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LOG NO: 0222	RD.
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**ASSESSMENT REPORT**  
**GEOLOGY OF THE AMY CLAIM GROUP**

**FILMED**

Latitude 49 Degrees 25'N. Longitude 115 Degrees 56'W.

NTS 82 G/5W

Fort Steele Mining Division

by

John M. Leask, BASc  
Gordon P. Leask, BASc

LOG NO: 0804	RD. 5
ACTION: Date received report back from amendments	
FILE NO:	

Owner/Operators: T. L. Eldridge  
G. P. Leask  
W. R. Bauck

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**18,416**

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ARIS SUMMARY SHEET

District Geologist, Nelson

Off Confidential: 89.11.25

ASSESSMENT REPORT 18416

MINING DIVISION: Fort Steele

PROPERTY: Amy  
LOCATION: LAT 49 24 00 LONG 115 55 00  
UTM 11 5472268 578603  
NTS 082G05W  
CAMP: 001 Purcell Belt (Sullivan)  
CLAIM(S): Amy 1-2, Hap, Shorty, Leigh, MR  
OPERATOR(S): Eldridge, T.L.  
AUTHOR(S): Leask, G.P.; Leask, J.M.  
REPORT YEAR: 1989, 20 Pages  
COMMODITIES  
SEARCHED FOR: Lead, Zinc, Silver  
KEYWORDS: Middle Aldridge Formation, Siltstone, Argillite, Wackes, Gabbro sills  
WORK  
DONE: Geological  
GEOL 2500.0 ha  
Map(s) - 2; Scale(s) - 1:50 000, 1:10 000

### LOCATION, ACCESS AND PHYSIOGRAPHY

The AMY claim group is located 15 kilometres southwest of the city of Cranbrook on the western flank of the Rocky Mountain Trench. The six claims comprise a block totalling 100 units in the headwaters of Semlin Creek and Little Lamb Creek.

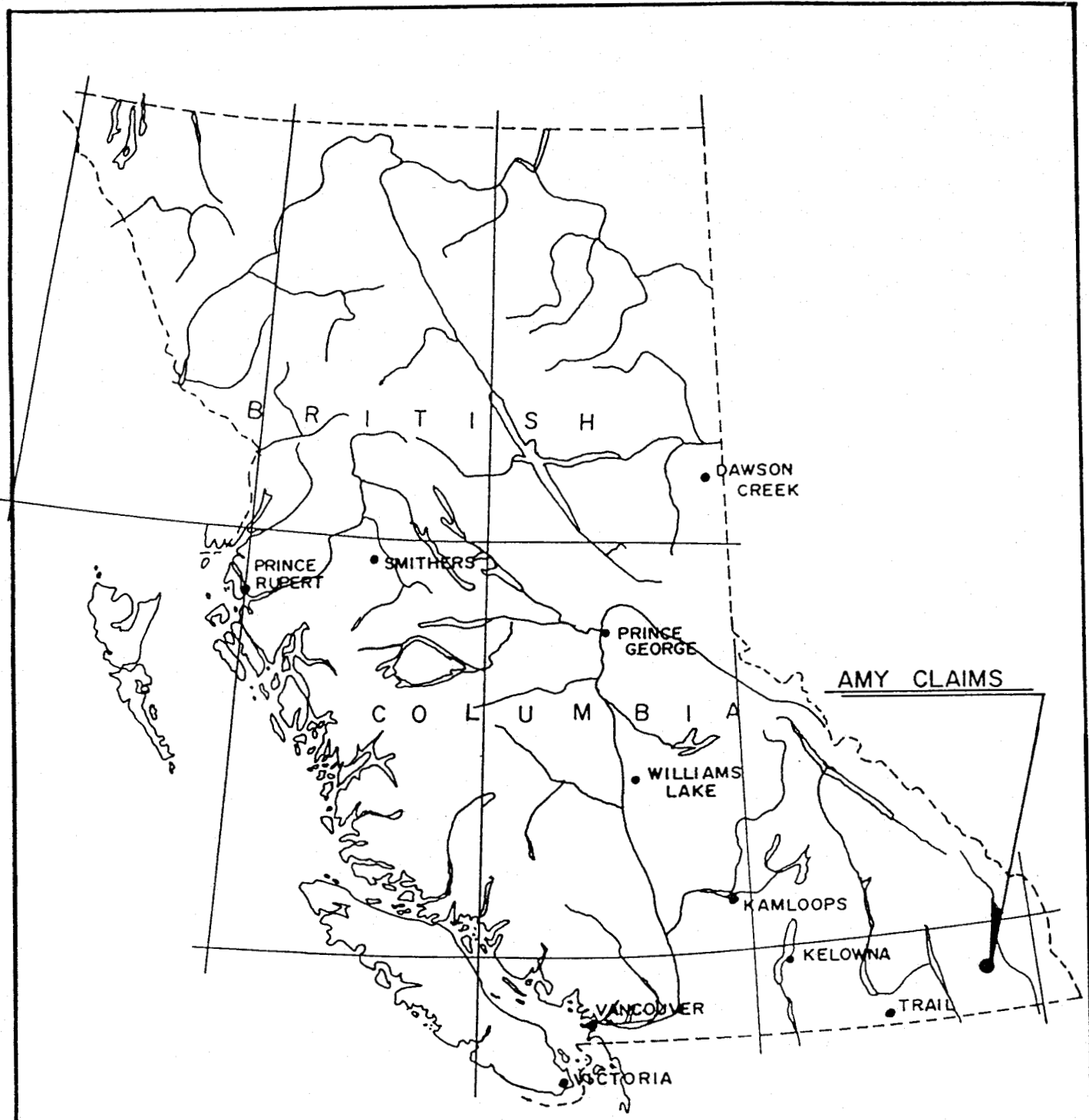
Access to the claim area is by Highway 3-94 south from Cranbrook, west on the Moyie River Forest Road and then south on the Semlin Creek Logging Road.

Steep sided valleys with abundant cliffs both east and south of the property characterize the topography. In the areas of the claims, elevations range between 3300 feet A.S.L. and 6600 feet A.S.L. In general, the area is heavily wooded although recent logging has opened up much of the claim area. Overburden usually forms only a thin veneer with outcrops within the trees and along steep valley slopes. Road construction for logging access also provides bedrock exposure.

Climate is that of the Rocky Mountain Trench rain shadow with annual precipitation of approximately 40 centimetres. Snowpack in winter rarely exceeds 2 metres. Temperatures range from -40C in winter to +40C in summer.

Geologic mapping and prospecting on the property was carried out between June 15, 1988 and October 1, 1988 by Gordon P. Leask and John M. Leask.

The claim location is shown on Figure 1.



AMY CLAIM GROUP	
LOCATION MAP	
	FIGURE: 1

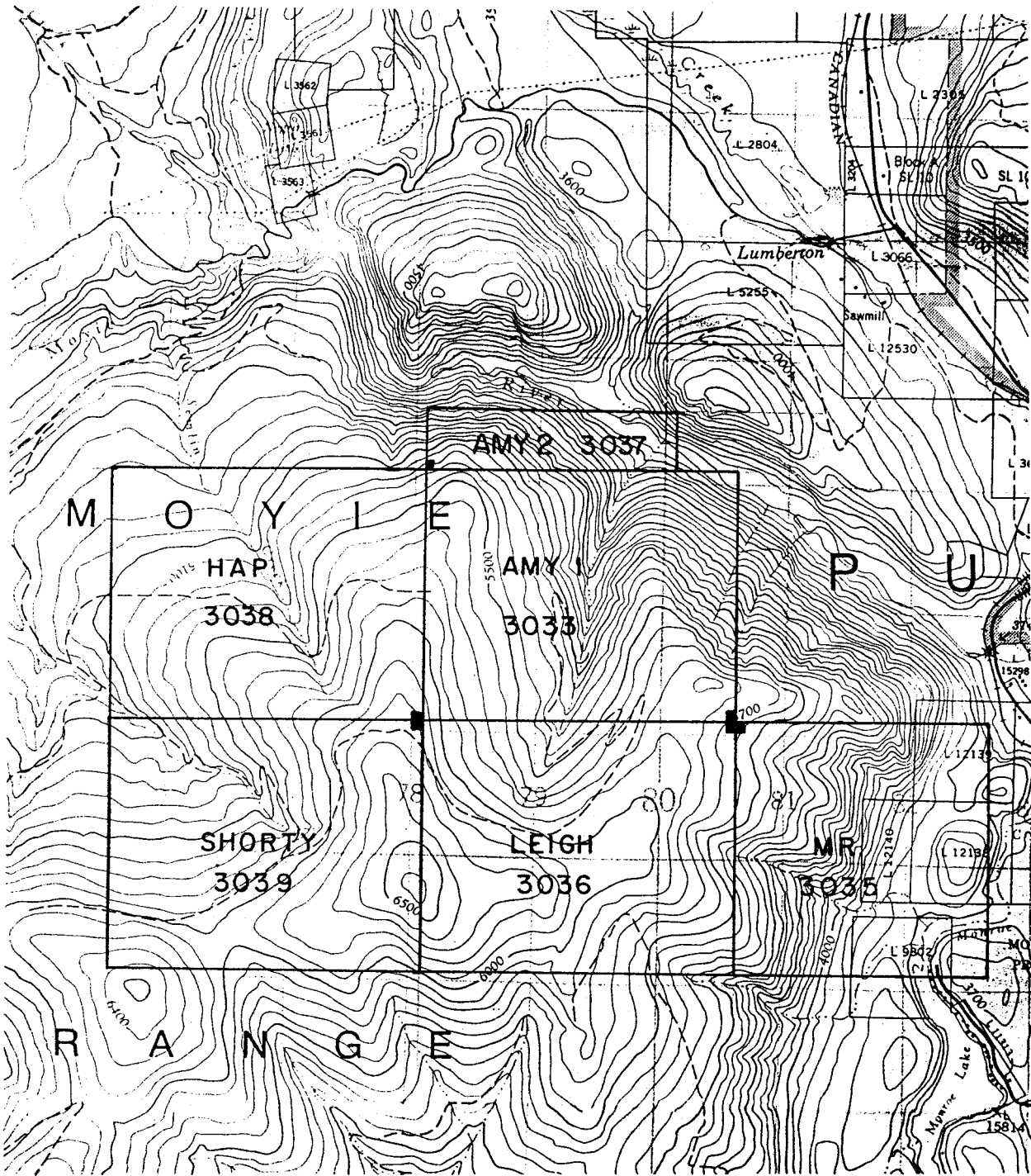
CLAIMS AND OWNERSHIP

The six claims comprising the AMY group are within the Fort Steele Mining Division and are shown in Figure 2.

CLAIM DATA

<u>NAME</u>	<u>SIZE</u>	<u>RECORD No.</u>	<u>RECORD DATE</u>
AMY 1	20 units	3033	Dec. 1/87
MR	16	3035	Dec. 1/87
LEIGH	20	3036	Dec. 1/87
AMY 2	4	3037	Dec. 1/87
HAP	20	3038	Dec. 1/87
SHORTY	20	3039	Dec. 1/87

The AMY 1 and AMY 2 claims are 100% owned by G. P. Leask, 192 West 23rd Avenue, Vancouver, BC. The MR and LEIGH claims are 100% owned by T. L. Eldridge, 905 4th Street, New Westminster, BC. The HAP and SHORTY claims are 100% owned by W. R. Bauck, 507 - 14th St. South, Cranbrook, BC.



AMY CLAIM GROUP	
CLAIM MAP	
NTS: 82G/5W	DATE: JAN. 1989
SCALE: 1:50,000	FIGURE: 2



## HISTORY

Mining development of the district began with the discovery of a Zn-Pb-Ag ore showing on the North Star hill in 1891. The HU zone of the Sullivan orebody was discovered in 1892, 4 kilometres northeast of the North Star hill. From the date of acquisition in 1909 by the Consolidated Mining and Smelting Company to the end of 1985, the Sullivan Mine produced 135,500,000 tons of ore containing 6.7% lead, 5.8% zinc, and 2.4 oz/ton silver. In total the Sullivan orebody approached 180,000,000 tons of ore grading 12% Pb-Zn and 2 oz/ton Ag.

The St. Eugene vein orebody was located in 1893 some 50 kilometres south of the Sullivan Camp and 20 kilometres south of the AMY claim group.

The Belleville and Lookout Crown Grants, about 7 km north of the AMY group, were explored prior to 1950 by approximately 300 metres of underground workings aimed at developing several Zn-Pb-Ag-Au veins high in the Middle Aldridge Section.

In recent years exploration of the Aldridge basin has been advanced by the following developments:

- o Recognition in 1962 of varved markers, their potential use in stratigraphic control within the Middle Aldridge and subsequent potential for exploration.
- o Discovery of lead-zinc float boulders at the FORS prospect, on the southern boundary of the AMY group, in 1965 which led to exploration of bedding controlled mineralization that was at a higher level than Sullivan time.
- o Discovery of lead-zinc mineralized strata of the Sullivan Time Horizon beneath deep overburden at the Polaris prospect in 1971. This property is 10 kilometres south of the Sullivan Mine.
- o During October, 1976, D. L. Pighin, a Cominco employed geologist/pro prospector discovered massive sphalerite - galena

- pyrrhotite boulders in a recently excavated road cut north of Moyie Lake. This discovery was protected as the Vine 1 claim consisting of 20 units. Further excavation in the immediate vicinity of the boulder occurrence uncovered a very impressive vein with widths from 2 to 6 metres. As the Sullivan Time Horizon was known to exist a hundred metres or so below this new showing, it was suggested that the sulphide vein was leakage from a bedded sulphide body below. Since 1976, at least 11 drill holes have probed the Sullivan Horizon and returned at least narrow intersections of bedded sulphide anomalous in lead, zinc, and mercury outlining a large apron of sulphides to the south and east of the Cranbrook fault. This apron is believed to be the equivalent of the Concentrator Hill horizon (distal extension of the Sullivan orebody).
- o Noranda Exploration drilled one deep hole on the Bar property in 1985 (McDonald, 1985). Geophysical work carried out in 1987 on the BAR property indicated a graben structure. (Cartwright, 1987)

## REGIONAL GEOLOGY

Regionally the area is underlain by rocks of the Purcell Supergroup on the western flank of the Purcell Anticlinorium, a broad slightly north plunging arch-like structure in Helikian and Hadrynian aged rocks. The oldest rocks exposed in the Purcell Anticlinorium are greenish, rusty weathering, thin bedded siltites and quartzites of the Lower Aldridge formation. Overlying the Lower Aldridge is a monotonous section of Middle Aldridge quartz wackes, subwackes and argillites some 3000+ metres thick. Within the Middle Aldridge formation, fourteen varved marker horizons can be correlated varve for varve over hundreds of kilometres. These represent the only accurate stratigraphic control. A number of areally extensive diorite sills are present within the Lower and Middle Aldridge Formations. The Middle Aldridge is overlain by Upper Aldridge, 300 to 400m of thin fissile, rusty weathering argillite/siltite.

Conformably overlying the Aldridge Formation is the Creston Formation, comprising approximately 1800 metres of grey, green and maroon, cross bedded and ripple marked platformal quartzites and mudstones. The Kitchener-Siyeh Formation, which includes 1200 to 1600 metres of green/grey dolomitic mudstone and buff coloured mudstone are shallow water sediments overlying the Creston Formation and mark the end of the Lower Purcell time.

The upper portion of the Purcell supergroup consists of the Dutch Creek and Mount Nelson formations. Dutch Creek formation consists of approximately 1200 metres of dark grey, calcareous dolomitic mudstones. Overlying the Dutch Creek formation is the Mount Nelson formation, 1000m of grey/green and maroon mudstone and calcareous mudstones. This marks the top of the Purcell Supergroup.

The Aldridge basin hosts the world class Sullivan Pb-Zn-Ag deposit. It is believed this basin evolved as a deep intercratonic trough,

analogous to the Guaymas Basin on the west coast of Mexico, as a result of tectonic activity along an ancient crustal spreading centre. It is proposed that the Sullivan is situated at the junction of a major penecontemporaneous transform fault (ie. the Kimberly Fault) and the oceanic spreading centre (rift zone). Transform faults are generated to relieve stresses in the crust induced during spreading. Zones of spreading within the Aldridge are believed to be marked by albitization (sodium addition), gabbro feeder dykes, and tourmalinite, a mineral/rock type produced from replacement by boron-silica rich fluids of magmatic origin.

The geology of the Moyie Lake area is presented in Figure 3 (Hoy and Diakow, 1980).

### PROPERTY GEOLOGY

The 1988 work program involved geologic mapping and prospecting. B.C. government air photos and 1:10,000 enlargements of standard NTS 1:50,000 scale maps were used for field control. The logging roads on the property were surveyed using a compass and hip chain and plotted on the 1:10,000 maps to provide location control in the field. Mapping and prospecting was carried out throughout the entire property. Bedrock occurs as small outcrops within wooded and recently logged areas, in recent road cuts and as large exposures on the cliffs to the east and north of the property.

The property is underlain by greywacke and siltstone units of the Middle Aldridge Formation. Overall structure consists of a single north to northeasterly dipping panel. Beds dip gently to the north and northeast at about 5 to 10 degrees with variations due to gentle folding. Lithologies present on the claims include thin to thick bedded grey quartzite wacke with minor siltstone and argillite. In the Bouma designation these correspond to AE turbidites and are indicative of a rapid depositional environment.

Varved sediments (marker) were located in a recent road cut on the HAP claim and were correlated with varved sediments found previously on other properties to provide some stratigraphic control.

A Moyie metadiorite sill occurs on the northern boundary of the MR claim. This sill provides rough regional stratigraphic control. Depth to the base of the Middle Aldridge formation projected from this sill and marker information varies from about 500 to 1200 m on the property.

Highly albitized (sodium enriched) or silicified and chloritized sediment float was found on the HAP claim. These altered sediments are hard, fine grained with a pale green/blue colour.

The property geology is shown in Figure 4, at a scale of 1:10,000.

The property is inferred to be within the "Cranbrook" graben, a major north trending basin formed during Sullivan time at a zone of crustal spreading. This inferred graben is defined on surface by the Little Lamb Creek fault (Figure 3), which crosses the southwest corner of the property and the unnamed northeast trending fault just west of Monroe Lake. The albitized/silicified sediments define the central axis of the graben.

#### MINERALIZATION

Base metal mineralization was not encountered on the property. Bedded lead/zinc mineralization occurs on the FORS prospect adjoining the southern boundary of the property and numerous veins and shear related mineralization is being actively explored on the RAM property to the west of the AMY group.

MODELLING

Recent studies have shown that massive sulphide deposits are now forming at the intersection of crustal spreading centres and major transform fault fractures. Some present day sites are the Juan de Fuca Strait, Gulf of Afar and the Guaymas Basin.

The importance of these intersections between transform faults and spreading centres is three fold.

1. It causes down-faulting and graben development forms the sub-basin necessary for thick accumulations of sulphides.
2. It halts the propagation of the spreading centre allowing the 'hot spot' to be focussed long enough for a convective cell to operate, leaching metals from the surrounding sediments, and precipitating the metal near the site of discharge on the sea floor. The effect of this focussed hydrothermal activity often results in the formation of a breccia pipe below the discharge site.
3. The Transverse Fault - Magma Chamber couplet are the heat sink - heat source necessary for convection with seawater recharge accommodated by the Transverse Fault-Fracture System.

Typically a spreading centre is not a single linear fracture, rather it is a zone one to several kilometres wide consisting of down dropped blocks. The marginal growth faults of these blocks are the locus of hydrothermal activity and may be marked by sodium addition (albite alteration) and tourmalinization. Both alteration types support a close magmatic association for these deposits.

As early as 1962 Dr. Aaro Aho and others observed that sedimentary hosted deposits within single rifted basins have a spacing of 20 to 30 kilometres. This has been a major, if somewhat empirical, predictive element of the model to date. These deposits are now seen as an integral product of a rifting environment with the spacing controlled by the physical parameters of the crust at that location.

ECONOMICS

The Sullivan deposit is most often quoted as containing reserves of 180,000,000 tons grading 6.7% lead, 6.5% zinc and 2 oz/ton silver and with recoverable gold, tin and REE. An important characteristic of these deposits, including the Sullivan, is the existence of a high grade core which may be exploited in times of low metal prices and during the initial payback of preproduction expenditures. The Sullivan deposit contained substantial tonnages (20,000,000 to 30,000,000 tons) grading greater than 30% combined Zn-Pb with 10 oz/ton Ag. This allows great latitude in the development and exploitation of these deposits and places them among the lowest cost producers of zinc, lead and silver.

A new discovery within reasonable distance of Kimberly would be well positioned to supplement and eventually replace the reserves of the Sullivan Mine. As the infrastructure and a skilled workforce already exist in the area, preproduction cost could be kept to a minimum.



CONCLUSIONS

To date, the Aldridge Basin is the only major sedimentary rifted basin in which only a single major deposit has been found. All other similar basins, both those forming at present and those preserved in the geologic record, host from 2 to 6 large deposits. It is likely that several large deposits remain to be found within the Aldridge formation.

Sullivan Time is projected to occur at a depth of 500 to 1200 metres within the Amy Claims. This is well within the depth capability of a moderate sized drill rig.

A large zone of Albite alteration was found in the northwest of the Claim block and may indicate the central axis of a graben structure.

Several silver-lead-zinc veins occur adjacent to McNeil creek on the Ram Claims immediately west of the Amy Property. A small lens of stratiform sulphide occurs on the Fors property immediately south of the Amy property.

STATEMENT OF EXPENDITURES**WAGES**

G. P. Leask 22 days @ \$400.00/day	\$ 8,800.00
J. M. Leask 12 days @ \$400.00/day	4,800.00

**ROOM AND BOARD**

34 man days @ \$45.00/man day	1,530.00
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**VEHICLES**

1983 Jeep 4x4 22 days @ \$60.00/day	1,320.00
1986 Jeep 4x4 12 days @ \$60.00/day	720.00

**FUEL**

650.00

**MISCELLANEOUS**

350.00

**REPORT PREPARATION**

4 days @ \$400.00/day	1,600.00
Typing	100.00
Drafting	<u>200.00</u>

**TOTAL****\$20,070.00**

## REFERENCES


- Bishop, D.T., Morris, H.C., and Edmunds, F.R., 1970, Turbidites and depositional features in the lower Belt-Purcell Supergroup (Abstr.): In Geological Society of America Program, Boulder, Colorado, pg. 797
- Cartwright, P.A., 1988, Report on the Controlled Source Audio-Magneto Telluric Survey on the BAR Property, Fort Steele Mining Division, British Columbia for Tectono Resources Ltd.
- Hoy, T. and Diakow, L., 1980, Geology of the Moyie Lake Map Area, Preliminary map No. 49, Ministry of Energy Mines and Petroleum Resources, Province of British Columbia.
- Hoy, T., 1982. The Purcell Supergroup in southeastern British Columbia: Sedimentation, Tectonics, and Stratiform Lead-Zinc Deposits, H.S. Robinson Memorial Volume (eds. R.W. Hutchinson, C.D. Spence and J.M. Franklin), Geological Association of Canada, special Paper 25, pg. 127-147
- McDonald, J.M., 1985, Drilling DDH BAR 85-1 on the BAR 8 Mineral Claim, Fort Steele Mining Division, BCDM Assessment Report 14548
- Price, R.A., and Lis, M.G., 1975, Recurrent displacements of basement controlled faults across the Cordilleran Miogeosyncline in southern Canada: Geological Society of America, Abstracts with Programs., pg. 1234.
- Ransom, P.W., 1977, Geology of the Sullivan Orebody: in Hoy T., ed. Lead-Zinc Deposits of southeastern British Columbia: Geological Association of Canada fieldtrip Guidebook, pg. 7-21.

STATEMENT OF QUALIFICATIONS

I, JOHN M. LEASK, do hereby certify that:

1. I am a geologist with residence at 843 West 15th Avenue, Vancouver, British Columbia, V5Z 1R8.
2. I am a graduate of the University of British Columbia with a Bachelor of Applied Science degree in Geological Engineering (1980).
3. I have been involved in mining exploration since 1979.

Respectfully submitted,

  
\_\_\_\_\_  
JOHN M. LEASK

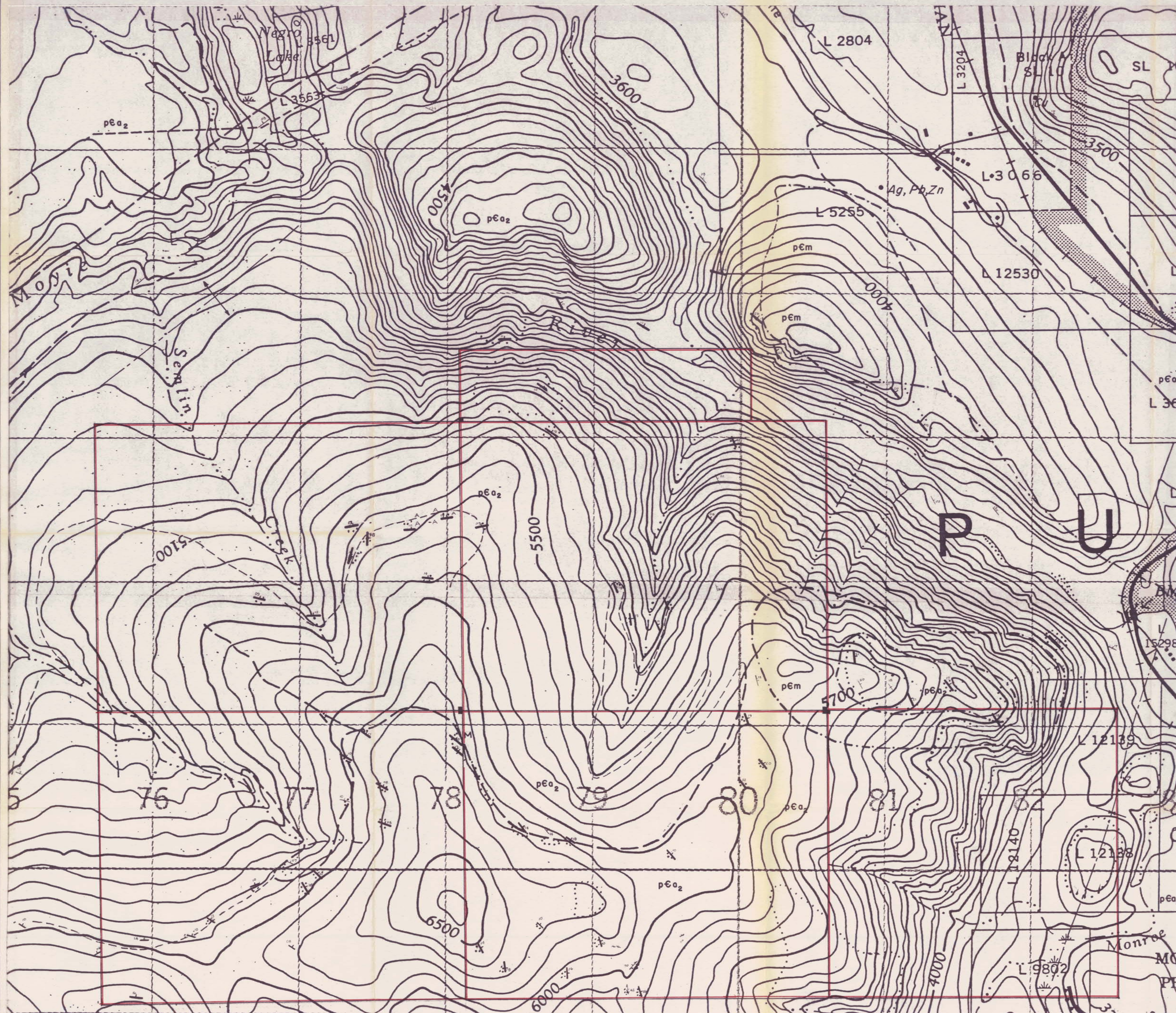
## STATEMENT OF QUALIFICATIONS

I, GORDON P. LEASK, do hereby certify that:

1. I am a geologist with residence at 192 West 23rd Avenue, Vancouver, British Columbia, V5Y 2G9.
2. I am a graduate of the University of British Columbia with a Bachelor of Applied Science degree in Geological Engineering (1985).
3. I have been involved in mining exploration as an independent since 1979.

  
GORDON P. LEASK





**LEGEND**

MIDDLE PROTEROZOIC

pEm MOYIE INTRUSIONS

METADIORITE TO METAGABBRO SILLS AND LOCALLY DYKES

PURCELL SUPERGROUP

pEa ALDRIDGE FORMATION

pEa<sub>1</sub> (UPPER ALDRIDGE): THINLY LAMINATED, RUSTY WEATHERING, LIGHT TO DARK GREY ARGILLITE AND ARGILLACEOUS SILTSTONE

pEa<sub>2</sub> (MIDDLE ALDRIDGE): THIN TO THICK-BEDDED GREY QUARTZITE WACKE INTERLAYERED WITH LAMINATED SILTSTONE; SILTSTONE AND RUSTY WEATHERING ARGILLITE DOMINATE NEAR TOP

pEa<sub>3</sub> (LOWER ALDRIDGE): RUSTY WEATHERING SILTSTONE AND QUARTZITE WITH INTERBEDS OF SILTY ARGILLITE; INTERLAYERED RUSTY WEATHERING QUARTZ WACKE AND SILTSTONE NEAR TOP

- BEDDING
- FOLIATION
- GEOLOGIC CONTACT  
known, inferred
- FAULT  
known, inferred
- FOLD**
- Anticline
- Syncline
- MINERAL OCCURENCE**
- ALBITE
- MARKER
- OUTCROP

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AMY CLAIM GROUP

GEOLOGY

N.T.S. - 82G/5W	DATE: JAN. 1989
LATITUDE: 49° 24'	SCALE: 1:10,000
LONGITUDE: 115° 56'	FIGURE: 4



