093E/12E
Hope Claims
Property
Submission

822306

GEOLOGICAL AND ROCK GEOCHEMICAL INVESTIGATIONS OF THE HOPE1-5 AND HOPE 7 MINERAL CLAIMS OMINECA MINING DIVISION TAHTSA LAKE, B.C. NTS 93 E/12 E LATITUDE 53°37' NORTH, LONGITUDE 127°36' WEST

Prepared for

HIGH HOPE INC.

PAUL KALLOCK
Consulting Geologist

November 20, 1986

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GEOLOGICAL AND ROCK GEOCHEMICAL INVESTIGATIONS OF THE HOPE1-5 AND HOPE 7 MINERAL CLAIMS OMINECA MINING DIVISION TAHTSA LAKE, B.C. NTS 93 E/12 E

SUMMARY

The Hope claim group is located in west-central British Columbia, 1 km south of Tahtsa Lake. Geologically the property straddles the boundary between the Coast Plutonic Complex and the Intermontane Belt. Coarse-grained granite and fine-grained diorite and numerous andesitic dykes are abundant at the claims. Volcanic flow and pyroclastic rocks of the Hazelton Group are also common. Geological mapping and rock chip sampling during 1986 have delineated a sulphide-bearing altered zone, 40 to 50 m wide and more than 700 m long which locally carries significant precious metals. Trenching has been carried out on several of these veins. Highest values within the altered zone assayed 38.09 oz Ag/ton and 0.091 oz Au/ton across 0.17 m of quartz calcite and tetrahedrite. Adjacent to the altered zone and extending southward into an area dominated by granitic rocks, several quartz-carbonate-galena-chalcopyrite-pyrite veins have been explored by trenching which contain high values in gold for considerable lengths. One of the quartz-galena veins is at least 245 m long, 0.1 to 0.3 m wide, and carries values which range from 0.008 to 0.381 oz Au/ton and 0.14 to 38.09 oz Ag/ton. In total 12.0 km of grid were surveyed, 137 m of trench were excavated and 66 rock samples collected for assay at the Hope claims during 1986. Geophysical surveys were carried out which will be documented in a later report.

A budget of $76,800 dollars is estimated for the next exploration Phase, consisting of short hole diamond drilling and support requirements.

INTRODUCTION

The Hope 1-5 and 7 mineral claims are located south of Tahtsa Lake in west-central British Columbia, 5 km due east of the east portal of Kemano-Tahtsa underground aquaduct. Elevation of the property ranges from 854 m near the northwest corner of Hope 5 to 1880 m near the southeast corner of Hope 7 claim.

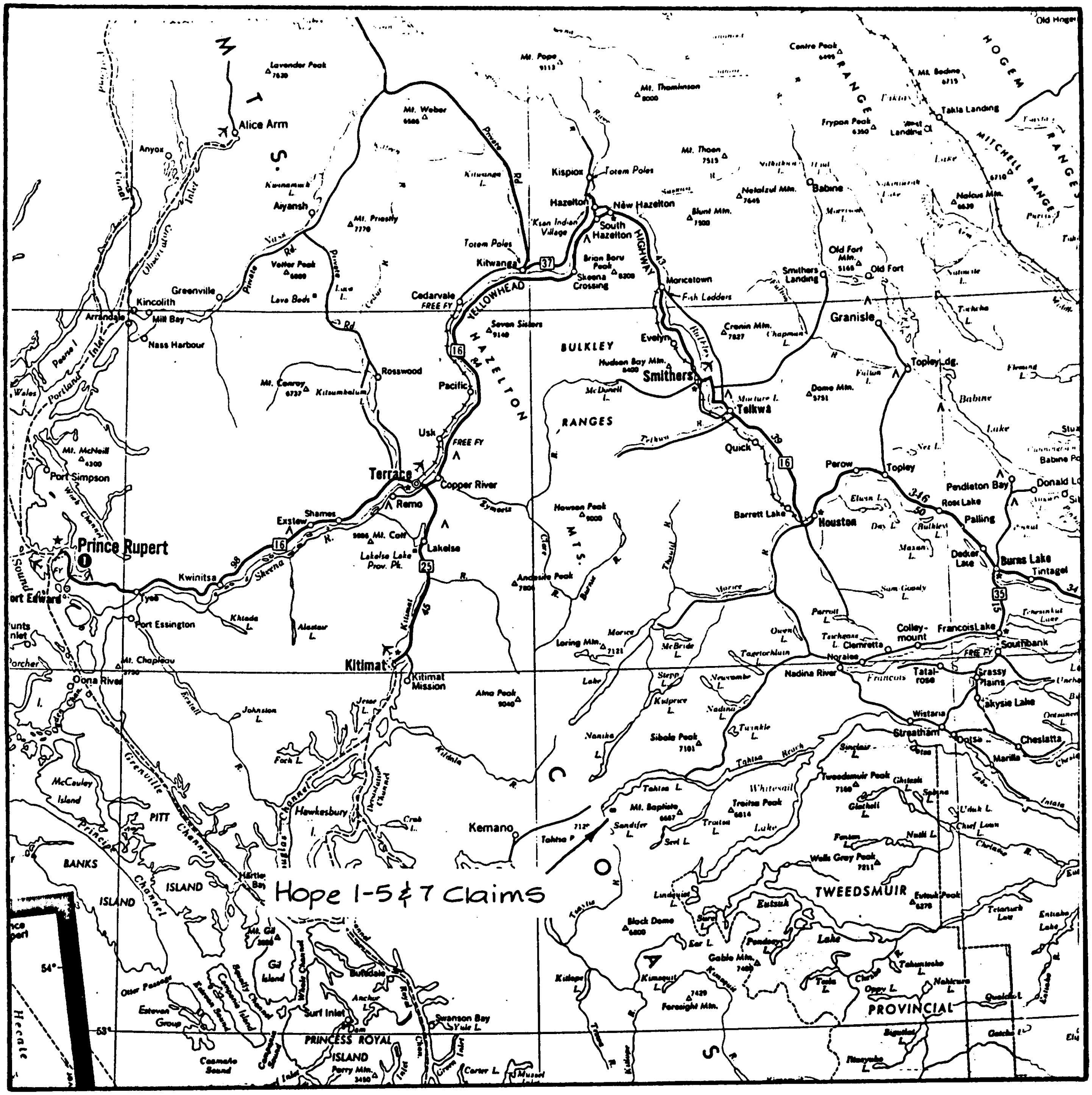
The property consists of two 20-unit claims (Hope 5 and Hope 7) which overlap four 2-post claims (Hope 1-4). Total area covered by the claims is approximately 1000 hectares. The accompanying claim map shows the location of the claims with respect to the legal corner posts as seen in the field. All claims lie within the Omineca Mining Division. Coordinates which cross the claim group include 53°37' north, 127°36'25" west.

Record data of the claims are as follows:

Claim Name	*Record No.*	*Size in Units*	*Record Date*
Hope 1	5856(10)	1	October 12, 1983
Hope 2	5857(10)	1	"
Hope 3	5858(10)	1	"
Hope 4	5859(10)	1	"
Hope 5	7519(3)	20	March 12 1986
Hope 7	7914(9)	20	September 16, 1986

Access to the property can be by boat or launch from numerous roads leading to the Nechako Reservoir of which Tahtsa Lake is a part. A well constructed gravel road serving the Alcan facility at the west end of Tahtsa Lake is located 3 km to the west. Access to the upper parts of the claim can be on foot via a blazed and flagged trail 3.0 km from Tahtsa Lake, or more easily by helicopter from Houston, B.C., 105 km to the northeast.

Prior to 1982, when Clifford McNeill discovered massive pyrite and chalcopyrite in large quartz viens on the property, there is no record of exploration activity. A portion of the cliams was mapped and sampled in 1984. More extensive exploration, including geological mapping, grid layout, trenching and rock geochemical sampling were carried out between August 2 and September 5, 1986, and is the subject of this report. Geophysical surveys including

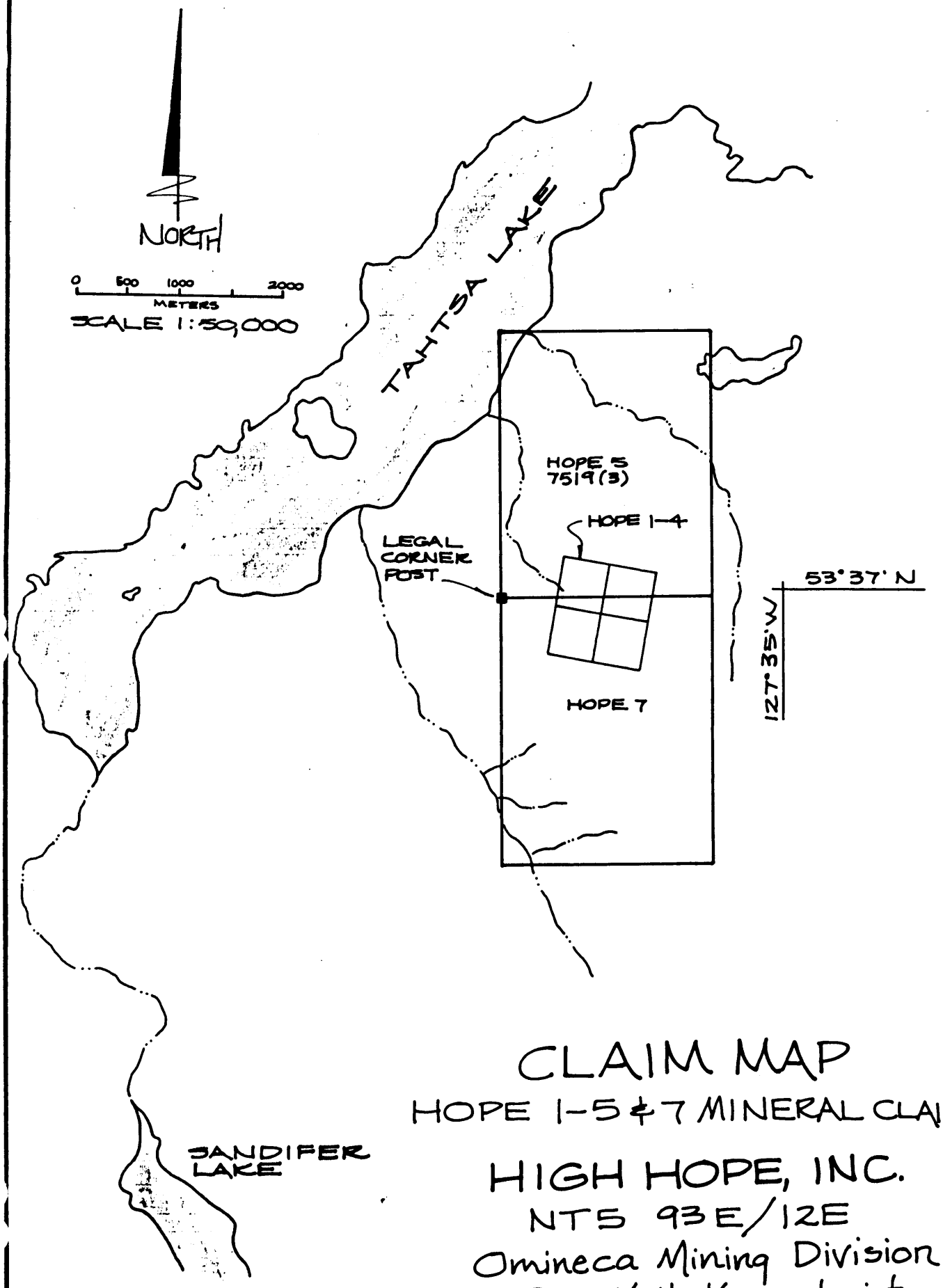


0 16 32
KILOMETERS
1:800,000

NORTH

LOCATION MAP

HOPE 1-5 & 7 CLAIMS
TAHTSA LAKE, B.C.
Ominica Mining Division
NTS 93 E/12 E
HIGH HOPE INC.
Paul Kallock, geologist



CLAIM MAP

HOPE 1-5 & 7 MINERAL CLAIMS

HIGH HOPE, INC.

NTS 93E/12E

Omineca Mining Division

Paul Kallock, geologist

September, 1986

magnetics and VLF-EM were also carried out at this time, but will be addressed in a separate report.

GEOLOGIC SETTING

The Hope claims lie on the eastern flank of the Coast Mountains. Numerous granitoid intrusions and metamorphics of Paleozoic to Tertiary age deominate the range. Jurassic and Cretaceous sedimentary and volcanic rocks have been intruded by or may blanket these intrusions in the Tahtsa Lake area. Folding and faulting of the bedded rocks is common along the contact of the main mass of Coast Intrusions and may be found to a lesser extent near isolated intrusions.

LOCAL GEOLOGY

According to mapping by van der Heyden (1982), Paleozoic diorites and greenstones have been thrust into place adjacent to Mesozoic granodiorite in the Hope claim area. Block faulting bounds volcanics of the lower Jurassic, Telkwa Formation of the Hazelton Group in the eastern part of the claims. Also in this area two small Paleocene/Eocene stocks belonging to the Nanika group of intrusions have been delineated.

During the 1986 exploration season 12.0 km of hip-chain and compass survey grid lines were established in the upper elevations of the central parts of the claim group to aid in geological mapping and subsequent geophysical surveys. A geology map of this grid area, constructed at a scale of 1:1000, is included in the pocket in the back of this report.

Stratigraphy

Establishing a sequential stratigraphic rock column at the Hope claims has been difficult. Only two units can be assigned a formal name as indicated by previous investigators in the Tahtsa area. In the northeast part of the map area, andesite and andesite flow breccia with lesser tuff and tuff breccia belong to the Telkwa Formation of the Hazelton Group. Bedding observed in some of the lithic tuffs trends N45°W 66°S. Age of the Telkwa Formation is lower Jurassic.

The other unit which can be correlated with some assurance is the Nanika Intrusion of Paleocene or Eocene age. Fine to coarse-grained granite which varies from pink to light grey is common throughout the property. It occurs as large outcrop areas in the south and east parts of the map area. Elsewhere it may form small plugs or dykes; however, in many places its relation with other rocks becomes complicated.

Excluding the altered zone, designated Z on the geology map, there are several episodes of intrusive activity including diorite and andesite as dykes and stocks. In localities such as 9+00N 11+00E, sub-horizontal andesite dykes are nearly volumetrically equivalent to the granite. Elsewhere diorite and andesite appear to be intruded by granite. Furthermore, textural gradations of diorite and andesite appear to vary. For example, near 5+50N 9+50E, unaltered, blocky, medium-grained diorite occupies a northwest trending outcrop belt. It appears to be younger than the gold-bearing quartz-galena vein.

Rhyolite or rhyodacite was seen at several localities within or near the altered zone. It is generally siliceous, very fine-grained, brittle and weathers white. Occasionally, small feldspar phenocrysts can be seen. Banding was also seen along the margins of a rhyolite dyke at 14+00N 13+25E and 13+20N 13+50E, and west of the map area near 8+00N 5+25E.

Another rock type which is confined to the altered zone has been labelled "mine dyke" due to its close spatial association with tetrahedrite-quartz-carbonate mineralization. The dyke, which varies in width from 0.5 to 10 m, is actually a grey to brownish grey andesite dyke with distinct voids or vugs of irregular shape and distribution. The dyke parallels the trend of the altered zone and occurs as a single intrusive or several smaller dykes. In the camp area (9+15N 10+35E) and towards the southwest the dykes are bisected and displaced by occasional oblique faults. The "mine dyke" is also distinct in its lack of alteration and mineralization. Only one exception to this was found at 9+30N 10+70E where a 0.15 m carbonate vein contained galena (?) pyrite and chalcopyrite. A sample of this vein contained 1.12 oz Ag/ton and 0.004 oz Au/ton.

An important, although complex, unit called the altered zone and labelled Z on the geology map, crosses the survey area from the northeast at 14+00N 13+25E where it is in fault contact with the volcanic breccias of the Hazelton Group to

the west near 8+40N 9+05E where it disappears under an icefield. It emerges from beneath the ice near 8+00N 5+00E and continues to the west.

The altered zone appears to be composed of several rock types including andesite, granite, basalt, rhyolite and massive carbonate (crystallized limestone?). It is characterized by the presence of abundant chlorite, calcite, epidote, siderite, quartz and hematite. Shearing and strong fracturing are common. Scattered throughout the altered zone are quartz and/or carbonate veins which contain sulphides. A petrographic sample collected at 8+86N 9+56E and described in the appendix revealed a siliceous volcanic breccia as the host to sulphide mineralization. West and south of Tahtsa Lake, van der Heyden (1982) has described the Gamsby Group of Permian and older (?) which fits remarkably well the type of rock seen in the altered zone. He describes the Gamsby Group as follows:

> *"Schistose and mylonitic felsic and mafic flows, tuff and lesser volcanogenic sediments, phyllite, amphibolite, marble, skarn, dykes and granite. Metamorphosed to greenschist facies."*

It is not known if the altered zone is correlative with the Gamsby Group or if it is an altered equivalent of other rock types seen nearby.

Structure

Faulting and numerous shear zones are associated with the altered zone. They generally trend northeast with moderate to steep dips to the northwest. Several prominent faults have been mapped which crosscut the general northeast trend of the altered zone. For example, at 8+50N 9+30E a vertical fault bisects the altered zone in a perpendicular direction. At 9+00N 10+20E a N30°E 55°N fault displaces granite and "mine dyke". Some of the most intense faulting occurs at 14+00N 13+15E. Here, a north trending, 1.0 m wide fault breccia is developed which dips at 40° to the west. Below this fault, volcanics and quartz-sulphide veins of the altered zone are bisected by additional block faults. It is believed that a regional northwest trending fault juxtaposes Hazelton Group volcanics against intrusive and Paleozoic (?) rocks in this area.

After trenching was carried out on mineral and vein occurrences it was seen that clay alteration, perhaps associated with faulting, was present on either the

footwall or hangingwall of numerous viens. This was readily apparent at 8+86N 9+56E and 7+18N 8+89E where several centimetres of clay were present.

A pronounced offset in the northeast trending altered zone is present at 9+50N 11+00E. From here, about 80 m of left lateral displacement on a northwest trending fault would account for the abrupt curve in altered zone. An actual fault was not seen in this area. However, the topography also suggests a structural feature is present here. A stream makes a 90° turn and leads into an ice-filled trough at the projected trend of the fault.

Folding was not observed in the map area due to a lack of bedded horizons and the abundant shearing in the altered zone.

TRENCHING, MINERALIZATION AND ROCK GEOCHEMISTRY

During the 1986 exploration programme at the Hope claims, 66 rock samples were collected. Many of these samples were obtained as continuous rock chip samples from exploration trenches and pits excavated in vein or alteration zones. A total of 137 m of trenching was excavated in 33 trenches. An Atlas-Copco air-percussion drill was used to bore holes between 1 and 2 m deep, which were then loaded with dynamite and blasted. Trenches were cleaned using pick and shovel. Locations of trenches are shown on the geology map. Rock sample locations are shown on the geochemistry map. Rock sample descriptions, assays and analytical procedures are included in the appendix.

Physical character and mineral composition of veins indicate that there are at least three main types of mineralization present at the Hope claims. Each type has a distinct oxidized mineral suite which occurs at surface.

As previously stated, the altered zone (designated Z on the geology map) contains abundant chlorite, epidote, quartz, calcite, hematite and siderite. In addition to these minerals, sulphides occur in veins and irregular patches. Among the sulphides which can be recognized in the hand specimen are tetrahedrite, galena, chalcopyrite, pyrite, and sphalerite. Thin section studies have also noted bornite.

At least 16 veins were found within the altered zone which contain tetrahedrite and other sulphides. Many of these veins were trenched by the use of

dynamite and pick and shovel. Rock chip samples were collected from these sites which show a wide distribution of precious metals. The highest value was received from a 0.17 m quartz, calcite, and tetrahedrite vein at 9+37N 10+52E which contained 39.09 oz Ag/ton and 0.091 oz Au/ton. Other wider chip samples of the vein taken at 3.0 m intervals indicate an average of 9.89 oz Ag/ton and 0.030 oz Au/ton across 0.56 m of width. The vein is at least 6 m long. It pinches toward the southwest but is open to the northeast. The vein is actually composed of several veinlets of carbonate and quartz with up to 10% sulphides. At surface, azurite and malachite are present. However, there is a lack of limonite or hematite or any gossanous outcrop. Host rock appears to be an andesite.

Numerous other veins of similar character were found within the altered zone. Each was spatially associated with narrow pods or lenses of carbonate; each displayed traces to several percent malachite and/or azurite at surface and did not have significant rusty cappings. One such vein was selected for multi-element spectrographic analysis and petrographic study. Analysis and polished section descriptions are included in the appendix. The sample called "Rodney's vein" was collected at 10+70N 10+83E and contained 6.81 oz Ag/ton and 0.001 oz Au/ton in a 0.15 m chip sample across the vein. Length of the vein does not appear to exceed 3.0 m. It is hosted in sheared andesite (?) and is primarily a quartzitic rock containing numerous patches of sulphides. Sphalerite and tetrahedrite are most common. Some bornite and minor chalcopyrite and galena are present. As might be expected, spectrographic analysis showed high values of copper, lead, zinc, and silver. Furthermore, a high value of 2871 ppm antimony probably can be attributed to the tetrahedrite.

The second type of mineralization is typified by the vein at 7+18N 8+89E. In this area, rubcrop or felsenmeer (broken weathered rubble in-place or slightly moved by gravity slide or soil creep) is common. During 1984 a float sample of orange-brown quartz-carbonate with traces of malachite and azurite and several percent tetrahedrite was collected which assayed 27.16 oz Ag/ton and 0.082 oz Au/ton. Trenching was carried out in 1986 and a N44°E 77°E vein of similar material was sampled. It is 0.20 m wide and contained 31.30 oz Ag/ton and 0.063 oz Au/ton. Limited prospecting and trenching in the area did not locate the extensions of this vein. Numerous cobbles of orange quartz-carbonate vein

material are present and often the host rock, a coarse-grained granite, is similarly iron-stained. Furthermore, there is a perplexing range of surficial rock displacement including everything from solid bedrock outcrops to glacial erratics. It is difficult to judge the proximity of the source of vein fragments.

Numerous veins of orange-brown quartz ± carbonate were sampled at the Hope claims. Most did not return significant precious metal values. They are common in the map area and vary in width from 1 to 25 cm. They are often brecciated and are most abundant in the coarse-grained granite.

The original discovery vein of the present map area has features common to both the first and second mineralization types. At 8+86N 9+56E a vein of orange-brown quartz-carbonate volcanic breccia trends N5°W 72°E. Rubble-float from this vein was discovered in 1984 and an assay of a select sample of quartz breccia containing 5% tetrahedrite analysed 94.91 oz Ag/ton and 0.312 oz Au/ton. A petrographic study was made from a piece of this vein material and is included in the appendix. Note the abundance of early stage pyrite, later tetrahedrite and galena and probably late chalcopyrite. Sulphides occur in the breccia fragments and within the matrix.

In 1986 a 2 m deep and 5 m long trench was excavated at the 8+86N 9+56E site. The vein was found to be 1.2 m wide but did not contain as much sulphides as the float material. Chip sample #8+86N 9+56E contained 0.68 oz Ag/ton and 0.002 oz Au/ton across 1.2 m. Other samples in the trench returned similar values. The vein is covered by overburden both to the north and south of the trench. However, numerous orange-brown quartz-carbonate float cobbles can be found south of the trench extending as far as the previously mentioned trench at 7+18N 8+89E.

The third main type of mineralization is exemplified by the long, narrow quartz-galena vein which extends south of 5+20N 8+80E. This vein varies in width from 0.1-0.3 m and is discontinuously exposed for 245 m of strike length. Additional exposures of the vein were seen 210 m south of the map area.

In outcrop the vein is mostly white quartz. Occasionally it is weakly iron-stained and shows visible boxwork structures after sulphides. The highest values in the vein were obtained at 4+25N 9+00E where a chip sample across 0.14 m of quartz containing 10% pyrite and 8% galena assayed 3.61 oz Ag/ton and 0.412 oz Au/ton. Seven trenches excavated along the vein were sampled. Values of gold ranged from 0.008 to 0.381 oz/ton and silver from 0.14 to 38.09 oz/ton.

The quartz-galena-pyrite vein appears to be hosted in coarse-grained granite and fine-grained diorite dykes. Trenching at the south part of the map area indicates that wider and stronger (?) mineralization is associated with the granite.

At 6+00N 7+75E another quartz sulphide vein hosted in coarse-grained granite trends N10°W 75°E. A chip sample across 0.10 m of the vein at surface assayed 0.51 oz Ag/ton and 0.315 oz Au/ton. After it was drilled, blasted with dynamite and excavated, sample #6+00N 7+81E was collected at 1.0 m depth. It represented 0.23 m of vein material consisting of 1% pyrite, and traces of chalcopyrite in quartz with 5 cm of clay on each wall. Assay value of this sample was 0.19 oz Ag/ton and 0.181 oz Au/ton. Other samples from trenches across the vein at 6 and 13 m farther north contained 0.15 and 0.16 oz Au/ton respectively. On surface this vein displays quartz with weak dark brown limonite and minor malachite and azurite. No galena was noted. Approximately 5 m east of the vein is a parallel orange-brown quartz-carbonate breccia vein which contained 0.39 oz Ag/ton and 0.011 oz Au/ton (sample #6+00N 7+80E).

There are other gold and silver veins which have been sampled and are shown on the geology and geochemistry maps in the pocket and listed in rock descriptions. They have variable size and value and show mineralogy of the three main categories or gradation between these main mineral types.

Only a small amount of work was done on the large quartz-chalcopyrite vein which was channel-sampled in 1984 (Kallock, 1984). With respect to the 1986 grid survey, the southern end of the vein is at 10+00N 5+60E. Near this point, sample 84-2 contained 0.90 oz Ag/ton and 0.144 oz Au/ton. It was collected from 0.15 m of quartz-chalcopyrite which trends N20°W and dips steeply to the east.

DISCUSSION

Several questions remain to be answered. How much of the altered zone is related to hydrothermal alteration and sulphide introduction? Perhaps some of the chlorite, epidote and carbonate have been generated by regional metamorphism. However, subsequent intrusion by granite and diorite and penetration by volcanic feeder vents is indicated. Precious metal-bearing fluids may have accompanied these intrusive events.

Recent work by van der Heyden (1986) in the Tahtsa Lake-Sandifer Lake may explain some of the plumbing system at the Hope claims. His mapping indicates that the area lies within a 3 km thick thrust sheet which contains a continuous, inverted metamorphic transition between annealed migmatitic tectonites of the Central Gneiss Complex to the west and mylonitic to cataclastic volcanics of the Hazelton Group to the east. A ductile to brittle thrust zone may underlie the claim area. Superimposed on this package are steep shear zones related to Cenozoic uplift. The veins of the Hope claims may coincide with these steep shears which tap the underlying thrust fault.

For descriptive purposes three types of mineralization have been outlined. However, distinction of these veins in the field is less certain. There is overlap of mineral assemblages between the groups. For example, galena has been seen in each of the areas, and in most of the veins. Tetrahedrite (and high silver values) is more restricted to the altered zone. Gold is strongest in the veins outside the altered zone except for 8+86N 9+56E where the sample collected in 1984 contained 0.312 oz Au/ton.

Within the altered zone precious metal values decrease to the northeast where strong faulting and sulphides were found at 14+00N 13+25E. Decrease in metals is also apparent to the southwest beyond the map area. Sample 8+00N 5+25E did not contain appreciable precious metals. Therefore, the central part of the altered zone is more attractive for exploration.

The gold-bearing veins which lie outside of the altered zone do not exhibit such zoning. In these veins, exploration must be directed towards finding greater width while maintaining grade.

CONCLUSIONS

Geological mapping and rock sampling at the Hope claim group during 1986 has greatly enlarged the area of known precious metal mineralization. A 40 to 50 m wide northeast trending zone of mixed igneous and sedimentary rocks displaying strong shearing with chlorite, epidote, calcite and quartz is host to numerous tetrahedrite, pyrite, chalcopyrite and galena bearing veins. Length of the sulphide bearing altered zone exceeds 700 m with a central 250 m which contain significant

precious metals in numerous parallel although discontinuous sulphide veins. Greatest concentration of veins was found near the camp site (9+15N 10+35E). A high value of 38.09 oz Ag/ton and 0.091 oz Au/ton was obtained from one of the veins which measured 0.17 m wide.

South of the altered zone, quartz and quartz-carbonate veins are hosted in coarse-grained granite which is believed to be a Nanika Intrusion of Paleocene or Eocene age. Several of the veins contain sulphides including galena, pyrite and chalcopyrite. They are steeply dipping, north-south trending veins which carry up to 0.306 oz Au/ton in widths up to 0.37 m. There is no significant wallrock alteration associated with these veins.

RECOMMENDATIONS

A programme of shallow diamond drilling is recommended for the next exploration season. Several of the silver-bearing veins within the altered zone, the discovery vein at 8+86N 9+56E, and several of the gold-bearing quartz-galena-chalcopyrite veins south of the altered zone are obvious drill targets. Drill targets may also be suggested in a forthcoming geophysical report addressing a VLF-EM and magnetometer survey also carried out in 1986.

COST ESTIMATE

Phase 1

The first exploration stage has been completed. Geological mapping, rock sampling, and trenching are documented by this report. Report of VLF-EM and magnetics surveys remains to be completed.

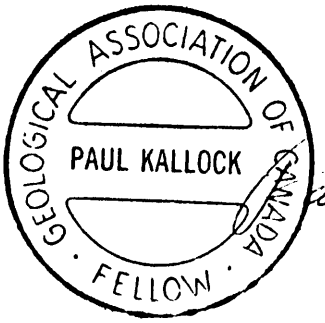
Phase 2

Diamond drilling, allow 300 m @ $120/m	$36,000	
Helicopter support	10,000	
Camp and supplies	3,000	
Transportation, excluding helicopter	5,000	
Geological supervision, assays, reporting	10,000	
Subtotal	64,000	
Contingencies @ 20%	12,800	
Total, Phase 2	76,800	$ 76,800

Phase 3

Extensive diamond drilling, allow 2000 m @ $130/m plus contingencies at 20%	260,000 52,000	
Total, Phase 3	312,000	312,000
Total, Phases 2 and 3		$388,800

Results of each Phase should be compiled into a geological report; continuance to the subsequent Phase should be contingent upon receiving favourable conclusions and recommendations from a qualified Geologist.



Respectfully submitted,

Paul Kallock
Geologist

Vancouver, B.C.
November 20, 1986

GEOLOGIST'S CERTIFICATE

PAUL KALLOCK

I, Paul Kallock, do state that:

1. I am an independent professional geologist.
2. I have a B.Sc. degree in Geology from Washington State University, 1970. I am a Fellow of the Geological Association of Canada.
3. I have engaged in mineral exploration in North and South America since 1970, both for major mining and exploration companies and as an independent geologist.
4. I have authored the report entitled, "Geological and Rock Geochemical Investigations of the Hope 1-5 and Hope 7 Mineral Claims, Tahtsa Lake Area, B.C." The report is based on my fieldwork carried out on the property and from previously accumulated geologic data.

GEOLOGICAL ASSOCIATION OF CANADA
PAUL KALLOCK
FELLOW

Paul Kallock
Geologist

Vancouver, B.C.
November 20, 1986

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APPENDIX

ANALYTICAL PROCEDURE

REGULAR ASSAY

1.00 gram sample is digested with 50 ml of 3-1-3 of HCl-HNO_3-H_2O at 95°C for one hour, and is diluted to 100 ml with water.

Detection for base metal is 0.01%.

ACME ANALYTICAL LABORATORIES LTD.
852 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6
PHONE 253-3158 DATA LINE: 251-1011

DATE RECEIVED: AUG 12 1986

DATE REPORT MAILED: Aug 16/86

ASSAY CERTIFICATE

SAMPLE TYPE: ROCK CHIPS AU* 10 GRAM REGULAR ASSAY

ASSAYER: . DEAN TOYE. CERTIFIED B.C. ASSAYER.

MARMEN FINANCIAL PROJECT-HOPE/TAHTSA FILE # 86-1993 PAGE

SAMPLE#	Ag OZ/T	Au OZ/T
939N 1054E	3.30	.005
937N 1052E	38.09	.091
935N 1050E	16.02	.071
933N 1048E	.15	.001
718N 889E	31.30	.063
8+86N 9+56E	.68	.002
6+00N 7+75E	.51	.315
6+00N 7+80E	.39	.011
4+25N 9+00E	3.61	.412
3+75N 905E	4.38	.783

ACME ANALYTICAL LABORATORIES LTD.
352 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6
PHONE 253-3158 DATA LINE: 251-1011

DATE RECEIVED: SEPT 2 1986

DATE REPORT MAILED: Sept 8/86

ASSAY CERTIFICATE

SAMPLE TYPE: ROCK CHIPS AU: 10 GRAM REGULAR ASSAY

ASSAYER: ..D. Toye..DEAN TOYE. CERTIFIED B.C. ASSAYER.

MARMON FINANCIAL FILE # 86-2423 PAGE

SAMPLE#	Ag OZ/T	Au OZ/T
1600N 600E	.08	.004
1600N 1350E	.01	.001
1400N 1324E	.19	.001
1400N 1324EA	.05	.001
1400N 1325E	.22	.001
1320N 1350E	.01	.001
1320N 1350EA	.09	.001
1320N 1350EB	.09	.001
1152N 1300E	.55	.001
1150N 1300E	.69	.005
1105N 1190E	.02	.001
1080N 1188E	.01	.001
1038N 1100E	.01	.001
1033N 1050E	.04	.002
1030N 1060E	.03	.001
1029N 1059E	.07	.003
1029N 1060E	.12	.003
1029N 1060EA	.21	.014
1028N 1059E	.14	.005
1028N 1060E	.02	.001
1028N 1060EA	.02	.001
1016N 1037E	.04	.001
1013N 1036E	.04	.001
1009N 1035E	.02	.001
1007N 1034E	.12	.001
1004N 1033E	.01	.001
988N 960E	.01	.001
920N 1040E	.02	.001
919N 1041E	.32	.002
918N 1042E	.01	.001
917N 1043E	2.85	.007
888N 956E	.52	.002
887N 956E	.53	.002
865N 853E	.26	.001
800N 525E	.01	.001
722N 894E	.01	.001

SAMPLE#	Ag OZ/T	Au OZ/T
675N 1052E	.05	.001
1080S 1760E	.73	.001
5460	.01	.001
NO NUMBER 1	.18	.024
NO NUMBER 2	.26	.015
NO NUMBER 3	.05	.003

1E ANALYTICAL LABORATORIES LTD.
552 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6
PHONE 253-3158 DATA LINE: 251-1011

DATE RECEIVED: SEPT 10 1986

DATE REPORT MAILED: Sept. 15/86

ASSAY CERTIFICATE

SAMPLE TYPE: ROCK CHIPS AU$ 10 GRAM REGULAR ASSAY

ASSAYER: D. Toye DEAN TOYE. CERTIFIED B.C. ASSAYER.

MARMON FINANCIAL PROJECT-HIGH HOPE/TASHTSA FILE# 86-2569 PAGE 1

SAMPLE#	Ag OZ/T	Au OZ/T
1070N 1083E	6.81	.001
1053N 1102E	3.09	.008
1051N 1100E	3.15	.004
930N 1070E	1.12	.004
807N 927E	.69	.002
766N 916E	1.03	.009
613N 778E	.21	.016
606N 780E	.04	.015
600N 781E	.19	.181
584N 879E	2.03	.011
545N 877E	.12	.123
520N 880E	9.04	.306
502N 884E	.14	.006
483N 884E	5.76	.381
425N 888E	38.09	.227
400N 906E	1.32	.182
372N 915E	.77	.087
324N 924E	1.89	.008
312N 926E	.90	.013
312N 927E	.07	.001
312N 928E	.89	.019
305N 928E	.26	.009
305N 930E	.02	.001

ACME ANALYTICAL LABORATORIES LTD. 852 E.HASTINGS ST.VANCOUVER B.C. V6A 1R6 PHONE 253-3158 DATA LINE 251-1011

GEOCHEMICAL ICP ANALYSIS

.500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN.FE.CA.P.CR.MG.BA.TI.B.AL.NA.K.W.SI.ZR.CE.SN.Y.NB AND TA. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: ROCK CHIPS

DATE RECEIVED: SEPT 10 1986 DATE REPORT MAILED: Sept 15/86 ASSAYER..D. Toye..DEAN TOYE. CERTIFIED B.C. ASSAYER.

MARMON FINANCIAL PROJECT - HIGH HOPE/TAHTSA FILE # 86-2569 PAGE 1

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM
1070N 1083E	1	7979	2161	2881	228.8	4	4	762	.46	625	5	ND	1	22	100	2871	2	6	5.66	.013	3	4	.10	70	.01	3	.25	.05	.12	1

ROCK SAMPLE DESCRIPTIONS

Coordinates	*Description*	*Ag oz/ton*	*Au oz/ton*
3+75N 9+05E	Chip sample of 0.10 m quartz vein containing 3-5% pyrite, 1-2% galena, hosted in fine-grained diorite; no wall alteration, weakly magnetic.	4.38	0.783
4+25N 9+00E	Chip of 0.14 m quartz vein containing 10% pyrite, 8% galena; same vein as 3+75N 9+05E.	3.61	0.412
8+86N 9+56E	1.2 m chip sample across N5°W 72°E trending vein, includes 15 cm near hangingwall with 2-3% tetrahedrite (?); malachite, azurite and traces of pyrite; remaining 1.05 m are quartz-carbonate alteration and brecciation with siderite veining and orange-brown limonite stain.	0.68	0.002
6+00N 7+75E	0.10 m chip sample of quartz vein containing 5% pyrite, 3% chalcopyrite; hosted in light tan coarse-grained granite. Vein trends N10°W 75°E.	0.51	0.315
6+00N 7+80E	0.30 m chip sample of brecciated coarse-grained granite with strong quartz-carbonate, orange limonite and dark brown siderite alteration; contains traces of pyrite. This vein is 5 m east of the 6+00N 7+75E vein and appears to be parallel to it.	0.39	0.011
The following 4 samples, 3 m apart, were collected across N45°E ∿vertical zone of calcite, quartz veins:			
9+39N 10+54E	1.1 m channel sample of calcareous andesite including two quartz, calcite veins of 2 cm each, containing 3-5% tetrahedrite (?); numerous other calcite veinlets within the sample width.	3.30	0.005
9+37N 10+52E	0.17 m channel sample across calcite, quartz vein containing 10% tetrahedrite (?), 5-10% malachite, 5-10% azurite.	38.09	0.091
9+35N 10+50E	0.4 m channel sample, true width, of carbonate-chlorite altered andesite containing 20% calcite, 10% quartz, and 3-5% tetrahedrite (?).	16.02	0.071

Rock Sample Descriptions (continued)

Coordinates	*Description*	*Ag oz/ton*	*Au oz/ton*
9+33N 10+48E	0.6 m channel sample of talcose altered andesite, lesser carbonate and one seam (1 cm) of calcite/tetrahedrite.	0.15	0.001
7+18N 8+89E	0.20 m chip sample across N44°E 75-80°SE trending quartz, carbonate vein containing 2-3% tetrahedrite, 2-4% pyrite within 12 cm; additional 8 cm of quartz, carbonate alteration with traces of sulphides.	31.30	0.063
10+80S 17+60E	Grab sample of float boulder, 10 m south of ridge, elevation ∿1915 m (6280 ft); silicified and locally clay altered granite with traces of chalcopyrite, malachite and tetrahedrite (?).	0.73	0.001
7+22N 8+94E	From lower (north) trench on projected trend of #7+18N 8+89E; 0.25 m chip sample across N50°E 90° trending vein; vein is 3 cm of quartz-carbonate-siderite (no visible sulphides); 2 cm clay on south wall; 20 cm of strong silicic and argilic altered coarse-grained granite.	0.01	0.001
6+75N 10+52E	0.25 m chip sample across brecciated coarse-grained granite; orange-brown surficial iron stain; strong quartz-carbonate matrix with traces dissemianted pyrite and grey metallic. Trend of rubble zone is N40°E.	0.05	0.001
11+05N 11+90E	Composite chip sample of 3 calcite, chlorite veins, each 4 cm wide; no visible sulphides; trend N70°E; fine-grained diorite host.	0.02	0.001
10+80N 11+88E	Composite chip sample of 3 calcite, chlorite veins each 5 cm wide; no sulphides; andesite and fine-grained serpentinized (?) fine-grained diorite.	0.01	0.001
10+33N 10+50E	Chips from 0.4 m float boulder of rounded quartzose pebble breccia (?) with chlorite-hematite-manganese matrix containing abundant calcite and 1% disseminated tetrahedrite and traces disseminated chalcopyrite.	0.04	0.002
10+38N 11+00E	Composite chip sample of 2 orange limonite, quartz, carbonate veins each 2-3 cm wide.	0.01	0.001

Rock Sample Descriptions (continued)

Coordinates	*Description*	*Ag oz/ton*	*Au oz/ton*
10+28N 10+59E	0.25 m channel sample of quartz-calcite-chlorite breccia trending E-W 47°N; contains 1% disseminated tetrahedrite; sharp footwall contact with fine-grained diorite and/or dark chloritic basalt (?).	0.14	0.005
10+29N 10+59E	0.30 m channel sample, north extension of previous sample; rounded quartz breccia (clasts of silicified granite ?), traces disseminated tetrahedrite.	0.07	0.003
14+00N 13+25E	0.10 cm chip sample of quartz, calcite vein trending N75°E 35°N; contains <1% pyrite and chalcopyrite, 1-2% tetrahedrite; host is chloritic altered andesite. Elevation 1700 m (5575 ft).	0.22	0.001
11+50N 13+00E	Approximate location, 0.12 m chip sample of irregular quartz vein with minor calcite, chlorite sheared andesite, tetrahedrite, trace malachite; structure trends N30°E 45°N.	0.69	0.005
11+52N 13+00E	0.20 cm chip sample of quartz vein similar to 11+50N 13+00E; 2-3% limonitic boxwork, no visible sulphides.	0.55	0.001
13+20N 13+50E	Chip sample representing 0.90 m true width of quartz and chloritic altered and sheared andesite; porphyritic orthoclase rhyolite dyke on footwall; andesite or basalt "mine dyke" on hangingwall; trend = N40°E 45°N. 1-2% tetrahedrite.	0.01	0.001
16+00N 13+50E	Representative grab sample of limonite-stained rhyolite (?) volcanic unit, possibly part of crystal lithic tuff breccia.	0.01	0.001
8+87N 9+56E	0.5 m channel sample of quartz, calcite, siderite vein with traces of pyrite, chalco-pyrite and tetrahedrite.	0.53	0.002
8+88N 9+56E	0.5 m channel sample in trench, vein of quartz, calcite, siderite, 1/2% tetrahedrite, trace chalcopyrite; andesite "mine dyke" to east, chloritic altered andesite to west.	0.52	0.002

Rock Sample Descriptions (continued)

Coordinates	*Description*	*Ag oz/ton*	*Au oz/ton*
9+88N 9+60E	2.0 m chip sample of moderate to strongly silicified and moderate to strongly argillic altered coarse-grained granite, minor siderite, no visible sulphides; quartz-chalcopyrite float noted below trench area.	0.01	0.001
8+65N 8+53E	0.5 m chip sample of orange quartz, carbonate, siderite vein or breccia zone trending N30°E 60°E (?); andesitic host; trace pyrite in quartz.	0.26	0.001
8+00N 5+25E	Representative grab sample of 4-6 m altered zone of crystalline limestone (?), brown to olive green altered andesite or basalt, locally sheared to serpentine (?); cut by sub-parallel andesite "mine dyke". No visible sulphides.	0.01	0.001
14+00N 13+24E	High grade select sample of quartz vein, 15 cm wide containing 2% tetrahedrite; trends N70°E 66°N.	0.19	0.001
The next 4 samples are continuous channel samples, 1.0 m each, in a N15°W trench.			
9+17N 10+43E	From andesite "mine dyke" on south, 15 cm of light grey altered granite (?); 25 cm sheared green schistose andesite, 25 cm massive coarse crystalline calcite with 2% tetrahedrite, 1% malachite; 35 cm light brownish green, granular andesite.	2.85	0.007
9+18N 10+42E	25 cm granular andesite; 75 cm sheared, pebble and cobble breccia clasts of andesite, rhyolite and granite; matrix of brownish green chlorite and carbonate.	0.01	0.001
9+19N 10+41E	15 cm rounded breccia; 30 cm resistant quartz, calcite andesite lens with trace of tetrahedrite; 55 cm dark olive green andesite or basalt and rounded fragmental basalt breccia (?).	0.32	0.002
9+20N 10+40E	15 cm knobby light green andesite with moderate calcite; 85 cm dark green to black basalt and basalt/andesite breccia.	0.02	0.001

Rock Sample Descriptions (continued)

Coordinates	*Description*	*Ag oz/ton*	*Au oz/ton*
10+28N 10+60E	1.0 m chip sample in trench; black basalt(?), occasional calcite stringer, trace pyrite, unaltered, footwall to vein.	0.02	0.001
10+29N 10+60E	0.35 m chip sample in trench; vein trending N80°E 55°N, rounded quartz pebble breccia in matrix of chlorite, calcite and quartz, dark greenish purple near footwall, light green in centre of vein, <½% tetrahedrite (?).	0.12	0.003
10+30N 10+60E	1.0 m chip sample, north end of trench, hangingwall side of vein; sheared basalt (?), minor quartz, calcite and hematite veins, common chlorite.	0.03	0.001
Following 5 samples from trench:			
10+04N 10+33E	1.0 m chip sample of moderately broken and sheared andesite, minor calcite.	0.01	0.001
10+07N 10+34E	1.0 m chip sample, sheared and altered andesite (?), local quartz, sericite, strong quartz and calcite veinlets, chlorite and hematite common, traces pyrite and tetrahedrite (?).	0.12	0.001
10+09N 10+35E	2.0 m chip sample, strong calc-silicate, chlorite altered volcanic (?).	0.02	0.001
10+13N 10+36E	2.0 m chip sample of light green calc-silicate, also chloritic altered andesite, traces of tetrahedrite (?).	0.04	0.001
10+16N 10+37E	3.0 m chip sample of green andesite (?), black basalt (?), lesser calc-silicate with trace tetrahedrite (?).	0.04	0.001
16+00N 6+00E	0.35 m vein of quartz with 10% pyrite, 1% chalcopyrite and trace of grey metallic, several boulders may be in-place, sample of select high grade.	0.08	0.004
3+12N 9+28E	0.25 m trench chip sample of quartz, limonite, trace pyrite and some altered (siderite) granite.	0.89	0.19
3+12N 9+27E	2.0 m chip sample in central part of trench, carbonate siderite and lesser argillic (sheared?) granite.	0.07	0.001

Rock Sample Descriptions (continued)

Coordinates	*Description*	*Ag oz/ton*	*Au oz/ton*
3+12N 9+26E	0.31 m chip sample in trench of quartz vein containing 1% pyrite, 1% chalcopyrite, trace galena over 6 cm; 25 cm of altered granite with lesser quartz and carbonate.	0.90	0.013
3+05N 9+30E	0.32 m chip sample in lower trench (4.5 m trench) vein of quartz and siderite, trace pyrite.	0.02	0.001
3+05N 9+28E	0.22 m chip sample of quartz, clay, siderite, trace pyrite; host coarse-grained granite.	0.26	0.009
6+00N 7+81E	0.23 m chip sample of quartz vein including 5 cm of clay on each wall; 1% pyrite, trace chalcopyrite; from trench wall 1 m below surface.	0.19	0.181
6+06N 7+80E	0.21 m chip sample across quartz vein containing 1-2% pyrite, 1% coarse blebs of chalcopyrite; some clay on hangingwall; host coarse-grained granite; vein trends N10°W 75°E.	0.04	0.015
6+13N 7+78E	0.15 m wide sample of quartz with 5% coarse chalcopyrite, 1% pyrite, strong malachite and azurite; located near medium-grained diorite and coarse-grained contact.	0.21	0.016
5+45N 8+77E	Chips from several cobbles representing approximately 0.15 m of quartz vein containing blebs of chalcopyrite; sample of fractured rubble in place at granite-diorite contact.	0.12	0.123
5+84N 8+79E	1.0 m chip sample across quartz, carbonate breccia vein; orange limonite on weathered surface; contains quartz, calcite, siderite, limonite, traces galena, sphalerite and pyrite; trend N18°W 75°E; host diorite or andesite.	2.03	0.011
10+70N 10+83E	"Rodney's Vein", 0.15 m chip sample of quartz vein and strongly sheared andesite (?) containing 5% tetrahedrite, ½% chalcopyrite, strong malachite and azurite; trend N69°E; vein appears to pinch within 3 m of length.	6.81	0.001

Rock Sample Descriptions (continued)

Coordinates	*Description*	*Ag oz/ton*	*Au oz/ton*
10+53N 11+02E	"Helen's Vein", 0.33 m chip sample across 15 cm of quartz and 18 cm of argillic altered andesite (?), both with 1-2% galena, 1% tetrahedrite and strong azurite and malachite. Vein is open in both directions.	3.09	0.008
10+51N 11+00E	0.18 m chip sample of poorly exposed quartz with clay vein containing 1-2% galena, strong azurite and malachite; host is sheared andesite and carbonate containing chlorite + epidote.	3.15	0.004
Seven samples from South Galena Vein:			
5+20N 8+80E	Cap #1 0.37 m chip sample	9.04	0.306
5+02N 8+84E	Cap #2 0.40 m chip sample	0.14	0.006
4+83N 8+84E	Cap #3 Select sample	5.76	0.381
4+25N 8+88E	Cap #4 0.20 m chip sample	38.09	0.227
4+00N 9+06E	Cap #5 0.30 m chip sample	1.32	0.182
3+72N 9+15E	Cap #6 0.10 m chip sample	0.77	0.087
3+24N 9+24E	Cap #7 0.30 m chip sample	1.89	0.008
8+07N 9+27E	Grab sample from rubble "in-place" of orange stained quartz, carbonate, siderite breccia vein, trace malachite and pyrite; vein is greater than 10 cm wide.	0.69	0.002
7+66N 9+16E	Grab sample from rubble "in-place" of quartz vein with strong siderite, calcite, less than 1% sulphides, trace malachite, strong hematite; andesite host.	1.03	0.009
9+30N 10+70E	0.15 m chip sample of carbonate altered andesite containing 2% cubic galena (?); trace pyrite and chalcopyrite.	1.12	0.004

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Invoice 5981

Report for: Paul Kallock,
29031 SR 530 N.W.,
Stanwood, Washington,
98292.

September 23, 1986

Sample: 1070 N, 1083E.

The sample is a quartzitic rock containing patches of sulphides a few millimeters in size. These make up 15 - 20% of the section. Sulphide proportions are:

sphalerite	78%
tetrahedrite	14
bornite	8
chalcopyrite	minor
galena	minor

Sphalerite forms subrounded/shapeless massive patches 2 to 8mm in size. Tetrahedrite and bornite are intergrown with the sphalerite and also form small irregularly shaped grains away from the sphalerite. The tetrahedrite forms shapeless grains 0.1 to 0.5mm in size which occur within the sphalerite, usually close to the edge of the grain. They tend to occur in clusters of a few grains. Tetrahedrite grains outside of the sphalerite also tend to occur in small clusters and range in size from 0.5 to 1.5mm. Small grains of bornite are included in the outer parts of the tetrahedrite or partly surround the smaller tetrahedrites. Very fine bornite grains are also scattered in the sphalerite and grains up to 0.5mm in size occur adjacent to it or partl;y intergrown with the edges. Small clusters of bornite occur without the sphalerite and tetrahedrite and these, and the ones occuring at the edges of sphalerite sometimes have slivers and small patches of chalcopyrite within them. A shapeless patch about 0.5mm in size consists of an intergrowth of galena and tetrahedrite in roughly equal amounts.

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Invoice 5891

Report for: Paul Kallock,
301 - 1885 Balsam Street,
Vancouver, B.C.,
V6K 3M3.

July 28, 1986

Sample #8: VOLCANIC BRECCIA WITH PYRITE AND TETRAHEDRITE.
886N 956E

This sample is a fine grained breccia containing ovoid siliceous fragments of variable size from 1 to 10mm. Sulphide mineralization is concentrated around and within the fragments, although some are disseminated throughout the matrix. Sulphides make up about 10% of the section; proportions are:

pyrite	58
tetrahedrite	40
chalcopyrite	2
galena	trace

Pyrite forms cubic grains mostly 0.05 to 0.3mm in size, averaging about 0.2mm. They are concentrated in aggregates up to 3mm in size within the siliceous fragments and are intimately intergrown with the quartz. Pyrite is the dominant disseminated sulphide mineral in the matrix and small clusters sometimes occur.

Tetrahedrite forms rounded grains with irregular, ragged margins which mainly occur in clusters around the outer part of the siliceous fragments. These are 1 to 2mm in size. Fine galena inclusions, less than 0.005mm in size, are scattered within them. A few much smaller grains are scattered in the matrix. Small parts of the pyrite aggregates are cemented by tetrahedrite. A patch about 0.5mm in size is cemented by a tetrahedrite - galena intergrowth.

Chalcopyrite forms shapeless grains mostly less than 0.2mm in size which are associated with the tetrahedrite but are paragenetically later. These occur adjacent to and partly within the tetrahedrite in a discontinuous zone around the grains. Small clusters occur close to the grains and single grains are scattered about the rock. A cluster of small pyrite grains is enclosed in a patch of chalcopyrite about 0.8mm in size. Traces of chalcopyrite occur along fine fractures. It may be associated with carbonate, but the polished section does not allow a detailed examination of this relationship.

A. L. Littlejohn

A. L. Littlejohn, M.Sc.