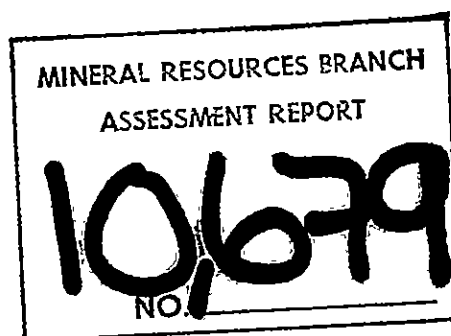


GEOLOGICAL REPORT ON THE CRAG CLAIM  
(Record Number 4130)

OMINECA MINING DISTRICT  
Mapsheet 93 E 11  
Latitude  $53^{\circ} 45'$  - Longitude  $127^{\circ} 30'$



By Barry D. Devlin  
Ryan Exploration Company, Ltd.

September 12, 1982

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## SUMMARY

The possibility of a similar sulfide deposit in the area around the Pb-Zn Emerald Glacier mine on Mt. Sweeney lead to the staking of the twenty unit Crag Claim. Volcanic flows and volcaniclastic beds overlain by sedimentary rocks were observed on the property. Evaluation of the property during July, 1982 involved preliminary geological mapping at a scale of 1:5,000. The purpose of this mapping was to determine whether the rock types hosting the Emerald Glacier Pb-Zn deposit were present on the Crag property. Future work will include detailed geological mapping and prospecting, grid soil sampling and a VLF-EM 16 geophysical survey.

## INTRODUCTION

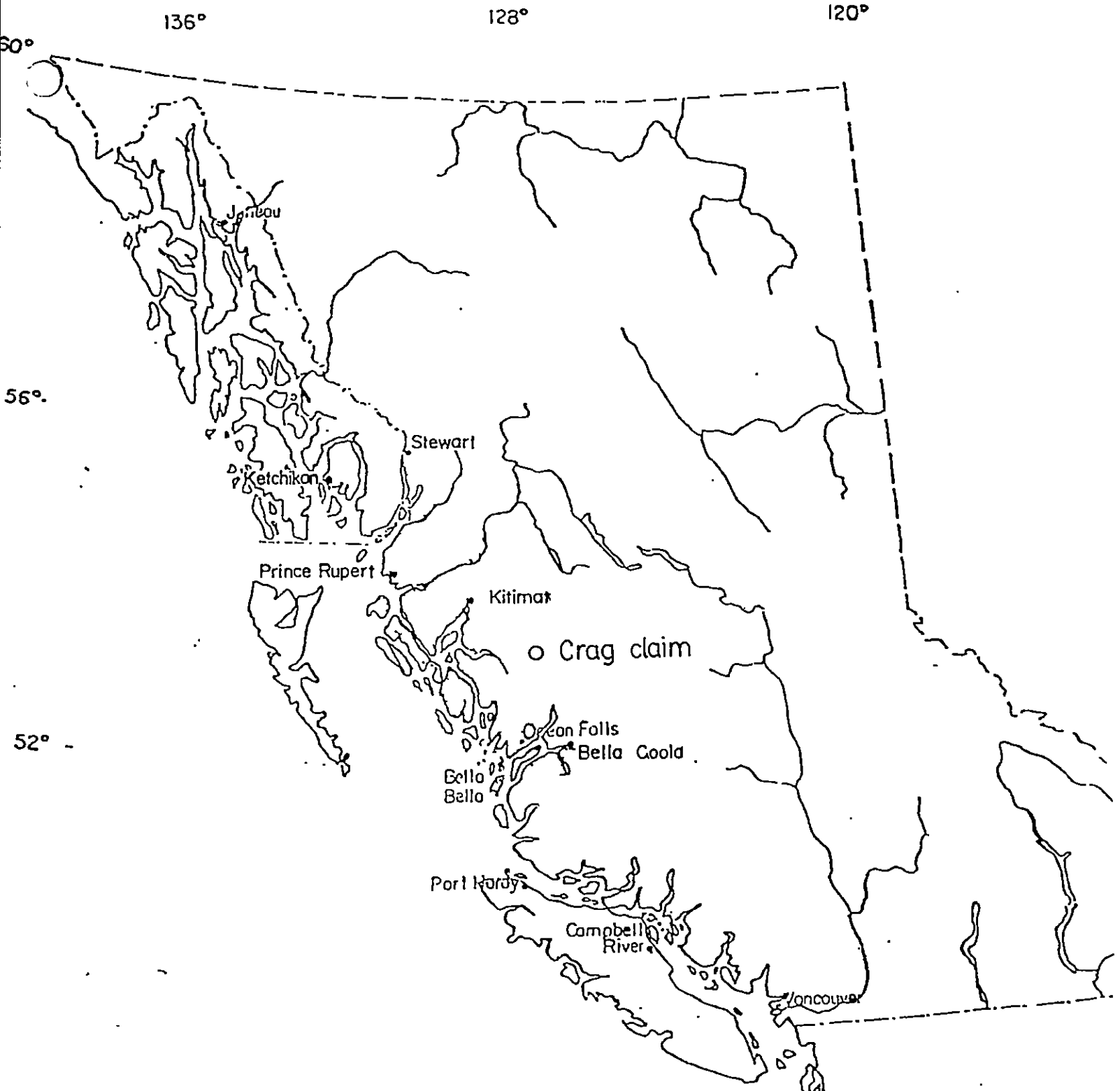
The Crag claim is located 90 kilometers (straight-line distance) southwest of Houston, approximately 10 kilometers north of Tahtsa Lake (Nechako Reservoir), as shown in Figures 1 & 2. Topography is characterized by a moderate, south-facing slope, with the elevation on the property ranging from 4,000 feet to the south and 6,500 feet to the north. Access to the property is possible along a well maintained gravel road, approximately 125 kilometers from Houston.

Staking of the Crag claim was carried out by Ryan Exploration Company, Ltd. during the summer of 1981. This area has been held by various owners in the past and the claim presently encloses part of the reverted crown grants of the inactive Emerald Glacier Pb-Zn mine. The Crag claim does not include the mineral rights of the Emerald Glacier mine. The economic potential is not known for the Crag property, however, the possibility of a mineralized occurrence along strike with the Emerald Glacier mine cannot be ruled out.

Preliminary geological mapping at a scale of 1:5,000 was conducted to find out if the rock types hosting the Emerald Glacier deposit are present on the Crag property.

Any evidence of structural trends, i.e. faults, was a primary concern. Emphasis was also placed on the stratigraphic contact between the sedimentary and volcanic rocks. The reason for this being that the area is favourable for a volcanogenic "Kuroko-type" massive sulfide deposit.

The geological mapping was carried out on 2.5 square kilometers of the Crag claim by Ryan Exploration Company, Ltd. This work partially overlapped some of the reverted crown grants which host the Emerald Glacier Pb-Zn deposit.



RYAN EXPLORATION  
LOCATION OF THE CRAG CLAIM

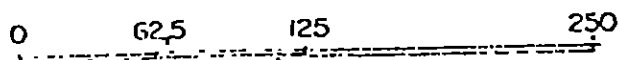
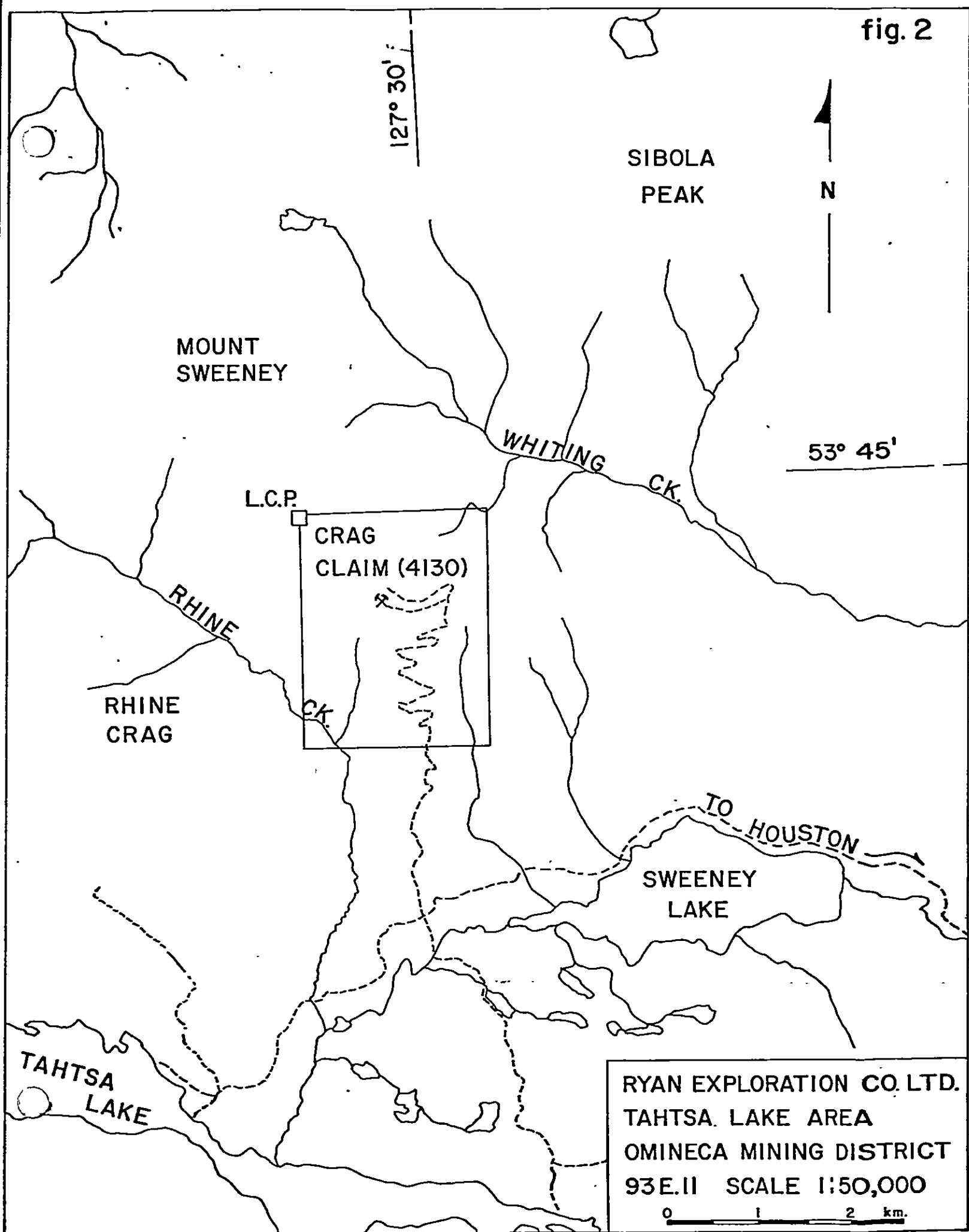


fig. 2



RYAN EXPLORATION CO. LTD.  
TAHTSA LAKE AREA  
OMINECA MINING DISTRICT  
93E.11 SCALE 1:50,000

0 1 2 km.



## REGIONAL GEOLOGY

Geological mapping of the Whitesail Lake (NTS 93E) map area was originally carried out by Duffell (1959) and then re-mapped by Woodsworth (1979). Woodsworth describes the area as being underlain by the Coast Plutonic Complex on the west, the Intermontane Belt on the east, and by a narrow, intensely faulted transition zone in the centre. The Coast Plutonic Complex consists of an isoclinally folded Central Gneiss Complex, plutonic rocks and the felsic and mafic tuffs of the Gamsby Group. The Intermontane Belt is underlain by the volcanic Lower Jurassic Hazelton Group, the sedimentary Middle Jurassic Ashman Formation, the sedimentary Lower Cretaceous Skeena Group, and Upper Cretaceous to Miocene (?) non-marine volcanics. Block faulting is the most dominant structure in the area.

The Crag claim area is underlain by the volcanic and sedimentary rocks of the Lower Jurassic Hazelton Group. This group is divided into the underlying Telkwa Formation and the overlying Smithers Formation. Flows and pyroclastic rocks of basaltic to rhyolitic composition comprise the Telkwa Formation. These rocks are predominantly red, maroon and green in colour and may contain minor sedimentary units. The Smithers Formation consists of grey to green volcanic sandstone, volcanic breccia and tuff, pebble conglomerate and rare limestone beds.

## PROPERTY GEOLOGY

### LITHOLOGY

Preliminary geological mapping on the Crag claim showed that the area is underlain by intermediate to acidic volcanics and volcaniclastics along with shales and sandstones (see Figure 3 in pocket). The volcanics consist of andesites, andesitic lapilli tuffs and dacitic tuffs. The andesites are light green in colour, aphanitic to medium grained and display a moderate to high degree of fracturing. The andesitic lapilli tuff is the most visible rock type with its deep purple colouration. Fragment size may reach up to 20 centimeters across, but the average size is only 2 centimeters across. The fragments are angular, but may be subrounded, especially with the smaller clasts. The dacitic tuffs are generally lighter coloured with various colours such as grey, tan and blue-green. This unit is fine to coarse grained and locally grades into a tuffaceous greywacke. No pervasive alteration of these volcanic rocks is observed on this property.

The shale is the most predominant rock type forming the sedimentary beds on the property. These shales are tan or blue-gray coloured and the texture is either massive or highly fractured. Local discontinuous chert beds occur within the shale. Interbedded with the shales are medium to

coarse grained, light brown sandstones. Weathering of these sedimentary rocks is a light orange-brown and locally a poorly developed foliation is evident. In places, the sandstone has the appearance of a volcanic greywacke and may grade into the aforementioned dacitic tuffs.

Fossils are observed in the sedimentary rocks. These fossils are primarily brachiopods and minor pelecypods were observed on the property. Most of the fossils were well preserved and the largest specimens found did not exceed 2.5 centimeters across.

#### STRUCTURE

The overall trend of the volcanic and sedimentary rocks within the map area is a northwest-southeast strike, at approximately 150 degrees. The beds on the eastern portion of the claim dip eastward whereas those on the western side have a westerly dip. However, no simple anticlinal structure is evident. Smaller scale folds observed on the property also have a northwest-southeast trend and plunge moderately southeast. It is possible that a significant fault transects the property and may account for the abrupt change in dip directions observed.

The absence of major regional deformation permits a reasonable interpretation of the stratigraphic relationships.

Several cycles of volcanics overlain by sediments are present on the property. Intermediate volcanics are overlain by acidic tuffs and then capped by shales and cherts. Apparent relationships indicate the rocks are younger moving from west to east, but this conclusion has not been proven.

#### MINERALIZATION

Mineralization on the property is lacking. However, although exposed outcrops are limited, the possibility of the discovery of a significant showing cannot be ruled out. The only mineralization observed occurred in either local silicified and pyritized zones, in fractures or as minor disseminations within the volcanic rocks. Some concentrations of pyrite reached as high as 2 percent in places. Minor amounts of malachite and azurite surface stains were observed on both the volcanic and sedimentary rocks.

## DISCUSSION AND CONCLUSIONS

The bedded volcanic and volcanoclastic series capped by fossil-bearing sedimentary rocks on the Crag claim is indicative of a submarine environment. Preliminary mapping on the property showed a favourable environment conducive to the formation of "Kuroko-type" volcanic exhalative massive sulfide deposits. Basic and intermediate volcanic flows grading upwards into acid volcanics and volcanoclastics, which in turn are capped by shales and cherts, were observed on the property.

The presence of localized pyritized zones with azurite and malachite surface stains, especially along contacts between acidic volcanoclastics and pelitic units, in addition to the close proximity to the Emerald Glacier sulfide deposit, indicates an excellent possibility for a Cu-Pb-Zn-Ag massive sulfide deposit. The Emerald Glacier deposit has been considered a "vein-type" occurrence, but stratigraphic relationships and rock types would support a syngenetic origin. The vein-type characteristics of the Emerald Glacier deposit and the presence of massive barite and quartz vein float on the northeast corner of the property may indicate a re-mobilizing event. Any mineralization may have been moved along a fault from its original place of formation. This would obscure the characteristics of a syngenetic submarine

exhalative massive sulfide deposit and would make its  
discovery more difficult.

## RECOMMENDATIONS

Further work done on the property should include comprehensive prospecting and mapping projects, especially along volcanic/sediment contacts. A geochemical soil grid, in conjunction with a geophysical survey such as VLF-EM-16, is highly recommended. These would help in locating any possible strike extension of the Emerald Glacier deposit or additional mineralized occurrences.

ITEMIZED COST STATEMENT

Wages

<u>Name</u>	<u>Nature of Work</u>	<u>Days Worked</u>	<u>Total Days</u>	<u>Rate Per Day</u>	<u>Total</u>
Barry Devlin	Field Work	July 24-28	5 days	\$84.00	\$ 420.00
	Report Writing	Sept. 13	1 day	\$84.00	\$ 84.00
Steve Lau	Field Work	July 24-28	5 days	\$78.00	\$ 390.00
Total Wages					\$ 894.00

Food and Supplies

July 24-28      5 days      10 Man-day @ \$15.00/day      \$ 150.00

Transportation

Helicopter      \$425.00/hour      2 hours      \$ 850.00  
 Fuel      \$2.25/gallon      45 gallons      \$ 101.25

Report Preparation

Drafting, typing, reproduction      \$ 100.00

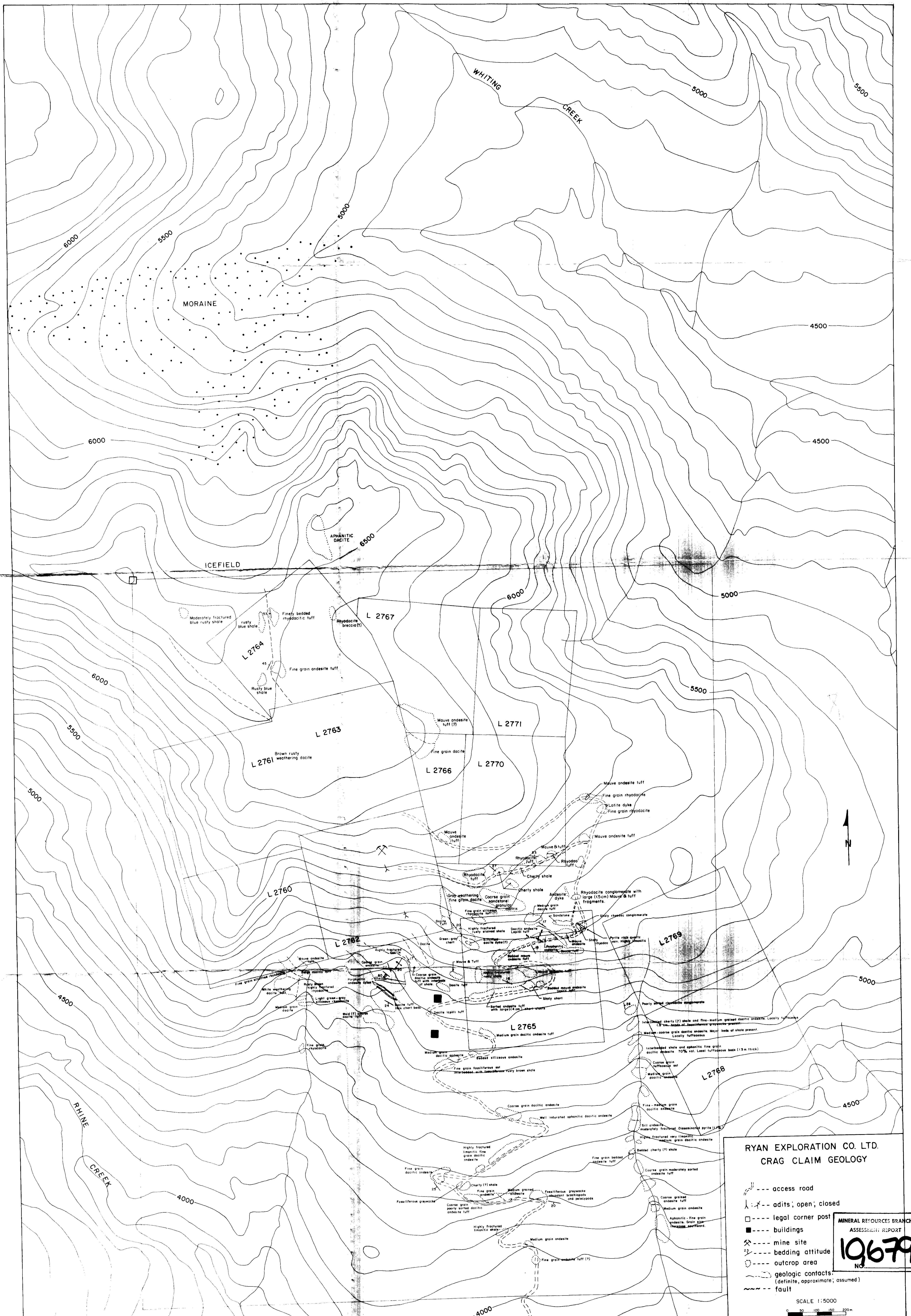
Total Costs      \$2095.25



## STATEMENT OF QUALIFICATIONS

I, Barry D. Devlin of #24-3039 East 56th Avenue, Vancouver in the Province of British Columbia hereby certify that:

1. I obtained a B.Sc. in Honours Geology from the University of British Columbia in 1981.
2. I have worked summers in mineral exploration since 1978.
3. I have been permanently employed by Ryan Exploration Company, Ltd. since May 4, 1981.
4. This report is based on personally working on the Crag claim during July, 1982.



**RYAN EXPLORATION CO. LTD.**  
**CRAG CLAIM GEOLOGY**

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
**19679**  
NO.

- access road
- ⊗ --- adits; open; closed
- --- legal corner post
- --- buildings
- ⊗ --- mine site
- --- bedding attitude
- --- outcrop area
- geologic contacts (definite, approximate, assumed)
- fault

SCALE 1:5000  
0 50 100 150 200m

by: Barry Devlin