Ag/t.  
(Bull. 29, B.C.D.M. Report, Page 28)



S.S. Tan

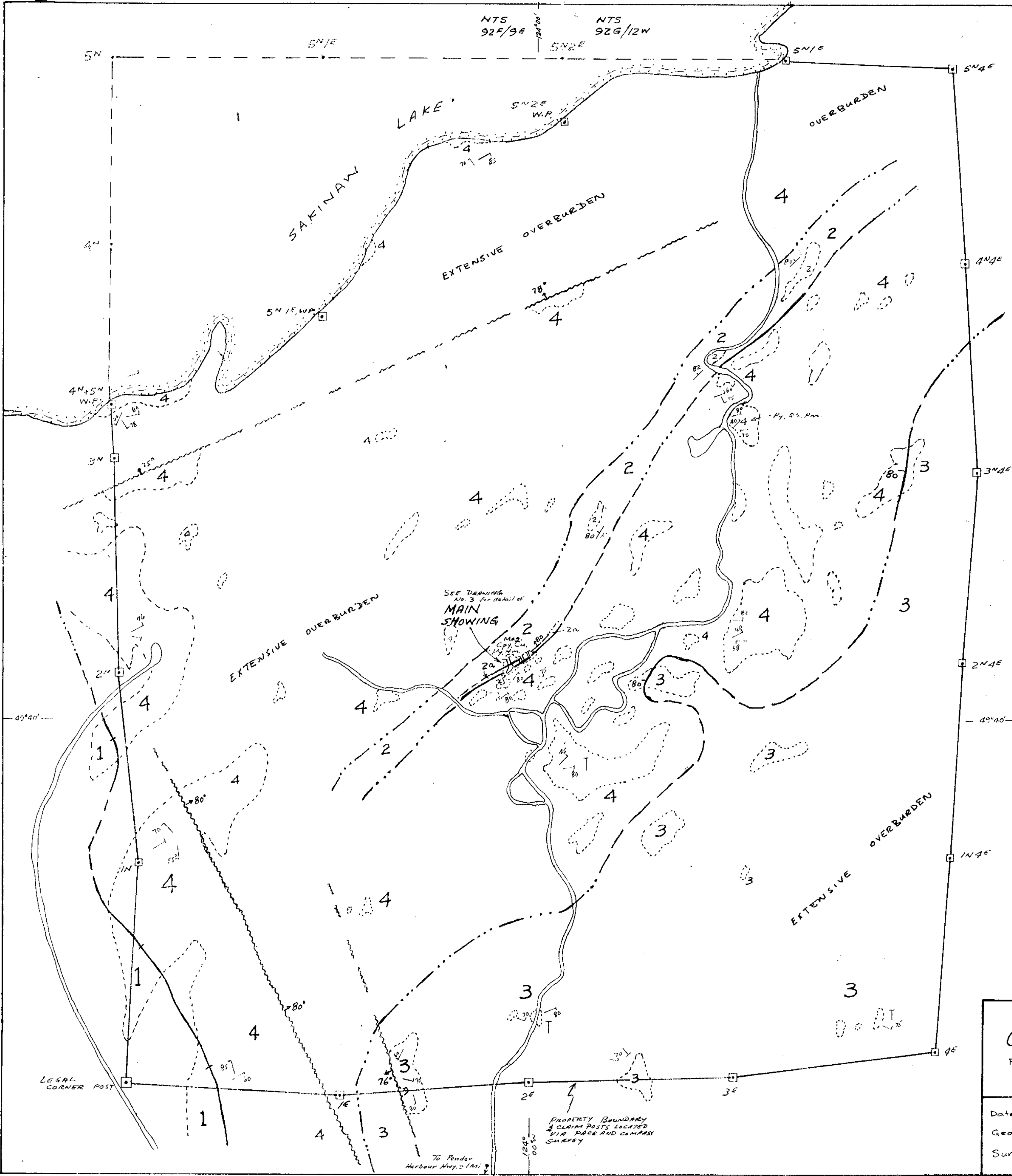
**ART CLAIM PROPERTY**

**GEOLOGIC SKETCH OF MAIN SHOWING**

CONSULTING ENGINEER: S. S. TAN, P. Eng.  
VANCOUVER, B.C.

Nov. 6, 1978

DRAWING: 3



7001



Magnetic declination Annual Change 3' Westerly.

NOTE: Geological Mapping, Boundary and Claim Post Location based on Face and Compass Survey.

**LEGEND**

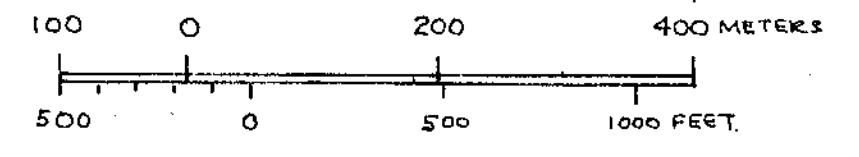
- 4 GRANODIORITE
- 3 QUARTZ DIORITE
- 2 L2a LIMESTONE, 2a SKARN
- 1 BASALT-ANDESITE (UNDIFFERENTIATED)

- Geological Boundary (defined, approximate)
- Fault (defined, approximate)
- Bedding
- Joint (Inclined, vertical)
- Outcrop
- Property Boundary - Claim Post
- Gravelled Road

**SYMBOLS FOR MINERALS**

Chalcopyrite	Cpy	Hematite	Hm
Native Copper	Cu	Magnetite	Mag.
Pyrite	Py	Quartz	Qz.

SCALE: 1:6000



To Accompany: Geological Report on the ART CLAIM By S. S. TAN, P.Eng. Dated: November 6th, 1978.

S. S. Tan

(PLAN)  
**GEOLOGY - ART CLAIM**

PENDER HARBOUR AREA, SECHULT PENINSULA, VANCOUVER MINING DIVISION, B.C.

Date: November 6th 1978  
Geology By: S. S. TAN, P.Eng.  
Surveyed By: S. S. TAN

**DRAWING**  
No. 4