Geology and Lithogeochemistry

of

the Lieberman Option

Victoria Mining Division
NTS 92B/13E

48°59' Latitude 123°45' Longitude

Owner: Corporation Falconbridge Copper
Operator: Corporation Falconbridge Copper

by: D. Lefebure

August 24, 1985

Claims

Sicker 1
Sicker 2
Lawarance

Table of Contents

1. Introduction

Corporation Falconbridge Copper optioned 30 claim units from P. Lieberman in the Duncan area of the Victoria Mining Division. This report presents the results of geological mapping and lithogeochemical sampling carried out on the Lieberman Option during 1985.

1.1 Location and Access

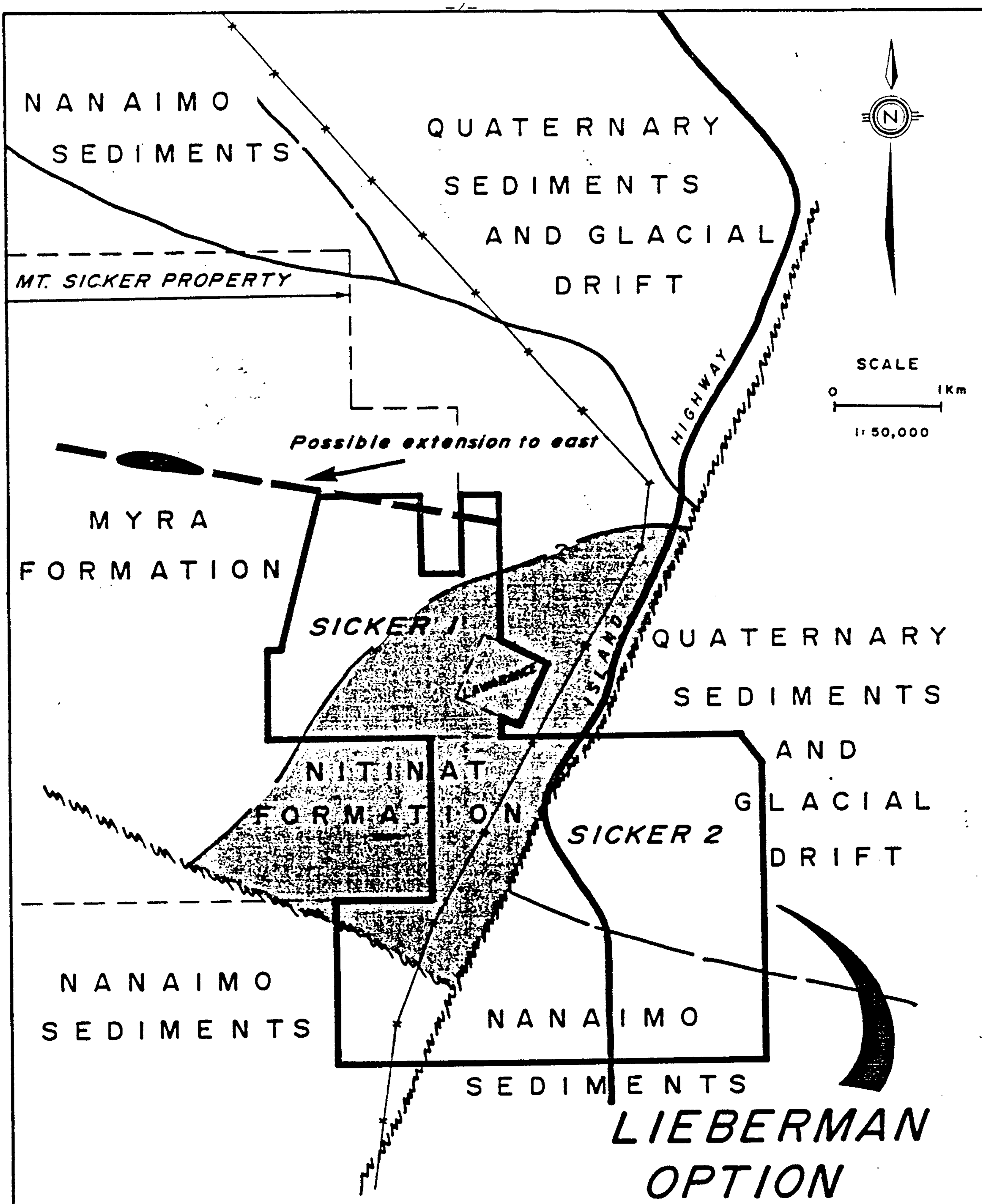
The Lieberman Option is located 10km north of Duncan, B. C. at the east end of Mount Sicker. The Trans Canada Highway crosses the Sicker 2 claim (Figure 1) and associated paved, gravel and logging roads provide excellent 2-wheel drive access to all parts of the Property.

1.2 Physiography and Climate

The eastern end of Mount Sicker is marked by a flat plateau which drops abruptly 500m to the flat Bonsall Creek and Cowichan River valleys to the east. Steep bluffs occur at the edge of the plateau and Little Sicker Mountain is the highest point at approximately 590m.

The valley areas are cultivated while the mountain is covered with dense mixed forest consisting of Douglas Fir, alder and cedar. The area has been logged several times during the past century and there are several clear cut areas.

The climate is moderate with temperatures ranging from $-10^{\circ}C$ in the winter to $30^{\circ}C$ in the summer. The precipitation falls principally as rain, although snow accumulates in small amounts at higher elevations between December and March. Summers are relatively dry and spring and fall are typically wet.



GEOLOGY OF THE LIEBERMAN OPTION

MYRA FORMATION – Predominantly felsic tuffs and lapilli tuffs

NITINAT FORMATION – Feldspar phyric and pyroxene phyric andesite flows

FIGURE 1

1.3 Mineral Rights

Claim status is as follows:

Name	Record #	Recorded	Units
Sicker 1	624(5)	May 31, 1982	9
Sicker 2	625(5)	May 31, 1982	20
Lawarance	730(12)		1

1.4 History

The Lieberman Option was acquired in 1983 to cover favourable stratigraphy in the same belt as, and along strike to the east of, the old Tyee and Lenora orebodies which produced a total of 300,000 tonnes of ore grading 3.31% Cu, 7.51% Zn, 94 g/T Ag and 4.46 g/T Au. Previous exploration appears to have been limited to prospectors pits and adits and three short diamond drill holes drilled in 1983 on the power line (Lonsdale, 1983).

1.5 Work Done

The claims were mapped at 1:5,000 scale covering 6.5km^2 using airphotos as base maps and hip chaining and compass work to locate outcrops. Rock samples (102) were collected and analysed for SiO_2, TiO_2, Na_2O CaO, MgO, K_2O, Al_2O_3, Fe_2O_3, Ba, Cu, Zn, MnO_2 and Zr. Mineralized samples (10) were assayed for Cu, Zn, Ag and Au. Several logging roads were surveyed in the areas where they did not show up on the airphoto.

2. Regional Geology

The Mount Sicker area is underlain by Paleozoic Sicker Group, Cretaceous Nanaimo Group and Quaternary sediments and glacial drift. These rocks are cut by the Paleozoic Saltspring intrusion, Jurassic Island intrusions and diorite/gabbro bodies. Muller (1980) has subdivided the Sicker Group, as follows, in order of increasing age:

i) Buttle Lake Formation,

ii) Sediment - Sill Unit,

iii) Myra Formation and

iv) Nitinat Formation.

The Buttle Lake Formation consists of commonly crinoidal recrysallized limestone, interbedded with calcareous siltstone and chert. Thinly bedded to massive argillite, siltstone and chert with interlayered sills of diabase form the Sediment - Sill unit. Underlying this unit is the Myra Formation basic to rhyodacitic banded tuff, breccia and lava with interbedded argillite, siltstone and chert. The Nitinat Formation basaltic lavas and agglomerates with minor massive to banded tuff layers forms the base of the Sicker Group.

Nanaimo Group conglomerate, sandstone and shale beds unconformably overly the Sicker Group rocks. The unconformity is commonly marked by a conglomerate containing fragments of Sicker Group volcanic rocks and quartz.

West to northwest and northeast striking faults divide the Mount Sicker area into fault blocks. The majority of fault movement occurred in Tertiary time. Older folds, possibly of Jurassic age, are assymmetrical with northwest trending axes.

As mentioned above, the Lenora-Tyee volcanogenic massive sulphide deposits occur in Myra Formation felsic volcanic rocks approximately 4km to the west of the Lieberman Option.

3. Property Geology

The Lieberman Option is underlain by Sicker Group volcanic rocks, Nanaimo Group sediments and Quaternary alluvium and glaial drift. The geological mapping and geochemical sampling was largely restricted to the Sicker Group rocks. Nanaimo Group sediments were only mapped to establish the limits of the Sicker Group (see Map 1). The stratigraphy, structural geology and mineralization of the volcanic rocks are discussed in detail below.

3.1 Stratigraphy

3.1.1 Nitinat Formation

On the Lieberman Option the Nitinat Formation consists mainly of basalt flows which outcrop north of Bonsall Creek both on the lower slopes and north of Little Mount Sicker (Map 1). The basalt flows can be subdivided into pyroxene feldspar basalt porphyry and plagioclase basalt porphyry lavas with interbedded basaltic flow breccias and tuffs.

Pyroxene feldspar baalt porphyry lavas (unit 1.3) consist of coarse (1-10mm), euhedral phenocrysts of pyroxene (augite?) up to 10mm long and smaller (<2mm), euhedral phenocrysts of plagioclase set in a fine-grained grey-green to green matrix. Rare amygdules (<1%) are present in most outcrops. These lavas weather dark green to light grey-green with conspicuous positive-relief, dark greenish-black crystals of pyroxene. Based on work by Muller (1980), it is suspected that the pyroxene phenocrysts are replaced by a felted mass of amphibole ("uralite").

Feldspar basalt porphyry lavas (unit 1.2) are distinguishable from unit 1.3 lavas by the absence or near absence of pyroxene phenocrysts. Plagioclase phenocrysts range in size from 1.2 to 3mm with an average of 2mm and form 10-20% of rock. Sausserlcitization of plagioclase is common. Some lavas contain up to 2% pyroxene phenocyrsts which are generally less than 3mm long. The groundmass consists of small feldspar crystals set in a dark f.g. matrix. Feldspar basalt porphyry lavas weather grey-green with up to 20% raised apple-green patches. These patches (clots, knots, etc) are ubiquitous and consist predominantly of epidote.

Basaltic flow breccias and lapilli-tuff (unit 1.5) are best exposed north of the Lawarance Claim between the power line and logging road. In this area there are pyroxene-plagioclase flow breccias and tuffs with pronounced compositional banding and zones of fragments aligned parallel to the foliation. The flow breccias weather grey-green to greenish-tan with conspicuous raised pyroxene phenocrysts; on some surfaces the fragments have a positive relief forming elongate lumps. The fragments are up to 1/3m long and width to length ratios range from 3:1 to 8:1. Almost all the fragments are pyroxene feldspar basalt porphyry and are set in a groundmass of the same composition. Interbedded with the flow breccias are bands of pyroxene-rich (>10%) lapilli-tuffs and minor tuff-breccias. They contain fragments up to 1/4m long which display length to width ratios of 3:1 to 8.1. Pyroxene feldspar basalt porphyry fragments are most abundant with lesser amounts of feldspar basalt porphyry clasts. Two fragments of pyroxenite or pyroxene gabbro were noted in one outcrop.

3.1.2 Myra Formation

The Myra Formation is made up of porphyritic felsic flows which outcrop on the northeast side of Mount Sicker. The contact between the Myra and Nitinat Formations is dyked out by "speckled" diorite. Two separate units occur in the Myra Formation on the Lieberman Option which are, from south to north, feldspar dacite porphyry and quartz feldspar rhyolite porphyry. Felsic crystal tuffs outcrop to the north of the Sicker 1 claim and may continue as far north as the Nanaimo sediments at the base of Mount Sicker.

The feldspar dacite porphyry flow (unit 2.2) is 80 to 100m thick. Plagioclase phenocrysts up to 2mm long form 5 to 10% of the flow and rest in a siliceous matrix. Quartz eyes are present but rare. Small chloritic smears could be altered hornblende or biotite. The unit shows relatively little evidence of deformation with a weak foliation and roughly perpendicular joints. Disseminated pyrite (1-3%) occurs throughout the unit and weathered surfaces are usually stained with limonite and jarosite. Weak sericite alteration follows joints and foliation planes.

Quartz feldspar rhyolite porphyry (QFP) flows (unit 3.3) lies immediately to the north of the feldspar dacite porphyry. The map pattern and nature of these flows suggest they belong to a rhyolite dome. The QFP flows are grey-green to dark grey-green on a fresh surface with round quartz eyes which range up to 1cm in length and average 4-5mm. Euhedral plagioclase phenocyrsts (<1-2mm) are partially saussertitized. The phenocryst content of the QFP flows varies between 10 and 20% with feldspar/quartz ratios of approximately 2:1. On a weathered surface the unit weathers a pale light green to almost white colour with rusty zones. The quartz eyes form small bumps and are sometimes lineated parallel to the foliation. The foliation is poorly developed compared to the adjacent felsic tuffs.

Several local zones of fragments are present. Green chloritic streaks are common and may represent relict fragments or alteration patches. In certain areas the chloritic streaks contain a higher pyrite content than the surrounding matrix. Pyrite, up to 3% is ubiquitous in the QFP flows and "veinlets" of pyrite-sericite-silica form irregular streaks through the outcrop. These pyritic zones are up to several meters wide but are generally less than a meter across and appear to be quite continuous laterally.

The contacts between QFP flows are marked by strongly foliated thin chloritic tuffs (unit 3.1 chl). The tuffs are dark green to grey-green with distinct light and dark coloured beds. Quartz eyes and lithic fragments are commonly present. The lithic fragments have width to length ratios of 1:3 to 1:4. Locally feldspar phenocrysts are abundant. Chlorite is pervasive throughout these tuffs and epidote replaces the feldspars. Trace to 2% pyrite is typical.

3.1.3 Intrusive Rocks

Three major types of intrusive rocks have been identified on the Lieberman Option which are, in order of decreasing age "speckled" diorite, felsic dykes and diorite.

Named for a characteristic weathered surface, "speckled" diorite (unit 4.3) outcrops on the eastern end of Mount Sicker immediately north of the Lawarance Claim. This unit is typically grey-green to green in colour with a light grey-green weathered surface marked by raised green epidote patches and small white feldspar phenocrysts (speckles). The subhedral to euhedral plagioclase phenocrysts range from 0.2 to 2mm in length and form 20-40% of the rock. Minor pyroxene phenocrysts can be seen locally but are not abundant. The homogeneous texture, fine to medium grained matrix, oval map pattern and irregular contacts show this is an intrusive body. The locally foliated zones and almost ubiquitous epidote patches suggest the intrusive was emplaced roughly contemporaneously with the adjacent Nitinat flows.

Felsic dykes and sills(?) intrude the Nitinat Formation and speckled diorite. Most of these intrusions strike parallel to the foliation. Typically the felsic dykes are quartz feldspar rhyolite porphry with 5 to 10% oval, glassy gray quartz eyes (<1cm) and 15 to 20%, subhedral to euhedral plagioclast phenocrysts (<2mm) in a grey groundmass. Occasionally the dykes contain only feldspar phenocrysts. Quartz veins appear to be more common in the felsic dykes. Some felsic dykes contain up to 3% disseminated pyrite.

Diorite dykes intrude all other map units except the Nanaimo sediments and Quaternary cover rocks. The diorite dykes consist of grey, m.g., equigranular mixture of plagioclase and ferromagnesian minerals. Typically the diorite grades within one to five meters of contact into a f.g. marginal phase with feldspar phenocrysts. The actual dyke contact is a v.f.g. foliated mafic rock which appears similar to a mafic tuff.

3.2 Structural Geology

Interpretation of the structural geology of the Lieberman Option is limited by the scarcity of distinguishable conformable contacts. Only four bedding determinations were made which strike from 90° to 120° and dip south 52 to 75°.

All units, except the diorite dykes, exhibit a weak foliation in at least some outcrops. The intensity of the foliation appears to be dependent upon original composition and proximity to shear zones. Felsic dykes "speckled" diorite and flows generally show only a weak foliation; tuffs and shear zones are moderately to strongly foliated. Over the Lieberman Option, the foliations dip steeply south and strike at 100 to 145° and average approximately 120°.

The limited structural data suggests the Lieberman Option is underlain by a homoclinal sequence of Sicker Group rocks on the southern limb of a large antiformal structure. Because Nitinat Formation rocks appear to overly Myra Formation rocks, the sequence may be overturned.

3.3 Mineralization

There are two types of mineralization on the Lieberman Option, pyritic shear zones and conformable exhalative tuff horizons. Typically the shear zones are strongly chloritized and foliated and extend over widths of 1 to 5m and sometimes contain pyrite plus or minus chalcopyrite. The principal pyritic shear zones are shown on the accompanying geological maps (Maps 1 and 2). The only possible exhalative horizon consists of several bands of silica and 5-10% pyrite that occurs at the contact between a pyroxene feldspar basalt porphyry flow and a pyroxene-feldspar tuff. This horizon can be followed 500m west to the diorite cliff and may continue on the west side of the diorite. No significant assay values (BCS 2402, 2406) were found for this horizon (see below).

Sample #	Cu %	Pb %	Zn %	Ag g/T	Au g/T
BCS 2402	0.01	<0.01	<0.01	0.7	<0.1
BCS 2406	<0.01	<0.01	0.01	0.7	<0.1
(west of diorite)					

4. Lithogeochemical Results

During field mapping rock samples were collected to identify the following:

i) mineralized zones using the path finder elements Cu, Zn, Ba, Mn, Fe_2O_3

ii) alteration zones using Na_2O, CaO, MgO, SiO_2, and K_2O; and

iii) primary rock compositions using TiO_2 and SiO_2.

The data is presented in Appendix I and the most significant elements plotted on Maps 3 to 8.

The Cu Zn values are considered anomalous on the Lieberman Option if greater than 100 ppm. Two strongly anomalous areas standout; the other anomalous base metal values are scattered. A sample of the possible exhalative horizon mentioned above contains 1910 ppm Zn with an adjacent mafic flow containing 910 ppm Cu. A chloritic shear zone in the speckled diorite contains 1700 ppm Cu. Both areas should be examined in more detail. Only 4 samples contain 1500 ppm Ba or more and they do not correlate with the best base metal values.

There are no lithogeochemical alteration zones on the claims. Some samples exhibit moderate Na_2O depletion. Because these samples contain normal to anomalously high CaO values and normal K_2O contents it is unlikely that the Na_2O depletion reflects hydrothermal alteration.

The felsic volcanic rocks, including the dykes, range from dacite to rhyolite compositions with 65 to 75% SiO_2 and <0.40 TiO_2. The felsic dykes typically contain more than 4% Na_2O while only some felsic flows or tuffs reach such high sodium levels. The mafic volcanic rocks of the Nitinat Formation contain 50-60% SiO_2 and more than 0.50% TiO_2.

5. Conclusions

Surface mapping and sampling defined one possible exhalative horizon with exploration potential on the Lieberman Option. Numerous shear zones on the claims carry significant amounts of pyrite and minor chalcopyrite but do not constitute suitable exploration targets. Further mapping, sampling and geophysical surveys are warranted on the possible exhalative horizon.

Reference

Lonsdale, R. 1983. Diamond drilling report on the Sicker 1, 2 and Geo 1 and 2 mineral claims. Contract report,

Muller, J. E., 1980. The Paleozoic Sicker Group of Vancouver island, British Columbia. GSC Paper 79-30, 22p.

Clapp, C. H. and Cooke, H. C. 1917. Sooke and Duncan map - areas, Vancouver Island. GSC Memoir 13.

Statement of Costs

Field Costs	
D. Lefebure, 17 days (April 18, 19, 23-27, May 2-5, 7-9, 20-22)mapping @ $300/day	5,100.00
S. Kilbreath, 20 days (May 4-23) mapping @ $300/day	6,000.00
T. Martin, 3 days (May 21-23)surveying @ $100/day	300.00
A. Davidson, 2 days supervising @ $400/day	800.00
Accommodation (duplex) for 1.5 months @ $501.50	752.25
Food 43 man days @ $20/man day	860.00
Truck Rental and gas 30 truck days @ $50/day	1,500.00
Miscellaneous Field Supplies (flagging, sample bags, topofile thread, etc)	100.00
	15,412.25
Analytical Costs	
102 rock samples @ $13.50	1,377.00
10 rock sample assays @ $17.50	175.00
112 shipping costs @ $0.40 sample	44.80
	1,596.80
Office Costs	
Drafting 5 days @ $125/day	625.00
Interpretation and Report (D. Lefebure) 3 days @ $300/day	900.00
Miscellaneous (materials, copying, typing, etc.)	150.00
	1,675.00
TOTAL	$18,684.05

Certificate of Qualifications

I, David V. Lefebure certify that:

1. I am an Exploration Geologist residing at 5433 7th Avenue, Delta, B. C.

2. I have Bachelor of Science (Honours) and Master of Science degrees in geology from Queen's University, Kingston, Ontario.

3. I am a Fellow of the Geological Association of Canada.

4. I have practiced my profession continuously since graduation in 1976.

5. I personally carried out or supervised the work reported herein.

August 24, 1985 — David V. Lefebure

Date — David V. Lefebure

Appendix I

List of Analyses

Appendix I

List of Lithogeochemical Analyses

Sample	AL2O3	BA	CAO	FE2O3	K2O	MGO	MNO2	NA2O	PB	SIO2	TIO2	ZR	*CU-PPM	*ZN-PPM
LIEB1	17.70	.003	8.39	10.24	.02	5.27	.23	2.01	.010	50.19	.69	.003	21	59
LIEB2	14.70	.065	1.99	2.64	.32	1.02	.10	6.03	.003	73.37	.26	.010	16	13
LIEB3	.15	.003	.005	.41	.005	.005	.005	.05	.003	93.07	.005	.003	9	3
LIEB4	18.80	.003	8.38	9.81	.02	6.19	.41	2.68	.003	52.52	.84	.003	392	76
LIEB5	18.72	.070	6.44	5.54	.56	1.81	.25	5.68	.003	61.12	.42	.015	26	30
LIEB6	19.18	.003	6.99	10.15	.07	5.00	.25	3.62	.010	55.14	.73	.003	21	32
LIEB7	17.52	.010	12.76	12.42	.17	8.46	.29	2.22	.010	54.48	1.35	.003	90	40
LIEB8	16.24	.003	5.64	10.07	.05	7.67	.38	4.80	.010	57.92	.64	.003	50	263
LIEB9	18.75	.003	.87	13.12	.04	12.93	.33	2.43	.010	53.31	.67	.003	26	149
LIEB10	15.60	.003	12.26	10.55	.005	8.61	.55	2.55	.003	52.03	.66	.003	39	44
LIEB11	17.91	.085	1.12	12.83	.72	11.32	.37	2.25	.010	52.87	.86	.003	18	94
LIEB12	20.95	.003	9.62	9.70	.03	5.26	.41	4.17	.003	49.65	.81	.010	10	51
LIEB13	13.62	.060	1.78	3.64	.33	2.11	.12	4.94	.003	64.18	.26	.003	10	25
LIEB14	18.52	.035	2.69	9.04	.17	5.49	.26	5.41	.003	57.12	.65	.003	81	54
LIEB15	.80	.003	.03	.50	.005	.12	.02	.33	.003	91.98	.14	.003	7	3
LIEB16	20.71	.200	.81	2.19	1.06	1.93	.08	8.00	.010	64.43	.30	.020	9	20
LIEB17	17.91	.020	4.17	8.53	.21	5.23	.24	3.93	.010	58.04	.65	.003	27	63
LIEB18	N/S													
LIEB19	18.67	.020	4.41	9.29	.18	5.80	.26	4.01	.010	57.03	.70	.003	23	67
LIEB20	13.87	.010	7.80	9.19	.09	7.68	.35	3.43	.003	47.23	.51	.003	50	106
LIEB21	13.27	.045	9.25	8.58	.45	7.62	.24	2.44	.003	45.97	.49	.003	99	64
LIEB22	14.67	.003	7.52	9.43	.08	9.00	.37	4.70	.003	53.61	.61	.003	14	50
LIEB23	14.18	.100	1.20	2.64	.61	1.61	.07	5.57	.003	64.11	.24	.003	12	23
LIEB24	17.41	.075	1.30	11.23	.45	8.63	.29	3.02	.003	46.68	.73	.003	30	89
LIEB25	14.92	.003	13.58	10.04	.005	4.55	.36	.12	.003	43.23	.55	.003	21	43
LIEB26	9.00	.010	.75	6.58	.07	2.42	.08	2.97	.003	69.82	.37	.003	52	1910
LIEB27	14.06	.010	6.07	8.06	.15	6.78	.25	4.58	.003	57.47	.51	.003	910	66
LIEB27A	16.47	.003	6.25	14.09	.005	5.72	.39	1.85	.003	55.06	.65	.003	14	70
LIEB28	15.72	.003	4.74	8.28	.02	5.67	.26	3.74	.003	56.47	.55	.003	23	92
LIEB29	19.20	.003	7.36	10.32	.005	5.31	.33	3.41	.003	54.77	.71	.003	24	52
LIEB30	18.14	.003	4.74	13.88	.005	8.87	.45	2.75	.003	52.10	.77	.003	1700	113
LIEB31	15.86	.010	7.98	8.90	.06	5.45	.24	5.85	.003	54.50	.60	.003	32	38
LIEB31A	13.54	.015	8.76	18.17	.38	5.22	.36	2.38	.003	49.52	2.65	.015	210	100
LIEB32	14.10	.020	2.02	2.91	.75	1.93	.08	5.11	.003	70.70	.27	.003	10	19
LIEB33	19.95	.015	6.22	8.66	.50	4.90	.23	4.14	.003	56.12	.65	.003	21	40
LIEB34	16.07	.015	10.47	13.81	.51	7.03	.32	2.99	.003	46.98	1.95	.010	172	53
LIEB35	15.41	.090	.56	2.23	1.91	.79	.05	3.23	.003	72.63	.28	.010	74	16
LIEB36	15.32	.035	.78	1.83	.97	1.09	.08	5.91	.003	74.27	.28	.010	4	32
LIEB37	18.56	.003	7.12	10.36	.05	8.02	.35	2.01	.003	52.88	.66	.003	13	70
LIEB38	17.18	.003	6.80	7.18	.07	4.80	.24	5.14	.003	57.28	.58	.003	25	54
LIEB39	14.38	.100	1.73	2.89	1.77	1.34	.06	3.77	.003	66.77	.27	.003	10	27
LIEB40	17.94	.060	6.81	14.05	.88	6.76	.64	2.24	.003	41.39	1.92	.010	46	132
LIEB41	17.18	.040	.39	4.57	1.11	1.47	.06	6.04	.003	68.60	.35	.010	10	22
LIEB42	14.65	.135	1.26	3.84	2.18	1.29	.08	2.56	.003	74.49	.25	.010	30	33

LIEB105	14.28	.010	10.08	15.50	.24	6.08	.38	2.95	.003	47.91	3.39	.025	181	69
LIEB106	15.03	.040	.44	6.52	1.38	2.17	.24	2.70	.003	71.70	.74	.010	34	90
LIEB107	19.82	.060	.58	8.70	2.38	2.83	.11	2.17	.003	63.47	.96	.015	50	122
LIEB108	16.77	.010	7.46	13.81	.09	4.28	.34	4.89	.003	52.17	2.33	.025	51	98
LIEB109	17.62	.010	5.65	11.33	.13	8.22	.51	1.94	.003	44.91	.80	.003	30	99
LIEB110	15.29	.010	9.03	9.68	.12	7.37	.38	2.76	.003	48.44	.77	.003	33	57
LIEB111	16.07	.010	4.96	7.88	.08	5.15	.36	3.46	.003	56.77	.67	.010	62	86
LIEB112	16.75	.020	8.85	9.94	.21	6.73	.38	3.27	.003	51.05	.76	.003	150	54
LIEB113	16.58	.155	1.93	8.57	.85	3.66	.14	5.28	.010	57.47	.54	.003	20	41
LIEB114	15.33	.020	5.26	12.05	.05	7.80	.37	1.45	.010	52.74	.69	.003	19	90
LIEB115	18.48	.010	8.17	9.50	.03	5.79	.41	2.30	.003	50.00	.84	.003	20	102
LIEB116	18.73	.120	7.57	8.82	.53	4.49	.25	2.74	.003	53.97	.64	.003	50	62
LIEB117	16.63	.050	6.49	8.57	.50	3.71	.26	3.04	.003	52.23	.59	.003	22	62
LIEB118	17.46	.190	3.19	5.35	2.30	1.48	.20	4.83	.010	64.58	.25	.015	11	35
LIEB119	18.67	.003	7.62	9.58	.04	6.07	.35	3.36	.003	48.52	.76	.003	10	71
LIEB120	18.01	.055	3.34	7.51	.57	5.06	.21	4.33	.003	52.49	.78	.003	17	51
LIEB121	14.16	.140	1.93	6.58	.49	3.11	.10	4.24	.003	63.46	.60	.003	10	26
LIEB122	15.43	.003	5.72	7.30	.07	3.57	.21	2.92	.003	50.36	.52	.003	13	23
LIEB123	14.75	.003	5.70	10.63	.16	7.63	.49	.28	.003	54.37	.70	.003	16	95
LIEB124	17.44	.075	3.98	7.80	.72	4.66	.35	3.05	.010	61.19	.72	.010	21	62
LIEB125	10.86	.190	.23	3.43	1.54	.76	.02	3.00	.003	72.05	.17	.003	11	12
LIEB126	12.72	.090	.71	1.97	1.21	.65	.04	4.45	.003	72.43	.14	.003	22	20
LIEB127	15.13	.003	9.45	12.70	.07	6.40	.30	1.94	.010	51.00	2.00	.015	136	70
LIEB128	19.75	.035	3.49	7.04	.48	5.11	.31	5.20	.010	54.76	.68	.003	12	80
LIEB129	17.80	.015	5.28	7.64	.12	4.02	.32	4.65	.003	55.93	.61	.003	54	72
LIEB130	15.39	.003	8.24	10.33	.05	8.61	.37	3.64	.010	53.21	.70	.003	14	84
LIEB131	14.69	.060	2.21	2.59	1.18	1.05	.10	4.76	.003	74.35	.26	.010	5	19
LIEB132	15.07	.003	9.03	9.96	.02	7.33	.29	3.03	.010	55.96	.70	.003	24	40
LIEB133	17.27	.003	6.73	10.17	.03	5.44	.33	2.71	.010	52.35	.83	.003	31	85
LIEB134	12.47	.003	10.62	9.05	.04	7.07	.36	2.41	.003	45.50	.50	.003	7	50
LIEB135	14.75	.003	11.85	9.78	.07	6.90	.40	2.35	.003	48.78	.69	.003	80	41
LIEB136	17.57	.003	6.94	9.16	.05	4.08	.29	2.92	.003	56.43	.64	.003	5	50
LIEB137	14.75	.070	1.25	1.97	1.62	.68	.14	4.25	.003	72.74	.18	.003	4	40
LIEB138	13.98	.050	.23	3.55	1.05	.88	.07	4.04	.010	74.28	.29	.010	10	45
LIEB38A	15.79	.105	2.73	2.68	3.01	1.16	.14	2.14	.003	67.67	.30	.003	10	22
LIEB139	13.65	.015	4.13	11.92	.34	4.80	.30	.97	.003	64.09	.55	.003	10	62
LIEB140	13.82	.065	.56	3.29	1.36	1.25	.10	3.65	.003	68.26	.26	.010	6	41
LIEB141	12.44	.040	.21	5.42	.78	1.11	.03	3.89	.003	69.17	.23	.003	49	29
LIEB142	17.52	.035	1.94	7.11	.70	2.69	.18	4.76	.003	55.63	.63	.003	12	43
LIEB143	13.58	.010	1.15	1.87	.19	.74	.07	6.22	.003	70.95	.23	.003	14	20
LIEB144	11.91	.080	1.37	1.91	1.91	.97	.20	2.38	.003	70.23	.22	.003	60	60
LIEB145	12.43	.025	.73	2.84	.34	1.36	.08	5.15	.003	71.66	.22	.003	21	32
LIEB146	10.81	.030	2.83	4.99	.67	2.23	.45	1.38	.003	66.28	.27	.003	40	64
LIEB147	13.74	.080	1.33	3.00	1.76	.72	.12	3.53	.003	71.35	.23	.010	370	23
LIEB148	13.34	.125	1.85	1.98	1.83	.88	.04	2.84	.003	66.89	.25	.010	22	19
LIEB149	13.74	.050	1.79	3.31	.64	1.83	.05	4.17	.003	68.29	.35	.010	14	31
LIEB150	13.34	.090	.31	1.69	2.67	.47	.06	2.75	.003	68.70	.24	.003	45	17
LIEB150A	12.40	.010	7.73	14.26	.21	5.34	.33	2.55	.010	49.41	3.01	.015	214	71
LIEB151	12.70	.110	.50	3.16	1.74	1.37	.04	2.81	.003	67.56	.23	.003	11	40
LIEB152	11.84	.105	.14	3.76	1.62	.83	.03	2.70	.003	64.96	.22	.003	10	20
LIEB153	12.88	.125	.07	4.29	1.88	1.61	.08	2.24	.003	66.16	.24	.003	11	51
LIEB154	13.00	.120	.07	3.85	1.90	1.49	.08	2.61	.003	67.32	.25	.003	14	80
LIEB155	13.07	.110	.07	3.21	1.88	1.06	.05	3.30	.003	68.54	.22	.003	22	23
LIEB156	15.26	.095	.07	3.08	2.79	1.25	.05	2.91	.003	75.30	.28	.003	31	56
LIEB157	18.72	.025	.36	9.12	.74	8.06	.12	4.68	.003	52.41	.93	.003	17	101
LIEB158	19.23	.040	4.63	11.68	1.10	5.16	.13	2.47	.003	49.74	.88	.003	32	61
LIEB159	21.04	.045	7.19	7.97	1.05	4.05	.14	2.58	.003	51.64	.89	.003	84	50
LIEB160	13.49	.130	.24	3.80	2.57	.89	.02	2.24	.003	68.11	.25	.003	105	12
LIEB161	16.21	.075	1.81	5.27	1.20	1.86	.19	4.69	.003	69.14	.34	.003	4	32
LIEB162	14.74	.060	1.46	3.09	1.31	1.26	.04	3.86	.003	73.04	.27	.003	15	23

LIEB163	14.56	.065	.25	3.78	1.19	1.39	.06	4.28	.003	73.74	.26	.003	6	28
LIEB164	15.35	.010	8.80	13.36	.17	8.21	.32	2.79	.003	52.48	1.98	.010	76	71
LIEB165	16.13	.010	6.42	7.70	.22	6.10	.29	4.14	.003	55.25	.60	.003	39	32
LIEB166	16.68	.003	5.15	8.64	.11	6.23	.24	2.96	.003	55.80	.59	.003	7	43
LIEB167	16.55	.015	3.92	7.51	.19	3.93	.20	4.09	.003	54.48	.63	.003	130	43
LIEB168	18.15	.020	2.92	7.97	.71	6.38	.20	4.11	.003	53.50	.71	.003	12	53
LIEB169	16.36	.045	3.91	9.19	.54	3.45	.25	3.71	.003	56.88	.54	.003	340	54
LIEB170	14.31	.105	.54	2.87	2.23	2.05	.06	3.00	.003	69.72	.26	.003	17	33
LIEB171	15.16	.010	3.33	9.39	.22	6.34	.27	2.68	.003	62.24	.49	.003	146	54
LIEB172	18.53	.010	6.01	8.86	.09	5.68	.36	3.42	.010	51.37	.81	.003	63	70
LIEB173	14.23	.065	.25	4.34	1.11	1.63	.05	4.11	.003	66.60	.27	.003	8	33
LIEB174	13.50	.075	1.59	3.17	1.78	.76	.13	3.61	.003	66.17	.22	.003	430	23

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6415-64TH STREET
DELTA, B.C.
V4K 4E2

CERT. # : A8512276-001-A
INVOICE # : I8512276
DATE : 10-JUN-85
P.O. # : NONE
307

ATTN: ALEX DAVIDSON CC: FALCONBRIDGE - DUNCAN

Sample description	Prep code	Cu %	Pb %	Zn %	Ag FA g/tonne	Au FA g/tonne	CO2 % inorg
BCS 2372	207	<0.01	<0.01	<0.01	1.4	<0.1	--
BCS 2373	207	<0.01	<0.01	<0.01	8.2	<0.1	--
BCS 2402	207	0.01	<0.01	<0.01	0.7	<0.1	--
BCS 2403	207	<0.01	<0.01	0.01	0.7	<0.1	--
BCS 2404	207	<0.01	<0.01	<0.01	0.3	<0.1	--
BCS 2405	207	<0.01	<0.01	0.01	0.3	<0.1	--
BCS 2406	207	<0.01	<0.01	0.01	0.7	<0.1	--
BCS 2407	207	<0.01	<0.01	0.01	0.3	<0.1	--
BCS 2375		<0.01	--	<0.01	<0.3	<0.07	--
BCS 2365		0.011	0.01	0.01	0.1	0.02	--
BCS 2366		0.015	0.01	0.01	0.1	0.01	--
BCS 2370		0.009	0.01	0.01	0.1	0.02	--
BCS 2371		0.011	0.01	0.01	1.0	0.01	--

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V4K 4E2

CERT. # : A8512276-001-B
INVOICE # : I8512276
DATE : 12-JUN-85
P.O. # : NONE
307

ATTN: ALEX DAVIDSON CC: FALCONBRIDGE - DUNCAN

Sample description	Prep code	SiO2 % fusion	TiO2 %				
BCS 2372	207	--	--	--	--	--	--
BCS 2373	207	--	--	--	--	--	--
BCS 2402	207	--	--	--	--	--	--
BCS 2403	207	76.60	0.11	--	--	--	--
BCS 2404	207	--	--	--	--	--	--
BCS 2405	207	--	--	--	--	--	--
BCS 2406	207	61.90	0.24	--	--	--	--
BCS 2407	207	52.90	0.33	--	--	--	--
				--	--	--	--
				--	--	--	--
				--	--	--	--
				--	--	--	--

Registered Assayer, Province of British Columbia

LEGEND
UPPER CRETACEOUS
6 Nanaimo Group
6.4 Haslam Formation -shale,siltstone
6.5 Comox Formation -sandstone,conglomerate
UPPER TRIASSIC?
4.1 Diorite Intrusions
LOWER DEVONIAN AND OLDER
5 Dacite Porphyry Intrusions
5.2 Feldspar dacite porphyry
5.4 Quartz feldspar dacite porphyry
4.3 Speckled Diorite Intrusion
4.4 Leucodiorite Intrusion
SICKER GROUP
3 Myra Formation
3.1 Quartz eye felsic tuff
3.2 Feldspar porphyry felsic tuff
3.3 Quartz feldspar porphyry felsic tuff
1 Nitinat Formation
1.2 Feldspar basalt porphyry
1.3 Pyroxene feldspar basalt porphyry
creek
road
overgrown road
claim post
lithogeochemical sample
fault
outcrop
bedding
foliation
conformable contact
intrusive contact
mineralized horizon
OSBORN BAY
CHEMAINUS RIVER
HALALT
IR 2
NANAIMO SEDIMENTS 6.4
Whitehouse Creek
Bonsall Creek
PEAR
SICKER 1
LAWRANCE
KILLER GOSSAN ZONE 5-20% py
NOT MAPPED
NO OUTCROP
pyroxene gabbro
POWERLINE
ESQUIMALT & NANAIMO RAILWAY (CN)
LOCATION MAP
CHEMAINUS
VANCOUVER ISLAND
SALTSPRING ISLAND
DUNCAN
CORPORATION FALCONBRIDGE COPPER
MT. SICKER PROJECT
LIEBERMAN OPTION
GEOLOGY
GEOLOGY BY S. KILBREATH AND D. LEFEBURE
0 50 100 200 300 400 500
SCALE: 1:5000
DRAWN BY: /DG
DATE: JULY 1985
N.T.S. 92 B/13
FIG. NO.: 1
GEOLOGICAL BRANCH ASSESSMENT REPORT

LITTLE SICKER MOUNTAIN
SICKER 1
SICKER 2
LAWARANCE
Stratfords Crossing
MOUNT RICHARDS
Bonsall Creek
NANAIMO SEDIMENTS
AIR MAG TREND
POWER LINE
GEOLOGICAL BRANCH ASSESSMENT REPORT
13,907
UPPER CRETACEOUS
6 Nanaimo Group
6.4 Haslam Formation - shale, siltstone
6.5 Comox Formation - sandstone, conglomerate
UPPER TRIASSIC?
4.1 Diorite Intrusions
LOWER DEVONIAN AND OLDER
5 Dacite Porphyry Intrusions
5.2 Feldspar dacite porphyry
5.4 Quartz feldspar dacite porphyry
4.3 Speckled Diorite Intrusion
4.4 Leucodiorite Intrusion
SICKER GROUP
3 Myra Formation
3.1 Quartz eye felsic tuff
3.2 Feldspar porphyry felsic tuff
3.3 Quartz feldspar porphyry felsic tuff
1 Nitinat Formation
1.2 Feldspar basalt porphyry
1.3 Pyroxene feldspar basalt porphyry
creek
road
overgrown road
claim post
lithogeochemical sample
fault
outcrop
bedding
foliation
conformable contact
intrusive contact
mineralized horizon
LOCATION MAP
RIVER
CHEMAINUS
STUART CHANNEL
Crofton
SALTSPRING ISLAND
VANCOUVER ISLAND
Quamichan Lake
DUNCAN
SCALE: 1:250,000
CORPORATION FALCONBRIDGE COPPER
MT. SICKER PROJECT
LIEBERMAN OPTION
GEOLOGY
GEOLOGY BY S. KILBREATH AND D. LEFEBURE
GEOLOGY EAST OF HIGHWAY 1 FROM EASTWOOD, 1979
0 50 100 200 300 400 500m
SCALE: 1:5000
DRAWN BY: DL/DM
DATE: JULY 1985
N.T.S. 92B/13
FIG. NO.: 2

N
LITTLE SICKER MOUNTAIN
MOUNT RICHARDS
Ba %
Cu ppm
Zn ppm
1
2
3
GEOLOGICAL BRANCH ASSESSMENT REPORT
13,907
CORPORATION FALCONBRIDGE COPPER
MT. SICKER PROJECT
LIEBERMAN OPTION
Ba%,Cu,Zn ppm
0 50 100 500m
SCALE: 1:5000
DRAWN BY: D.L/T.M
DATE: JULY, 1985
N.T.S. 92B/13
FIG. NO.: 4

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,907

CORPORATION FALCONBRIDGE COPPER

MT. SICKER PROJECT
LIEBERMAN OPTION

K_2O, SiO_2, TiO_2%

SCALE: 1:5000

DRAWN BY: D L/TM

DATE: JULY, 1985

N.T.S. 92B/13

FIG. NO.: 5

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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CORPORATION FALCONBRIDGE COPPER

MT. SICKER PROJECT
LIEBERMAN OPTION

Ba%,Cu,Zn ppm

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FIG. NO.: 3

CORPORATION FALCONBRIDGE COPPER

MT. SICKER PROJECT
LIEBERMAN OPTION

$Na_2O, MgO, CaO\%$

0 50 100 500m

SCALE: 1:5000

DRAWN BY: DL/TM		FIG. NO.:
DATE: JULY, 1985	N.T.S. 92B/13	7

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,907

CORPORATION FALCONBRIDGE COPPER

MT. SICKER PROJECT
LIEBERMAN OPTION

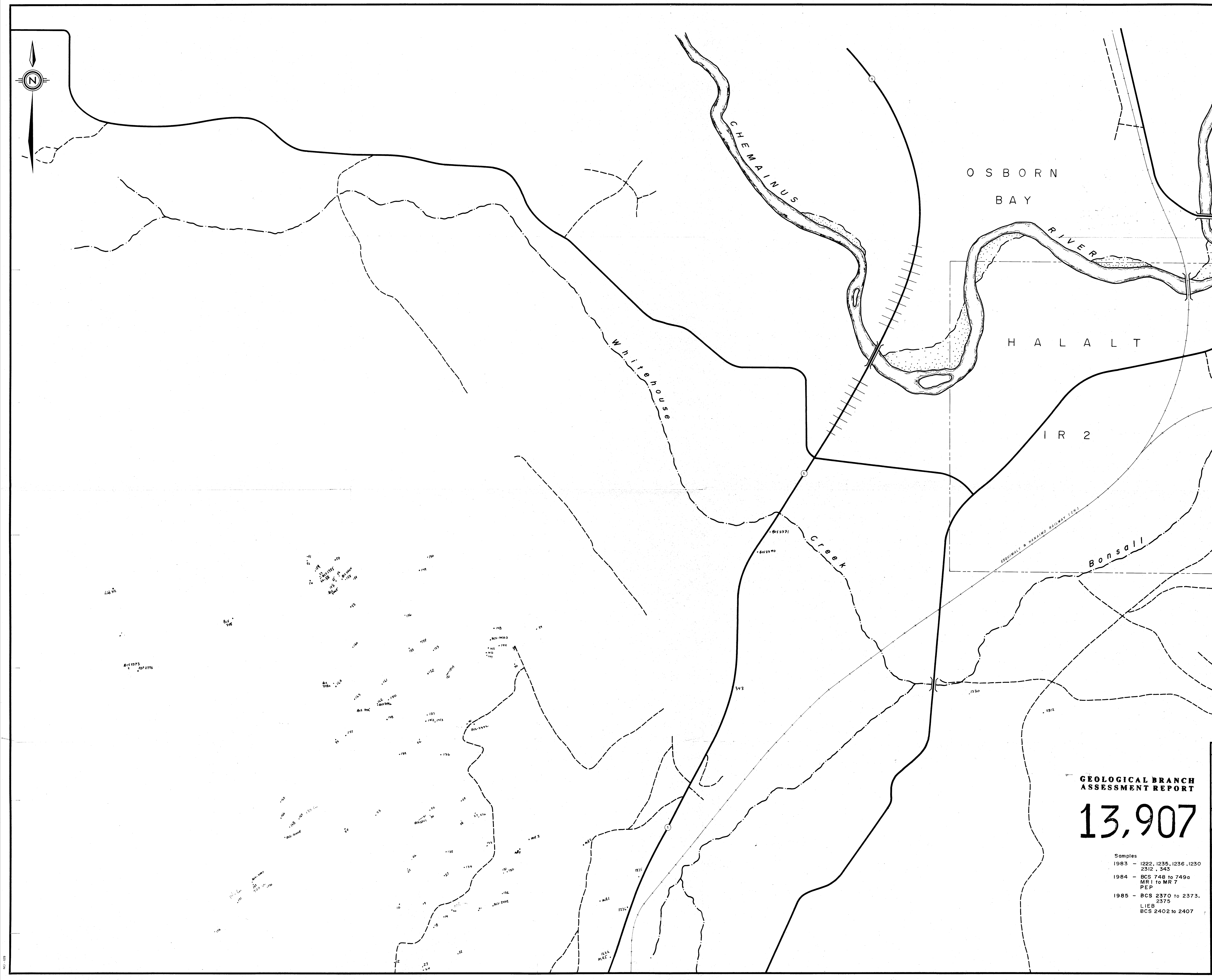
Na_2O, MgO, CaO%

0 50 100 500m

SCALE: 1:5000

DRAWN BY: DL/TM		FIG. NO.: 8
DATE: JULY, 1985	N.T.S. 92B/13	

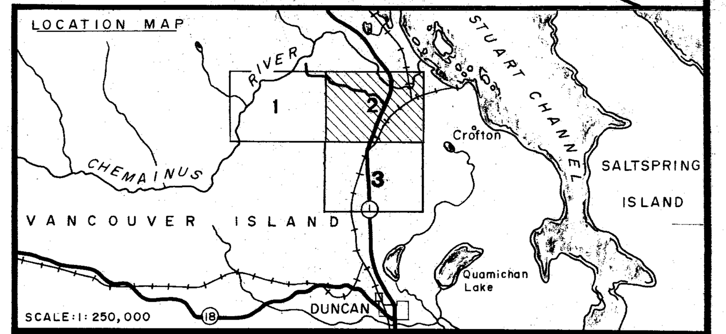
LITTLE SICKER MOUNTAIN
MOUNT RICHARDS
K2O
SiO2
TiO2
1
2
3
GEOLOGICAL BRANCH
ASSESSMENT REPORT
13,907
CORPORATION FALCONBRIDGE COPPER
MT. SICKER PROJECT
LIEBERMAN OPTION
K2O, SiO2, TiO2%
0 50 100
500m
SCALE: 1:5000
DRAWN BY: D L/TM
DATE: JULY, 1985
N.T.S. 92B/13
FIG. NO.:
6



GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,907

Samples
1983 – 1222, 1235, 1236, 1230
2312, 343
1984 – BCS 748 to 749a
MR 1 to MR 7
PEP
1985 – BCS 2370 to 2373,
2375
LIEB
BCS 2402 to 2407



CORPORATION FALCONBRIDGE COPPER

MT. SICKER PROJECT
LIEBERMAN OPTION

LITHOGEOCHEMISTRY
SAMPLE LOCATIONS

0 50 100 200 300 400 500
SCALE: 1:5000

DRAWN BY: DL/SK
DATE: JULY 1985 N.T.S. 92 B/13
FIG. NO.: 9

LITTLE SICKER MOUNTAIN
MOUNT RICHARDS
Stratfords Crossing
Bonsall Creek
POWER LINE
Samples
1983 - 1225 to 1228, 1222
1984 - MR5
1985 - LIEB-
BCS 2365, 2366
GEOLOGICAL BRANCH ASSESSMENT REPORT
13,907
LOCATION MAP
CORPORATION FALCONBRIDGE COPPER
MT. SICKER PROJECT
LIEBERMAN OPTION
LITHOGEOCHEMISTRY
SAMPLE LOCATIONS
0 50 100 200 300 400 500m
SCALE: 1:5000
DRAWN BY: DL, SK
DATE: JULY 1985
N.T.S. 92B/13
FIG. NO.: 10