8405

GOV

GEOLOGICAL AND GEOCHEMICAL PROGRAM

OVERPROOF, OP 1 to 5, 8 to 11

MINERAL CLAIMS

SECURITY INLET, B. C.

53°03'N 132°15'W

NTS 103F/1E and 1W

Owner: Chevron Canada Limited

Operator: Chevron Standard Limited

Authors: G. Walton

L. Dick

D. Arscott

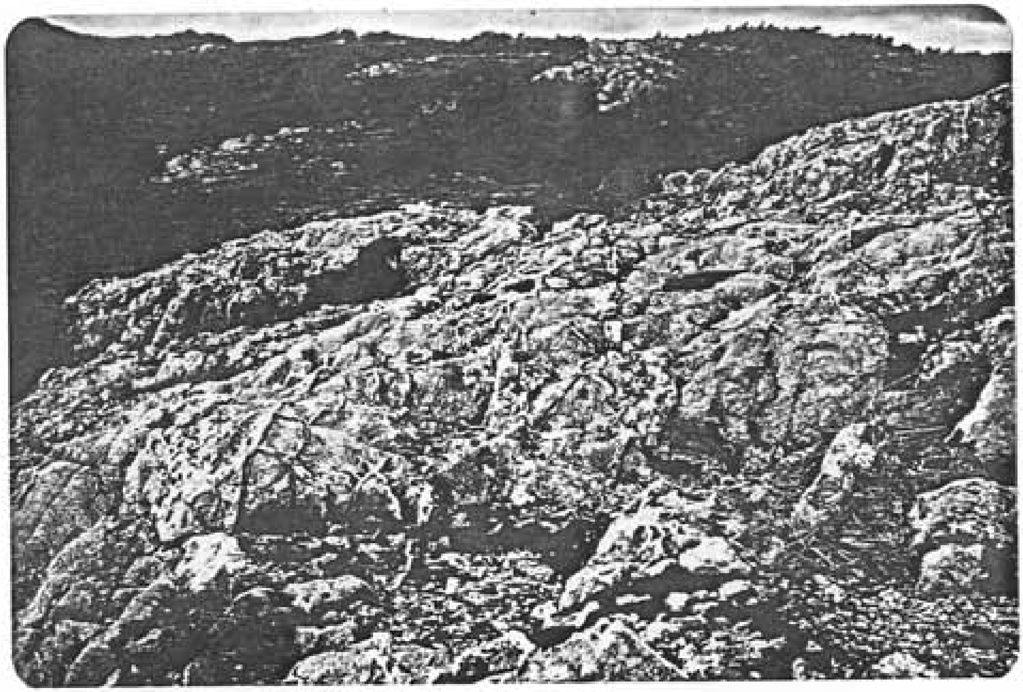
M486

September 15, 1980

CONTENTS

APPENDIX

ILLUSTRATIONS



Security Property:
Intense quartz veining in Karmutsen

INTRODUCTION

Reconnaissance geological and 3-media geochemistry carried out in the Security Inlet - Inskip Channel area in 1978 and 1979 by JMT Services Corp. led to the recognition of this area as having a prime potential for the discovery of disseminated gold deposits.

The early work, ranging from shore-line traverses to loosely controlled grid sampling, generally outlined at least three areas of potential, geochemically anomalous in gold and arsenic. These were found to be associated with a number of geological factors such as intense silica-carbonate-tourmaline alteration, quartz veining, strong fault structures, and a variety of potential host rocks.

In July 1978 a large block of claims was staked to cover this area and the property optioned to Chevron Canada Ltd. Further claims were staked in May 1979.

Between the 9th and 22nd of June 1980 the three known zones were subjected to more detailed and more tightly controlled geological and geochemical study, as desribed in this report.

There is no known history of "old" exploration in this immediate area. It is worth noting, however, that the claim block lies only 8 km NW of Mitchell Inlet, the site of the first lode gold mine in British Columbia. The production from this mine is believed to have been 304 oz of gold and 30 oz of silver, mined from a frayed quartz-calcite stringer system in Triassic Karmutsen (pillow lava facies) volcanics. Wall rock alteration included minor silica, chlorite, and pumpellyite.

LOCATION AND ACCESS (Figures 1 and 2)

The property lies 740 km NW of Vancouver, B. C. and 35 km SW of the airport at Sandspit in the Queen Charlotte Islands. It is accessible only by float plane or boat from Sandspit to the well protected waters of the aptly name Security Inlet. Access to higher elevations on the property is best by helicopter, as is that to the less protected Inskip Channel side (at low tide).

CLAIMS (Fig. 3)

The following comprise the entire property at time of writing and all are registered in the name of Chevron Canada Ltd.

Name	No. of Units	Record No.	Record Date
Overproof	4	677	28 July 1978
OP 1	2	673	"
2	12	674	"
3	12	675	"
4	6	676	"
5	15	678	"
6	15	679	"
7	18	1305	29 May 1979
8	20	1306	"
9	20	1307	"
10	20	1308	"
11	4	1309	"

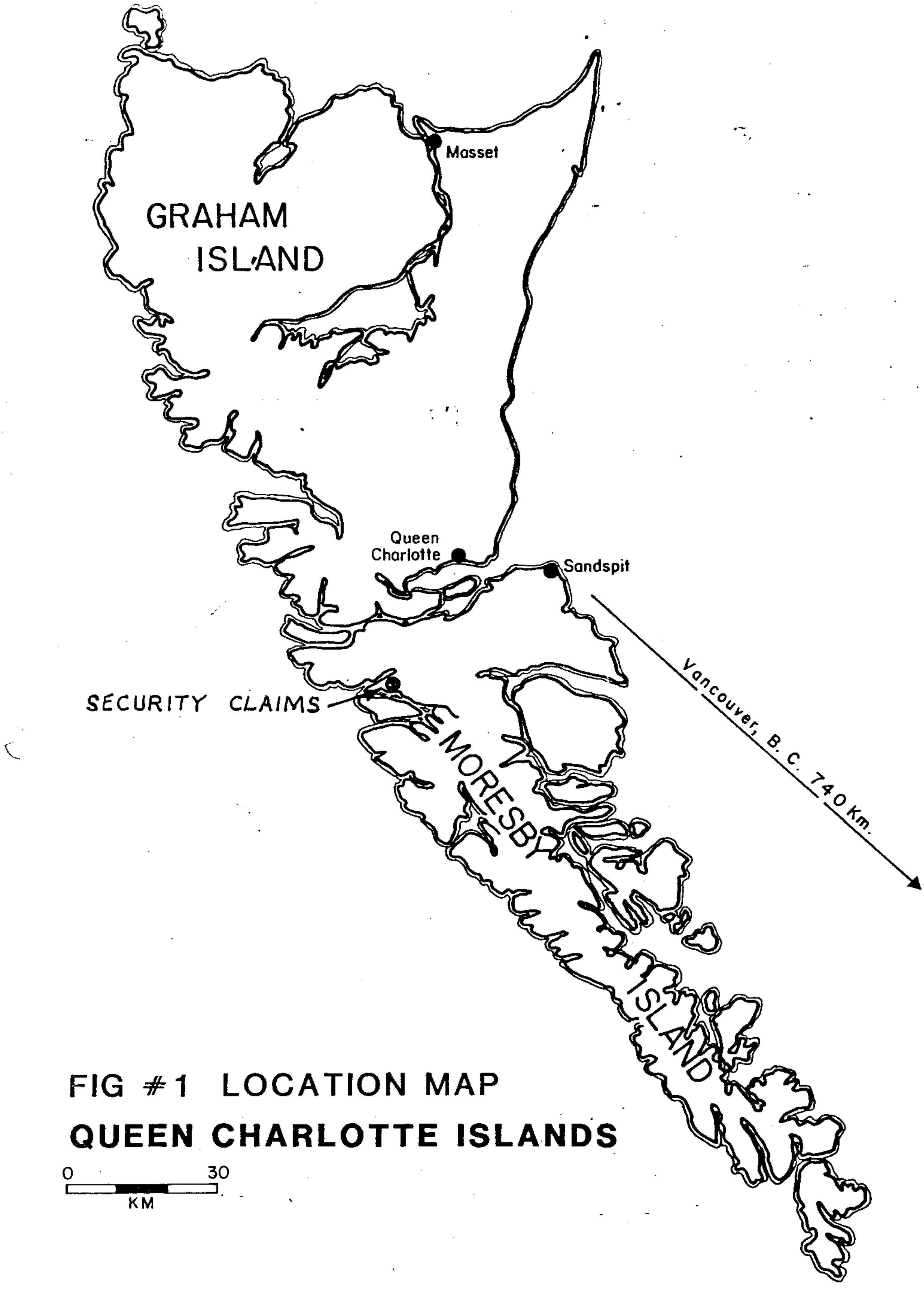


FIG #1 LOCATION MAP

QUEEN CHARLOTTE ISLANDS

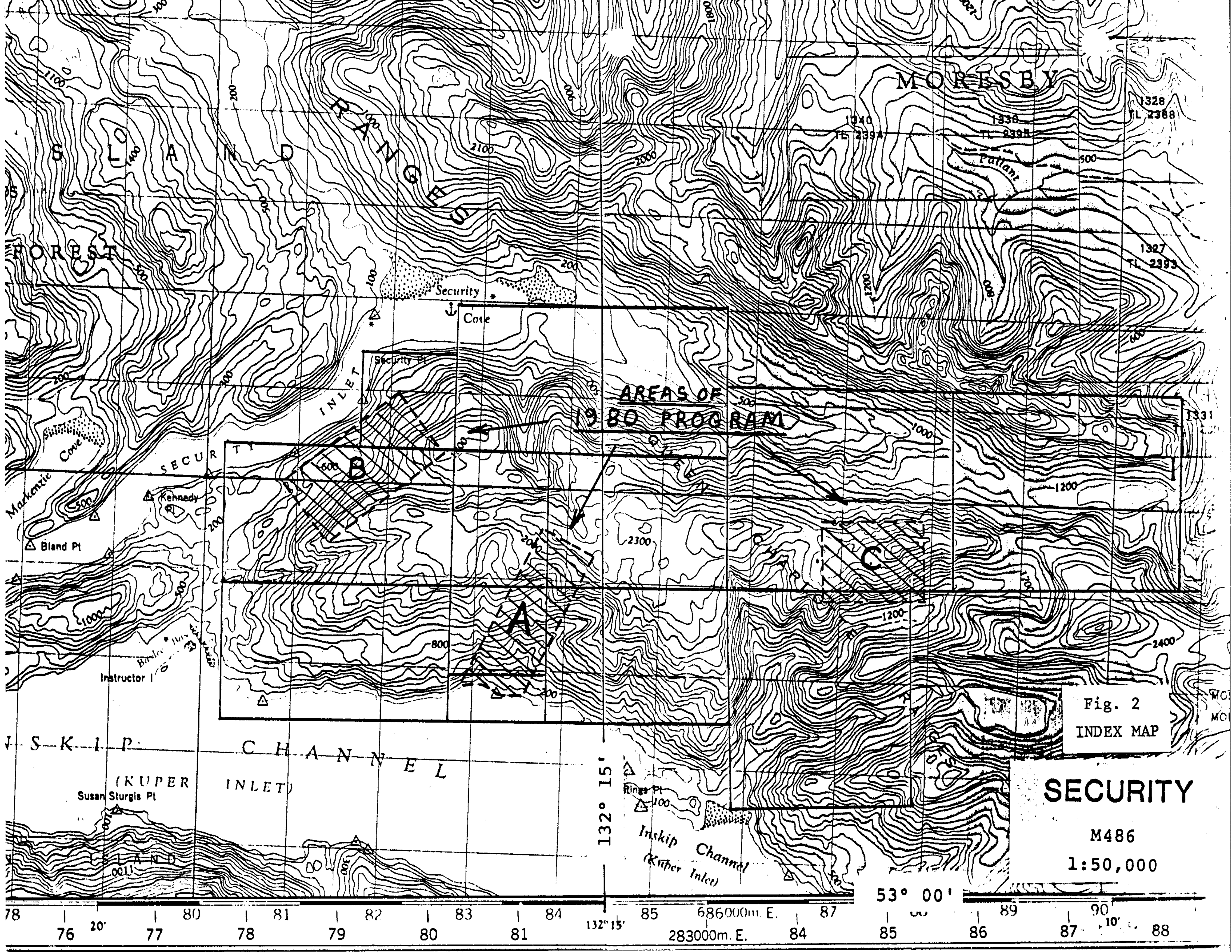


Fig. 2
INDEX MAP

SECURITY
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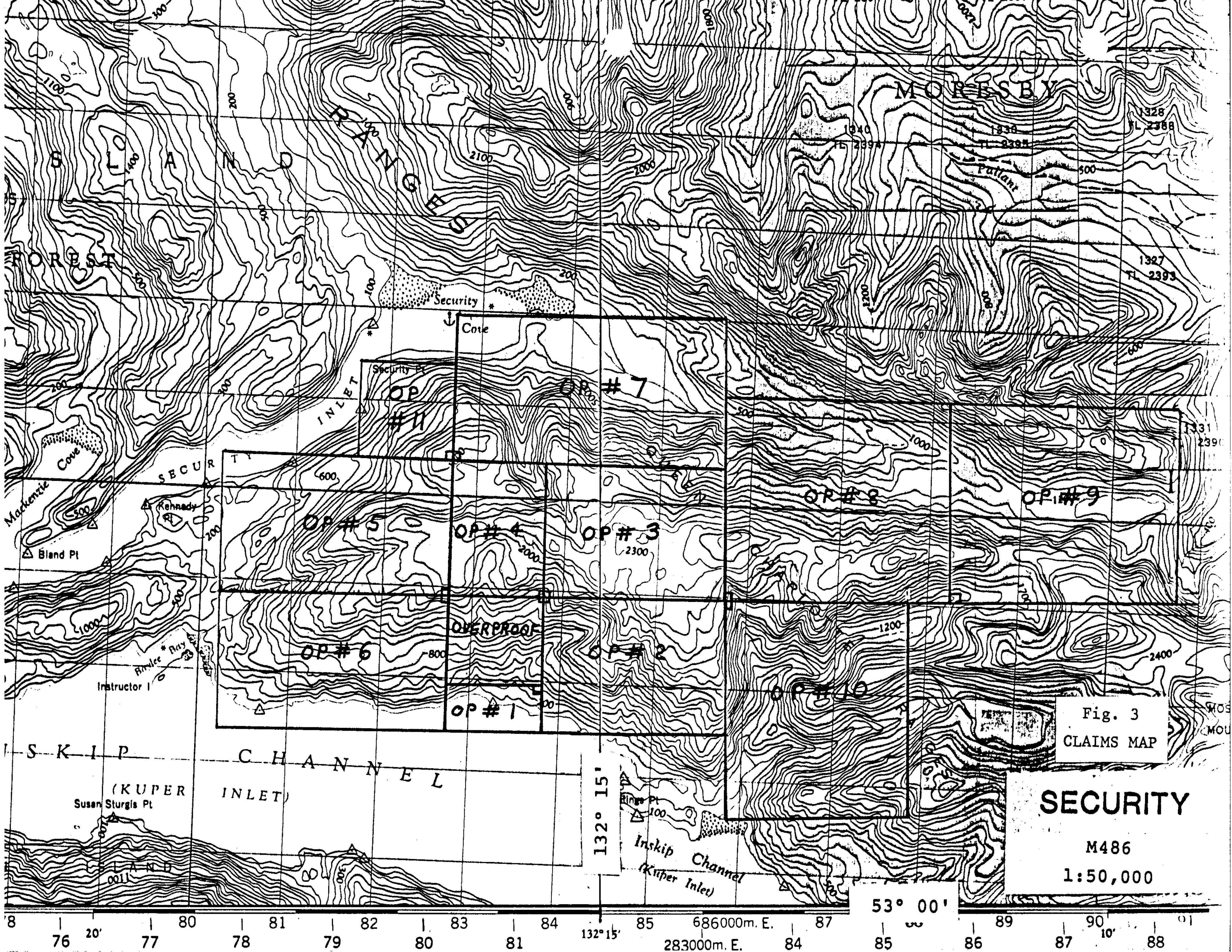
1:50,000


MORESBY
ISLAND RANGES
FOREST
Security Cove
Security Pt
SECURITY INLET
Mackenzie Cove
Kennedy Pt
Bland Pt
Instructor I
Bruler Bay
OP #7
OP #11
OP #5
OP #4
OP #3
OP #8
OP #9
OP #6
OVERPROOF
OP #2
OP #1
OP #10
INSKIP CHANNEL
(KUPER INLET)
Susan Sturgis Pt
Bings Pt
Inskip Channel
(Kuper Inlet)
132° 15'
53° 00'
686000m. E.
283000m. E.
Fig. 3
CLAIMS MAP
SECURITY
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1:50,000

GEOGRAPHY (Fig. 2)

Essentially the claims cover a rough, narrow, and nearly treeless scrub spruce plateau some 6 km long, and the adjacent heavily forested 40° slopes. Terrain negotiability on foot below the plateau, cannot be considered easy. The overall relief is 890 m.

The climate is typical of West Coast rain forest, with a yearly precipitation, (mainly September to May), of possibly 500 cm. Despite the amount of rainfall, water is not always abundant at higher elevations which drain quickly during dry spells. There are several small lakes, however, which do not show on the 1:50,000 topographic map.

GEOLOGY

General

Rocks which underlie the Security property on the three areas which were mapped and sampled in detail (i.e. Areas A, B. and C, of Figures 6a & b) comprise the following formations and rock types:

1. Karmutsen Formation - volcanic flows and pillow lavas.
2. Kunga Formation? - limestones and argillites.
3. Masset Formation? - rhyolite flows and quartz-feldspar porphyry and gabbroic intrusions.

Karmutsen Formation

The Triassic-aged Karmutsen Formation is the oldest rock formation outcropping on the Queen Charlotte Islands and is, by far, the most areally significant rock type on the property.

Rocks comprising the Karmutsen Formation are massive and pillowed basalts with subordinate amounts of argillaceous and cherty, interflow sedimentary rocks.

Basaltic rocks are variable in colour and texture. Colour varies from grey-green to black to maroon and the texture from fine grained and massive, to slightly porphyritic, to amygdaloidal. On the larger scale, both massive and pillowed varieties occur, with the pillowed variety dominating. Pillowed-textured basalts are common on Area A, particularly on the ridge, where pillow intersticies are filled with massive, very coarse grained quartz ("bull" quartz). The quartz, which has been introduced into the basaltic rocks, probably coincident with rhyolite intrusion, (see below) replaces the pillows locally on a large scale.

Area A, where the basalts were observed in most detail,there are two dominant types: (a) massive to weakly-phenocrystic variety, pillowed, with local plagioclase phenocrysts and, (b) an amygdaloidal variety. The latter is locally hematite-rich, imparting a maroon-red colour to the rock. Amygdules are either open or, more often infilled with one or more of calcite or an unidentified, very soft, light green mineral. In Area A very minor malachite and azurite were observed both along fractures or within amygdaloidal cavities.

Alteration of Karmutsen volcanics is very irregular. The most important alteration types are: (a) silicification; (b) choritization; (c) epidotization; (d) pyritization; and, (e) tourmalinization.

Near the camp on Area A the basalts are highly fractured, silicified and epidotized. Quartz veins, with an attitude of 360°/vertical carry spotty to abundant chlorite and epidote. Locally the alteration becomes pervasive. Fine disseminated pyrite generally accompanies the more heavily choritized parts. In Area A, progressing from the ridge top to shoreline bearing south, the basalts exhibit local intense quartz veining; veins ranging from millimeters to over one meter in width, and locally intense chloritization, especially where the rock is highly fractured. In Area C, quartz-epidote alteration (prevalent on the ridge crest in Area A) gives way to quartz/quartz-tourmaline veining. The nature of this alteration is discussed further below.

The most intense alteration observed in basalts is a pervasive and very possibly structurally controlled carbonatization which occurs both in Area A (adjacent to contacts with marble beds) and in the northwestern portion of Area B. In this area, basalts are heavily fractured. Micro-fractures are infilled with calcite and a white chlorite-like mineral (magnesian?). Pyrite, as very fine-grained fracture-fillings, accompanies the carbonate-chlorite. The alteration is often pervasive,and in thin-section, the basalt matrix is completely replaced by calcite while plagioclase phenocrysts remain only partially altered to a mixture of sericite, chlorite, and carbonate.

Minor fine-grained epidote crystals accompany the alteration, but epidote is a minor constituent. Within this alteration minor malachite and azurite has been observed on weathered fracture faces but pyrite is the only sulphide mineral noted both in hand specimen and thin-section.

In Area A, this alteration occurs in the vicinity of the contact of basalt with marble, although these relationships were not observed in Area B.

Sedimentary Rocks

Limestones have been located in both Areas A and B where they are interbedded with Karmutsen basalt. Whether they are in fact part of the Karmutsen, or whether they are down-faulted blocks of the younger Kunga limestones remains in question. In Area A it is difficult to conceive of a structural configuration which could have juxtaposed the limestone beds with approximately 600 m of overlying Karmutsen. In Area A approximately 30 m of grey, coarsely-crystalline marble, much of which is heavily quartz veined and fractured, crops out mainly on creek bottoms a short distance up-slope from shoreline. In this area it is in obscured contact with heavily carbonatized basalt (see above) and the exact contact is difficult to pinpoint. Limestone varies from grey to white in colour and overlies basalt and well-bedded argillaceous sedimentary rocks. In Area B, exposures in creek bottoms of interbedded argillite and chert occur locally. Here, the well-bedded section of interbedded argillites, siltstones, and cherts appear to both overly and underly Karmutsen basalt. The thickness of this package of sedimentary rocks is not known.

Rhyolite

Rhyolitic rocks occur in the form of cross-cutting dykes and as flow-banded sheet-like bodies. In Areas A and C, on and near the crest of the ridge, dykes and circular bodies of white rhyolite are abundantly exposed. These rhyolites post-date all other rock units and are the youngest rock types present except for quartz veins and related alteration which cut the dykes but which may represent a last phase of the same general intrusive/alteration event. Rhyolitic rocks are in all cases heavily quartz-veined and the intensity of quartz veining on the property, in general, appears to increase in the vicinity of rhyolitic bodies. Quartz veins have a consistently N-S attitude. On the ridge crest in Area A, quartz veins which cut rhyolite, as well as basalt, have associated epidote and chlorite whereas locally, in Area C, the epidote gives way to intense quartz-tourmaline alteration of the rhyolite. Tourmaline occurs as: (a) massive replacements; (b) vein-fillings with quartz; and, (c) as irregular disseminations in non-quartz-veined rhyolite. Locally, the rhyolites are near completely replaced by massive, fine-grained tourmaline, with brecciated fragments of rhyolite remaining as xenoliths.

In Area B, a heavily-fractured, sheet-like body of rhyolite is widely exposed. As in the other areas, these are cut by strong N-S fractures which have been infilled with quartz veins. Quartz veining is more intense in the area of rhyolite in Area B than anywhere else on the property. Also in Area B, rhyolite is in contact with a body of medium-to-coarse grained, pyroxene,-amphibole,- and plagioclase-bearing gabbro. This is the only locality where gabbro was observed on the property and its genetic relationship to the adjacent rhyolites is uncertain.

The rhyolite is presumed to be Masset (Tertiary) in age on the basis of:

(a) Its youth (it is not cut by anything except quartz veins).

(b) Its flow-banded texture, not unlike Masset rhyolites elsewhere. and

(c) Its proximity to the gabbro, a possible feeder for Tertiary basalts.

<u>(Quartz) feldspar porphyry</u>

Intrusive porphyries are common on the claims, and especially in Area C, where they assume a variety of forms (both plug and dyke-like) and a variety of orientations. The largest, NE of Area C, appears to be a kilometre long and 400 metres wide, but is not fully delineated. It is pale grey, fine grained, highly siliceous, and lacking sulphides.

These porphyries are believed to represent feeders for felsic Masset volcanics, and in this regard their absence in Area B (the vicinity of the main rhyolite body) is interesting. We may be seeing two distinct levels, in the intrusive sense, within this one property. The rhyolite could be with a down-thrown block of considerable vertical displacement.

<u>Gabbro</u>

The gabbro is homogeneous, fairly fresh coarse to fine grained or doleritic, and erosion resistant. It forms the outer wall for part of the rhyolite bench in Area B. It probably represents feeder material for a now-eroded or potential Masset basalt.

set on the N side of the ridge occur over a 1 km length at a 440 to 480 m level. The implication of course is of EW striking beds with a shallow northerly dip, correlating well with the sparse bedding data for Area A. These benches may match a mapped massive lava section in the Karmutsen.

Evidence for the position of the sediments in the stratigraphic column is ambiguous. The following lines of observation suggest that the sediments could be Kunga, i.e. postdating all Karmutsen volcanism:

(a) Some of the lithologies (massive grey limestone and black thin bedded argillites) are typical of Kunga types.

(b) The required block faulting to bring the sediments to their present positions is not unlikely. It is a common feature of regional Queen Charlotte geology. We have one clear instance of it at Buck Point 20 km to the W, and roughly on trend, and a second distinct possibility in the probably down-thrown rhyolite in Area B.

On the other hand, the following features suggest that the sediments are intervolcanic:

(a) The required block faulting would have to have major displacement, i.e. greater than 800 m on the conservative assumption of overall horizontal bedding in Area A.

(b) The abundant cherts in Area B are not a normal Kunga constituent.

(c) Considerable overturning of beds would appear to be necessary to bring Karmutsen over Kunga in Area B.

Previous mapping shows limestone both above and below limey argillites, in itself ambiguous evidence for categorizing the sediments as Kunga. However, major movement (faulting or folding) could well be preferentially located within the sediments, and might express itself in locally overturned bedding.

This stratigraphic question must remain open. There is a reasonably good chance of answering it during further mapping.

The area is strongly fractured and faulted. A lineament study suggests the presence of 3 preferred orientations of faulting:

(i) N35°E, near vertical, and a common locus of feldspar porphyry dyking. (One of these lineaments, topographically prominent was found to be persistent and either of small displacement or quartz healed. The latter view seems more likely.)

(ii) N60°E, probably steep. These include a relatively major feature, 3 km long, The direction is generally parallel to Security Inlet.

(iii) N25°W. Apparent offsets suggest that this may be the youngest set.

No true stratigraphic offsets are known, but photo evidence shows one clear possibility of a right-lateral or E side down movement on a N25°W fault. In Area A one very strong vertical NE striking fault was mapped which postdates quartz veining.

Summary

On the Security property, a sea-floor suite of basalts, limestones and clastic sediments have been weakly deformed and intruded by rhyolitic and quartz feldspar porphyry dykes and apophyses. This intrusive event may have been synchronous with the hydrothermal alteration of the basaltic volcanic rocks. Quartz, quartz-epidote, and quartz-tourmaline veining affected all of the rocks on the property.

GEOCHEMISTRY

General

A total of 768 samples were collected in June and analysed for Au and As, with a distribution as follows:

	Area A	Area B	Area C
Rock	102	53	48
Soil	219	234	112

The soils were collected on 100 m x 50 m grids, mainly from "B" horizon material at an average depth of 15 cm to 20 cm using prospecting picks and high wet-strength paper bags. These were analysed by Vangeochem Lab Ltd. in North Vancouver, by the methods outlined in the Appendix.

15 soil samples were analysed in addition for Sn, with negative results.

Soil Profiles

Test profiles were dug at 4 points (3 in Area C, one at camp) to examine the metal contents of each soil horizon (see Fig. 5).

A striking increase in As content with depth is apparent, suggesting either leaching in the upper horizons or the presence of a transported soil. In any case, anomaly masking is definitely present in these areas.

No such consistent pattern is evident for the Au, which does not vary more than two-fold, one way or the other, in 3 of the 4 instances.

Obviously in these circumstances As soil anomalies should be interpreted with care and a number of extra soil profiles should be dug in apparently anomalous as well as non-anomalous areas.

Statistics

A cumulative logarithmic-probability plot for Au in soil (Fig. 4a) shows an excellent similarity between the 3 zones with respect to background values and evident thresholds. The latter vary from 30 to 40 ppb, and are especially well defined for Area A. By this criterion 8% of all the soil samples collected were anomalous.

The As plots for the three areas (Fig. 4b) are not so comparable. Possibly the As has a more complex secondary dispersion, as suggested by the test profiles, and/or multiple primary sources. Apparent thresholds vary from a minimum of 40 to a maximum of 70 ppm (Area C). In all three cases, however, the proportion of anomalous samples is very high, averaging 30 to 50%.

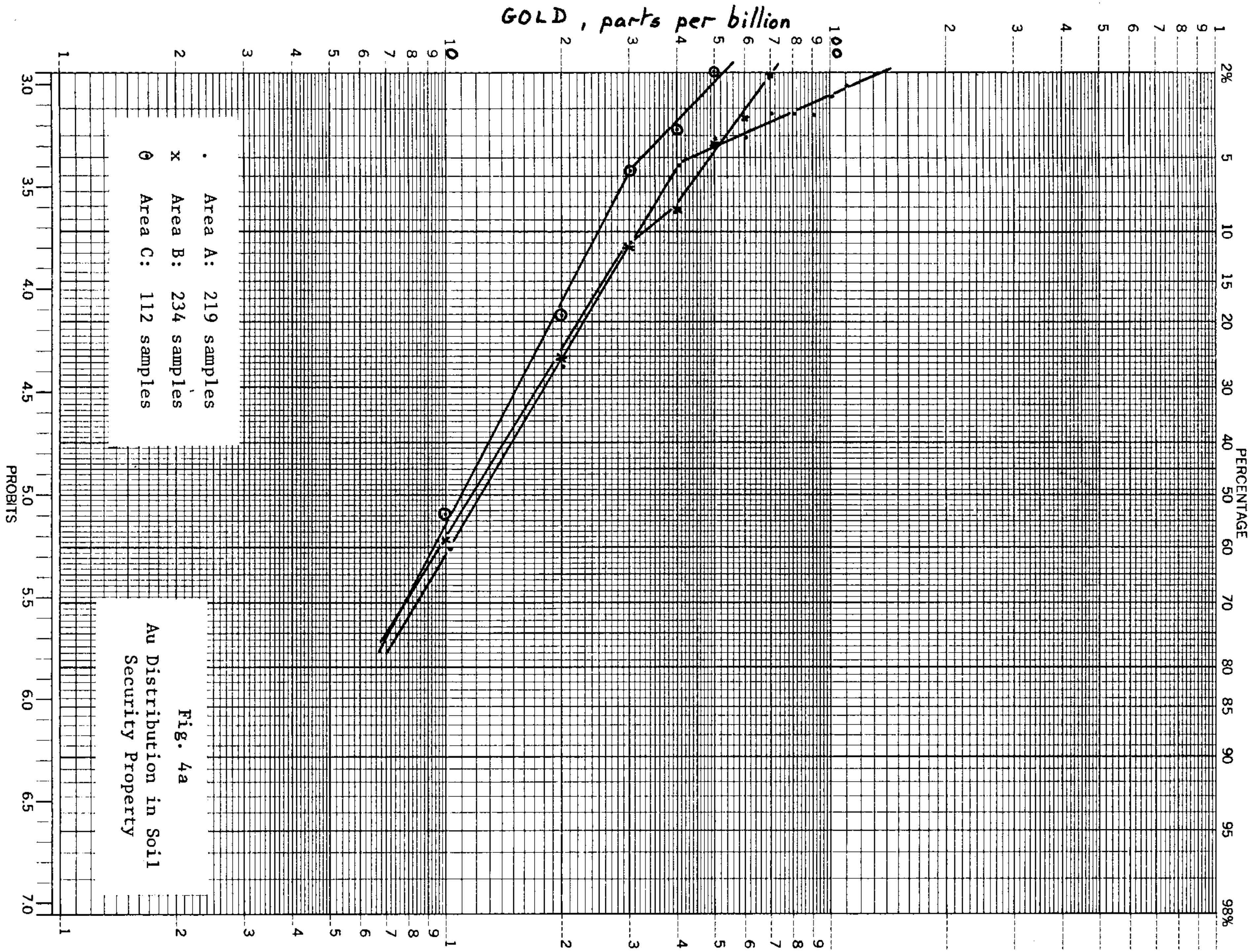


Fig. 4a
Au Distribution in Soil
Security Property

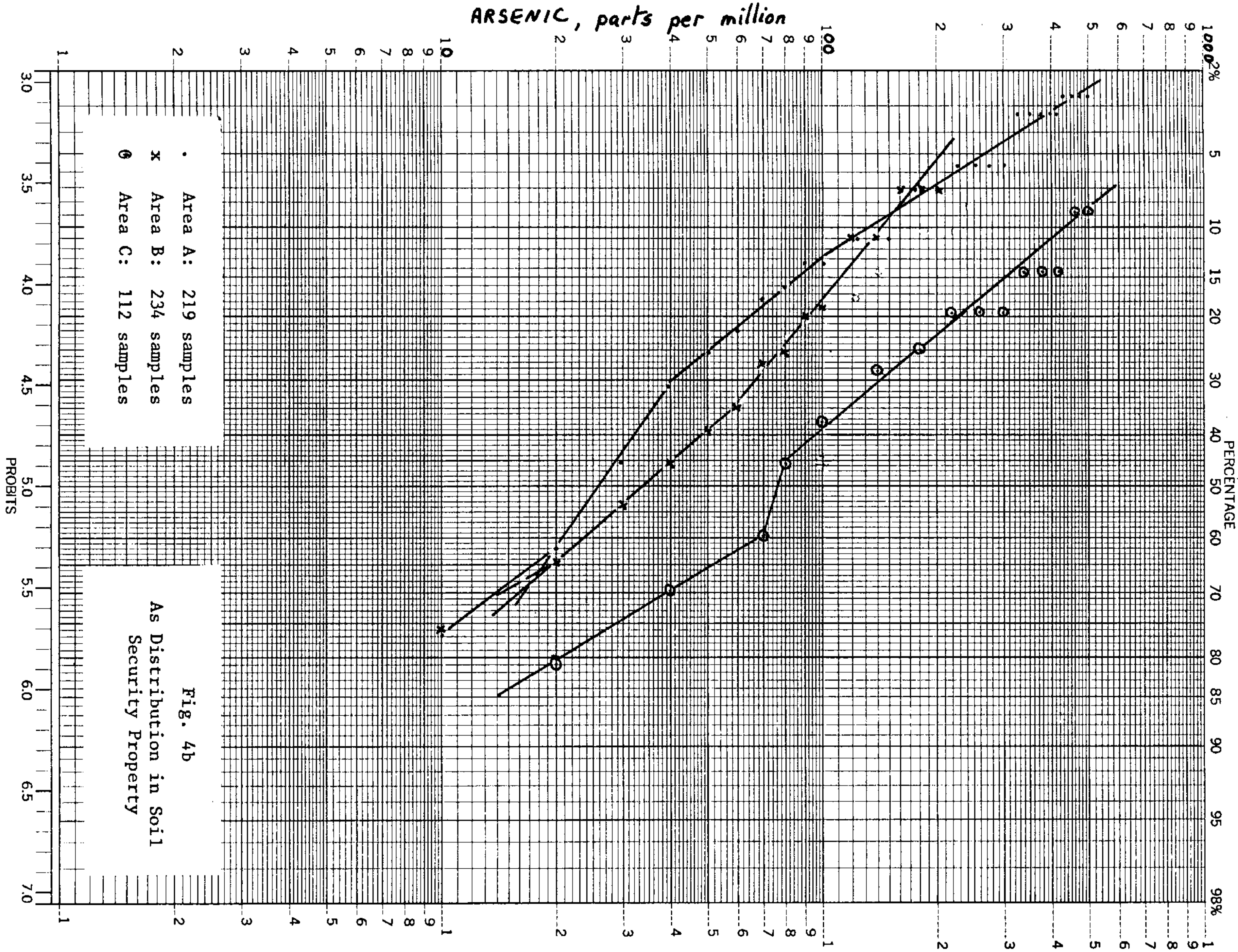


Fig. 4b
As Distribution in Soil
Security Property

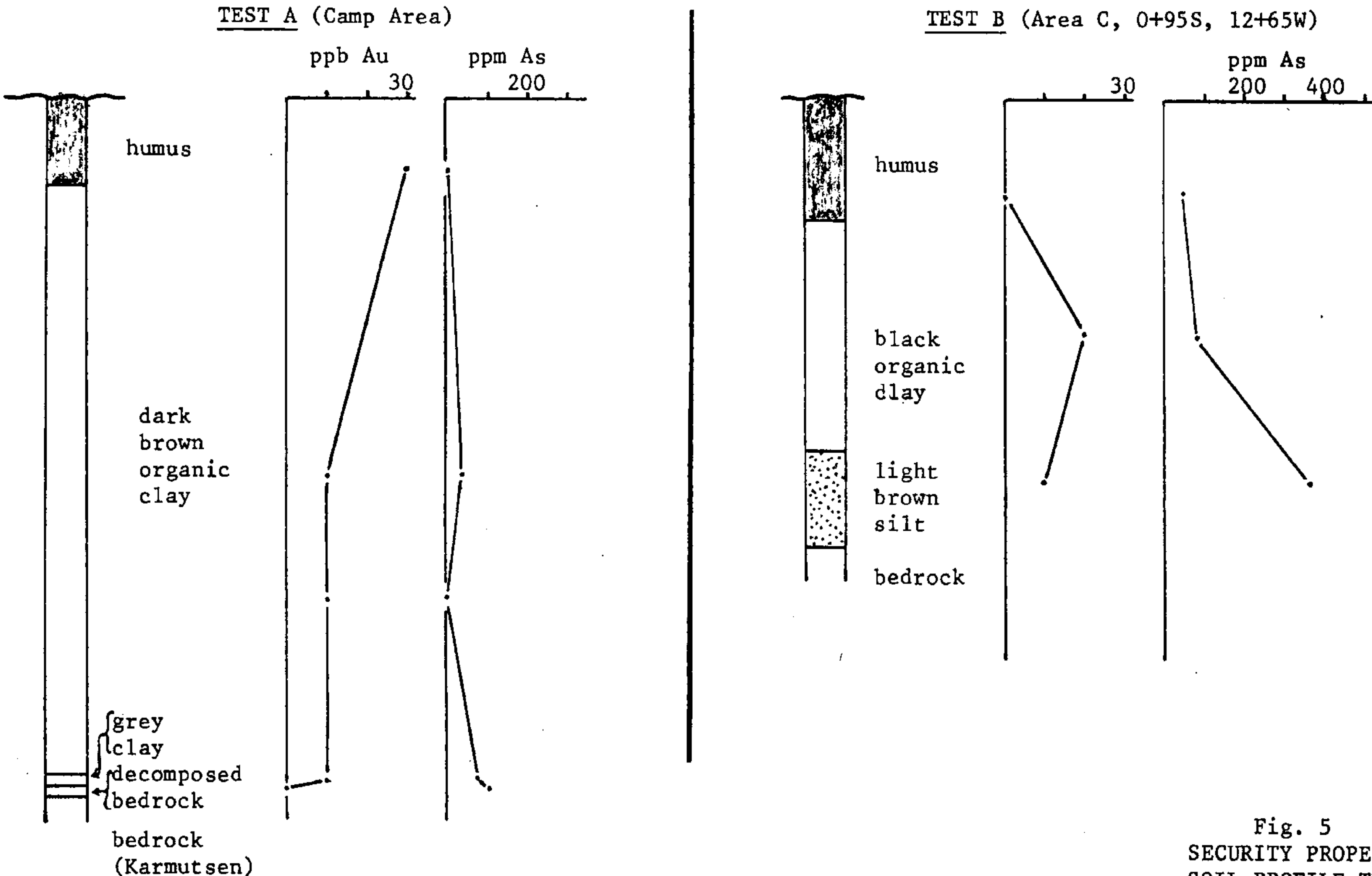
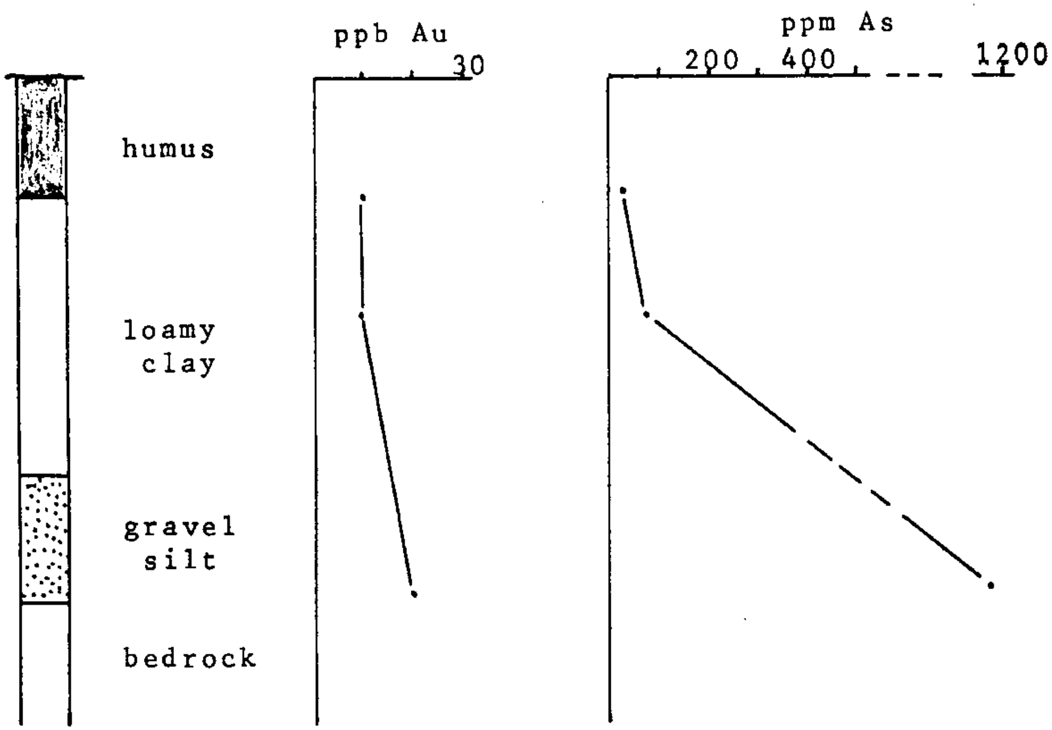


Fig. 5
SECURITY PROPERTY
SOIL PROFILE TESTS
(Sheet 1 of 2)
1:5 June 1980

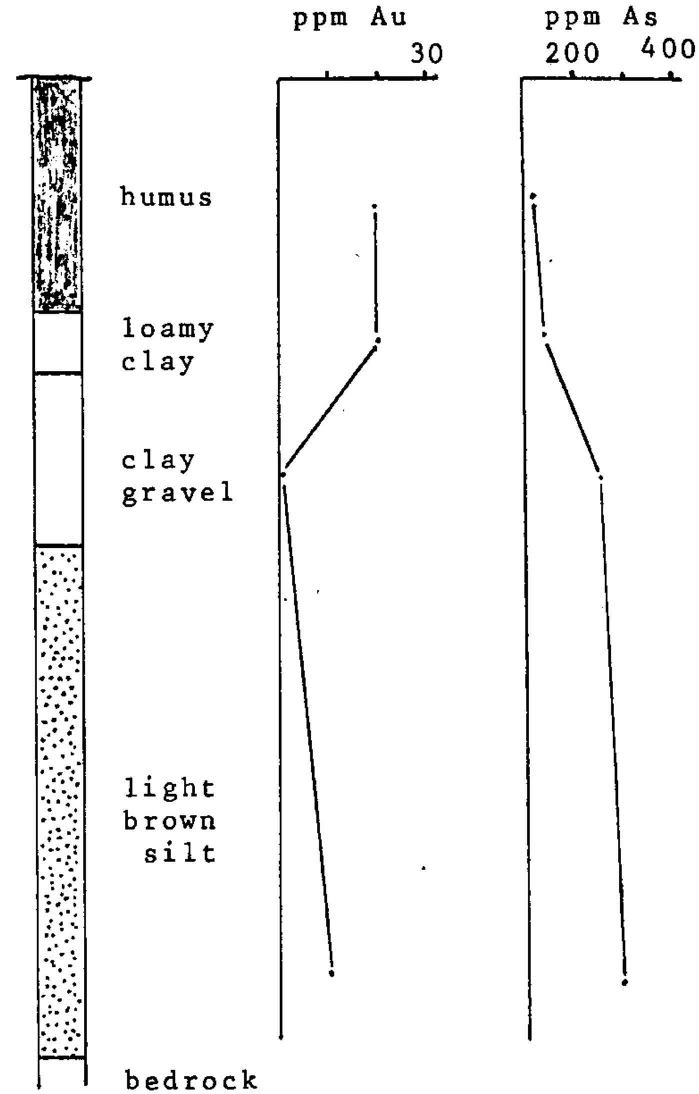
TEST C (Area C, 0+40N, 13+60W)



Note: Test B is at site of earlier JMT sample yielding 10 ppb Au, 430 ppm As, depth unknown

Test C is at site of earlier JMT sample yielding <5 ppb Au, 300 ppb As, depth unknown

TEST D (Area C. 0+95S, 10+83W)



SECURITY PROPERTY

SOIL PROFILE TEST
(Sheet 2 of 2)
1:5 June 1980

Principal Soil Anomalies

i) Area A

A peak value of 1200 ppb Au is present at the NE corner of the grid in a Au-anomalous zone possibly 200 m wide, trending north northeasterly. It coincides with a much more extensive As zone of the same trend. The As zone would in fact average several hundred ppm over a 300 m width and 1900 m length. Both the Au and As anomalies are open to the NNE and together constitute a fairly impressive anomaly.

ii) Area B

Only two small soil Au anomalies of any significance are present on this grid, peaking respectively at 190 and 110 ppb. Neither, however, are completely delineated. On the other hand a strong and extensive As anomaly is present occupying not only the aforementioned Au anomalies but about half the entire grid.

iii) Area C

The soil Au results on this grid were also somewhat spotty, although an anomaly represented by an isolated 1140 ppb sample is open to the W. The As is, on the other hand, strong and extensive, anomalous across much of the entire grid, and open in all directions.

Rock Sampling

The sample numbers, locations, and lithologies of rock samples collected on the Security property which were found to contain anomalous values of Au are listed in the following table. It was found that, in general, rocks which are silicified and heavily quartz veined are those most likely to contain anomalous gold. Some anomalous samples however, contain no obvious quartz veining but these are subordinate to, and less anomalous than, the silicified anomalous rocks. Thus there is a relationship between anomalous values of Au and the presence of late quartz veining and silicification.

CONCLUSIONS

The geology and geochemistry of those parts of the Security property studied in 1980 suggest that the anomalous As and Au are related to a period of silicification and fracturing. This event may have been related to the intrusion of Tertiary? age rhyolite dyking, perhaps part of widespread Teritary volcanism and intrusion which affected large parts of the Queen Charlotte Islands.

The intense quartz veining and fracturing, the presence of tourmalinized breccias (Area C) and the local presence of malachite and azurite as fracture coatings in basic volcanic rocks on the property suggest that the environment may be suitable for the presence of fracture-controlled Cu mineralization ("porphyry" Cu). Another possible indication of porphyry mineralization is the presence of intense epidotization of country-rock basalts on Areas A and C which appears

SECURITY ROCK SAMPLING

Sample No.	Area	Field Description	As (ppm)	Au (ppb)
L-SO-13	A	Thin quartz veinlets cutting grey limestone	35	13200
S-80-68	A	Basalt - highly altered and quartz veined as pyrite (70 - 90% quartz).	1800	2120
S-80-31	B	Quartz vein in altered basalt	4	1500
S-80-74	A	Basalt - altered, cut by quartz veins on the rock face, possibly a fault filled by quartz.	1200	640
S-KO-16	A	Basalt - silicified, minor pyrite.	1000	480
S-80-2	A	Basalt - silicified, possibly arsenopyrite in veins.	500	290
S-80-33	B	Basalt/quartz vein. Chip sample over 1 metre cutting quartz vein. Associated with S-80-31/32.	4	280
S-80-32	B	Basalt - minor quartz vein host for sample S-80-31.	10	140
S-80-34	B	Quartz vein in a rhyolite by a very rusty creek (no pyrite seen).	10	130
S-80-78	A	Basalt - altered, numerous quartz veins, no pyrite seen. 2 metres from S-80-76.	400	110
S-K0-37A	B	Quartz vein in basalt.	8	100

SECURITY ROCK SAMPLING

Sample No.	Area	Field Description	As (ppm)	Au (ppb)
S-80-69	A	Basalt, altered, quartz veining (50-70%) pyrite. Very close to S-80-68.	150	90
S-80-76	A	Basalt, altered, little quartz, pyrite.	200	80
S-KO-57	C	Basalt - heavy pyrite in patches.	8	80
S-80-70	A	Basalt, altered, quartz veining (50-70%) close to S-80-68/69.	150	60
S-80-41	B	Basalt - altered, quartz veined, sample of large veins in main creek.	40	60
S-DO-29	A	Andesite, strongly fractured and quartz veined.	50	60
L-SO-31	B	Pyritic rhyolite, possibly in fault zone.	8	50
L-SO-12	A	Basalt, fine grained, recrystallized, with minor quartz and possible minute sulphides.	50	50
S-DO-30	A	Andesite, fractured. No obvious quartz.	15	50
S-80-49	C	Quartz vein in altered basalt, just north of baseline.	80	50

to envelope the zone of quartz-tourmaline brecciation. It is possible that this region of the property is underlain by an intrusive stock.

The work to date has shown that the geological environment on the Security property is potentially favourable for the deposition of Au in an environment of intense silicification and fracturing, possibly above the apical region of a shallowly buried acidic intrusive body. In this regard, future work should involve detailing zones of intense silicification, especially in those large parts of the property where geologic mapping and sampling has yet to be carried out, even in a cursory manner. Attention should be paid to detailing the distribution of the various types of alteration observed on the property, and relationship of alteration-type to gold mineralization. Since there is a good possibility that the most important mode of occurrence of Au mineralization is as fracture-, and vein-controlled, then future maps should contain information on fracture density and orientation.

RECOMMENDATIONS

1. Expand area of geological and geochemical coverage. Rather than proceeding in the detailed manner of coverage performed in 1980, future work should proceed in a more reconnaissance manner, whereby broader-scale geological mapping is used to select areas of detailed geochemical sampling. Since the topography of this property is extremely rugged, those areas underlying ridge crests, where vegetation is sparse and topography relatively

flat, should be examined first. This would ensure maximum coverage and a starting-point for subsequent, more detailed coverage.

2. Soil profiles should be collected at more frequent intervals to better understand the significance of geochemical results.

3. Soil samples should be analyzed for copper, since traces of Cu mineralization have been found, and in that the geological environment is not unlike that which might potentially host "porphyry"-type Cu mineralization.

L A Dick

L. Dick

Godfrey Walton

G. Walton

D. Arscott

D. Arscott

Mineralization

The mode of occurrence of gold mineralization is not clearly defined. A number of observations are pertinent however.

1. Gold is strongly associated with <u>some</u> quartz veining. There is some indication of a preference for NW and NE striking faults.

2. In one place at the N end of Area A there is zone of intense quartz veining associated with a NE striking fault. Gold values are present and this is one specific area that deserves further work.

Stratigraphy and Structure

Sedimentary rocks on the Security property are variably dipping from 30°N (Area A, black argillites) to 70°E (Area B, stream-bed exposure of black silty argillite). Because of the limited exposure of sedimentary rocks, and the massive nature of the limestone, very few determinative attitudes could be measured. A general EW strike, based on previous mapping and airphoto evidence, can scarcely be doubted however.

A vegetation anomoly 2 km long trending N 70° W is almost certainly underlain by limestones, and an interesting set of topographic benches with a distinctive swampy surface occur on both sides of the main ridge. On the S side 8 such benches over a 3 km length, lie at the 550 to 590 m elevation, and there is commonly a noticeable break in slope 800 to 1400 m below them. A similar but smaller

1980 GEOLOGICAL AND GEOCHEMICAL PROGRAM
SECURITY PROPERTY
JUNE 9 to 22, 1980

LABOUR COSTS

Employee	Position	No.of days Field	Office	Travel	Total
D. Arscott	Geologist	6	3	1	10
G. Walton	"	13	4	1	18
L. Dick	"	8	1	1	10
K. Hicks	Assistant	13	-	1	14
D. Abercrombie	"	13	-	1	14
D. Madsen	"	13	-	1	14
H. Johnson	"	13	-	1	14
T. Zanger	"	13	-	1	14
		92	8	8	108

Total labour cost is $88.43 per person day, or $ 9,550.00

EXPENSES

Analyses:	Rock 215 samples @$8.90 (Au + As)	$1,913.50	
	Soil 553 samples @$7.40 (Au + As)	4,092.20	
Helicopter:*	18.4 hrs. @$355.	6,532.00	
Fixed Wing:	Otter, 80 miles @$2.40	192.00	
Airfares:	Vancouver/Sandspit(pro-rated) 30% x $174.95 x 8	419.88	
Food:	92 days @$12.00	1,104.00	
Hotel:	4 rooms @$30.00	120.00	
Freight:		169.60	
Thin sections:	12 @$5.75	69.00	
Orthophoto:	(Pacific Survey Corp)	3,411.65	
Camp:	92 days @$5.00 per day	460.00	
Field Supplies:	92 days @$10.00 per day	920.00	
Drafting and reproduction, allow		400.00	
		$19,803.83	19,803.83
	TOTAL PROGRAM COST		$29,353.83

David Arscott

DAVID ARSCOTT

*High helicopter costs reflect need to examine 3 separate areas from one camp site.

STATEMENT OF QUALIFICATIONS

I, Lawrence Allan Dick, am a professional geologist with office at 901 - 355 Burrard St., Vancouver, B. C. V6C 2G8.

I am a graduate of the University of British Columbia (B.Sc. 1973) and Queen's University (M.Sc. 1977, Ph.D. current). I have worked in mineral exploration, mainly seasonally, since 1969, and am a member of the Geological Association of Canada and of the Mineralogical Association of Canada.

L.A. Dick

LAWRENCE ALLAN DICK
September 1980

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).

David Arscott

DAVID ARSCOTT, P.Eng.
September 1980

STATEMENT OF QUALIFICATIONS

I, Godfrey Walton, am a professional geologist with office at 901 - 355 Burrard Street, Vancouver, B. C. V6C 2G8.

I am a graduate of the University of Alberta (B.Sc. 1974) and Queen's University (M.Sc. 1978). I have worked in mineral exploration since 1970, and am a member of the Canada Institute of Mining and Metallurgy and Mineralogical Association of Canada.

Godfrey Walton

GODFREY WALTON

September 1980

986-5211
VANGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 604-~~XXXXXXX~~
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 Eddie Tang
VANGEOCHEM LAB LTD.

ET: jl

VANGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA V7P 2S3 986-5211 604-888XXXX

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.

GRID CONTROL

All control was by hip chain and compass, with slope corrections. Stations were marked on double flags, and inter-station lines with single flagging. The grids overlapped the previous lines emplaced by JMT Services Corp. and every effort was made to tie the old and new grids together. This was particularly necessary because the former grids were loosely controlled by a not entirely satisfactory 1:50,000 topographic map enlargement.

In addition two orthophotos with contour overlays were acquired (Figs. 8a and b) in order that all work could be plotted on an acurate base with close topographic control.

SECURITY LEGEND
(GEOLOGY MAPS)

	OUTCROP	w	WEAK
	BEDDING	m	MEDIUM
	STRONG SHEETING	h	STRONG
	PRESUMED CONTACT	f	FRACTURING
	PRESUMED FAULTING (STRONG)	q	QUARTZ
	" " (WEAK)	v	VEINING
		s	SILICIFICATION
		a	ALTERATION
G	GABBRO / DIORITE	py	PYRITE
		cl	CHLORITE
R	RHYOLITE	hem	HEMATILE
		⊡	CLAIMPOST
QFP	QUARTZ and/or FELDSPAR PORPHYRY	T	TOURMALINE
S	SEDIMENT ar =argillaceous, c =cherty, l =limy, i =silty		
AG	AGGLOMERITE		
D	DACITE or SILICIFIED B		
B	BASALT / ANDESITE		

8405 NC

D. Arscott

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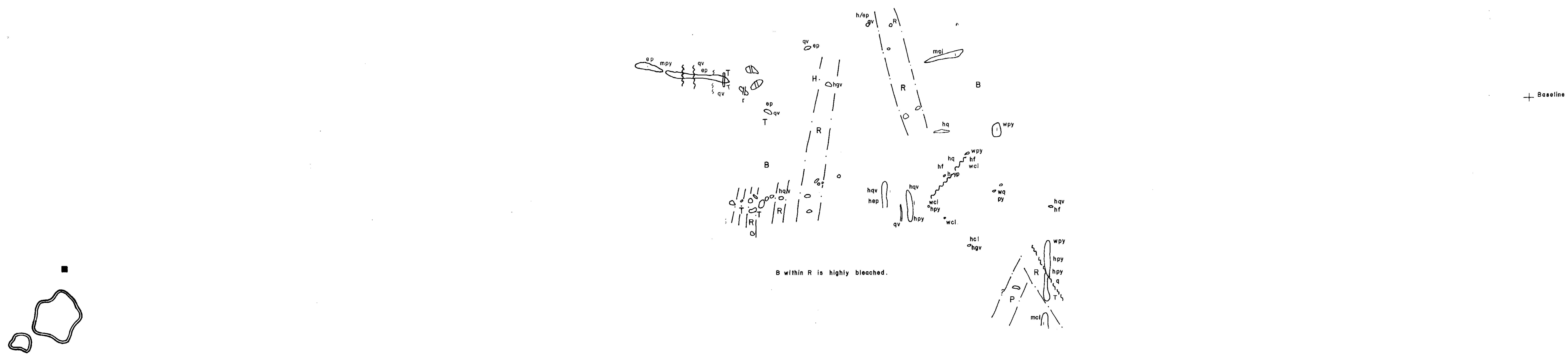
SECURITY PROPERTY
GEOLOGY : AREAS A and B.

100 m.

FIGURE No. 6 a.		PROJECT No. M 485	
DATE Oct 80	REVISIONS		SCALE 1:5000
NTS No			FILE No.
COMPILED BY			

AREA C



Note: LEGEND see map 6a.

D. Ascott

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SECURITY PROPERTY
GEOLOGY : AREA C

100 m

FIGURE No 6 b.		PROJECT No M 485	
DATE SEP 80	REVISIONS		SCALE 1:5000
NTS No			FILE No
COMPILED BY			

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SECURITY
GEOCHEMISTRY. As
AREAS A + B

FIGURE No. 7a.		PROJECT No. M486	
DATE SEPT 80.	REVISIONS		SCALE 1:5000
NTS No. 103F1E&W			FILE No.
COMPILED BY G.W.			

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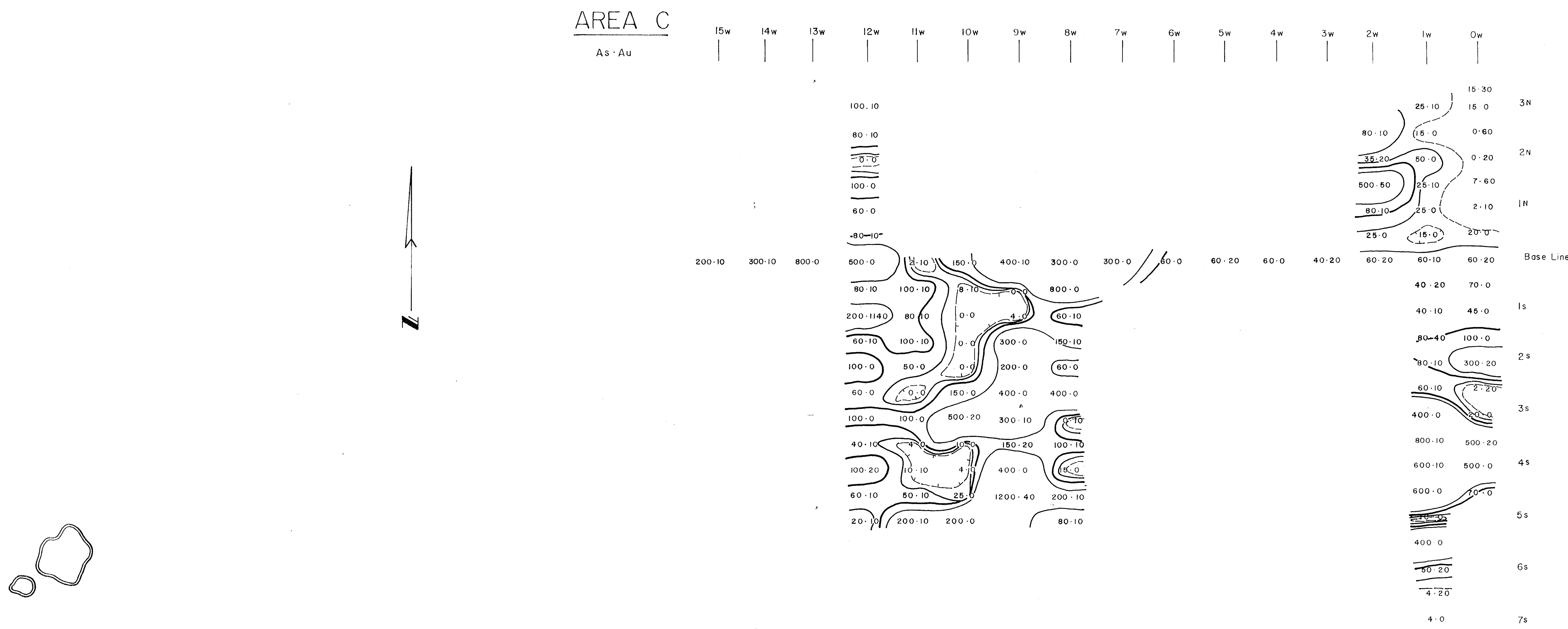
SECURITY
GEOCHEMISTRY. Au
AREAS A+B

FIGURE No 7b.		PROJECT No M486	
DATE SEPT 80.	REVISIONS		SCALE 1:5000
NTS No 103F1 E &W			FILE No
COMPILED BY G.W.			



As (p.p.m.)

As Contours at 20
40
80
160

Scale 0 100 200 300 meter

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
8405

D. Arscott

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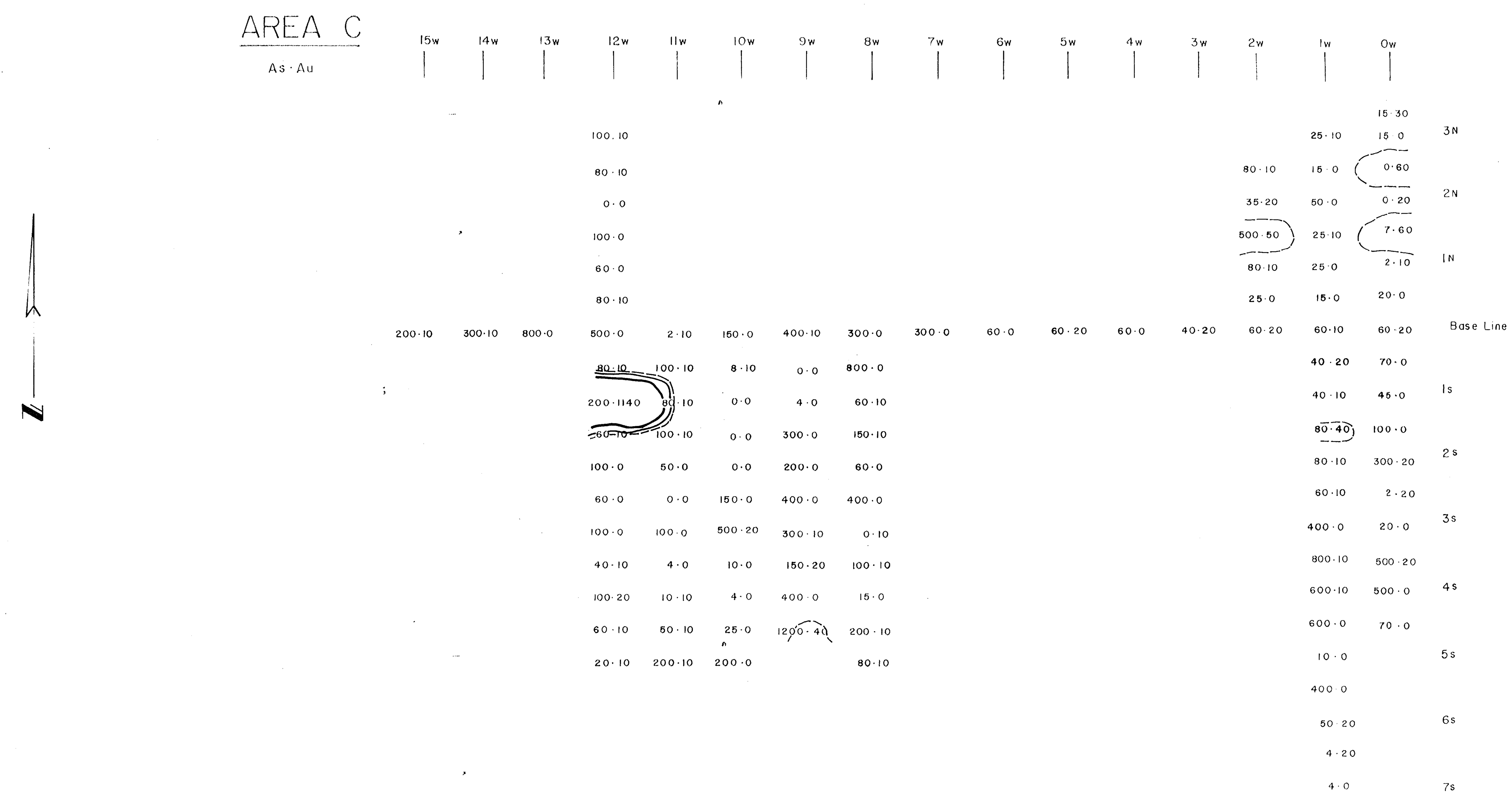
SECURITY
GEOCHEMISTRY As
AREA C

FIGURE No. 7a.		PROJECT No. M 486	
SEPT 80			1:5000
103F1E 6W			
G.W.			



Au (ppb)

Au Contours at 35
70
140

Scale 0 100 200 300 meter

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SECURITY
GEOCHEMISTRY Au
AREA C

FIGURE No 7 b.		PROJECT No M 486	
DATE SEPT 80.	REVISIONS		SCALE 1:5000
NTS No 103F 1E &W			FILE No
COMPILED BY G.W.			


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2 of 2

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CONTOUR 10 M
Pacific Survey Corporation Neg. No 5294
1 of 2

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