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REPORT ON

"MCLEESE", "TOR" AND "BOB"  
CLAIMS - MCLEESE LAKE AREA, B. C.  
CARIBOO MINING DIVISION

Prepared for:

SHERIDAN COPPER MINES LTD. (N.P.L.)

By: W. Meyer, B.Sc.

April 15, 1971, Vancouver, B. C.



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April 15, 1971

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### SUMMARY AND CONCLUSIONS

The McLeese claims are located near the southeast contact of the Granite Mountain Batholith. Copper mineralization of potentially economic significance is exposed in a number of cuts on McLeese #5 M.C. The areal extent of the mineralization has not been determined by the most recent trenching. An aggressive programme of continued exploration on the claim group is warranted. An expenditure of \$81,000.00 is recommended for the first stage.

## INTRODUCTION

The following report is prepared at the request of Mr. T. P. Bowes of Sheridan Copper Mines Ltd. (N.P.L.) and is based on a physical examination of the claim area March 10th to 11th, 1971 and April 7th to 8th, 1971 as well as a review of previous technical data.

During March 1971 bulldozer trenching was carried out by Sheridan with the object of:

- 1) extending and deepening existing (1970) cuts
- 2) extending the trenching to new areas to the north to check bedrock geology and mineralization
- 3) fulfill assessment requirements

Due to snow cover at the time of this work, observations and comments in this report are based only on bedrock geology of the trenches and the regional data available.

Four chip samples of representative mineralization were taken in the northern trenches.

An orientation geochemical survey was carried out by examining the trace element content of the various soil horizons in 2 of the trenches.

## CLAIMS

The present group of 87 claims held by joint venture agreement between Sheridan Copper Mines Ltd. (N.P.L.) and Argonaut Mines Ltd. (N.P.L.) consists of the following claims:

	<u>CLAIM</u>	<u>RECORD NO.</u>	<u>EXPIRY DATE</u>
McLeese	1-9	49662-49670 Incl.	Mar. 20, 1972
McLeese	10-23	56591-56604 Incl.	Mar. 24, 1972

<u>CLAIM</u>	<u>RECORD NO.</u>	<u>EXPIRY DATE</u>
Bob 1-46	57781-57826 Incl.	May 12, 1971
Tor 1-10	57771-57780 Incl.	May 12, 1971
Tor 11-18	51004-51011 Incl.	May 6, 1971

Part of the 'McLeese' group was checked by chain and compass surveys between and along claim lines and these appear to be staked in accordance with the Mineral Act. Further surveying will be required to establish more accurately their location relative to earlier adjacent claims.

#### LOCATION AND ACCESS

The claims are located approximately 3 miles south of the ore bodies being developed by Gibraltar Mines Ltd. east of the Fraser River between Williams Lake and Quesnel. Access to the area is by the Likely road which leaves Highway 97 at McLeese Lake. The group straddles Sheridan Creek and the Likely road approximately 2 miles east of the Gibraltar Mines turn-off.

#### HISTORY

The area now covered by the McLeese #1-9 claims was originally staked in 1966 and held by various individuals and companies, since. Previous technical work was largely extensions of surveys intended to explore the Iron Mountain copper occurrences to the north-west. Two small magnetic 'anomalies' in the north-west part of the group were tested by drilling with discouraging results. The mineralization in the trenches on McLeese #5 are original discoveries resulting from the activities of Sheridan Copper Mines Ltd. (N.P.L.) and have no previous history of physical work.

## GEOLOGY

### General

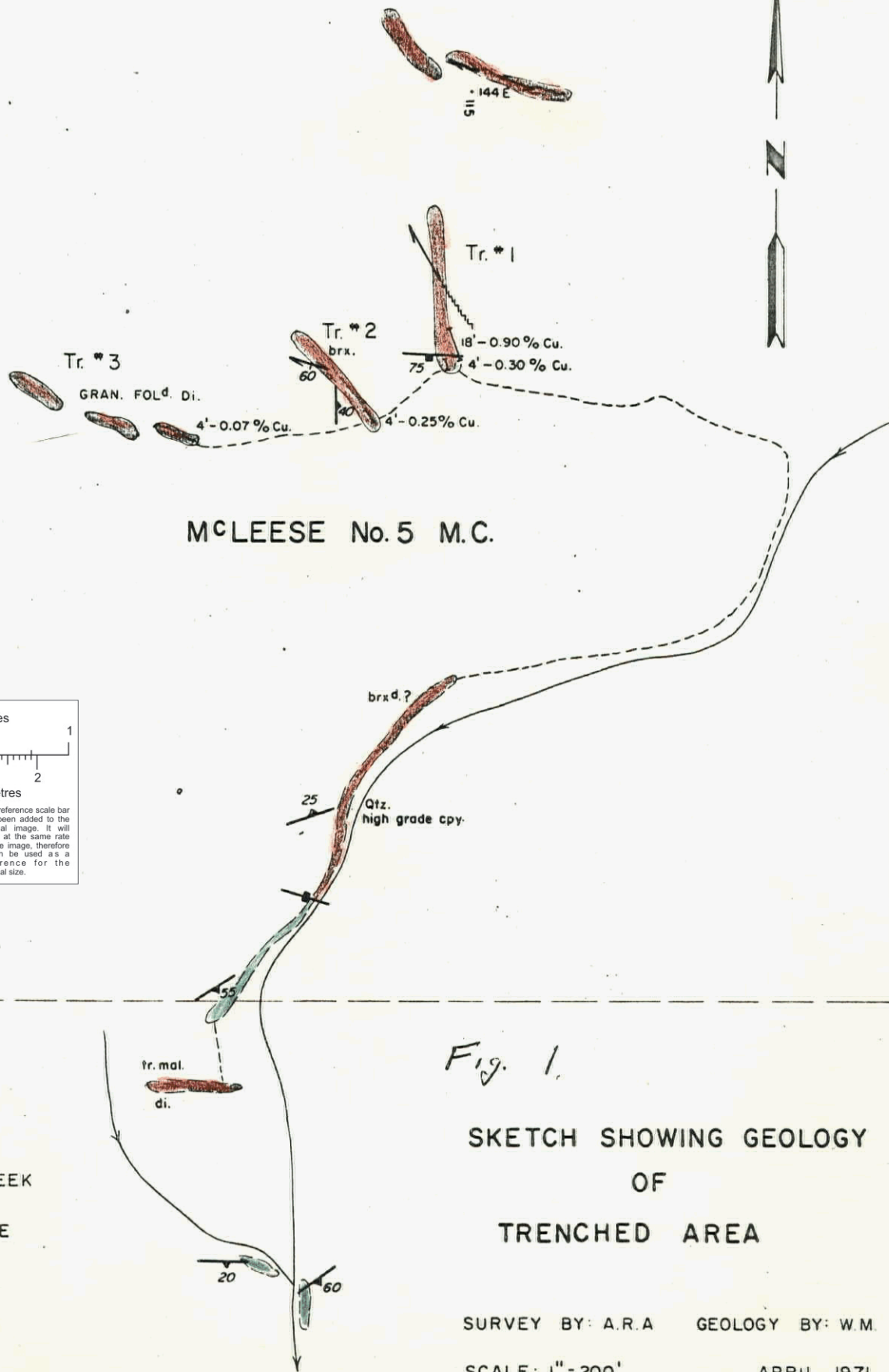
In the general claim area, Permian and Triassic rocks of the Cache Creek group are intruded by a batholith sized body of quartz diorite. Near the west contact of the intrusive, both units are covered by Tertiary basaltic flows. The intrusive rocks are the principal host rocks for mineralization in the area. Approximately 3 miles to the North and near the centre of the batholith, Gibraltar Mines Ltd. is preparing for production a number of large ore bodies aggregating more than 300,000,000 tons of 0.39% Cu.






The intrusive is known to be a composite batholith but the areal extent of the various phases and their relationship to mineralization has not been determined due in part to the lack of outcrop and sufficient regional mapping. The main mass of the batholith consists of at least 3 major phases and several dyke forms. The north part of the Sheridan claims (McLeese claims) are underlain by the outer 'diorite' phase and the southern part of the group (Bob and Tor claims) by the 'Granite Mountain' phase (a unit approximately equivalent to the light green quartz diorite or 'leuco' phase east of Granite Mountain near the centre of the batholith).

### McLeese Claims

#### Lithology

The general geology of the trenched area is shown in Fig. 1. The intrusive



-  CACHE CREEK
-  F.G. DIORITE
-  SHEARING
-  FOLIATION
-  JOINTING



rocks consist of fine grained green diorite composed of 30% chlorite after mafics (biotite ?), 60% feldspar (plagioclase) altered to epidote and sericite and 10% quartz. 3 thin sections were prepared from specimens of the diorite in varying degrees of alteration. Appendix 1 is a report prepared by P.M. McAndless & Associates on the sections. The south part of the trenched area is underlain by chlorite-sericite schists tentatively identified as being part of the Cache Creek formation. There is, however, some doubt as to their field classification due to the intensity of the shearing, alteration and lack of exposures except near the creek which occupies a fault zone.

Approximately 800' south of the trenched area, 2 exposures of relatively fresh quartz diorite occur along the road. This unit is similar to the medium grained light coloured quartz diorite on the east side of the Granite Mountain batholith, and consists of approximately 10% mafics (biotite greater than hornblende ?) altered to chlorite, 60% plagioclase altered to epidote and 30% quartz.

### STRUCTURES

The most prominent structural features in the area are the two fault zones that occur along the two major creeks in the trenched area. These appear to post-date the intrusive rocks and may account for the irregular shaped blocks of Cache Creek rocks in this part of the contact zone.

Limonitic gouge related to shears striking N20°W is exposed in the northern trenches. A strong E-W joint system appears to pre-date the mineralization and is one of its' controls.

### MINERALIZATION

In the southern part of the trenched area chalcopyrite, malachite, azurite and minor pyrite occurs with lenses of quartz along a few small shallow dipping shears in both the Cache Creek (?) and intrusive rocks. In one location (see Fig. 1) the quartz lenses out to approximately 5' and contains erratic large blebs of massive chalcopyrite. In the northern trenches, chalcopyrite, malachite and minor pyrite occur as disseminations along the foliation and in fracture fillings in the intensely altered and brecciated diorite. Four chip samples were taken by J. Buccholz and the writer of Western Geological Services Ltd. in three of the trenches are shown in Fig. 1 and tabulated below:

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<u>Sample</u>	<u>Location</u>	<u>Length</u>	<u>%Cu.</u>
22401	Tr #1	4'	0.30
22402	Tr #1	18'	0.90
3801	Tr #3	4'	0.07
3802	Tr #2	4'	0.25

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The mineralization is exposed by the trenches over approximately 600' but its' total extent and geometry has not been determined by the work to date.

### RECOMMENDATIONS

It is important initially to complete a chain and compass survey of the northern claims and determine their location relative to the adjacent groups.

This should be followed by a technical and physical programme which would include soil geochemical and I.P. surveys, geological mapping and bulldozer stripping.

This work is estimated to cost:

Claim survey	\$	1000.00
Line cutting (northern claims 40 mi. @ \$100/mi.		4000.00
Geochemical survey @ \$100/mi.		4000.00
I.P. survey @ \$500/mi.		20,000.00
Geological mapping		3000.00
Consulting, engineering, drafting		5000.00
Board and lodging		4000.00
Transportation and Communication		1500.00
Vehicle rentals		1500.00
Field tools and hardware		500.00
Bulldozer trenching		5000.00
2000 feet diamond drilling @ \$12/ft.		24,000.00
	\$	<u>73,500.00</u>
Contingencies		7500.00
	\$	<u><u>81,000.00</u></u>

The above programme is intended to provide data of reasonable

RECOMMENDATIONS (continued)

detail in the northern claim area and data of a reconnaissance nature in the south. This expenditure does not take into account detailed follow-up in the south since the specific nature and extent of the work would be contingent on the results of the initial surveys.

The estimate for diamond drilling includes only the minimum required to test the grade in the area of trenches 1 - 3.

The ultimate size of the initial drill programme in this area will be contingent on the outcome of the technical surveys.

Respectfully submitted

W. Meyer, B.Sc.

Appendix 1



P. M. McANDLESS & ASSOCIATES  
#327 - 470 Granville Street  
Vancouver 2, B.C.

PETROGRAPHIC REPORT

WESTERN GEOLOGICAL SERVICES LTD.

Rock Number: Hand specimen #1 and T.S. #1

Megascopic Description:

Weathered, dark green, chloritic-sericitic schistose rock, weathered surfaces, malachite staining cut-surface, disseminated sulphides [ $< 1\%$ ], some chalcopyrite, malachite along fractures.

Microscopic Description:

Mineralogy:

- Quartz:  $> 12\%$ , subhedral to anhedral crystals and fragments, interstitial and as inclusions, strained, foliated quartz, healing and secondary growths.
- Plagioclase:  $> 50\%$ , subhedral to anhedral crystals and fragments, ragged edges, some poikilitic; sericite-epidote inclusions, moderate to strong sericite-clay alteration, crystals zoning absent, preferred orientation.
- Epidote:  $> 5\%$ , subhedral to anhedral aggregates and crystals, interstitial and fracture fillings.
- Chlorite:  $> 20\%$ , massive to fibrous; interstitial, biotite, pseudomorphs, as inclusions.
- Sericite:  $> 10\%$ , moderate to strong alteration of feldspars; throughout sections as inclusions and interstitial material and veinlets.
- Accessories: Carbonate, apatite, hornblende.

**Opaques:** 2-3%, interstitial with chlorite-sericite, silica, and epidote, also as inclusions in feldspars as irregular grains and blebs; associated limonitic halos, some subhedral crystals; generally disseminated.

**Clay:** Moderate to strong alteration throughout.

**Rock Texture:** Medium grained, schistose fabric, micro fracturing generally cross cutting schistosity.

**Discussion:** The rock has undergone shearing to produce schistose fabric as well as chlorite-sericite alteration of feldspars and biotites and epidote replacement of ferro-magnesium minerals. Occurring with and/or following shearing. Iron rich solutions were possibly introduced along zones of weakness. Clay alteration and copper carbonates resulted from a weathering process.

**Rock Name:** Shear intermediate intrusive.

**Rock Number:** Hand specimen #2 and T.S. #2.

**Megascopic Description:** Altered buff, schistose chloritic feldspar rock; sulphides, sparse.

**Microscopic Description:**

**Quartz:** > 20%, subhedral to anhedral crystals and fragments, interstitial as inclusions in feldspars, veinlets; strained, healing and secondary growths, foliated quartz grains.

**Feldspars:** > 55%, subhedral crystals; fragments, strong clay alteration, weak sericite development, silica replacement; evidence of zoning absent.

**Hornblende:** 5%, subhedral to anhedral crystals, ragged edges, interstitial and as inclusions in feldspars, slightly chloritic.

Chlorite: >10%, fibrous, interstitial biotite pseudomorphs.

Sericite: >5%, slight alteration of feldspars, inclusions, along fractures.

Epidote: <3%, veinlets and inclusions in feldspars.

Clay: Strong alteration throughout.

Accessories: Apatite.

Opagues: 2-3%, interstitial with chlorite sericite epidote-hornblende and quartz; inclusion in feldspars.

Rock Texture: Fine to coarse grained, schistose fabric.

Discussion:

The history of shearing in T.S. #2 is not as advanced as T.S. #1 and T.S. #3 as noted by the fine to coarse gradation of feldspar fragments. Consequently, the alteration of hornblendes in T.S. #2 to epidote has not progressed as far as in T.S. #1 and T.S. #3. Iron rich solutions were introduced as in T.S. #1 and #3. Clay alteration is strong but there is an absence of copper carbonate development.

Rock Name: Sheared intermediate intrusive.

Rock Number: Hand specimen #3 and T.S. #3.

Megascopic Description: Weathered, greenish, chloritic-sericitic, schistose rock; weathered surface, malachite staining; cut-surface, minor sulphides, malachite along fractures.



Microscopic Description:

## Mineralogy:

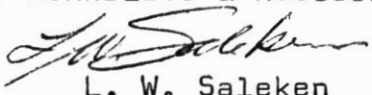
- Quartz: >15%, subhedral to anhedral crystals and fragments, interstitial and as inclusions, strained, fractured, foliated quartz, healing and secondary growths.
- Plagioclase: >50%, subhedral to anhedral crystals and fragments, ragged edges, some myrmekitic; sericite-epidote inclusions; moderate to strong; sericite-clay alteration; albitization.
- Hornblende: 1% , small subhedral crystals, partial chlorite and epidote replacement, zoning absent.
- Epidote: 7%, subhedral to anhedral aggregates and crystals interstitial and fracture fillings.
- Chlorite: >15%, massive to fibrous, interstitial, biotite pseudomorphs, as inclusions.
- Sericite: >10%, moderate alteration of feldspars; interstitial, inclusions and in veinlets.
- Clay: Moderate alteration throughout.
- Accessories: Apatite, carbonate.
- Opaques: 2-3%, interstitial with chlorite-sericite, silica and epidote, as inclusions in feldspars; irregular grains and blebs; associated limonitic halos, some subhedral crystals, generally disseminated.
- Rock Texture: Medium grained, schistose fabric, micro-fracturing generally cross cutting and also conforming to schistosity.

Discussion:

History same as T.S. #1.

Rock Type

Sheared intermediate intrusive.

Respectfully submitted,  
P. M. McANDLESS & ASSOCIATES  
PER:   
L. W. Saleken

CERTIFICATE

I, William Meyer, do hereby certify that:

1. I am a geologist with residence at 555 Cochrane Ave., Coquitlam, B. C.
2. I am a graduate of the University of British Columbia (B.Sc., Physics and Geology, 1962).
3. I have worked as an exploration geologist for nine years for the following companies: Phelps Dodge Corporation of Canada Ltd. (4 years), Gibraltar Mines Ltd. (1-1/2 years) and Associated Geological Services Ltd. (1/2 year). From April, 1968 to the present, I have been a senior partner in Western Geological Services Ltd.
4. This report is based on examinations of the trenches made by the writer on March 10th to 11th, 1971 and April 7th to 8th, 1971 and on other available regional data.
5. I have no interest, direct or indirect in the properties or securities of Sheridan Copper Mines Ltd. (N.P.L.) or any of its affiliates nor do I anticipate receiving any.

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W. Meyer, B.Sc.

April 15, 1971