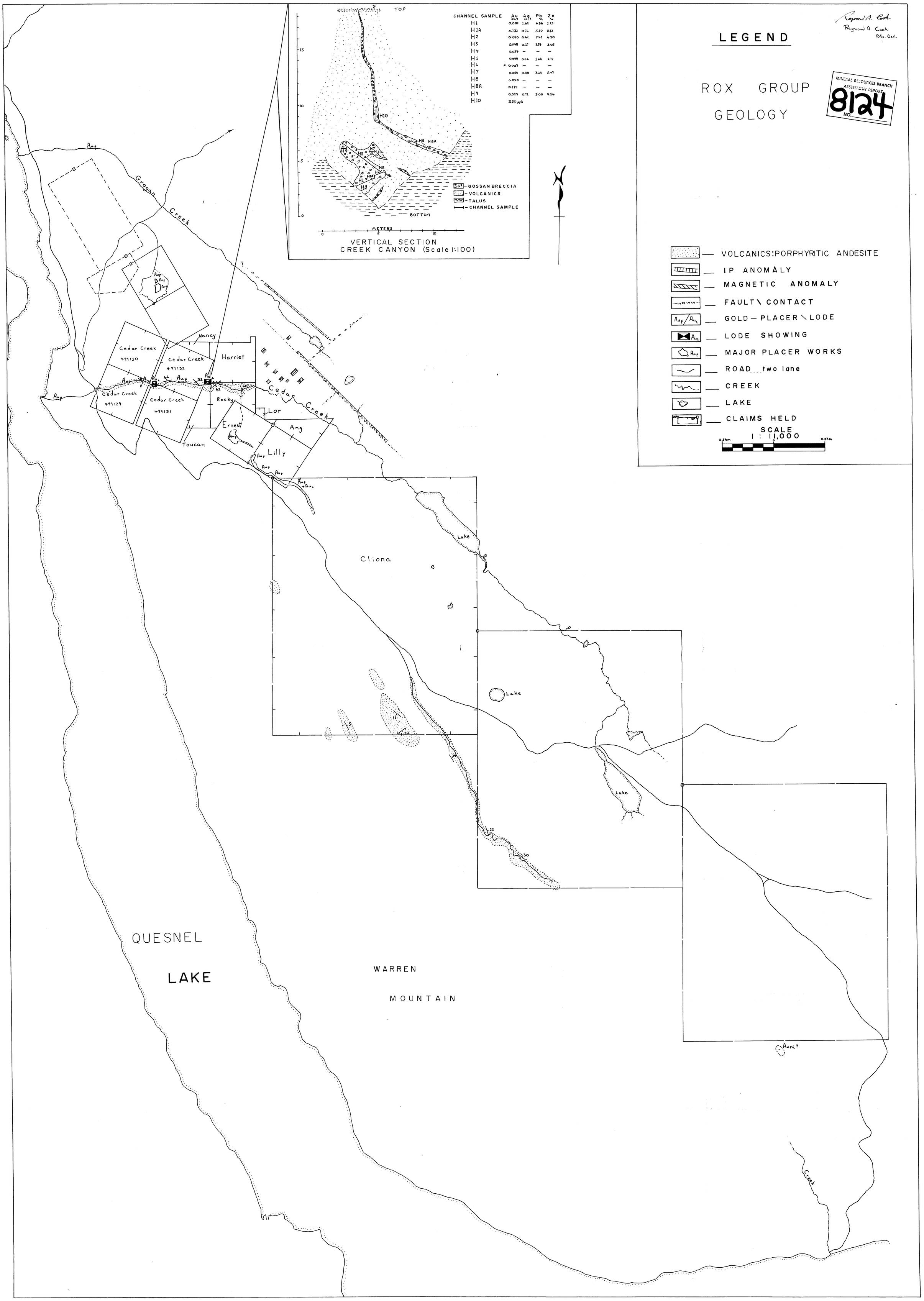
LEGEND
ROX GROUP
GEOLOGY
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
8124
NO.
Raymond A. Cook
Raymond A. Cook
BSc. Geol.
VOLCANICS:PORPHYRITIC ANDESITE
IP ANOMALY
MAGNETIC ANOMALY
FAULT \ CONTACT
GOLD — PLACER \ LODE
LODE SHOWING
MAJOR PLACER WORKS
ROAD....two lane
CREEK
LAKE
CLAIMS HELD
SCALE
1 : 11,000
0.5km
0
0.5km
TOP
BOTTOM
CHANNEL SAMPLE Au oz/t Ag oz/t Pb % Zn %
H1 0.084 1.62 6.86 2.29
H1A 0.132 0.76 3.20 2.12
H2 0.080 0.62 2.45 6.20
H3 0.048 0.27 1.14 3.05
H4 0.034 — — —
H5 0.098 0.46 1.68 2.77
H6 < 0.003 — — —
H7 0.056 0.38 3.23 5.47
H8 0.040 — — —
H8A 0.114 — — —
H9 0.524 0.72 3.08 4.26
H10 1150 ppb
GOSSAN BRECCIA
VOLCANICS
TALUS
CHANNEL SAMPLE
METERS
0
5
10
15
VERTICAL SECTION
CREEK CANYON (Scale 1:100)
Gregan Creek
Cedar Creek
Nancy
Harriet
Rocky
Lor
Ang
Ernest
Lilly
Toucan
Cliona
Lake
QUESNEL
LAKE
WARREN
MOUNTAIN
Aum?
Creek

A Geological Report

on the

ROX GROUP PROPERTY

(Cedar Creek, Lilly 1, Ernest 1, Lor, Ang, Rocky, Harriet,

Nancy, Toucan, and Cliona claims)

located in the

Likely Area, Cariboo Mining Division

MAP M93A/12E AND M93A/11W

Latitude 52°34' and Longitude 121°31'

for

Raymond A. Cook

(owner and operator)

by

Raymond A. Cook B.Sc. Geology

May 30, 1980

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 8124

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Geology map.....in pocket

# I. Introduction

A program of initial exploration was performed on the Cedar Creek property to evaluate known polymetallic lode showings and examine old upper bench placers and their lode associations.

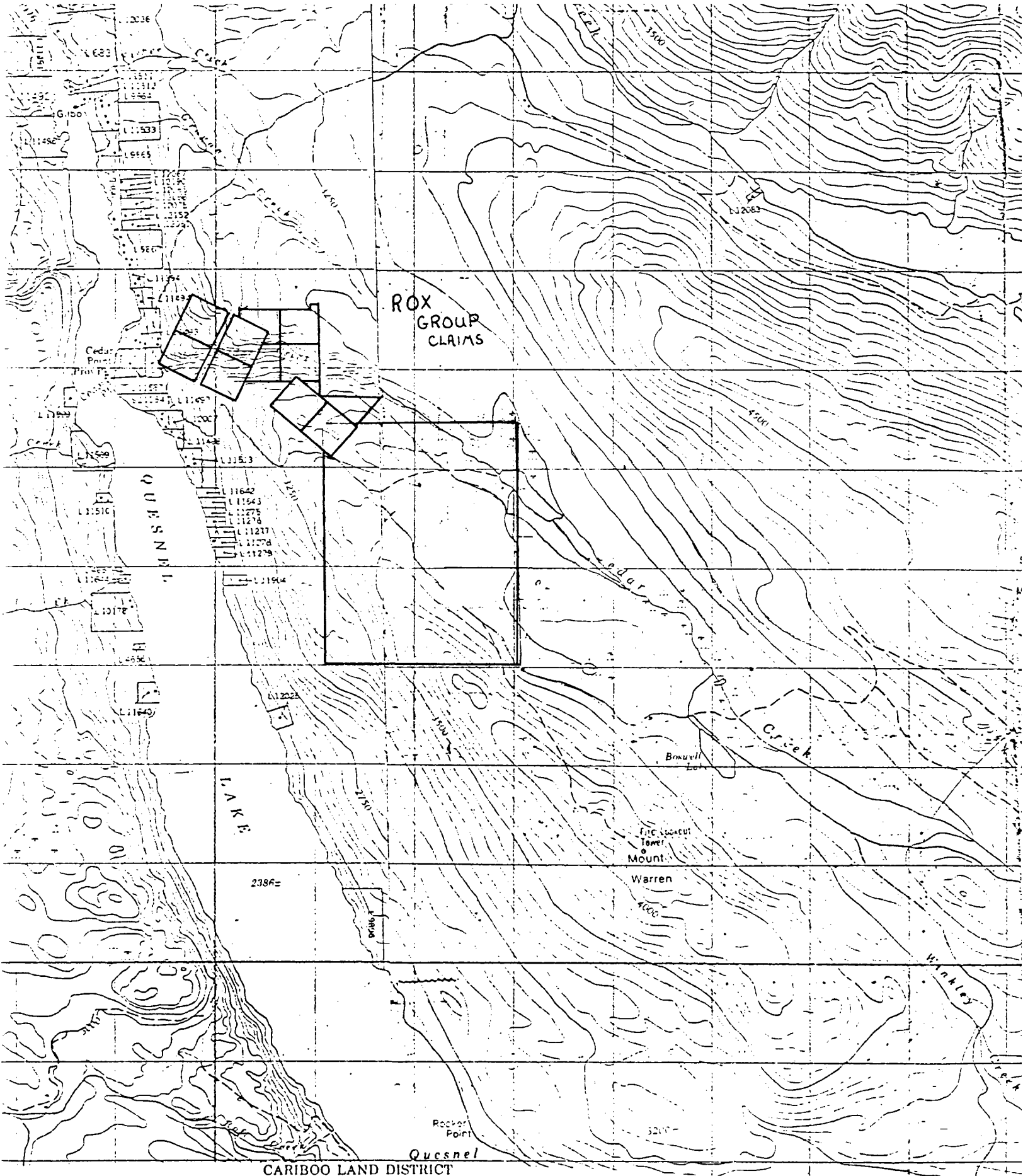
## Property

The claims included in the Cedar Creek property are located in the Quesnel Lake area of the Cariboo Mining Division, British Columbia. The claims are held by Raymond A. Cook and include:

| Claim | Record No. | |
|---|---|---|
| Cedar Creek 1 | 979 | May 7, 1979 |
| Cedar Creek 2 | 980 | " |
| Cedar Creek 3 | 981 | " |
| Cedar Creek 4 | 982 | " |
| Ernest 1 | 1002 | May 22, 1979 |
| Lilly 1 | 1003 | " |
| Cliona (20 units) | 1238 | Oct. 3 1979 |
| Lor | 1240 | " |
| Ang | 1239 | " |
| Rocky | 1241 | " |
| Harriet | 1242 | " |
| Nancy | 1243 | " |
| Toucan | 1244 | " |

## Location and Access

The property is situated approximately 6 to 13 kilometers southeast of the town of Likely, British Columbia. Likely is some eighty-three kilometers from One Hundred and Fifty Mile House, by a good gravel road. The property is accessible for its entire length by a fair gravel road from Likely and it leads to the Cedar Creek Dam, which is situated at the southern end of the property. Cedar Creek runs through the northern part of the claim group.




CARIBOO LAND DISTRICT

BRITISH COLUMBIA

Scale 1:50,000 Échelle

Miles 1 0 1 2 3 Milles

Metres 1000 0 1000 2000 3000 4000 Mètres

Yards 1000 0 1000 2000 3000 4000 Verges

CONTOUR INTERVAL 50 FEET

Elevations in Feet above Mean Sea Level

North American Datum 1927

Transverse Mercator Projection

## Topography and Vegetation

The elevation varies on the property from 758 meters to 1,212 meters above sea level. The topography of the property varies from the steep 100 meter Cedar Creek canyon to the flats of the Cedar Creek valley plateau bordered to the west and south by Warren Mountain. The vegetation cover is very dense with several periods of regrowth. Cedar, birch, hemlock, fir, pine, and alder trees predominate with Cedar trees frequently over 30 meters in height throughout the area. The climate although temperate has been semi-arid for the past few years creating problems for the placer miners.

## Performed Work

The property was geologically mapped and plotted at a scale of 1:11,000. Geological interpretation on the property was the result of detailed prospecting, channel sampling, assays, structural measurements, hand sample and polished section studies. Work to date is only preliminary and all results will be directed to future exploration.

## General Regional Geology

The history of intense prospecting for gold in the Cariboo had an unique influence on the development of British Columbia. In 1859 the first area of major interest was the Quesnel River area, however, with major placer finds on Williams Creek in the 1860's, many prospectors moved to the Barkerville-Wells camp. Interest in placer and lode gold deposits reoccurred with the opening of the Bullion Pit, the Cedar Creek gold rush of 1921, and the

discoveries of vein gold which led to the Cariboo Gold Quartz mine, the Island Mountain mine, the Cariboo Hudson mine and several significant showings throughout the Cariboo. In the 1960's a resurgance of exploration interest resulted in the examination of the volcanics and intrusive stock complexes for massive sulphides and porphry copper and molybdenum deposits. Resultant properties include the Cariboo Bell and Big Timothy Mountain deposits.

Current economic difficulties coupled with global troubles have markedly increased the value of precious and strategic metals such that once again renewed interest has entered the Cariboo region.

The influence to the east of the Shuswap Metamorphic Complex and several regional periods of folding and faulting has created significant difficulties in mapping and correlating stratigraphically equivalent rock-types throughout much of the Cariboo. The area encompassed by the Quesnel Lake geology map sheet 93A edition 2, basically shows an eastern anticlinorium bound to the west by a corresponding synclinorium both with their axis trending northwest-southeast. The rocks of the anticlinoium are dominantly those of the Cariboo Group, a sequence of lower Paleozoic phyllites, quartzites, carbonates and their metamorphic equivalents which are overlain by the Slide Mountain Group clastics, carbonates and basalts of Mississippian age. The western synclinorium is more structurally obscured by the dominant pile of Triassic to Tertiary intrusive and extrusive rocks overlying and crosscutting Pennsylvanian to lower Triassic sediments. Mapped between the two dominant fold axes is a major contact zone or thrust fault with younger rocks overthrust upon older Paleozoic rocks. Three phases of folding plus normal, thrust and reverse faulting with associated tension fractures occur

most strongly in the metamorphosed rocks of the eastern Quesnel Lake map area. The general homogeneity of the western located extrusives obscure the presence of such folds and structural stresses are evident as faults, shears, and numerous crosscutting quartz and carbonate filled veins and fractures.

The intrusive and extrusive rocks are mapped with a northwest to southeast lineament passing through the Morehead Lake, Bootjack Lake topographic areas. The rocks on either side of this lineament dip and young toward this central structure. Detailed mapping by D.G. Bailey of Queens University and R.B. Campbell of the Geological Survey of Canada, show the oldest and most distal rocks as calcareous argillites, sandstones, and conglomerates exposed on the eastern slopes of centrally located Spanish Mountain. This sequence becomes more volcaniclastic upsection and is believed Norian in age. Overlying the Norian clastics are green pyroxene-hornblende basalts and tuffs of early Hettangian age. The basalt flows are overlain by maroon pyroxene basalts which in turn are overlain by hornblende-pyroxene flows and breccias followed by polylithic volcanic breccias and clastics. Lower Jurassic maroon trachybasalt flows overlie the Triassic volcanics and are most centrally located to the Morehead Lake and Bootjack Lake lineament.

Two basic trends of fault systems occur throughout the Quesnel Lake igneous units, a dominant northwest-southeast trend paralling the tectonic lineament and a near rightangled northeast-southwest system of crosscutting normal faults. The normal fault system clearly shows offset up to several hundred meters while the northwest-southeast contact faults, because of their

position, do not as clearly show offset. Slickenside striae and fault-zone brecciation strongly suggest northwest-southeast movement but the amount of offset is obscurred and difficult to estimate.

The entire sequence of igneous units of the Quesnel Lake area follow a clearly defined hingeline or tectonic trend which is believed to be a paleo-island arc complex over 200 kilometers on strike with the interarc basinal clastics and carbonates to the east of the arc. Successive sequences of intrusives show a shift of magma chambers from east to west with oldest to youngest events.

## II. Property Geology

The Cedar Creek property was staked on the belief that those major placer areas which were worked discontinuously on the upper benches since 1921 are directly associated with insitu lode gold deposits. This concept is not entirely new since several officers of the Geological Survey of Canada and the British Columbia Department of Mines speculated on this possibility but found it too difficult to substantiate. An examination of the Cedar Creek upper bench placer fields as an insitu lode deposit has not been approached until the present time.

To resolve the question on precious metal source a composite examination of property prospecting, geological mapping, sampling and assaying, were initially performed.

Prospecting of the Cedar Creek canyon has revealed two mineralized lode gold-sulphide deposits. These deposits are structurally controlled and polymetallic in nature with a distance of 600 meters separating the

major showings. The showing approximately 900 meters upstream from the delta mouth is predominantly sulphide mineralization in a northwest-southeast striking vein that dips flatly to the northeast. The dominant gangue minerals are chlorite, anchorite and carbonate. The lode deposit approximately 1600 meters upstream from the delta mouth is the main showing and again dominated by sulphides in a gangue of chlorite, anchorite, calcite and minor quartz stringers. The dominant trend of the mineralized structures are northeast-southwest, dipping from 30 to 60 degrees to the southeast. Crosscutting the mineralized structures is also a northwest-southeast carbonate dominated trend that dips flatly to the northeast, essentially the same in trend as that of the lode showing furthest downstream. Most noteworthy about the lode showings is the abundance of gold values even though little in the way of vein quartz is macroscopically evident.

The bedrock geology was mapped where outcrop was available; along Cedar Creek canyon, the confluence of Cedar Creek canyon and the upper bench placer ditchline, the southeastern limits of the old upper bench placer works, and the flanks, top and roadcuts of Warren Mountain. Little obvious variation in rock type occurs at any of these localities although several features are noteable. The rock is pyroxene-rich, albitized amygdaloidal, porphyritic andesite flows. These volcanics weather a medium to dark greyish green and are dark green on fresh surfaces. The rocks tend to be massive and blocky along undisturbed pillow flows and where faulted abundant brittle fracturing predominates. Manganite and limonite frequently coat the chloritized surfaces of the fracture planes. Slickenside striae are frequently visible along fracture surfaces and are in strongest evidence

along dominant vein systems as found at both Cedar Creek lode showings. Lithologic variation is primarily one of texture where amygdules occur adjacent to the chill margins of the andesite pillows often associated with phenocrysts of plagioclase feldspar and augite in a mafic medium to dark green matrix. Other zones lack a porphyritic and amygdaloidal texture such that they show only a medium to dark coloured aphanitic groundmass.

The structural features of the property appear crucial to an understanding of the lode mineral controls. Attitude measurements are best available in Cedar Creek canyon for mineralized lode showings and several dominant trends characterize the entire property. Three sets of attitudes predominate; a north 50 to 70 degrees east trend dipping between 50 to 65 degrees southeast, a north 25 to 35 degrees west trend dipping between 30 to 76 degrees northeast and a north 55 to 65 degrees east trend that dips between 35 to 65 degrees northwest. Two dominant structural trends are thus found locally and regionally. The northwest-southeast trend parallels the regional units and is characterized by thrust and reverse faults. At oblique and near right angles to the fold axis are normal faults with offsets measuring several hundreds of meters. It is this fault system that hosts the Cedar Creek property auriferous polymetallic sulphides. The normal faults are believed to be tension faults at right and oblique angles to the northwest-southeast tectonic hingeline.

It can now be stated that both structual and lithological controls may have affected the positioning of lode gold-sulphide deposition along Cedar Creek canyon and within the bedrock of the southern upper bench placer works. The bedrock in both localities is however, the same, being andesitic

pillows and flows while one mile east the bedrock is interbedded flows and welded tuffs. The question as to the importance of the contact between the two separate sequences and its proximity to the gold showings must be resolved to reduce the scope of the exploration work. Previous assessment work by other companies show to the east of the property two major lineations which coincide geographically with Cedar Creek and Grogan Creek. Offset of the lineation by several hundred meters between the creeks explains the actual creek positions and also the location of the contact zone between the two different rocktypes.

Based on the uniform bedrock lithology in the property area and the apparent lithologic contact to the eastit can be suggested that the northwest - southeast gold persistence characteristic of the old upper bench placer leases and the main Cedar Creek lode showing are controlled by a single fault zone rather than a major lithologic contact.

## Mineralization

The presence of gold in the upper Cedar Creek benches was well documented as a result of the famous 1921 Cedar Creek gold rush and ensuing investigations. Results of British Columbia Department of Mines reports from 1921 to 1935 revealed that the character of placer gold reflected strongly an immediate association with lode mineralization. Pseudomorphic crystals of limonite after pyrite in large quantity were characteristic of the richest gold pockets. The gold was of greatest concentration in shattered bedrock where it was associated with small quartz veinlets.

The showings in Cedar Creek canyon vary in size and in trend of mineralization. The showing furthest downstream has a strike of north 32 degrees west and a dip of 45 degrees northeast. The structure has a true width of one meter with carbonate, chlorite, anchorite and minor quartz as the gangue minerals. The sulphides of interest are pyrrhotite and pyrite with the best grab sample assaying 0.01 oz/ton gold and 0.31 oz/ton silver. The main showing approximately 600 meters further upstream exhibits a significantly greater abundance of auriferous sulphides. Numerous channel samples, assays, whole rock examinations and structural measurements were obtained from this location. The host volcanics surrounding the mineralized structures are highly sheared and show chloritic alteration and brecciation. Veins trending northeast-southwest are the most favourably mineralized with auriferous sulphides. Veins trending northwest-southeast also dominate the showing and frequently contain pyrite in a brecciated chloritized carbonate gouge. Economic minerals observed in the main showing are sphalerite, galena, chalcopyrite, gold bearing pyrite, and free gold. Polished sections on sulphide samples show that pyrrhotite and pyrite were the initial sulphide phases followed by sphalerite and galena, then chalcopyrite. The sulphides were later folded and strained with pyrrhotite being replaced with marcasite and synchronous or later deposition of remobilized free gold with finely crystalline pyrite along chloritic shears. The presence of auriferous sulphides is characteristic only of the basal 20 meters of the main showing. A zone of structurally parallel gossanous breccia continues from the sulphide area of the main showing to the top of the canyon wall to be buried under overburden. The gossanous

breccia zone has been sampled, crushed, panned and assayed revealing slightly rounded vein gold. A channel sample from this zone assayed 1150 parts per billion gold. It appears that the zone of most intense oxidation penetrated to a depth of approximately fifteen meters from the canyon surface. This depth is manifest as the gossanous gold bearing breccia zone overlying the deeper less oxidized sulphide bearing structural extensions.

Thus, based on the work performed to date auriferous sulphides are controlled by the confluence of two major structural trends. The Northeast -southwest trend has the best sulphide mineralization but the shortest persistence on strike and the northwest-southeast trend that appears sparsely mineralized except where in confluence with a northeast vein but persists for many thousands of meters.

## III. Conclusion

Historical data on the occurrence and nature of gold found on the upper bench placer leases south of Cedar Creek canyon suggests an insitu lode rather than placer source. The strikingly obvious northwest-southeast trend to the old placer works and the northwest-southeast carbonate breccia exposed in the main showing substantiate the persistence and importance of this trend as a lode gold exploration guide. Northeast-southwest veins contain the most economic polymetallic sulphides in gossanous brecciated andesite and it is the frequency and size of these structures which will determine the mining feasibility of the property.

## Recommendations

Additional work on the property would need to be extensive if extension and verification of a lode auriferous sulphide source is to be realized. Trenching to bedrock in the upper bench placer works;geophysical surveys to define metallic, structural and lithologic anomalies;diamond drilling of known and discovered metallic anomalies and considerably more prospecting are required.

The presence of a locally thin to thick cover of glacial till complicates geochemical, geophysical and prospecting surveys such that lode targets must be individually examined and locally combined to develop a succesful exploration program.

Raymond A Cook

# APPENDIX I

## COST STATEMENT - ROX GROUP

Exploration expenditures from April 20, 1979 to Sept. 25, 1979.

| Name | Work | Dates Worked | No. of Days | Salary/Day | Value |
|---|---|---|---|---|---|
| R. Cook | Supervising; Geologist; mapping; sampling; exploration | April 21 to 22 | 2 | 150 | 300 |
| | | May 18 to 21 | 4 | | 600 |
| | | Sept. 3 to 8 | 6 | | 900 |
| | | Sept. 19 to 25 | 7 | | 1050 |
| R. Stonard | Prospecting; sampling | Sept. 3 to 8 | 6 | 100 | 600 |
| | | Sept. 19 to 25 | 7 | | 700 |
| H. Cook | Prospecting; expediting | Sept. 19 to 25 | 7 | 100 | 700 |
| T. Stacey | Prospecting; sampling | April 21 to 22 | 2 | 100 | 200 |
| | | | | subtotal | 5,050 |

GENERAL EXPENSES

| | |
|---|---|
| Car and Truck Rentals and Gasoline | 1,400 |
| Meals and Lodging | 2,000 |
| Report Compilation and Assays | 600 |
| subtotal | 4,000 |

Raymond A. Cook

Total : 9,050

# APPENDIX II

## Qualifications

I, Raymond A. Cook have been practising my trade as a geologist since 1973.

I am an honours graduate in Geology from the University of Alberta. Edmonton 1973.

In applying my profession I have worked with Eldorado Nuclear, Cominco, Terra Mines Ltd., and Union Carbide in mineral exploration and underground development.

I have worked on research projects in geology for the University of Alberta, Edmonton Alberta and the University of British Columbia, Vancouver, British Columbia.

I have worked privately on interests of my own in British Columbia and the Northwest Territories since 1975.

I am currently completing a Masters Thesis in geology at the University of British Columbia.

I hold interest in the property described in this report and I supervised and directed all exploration activity.

Raymond A. Cook

Raymond A. Cook, B.Sc. Geology