

GEOLOGICAL RESTUDY OF  
THE ESTELLA MINE AREA  
(Giant Soo Property)  
BETTY, ANN MINERAL CLAIMS

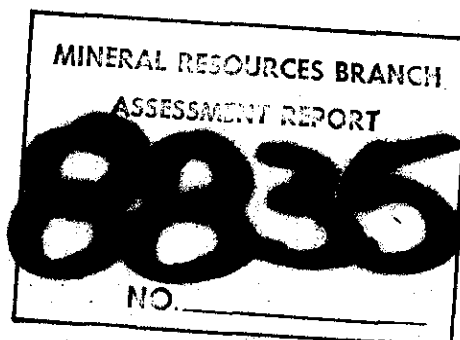
CRANBROOK MINING DIVISION, B.C.  
NTS 82G/13E  
Latitude 49° 47' North  
Longitude 115° 35' West

for

G M RESOURCES LIMITED  
Suite 310 - 800 Sixth Ave. S.W.  
Calgary, Alberta T2P 3G3

Submitted  
December, 1980

W.G. Hainsworth, P. Eng.  
G. Mason



REPORT ON THE GEOLOGICAL RESTUDY OF  
ESTELLA MINE AREA

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**Map**

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**Maps (In Pocket):**

- (1) Estella Mine Area - Vertical Section - Scale 1" = 1000'.
- (2) Estella Mine - Surface Geology and Underground Geology  
in Tracey Creek Basin - Scale 1" = 40'.

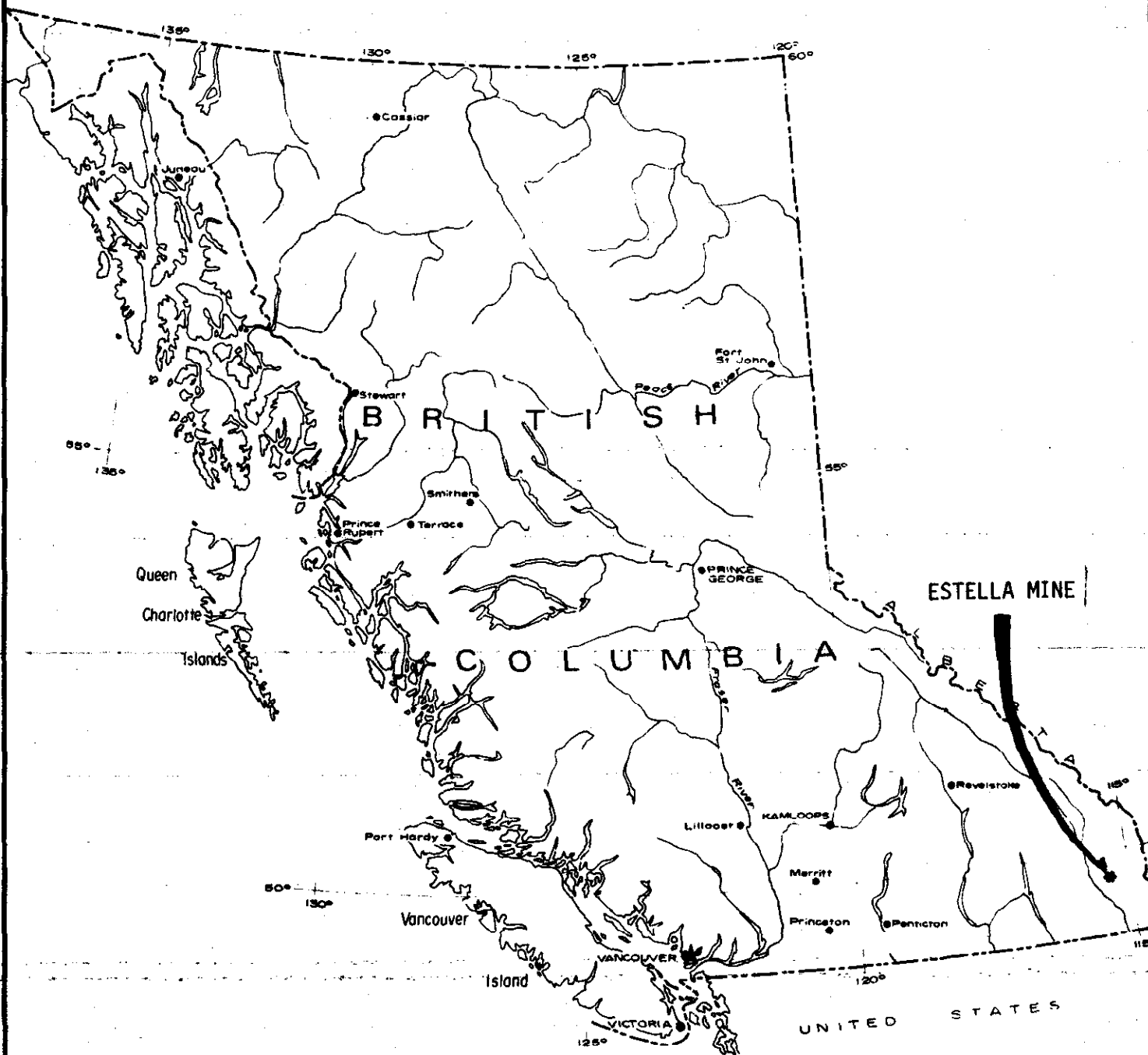
### INTRODUCTION

The surface geology of the Estella Mine Area was re-examined and partially mapped by W. G. Hainsworth and G. Mason to evaluate the possibilities of finding additional silver, lead, zinc ore.

Work was directed towards the SKYLARK CLAIM, Lot 6579.

### LOCATION

The Estella Mine Area is covered by ninety mineral claims owned by G M Resources, Suite 310, 800 Sixth Avenue S.W. Calgary, Alberta, T2P 3G3. The claims are located in the Rocky Mountains in Tracey Creek and Grundy Creek basins. The mine was worked from 1948 to 1970 from two main levels, Estella and Rover levels. The orebody is between elevations of 6000 feet and 6500 feet. Previously, the deposit had been interpreted as a fracture filling fissure vein 1200 feet long, 400 feet in dip length, and from 2 to 12 feet wide. The attitude of the orebody is azimuth  $135^{\circ}$ , dip  $75^{\circ}$  S.W. The vein originally was believed to occur at the Aldridge-Fort Steele Formation contact.



LOCATION MAP

PRODUCTION

Production from "vein" between 1948 and 1970 was 93,767 tons. The original reserves prior to mining were 96,903 tons, 2.4 ozs. Ag, 6.4% Pb, 15.56% Zn.

The objective of this study is to find extensions of this orebody. The bulk of original ore reserves has been extracted.

## APPROACH

In July, 1980, Hainsworth and Mason first examined the Fort Steele Formation from Fort Steele to Premier Lake, a distance of 16 miles. The stratigraphic column from the base upward consisted of 1000 feet of white crossbedded ortho-quartzites, 500 feet of black argillite of typical argillites similar to the Aldridge formation.

This impure limestone horizon is believed to be one of three limestone horizons in the vicinity of the Sullivan Mine that is either 800 feet above, equivalent to the Sullivan Sulphide horizon, or 1300 feet below the Sullivan Sulphide horizon.

Next examined was the sulphide horizon exposed on Tracey Creek adjacent to No. 2 Shaft on the Estella property. This sulphide horizon is about two feet thick and appears to be stratabound ore which has lead and zinc values in excess of 40%. This zone has characteristics of the "Hu ore" zone in the Sullivan Mine. If it were a vein or fracture-filled fissure as at the Sullivan Mine, one would expect a halo of disseminated sphalerite. This feature was not recognized. This bedded horizon appears to have been stretched and extended in enclosing highly argillaceous rocks. The rocks enclosing the Estella Rover horizon appear to have suffered soft rock deformation.

Next, Hainsworth and Mason climbed the west slope of Tracey Creek basin from below the Estella Portal to examine a carbonate rock stratigraphically below the 600 foot thick diorite sill. A varve laminated zone was recognized. This varve lamination was identified by John Hamilton

and Art Hagen of Cominco as being equivalent probably to the "R" marker zone in the Aldridge Formation. This means that this "R" marker zone is located 4500 feet below the Creston Formation contact. It also means that the Kootenay King horizon could be located immediately (100 feet) under the "R" horizon. This favorable prospecting area is on the east slope of Grundy Creek basin and on G M Resources claims.

In August John Rokosh, Ed Frost and G. Mason made a chain and compass survey along Tracey Creek toward the head of the basin. Mapping included the outcrops of the Estella-Rover horizon, a fault plane, other argillites and syenites for a distance of 1500 feet. In Tracey Creek, 200 feet upstream from No. 2 Shaft, a fault was located. This fault, named the Bedford Fault (Bedford was an original staker in 1898), displayed an attitude bearing  $10^{\circ}$  and dipping South East  $62^{\circ}$ . The fault, both from surface and from underground information, appears to truncate the Estella-Rover Ore Horizon. West of the Bedford Fault the altitude of the bedding is azimuth  $122^{\circ}$  with a dip overturned  $75^{\circ} - 80^{\circ}$  to the South West. East of the Bedford Fault the attitude of the beds is similar in strike but dipping  $26^{\circ}$  to the North East. Further south in Tracey Creek Basin the sediments expose a bearing of  $N25^{\circ} W$  and dip  $45^{\circ}$  to the North East.

The rocks at the top end of Tracey Creek Basin are noticeably mineralized with pyrite cubes (7% by volume) which suggest they may be adjacent to a bedded sulphide horizon.

A map  $1" = 40'$  of the surface outcrops was prepared to show outcrops examined and core hole collar sites. Collars of C.M. & S. diamond drill holes Nos. 9 and 10 in September, 1929 were surveyed. These were found



to be out of place by 40 feet, which may explain the lack of success in locating mineralization found in these holes in underground test diamond drilling 1967 - 1970.

Also a map of Kootenay King - Estella by the B.C. Government was copied. Structural contours were prepared on the Limestone Horizon in the Fort Steele Formation, which it is believed, could be an extension of the main Sullivan Ore Horizon. This map indicates the Estella Rover Horizon to be located in the only synclinal structure within a distance of 16 miles. The attitude of the axial plane of the syncline is  $N 45^{\circ} E$ . The beds involving the sulphide are perpendicular to the axial plane, i.e.  $135^{\circ}$  and are overturned. The injection of syenite occurs as "saddle reefs" in this fold structure.

This structural map also indicates the Tracey Creek Fault Plane whose bearing is east-west with a dip of  $45^{\circ} - 70^{\circ}$  is pre-Purcell diorite sill in age, or over 1,100,000,000 years old.

These structural features may aid in explaining why the Estella Rover Horizon has been described as fracture filled vein. If it is a stratabound horizon, then it is 1,200,000,000 years old, the diorite sill is 1,000,000,000 years old, and syenite is 60,000,000 years old. - Hence, sulphides adjacent to these intrusive rocks may have migrated locally from the heat of both the diorite intrusive and the syenite intrusives.

## CONCLUSION

The Estella-Rover Horizon is a stratabound horizon located about 3200 feet below the Creston Formation. It is possible that southerly extensions of bedded sulphide ore to the amount of 100,000 tons may be found southeast of the Estella-Rover workings in the upper Tracey Creek basin.

Kootenay King Horizon is a stratabound <sup>lead zinc</sup>~~copper~~ horizon located in the Aldridge Formation about 4500 feet below the Creston Formation. An extension of this horizon (25,000 tons) may be found in the Grundy Creek basin.

The Sullivan Horizon stratabound copper, lead, and zinc may be found 2000 feet below the surface under Lewis Creek. These extensions of the Sullivan Horizon could be tested by a 2000 foot hole drilled from the lowest stratigraphic point in the Fort Steele ortho-quartzites. This location is on open ground and would require staking of a large block of claims.

The Estella workings were examined by G. Mason in 1950, 1964, and in July, August and September, 1980. In addition, G. Mason also examined several copper occurrences in the Fort Steele Formation between the years of 1976 to 1979.

ASSESSMENT BREAKDOWN

Truck Mileage Allowance (G. Mason)	- \$401.31	(July to Sept.)
Four Wheel Drive Rental	- \$150.00	(Aug. 21 & 28)
Surveying (J.P. Rokosh, Kimberley)	- \$150.00	(Aug. 20)
Miscellaneous (July to Oct.)	- \$136.58	

Personnel

W.G. Hainsworth, P. Eng. 6 days @ \$200.00 - \$1,200.00  
(Aug. 4 through 7; Aug. 28 & 29)

G. Mason 8 days @ \$150.00 - \$1,200.00  
(Aug. 4 through 7; Aug. 20 & 21; Aug. 28 & 29)

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TOTAL	\$3,237.89
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(Note: Travel Time for Hainsworth from  
Calgary to property not included.  
PWA = \$173.80 in 2 trips)

GERALD MASON - GEOLOGICAL EXPERIENCE

1935 - 1941		Field assistant on Geological Survey of Canada
1941 - 1944		Cominco - Mine Geologist, Pinchi Lake Mercury Mine
1945 - 1946		Cominco - Exploration Northern B.C.
1947 - 1964		Cominco - Sullivan Mine Geology
1964		Cominco - Deep drilling Pinchi Lake Mercury
1965 - 1976		Cominco - Sullivan research exploration
NOV. 1976		Retired Cominco
1977		Consulting geology - Texas Gulf
1978	"	" - Nelson Price - gold, Sawmill Creek
		- A. Miller - Hat - barite
		- Imperial Oil - Frost's claim
		- BBX - barite claims
		reports to Baroid and
		Mountain Minerals
1979	"	" - International Marble and Stone Ltd.
		- magnesite
		- Doug Roller - Wardner - limestone
1980	"	" - Bonn Energy - Frost's claim

*Gerald Mason.*

GERALD MASON

W. G. HAINSWORTH, P. ENG.

