GEOLOGICAL AND GEOCHEMICAL PROGRAM

HUSTON PROPERTY

HUSTON 2 and 3 and HAMMER MINERAL CLAIMS

SKEENA MINING DIVISION

MORESBY ISLAND, B. C.

N.T.S. 103B, 3E and 6E

131° 12' W, 52° 16' N

Owner: G. R. Richards

Operator: Chevron Canada Limited

Authors: S. McAllister
D. Arscott

[illegible] BRANCH
ASSESSMENT REPORT
NO. 9702

November, 1981

M502

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LIST OF FIGURES AND TABLES

INTRODUCTION

From August 18th to 28th, 1981 an extension of the preliminary geological and geochemical coverage conducted in 1980 by Chevron Standard personnel was extended approximately 1 kilometer to the east. The 1980 program conducted from the 27th of May to the 1st of June 1980 was in response to regional data collected a year earlier by JMT Services Corp., and on the basis of which the Huston claims had been staked. The geology and geochemistry maps contain both 1981 and 1980 data.

As previously, the program was an attempt to assess the relationship between geochemically anomalous gold and previously known magnetite-copper skarn mineralization and the significance of the anomalies.

CLAIMS

The property comprises the following claims:

Claim	Record No.	No. of Units	Expiry (prior to 1981 work)
Huston #1	1355	9	14 June 1982
Huston #2	1356	20	14 June 1982
Huston #3	1617	15	7 August 1982
Hammer	2685	20	2 December 1981

The Huston claims were staked by Gordon G. Richards in 1979 and the Hammer claim was staked by James S. Christie in 1980. They are now registered in the name of Chevron Canada Limited.

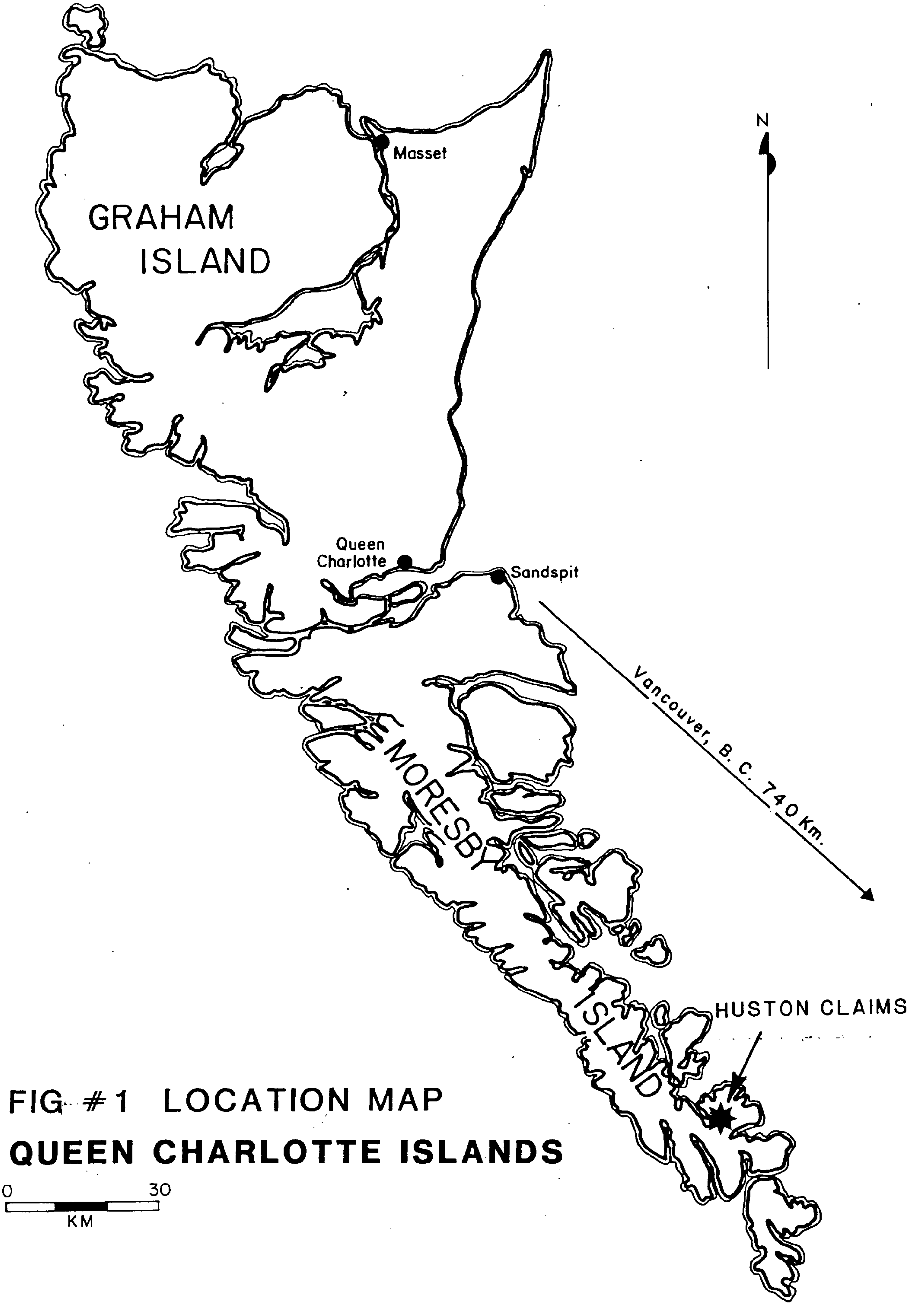
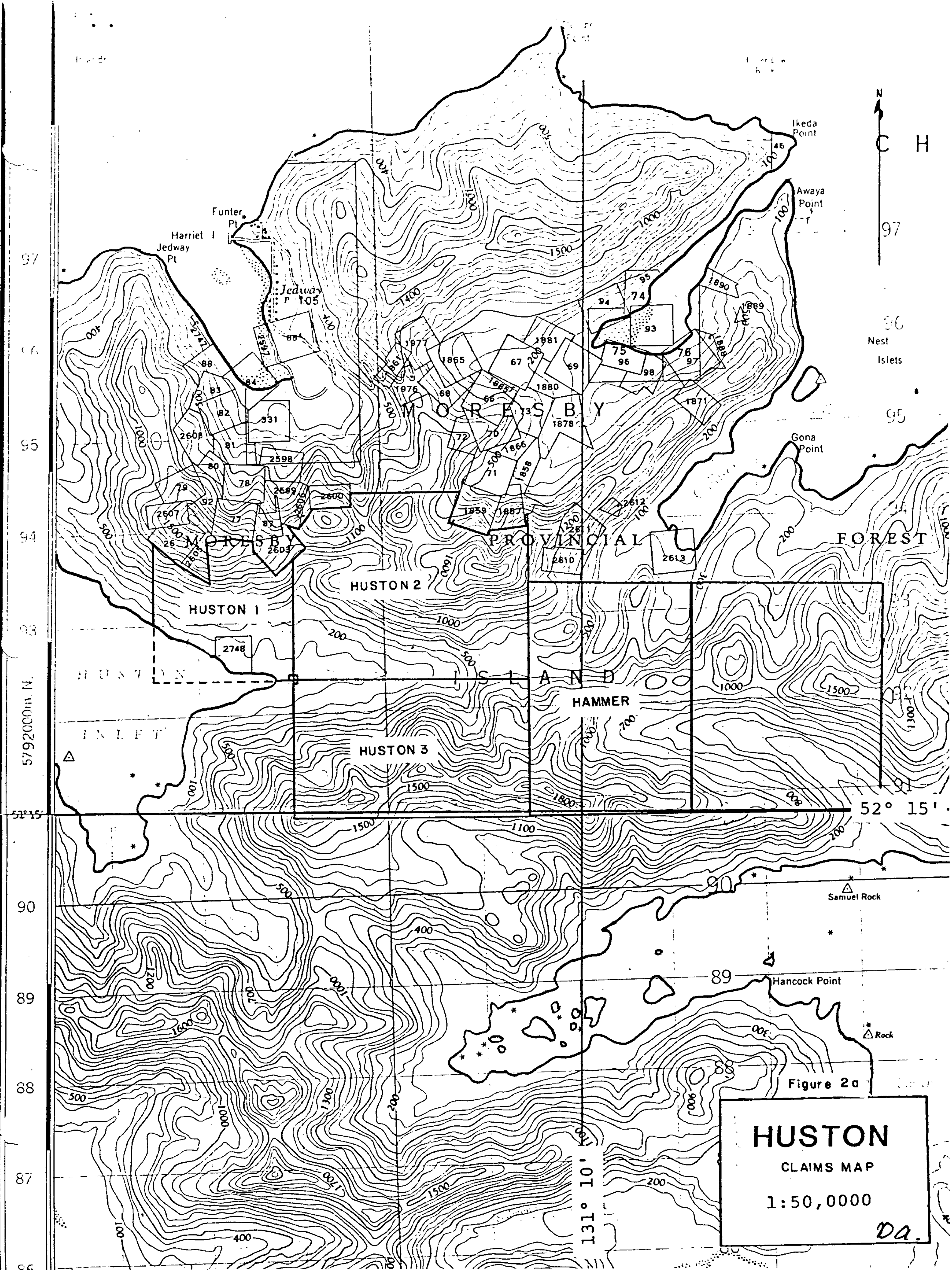


FIG #1 LOCATION MAP

QUEEN CHARLOTTE ISLANDS

HUSTON 1
HUSTON 2
HUSTON 3
HAMMER
MORESBY
PROVINCIAL
FOREST
MORESBY
ISLAND
HUSTON
INLET
Funter Pt
Harriet I
Jedway Pt
Jedway
Ikeda Point
Awaya Point
Gona Point
Nest Islets
Samuel Rock
Hancock Point
Rock
CH
N
5792000m.N.
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52° 15'
131° 10'
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1800
Figure 2a
HUSTON
CLAIMS MAP
1:50,0000
Da.

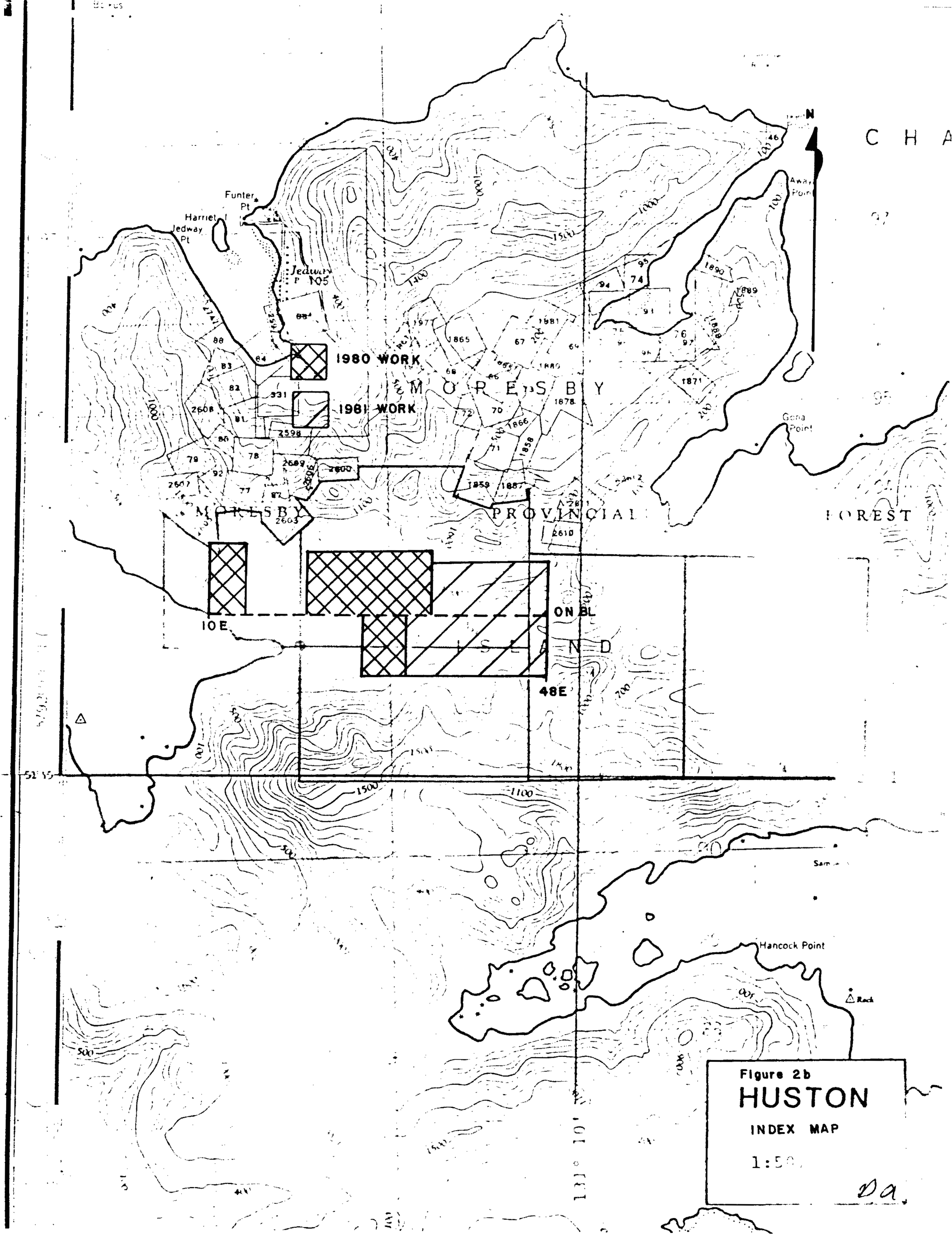


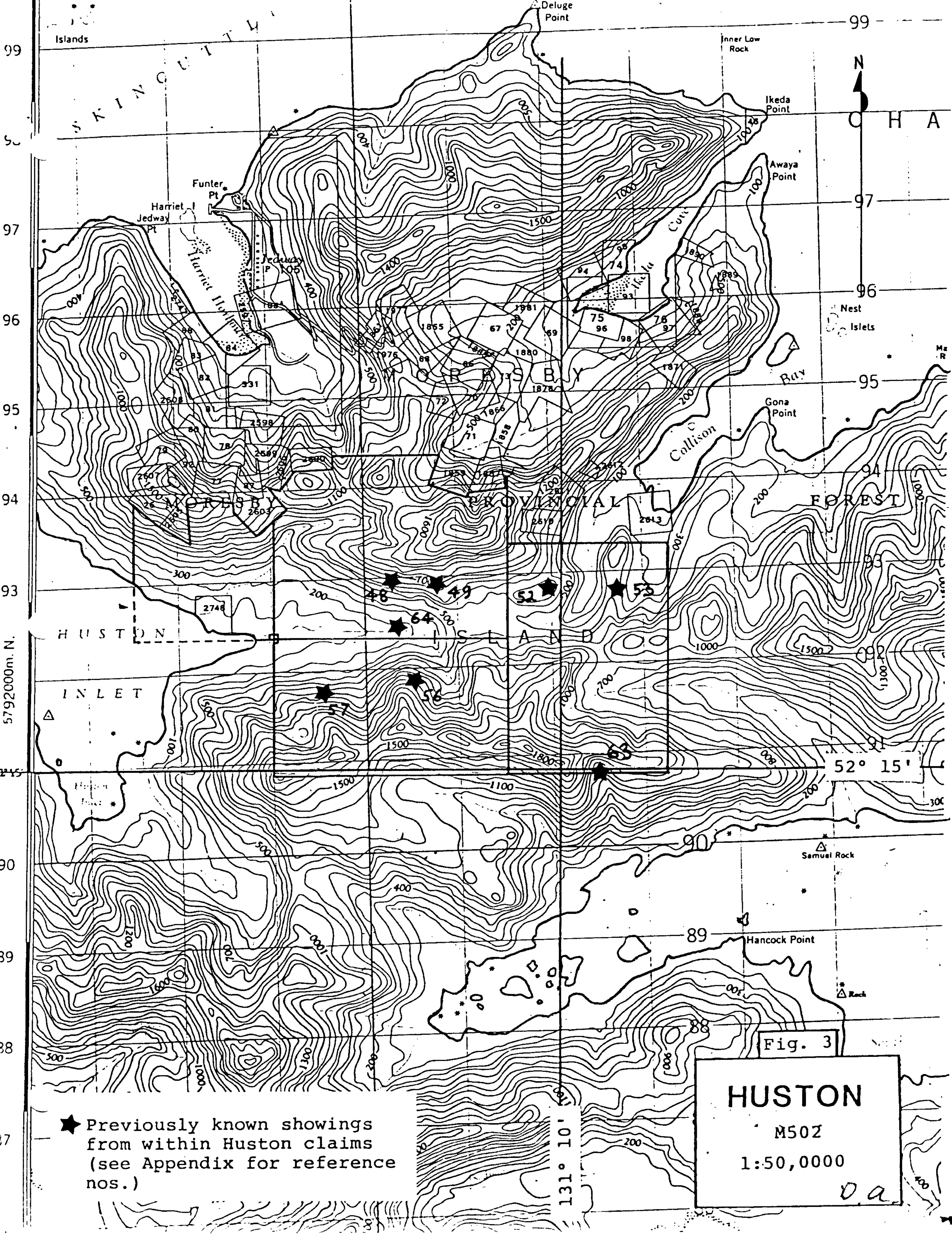
Figure 2b

HUSTON

INDEX MAP

1:50

Da.



★ Previously known showings from within Huston claims (see Appendix for reference nos.)

Fig. 3

HUSTON

M502

1:50,0000

Da

HISTORY

First interest in the Huston Inlet area occurred at the turn of the century with the discovery of the Jedway iron-copper deposit. Mineralization, on what later became the Jedway Iron Ore Ltd. property (immediately north of the Huston claims), was first explored by Francis Poole in 1863. Intermittent exploration followed until 1959, when major evaluation began. The Jedway property was in production from 1962 until 1968 producing 4.3 million tons of magnetite averaging 62% iron.

The interest spawned by the progressive development of the Jedway ore led to extensive exploration in adjacent areas, including that now covered by the Huston claims. Eight iron and/or copper showings are recorded on the Huston ground. The Hercules and Ida were worked in 1906 and 1907, the Meal Ticket and Maple Leaf in 1906, the Ivan in 1913, the Hope in 1960, and the Plunger in 1962. A description of these showings is included in the Appendix. Their location is shown on Figure 3.

GEOGRAPHY

The claims cover two main valleys draining into Collison Bay and Huston Inlet at the southeastern end of the Queen Charlotte Range. The adjacent ridges to the south and north are also on the property.

Rock outcrop is most extensive on steeper slopes and at higher elevations within the Huston property. The valley floors and gentle slopes, regardless of elevation, contain little outcrop. The topography is moderately steep and the vegetation is typical of west coast rain forest. The area is unlogged.

Some swampy areas are found in the poorly drained valley bottoms. Approximately 60% of the claims are underlain by glacial and alluvial cover. Outcrop is more extensive within the eastern part of the claim group.

GEOLOGY

General

During August of 1981, 36 person days were spent mapping on the Huston property. The geological map illustrated in Figure 4 incorporated both this year's work and 1980 mapping. The geology in this report is taken primarily from the 1980 Huston report. The general stratigraphy of the property is as follows:

Tertiary	Masset Formation?	Basalt dykes Rhyolite and rhyolite porphyry dykes
Tertiary and Cretaceous	Post-Tectonic Plutons	Granodiorite and diorite stocks
	Skarn	Magnetite-chalcopyrite skarn, magnetite skarn and silicate skarns
	Conglomerate	Highly siliceous conglomerate/breccia
Jurassic and Triassic	Kunga Formation	Massive black or white limestone
Triassic	Karmutsen Formation	Pillowed, amygdaloidal and massive basaltic andesites

Basalts

Basalts and basaltic andesites of the Karmutsen formation underlie approximately 70 percent of the claim group. These rocks vary from blackish-green to purple in colour and their texture varies from massive to vesicular to pillowed and amygdaloidal. The basalts tend to be find grained and equigranular although, locally, porphyritic varieties are observed. Vesicular basalt is more abundant than amygdaloidal basalt. Quartz or zeolites are present in the amygdaloidal basalt. Occasional olivine phenocrysts occur but are not common. The basaltic rocks in the northern central part of the grid and on the ridge at the north end of the mapped area appear dacitic in composition. Contacts between various textural types of basalt are commonly observed and have been followed partially during mapping, such as at the north east end of the grid when pillowed basalts overlie amygdaloidal basalts. At the northwestern end of the 1980 grid highly vesicular basalt overlies more massive non-vesicular basalt.

Volcanic rocks at the Huston property are variably altered and the intensity of alteration appears to be related to the intensity of fracturing of the rock. The types of alteration are (a) pyritization (b) epidotization (c) silicification and (d) carbonatization. Pyrite is common on fracture faces within the basalt and as fine grained disseminations. Pyrite generally accompanies fracture-filling epidote and quartz. Epidotization of basaltic rocks is widespread and more pervasive in nature. Quartz veins are not abundant in these basalts, however quartz is abundant as irregular pods and "bulls" in the pillowed variety. Quartz veins are most abundant where the basalts have been faulted and heavily fractured. In the northwestern part of the mapped area, fine grained silica was observed to cement fault gouge, and found accompanied by fine-grained epidote and pyrite. The basalts at the north east end of the grid commonly are weakly calcareous and in places are cut by small irregular calcite veins.

Limestone

Two types of limestone crop out on the property:

1. Coarsely-crystalline white limestone and marble.
2. Coarsely-crystalline, black, fetid limestone and marble.

Outcrops of marble are sporadically distributed and largely confined to the valley flanks on the eastern part of the property. A second area of limestone is in the vicinity of BL 12 + 00E, in the western part of the claims. Extensive drift cover and lack of bedding plane orientations precludes correlation of the limestone between the two areas.

The limestones have been designated by Sutherland-Brown (1968) as belonging to the Triassic to Jurassic-age Kunga formation and as overlying the Triassic-age Karmutsen basalts. On the claims this age relationship is not clear. The highest elevations on both the north and south sides of the property are underlain by basalt and it appears that the limestone in part, at least, underlies the basalts. If the limestone is younger, than extensive block faulting must have occurred in order for the limestone to crop out at lower elevations and be intermixed with the basalt (Figure 4). Only infrequently, however, can faults be mapped on the ground.

White and grey-white marble and limestone is much more common than black limestone, the latter giving off a foul smell when broken. These two limestone types have not been distinguished on the geological maps (Figure 4).

Conglomerate

A highly siliceous conglomerate/breccia unit of unknown thickness and extent, crops out in a major, north-flowing drainage at the southern border of the map area.

The conglomerate is composed of subangular to rounded clasts of basalt, argillaceous siltstone, and granodiorite set in a sugary-textured, white, very fine-grained matrix. The fragments, or clasts, are extremely variable in size and appear to constitute all of the rock types, except limestone, observed on the property. The origin of this rock type is not clear. It could have formed as the result of the incorporation of country rocks into an intruding rhyolite dyke or stock-like body, but the extent of the unit, and the absence of country-rock fragments in other rhyolitic bodies on the property argues against this hypothesis.

Skarn

Skarn is an important rock type underlying the central part of the property, at lower elevations. It has formed where marble has been metasomatically altered in the vicinity of the (grano) diorite stock and rhyolite dykes. Exposures of skarn are numerous and Figure 4 show the aerial extent of observed skarn outcrops on the property. The skarns have formed in a zone where there is a spatial coincidence of limestone, (grano) diorite, and rhyolite.

Three types of skarns occur:

1. Magnetite-chalcopyrite (bornite) skarn
2. Magnetite skarn
3. Silicate skarn

Magnetite-chalcopyrite skarn is only locally observed and chalcopyrite is, on the whole, a rare mineral. The most common skarn type is a nearly-massive magnetite rock with occasional pods and lenses of green to brown-coloured andradite garnet.

Large masses of calc-silicate skarn which either lack, or contain only minor amounts of magnetite, occur locally. The most abundant silicate mineral is medium to coarse-grained andradite garnet. Pyroxene also occurs but is usually subordinate to the garnet. Other calc-silicate minerals such as epidote and amphibole are not observed in the skarns at the Huston property. The silicate-rich skarn can contain abundant pyrite but less magnetite. In general, the proportion of garnet and pyrite decreases at the expense of magnetite. Massive magnetite skarns are pyrite-free.

The Huston skarns are, with one important exception which will be discussed below, mineralogically analogous to those at the Jedway deposit, 2 km north of the northern border of the claim group (Figure 2a).

Unlike the skarns which comprise the Jedway deposit, those at the Huston are locally highly silicated. A characteristic of many of the skarns on the property, which range up to 20 m thick, is the preponderance of quartz veins which cross-cut the earlier formed silicate and magnetite skarns. Coarse, euhedral to subhedral, prismatic quartz crystals grow in the veins. In addition, quartz fills vugs and open spaces in the skarns or occurs as 'blobs' which weather more resistantly than the skarn. In highly siliceous skarns, quartz and chlorite are the most common minerals.

In the vicinity of skarn outcrops, the black, fetid limestones and marbles are absent and only white limestones occur, perhaps indicating that the black marble is bleached in the vicinity of the skarn. While Sutherland-Brown (1968) divided the marbles in the region into two distinct units, based on their colour, evidence for this subdivision at the Huston property is lacking, and the change in colouration may be largely due to bleaching of black carbonates coincident with metasomatism.

Skarns are generally in contact with either rhyolite, granodiorite, or both. All three rock types are intimately intermixed. There is very little lateral continuity to the skarns. It is not possible to determine whether skarn formed during the intrusion of the granodiorite or the rhyolite. However, it is likely that skarn formed during intrusion of the granodiorite stock and that subsequent rhyolite dyking, quartz veining, and silicification of the skarn occurred contemporaneously. At the Jedway Pit, neither rhyolites nor the intense silicification common to the Huston skarns were observed, supporting the suggestion that silicification of skarn and intrusion of rhyolites are genetically related.

Skarns formed only in the region where limestones occur on the Huston property and therefore it is likely that limestone was the protolith of the skarns. There is no evidence of skarn having formed from basic volcanic rocks. However, as has been suggested by others, the ferruginous basalts may have supplied much of the ferric iron necessary for the deposition of magnetite in the skarns.

Granodiorite and Diorite Stocks

Intrusive rocks varying in composition between granodiorite and diorite are extensively exposed in the southeastern part of the area and form small, irregular dyke-like bodies in the northwest. The rock is medium grained and even-textured and forms irregular apophyses intermixed with all other rock types. A continuous intrusive body likely underlies this part of the claims at a shallow depth.

The (grano) diorite is generally pervasively, but weakly, chloritized and locally epidotized. The rock is generally only weakly fractured; fracture faces are weakly iron stained.

At the southeastern part of the property the granodiorite is cut by abundant basaltic dykes. Rhyolite dyking, however, is more common in the western part of the granodiorite stock.

Rhyolite

A northwest-southeast trending area of rhyolite dykes bisects the claim group. Rhyolite has been observed to cross-cut all other rock types except the basaltic dykes and is, therefore, one of the youngest rock types on the property. The rhyolite weathers the typical white colour. Very weakly disseminated pyrite can occur but more commonly, the pyrite occurs as fracture fillings. No other alteration is observed.

The rhyolite may represent feeders to Tertiary felsic volcanism and may be considered part of the Masset formation.

Basaltic Dykes

Abundant basaltic dykes with various attitudes are found in the southeast end of the grid cutting the granodiorite stock as well as rhyolite dykes. These basalts are probably the youngest rocks on the property and may represent feeders to Tertiary basaltic flows of the Masset formation.

The basalts are medium to fine grained, equigranular, often calcareous and contain disseminated pyrite.

Structure

Only one bedding attitutde could be obtained from limestone, near 13E, IN, of 290/35S. Lack of bedding attitudes precluded detailing the attitude of the unit. Juxtaposed outcrops of limestone/skarn and of basalt in the region of skarns on the property, indicate that vertical or block faulting may have occurred, as was discussed. A few vertically dipping normal faults were mapped. Prominent linear features of a variety of orientations are evident on the airphotos. Few were observed within the area of the detailed grid coverage, perhaps due to the very heavy timber growth.

The zone of rhyolite dykes defines a broadly linear trend in the NW-SE direction, and the emplacement of these dyke-like bodies may have been controlled by a pre-existing structural feature.

The rocks which underlie the Huston property are little-deformed and relatively non-metamorphosed in the regional sense.

Summary

The geological history of the Huston property is summarized as follows:

1. Deposition of Karmutsen basalts of alternating massive, pillowed and vesicular flows in a submarine environment.
2. Deposition of black and grey limestones with intermittent basaltic volcanism.
3. Intrusion of granodiorite and diorite stocks and resultant formation of skarn. Chloritization, epidotization, pyritization, and perhaps silicification of basalts may have occurred at this time.
4. Intrusion of the swarm of rhyolite dykes and the co-eval intense silicification and quartz veining of the skarns.
5. Intrusion of basaltic dykes.

GEOCHEMISTRY

General

A total of 36 person days were spent collecting 270 samples in August 1981. These samples were analysed for Au, As and Cu. Additionally 14 of the samples were also analysed for Ag. The sample distribution is as follows:

Sample Type	Number of Samples
rock	51
silt or soil	219

The soils were collected perdominantly on a 50 m x 100 m grid with a 200 m line spacing near the eastern end of the 1981 grid. The soils were sampled from the 'B' horizon at an average depth of 10 to 15 cm using prospecting picks and high wet strength paper sample bags. The rocks were collected sporadically throughout the mapping traverse in small plastic sample bags.

The samples were shipped to Vangeochem Labs in North Vancouver for analysis. The analytical techniques are outlined in the Appendix.

Rock Anomalies

A description of rocks collected with anomalous gold values follows in Table I. It was found that these rocks are all either magnetite skarns or silicified basalts closely associated with the skarn rocks. The gold-rich rocks were collected mainly from the center of the 1980 - 1981 grid between 32 E and 39 E both north and south of the baseline. One zone of anomalous rocks occurs north of the baseline and trends generally east-west, reflecting the distribution of skarn rocks in the area.

In Table 2 that follows there is a list of rocks collected with anomalous copper values. These rocks are either magnetite skarns, magnetite-chalcopyrite skarns or silicified basalts closely associated with the skarns. The distribution of these rocks on the grid coincides quite closely with the distribution of gold-rich rocks.

Two of the six rocks analysed for silver show anomalous values. Both are silicified basalts.

The arsenic geochemical results are generally low in all lithologies, with only three values greater than 100 ppm.

TABLE 1

ROCK SAMPLES
(Au rich)

Sample No.		Au (ppb)	As (ppm)	Cu (ppm)
BC-9	Silicified basalt in contact with a magnetite skarn (35+55E 6N)	4400	80	149
BC-21	Magnetite skarn with pyrite and quartz veins (33E 5+90S)	580	2	191
BC-6	Skarn with pyrite, magnetite and quartz (35E 3N)	370	35	83
BC-25	Magnetite skarn with epidote and garnet (float) (37E 3+95N)	330	2	1190
H-80-16*	Highly rusty outcrop intensely silicified and cut by quartz veins	270	2	247
H-KO-5*	Quartz and pyrite rich float (34+70E 2N)	240	300	259
RW-136	Magnetite skarn in contact with silicified basalt (39E 5N)	190	2	269
H-80-17*	Showing of malachite, azurite, chalcopyrite and magnetite in 3' x 8' trench in diorite	190	4	6900
BC-28	Magnetite skarn with malachite, quartz and pyrite (37E 5+10N)	180	2	7500
BC-34	Skarn with chalcopyrite? (37+80E 4+50N)	160	25	166
RW-84	Magnetite skarn in contact with intensely quartz veined basalt (42E 4+75N)	150	2	3670
BC-12	Magnetite skarn with pyrite, specularite, and quartz (float) (35 + 70E 3+30N)	150	150	65
L-HO-34*	Magnetite skarn with pyrite and highly siliceous	150	50	490
K-HO-3*	Magnetite skarn float (34+50E 1+80N)	100	4	2880

Note: *denotes a rock sample taken in 1980.

TABLE 2

ROCK SAMPLES
(Cu rich)

SAMPLE NO.		Cu (ppm)	As (ppm)	Au (ppb)
BC-28	Magnetite skarn with malachite, quartz and pyrite (37E 5+10N)	7500	2	180
H-80-17*	Showing of magnetite, chalcopyrite, azurite and malachite in 3' x 8' trench in diorite	6900	4	190
BC-32	Chalcopyrite, magnetite skarn (38+20E 4N)	6000	4	40
RW-84	Magnetite skarn in contact with intensely quartz veined basalt (42E 4+75N)	3670	2	150
HKO-3*	Magnetite skarn float (34+50E 1+80N)	2880	4	100
TS-14	Silicified basalt with chalcopyrite and epidote veins (48+50E 2+50S)	2100	2	40
RW-37	Magnetite skarn in contact with basalt (34+80E 5+70S)	1760	10	nd
BC-15	Magnetite skarn (33+50E 0+75S)	1220	2	70
BC-25	Magnetite skarn with epidote and garnet (float) (37E 3+95N)	1190	2	330
H-80-8*	Magnetite skarn	1040	4	90
L-HO-3*	Magnetite skarn float	820	2	40
DO-14*	Basalt with quartz veining and epidote	640	4	nd
RW-38	Magnetite skarn in contact with pyritic basalt (34E 6S)	560	2	50

Note: *denotes a rock sample taken in 1980.

There is a very strong positive correlation between Au and Cu content of the rocks, as is seen quite clearly both in Tables 1 and 2, as well as in Figure 5a. The copper rich rocks define a slightly broader zone than do the gold rich rocks. The correlation between Cu and As is strongly negative. Rocks that show high Cu values have very low As values. The relationship between the As and Au content of the rock is less clear. It is tempting to say that no correlation exists between these two elements in this environment.

With so few samples analysed for Ag it is not possible to determine its relationship with other metals.

Soil Anomalies

These main zones of anomalous gold values occur in the centre of the Huston grid (Figure 5b). These zones are approximately located as follows:

30E to 33E and ON to 2 + 50S
28E to 34E and 3N to 6N
34E to 39E and 2N to 6N

The highest value obtained was 700 ppb (1980 soil sample).

A broad arsenic zone is defined between 27E and 33E from 6S to 6N which exhibits a fair positive and somewhat peripheral correlation with the gold distribution (Figures 5c and 5e). The highest value obtained is 600 ppm As.

The distribution of copper anomalies exhibits a strong positive correlation with that of gold anomalies with three general zones defined as described above for gold. The maximum value obtained was 1450 ppm Cu. The relationship of copper and arsenic is less clearly defined. The arsenic anomalies have a weak positive correlation with, are more broadly defined than and are peripheral to the copper anomalies.

The gold and copper soil anomalies show a strong positive correlation with respect to each other. The arsenic anomaly is peripheral to the gold copper anomalies.

Correlations between Soil and Rock Geochemistry and Bedrock Geology

Comparison of Figure 4 (Geology), Figure 5c (Rock Geochemistry) and Figure 5c (Soil Geochemistry: Correlations) show that there is a well defined correlation between soil and rock geochemistry and general geology.

Values for all metals over the western and for eastern part of the grid are low. In this region the Karmutsen basalts and diorite predominates. The contact between the basalt and the diorite can be delineated partially on the basis of soil geochemistry (copper and arsenic).

The soil and rock gold anomalies are positively correlated and reflect the underlying geology. The Au anomalies overlie basalts associated with rhyolite dykes, limestones and skarns to the west of the intrusive stock. All the rocks with anomalous gold values are either skarns or basalts closely associated with skarns suggesting that the skarn has resulted in the anomalous soil values. A composite rock chip sample of the Jedway Fe-Cu skarn ore, however, returned a value of only 20 ppb Au and 4 ppb As. This would indicate a greater

Au enrichment of the skarns on the Huston property, than on the Jedway. The higher gold value of the Huston skarn (up to 580 ppb Au) may be related genetically to the period of silicification.

The copper soil anomalies exhibit a weak positive correlation to the copper rock anomalies. The copper dispersion within the rocks is much broader than and occurs peripherally to the east of the soil anomalies. Basalts associated with skarns, limestones and rhyolite dykes underlie the copper soil anomalies.

The few rocks exhibiting anomalous arsenic values occur to the east of the arsenic zones defined by a broad distribution of anomalous As values in the soil. The arsenic zone lies to the west of the intrusive contact and is underlain primarily by basalts. This zone is outside the limit of skarn outcrop.

The clear correlation between anomalous soil and rock values (Cu and Au) and regions underlain by rhyolite, limestone, skarn and basalt in the central part of the grid indicate that metals have been introduced or concentrated during the intrusion of the granodiorite or rhyolite. The anomalous metal content, Au and Cu, within the skarn is seen by the anomalous rock and soil geochemistry in these areas.

MAGNETOMETER SURVEY

The overall survey results are characterized by a moderately broad (2770γ) range on a base of 58,000γ. There are two distinct categories of response, one broad and relatively even, clearly relating to bedrock type, and another of close, erratic variations, corresponding to small bodies of magnetite skarn.

The Karmutsen basalts are well represented by a broad range of values from 700 to 1300γ, the limestones by a narrow range of 900 to 1100γ, and the intrusive diorite by a broad area of 200 to 800γ. In addition the diorite contact zone is represented by extreme fluctuations (110 to 2630γ) which probably represents a particular abundance of skarn in this vicinity.

Except for a partial positive correlation of Cu with magnetism, (a consequence of many of the skarns being Cu rich), there is little obvious relationship between the geochemical response and the magnetic response. Obviously magnetic readings on this property provide a valuable adjunct to geological mapping, and their coverage should be expanded during subsequent work.

CONCLUSIONS

The geological and geochemical studies together with the magnetometer survey of the Huston property have further delineated the zones of anomalous soils and rocks and emphasized the complexity of the underlying geology. The anomalous areas coincide with a region underlain by basalt, rhyolite dykes, limestone and skarn. The skarn zones appear to be the source of the anomalous metal values both in rocks and soils.

RECOMMENDATIONS

1. An extension of the present grid especially to the east and to the north.

2. Extension of the magnetometer coverage especially in the area of known skarn outcrop.

3. Fill-in mapping and geochemistry on northeastern end of the grid between 40E and 48E.

4. Detailed mapping of the skarns.

S McAllister

S. McAllister

D. Arscott

D. Arscott

APPENDIX

HUSTON CLAIMS
1981 PROGRAM COST
(16 AUG to 30 AUG 1981)

LABOUR COSTS

NAME	FUNCTION	FIELD	OFFICE	TRAVEL	TOTAL
H. Wober	Supervisor	2	-	2	4
D. Arscott	Supervisor	1	3	2	6
T. Sandberg	Party chief	13	-	2	15
D. Francis	Assistant	13	-	2	15
C. Williams	Assistant	13	-	2	15
C. Bradley	Assistant	13	-	2	15
R. Watson	Assistant	13	-	2	15
B. Coates	Assistant	13	3	2	18
		81	6	16	103

103 days @ average per diem rate of 90.	9270.00

EXPENSES

Airfares, Vancouver-Sandspit, pro-rated			
HW.,DA 50% X 2 X 220.30 =	220.30		
TS,CB,RW,CW 100% X 4 X 220.30 =	881.20		
BC,DF 30% X 2 X 220.30 =	132.18		
	1233.68	1233.68	
Helicopter Mobilization 4.7*, 16 Aug			
Servicing 1.4 hrs, 20 Aug			
Demobilization 4.5 hrs, 30 Aug			
10.6 hrs @ 538.		5702.80	
Analyses, 220 soils, for Au,As&Cu (11.05)	2431.00		
51 rock for Au,As, &Cu (11.30)	576.30		
	3007.30	3007.30	
Food 97 days @ 15.		1455.00	
Freight, allow		50.00	
Allowance for drafting		300.00	
Magnetometer 15 days @ 50.	750.00		
Magnetometer base station,17days@82.12	1396.04		
		2146.04	
Hotels, 4 room, 1 might @50. ea		200.00	
Field supplies, 81 days @ 10.		810.00	
Camp, 81 days @ 10.		810.00	
Truck 2 days @ 40		80.00	
TOTAL EXPENSES			15794.82
TOTAL PROGRAM COST			$ 25064.82

* 3 round trips, 6+ camp gear.

D. Arscott

D. Arscott
10 Sept 81

CERTIFICATE

I, David Philip Arscott am a Professional Engineer, registered in British Columbia with office address at 901 - 355 Burrard Street, Vancouver, B. C. V6C 2G8.

I have practiced Mineral Exploration almost continuously since 1961, and hold degrees in Mining Engineering (1963) and Mineral Exploration (1966).

The 1981 program on the Huston claims was carried out under my direction.

D. Arscott

DAVID ARSCOTT, P.Eng.
September 1981

STATEMENT OF QUALIFICATIONS

I, Sandra Gael McAllister, am a professional geologist with office at 901 - 355 Burrard St., Vancouver, B. C. V6C 2G8.

I am a graduate of Queen's University (B.Sc.(Hon.) 1981) and have worked in mineral exploration, mainly seasonally, since 1978.

Sandra Gael McAllister

SANDRA GAEL McALLISTER
November, 1981

PREVIOUSLY KNOWN SHOWINGS OUTCROPPING WITHIN HUSTON CLAIMS

(Excerpts from Sutherland-Brown 1968)

Plunger
(56)

This property is part of the large group of claims held by Jedway Iron Ore Limited and The Granby Mining Company Limited, specifically the Plunger 1 to 4 held by Granby. It seems likely these showings were originally called the Ivan in 1913. They are 1 mile east of the southeast end of Huston Inlet and scattered on the south side of the valley from about 300 to 850 feet. There are two principal showings: one at about 550 feet elevation is a blob-like body some 50 by 30 feet on the surface, composed of magnetite and garnet; the other, between 700 and 825 feet elevation, is a planar deposit some 500 feet long and 25 feet or less wide, composed of skarn with magnetite, pyrite, and chalcopyrite. The upper deposit apparently is a replacement of a northwest-trending shear zone and is of interest primarily for copper content. A number of pits dating from the early exploration expose the mineralization. A small adit of similar age below the showings fails to reach the mineralization.

The showings are all very near the contact of the Carpenter quartz monzonite stock, and the lower magnetite deposit is actually a local flatish contact. Most of the replacement is of metamorphosed Karmutsen greenstones, some of granitic rock. Post-ore rhyolite and basalt dykes are common in the area. In 1962 Jedway did 150 feet of packsack drilling on the property.

[References: *Minister of Mines, B.C.*, Ann. Rept., 1913, p. 101; Young and Uglow, *Geol. Surv., Canada,* Iron Ores of Canada, Vol. I, Ec. Geol. Ser. No. 3, 1926, pp. 42–43.]

Ida
(48)

This property is part of the Jim group of recorded claims held by Jedway Iron Ore Limited, about a mile east of the southeast end of Huston Inlet and about 1,000 feet west of the Hercules. The showing, at an elevation of about 800 feet, is a vertical dyke-like body of magnetite-rich skarn striking north 10 degrees east. The magnetite contains green garnet and calcite in variable amounts and minor sulphides. The body can be traced for nearly 200 feet and is up to 25 feet wide.

[References: *Minister of Mines, B.C.*, Ann. Rept., 1907, p. 68; Young and Uglow, *Geol. Surv., Canada,* Iron Ores of Canada, Vol. I, Ec. Geol. Ser. No. 3, 1926, p. 43.]

Hercules
(49)

This property is part of the Jim group of recorded claims held by Jedway Iron Ore Limited. The showing is 1¼ miles east of the southeast end of Huston Inlet at an elevation of about 1,100 feet. It was discovered about 1906 by McMillin, Watson, and McEachern. The showing consists of the irregular metasomatic replacement of the contact of the Karmutsen Formation with the Carpenter quartz monzonite stock, near the base of the Kunga limestone and is up to 100 feet thick. The purity of the skarn varies widely, much being quite garnetiferous. Some cuts and two small adits expose the ore on the steep but covered slope.

[References: *Minister of Mines, B.C.*, Ann. Repts., 1907, p. 68; 1913, p. 101; Young and Uglow, *Geol. Surv., Canada,* Iron Ores of Canada, Vol. I, Ec. Geol. Ser. No. 3, 1926, pp. 43–44.]

Hope
(64)

This property is part of a group of located claims held by The Granby Mining Company Limited. The showings are about 1 mile east of the southeast end of Huston Inlet at about 300 feet elevation.

The showings consist of a dyke-like replacement body of sulphide-rich skarn, of interest primarily for its copper content. The body is exposed for about 80 feet and is up to 20 feet wide, although the copper-rich portion is narrower. Grades of the order of 2.7 per cent copper across 10 feet are reported (Ann. Rept., 1918). It strikes north 60 degrees west and dips steeply east. A similar showing occurs several hundred feet to the south along strike. The body occurs near the contact of the Carpenter quartz monzonite but is seemingly entirely within that body. Silver Standard Mines Limited drilled one short packsack hole in February, 1960, which intersected 20 feet of magnetite with 5 feet containing 0.85 per cent copper.

[References: *Minister of Mines, B.C.*, Ann. Repts., 1913, p. 101; 1918, pp. 39–40; 1929, p. 61.]

Ivan
(57) Cu, Fe replacement in Karmutsen

(63) Fe replacement in Karmutsen

Meal Ticket and Maple Leaf
(52) (53)

These two separate properties are similar and adjacent, about one-half mile south of Collison Bay. Although they have been covered by recorded claims in recent years, they have received little new work. Both were discovered about 1906. They both consist of dyke-like sulphide-rich masses of magnetite, pyrrhotite, pyrite, and chalcopyrite that are of interest for their copper content. They appear to be metasomatic replacements along steep northerly striking fault or fracture zones within the Karmutsen Formation. The Meal Ticket has been followed about 200 feet on the surface, is up to 8 feet wide, and is intersected by a 33-foot adit. The Maple Leaf had considerable development by the Collison Bay Mining Company. Three adits were driven; the upper at 500 feet is 15 feet long, the central at 350 feet elevation has a 100-foot crosscut, 100-foot drift, and 80-foot winze; and the lower is 50 feet long but did not reach the ore. Both bodies had copper contents of the order of 1 to 2 per cent.

[References: *Minister of Mines, B.C.*, Ann. Repts., 1907, p. 65; 1909, p. 81; 1918, pp. 44–45; 1923, p. 44.]

FIELD TECHNIQUES

GRID CONTROL

All control was by hip chain and compass with slope corrected stations at 50 m intervals. The stations were marked with double flags (orange and blue survey tape) and interstation lines with single orange flagging.

The base map was fitted to coutoured 1:5,000 scale orthophotos. A reasonably good fit with close topographic control was obtained for the 1981 data.

MAGNETOMETER SURVEY

This survey (8.3 line km) was carried out by Chevron personnel, covering some of the more geologically complex areas mapped in both 1980 and 1981. Readings were taken at 25 m intervals in general, and more closely in magnetically active areas. Diurmal corrections were made against a fixed base station, up to 2.2 km away from the most distant reading. The field magnetometer was a Barringer MP-2 with remote pole supported sensor, measuring total magnetic field. The base station was the same model instrument with a chart recorder supplied by Scintrex.

VGC

986-521
NGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 604-~~988XXXX~~
V7P 2S3

To: Chevron Standard Ltd.
Mineral Staff
#901 - 355 Burrard St.
Vancouve, B.C. V6L 2G8

From: Vangeochem Lab Ltd.
1521 Pemberton Avenue
North Vancouver, B.C. V7P 2S3

Subject: Analytical procedure used to determine Aqua Regia soluble gold in geochemical samples.

1. Method of Sample Preparation

(a) Geochemical soil, silt or rock samples were received in the labroatory in wet-strength 4 x 6 Kraft paper bags or rock samples sometimes in 8" x 12" plastic bags.

(b) The dried soil and silt samples were sifted by hands using a 8" diameter 80-mesh stainless steel sieve. The plus 80-mesh fraction was rejected and the minus 80-mesh fraction was transferred into a new bag for analysis later.

(c) The dried rock samples were crushed by using a jaw crusher and pulverized to 100-mesh or finer by using a disc mill. The pulverized samples were then put in a new bag for later analysis.

2. Method of Digestion

(a) 5.00 grams of the minus 80-mesh samples were used. Samples were weighed out by using a top-loading balance into beakers.

(b) 20 ml of Aqua Regia (3:1 $HCl:HNO_3$) were used to digest the samples over a hot plate vigorously.

(c) The digested samples were filtered and the washed pulps were discarded and the filtrate was reduced to about 5 ml.

(d) The Au comples ions were extracted into diisobutyl ketone and thiourea medium. (Anion exchange liquids "Aliquot 336").

.....2

(e) Separate Funnels were used to separate the organic layer.

3. Method of Detection

The gold analyses were detected by using a Techtron model AA5 Atomic Absorption Spectrophotometer with a gold hollow cathode Lamp. The results were read out on a strip chart recorder. A hydrogen lamp was used to correct any background interferences. The gold values in parts per billion were calculated by comparing them with a set of gold standards.

4. The analyses were supervised or determined by Mr. Conway Chun or Mr. Eddie Tang and his laboratory staff.

for Conway Chun
Eddie Tang
VANGEOCHEM LAB LTD.

ET: jl

VGC

986-5211
ANGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 604-~~988-XXXX~~
V7P 2S3

TO: Chevron Standard Ltd.
Mineral Staff
#901 - 355 Burrard St.
Vancouver, B.C. V6L 2G8

FROM: Vangeochem Lab Ltd.
1521 Pemberton Ave.
North Vancouver, B.C. V7P 2S3

SUBJECT: Analytical procedure used to determine hot acid soluble arsenic in geochemical silt, soil, lake sediments and rock samples.

1. Sample Preparation

(a) Geochemical soil, silt, lake sediments or rock samples were received in the laboratory in wet-strength 3½ x 6½ Kraft paper bags and rock samples in 4" x 6" Kraft paper bags.

(b) The wet samples were dried in a ventilated oven.

(c) The dried soil and silt samples were sifted by hands using a 8" diameter 80-mesh stainless steel sieves. The plus 80-mesh fraction was rejected and the minus 80-mesh fraction was transferred into a nwq bag for analysis later.

(d) The dried rock samples were crushed by using a jaw crusher and pulverized to 100-mesh or finer by using a disc mill. The pulverized samples were then put in a new bag for later analysis.

2. Method of Digestion

(a) 0.25 gram of the minus 80-mesh sample was used. Samples were weighed out by using a top-loading balance.

(b) Samples were heated in a sand bath with concentrated perchloric acid (70 - 72% $HClO_4$ by weight) at a medium heat for four hours.

(c) The digested samples were diluted with demineralized water.

...2

3. Method of Analysis

   (a) Potassium iodide and stannous chloride in HCL were added to the digested samples.

   (b) Zinc metal was introduced and the arsenic in solution was gassed off as arsene through a glass wool scrubber plug saturated with lead acetate and into a solution of silver diethyldithiocarbamate in chloroform with 1-ephedrine, forming a red complex with the silver diethyldithiocarbamate.

   (c) The concentration of the arsenic was determined colorimetrically by comparing the intensity of the color of the red complex with a set of known standards prepared in a similar fashion as the samples.

4. The analyses were supervised or determined by Mr. Eddie Tang or Mr. Conway Chun and their laboratory staff.

for Conway Chun
Eddie Tang
VANGEOCHEM LAB LTD.

VGC

986-5211
VANGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 604-XXXXXXXX
V7P 2S3

October 16, 1981

To: Chevron Standard Ltd.
901 Marine Building
355 Burrard Street
Vancouver, B.C. V6C 2G8

From: Vangeochem Lab Ltd.
1521 Pemberton Avenue
North Vancouver, B.C. V7P 2S3

Subject: Analytical procedure used to determine hot acid soluble Cu & Ag in geochemical silt, soil, and rock samples.

1. Sample Preparation

(a) Geochemical rock, silt, and soil samples were shipped to the lab by the above client. The rock samples were either stored in 8" x 13" plastic bags or in 4" x 9" cotton mailing bags. The silt and soil samples were stored in the wet-strength 3½" x 6½" Kraft paper bags.

(b) The wet samples were dried in a ventilated oven over-night.

(c) The dried soil or silt samples were sifted by hands, using a 8" diameter 80-mesh stainless steel sieve. The plus 80-mesh fraction materials were rejected and the minus 80-mesh fraction materials were transferred into coin envelopes for analyses later.

(d) The dried rock samples were crushed by a jaw crusher and pulverized by using a disc mill to minus 100-mesh. The pulverized samples were stored in the 4" x 6" paper bags for later analysis.

.....2

SPECIALIZING IN TRACE ELEMENT ANALYSIS

2. Method of Digestion

(a) 0.50 gram of the minus 80-mesh samples was used. Samples were weighed out by using a top-loading balance.

(b) Samples were heated in a sand bath with nitric and perchloric acids (15% to 85% by volume of the concentrated acids respectively.)

(c) The digested samples were diluted with demineralized water to a fixed volume and shaken.

3. Method of Analysis

Cu & Ag analyses were determined by using a Techtron Atomic Absorption Spectrophotometer Model AA4 with their respective hollow cathode lamps. The digested samples were aspirated directly into an air and acetylene mixture flame. The results, in parts per million, were calculated by camparing a set of standards to calibrate the atomic absorption units.

4. Back Ground Correction

A Hydrogen continuum lamp is used to correct the Silver background interferences.

5. Analysts

The analyses were supervised or determined by Mr. Conway Chun or Mr. Eddie Tang and the laboratory staff.

Eddie Tang

Eddie Tang
VANGEOCHEM LAB LTD.

ET:jl

LEGEND

Basalt textural contact	– – – –
Geological contact	—·—

▨ Rhyolite	R
▨ Granodiorite & Diorite	Di
■ Skarn	
Andesite	A
Conglomerate	Sco
Limestone	SL
Chert	Sch
Basalt	B
Silicification	s
Amygdaloidal	amy
Porphyry	p
Pillowed	pil
Breccia	bx
Tuff	t
Veining	v
Massive	mas
Malachite	mal
Chalcopyrite	cp
Pyrite	py
Chlorite	cl
Epidote	ep
Calcite	ca
Magnetite	M
Quartz	q
Dyke	dy

Soil sample	•
Rock sample	▪
Silt sample	x
Float	△
Peak	⩓
Ridge	— - - -
Creek	— — ←
Bedding	⫱
Faulting	〰
Trench	)(

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 9702

Chevron Standard Limited
Minerals Staff

HUSTON PROPERTY
QUEEN CHARLOTTE ISLANDS
GEOLOGY

0 100 200 300

FIGURE No 4		PROJECT No M 502	
DATE NOV 1981	REVISIONS		SCALE 1: 5000
NTS No 103 B/6E			FILE No
COMPILED BY SM			

LEGEND

Soil sample	•	$30 \overset{40}{\underset{1.1}{\bullet}} 20$	ppm.Cu. ▪ ppm.Au (ppm.As. above, ppb..Ag. below)
Rock sample	▪		
Silt sample	x	⏢201	Cu. +200 ppm.
Float	△	(201)	As. +200 ppm
Peak		51	Au +50 ppm.
Ridge	— — —	1.1	Ag + 1.0 ppb.
Creek	——		

NOTE: TS and HW series only were run for Ag.
TS, RW, BC, and HW are 1981 series.
KO, LO, DO, and 80 are 1980 series.

Chevron
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Minerals Staff

HUSTON PROPERTY
QUEEN CHARLOTTE ISLANDS
GEOCHEMISTRY: ROCKS As, Au, Ag, & Cu.

0 100 200 300

FIGURE No 5a		PROJECT No. M 502	
NOV 1981	REVISIONS		SCALE 1: 5000
103 B/6E			FILE No
SM			

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 9702

J. McAllister

LEGEND

Soil sample	•	As Contours ppm.	
Rock sample	▪	40	– – – –
Silt sample	x	80	———
Float	△	160	━━━
Peak	•		
Ridge	— —	ppm.As •	
Creek	— — ⟶		

Chevron Standard Limited
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HUSTON PROPERTY

QUEEN CHARLOTTE ISLANDS

GEOCHEMISTRY: SOILS As. ppm.

0 100 200 300

FIGURE No 5c	PROJECT No. M 502
DATE NOV 1981	SCALE 1: 5000
NTS 103 B/6E	
COMPILED BY SM	

LEGEND

Soil sample •
Rock sample ▪
Silt sample x
Float △
Peak
Ridge — — —
Creek ——

Au contours (ppb.)
25 — — —
50 ———
100 ━━━

• 10 • ppb Au

NOTE: no values plotted where gold analysis yielded nd.

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HUSTON PROPERTY

QUEEN CHARLOTTE ISLANDS

GEOCHEMISTRY: Soils Au.

0 100 200 300

FIGURE No **5b**
PROJECT No. M 502
DATE NOV 1981
REVISIONS
SCALE 1: 5000
NTS No. 103 B/6E
FILE No
COMPILED BY SM

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
9702
NO.

S McAlister

LEGEND

Soil sample	•	Cu. Contours ppm.	
Rock sample	▪	40	– – –
Silt sample	x	80	——
Float	△	160	——
Peak			
Ridge		Cu.ppm. • Ag.ppm.	
Creek			

NOTE: TS and HW series only were run for Ag.

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Minerals Staff

HUSTON PROPERTY

QUEEN CHARLOTTE ISLANDS
GEOCHEMISTRY: SOILS, Cu & Ag

0 100 200 300

FIGURE No 5d	PROJECT No M 502
DATE NOV 1981	SCALE 1:5000
N.T.S. 103 B/6E	FILE No
DRAWN BY SM	

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 9702

LEGEND

Soil sample	•	▨	50+ppb. Au.
Rock sample	▪	▨	80+ppm. As.
Silt sample	x	▨	160+ppm. Cu.
Float	△		
Peak	▲		
Ridge	— — —		
Creek	——		

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HUSTON PROPERTY

QUEEN CHARLOTTE ISLANDS

GEOCHEMISTRY: CORRELATION Au,As,Cu.

0 100 200 300

FIGURE No **5e**		PROJECT No. M 502	
DATE NOV 1981	REVISIONS		SCALE 1: 5000
NTS No. 103 B/6E			FILE No
COMPILED BY SM			

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 9702

LEGEND

Soil sample	•
Rock sample	▪
Silt sample	x
Float	△
Peak	
Ridge	— — -
Creek	—— ⁃
360	Reading in gammas, total field (56,000 deducted from all reading)
(250)	Negative reading

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Minerals Staff

HUSTON PROPERTY

QUEEN CHARLOTTE ISLANDS
MAGNETOMETER SURVEY

0 100 200 300

FIGURE No 6		PROJECT No. M 502	
DATE NOV 1981	REVISIONS		SCALE 1: 5000
NTS No 103 B/6E			FILE No
COMPILED BY SM			