

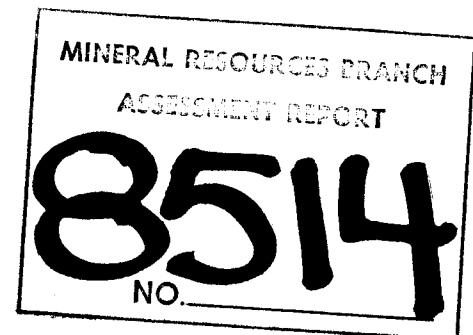
ECHO BAY MINES LTD.

BJ1, BJ2, BJ3 AND BJ4 MINERAL CLAIMS

EXPLORATION - 1979 AND 1980

GOLDEN MINING DIVISION

BRITISH COLUMBIA, CANADA



Trigg, Woollett Consulting Ltd.

November, 1980

P. Foley
K. Root
R. Olson

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ECHO BAY MINES LTD.

BJ1, BJ2, BJ3 AND BJ4 MINERAL CLAIMS

EXPLORATION - 1979 AND 1980

GOLDEN MINING DIVISION

BRITISH COLUMBIA, CANADA

SUMMARY

The stratigraphic units that exist within the BJ1, BJ2, BJ3 and BJ4 (BJ1-4) mineral claims include Horsethief Creek Group, the disconformably overlying Ordovician to Silurian Beaverfoot Formation, the unconformably overlying Devonian Cedared Formation, and an overlying thrust block of Helikian Dutch Creek Formation and Mount Nelson Formation. Lithologies comprise coarse- to fine-grained clastic and carbonate rocks.

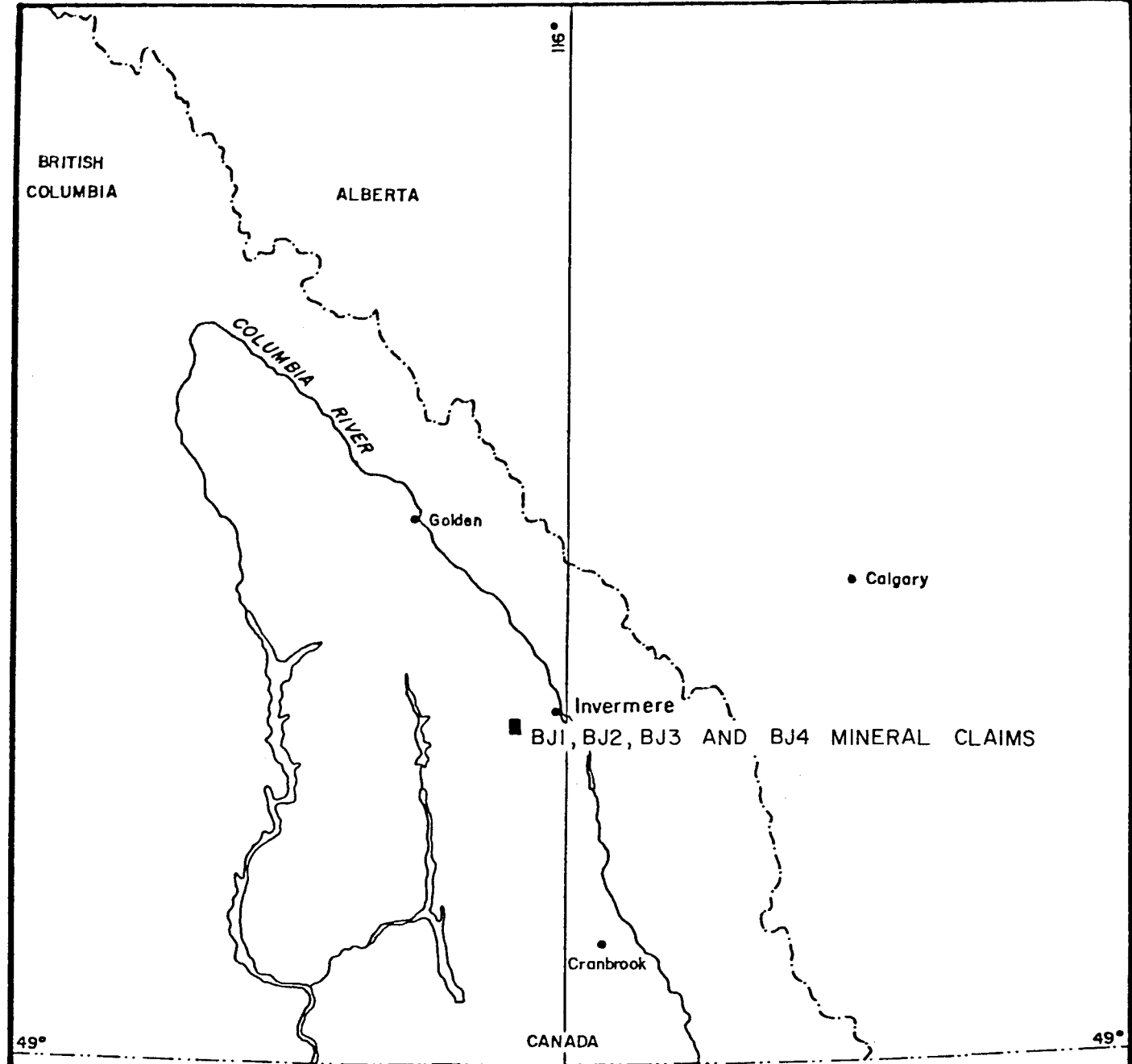
Within the BJ1-4 mineral claims, the lower Horsethief Creek Group is divisible into at least nine sequential lithological units: two of these units, 8a and 8f, are dolomite and host the sulphide mineral occurrences that exist within BJ1 and BJ2 mineral claims. Sulphide mineral occurrences in the upper dolomite unit 8f typically comprise small amounts of galena, sphalerite and/or tetrahedrite in quartz and calcite veins, and in fractures. Sulphide mineral occurrences in the lower dolomite unit 8a mainly comprise galena and tetrahedrite in quartz and calcite veins, and in fractures. None of the sulphide mineral occurrences discovered in bedrock within BJ1 and BJ2 mineral claims are economically important.

Exploration for lead-zinc-silver deposits is warranted within selected portions of the BJ1-4 mineral claims: however, the probability of discovering economically important deposits is low. Further prospecting along the strike of the two dolomite units, 8a and 8f, is warranted outside the BJ1-4 mineral claims to assess whether important sulphide occurrences exist elsewhere within these units.

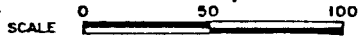
INTRODUCTION

Location

The BJ1, BJ2, BJ3 and BJ4 (BJ1-4) mineral claims are in Golden Mining Division within National Topographic System (NTS) map-sheet 82K/8W, and are centered at 50°26'N latitude, 116°27'W longitude (Dwg. 0EBI-6). The BJ1-4 mineral claims cover an area of 700 hectares and are accessible by helicopter or by road to within 500 m of the southeast corner of the claim group.



UNITED STATES OF AMERICA

ECHO BAY MINES LTD.	
BJI, BJ2, BJ3 AND BJ4 MINERAL CLAIMS	
LOCATION	
NTS 82 K/8W	
GOLDEN MINING DIVISION, BRITISH COLUMBIA	
SCALE  KILOMETRES	
TRIGG, WOOLLETT CONSULTING LTD.	
EDMONTON, ALBERTA	October, 1980

History and Previous Work

The area has been geologically mapped by the Geological Survey of Canada at a scale of 1 inch to 2 miles (Walker, 1926) and at a scale of 1 cm equals 2.5 km (Reesor, 1957 and 1973). In 1979, following preliminary geochemical stream and lake sediment sampling, and a geological examination, Trigg, Woollett Consulting Ltd., on behalf of Echo Bay Mines Ltd., performed a detailed geochemical stream sediment survey of the area now covered by the BJ1-4 mineral claims. The BJ1-4 mineral claims, bearing record numbers 438, 439, 440 and 441 respectively, were staked on September 8, 1979, were recorded on September 28, 1979, and are held by Echo Bay Mines Ltd.

Exploration - 1979 and 1980

A total of 39 man-days of field work, which included logistical preparations, geological mapping and geological examinations, prospecting of selected areas, overburden trenching, and preparation of a report with accompanying maps were performed at the BJ1-4 mineral claims and at the base camp between September 12, 1979 and August 29, 1980 (Appendix I). The northern portion of BJ1 mineral claim was geologically mapped in detail, whereas the remainder of the mineral claims were only reconnaissance geologically mapped and prospected. The total cost of exploration performed within BJ1-4 mineral claims between September 12, 1979 and August 29, 1980 is \$9,941.00 (Appendix II).

GEOLOGY

Regional Geology

The eastern Purcell Mountains are underlain by rocks of Helikian, Hadrynian and lower Paleozoic age.

The Helikian Purcell System comprises several formations: the two uppermost formations are Dutch Creek Formation and Mount Nelson Formation. Dutch Creek Formation comprises argillite, dolomite and quartzite, and the overlying Mount Nelson Formation comprises dolomite with some argillite and quartzite.

The Purcell System is unconformably overlain by two rock-units which together comprise the Hadrynian Windermere System. The basal rock-unit, Toby Formation, is a polymictic conglomerate. Horsethief Creek Group overlies Toby Formation and includes quartzite, argillite, dolomitic sandstone, grit, pebble conglomerate, limestone and dolomite.

Paleozoic Rocks exist locally in the eastern Purcell Mountains and include a varied sequence of carbonate rocks with minor argillite and quartzite.

Rock-units within the eastern Purcell Mountains have undergone at least two major orogenic events. The first orogeny occurred prior to, and

possibly during, the deposition of the Windermere System: during this orogeny rocks of the Purcell System were faulted and were folded into northerly trending folds. The second orogeny occurred during the Mesozoic; this orogeny folded all older rocks into a northwesterly plunging anticlinorium with northwesterly trending folds, and produced faults that strike mainly northwesterly, northerly and, less commonly, easterly (Reesor, 1973; Jansen and Olson, 1979).

Stratigraphy Within BJ1-4 Mineral Claims

The rock units underlying the BJ1-4 mineral claims include Dutch Creek Formation, Mount Nelson Formation, Toby Formation, Horsethief Creek Group, diabase sheets, Ordovician and Silurian Beaverfoot Formation, and, possibly, Devonian Cedared Formation.

Dutch Creek Formation, unit 5, comprises dark grey and green-grey fissile argillite (Dwg. 0EBI-7). Mount Nelson Formation comprises a basal quartzite, unit 6a, and overlying dolomite and argillaceous dolomite, unit 6b. Toby Formation conglomerate is reported by Reesor (1973) to exist in the southern portion of BJ1 and BJ2 mineral claims; this area was not geologically examined.

Horsethief Creek Group, which hosts the majority of the sulphide mineral occurrences that exist within BJ1-4 mineral claims, comprises a diverse sequence of lithologies which includes pebble conglomerate, grit, greywacke, quartzite, slate, argillite, dolomitic sandstone, sandy dolomite, dolomite and limestone. In general, clastic rocks are more common and are coarser towards the base of the group, whereas dolomite, sandy dolomite and dolomitic sandstone are more common towards the top.

Geological mapping at a scale of 1 cm equals 50 m which was performed within BJ1 mineral claim shows that at least nine sequential lithological units, 8a to 8i, exist within lower Horsethief Creek Group (Dwg. 0EBI-7). Unit 8a comprises a cream- to buff-coloured, tan- to buff-weathering, fine grained dolomite. The dolomite is well bedded with bedding planes spaced 1 to 60 cm apart, and is about 15 m thick. Calcite and quartz veins are common throughout the unit; minor amounts of galena and tetrahedrite exist in quartz and calcite veins at several locales. Unit 8a directly overlies a sequence of black argillaceous rocks that also belongs to lower Horsethief Creek Group.

Unit 8b comprises approximately 5 m of greywacke, grit, argillite and black limestone.

Unit 8c is a grey, dull grey weathering quartz pebble conglomerate with angular to subangular quartz pebbles up to 5 mm in diameter. The matrix, which comprises 60 to 80 per cent of the rock, is a gritty greywacke with minor sericite. The unit is well bedded with bed thicknesses ranging from 15 to 60 cm. In the basal bed of unit 8c are large angular

blocks of black argillite that are up to 25 cm long and 5 cm wide. Unit 8c generally becomes finer up section.

Unit 8d is an interbedded sequence of red-brown greywacke and grey grit overlying approximately 2 m of grey, pebbly grit. Bed thicknesses range from 1 to 4 cm. Minor black limestone beds which are approximately 20 cm thick, exist locally in unit 8d.

Unit 8e is a black, dark grey weathering, fine grained limestone; the lowermost 50 cm of the unit is a rusty weathering sandy limestone. Bed thicknesses range from 1 to 15 cm. Thin beds, 1 to 3 cm in thickness, of coarsely crystalline acicular calcite exist throughout unit 8e. The crystalline calcite in these beds is preferentially oriented perpendicular to bedding.

Unit 8f is a dark grey, tan to buff-brown weathering, fine- to medium-grained dolomite. The dolomite is finely laminated and thinly bedded with bed thicknesses ranging from 2 to 20 cm, and is about 50 m thick. Sandy and gritty beds exist in the dolomite and weather rusty brown. Unit 8f dolomite commonly is well fractured; the fractures are randomly oriented. Quartz and calcite veins are ubiquitous within unit 8f. Minor amounts of galena, sphalerite and tetrahedrite exist locally in the quartz and calcite veins.

Unit 8g comprises approximately 25 m of argillite, greywacke, grit, quartzite and pebbly sandstone.

Unit 8h is a distinctive marker bed which can be traced throughout the central region of the claim group. Unit 8h comprises red-purple to orange-purple weathering argillaceous dolomite with fine laminations of dark purple argillite evenly spaced at 1 to 2 cm intervals. Most exposures of this unit display well-developed strain-slip cleavage planes, spaced at one-half to three cm intervals, into which the purple argillite layers have been remobilized; this causes unit 8h to exhibit a distinctive cross-hatched pattern when viewed perpendicular to the axial plunge direction. In areas of disharmonic folding, unit 8h has undergone only gentle folding.

Unit 8i comprises undifferentiated units of Horsethief Creek Group above Unit 8h. Unit 8i is a diverse sequence of dolomitic sandstone, grit, quartzite, pebble conglomerate, sandy dolomite and argillite.

Two diabase sheets, units A, lie approximately at the stratigraphic midpoint of Horsethief Creek Group within the BJ1-4 mineral claims. The diabase generally is unaltered, except locally where chlorite exists. The sheets are semi-concordant; that is, they generally parallel bedding and only locally are cross cutting. The stratigraphically lower sheet thins from approximately 40 m thick at the eastern boundary of BJ4 mineral claim to approximately 5 m thick within BJ2 mineral claim.

Unit 22 disconformably overlies Horsethief Creek Group within BJ2, BJ3 and BJ4 mineral claims; unit 22 comprises grey, grey weathering fossiliferous limestone and black sandy limestone. Unit 22 contains unidentified brachiopods, gastropods and corals, as well as the chain corral, *Manipora* of Late Ordovician age, and several stromatoporid *Stromatoporoids* of Silurian to Devonian age (Nelson, 1965). The fossil age and lithology of unit 22 indicate it is stratigraphically correlative to Beaverfoot Formation. In the grey fossiliferous limestone of unit 22 there is abundant breccia; the existence of irregular breccia-limestone contacts and, locally, mosaic breccia indicate that the breccia may be of karst origin. Unit 22, because it is overlain with angular unconformity by unit 23a, is of variable thickness within the BJ1-4 mineral claims: unit 22 is thin or locally absent within BJ3 and BJ4 mineral claims and is thickest to the southwest within BJ2 mineral claim.

Unit 23a comprises, at the base, a silty black limestone which becomes sandier and more argillaceous stratigraphically upwards. The basal limestone is overlain by blue-grey argillite that is in turn overlain by thinly bedded yellow-red quartzite. The stratigraphic position and lithological composition of unit 23a indicate it may correlate with Devonian Cedared Formation which outcrops in the Brisco Range east of the Rocky Mountain Trench.

Structure

Horsethief Creek Group (unit 8), Beaverfoot Formation (unit 22) and Cedared Formation (unit 23a) are folded, and are overthrust by rocks of the upper Dutch Creek Formation and lower Mount Nelson Formation within BJ1-4 mineral claims (Dwg. OEBI-7).

Folding locally is disharmonic; fold axes generally trend north-northwesterly to northerly and fold plunges range between 5 degrees and vertical but generally are between 25 to 50 degrees. Folds generally are upright or overturned to the southwest; locally, however, minor folds are overturned to the northeast.

A broad anticlinorium exists east of, but near, the eastern border of the BJ1-4 mineral claims. Many small-scale folds exist on both limbs of the anticlinorium but the average dip of the western limb is approximately 40 degrees to the west-southwest. A large scale parasitic fold associated with the anticlinorium exists northeast of Shamrock Lake. This parasitic fold is overturned to the southwest, becomes more asymmetric and overturned stratigraphically upwards, and dies out stratigraphically downwards.

South of Shamrock Lake the rock-units within Horsethief Creek Group generally are disharmonically folded; an exception is the purple argillaceous dolomite unit 8h which has been only deformed into broad, gentle folds. The overlying grit, dolomitic sandstone and quartzite of unit 8i are folded into tight, sometimes isoclinal, folds that have smaller wavelengths and much greater amplitudes than the folds in unit 8h. Structure in the area south of

Shamrock Lake near the legal cornerpost is dominated by numerous small, tight folds with vertical and subvertical fold axes. The overall dip of bedding immediately south of Shamrock Lake is to the northwest; bedding in this area therefore represents a lessening of the dip of the western limb of the broad anticlinorium which exists to the east of BJ1-4 mineral claims. This lessened dip of bedding continues throughout the Horsethief Creek Group and Beaverfoot Formation rocks which exist to the southwest within BJ2 mineral claim.

Within the Paleozoic rocks an isoclinal syncline, overturned to the east, is delineated by a quartzite unit in Cedared Formation within BJ2 mineral claim.

Dutch Creek Formation and overlying Mount Nelson Formation have been thrust over Cedared Formation and Horsethief Creek Group within BJ2, BJ3 and BJ4 mineral claims (Dwg. OEBI-7). The thrust fault strikes approximately southwesterly and dips at low angle to the northwest.

Bedding within Dutch Creek Formation argillite and overlying Mount Nelson Formation quartzite and dolomite generally strikes northwesterly and dips at approximately 10 degrees to the northeast. A syncline, overturned to the east, exists in Mount Nelson Formation west of, but near, the western limit of BJ3 mineral claim.

MINERAL OCCURRENCES

Sulphide mineral occurrences discovered in bedrock within the BJ1-4 mineral claims are confined to two separate dolomite horizons, units 8a and 8f, in lower Horsethief Creek Group (Dwg. OEBI-7).

In Unit 8f, most mineral occurrences comprise galena, sphalerite and/or tetrahedrite that exist as irregular or disseminated masses in fractures, and/or in quartz veins and calcite veins. Smithsonite and/or a zinc hydroxide mineral typically coat fracture surfaces in unit 8f dolomite in the vicinity of mineral occurrences. The mineralized zones and veins generally trend easterly and are subvertical.

In Unit 8a, only galena and tetrahedrite occurrences exist. The majority of the galena and tetrahedrite occurrences exist in vertical to subvertical fractures and/or in quartz veins or, to a lesser extent, calcite veins that trend 050 or 090 degrees. At occurrence OSHM021, however, galena exists in a subvertical fracture trending 130 degrees; also present in the immediate area of occurrence OSHM021 are malachite and barite veins in dolomite, and gypsum and iron-sulphate minerals coating outcrops.

The majority of sulphide mineral occurrences which exist in dolomite units 8a and 8f are near the axes of folds.

A galena occurrence which exists within the northern part of BJ4

mineral claim comprises small amounts of galena in dolomite float; the source of this float is unknown.

Trenching; Rock Chip Sampling

Overburden trenching to bedrock was performed at three locales that cross the postulated strike of mineral occurrences in the upper dolomite unit 8f (Dwg. 0EBI-7). Trenches A and B were geologically mapped at a scale of 1 cm equals 2 m; trench C was not geologically mapped. No important mineralized zones were exposed in the trenches.

Rock chip samples were collected at two occurrences within BJ1 mineral claim (Dwg. 0EBI-7; Appendix III). One of the rock samples is a channel sample 0.5 m in length collected across a galena-rich vein which is 0.1 m wide; the sample assays 2.57 ounces silver per ton, 8.95 per cent lead, 4.36 per cent zinc and 0.05 per cent copper over the sampled width of 0.5 m. The other rock sample was collected selectively from tetrahedrite-bearing quartz veins: the intervening barren rock was not sampled. This sample assays 1.93 ounces silver per ton, 3.36 per cent lead, 0.13 per cent zinc and 0.47 per cent copper. Recalculating these grades to include the intervening barren host rock gives 0.23 ounces silver per ton, 0.40 per cent lead, 0.016 per cent zinc and 0.056 per cent copper over a total sampled width of 3.1 m.

CONCLUSIONS

The stratigraphic units that exist within the BJ1-4 mineral claims include Horsethief Creek Group, the disconformably overlying Ordovician to Silurian Beaverfoot Formation, the unconformably overlying Devonian Cedared Formation, and an overlying thrust block of Helikian Dutch Creek Formation and Mount Nelson Formation. Lithologies present range from coarse- to fine-grained clastic rocks, and carbonate rocks. Within the BJ1 mineral claim the lower Horsethief Creek Group is divisible into at least nine sequential lithological units: two of these units, 8a and 8f, are dolomite and host the sulphide mineral occurrences that exist within BJ1 and BJ2 mineral claims.

The structural geology within the BJ1-4 mineral claims comprises a series of north-northwesterly trending folds that generally plunge northwesterly at 25 to 50 degrees. The intensity of folding is dependent upon lithology, and ranges from open symmetric folds to isoclinal or overturned, asymmetric folds.

Sulphide mineral occurrences which exist in the upper dolomite unit 8f of lower Horsethief Creek Group typically comprise small amounts of galena, sphalerite and/or tetrahedrite in fractures and/or in quartz or calcite veins. Smithsonite and/or a zinc hydroxide mineral exist locally in unit 8f near sulphide mineral occurrences. Mineral occurrences in the lower dolomite unit 8a comprise galena and tetrahedrite in fractures and/or in quartz or calcite veins; malachite and barite veins exist at one locale.

The majority of the mineral occurrences discovered within BJ1 and BJ2 mineral claims are spatially near fold axes; this indicates that the sulphide-bearing veins and fractures may be tensional structures which formed contemporaneously with folding.

None of the sulphide mineral occurrences in bedrock discovered within BJ1 and BJ2 mineral claims are economically important. Further prospecting along the strike of the two Horsethief Creek Group dolomite units, 8a and 8f, is warranted outside BJ1-4 mineral claims to assess whether important sulphide occurrences exist elsewhere within these units.

The brecciated, possibly karsted, Paleozoic rocks that exist within BJ2, BJ3 and BJ4 mineral claims are geologically interesting. Further prospecting is warranted in the vicinity of the galena-bearing float boulder which exists within BJ4 mineral claim to establish whether sulphide occurrences are present in the Paleozoic rocks. The probability, however, of discovering economically important sulphide deposits is low.

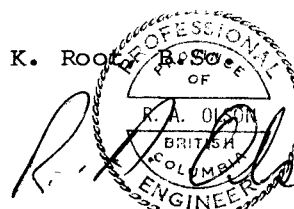
RECOMMENDATIONS

Further exploration for lead-zinc-silver deposits is warranted within selected portions of the BJ1-4 mineral claims.

Trigg, Woollett Consulting Ltd.

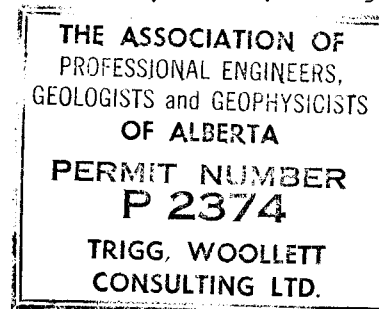
P. Foley, B.Sc.

K. Roof



R.A. Olson, Ph.D., P.Eng.

November 26, 1980
Edmonton, Alberta



REFERENCES

- Jansen, J.G. and Olson, R.A. (1979) Exploration - 1979, Invermere Project, Golden Mining Division, British Columbia unpublished report prepared for Echo Bay Mines Ltd. by Trigg, Woollett Consulting Ltd.
- Nelson, S.J. (1965) Field Methods in Palaeontology; Bulletin of Canadian Petroleum Geology, Vol. 13, No. 1, pp. 6, 7 and 9.
- Reesor, J.E. (1957) Geology, Lardeau, British Columbia, Sheet 82K (East Half); Geol. Surv., Canada, Map 12-1957.
-
- (1973) Geology of the Lardeau map-area, East-Half, British Columbia; Geol. Surv., Canada, Memoir 369.
- Walker, J.F. (1926) Geology and Mineral Deposits of Windermere map-area, British Columbia; Geol. Surv., Canada, Memoir 148.


CERTIFICATION

I, R. A. OLSON OF 8727 - 181 STREET, EDMONTON, ALBERTA CERTIFY AND DECLARE THAT I AM A GRADUATE OF THE UNIVERSITY OF BRITISH COLUMBIA WITH A B.S.C. DEGREE IN GEOLOGY (1968), A GRADUATE OF THE UNIVERSITY OF WESTERN ONTARIO WITH A M.S.C. DEGREE IN GEOLOGY (1971) AND A GRADUATE OF THE UNIVERSITY OF BRITISH COLUMBIA WITH A PH.D. DEGREE IN GEOLOGY (1977). I AM REGISTERED AS A PROFESSIONAL ENGINEER WITH THE ASSOCIATION OF PROFESSIONAL ENGINEERS OF BRITISH COLUMBIA AND AS A PROFESSIONAL GEOLOGIST WITH THE ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOLOGISTS AND GEOPHYSICISTS OF ALBERTA.

MY EXPERIENCE INCLUDES SERVICE AS AN EXPLORATION GEOLOGIST WITH TEXASGULF INC., VANCOUVER, BRITISH COLUMBIA. SINCE 1969 I HAVE CONDUCTED AND DIRECTED PROPERTY EXAMINATIONS, PROPERTY EVALUATIONS AND EXPLORATION PROGRAMS ON BEHALF OF COMPANIES AS A GEOLOGIST IN THE EMPLOY OF TRIGG, WOOLLETT & ASSOCIATES LTD. AND TRIGG, WOOLLETT CONSULTING LTD., EDMONTON, ALBERTA.

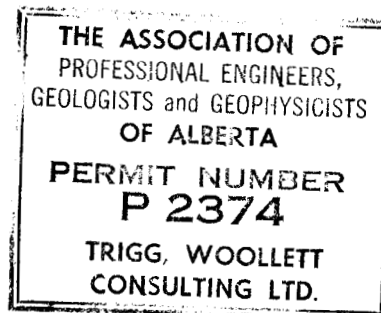
TRIGG, WOOLLETT CONSULTING LTD. HAS A RETAINED INTEREST IN THE INVERMERE PROJECT OF ECHO BAY MINES LTD. I AM A PARTNER IN TRIGG, WOOLLETT CONSULTING LTD.

P. FOLEY AND K. ROOT'S REPORT ON BJ1, BJ2, BJ3 AND BJ4 MINERAL CLAIMS IS BASED UPON FIELD WORK AND UPON STUDY OF PUBLISHED AND UNPUBLISHED DATA.

A circular seal for the Association of Professional Engineers, Geologists and Geophysicists of Alberta. The seal contains the text "PROFESSIONAL ENGINEER OF ALBERTA" around the perimeter and "R. A. OLSON" in the center. A signature is written over the seal.

R. A. OLSON, PH.D., P.ENG.

NOVEMBER, 1980
EDMONTON, ALBERTA



APPENDIX II

COST STATEMENT
BJ1, BJ2, BJ3 AND BJ4 MINERAL CLAIMS

(1) SALARY (Includes salary, fringe benefits and related charges):

1979:	S. Hawker	1 day @ \$ 92/day	\$ 92
	J. Jansen	2 days @ \$158/day	316
	R.A. Olson	1 day @ \$300/day	300
	C.M. Trigg	1 day @ \$450/day	450
1980:	P. Foley	10 days @ \$ 92/day	920
	S. Hawker	5 days @ \$104/day	520
	J. Jansen	4 days @ \$164/day	656
	R.A. Olson	1 day @ \$350/day	350
	I. Redwood	5 days @ \$ 57/day	285
	K. Root	9 days @ \$ 79/day	<u>711</u>

\$4,600

(2) MEALS AND ACCOMMODATIONS (Includes accommodation, food and food preparation):

1979:	5 man-days @ \$25/man-day	125
1980:	34 man-days @ \$30/man-day	<u>1,020</u>

1,145

(3) TRANSPORTATION:

(a) Helicopter

1979:	2.6 hrs. @ \$375/hr.	\$975
1980:	3.9 hrs. @ \$410/hr.	1,599

(b) Truck (includes rental, kilometrage, fuel, oil, repairs):

1980:	34 man-days @ \$18.00/ man-day	<u>\$612</u>
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3,186

(4) EQUIPMENT (Includes rental of technical and camp equipment, and cost of maps, air photos, etc.):

1979, 1980:	39 man-days @ \$ 5/man-day	195
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(5) REPORTING (Includes secretarial, drafting, reproduction, editing):

TOTAL COST	<u>815</u>
	\$9,941

Trenching cost (phys) 500
9141.00

APPENDIX III

ASSAY CERTIFICATE

10504 - 103rd Street
Edmonton, Alberta T5H 2V4

CERTIFICATE OF ASSAY

Samples submitted: October 1, 1979
Results completed: October 12, 1979

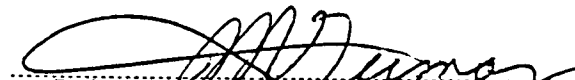
PROJECT: EBI

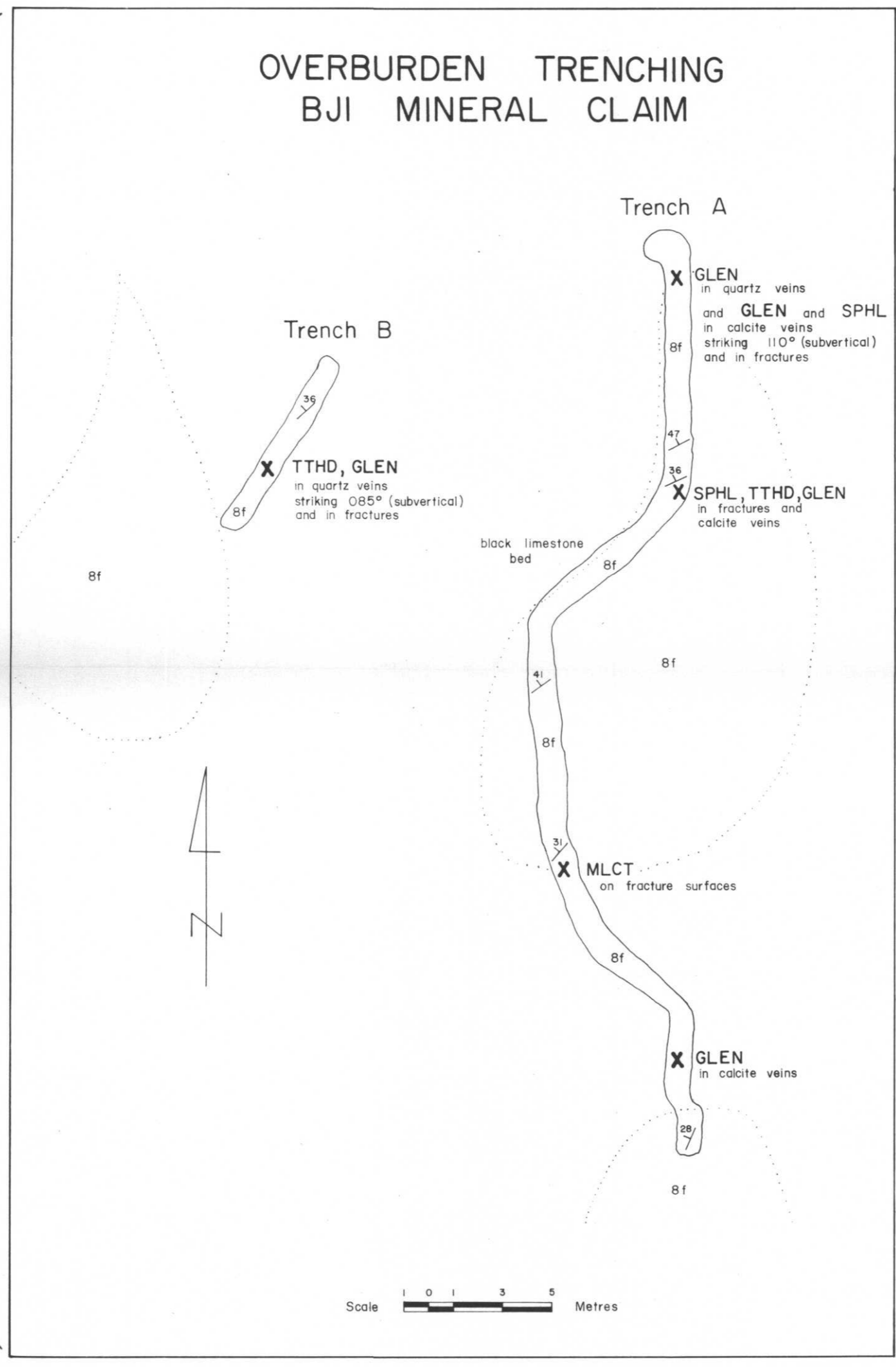
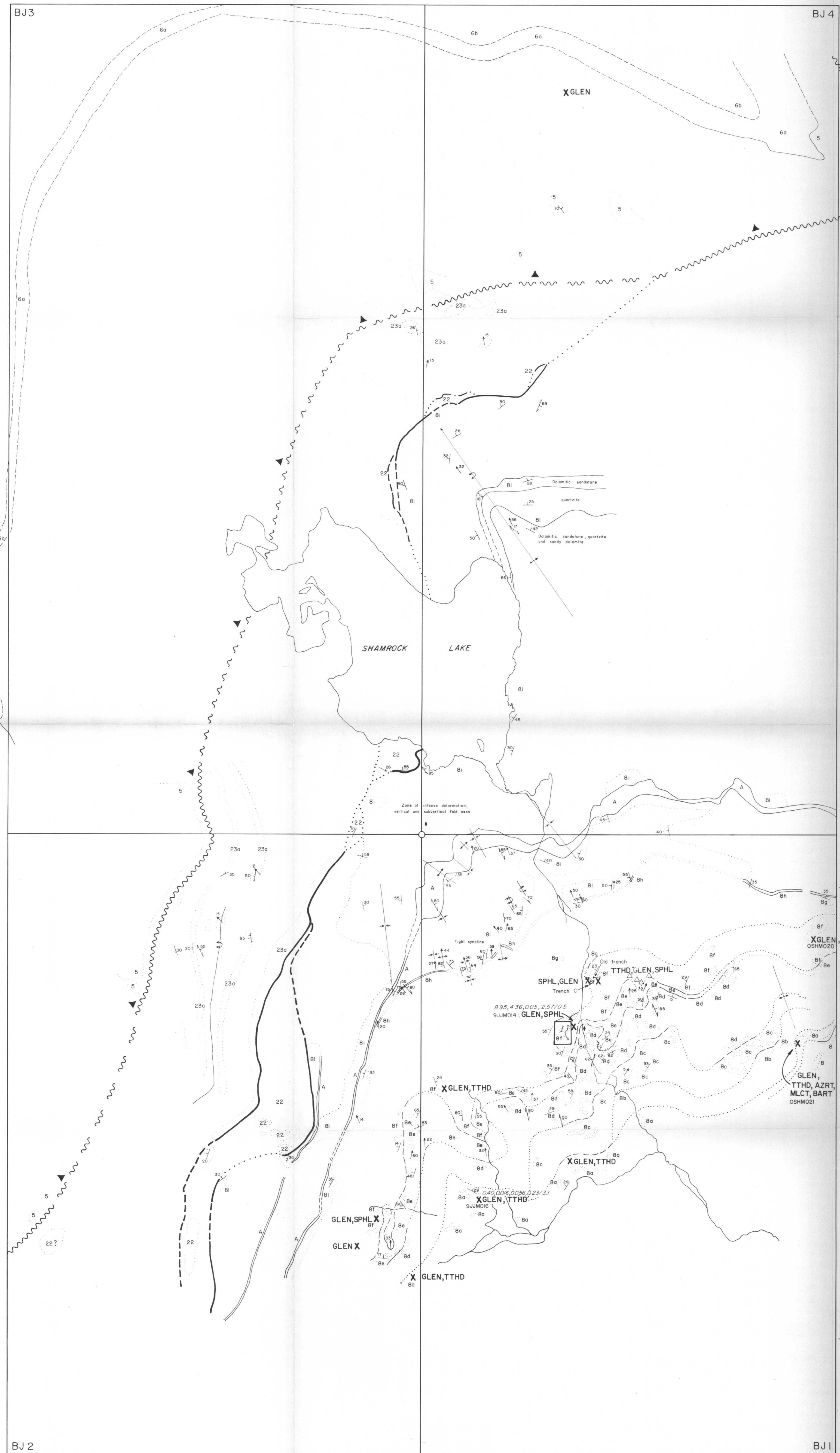
OCT 16 1979

I hereby certify that the following are the results of assays made by us upon the herein described rock chip samples.

MARKED	GOLD		SILVER		Cu	Pb	Zn					
	Ounces per Ton	Grams per Metric Ton	Ounces per Ton	Grams per Metric Ton	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
82K-79JJM - 014			2.57		0.05	8.95	4.36					
016			1.93		0.47	3.36	0.13					

NOTE:
Rejects retained three weeks
Pulps retained three months
unless otherwise arranged.


Registered Assayer, Province of British Columbia

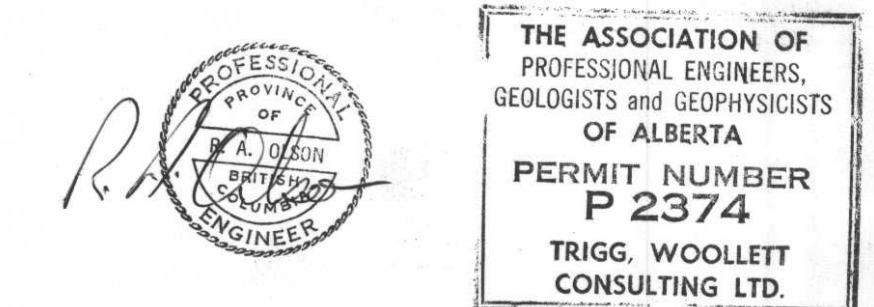


LEGEND

- PALEOZOIC**
- DEVONIAN**
- 23a CEDARED (?) FORMATION: sandy to argillaceous black limestone, blue-grey argillite, yellow-red quartzite
- ORDOVICIAN to SILURIAN**
- 22 BEAVERFOOT FORMATION: grey fossiliferous limestone, black sandy limestone
- PROTEROZOIC**
- HADRYNIAN**
- A DIABASE
 - 8 HORSETHIEF CREEK GROUP: undifferentiated pebble conglomerate, grit, greywacke, quartzite, slate, argillite, dolomitic sandstone, sandy dolomite, dolomite
 - 8a dolomitic sandstone, grit, quartzite, pebble conglomerate, sandy dolomite, argillite
 - 8b argillaceous dolomite
 - 8c argillite, greywacke, grit, quartzite, pebbly sandstone
 - 8d grey dolomite
 - 8e black limestone
 - 8f greywacke, grit, minor limestone
 - 8g pebble conglomerate
 - 8h greywacke, grit, with minor argillite and limestone
 - 8i cream to buff dolomite
- HELIKIAN**
- 6 MOUNT NELSON FORMATION: white quartzite, buff weathering grey dolomite, argillaceous dolomite
 - 6a interbedded grey dolomite and argillaceous dolomite
 - 6b quartzite
 - 5 DUTCH CREEK FORMATION: green-grey argillite

SYMBOLS

- Geological boundary (defined, approximate, assumed)
- Unconformity or disconformity (defined, approximate, assumed)
- △ Area of outcrop: frost heaved rock
- Bedding (inclined, vertical, tops unknown)
- Foliation (inclined, vertical)
- Linciation or axis of small fold (inclined, vertical)
- Thrust fault (defined, approximate, assumed, teeth indicate upthrust side)
- Anticline (upright, overturned, arrow indicates plunge)
- Syncline (upright, overturned, arrow indicates plunge)
- X GLEN, TTHD Mineral occurrence (identifier)
Note: GLEN denotes galena, SPHL denotes sphalerite, TTHD denotes tetrahedrite, AZRT denotes azurite, MLCT denotes malachite, BART denotes barite
- X #95,436,005,257/0.5 Mineral occurrence where a rock sample was collected: lead, zinc and copper in per cent; silver in ounces per ton/sampled width in metres
- Trench
- Mineral claim (name, legal corner post shown)



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
8514
NO

ECHO BAY MINES LTD.
BJ1, BJ2, BJ3 AND BJ4 MINERAL CLAIMS

GEOLOGY, MINERAL OCCURRENCES

NTS 824/RW
GOLDEN MINING DIVISION, B.C.
SCALE 1:50,000 METRES
TRIGG WOOLLETT CONSULTING LTD.
EMMONTON, ALBERTA
OCTOBER, 1989