

CORPORATION FALCONBRIDGE COPPER

MEMORANDUM

DATE: September 16, 1983
TO: D. H. Watkins
COPIES TO: M. J. Knuckey
DE FROM: A. J. Davidson
SUJET SUBJECT: ANACONDA'S BRITANNIA PROPERTIES

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SUMMARY

Anaconda have invited us to submit an exploration proposal to earn an interest in their large (6700 hectares) property at Britannia B.C. This property consists of two separate areas, Furry Creek and Indian River, separated by the Vancouver watershed. These areas are adjacent to the old Britannia Mines and in fact comprise some of the workings.

Previous work in the area has been spotty since the mines closed in 1974 and was not comprehensive before then. Variable methods of geophysics and soil geochemistry have been carried out but the areas were not geologically mapped at 1:5000 until 1980-1982. Some drill testing was carried out in the early 1970's and in 1980-81.

The Britannia deposits produced a total of 55 million tons of ore grading 1.33% Cu, 1.0% Zn, 0.18 oz/t Ag, and 0.2 oz/t Au. Some lenses however produced 2.1 million tons of 1.55 Cu, 4.4% Zn, 0.29 oz/t Ag, and 0.28 oz/t Au. All of the orebodies were located at or near the top of the Britannia Shear Zone which extends onto the Furry Creek area.

The rocks on the property are acid to intermediate flows and tuffs, volcanoclastics, and argillaceous sediments. Significant hydrothermal alteration is present in the area and forms the footwall to all of the Britannia deposits. Evidence of a proximal environment such as domal features and dyking are also present. Numerous showings outcrop in the area though most of them are of massive chalcopyrite stringers. This combined with the fact that the stratigraphy is overturned opens up a great deal of potential for new discoveries of significant grades.

Exploration potential in the area is excellent and well suited for a CFC style approach. I recommend that we submit to Anaconda a work program to insure an economic discovery within 5 years. This program would cost about \$1.5 million dollars and this expenditure should earn CFC a 70% interest in the property. The acquisition of this property with its exceptional location and superb potential for discovery is an opportunity not to be missed.

LOCATION AND ACCESS

Anaconda's Furry Creek and Indian River properties are located about 50 km north of Vancouver and 10 to 17 km east of Britannia Beach (Fig.1). Elevations range from 770m to 1400m. The areas have been variably logged and the steep slopes are covered in dense vegetation.

Access is by 4 wheel drive to both areas though neither is accessible by road before July due to snow cover in the passes.

PROPERTY

The Indian River-Furry Creek property consists of 310 Crown Grants, 6 reverted Crown Grants and 7 staked claims and comprises approximately 6746 hectares (Fig. 2). Anaconda once held over 700 Crown Grants in the area but late in 1979 they sold 400 of the Crown Grants lying north of Furry Creek and encompassing the former Britannia mine. The Vancouver watershed, divides the area into Furry Creek, west of the watershed and Indian River, east of it.

Due to the large proportion of Crown Grants the assessment requirements on the property are low but about \$4000 are payable in taxes each year.

Falconbridge Ltd. holds 5 claims in the middle of the Indian River group but it is not an active project.

PREVIOUS WORK

Furry Creek: Preliminary mapping in the early 1900's revealed lithologies, stratigraphy, and alteration similar to that at the Britannia Mine. Exploration continued sporadically for the next 70 years as part of the Mine exploration program. Massive sulphides were discovered at Cyrtina Creek (Fairwest) and were worked in 1925-1926. The 4100' Level East Drift was extended to Cyrtina and the area was explored by geophysics and drilling. Three anomalous areas were outlined between Fairwest and Victoria.

In 1972-3, a drill program discovered and outlined 300,000 tons of ore along Furry Creek. The grades are in the order of 1% Cu and no gold.

In 1980, a soil survey was carried out on the north side of the valley and the area is presently being mapped by a U.B.C. Master's student.

In 1982 the Furry Creek area was also flown with Questor helicopter INPUT. However due to extreme topography problems and poor helicopter lift the survey was deemed a failure. No anomalies were found.

Indian River; In the early 1900's a certain amount of work including drilling was carried out on the Roy Showing (massive chalcopryite stringers?) and on other showings in the area.

In 1963-66, Anaconda drill tested siliceous pyritic zones and extensions of the Roy mineralization in the Londen-Roy Creek area. No significant mineralization was intersected and no geological map was produced in the 4-year program. In the early 1970's new logging roads provided good access and the area was finally mapped in 1975.

From 1980-1981 Anaconda mapped the Indian River claims at 1:5000 and 1:2000 and generated some drill targets. Holes tested both massive sulphide and "porphyry-type" targets but no significant mineralization was intersected.

REGIONAL GEOLOGY

The property is underlain by the Britannia and Indian River pendants which are two of several northwest trending remnants of mid-Mesozoic volcanic and sedimentary rocks. These pendants are completely surrounded by the Coast Plutonic Complex (Fig.3). Structure within these pendants is complex and difficult to define due to a lack of stratigraphic markers. Late shear zones which cut across the units are developed on a regional scale at both Indian River and Furry Creek. Folding is not thought to play a major role in either of the pendants.

LOCAL GEOLOGY

Furry Creek: The area is underlain by a complex package of intermediate-felsic flows and pyroclastics, and argillaceous, cherty and tuffaceous sediments. These volcanics and sediments are "transected by the Britannia Shear Zone" which is a zone of hydrothermally altered (sericite -quartz sericite -chlorite schists) acid volcanics that outcrop along the floor of the Furry Creek valley. This zone ranges from 50 m wide underground at Jane Basin to 300-1200 m wide at the Bluff Mine. It is 600 m wide at Victoria and continues along the Furry Creek valley widening to 900 m at Fairwest where it cuts across to the south side of Furry Creek and continues to the southeast just north of Ice Lake. High level dacite plugs outcrop along the north side of the creek with pillow basalts and are not part of this 'Shear Zone'. Most rocks in the area strike northwest and dip shallow to moderately southwest.

Historically, the Furry Creek valley and the Britannia Shear Zone have been interpreted as the axis of the 'Britannia Anticline'. This was a broad open fold, overturned to the north and which strikes northwest and plunges gently west. However, this interpretation is based on extremely flimsy evidence at Furry Creek and I do not believe it.

I feel that the rocks exposed at Furry Creek form a homoclinal sequence which faces north and which is overturned to the north. This is based on the fact that all the Britannia deposits occur on the north contact of the 'Shear Zone' which is probably just a subparallel footwall alteration zone to the orebodies. Overlying the deposits is a thin argillite unit overlain by an unaltered pillowed basalt. This is a classic massive sulphide volcanic pile.

Indian River: Rocks in the Indian River area consist of rhyolitic flows, domes, intermediate pyroclastics and volcanoclastic sediments and tuffs. This sequence is cut by what is called the 'London Porphyry', a quartz-microporphyry which has been extensively altered to an aphanitic textureless assemblage of quartz - sericite - chlorite -pyrite. These rocks are cut by several generations of py-cp veinlets and qtz-py-moly veins up to 10 cm thick. This 'porphyry' could also be (and in fact looks like) hydrothermally altered massive rhyolites and is thus part of significant footwall alteration.

Topographically and ?stratigraphically? below the 'London Porphyry' the dominant rocks are massive and flow banded sharp rhyolites and rhyolite breccias that host numerous small pods of massive chalcopyrite and chalcopyrite stringers. Dykes of various ages and compositions ranging from rhyolite to lamprophyre are especially prominent between the 'London Porphyry' and these underlying acid volcanics making it a classic vent area.

Above the 'London Porphyry' the dominant rocks are volcanoclastic sediments and tuffs. Very little exploration for exhalative horizons, rhyolite horizons, or for evidence of hydrothermal alteration has been carried out above this porphyry.

THE BRITANNIA MINES

The Britannia Mines were in production almost continuously for 60 years. They produced a total of 55 million tons grading 1.33% Cu, 1.0% Zn, 6g/T Ag, and 0.8g/T Au. Some lenses however produced 2.1 million tons of 1.5% Cu, 4.4% Zn, 10g/T Ag, and 9.5g/T Au. It is in this latter type of ore that we are most interested. Ten major orebodies of various sizes extended for 4 km in a lineal belt and were developed by an extensive system of pits and underground workings. A main haulage level (4100' level) extends east from a portal near Britannia Beach to the Fairwest workings at Cyrtina Creek, a distance of about 4 km.

The orebodies were crude lenses of semi-massive to massive layers, stringer deposits and pyritic sediments. Some display a zoning of a Cu-, py-, Si- rich core with Zn occurring in the upper central part or in separate sheet like masses. The zinc ore typically showed fine banding.

All known orebodies occur within a 1.5 km segment of the 'Shear Zone' immediately west of the Furry Creek project area. The ore zone roughly coincides with the base of the argillite along the north contact of the 'Shear Zone'. The more massive orebodies are the Bluff, East Bluff, #5, #8, 040, and the 'stringer' orebodies are Fairview, Empress, and Victoria (Fig.4).

EXPLORATION POTENTIAL

Furry Creek: The main known exploration potential of the Furry Creek area is along the north contact of the 'Shear Zone'. All the Britannia orebodies including the deposit discovered by Anaconda in 1972-3 are located at or near this contact. No geophysics or drilling has been done in the area since 1974 and no deep drilling has ever been done. No lithogeochemical surveys have been tried on the ground though alteration is abundant. Over two kilometres of this contact are completely unexplored and the concept of stacked lenses or multiple horizons has not even been considered. Also several I.P. (1974), soil, and rock geochem anomalies remain unexplained along this favourable contact.

Besides the potential of the unexplored ground mentioned above, there remains the 300,000 tons of ore discovered by Anaconda in 1974. To my knowledge no exploration has taken place in the immediate area of this deposit to search for additional ore either downplunge, downdip, or along strike. The little we know of this zone suggests that it is made up of stringer material. No work has been done to find an associated massive lens. If our interpretation of an overturned sequence is correct, associated massive sulphide lenses would all lie below the stringer zones and outside the range of 1974 era geophysics.

Potential, in short, is awesome.

Indian River: Exploration potential in the Indian River area, while not as obvious as at Furry Creek, is still excellent. All previous exploration in this area has concentrated on the 'London Porphyry' and the massive chalcopyrite showings associated with the rhyolites below it. It is my feeling that the massive sulphide showings such as the Roy Prospect etc. are just stringer zones and pods of chalcopyrite both in and near the top of a vent area as exemplified by the rhyolite flows, the dyking and the talus breccias. The part of the sequence that should lie above the rhyolites seems to be cut off by this porphyry. However, my interpretation of the porphyry is that it may represent a hydrothermally altered and mineralized zone associated with the underlying rhyolites. Potential then exists immediately above these altered rocks in the bedded volcanoclastics and tuffs. The identification of a specific horizon such as an exhalite or an acid tuff in these

volcaniclastics would open up a great deal of potential. A CFC style program of detail mapping and sampling would have an excellent chance of identifying such a horizon.

CONCLUSIONS AND RECOMMENDATIONS

Anaconda's Britannia property, 50 km north of Vancouver, comprises 6700 hectares in the Britannia and Indian River volcanosedimentary pendants. The area has produced significant amounts of ore from massive sulphide deposits in the past.

The exploration work that has been carried out in the area has been both inconsistent and discontinuous and no significant exploration has been done in the past ten years. Potential for discovering new orebodies is excellent.

CFC should attempt to acquire this prime exploration property by submitting to Anaconda a work program that will insure an economic discovery on the property within five years.

Anaconda's expenditures on the ground since 1970 have been approximately \$700,000 dollars. Thus CFC should commit to spend in the order of \$1,500,000 dollars over 5 years to earn a 70% interest in all of Anaconda's property in the area.

A five year plan for the program would include the following:

YEAR I

- Six week program of mapping and lithochemical sampling in each of the Furry Creek and Indian River areas
- Two-three weeks of surface DEEPEM along favourable contacts
- 2000 metres of diamond drilling to test stratigraphic and geophysical targets
- Downhole Pulse EM
- Cost-\$300,000

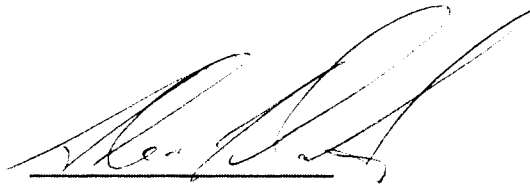
YEAR II

- Three month continuation of mapping/sampling program
- Detail remapping and sampling on anomalous zones
- Surface DEEPEM

- 5000 metres of diamond drilling on new targets and on follow-up of Year I targets
- Downhole Pulse EM
- Cost-\$500,000

YEARS III to V

- Step out and delineation drilling on Year I and Year II zones
- Further exploration drilling to discover new zones
- Cost- +\$1,000,000

A handwritten signature in black ink, appearing to read 'Alex J Davidson', written over a horizontal line.

Alex J Davidson

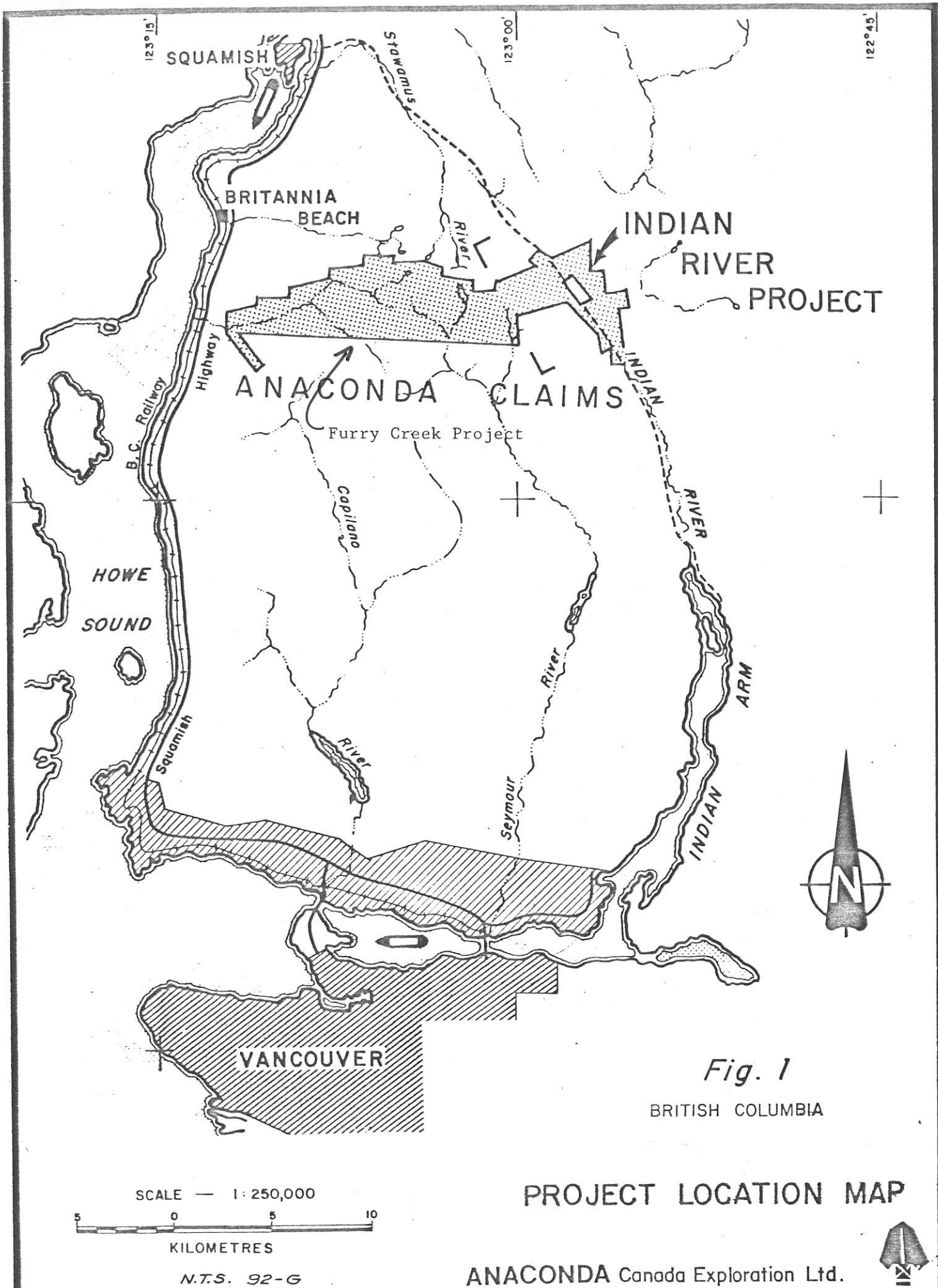
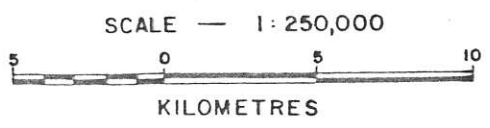


Fig. 1

BRITISH COLUMBIA

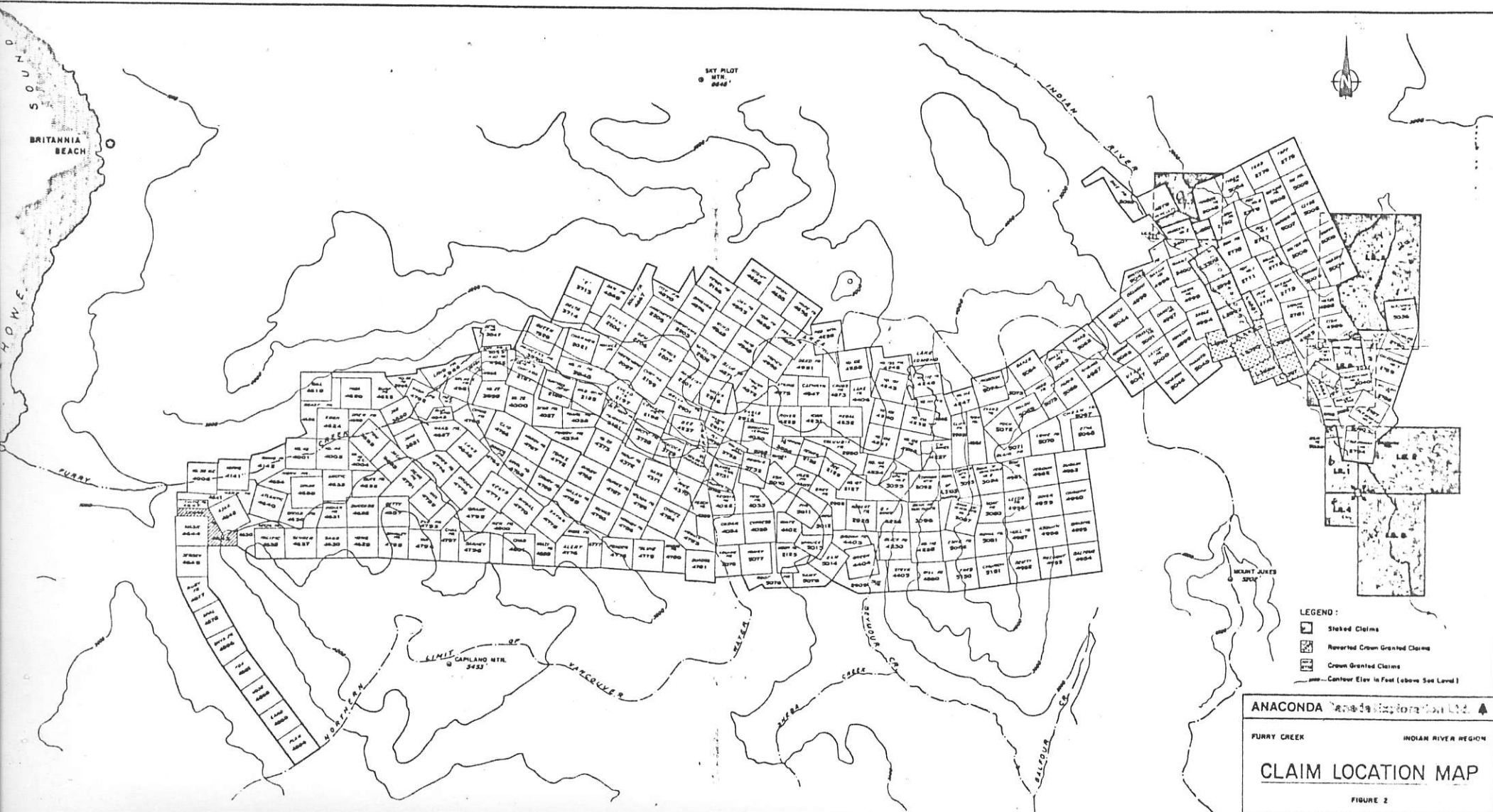
PROJECT LOCATION MAP



N.T.S. 92-G

ANACONDA Canada Exploration Ltd.





- LEGEND:**
- Stated Claims
 - Reverted Crown Granted Claims
 - Crown Granted Claims
 - Contour Elev in Feet (above Sea Level)

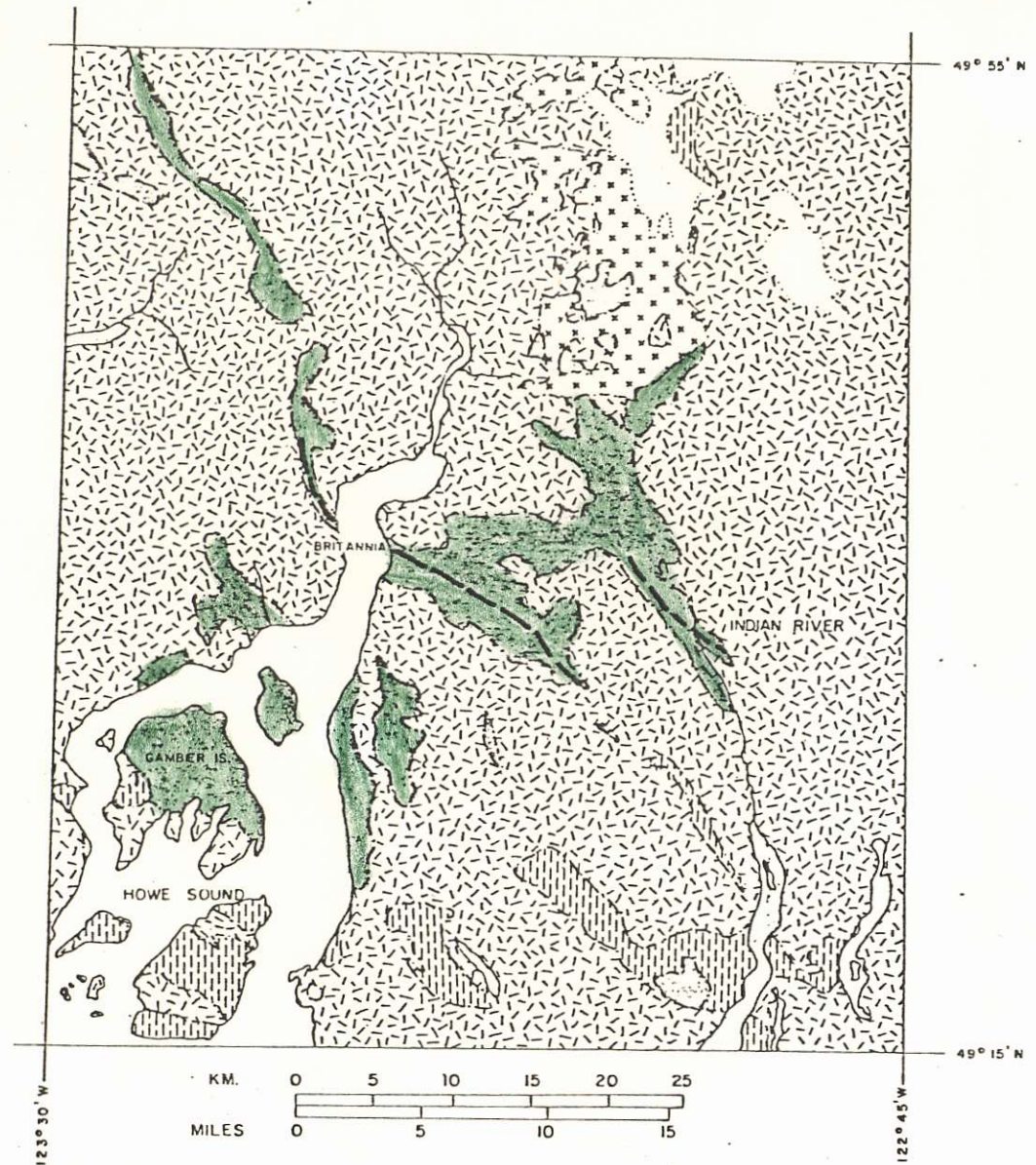
ANACODA Canada Improvement Co. Ltd.

FURRY CREEK INDIAN RIVER REGION

CLAIM LOCATION MAP

FIGURE 2

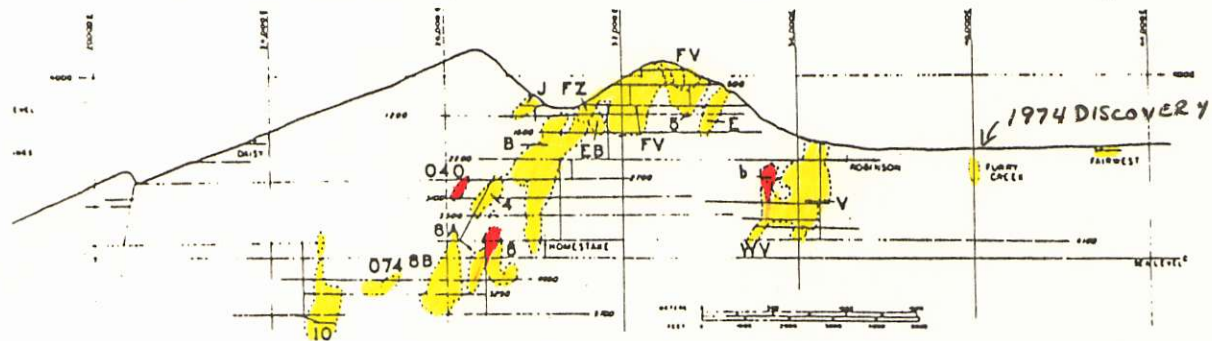
Surveyed by: C.M.W. Drawn by: C.D. Date: November 1960
 Scale: 1:10,000 Project No.



LEGEND

- QUATERNARY
 Glacier, snowfield
- Garibaldi group: basalt to rhyodacite flows
- CRETACEOUS – JURASSIC (?)
 Coast range batholith: include younger massive granodiorite to quartz monzonite and older, commonly foliated, diorite to granodiorite
- JURASSIC (?) CRETACEOUS
 Gamber, Britannia groups: predominantly intermediate to acid volcaniclastic rocks, locally schistose and gneissic
- PRE - JURASSIC
 Bowen Island, Twin Island groups: greenstone locally schistose and gneissic
- Britannia and Indian River shear zones

Fig. 3 Regional Geology (after Payne et. al., 1980)



ORE BODIES & PROSPECTS

Victoria	E	Empress	FZ	Fairview Zinc	4	No 4 (Bluff)	8A	No 8A	10	No 10
Robinson	S	No 5	B	Bluff	040	040	8B	No 8B	EB	East Bluff
Beta	FV	Fairview Veins	J	Jane	8	No 8	074	074	FC	Furry Creek
West Victoria										

SUMMARY FOR ORE TYPES (from mined ore)

Type	Tons ($\times 10^6$)	Cu %	Zn %	Pb	Ag (ppm)	Au (ppm)	Mineralogy	Original Morphology (after Sangster, 1972)	Ore Bodies	Percentage of Total Ore Mined
ZN	0.5	0.25	5.0	0.4	34	0.6	sl-py-ba-gl-cp	massive	Jane, Fairview Zinc	1.5
ZN-CU	2.1	1.5	4.4	0.3	10	0.5	sl-py-cp-(gl-qz-chl)	massive	No. 8 (top), Beta, 040, Bluff ^a	4.5
CU	8.9	2.2	0.2	0	10	0.2	cp-py-qz-(chl)	massive	No. 8 (bottom), No. 10, Empress, Victoria, West Victoria	15
Q	43.5	1.1	0.4	0	4	0.6	qz-py-cp-sl	stringer	Bluff, East Bluff, Jane, No. 4 (Bluff), No. 5, No. 10, Fairview Veins	79
TOTAL	55.0	1.33	1.0	trace	6	0.8				

^a local zones in Bluff near footwall (stratigraphic top) above 1800 level

from Payne, Bratt and Stone, 1974

FIGURE 4