

An Estimate of the Potential

861976

of the

**LADNER CREEK
GOLD PROPERTY**

Exclusive of the Idaho Zone

and

Owned by -



of Vancouver, B.C.

Report by:

D. R. Cochrane, P. Eng.

May 28, 1979

Delta, B. C.



Cochrane Consultants Limited
4882 Delta St., Delta, B.C. V4K 2T8 946-9221
Geotechnical Consulting / Exploration Services

geology
geophysics
geochemistry

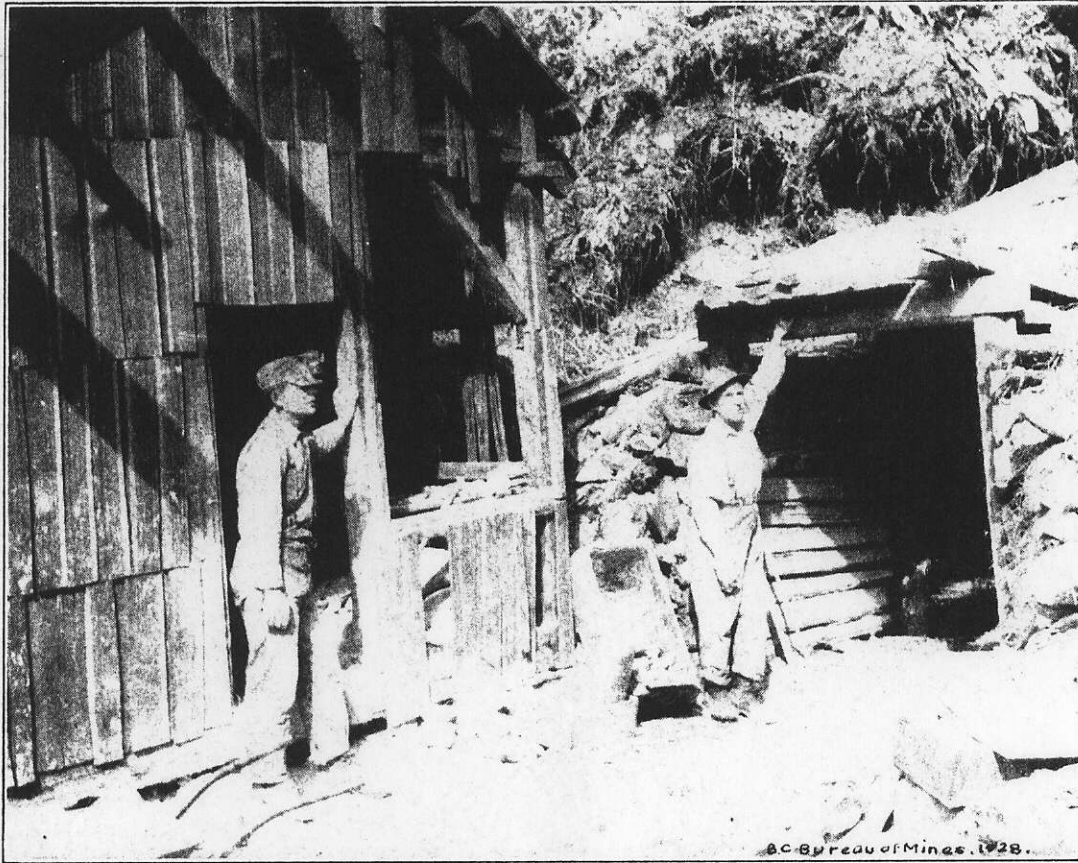


Plate I

Aurum Portal, 1928

(Annual Report of the Minister of Mines)



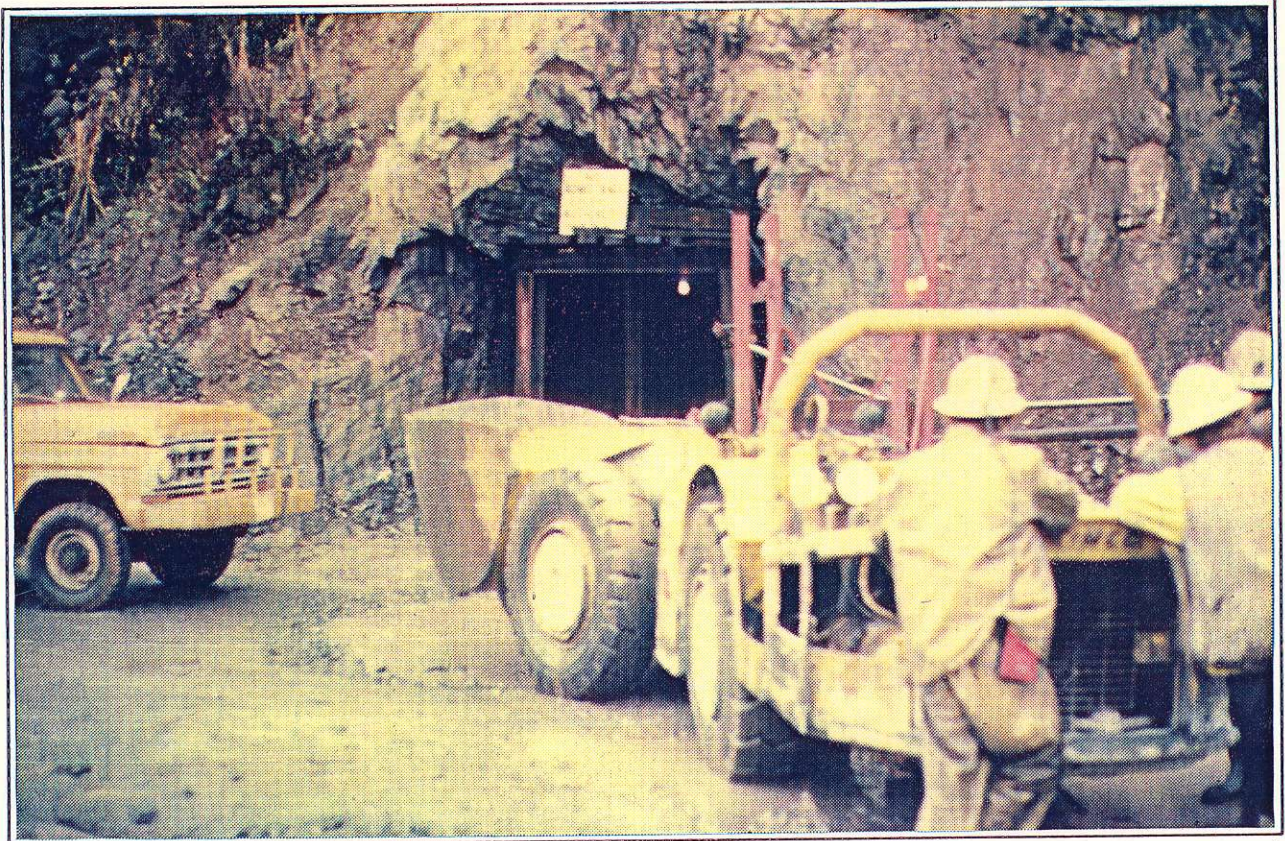
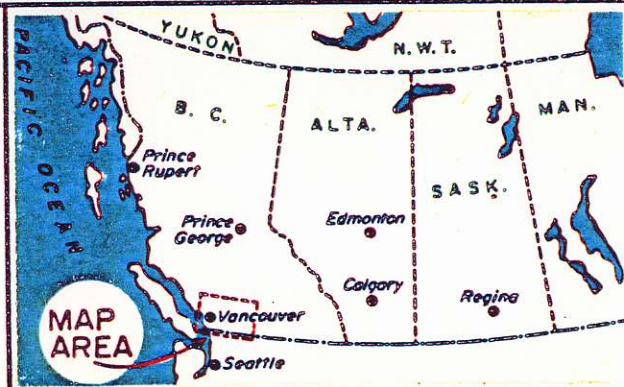
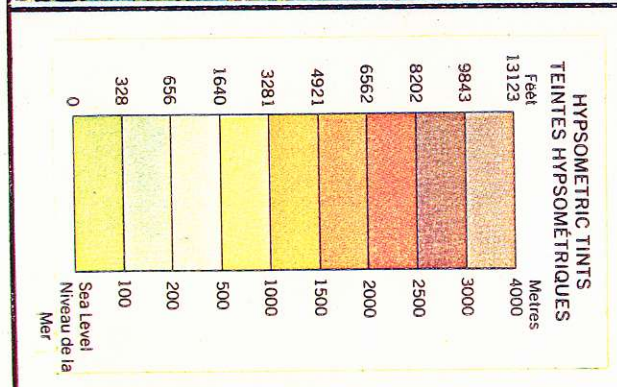


Plate II

Idaho Decline Portal, 1977





Ladner Creek Project

Location Map
from E.M. & R. map NM 9-10

Figure 1



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PREAMBLE

The author first inspected claims on Ladner Creek in the Coquihalla Gold Belt, on behalf of Carolin Mines Ltd., in the spring of 1973. There were five (5) former gold producers along the Coquihalla belt and the claims first inspected covered three of these old mines. The gold belt lies immediately east of the town of Hope in the Cascade Mountains of Southern British Columbia and therefore; there is facile access, readily available power services, work force and an abundance of water and timber resources.

Since 1973, there has been almost continuous and intensive exploration work on the claims by Carolin Mines Ltd., and work has resulted in outlining a portion of the Idaho gold bearing zones which to date total an estimated (by Carolin) 1.98 million short tons grading 0.127 troy ounces of gold per ton at the 0.05 ounce cut off level

or

1.4 million short tons grading 0.15 troy ounces of gold per ton at the 0.08 cut off level.



The Idaho Zone has been investigated in detail for a strike length of some 1200 feet (365 m) and the tonnage estimates are within this tested section. The zones are open to the north and in places down dip and, therefore, they may be expected to persist for some unknown distance. There are no apparent known offsetting structures and the mineralized zones remain strong and persistent at the north end.

There are several empirical "rules of thumb" for estimating the persistence of ore at depth and as McKinstry (1959; Mining Geology pg. 372) points out:

"It is common practice, in estimating the amount of ore that may be counted on with reasonable safety, to assume that the ore will extend downward for a distance at least equal to half the horizontal length of the shoot as exposed on the bottom level."

The vast bulk of the exploration work has been directed to the Idaho, (lot NO. 1234; 40.75 acres) a single crown granted mineral claim, one of a total of eighty-one (81) contiguous claims collectively known as the Ladner Creek Group.



Much has been written about the Idaho but recently there has been no discussion of the potential on other claims and showings. This brief report is an attempt to fill that gap and contains background information and discusses the possibilities on the remainder of the claim group.



Plate III. Idaho Sidehill-looking north west



BACKGROUND INFORMATION

Lode mining along the Coquihalla Gold Belt followed the great placer gold rush along the Fraser River, its tributaries and streams near Yale and Hope in the late 1850's. The first recorded lode gold production was in 1905 from the Ward claims on Siwash Creek just north of Carolin's Ladner Creek claim group and a prospector by the name of William Teague discovered gold in the Ladner slates near the Emancipation Mine (now the Hope Group) in 1906 or 1907. This old mine lies just south of the Carolin property and near the Teague discovery and reached production by 1916. The Idaho mineral claim is first mentioned in the Annual Report of the Minister of Mines B. C. in 1919, and in the late 20's "spectacular" free gold was found on the adjacent Aurum claims. A staking rush followed, and the Aurum stock rose to over \$100 per share in 1929. The Georgia No. 2 situated just north of the Aurum, produced in 1925 and the Pipestem (or Home Gold Mine) first produced in 1935. The present Ladner Creek Property covers the Georgia No. 2, Aurum and Pipestem Mines, and a number of other gold prospects including



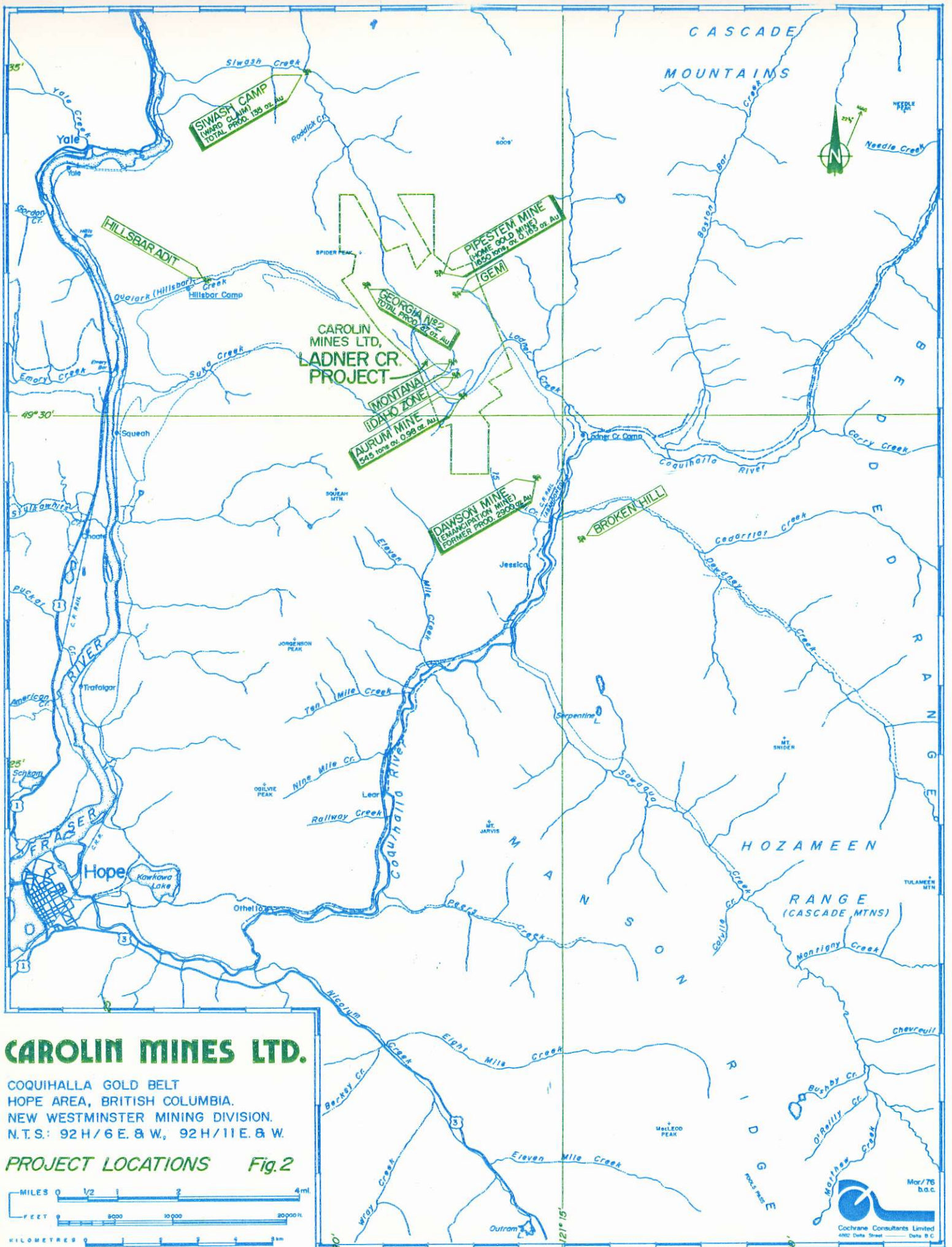
The Montana, Rush of the Bull, Golden Cache and Gem.

Government records document previous lode gold production along the Coquihalla Gold Belt, from the five old producers, as a total of 3886 troy ounces. The last recorded production was in 1941.

The potential of the Coquihalla Gold Belt was recognized early by Dr. C.E. Cairnes of the Geological Survey of Canada and in 1920 he compared the geology and mineralization as similar to that of the Mother Lode Gold Belt in California. Cairnes stated:

"The geology and ore deposits of the serpentine belt and adjacent formations of Coquihalla area present many striking comparisons with the Mother Lode district of California ---- The Mother Lode System of California, could, in a general way, be a description of the Coquihalla area."





CAROLIN MINES LTD.

COQUIHALLA GOLD BELT
 HOPE AREA, BRITISH COLUMBIA.
 NEW WESTMINSTER MINING DIVISION.
 N.T.S.: 92H/6 E. & W., 92H/11 E. & W.

PROJECT LOCATIONS Fig.2

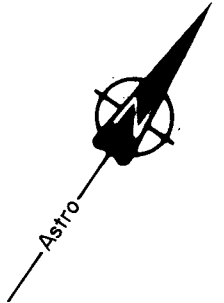
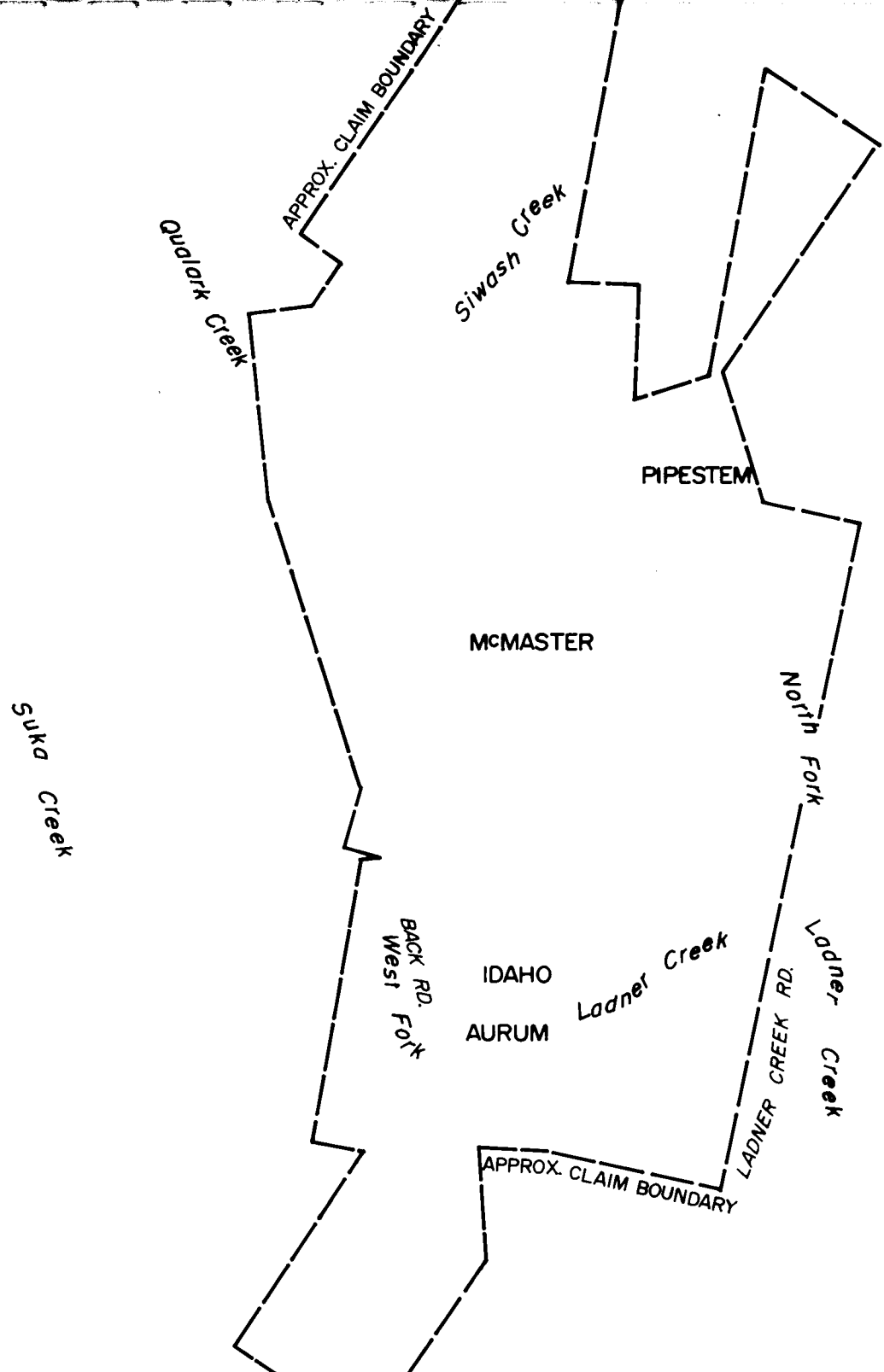


The author certainly agrees with the comparison, however, the Mother Lode belt has produced several million ounces of gold whereas the Coquihalla only a few thousand ounces to date.

Extensive development of the Coquihalla Gold Belt was somewhat inhibited, however, by widespread overburden cover, rugged nature of the area and, in the early days, a fragmentation of ownership. It was not until the 60's that a good portion of the belt was placed under one single ownership by Summit Mines, and further staking by Carolin Mines Ltd., in 1973, placed a large portion of the belt under a single ownership umbrella.

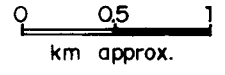
The Ladner Creek claim group lies in the rugged and heavily forested Cascade Mountains which are characterized by deeply incised streams and rugged mountain peaks. Elevations on the property vary from about 750 metres (2500 feet) to just over 1500 metres (5000 feet) above sea level. There is fair access to the claim group however, via the Coquihalla Road and the Ladner Creek access road.

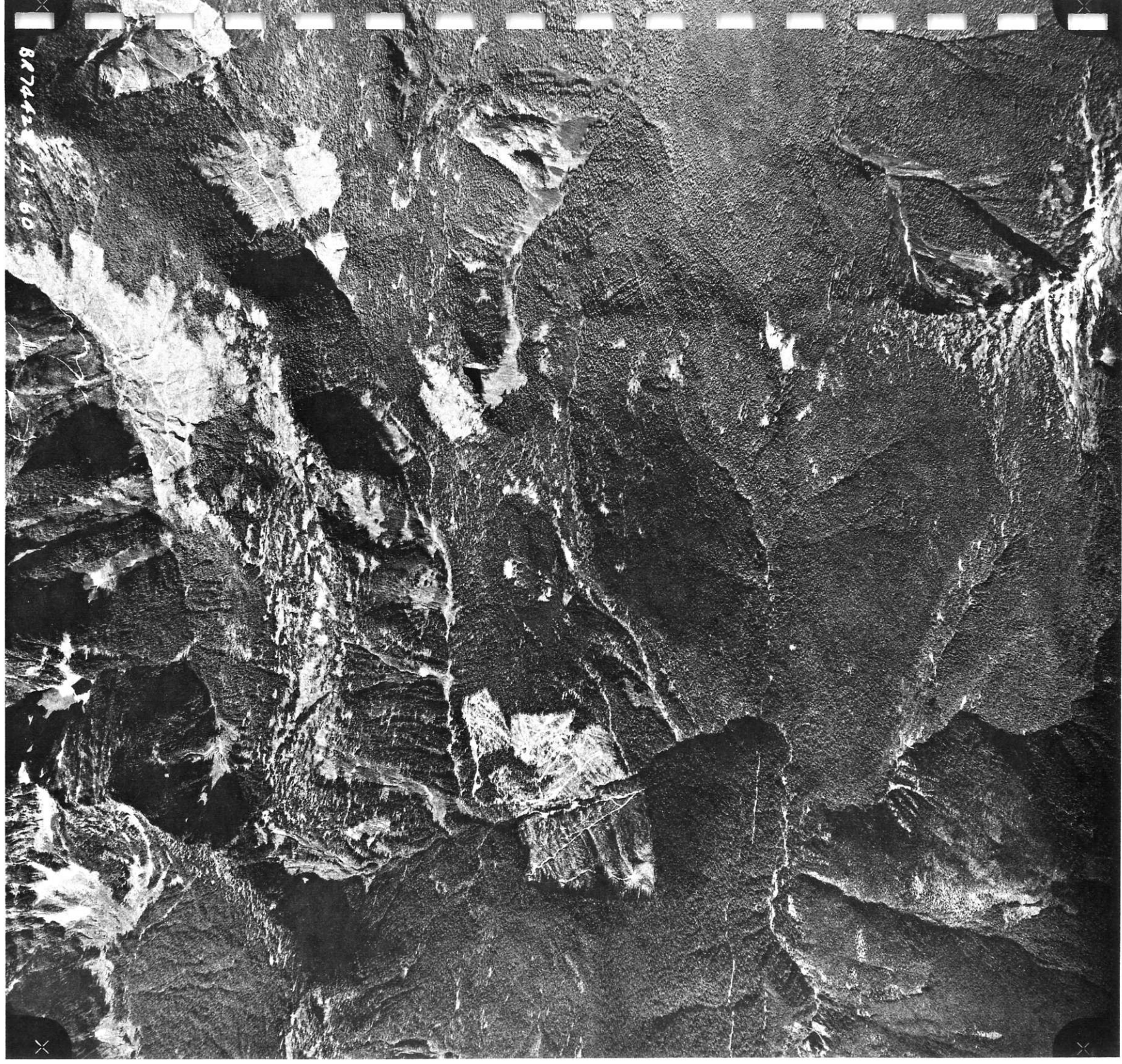




Ladner Creek Project

OVERLAY



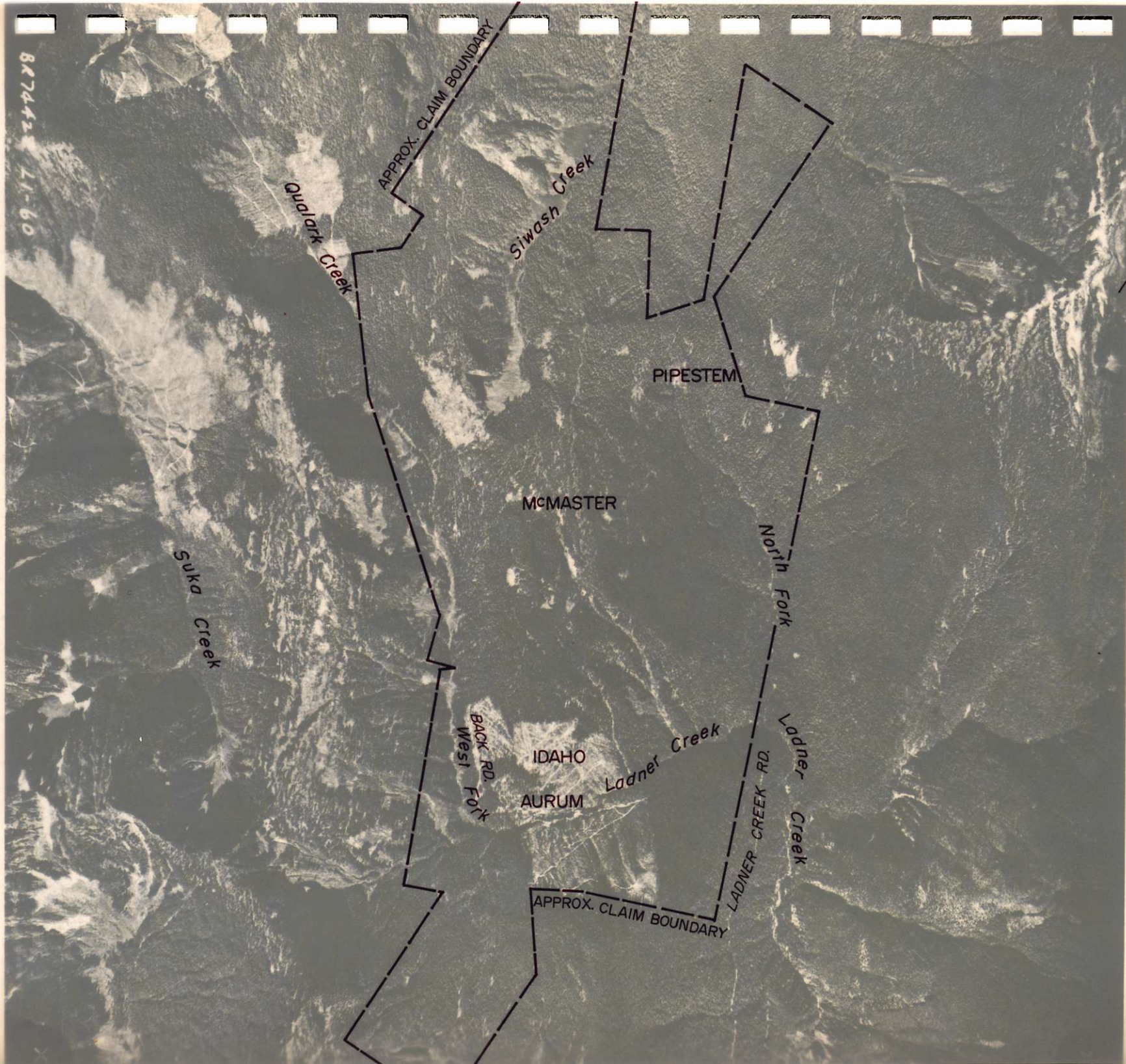


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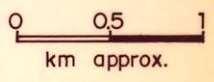
AIR PHOTO

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Ladner Creek Project

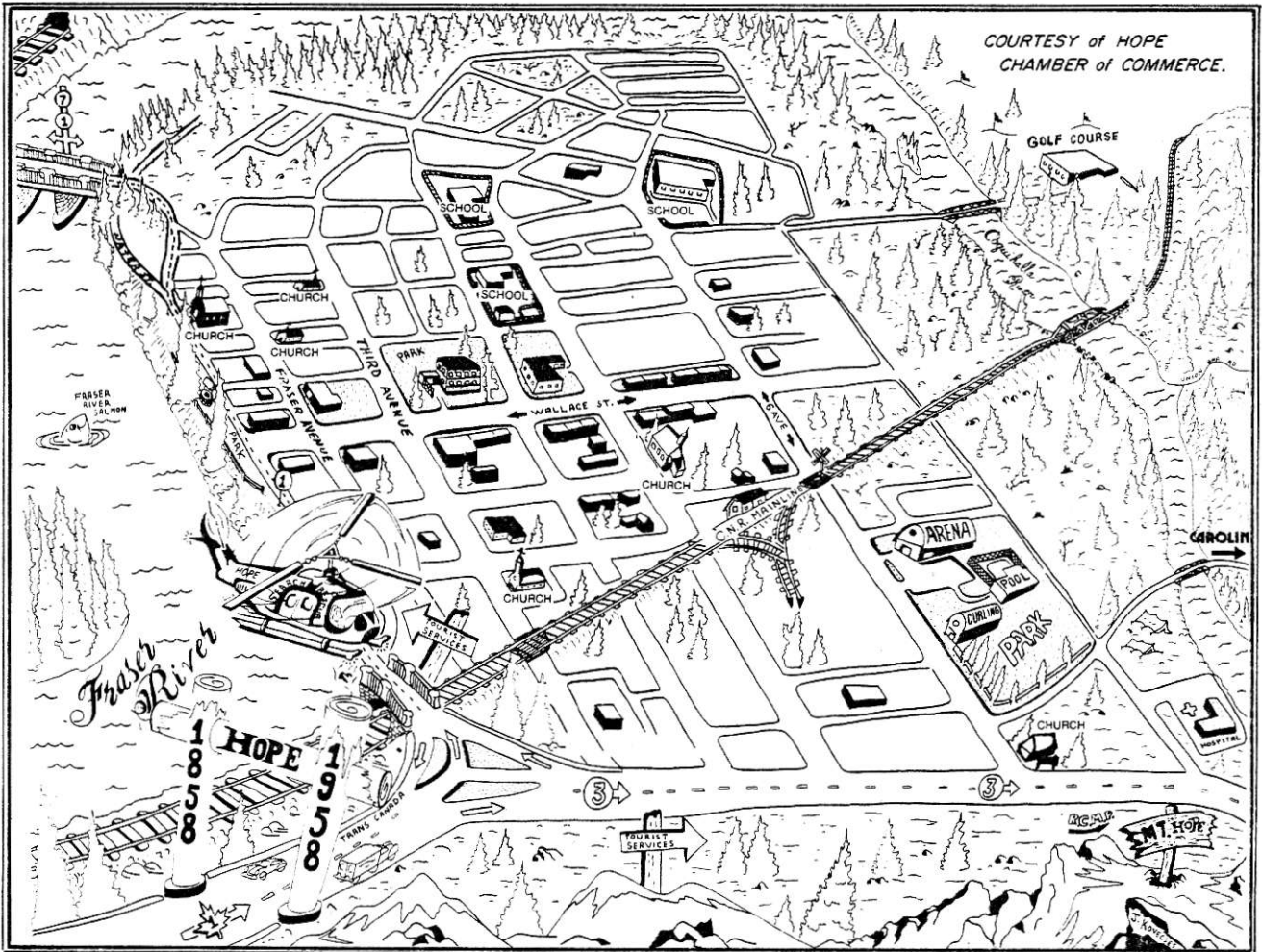
AIR PHOTO OVERLAY

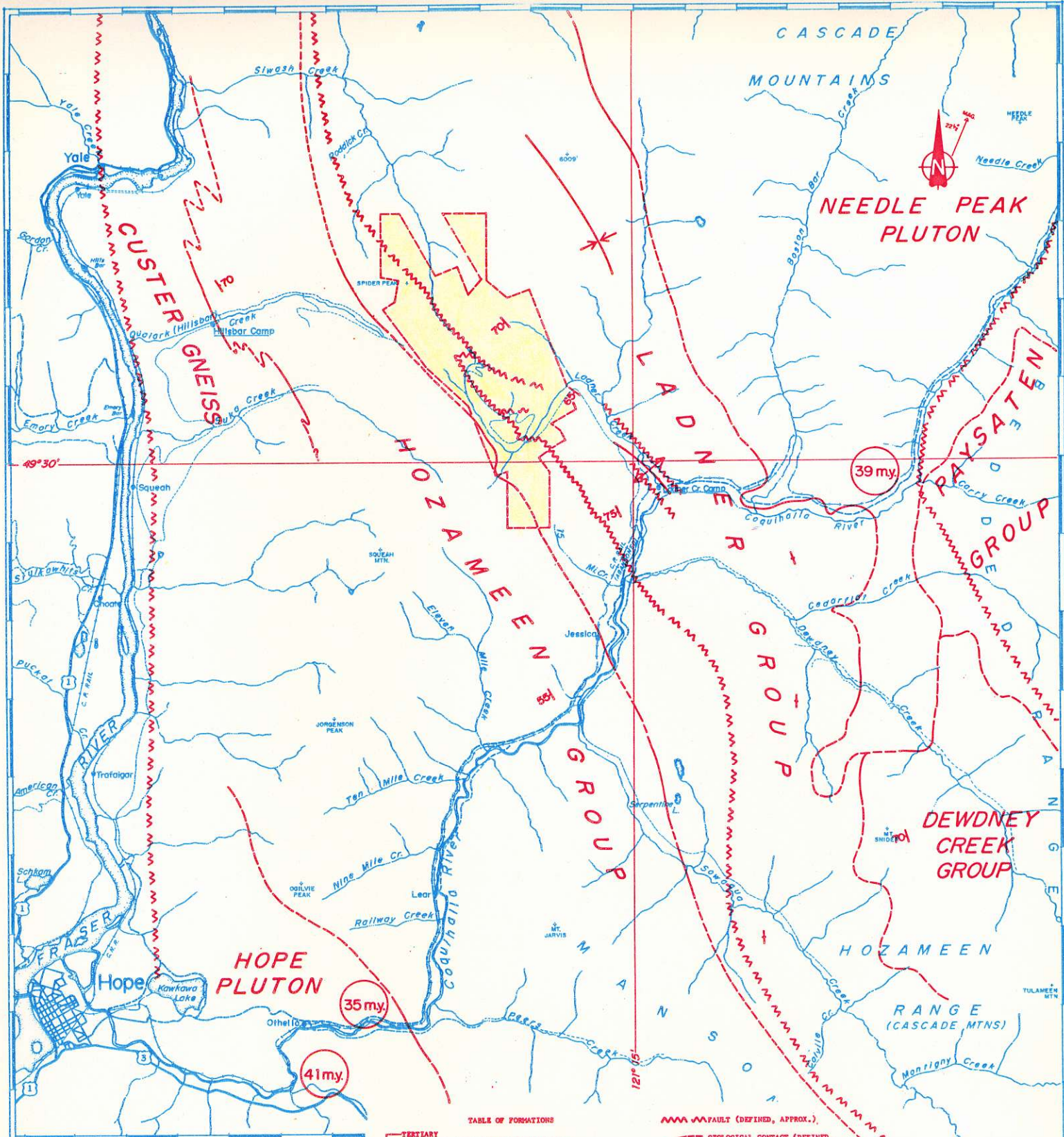


A new four lane paved highway between Hope and Merritt will pass within five (5) road miles of the Idaho portal and this freeway is scheduled for completion in 1986. The first portion of the contract, between Hope and Peers Creek has now been let. (See location map, Figure 1).

The town of Hope is a scenic and pleasant small town and an excellent townsite for future mining operations.

FIGURE 3. SKETCH of HOPE, B.C.





CAROLIN MINES LTD.

COQUIHALLA GOLD BELT
 HOPE AREA, BRITISH COLUMBIA.
 NEW WESTMINSTER MINING DIVISION.
 N.T.S.: 92 H/6 E. & W, 92 H/11 E. & W.

GENERAL GEOLOGY Fig. 4

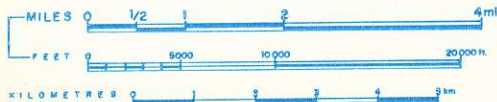


TABLE OF FORMATIONS

TERTIARY	ACIDIC INTRUSIVES (GRANODIORITES, QUARTZ DIORITES)
LATE CRETACEOUS/EARLY TERTIARY	CUSTER GNEISS (METAMYZED HOZAMEEN ROCKS)
LOWER CRETACEOUS	PAYSATEN GROUP (SANDSTONE, CONGLOMERATE)
UPPER JURASSIC	DEWDNEY CREEK GROUP (SANDSTONE, PELITE/TUFF)
LOWER AND MIDDLE JURASSIC	LADNER CREEK GROUP (ARGILLITE, GREYSLATE, SLATE, ETC.)
UPPER PALEOZOIC	HOZAMEEN GROUP (CHERT, ARGILLACEOUS SCHISTS, METAGREENSTONE, MINOR LIMESTONE)
ROCKS OF UNKNOWN AGE	COQUIHALLA SERPENTINE BELT (INCLUDES SERPENTINE, METAGREENSTONE, TALC, SCHIST, MISC. BASIC INTRUSIVES)

- FAULT (DEFINED, APPROX.)
- GEOLOGICAL CONTACT (DEFINED, APPROX.)
- BEDDING ATTITUDE
- ANTIFORM, SYNFORM
- AGE DATE (MILLION YEARS BEFORE PRESENT)
- BETWEEN 1916 AND 1942 FIVE (5) PROPERTIES PRODUCED 3,912 oz. Au FROM 3,102 TONS. (AVERAGE OF 1.2 oz.)

- See Fig. 2
- GEOLOGY MODIFIED FROM:
1. CAIRNES, C.E. (1924) GEOLOGICAL MAP, COQUIHALLA RIVER AREA, G.S.C.
 2. MONGER, J.W.H. (1969) G.S.C. PAPER 69-67, HOPE SHEET, WEST HALF.
 3. MCTAGGART, K.C. & THOMPSON, R.H. (1967) GEOLOGY OF PART OF THE NORTHERN CASCADES, CAN. JOUR. EARTH SCIENCES, VOL. 4.
 4. GRIFFITH, D.J. PERSONAL COMMUNICATIONS.
 5. MONTGOMERY, J.N. (1975) GEOLOGY OF HILLSBAR GROUP (PRIVATE REPORT FOR CAROLIN MINES LIMITED)
 6. COCHRANE, D.R. VARIOUS PROPERTY EXAMINATIONS, COQUIHALLA GOLD BELT.
 7. STEPHENS, G.C. GEOLOGY OF THE HOPE CLAIMS.
 8. STEWART, J. GEOLOGY OF THE HOPE CLAIMS.

REGIONAL GEOLOGY

The geology of the Coquihalla area has been described in various Geological Survey of Canada publications including; Summary Report for 1919 (Part B), Summary Report for 1920 (Part A), Memoir 139 (1924), Summary Report for 1929 (Part A), and in several Annual Reports of the Minister of Mines, B. C. In addition, several properties have been studied by geologists, including; private reports by Al Littlejohn, for Aquarius Resources; and David Griffith, Walter Clarke, and the author for Carolin Mines Ltd. The following description very briefly summarizes the results of this work to date:

The Ladner Creek group of mineral claims straddles the north trending Hozameen Fault and adjacent serpentine band which separates Paleozoic Hozameen series rocks on the west, from Jurassic Ladner slate rocks on the east. McKee (1972), describes this major crustal feature as the west boundary of the Methow grabben which extends from the north part of Washington State, to near the town



of Boston Bar in the Fraser River Canyon, a distance of several hundred miles. The Coquihalla Gold Belt is a small 30 to 40 mile (50 to 65 km) segment of this major geological feature.

The geology of the Ladner Creek claim group is complex but in general is northerly biased and consists of the following essential features (and in a general succession from west to east:)

- (a) the paleozoic Hozameen Series consisting predominantly of ribbon cherts;
- (b) a greenstone and ultramafic intrusive complex of unknown age;
- (c) a narrow serpentine band; believed to be derived from the basic and ultrabasic suite;
- (d) the Hozameen fault and a complex of ancillary and splay faults which, ^{where discernible} were discernable, appear to be "normal" (east side down);

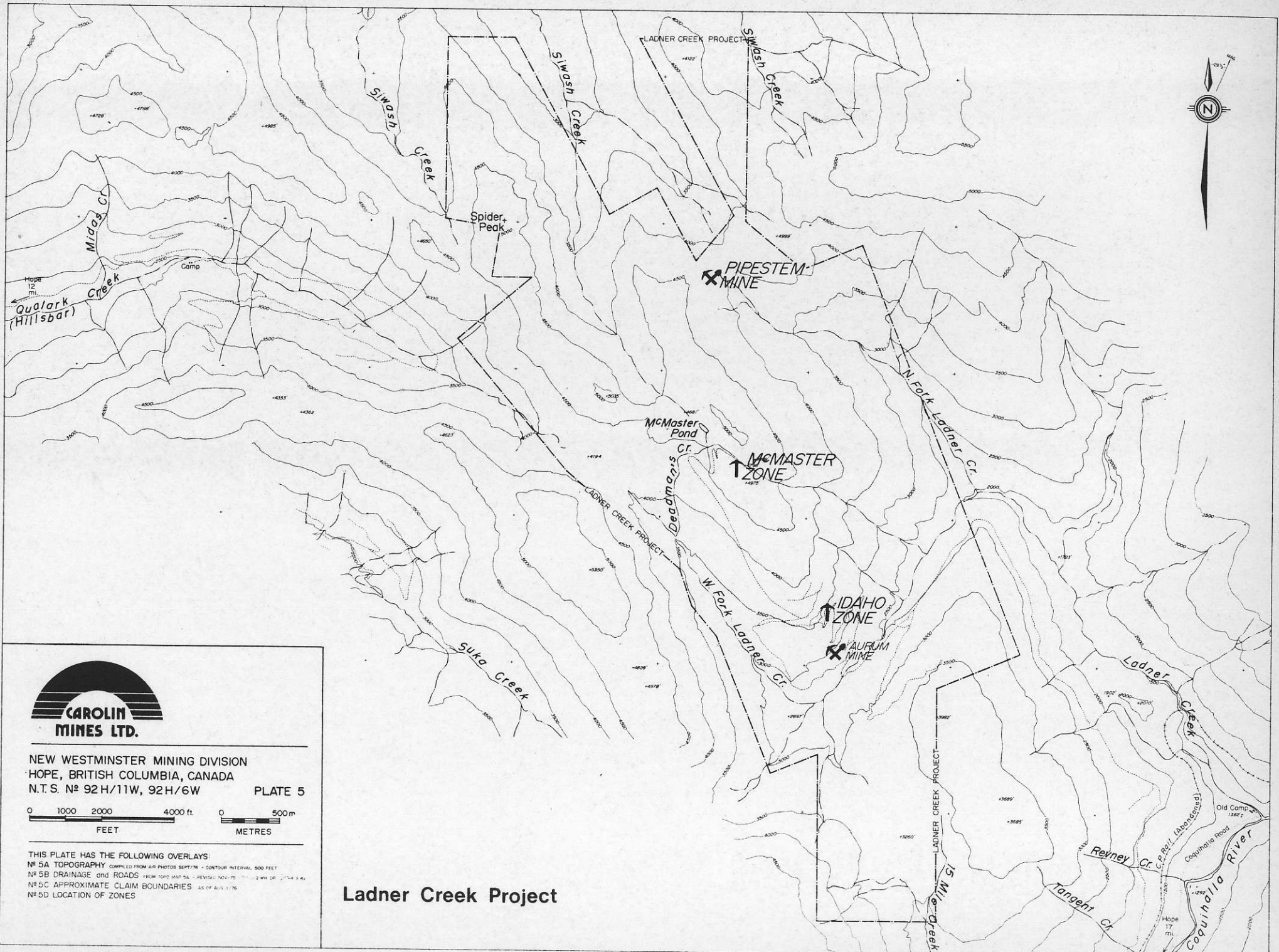


- (e) the Jurassic Ladner Creek group consisting predominantly of slates, argillites and greywackes;
- (f) a suite of acidic dikes, sills and plugs and a diorite plug near the center of the claim group;
- (g) gold bearing quartz veins, shear zones and replacement bodies.

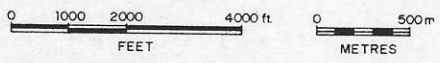
Economic metalization discovered to date along the belt is primarily restricted to gold, and several types of gold deposits are represented including:

- 1 Shear zone type deposits along major and ancillary faults (such as the Aurum deposit).
2. Vein type deposits in several rock types such as the Hillsbar in Hozameen Rocks, The Emancipation in volcanics and slate, The Monument in slates, and Siwash Camp - partly in intrusives.





NEW WESTMINSTER MINING DIVISION
 HOPE, BRITISH COLUMBIA, CANADA
 N.T.S. N° 92H/11W, 92H/6W **PLATE 5**



THIS PLATE HAS THE FOLLOWING OVERLAYS:
 N° 5A TOPOGRAPHY COMPILED FROM AIR PHOTOS SEPT/74 - CONTOUR INTERVAL, 500 FEET
 N° 5B DRAINAGE and ROADS FROM TOPO MAP 92H/11W/6W - REVISED NOV/75 1:250,000
 N° 5C APPROXIMATE CLAIM BOUNDARIES AS OF AUG. 1976
 N° 5D LOCATION OF ZONES

Ladner Creek Project

3. Breccia type gold deposits such as parts of the Pipestem in Ladner slates.

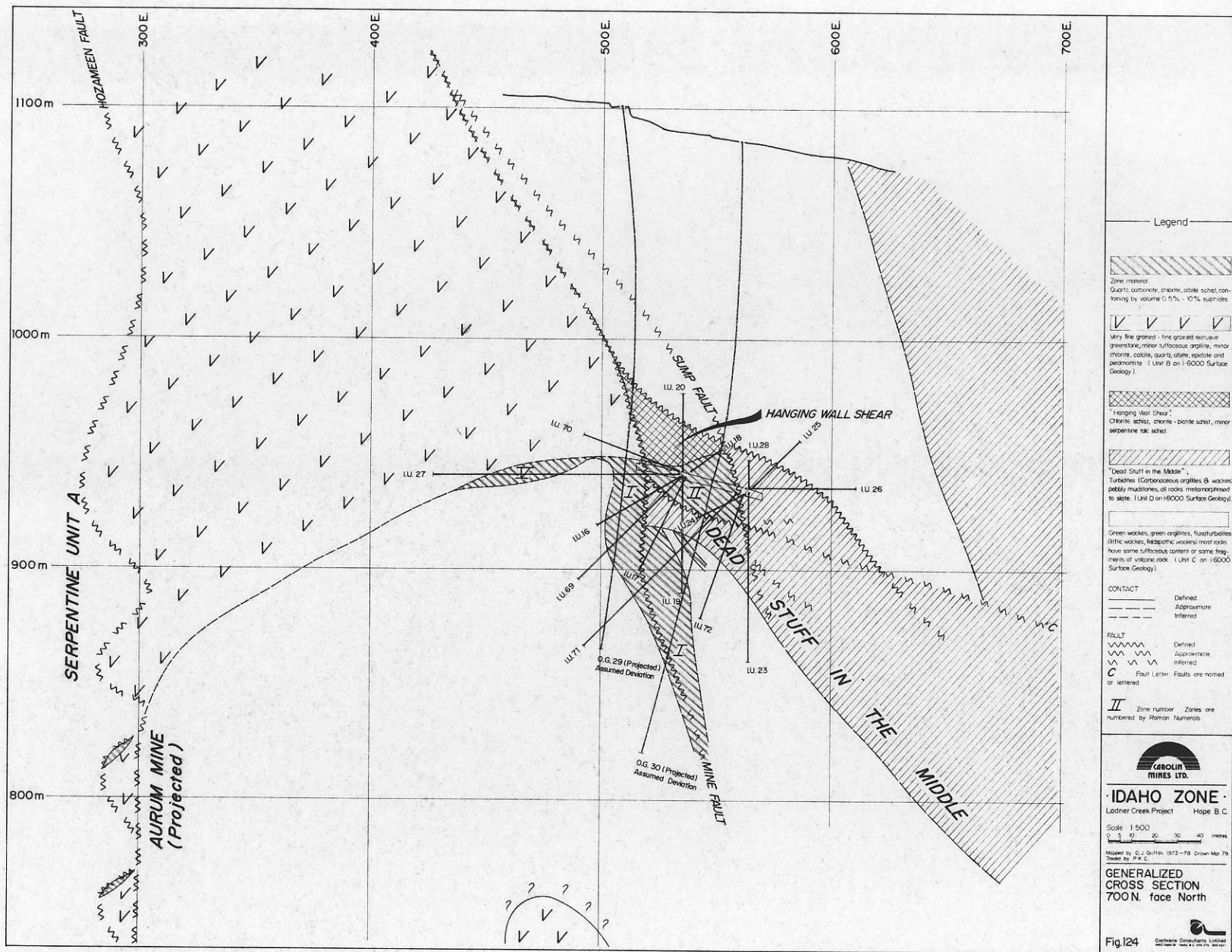
4. Replacement type deposits such as the Idaho and McMaster Zones, also in Ladner slate rocks.

There are small placer gold deposits associated with some of the lode deposits, the most noteable on Hillsbar (Qualark) Creek.

The Idaho Zone deposit consists primarily of fine free gold in silicified albite-carbonate bands in schistose slates which contain disseminated pyrrhotite, arsenopyrite and pyrite close to a greenstone contact. It is interesting to note by comparison, Knopf's (1929) description of the Mother Lode deposits of California:

"The ore bodies in country rocks are of diverse type, but the mineralized greenstone, known as gray ore, and mineralized schists are the most productive. The mineralized greenstone is composed of ankerite (iron rich carbonate), sericite, albite, quartz and 3 to 4 percent pyrite and arsenopyrite."





The free gold at the Mother Lode is usually associated with pyrite. To this date replacement type deposits have not been identified in greenstone rocks along the Coquihalla belt, however this potential is very real, and drilling underground at the Idaho Zone has shown that parts of the greenstone are mineralized to some extent. A second rock type that often contains anomalously high concentrations of gold, is a carbonate-green mica unit similar in appearance to the Green Leader formation in the Kalgoorlie (the famous Golden Mile) area of Western Australia. The third rock type that may be important are the intrusives which are often shattered and, contain a network of gold and tungsten bearing quartz veinlets.

Due to former exploration budget restrictions however, exploration attention along the belt has been mainly restricted to a claim width on the east side of the fault in Ladner slate rocks, the host rock for the Idaho Zone. Other rock types have been considered lower priority hosts.



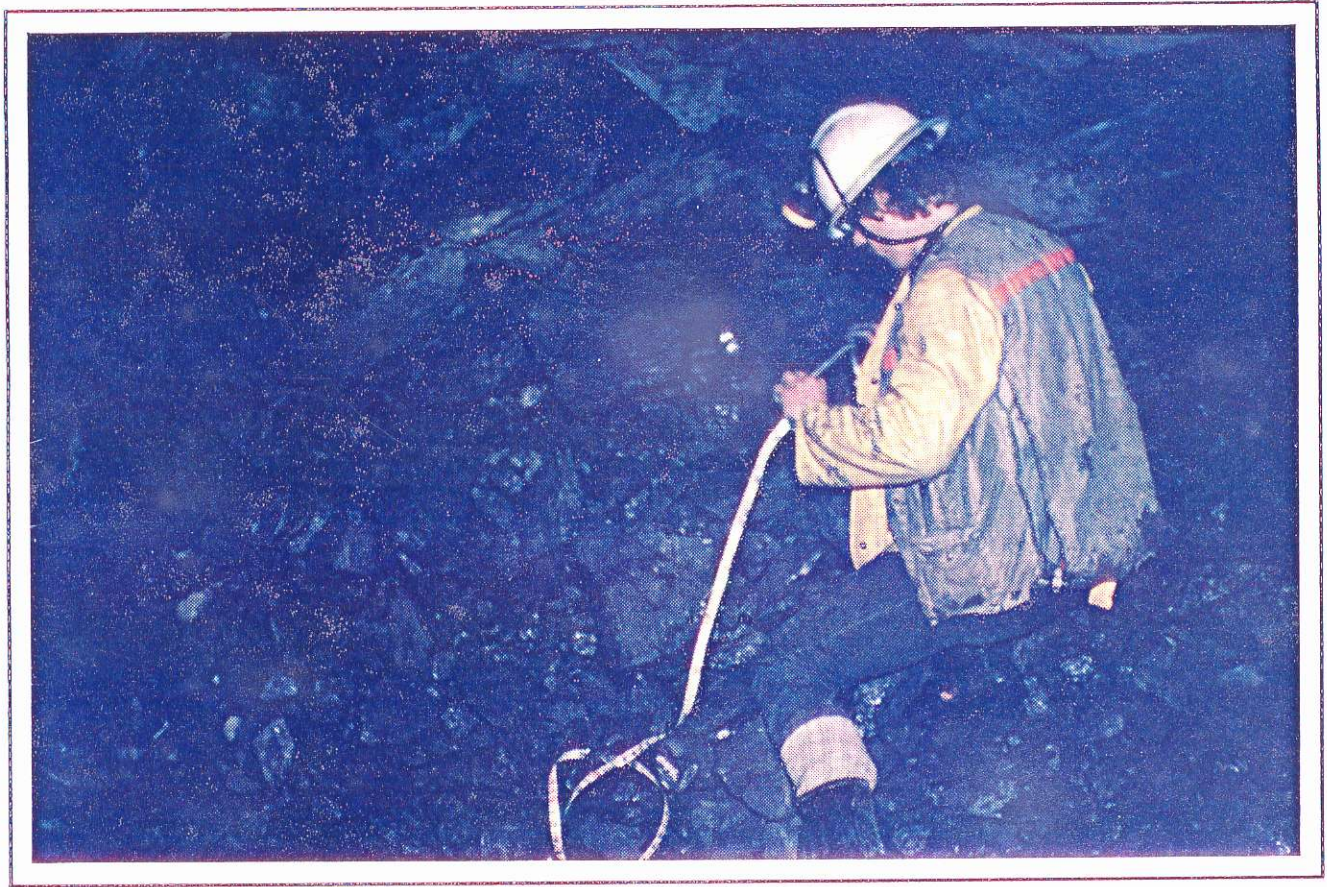
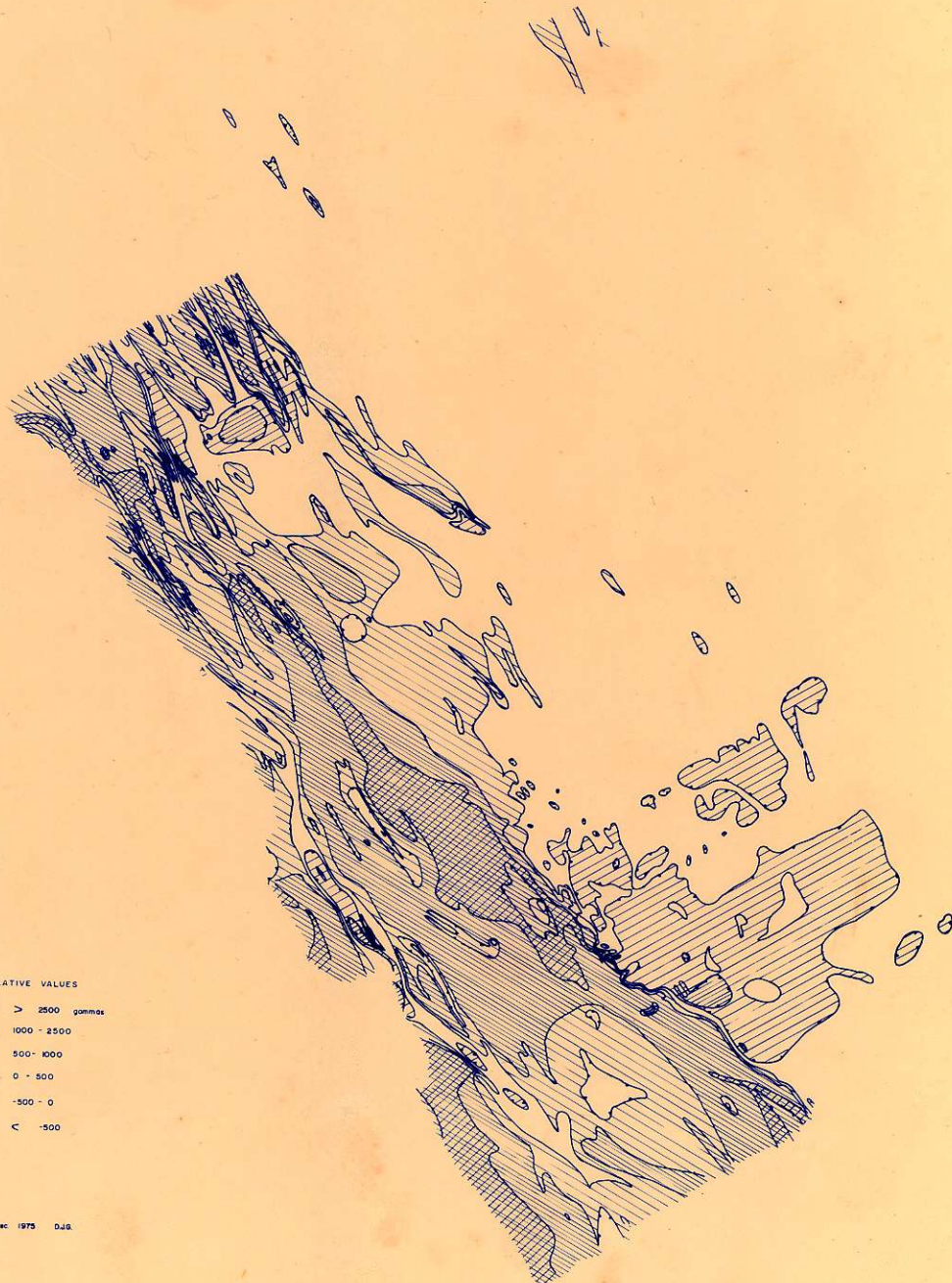


Plate V. Project Geologist at face, Idaho Decline, November, 1977.

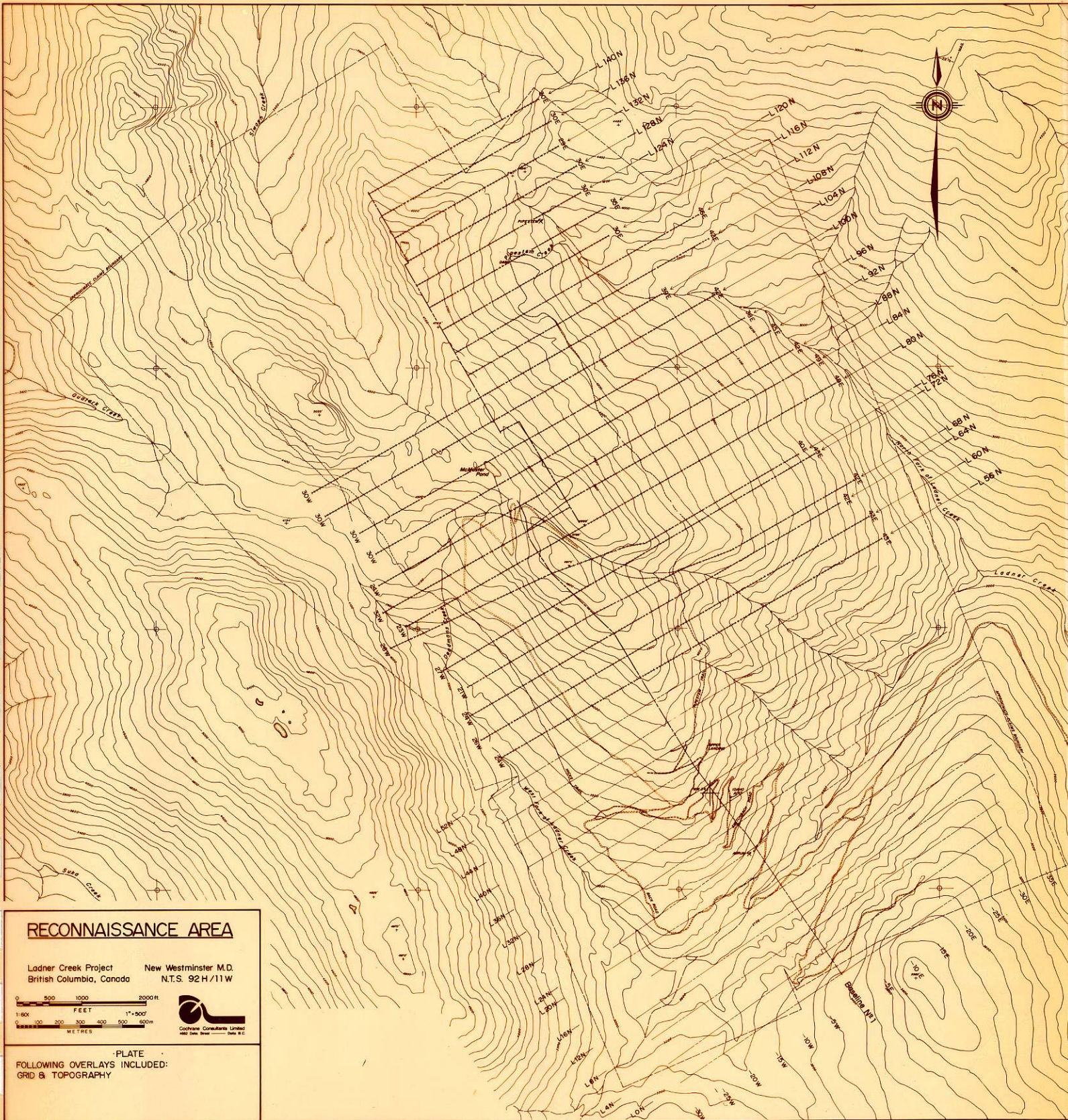




RELATIVE VALUES

	> 2500 gammas
	1000 - 2500
	500 - 1000
	0 - 500
	-500 - 0
	< -500



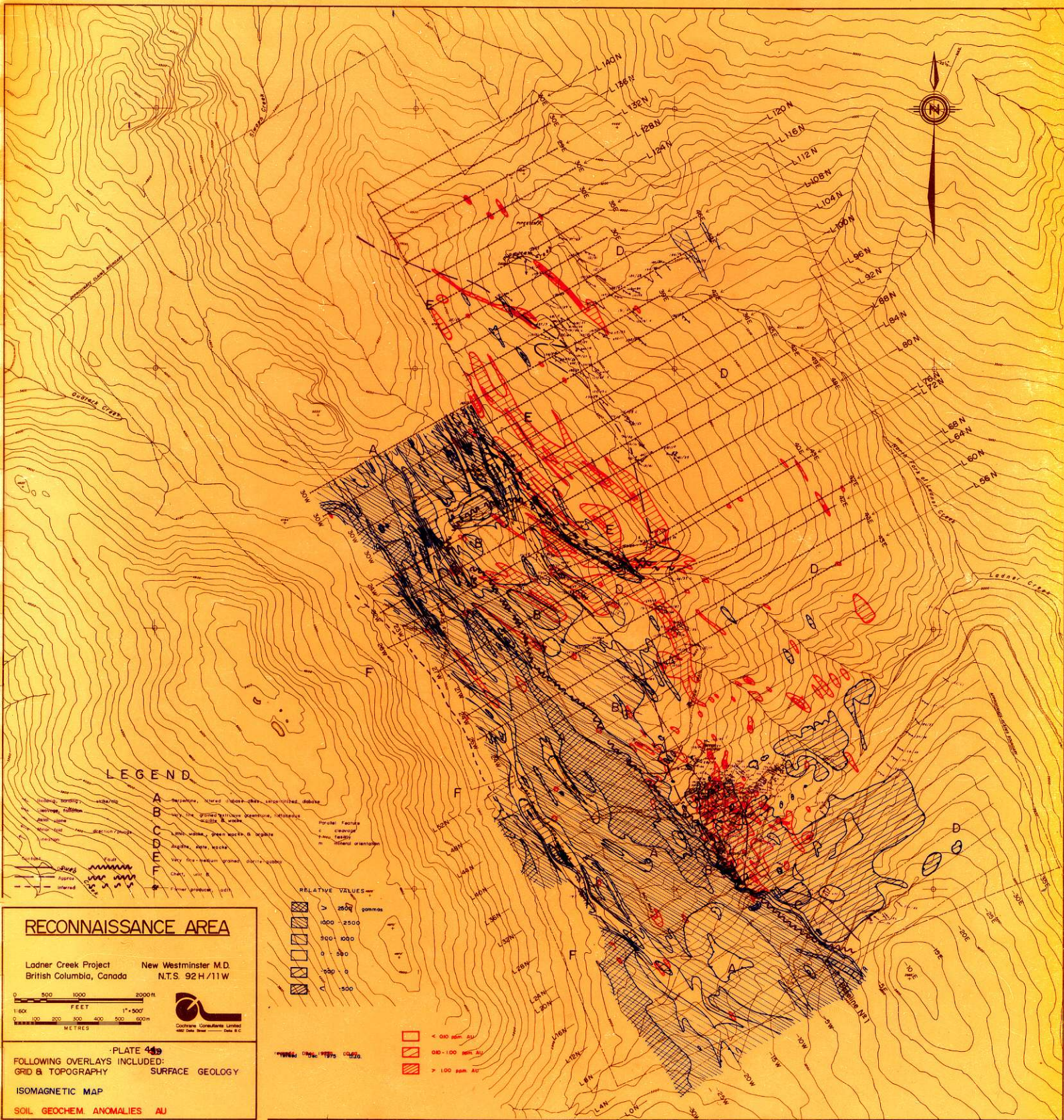


RECONNAISSANCE AREA

Ladner Creek Project New Westminster M.D.
 British Columbia, Canada N.T.S. 92 H/11W



PLATE
 FOLLOWING OVERLAYS INCLUDED:
 GRID & TOPOGRAPHY



LEGEND

- A - Residual, mixed siliceous-siliceous, siliceous, siliceous
- B - Very fine grained siliceous, siliceous, siliceous, siliceous
- C - Siliceous, green, green, green, green
- D - Siliceous, green, green, green, green
- E - Siliceous, green, green, green, green
- F - Fine, medium, coarse, coarse

RECONNAISSANCE AREA

Ladner Creek Project
 British Columbia, Canada
 New Westminster M.D.
 N.T.S. 92 H / 11 W

0 500 1000 2000 ft
 1:60x FEET 1" = 500'
 0 100 200 300 400 500 600m
 METRES



PLATE 489

FOLLOWING OVERLAYS INCLUDED:
 GRID & TOPOGRAPHY SURFACE GEOLOGY

ISOMAGNETIC MAP

SOIL GEOCHEM. ANOMALIES AU

RELATIVE VALUES

- > 2500 gpmms
- 1000 - 2500
- 500 - 1000
- 0 - 500
- 0 - 500
- < 500

- < 100 ppm AU
- 100 - 1000 ppm AU
- > 1000 ppm AU

DISCUSSION

Detailed exploration work on the Ladner Creek property of Carolin Mines has been centred primarily on the Idaho claim. Grass roots exploration work however, has included fairly extensive linecutting coverage on the property in addition to good geological, geochemical soil sampling and ground magnetometer surveys. (see accompanying maps). The gold in soil geochemical maps show many anomalies which are, as yet, untested. The two areas that have been detailed include the Idaho Zone and the McMaster Zone, the latter being a mile north of the Idaho and similar both geologically and mineralogically to the Idaho. Of the seven (7) diamond drill holes completed on the McMaster in 1975 the best hole averaged 0.13 ounces of gold across 19.4 feet. This discovery has not been further investigated since 1975 and certainly remains a prime exploration target on the Ladner Creek claim group. Mr. D. Griffith, geologist for Carolin Mines Ltd., describes the McMaster area as characterized by a soil geochemical anomaly covering an area about 205 acres and "systematic exploration of the area will eventually yield discovery of a zone of comparable economic significance to the



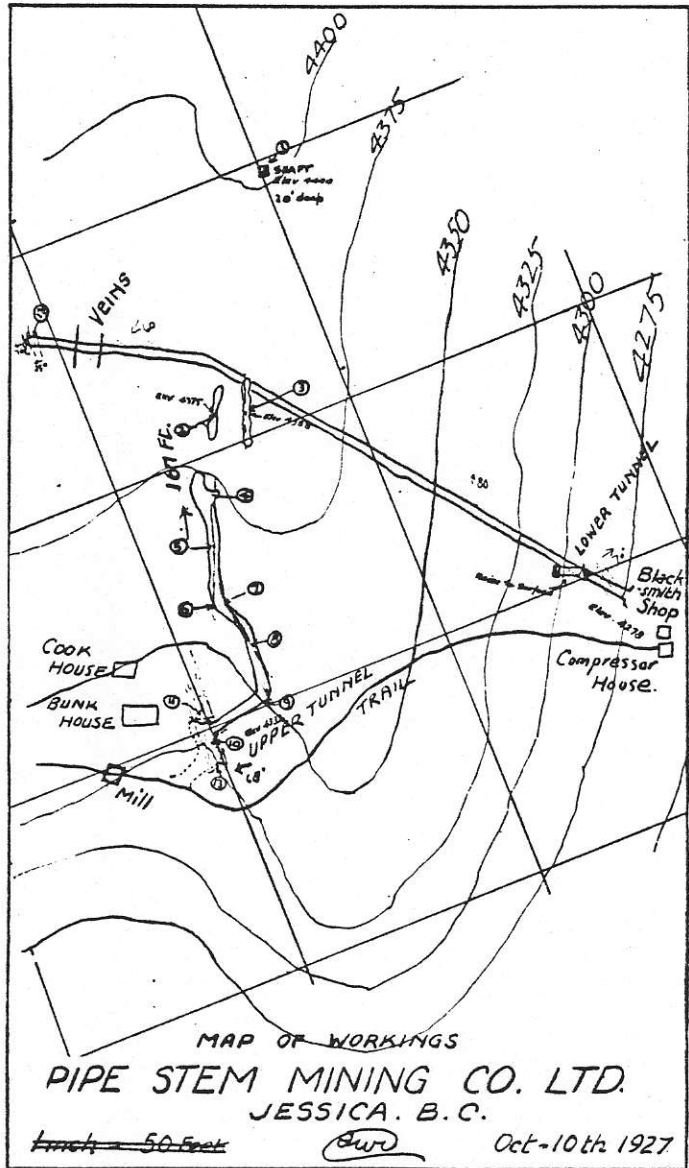
Idaho Zone." (Private report dated March 20, 1979).

Anomalously high gold in soil values are certainly important since, due to the low mobility of gold in the weathering cycle, soil anomalies are indicative of areas in which bedrock also contains higher than average amounts of gold. In this respect the reader is referred to the accompanying geochemical map (Fig. 40) of the area covered thus far on the Ladner Creek group, and please note the large number of anomalies, most of which remain, as yet, untested.

The former producing Pipestem Mine near the north end of the Ladner Creek property has not been fully re-evaluated. A small portion of the fairly extensive underground workings have been inspected and there has been little in the way of modern geological work and sampling. Therefore the Pipestem Mine remains a prime exploration target.



Figure 6.
Sketch Map of
Workings - Pipe
Stem Mine.
(dated October
10, 1927)



The former producing Aurum Mine adjacent to the Idaho Zone has been remapped, surveyed and partly sampled. Due to the narrow nature of the gold bearing zone, it has remained a low priority target, however there is a good possibility of a repetition of the spectacular "Aurum" type of deposit along the Hozameen fault.

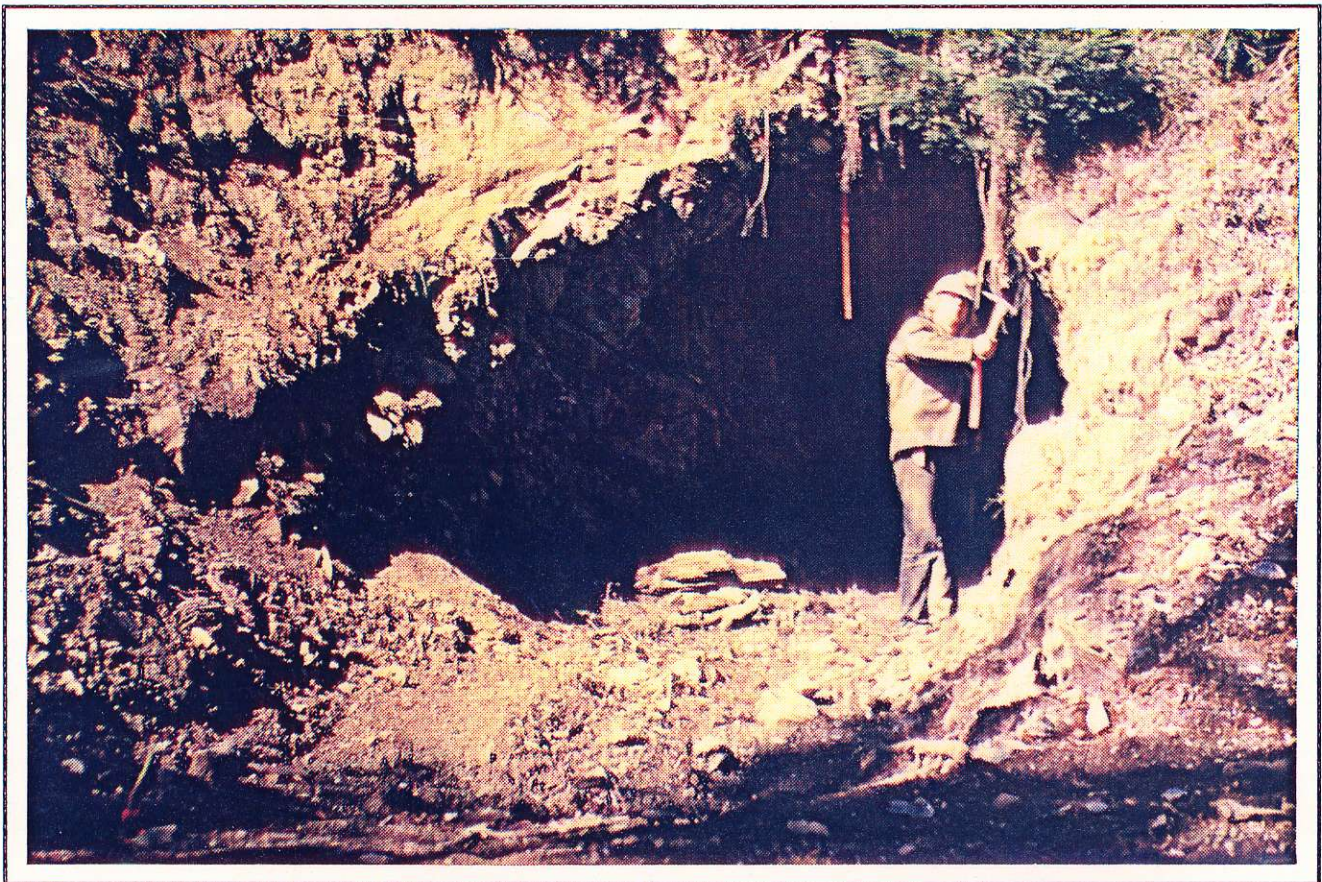


Plate VI. Aurum Adit, September, 1973.

The third former gold producer on the Ladner Creek claims is the Georgia No. 2. Its production record is 37 ounces of gold produced from 2 tons of shipped ore. It has, as of this date, not yet been pinpointed in the field.



SUMMARY AND CONCLUSIONS

Carolin Mines Ltd., of Vancouver, B. C., holds outright title to just over eighty (80) mineral claims known as the Ladner Creek Property. These claims cover a five (5) mile (8 km) section of an unusual metalogenic province named the Coquihalla Gold Belt of southern British Columbia. There were five former gold producers along the belt and the Ladner Creek Group covers three of the old mines. Gold production commenced in 1905 and continued intermittently until 1941. In 1973 and during the first increase in the price of gold since 1933, Carolin aquired a large block of claims from Summit Mines and over the years has added additional claims to the original core group.

Exploration work on the Ladner Creek group has been reasonably continuous since 1973 and the work and bulk of the exploration budget of over 4 million dollars has been directed to the Idaho Gold bearing zones which are located on the Idaho crown granted mineral claim.



The Idaho deposit is located on a single 40 acre claim of the just under 4000 acre claim block. A deposit similar in nature to the Idaho was discovered in 1975 and tested by four (4) trenches and seven (7) diamond drill holes. This zone is located some 4000 feet north of the Idaho and is called the McMaster Zone. No work has been conducted on this zone since 1975, however there are remarkable geological and mineralogical similarities with the Idaho and the partly tested McMaster Zone. Considerable potential is expected on McMaster since it lies along the same structure, exhibits similar alteration and is hosted by the same rock type as the Idaho Zone.

Of the three former producing gold deposits on the property the Pipestem is believed at this time to be the most noteworthy target since preliminary inspection has shown it to be, in part at least, a breccia type with fair dimensions. However, only part of the workings have been inspected. The Georgia No. 2 has not yet been located and the Aurum Mine, adjacent to the Idaho is somewhat restricted in width although Aurum type deposits may re-occur on other parts of the property.



Past experience on the property under discussion has shown that anomalously high gold in soil areas are often indicative of and coincident with high values of gold in the bedrock. Both the Idaho and McMaster Zones are easily discernable by geochemical soil sampling techniques, and many soil anomalies remain to be further tested. Finally, due to the geological location of the Idaho Zone, much of the exploration emphasis has been placed on a narrow band immediately east of the serpentine band (and Hozameen fault) lying within the Ladner Slate Group. Similar gold belts, such as the Mother Lode, however, are characterized by deposits in volcanic rocks, a lithologic unit that has been thus far somewhat neglected on the Ladner Creek property.

In addition there has been high gold values found in other rock types such as intrusive bodies and a carbonate-green mica band. These rock types all warrant further attention.



It is the author's opinion that considerable potential exists for the discovery of additional gold deposits along the Coquihalla Gold Belt and along the Ladner Creek group section owned by Carolin Mines Ltd. Additional funds will be required in order to explore for, and develop, these gold occurrences. The outcome is, of course, unpredictable but is believed to be most favourable considering the geology and mineralogy of the belt, the number of exploration targets already outlined on the property, and last, but not least, the current price of gold.

Respectfully submitted



D. R. Cochrane, P. Eng.

May, 1979,

Delta, B. C.



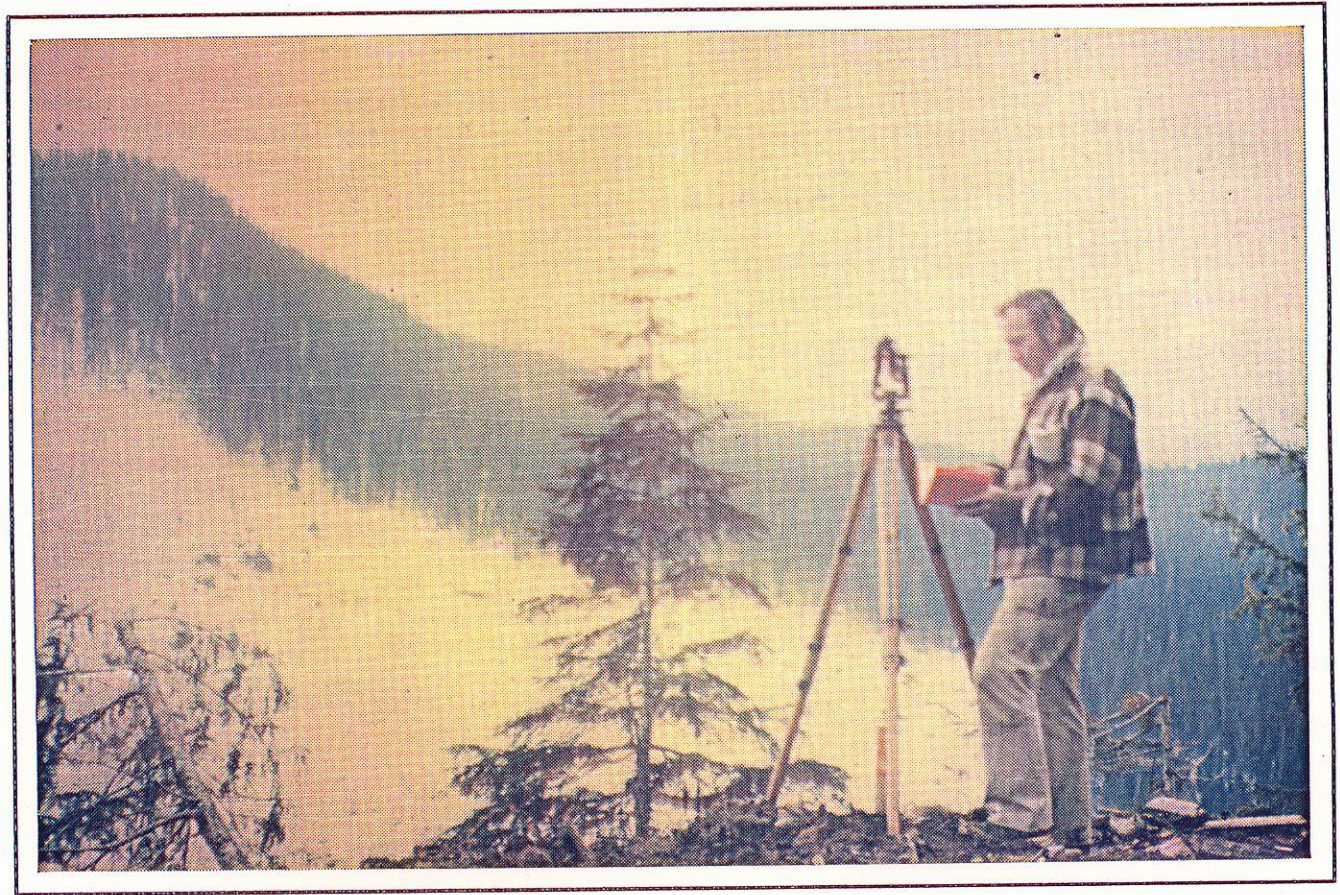


Plate VII. Author, Surveying on the Idaho Crown Grant. Spring, 1974

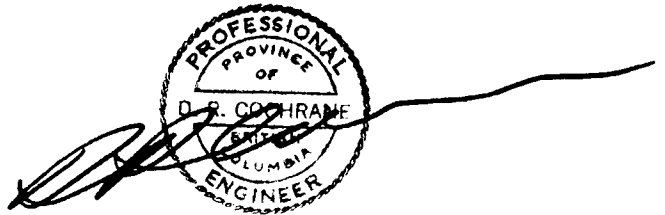


APPENDIX I

CERTIFICATE:

I, Donald Robert Cochrane, of the Municipality of Delta, British Columbia, do hereby certify that:

1. I am a consulting geological engineer with an office at 4882 Delta Street, Delta, B. C.
2. I am a graduate of the University of Toronto (1962) with a degree in Applied Geology (B.A.Sc.) and a graduate of Queen's University (1964) with a degree in Economic Geology (M.Sc., Eng.).
3. I have practiced my profession continuously since graduation while being employed by such companies as Noranda Exploration Co. Ltd., Quebec Cartier Mines, and Meridian Explorations Syndicate. I have been in private independant practice since 1969.
4. I have no interest, either direct or indirect in the properties or securities of Carolin Mines Ltd., nor do I expect to acquire any such interest.
5. I am a member in good standing of the Association of Professional Engineers (A.P.E.) of the Province of British Columbia, and also a member of the A.P.E. in the Province of Ontario, Saskatchewan, and the Yukon Territories.



D. R. Cochrane, P. Eng.
May, 1979
Delta, B. C.



APPENDIX II

BIBLIOGRAPHY

- CAIRNES, C.E.
1924: Coquihalla Area, B.C., G.S.C. Mem. 139
- CAIRNES, C.E.,
1929: The Serpentine Belt of Coquihalla Region,
Yale District, B.C., G.S.C. Sum. Rep.
1929-A
- (a) B.C. Dept. of Mines, Index No. 3, Table 1, Recorded Lode
Metal Production
(b) B.C. Minister of Mines Reports, 1936, F35
- COCHRANE, GRIFFITH, and MONTGOMERY,
Jan. 1974: Report on the Idaho/Aurum Pipestem
Project for Carolin Mines Ltd.
(Assessment Report)
- COCHRANE, D.R.
July, 1973: Report on Carolin Mines, Coquihalla
Property
- COCHRANE and GRIFFITH
Feb., 1974: Report on the Diamond Drilling and
Assaying, Idaho Zone (Private Report)
(Includes drill logs and sections)
- COCHRANE et al
June, 1974: Report on the Drilling of the Idaho
Zone
- MONTGOMERY, Dr. J. and SINCLAIR, Dr. A.J.
Statistical Evaluation of the Idaho Zone
based on drilling to date, (in progress).
- KAYIRA, G.K.
1975: A Mineralographic and Petrographic Study
of the Gold Deposit of Upper Idaho Zone,
Carolin Mines Ltd.
- FLETCHER, Dr. K
1975: Rock Geochemical Analysis of the Idaho
Zone of Carolin Mines Ltd.
- BRITTON, J
Report No. 1 and No. 2 on the Mill Tests,
Idaho Zone, for Carolin Mines Ltd.



D.F. #4195