

SUMMARY REPORT

826330

GEOLOGICAL - GEOCHEMICAL

on

CAROL-S, TANIA S, LUCIA S, MARINO S, CAROL S #2,
EFREN S, TANIA S #2, TANIA #3, TANIA S #4, CAROL S #3

RECORD NO. 644-649, 683-686

March 7th to May 15th, 1983

for

CHEVRON CANADA RESOURCES LIMITED

by

G. WALTON

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INTRODUCTION

The purpose of this report is to summarize the work completed to date, to assist the in house change of supervision and to provide Falconbridge with some results and a proposed program for the remaining portion of 1983.

LOCATION AND ACCESS (Fig. 1)

The property is located on map sheet 92E/15, 16 and F1, 2. It is accessed from Duncan by either the north or south shore roads along Cowichan Lake, past the old town of Nitinat and up Crown Zellerbach line to Heather Creek (Fig. 1). The roads are all in excellent shape since Crown Zellerbach rehabilitated the property roads in early May; however, permission must be obtained from the manager at the Nanaimo Lakes' office.

The property itself has been almost completely logged off which has resulted in excellent road coverage. The roads have provided good outcrop sections. Grid work, in the form of geochemistry or geophysics at a later date, could be quite slow and expensive because of the steep terrain.

CLAIM STATUS (Fig. 2)

The property consists of 191 units which are owned by Canamin and are under option to Falconbridge. Chevron has an agreement with Falconbridge which gives Chevron a 51% interest of Falconbridge's 75% interest in the property. This interest could increase after feasibility if Canamin opts not to participate.

The data for the claims is outlined below:

<u>Claim Name</u>	<u>No. of Units</u>	<u>Record Date</u>	<u>Record No.</u>	<u>Valid To</u>
Carol - S	20	August 3, 1982	644	August 3, 1983
Tania S	20	"	645	"
Lucia S	20	"	646	"
Marino S	20	"	647	"
Carol S #2	20	"	648	"
Efrem S	20	"	649	"
Tania S #2	15	October 5, 1982	683	October 5, 1983
Tania S #3	20	"	684	"
Tania S #4	16	"	685	"
Carol S #3	20	"	686	"

Under the current letter agreement with Falconbridge, we are required to spend \$151,030. Canadian on the claims. This amount is made up of an initial payment of \$6,030. plus a \$25,000. payment due November 30, 1983. The remaining \$126,000. is work in 1983. To date, Chevron has spent approximately \$26,000. Canadian. This expenditure will effectively earn Chevron the 51% interest, after which all costs will be split 51% Chevron and 49% Falconbridge (including all payments, Fig. 3).

GEOLOGY

Regional

The claim block is underlain by the Sicker volcanics. These Sicker volcanics can be subdivided into three main formations (Muller 1981):

- Buttle Lake Formation - crinoidal limestone, calcareous siltstones.
sediment-sill unit - diabase sills and argillite beds.
- Myra Formation - rhyolite to rhyodacite tuff and agglomerates, some graphitic and sedimentary beds, massive sulphides.
- Nitinat Formation - basalt - andesite agglomerates, pillow lavas and flows.

The formation of primary interest is the Myra Formation which hosts the mineralization at Westmin and at Mount Sicker. Some of the important characteristics of these deposits are:

- (1) multiple lenses that have varying grade and tonnage.
- (2) association with felsic volcanism.
- (3) association with coarse pyroclastics.
- (4) typical chlorite, sericite and clay alteration in footwall.
- (5) typical disseminated pyrite in footwall that can increase area of deposit.
- (6) deposits in Sicker have consistently good precious metal values.

Property Geology (Fig. 4, 5, 6)

The complex stratigraphy of the Sicker group can be recognized on the property. The more compositionally basic Nitinat Formation is found at the head of Heather creek. Lower down Heather creek, a 1 kilometer wide band of Myra Formation is located which has been intruded on the southwestern side by a diorite plug. Further down the creek is an outcrop of limestone and calcareous siltstone with some diabase or basaltic rocks. These last rocks are presumed to be the Buttle Lake Formation although no definitive fossils were identified.

Nitinat Formation

The Nitinat Formation is found at the headwaters of Heather and Hooper creek in the property. It is composed of coarse pillow breccias, agglomerates, or flows, crystal lithic tuff and lapilli tuffs, all of basaltic and andesitic composition. Typically the formation is massive with only a slight foliation visible in outcrop. A small bed of chert suggests there is some folding

present in the formation, but the units are too massive and not distinctive enough to outline the exact nature of any folding.

The rock is typically maroon to green in colour, both fresh and weather. Some quartz veins cut the formation near the head of Heather creek. Large maroon and green agglomerate clasts are visible in some of the road cuts, with very rare rhyolite fragments. No sulphide fragments were seen in any of the road cuts.

Myra Formation

The Myra Formation is found part way down Heather creek and Hooper creek. It is a band approximately 1 to 1.5 kilometers which cuts across country. The band strikes approximately northwesterly as does a lot of the foliation within the Myra. The Myra Formation is comprised of a series of well bedded tuffs and tuffaceous sediments (in some cases shaly). The tuffs are rhyodacitic in composition although some rare quartz eyes have been located which may indicate the presence of some rhyolite tuffs.

The Myra Formation is comprised of three main units which have been named in the field, (1) green tuff, (2) maroon tuff and (3) silty tuff. The green tuff appears to be the main volcanic unit which occurs below and above the other two units. The maroon tuff overlies the silty tuff. The maroon tuff is very well bedded and locally resembles a shale. The silty unit is well bedded (beds approximately 1-2" thick) and locally well sheared. Most of

the faulting appears to have been taken up in the silty unit. Locally pyrite content will approach massive in form although it is fairly well disseminated.

- ^ The structure and mineralization associated with this unit will be discussed later.

Buttle Lake Formation

This formation is presumed to be the limestone outcrop on one of the roads above Heather creek. Only one outcrop is visible and no fossils were seen in outcrop. Associated with the limestone are some basalt flows which are known in the Buttle Lake Formation. These flows are fairly extensive on the lower slopes of the nose between Hooper and Heather creek.

Diorite

The diorite is medium to coarse grained intruding both the Myra and Nitinat Formations. It has hornfels, some of the volcanics and has digested some large xenoliths. Its age is not known but it is probably related to the Island intrusions. At its contact, it often has massive pyrite in quartz veins and disseminated pyrite in the volcanics.

Structure

Little structure is visible in the Nitinat Formation primarily because of its massive style. A persistent foliation is visible in most outcrops.

The Myra Formation is highly contorted and suggests the whole Sicker group is actually highly deformed. This change in visual degree of deformation is probably due to the thinly bedded nature of the Myra. Two stages of folding are visible. One has an axial plane striking northwesterly with fairly shallow (45-60°) dipping a northeasterly limb and quite steeply (70-90°) dipping a southwesterly limb. The southwesterly limb is quite frequently sheared off which has provided some problem in correlating stratigraphy within the Myra.

In addition to the limbs being sheared off, there are numerous other faults which cut the stratigraphy. In some cases the crests have also been sheared out along the axial planar cleavage. These northwesterly striking folds are quite tight with a wave length of approximately 150 meters (this is approximate because of the faulting along the limbs).

A second phase of folding has an axial plane striking northeasterly and appears to have a broad wave length, approximately one to one and a half kilometers. On the east side of Heather creek, the phase one folds have a plunge of approximately 0-10° northwest, while at the top of the ridge between Hooper and Heather creek the plunge is 60-70° to the northwest. No foliation was seen parallel this second phase of folding.

Mineralization

Four types of mineralization have been recognized in the property. These are as follows:

- (1) Quartz veining with gold values.
- (2) Quartz pyrite veining.
- (3) Quartz-chalcopyrite-pyrite veining associated with the intrusive.
- (4) Massive sulphide type - quartz, pyrite, chalcopyrite and gold.

Of these four types of mineralization, the only one with any economic potential appears to be the massive sulphide mineralization. The other types are too small and insignificant. Although high grade samples do produce good values, when bulk samples or chip samples are taken, little encouragement is received.

The massive sulphide mineralization was located by E. Specogna while prospecting in 1982 on the Crown Zellerbach logging roads. At the time Chevron first looked at the area, the showing was just a small nose surrounded by glacial material. Hand mucking, and later blasting, has uncovered about 16 feet of rock that has disseminated pyrite throughout. In addition, it has two zones of massive pyrite and possibly chert. Numerous faults can be seen throughout this section. Within one of these fault zones, three blocks or fragments of massive pyrite have been caught up (a sample from one of these assayed 1.7% Cu, .7 ppm Au).

The showing itself is possibly a stringer zone or the fringe of a massive sulphide; however, only further exploration will clarify that. The showing is hosted by the silty tuff horizon which, in the area of the showing, exhibits clay, chlorite and sericite alteration. The showing is in the central part of a large antiform so the orientation of ~~only~~^{any} economic massive

sulphide body within it is not clearly defined. The initial orientation of the ore body would have been dependent upon the orientation of the basin on the ocean floor.

GEOCHEMISTRY (Fig. 7, 8, 9)

Since mineralization was known in Heather creek, the first phase of soil sampling was orientated towards this area. During the first phase, samples were selected every 50 meters along all of the roads that were clear of snow. Samples were taken above the road bank and flags (gold and blue) placed on the road for quick location. Hooper and the Nitinat drainages were sampled at 100 meter spacing, again along most roads.

Background was arbitrarily taken to be 100 ppm Cu, 100 ppm Zn, 3 ppm Pb and 25 ppb Au. Contouring has been completed above 200 ppm Cu, 200 ppm Zn, 6 ppb Pb and 35 ppb Au. This clearly outlines a strong anomaly over the showing that can be traced 2 kilometers along strike through the hill between Hooper and Heather creeks. This anomaly ties in very clearly with the altered silty tuff horizon.

There are few sporadic copper, zinc anomalies which may reflect a small area of high background. An area at the headwaters of the Heather creek, which has high lead values, is very curious and is not completely explained. One current explanation is there are a number of quartz veins that may carry some lead; however, no significant lead has been obtained from them.

An average of five rock samples were taken from each rock type for whole rock analysis to try to determine any variation in the whole rock geochemistry. They do suggest changes that are compatible with massive sulphide mineralization.

CONCLUSION AND RECOMMENDATION

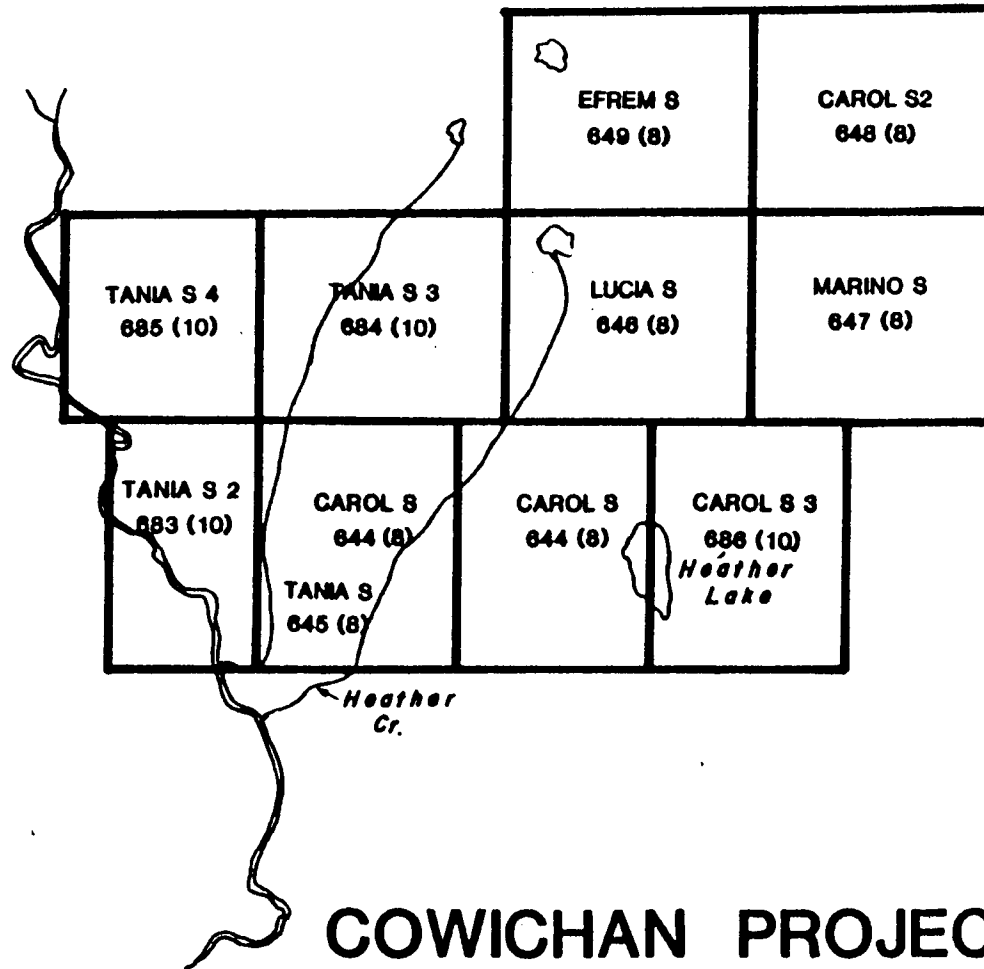
The property has definitely the correct geological environment, namely the Myra Formation, for massive sulphide mineralization. A showing of this type has been identified that has returned some reasonable values. To date only geological mapping and prospecting combined with soil and rock geochemistry has been completed. However, a good correlation exists between anomalous geochemical values of copper, zinc and gold, and the geological mapping, which suggests them anomalous, are all associated with one altered unit.

As a result, the following program is recommended for the property in the remaining part of the year:

- (1) An airborne (helicopter EM survey over the Myra Formation on the claim block flown in two directions (one parallel and one transcurrent to the belt). This will provide a net that should outline any potential deposits. Proposed line spacing 100 meters.
- (2) Further back hoe work to expose the mineralization over 100 or more meters, and

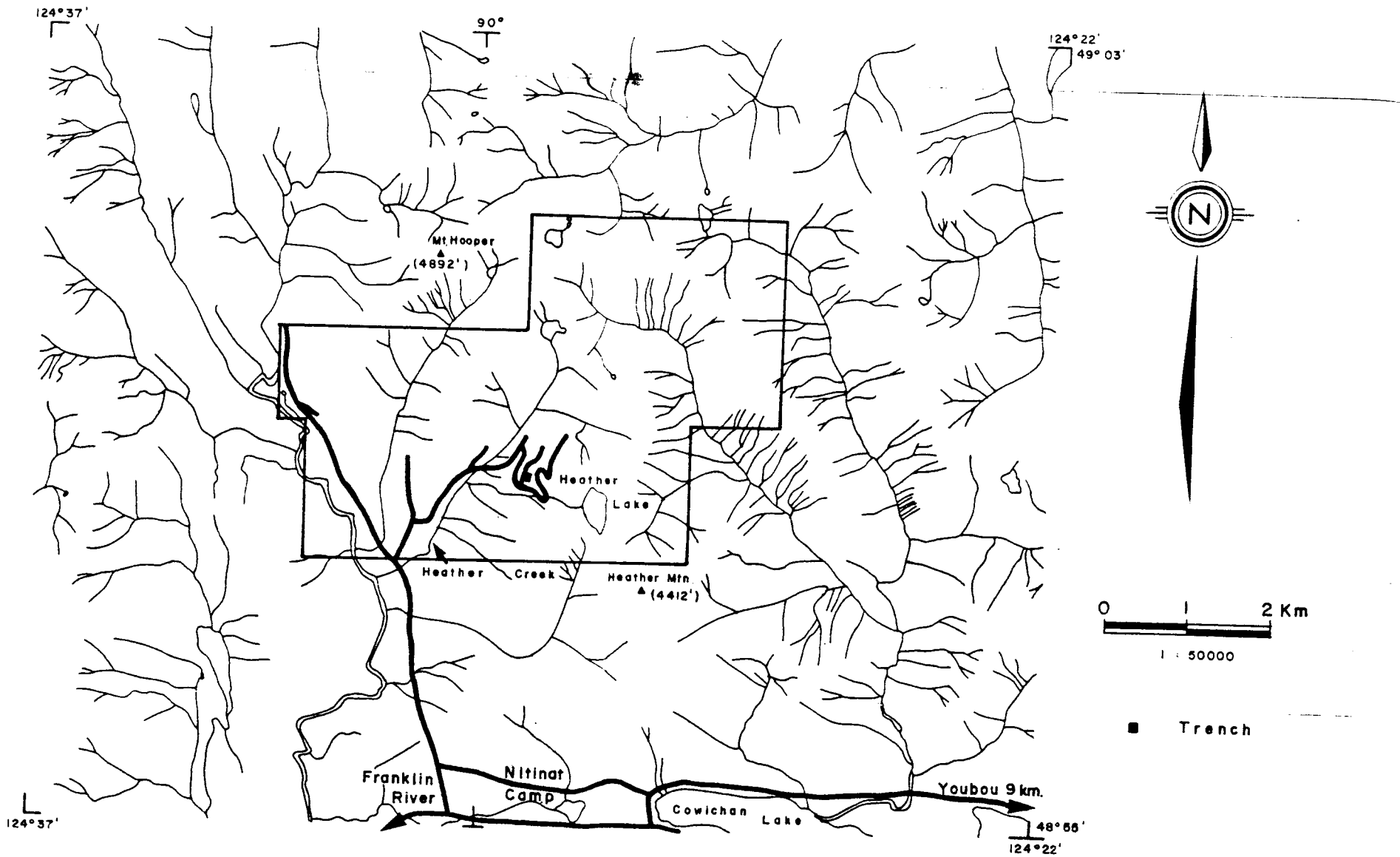
- (3) Follow up ground geophysics over suitable targets from airborne work. Hopefully, an orientation will be clearly outlined from the airborne work. Ground work would be made up of EM and/or I.P., soil geochemistry and geological mapping on cut grids.

G. Walton



CLAIM MAP

FIG.2



DRAINAGE OF THE HEATHER LAKE AREA

FIG.5