EXPLN PROPOSAL FOR QUEEN CHARLOTTE Is. AUG 30 1978 REV: JAN 4 1979

JCS OFFICE

EXPLORATION PROPOSAL

for

GOLD

in the

QUEEN CHARLOTTE ISLANDS

103 F,G, 53°30', 132°00', Skeena M.D.

by

J.T. SHEARER, M.Sc.

for

McINTYRE MINES LIMITED

Vancouver, B.C. August 30,1978

Revised:January 4,1979

671531

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Region: $52^{o}00'$ to $54^{o}20'$, $133^{o}15'$ to $131^{o}00'$
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for

B.C. GOLD SYNDICATE

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SUMMARY

1. An overview of the potential for bulk tonnage disseminated gold mineralization in the Queen Charlotte Islands is presented.

2. Environments discussed are:
   a) Specogna-type deposits in Skonun sediments.
   b) Acidic volcanism throughout the Masset Formation.
   c) Sulfide systems in Yakoun Formation.
   d) Pervasive replacement in Kunga Formation argillaceous carbonates.

4. A brief history of the area is outlined.

5. The proposed program is attractive because of highly favorable and relatively little prospected geological environments and initial low exploration costs.

6. A discussion of the Specogna deposit is included.

7. Conclusions and recommendations from the Summary Report (December 20, 1978) are included.

Note: The original report (August 30, 1978) has been divided into 2 separate reports (a) This report - Queen Charlotte Islands, and(b) Boundary - Lightning Peak Area. The Queen Charlotte section is supplemented by notes from Phase I work (in small type January 4, 1979).

INTRODUCTION

Preliminary investigations during 1978 indicate two broad areas in which diverse geological environments are favourable to bulk tonnage gold deposits. Disseminated gold mineralization is known in both areas, however systematic exploration has not been done in the key settings as detailed in this report.

The two areas are: (A) Queen Charlotte Islands and (B) Boundary District. This proposal deals exclusively with grassroots reconnaissance programs. Follow-up work resulting from the many property examinations done during the early part of 1978 are to be the subject of a comprehensive summary report to be completed in October on receipt of all assays and drafting compilations. Refer to interim progress reports and exploration proposals (Proserpine Prospect - J. Shearer, June 20 and August 20, 1978, plus inter-office correspondence).

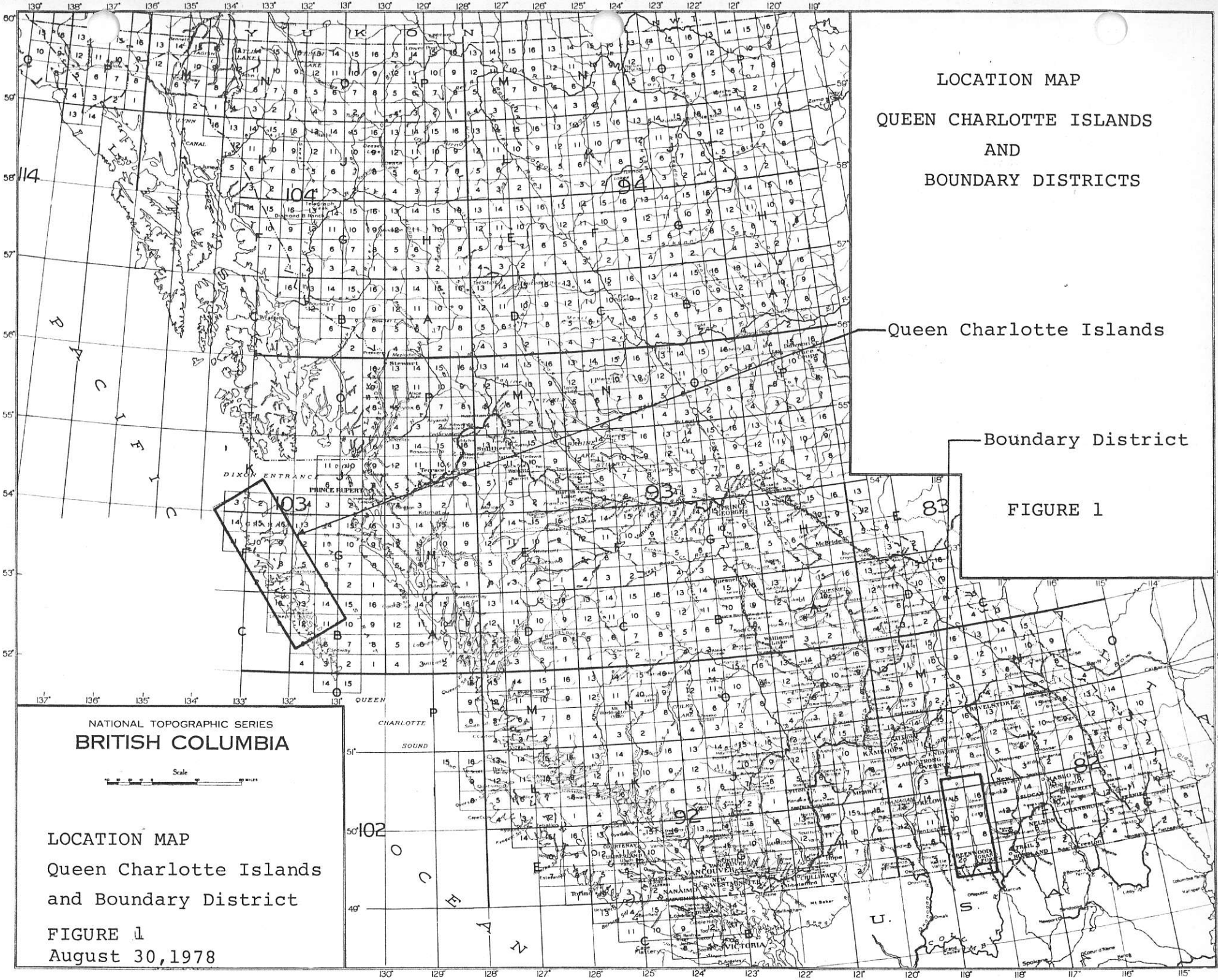
(refer to Summary Report on Queen Charlotte Reconnaissance, J. Shearer December 20, 1978.)

In the Charlottes, potential for large low grade gold deposits is shown by a recent discovery, the Specogna deposit, which is estimated to contain at least 50 million tons of 0.06 oz Au/ton mineable by open pit. At present this is uneconomic due to difficult metallurgy and low grade but continued drilling suggest higher grade intervals at depth.

(refer to attached report)

In the Boundary District, this report is not concerned with the multitude of small gold showings or the substantial gold content of the Phoenix skarns. The target is the neglected Tertiary section where correlated rocks along trend to the south have been productive in the Republic District of Washington State. At Republic, although the majority of gold production has come from veins in the underlying Mesozoic volcanics, open pit mining was started in 1936 on a low grade blanket deposit in the basal Tertiary lake-bed series. Currently Houston Oil and Minerals is conducting a multi-year drill program directed toward outlining additional disseminated gold zones

FIGURE 1
LOCATION AND INDEX MAP


LOCATION MAP
QUEEN CHARLOTTE ISLANDS
AND
BOUNDARY DISTRICTS
Queen Charlotte Islands
Boundary District
FIGURE 1
NATIONAL TOPOGRAPHIC SERIES
BRITISH COLUMBIA
Scale
LOCATION MAP
Queen Charlotte Islands
and Boundary District
FIGURE 1
August 30,1978
PACIFIC OCEAN
DIXON ENTRANCE
QUEEN CHARLOTTE SOUND
PRINCE RUPERT
PRINCE GEORGE
VANCOUVER
VICTORIA
U.S.

in Tertiary sediments around the old Flag Hill Mine. A very similar structural and lithological setting occurs in British Columbia at the old Franklin Camp. All gold production at Franklin came from veins in the older rocks but some showings are noted in Tertiary acid volcanics. Other possible, less documented extrapolations are indicated from preliminary work done this summer by the writer.

The target environments dealt with in this proposal for bulk gold area:

(A) In the Queen Charlotte Islands

1. Silicified breccia zones in Skonun sediments along deep rooted structures.
2. Eocene acid volcanics (Masset Formation) vent and subsidence zones, pyroclastic accumulations.
3. Silicified sulfide systems in the Yakoun Formation in intermediate volcanics and fine clastics.
4. Replacement zones in argillaceous Kunga Formation carbonates.

(refer to Figure 1a for areas investigated by Phase I)

(B) Boundary District

1. Porous basal rubble zones, subvolcanic caldera collapse zones, acid volcanic vent area, within Tertiary section adjacent to graben boundaries.

The two areas logistically compliment each other in that a very low cost program can be started early in the spring in the Boundary district which can progress to a relatively low cost ongoing Charlotte's program beginning around mid-July. Estimates of the involved costs are tabulated in Appendix I.

This proposal is of necessity somewhat brief and accompanied by rough illustrations due to lack of available time and drafting services.

LOCATION AND ACCESS

The Queen Charlotte Islands are at the western edge of the continental shelf seaward of central British Columbia. They lie between 52° and 54° north latitude and 131° and 133° west longitude mainly in N.T.S. 103F as shown on Figure 1. Considering the amount of activity in the forest industry the islands are relatively isolated. There are daily flights from Vancouver and Prince Rupert by P.W.A. and T.P.A. but no regular ferry service exists. Rivtow Ltd. provides a contract barge service from Prince Rupert. Access to many parts of the islands is provided by an intricate network of private logging roads or by small boat to various inlets. Vancouver Island Helicopters have a base at Sandspit. Queen Charlotte Helicopters also has a base at Sandspit and both have Jet Rangers.

GEOLOGY

a) General

The Queen Charlotte Islands together with Vancouver Island and part of southwest Alaska from a distinct structural (tectonic) province referred to as the Insular Belt. The Insular Belt lies to the west of the Coast Plutonic Complex and is considered by many workers to be allochthonous with respect to the North American craton. It has been suggested that the basic elements making up the Insular Belt were emplaced by latest Paleozoic or early Mesozoic right lateral trans-current faulting from the south.

The stratigraphic and tectonic history of the Queen Charlotte Islands is very similar to the better documented Vancouver Island but with differences of timing and facies which progressively diverge from the begining of mid-Jurassic time.

b) Stratigraphy and Lithology

Regional geology is shown on Figure 2 (1 inch = 20 miles) and a generalized stratigraphic column is illustrated in Figure 2. Details of each formation of particular interest is given in the section on exploration targets.

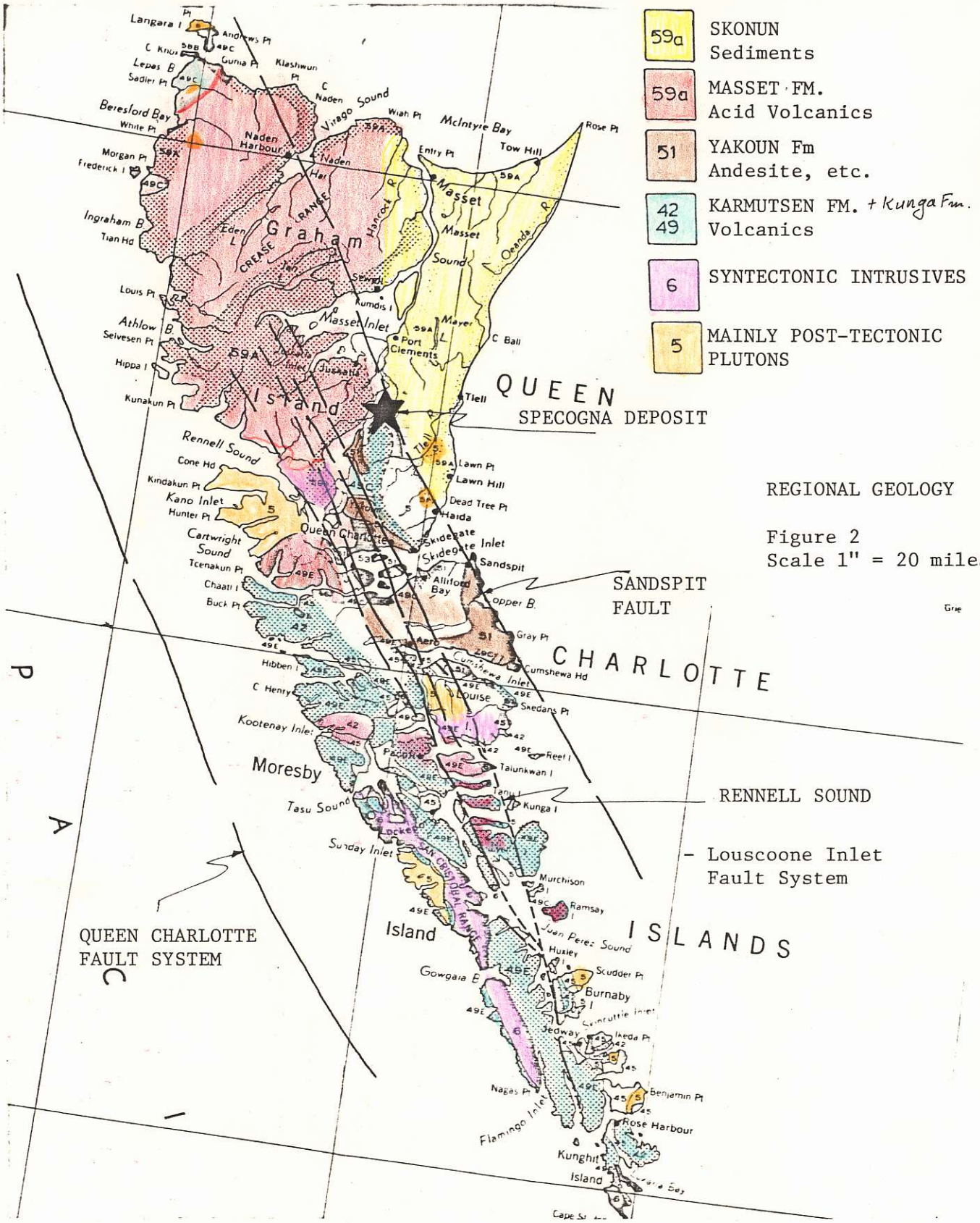
The oldest rocks are mid Triassic, thick accumulations of submarine basic lavas, sodic pillow basalt and breccia belonging to the Karmutsen Formation. Chemically these rocks resemble oceanic basalts in both major and minor element with a slightly alkaline bias. The Karmutsen Formation is extensively exposed on Moresby and adjacent islands but is rare on Graham Island.

The Kunga Formation conformably overlies the Karmutsen and is composed dominantly of thick carbonates and argillite. The Kunga-Karmutsen - Coast Intrusive suite has been extensively prospected in the past for copper-magnetite skarn mineralization. The Kunga Formation is correlative with the Quatsino limestone and Parson Bay Formations on Vancouver Island.

The Yakoun Formation is characterized by its diverse lithology and can be subdivided into 5 separate members based on composition and abundance of volcanic rocks. The Yakoun is broadly comparable to the Bonanza Group on Vancouver Island which is marked by explosive eruptions of porphyritic andesite agglomerate and tuffs. Completely volcanic structures, 6,000 feet thick were built in some areas whereas in others considerable quantities of marine volcanic sandstones and argillite interfinger.

The Longarm Formation is composed of turbiditic greywacke and siltstone occurring in a graben-like trough grading southeastward to a thinner section of cleaner sandstones and shoreline conglomerates.

Much of the middle to late Jurassic was marked by uplift, intrusion and minor deformation.



REGIONAL GEOLOGY

Figure 2
Scale 1" = 20 miles

(from Little 1962, Map 932A)

FIGURE 3
IDEALIZED STRATIGRAPHIC SECTION
QUEEN CHARLOTTE ISLANDS

AGE	THICKNESS	NAME	LITHOLOGY
		PLEISTOCENE	
MIO-PLIOCENE	6,000'	SKONUN FM	Sandstone, shale, minor conglomerate, lignite
PALEOCENE-EOCENE	18,000'	unconformity	
		MASSET FM.	Acid to basic flows & pyroclastics
		unconformity	
L. CRETACEOUS	2,000'	SKIDEGATE FM	Siltstone and sandstone
	1,300' to 4,000'	HONNA FM	Conglomerate, shale sandstone
MID CRETACEOUS	1,000'	HAIDA FM (2 separate members)	Shale member, underlain by sandstone
	2,700'	unconformity	
LOWER CRETACEOUS	4,000'+	LONGARM FM	Siltstone, minor conglomerate and volcanics
		unconformity	
	4,500' variable	YAKOUN FM	Intermediate pyroclastics sandstone, shale
LOWER JURASSIC	600'	MAUDE FM	Shale, minor sandstone
	2,000'	KUNGA FM	(argillite member)
UPPER TRIASSIC	1,200'	KUNGA FM	(carbonate member)
MID TRIASSIC	14,000'	KARMUTSEN FM	Basalt, Pillow lavas, breccias aquagene tuffs.

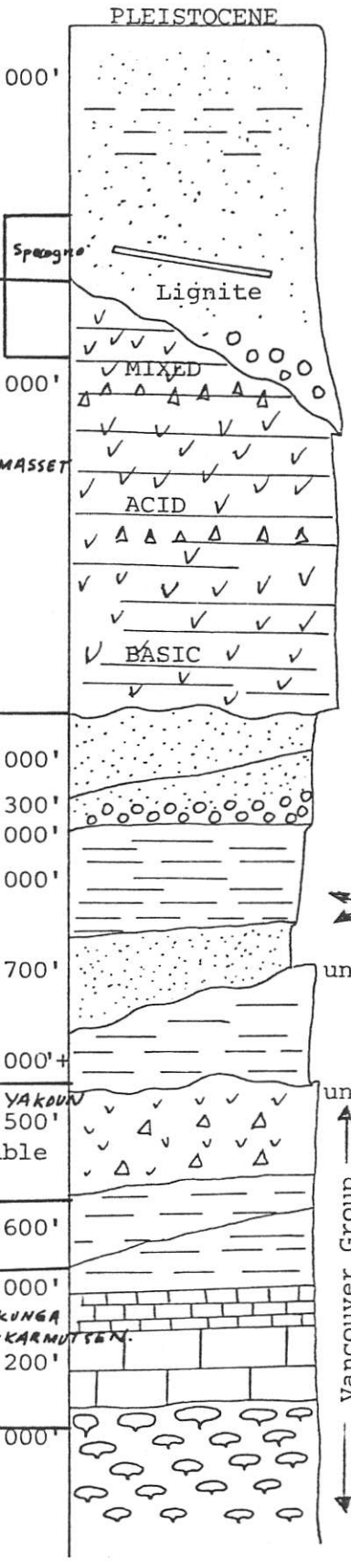


Figure 3
Idealized Stratigraphic Section
QUEEN CHARLOTTE ISLANDS
Drawn by: JS Date Aug.30,1978

Just before and during the beginning of the Late Cretaceous, marine sandstone and shale of the Hiada Formation were deposited. The basal pebbly sandstone contains the first granitic debris evident in the Islands.

The eruption of an extensive and very thick sequence of columnar basalt flows, breccias and rhyolitic ash flows (Masset Formation) started in the Paleocene and continued into the Eocene. Almost all these rocks accumulated subaerially except in an area on the southeast of Moresby Island where breccia of mixed basalt and rhyolite clasts appear to have been formed sub-aqueously. The Masset Formation has some interesting affinities to the acid volcanics of the Midway-Boundary District which are discussed at the end of this report.*
(see attached report)

The last significant sedimentary event was the deposition of the thick Skonun Formation in Mio-Pliocene time on eastern Graham Island composed mainly of poorly consolidated sands, shale and conglomerate.

Syntectonic plutons with associated amphibolitic borders are concentrated along the western flank of Moresby Island whereas late, post tectonic intrusives are distributed throughout but dominantly east of the earlier ones.

c) Structure

Complex faulting govern the present distribution of rocks and characterize the tectonic style. Major faults are conspicuous for their continuous linkage in a northwestward trend. There are three subparallel systems, as shown on Figure 2,: (1) the Sandspit fault zone in the east, (2) Rennell Sound - Louscoone Inlet fault zone in the centre, and (3) the Queen Charlotte System offshore to the west. The Queen Charlotte fault forms a small part of the transform suture making up the western margin of the North American plate and eventually connects to the Mid-Pacific ridge. Faulting is still active in this region which is the most active seismic area in Canada.

Folding is of much less importance and in many cases is related to fault tectonics.

Most northwest trending faults have the following characteristics according to Sutherland-Brown (1968):

> "They have been active since at least Early Cretaceous; they generally combine right hand wrench movement with normal, east block down displacement; they are spatially related to post-tectonic plutons and some sedimentary sequences; and they have the same orientation as late folds."

A detail analysis of many structural relationships throughout the Islands is presented in Sutherland-Brown (1968) from page 147 to 164. A preliminary inspection of Landsat images reveals substantially more linears than those shown on Figure 26 (Sutherland-Brown (1968) pg 148). As discussed in the following sections these strong, deep seated vertical structures form an important prospecting criteria. A thorough study of the Landsat images may provide additional targets or focus attention within a broad area.

HISTORY OF PREVIOUS EXPLORATION

Mineral deposits in the Queen Charlotte Islands were first explored more than 120 years ago. Mitchell Inlet was the site of the first Lode metal mine in British Columbia. Starting in 1852 gold shipments were made under the ownership of the Hudson Bay Company and resulted in the Islands becoming a Crown Colony.

In 1862-63 Francis Poole explored the vicinity of Skincuttle Inlet and discovered copper-magnetite showings at Jedway and Jib. Coal exploration started about 1865 and continued sporadically until the early 1900's. Currently MacMillian-Bloedel hold the coal rights for much of the Graham Island. During the years 1906 to 1914, prospecting was intense and a large percentage of the copper showings known today were found. Between 1918 and 1939 little exploration was accomplished, however development of the 5 known gold vein properties and beach placers occurred in this period concentrating on:

1) Blue Mule at Kootenay Inlet
2) Homestake at Cumshewa Inlet
3) Early Bird, Mitchell Harbour
4) Southeaster, near Skidegate
5) Ellen, Shuttle Island

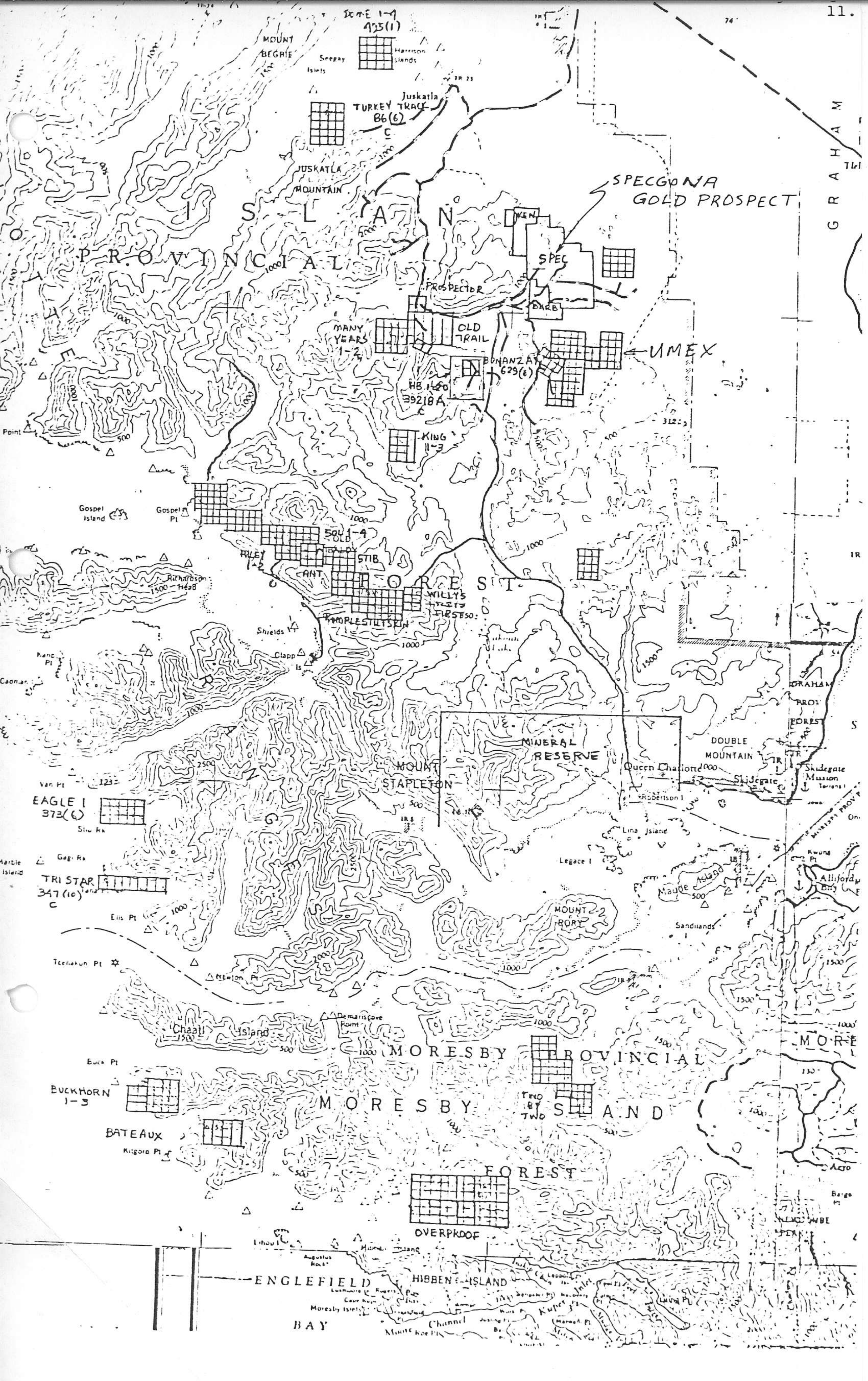
Some work on a joint venture, Umex-Falconbridge, was performed in the early 1970's on the Cumshewa Inlet prospect.

The most prolonged period of intense exploration was from the mid 1940's to mid 1960's, when several major copper-magnetite ore bodies were outlined. Details of this phase are given on page 166-167 of Sutherland-Brown(1968). The highlights are:

1) 1953 - acquisition of crown grants at Tasu by Wesfrob.
2) 1956 - drilling of Tasu orebody, drilling at Copper Queen and Jedway.
3) 1959-60 - drilling by Silver Standard at Harriet Harbour.
4) 1961 - Granby purchases Jedway from Silver Standard.
5) 1962 - Production from Jedway, Canex drills Iron Duke.
6) 1963 - Highland-Bell drills Burnaby Island.
7) 1966 - Tasu starts production.

Little or no concentrated effort towards copper skarns in the Charlottes has been recorded since around 1972.

Between 1971 to 1975 a flurry of activity for low grade gold was initiated due to the discovery of the Specogna deposit. At one time most of the Sandspit fault was staked by such companies as Kennco, Cominco, Canex-Placer, Silver Standard, Umex and Quintana. However the restrictive policies introduced by the N.D.P. government coupled with the failure to locate any new showings along the fault resulted in the current 3 year lull in exploration. However this state of affairs predictably will not last and the coming 1979 season already has several drill programs planned on gold bets.



SPECGONA GOLD PROSPECT
MOUNT BEGBIE
Seepay Islets
Harrison Islands
Juskatla
TURKEY TRACK B6(6)
JUSKATLA MOUNTAIN
I S L A N D
P R O V I N C I A L
KEN
SPEC
PROSPECTOR
BARB
MANY YEARS 1-2
OLD TRAIL
BONANZA 629(6)
UMEX
HB 1-60 39218A
KING 1-3
Gospel Island
Gospel Pt
SOU 1-4
OLD
STIB
RILEY 1-2
ANT
Richardson Head
F O R E S T
WILLYS
FIRST
RUMPLESTILTSKIN
Shields
Clapp Is
Kano Pt
Cadman
MINERAL RESERVE
MOUNT STAPLETON
DOUBLE MOUNTAIN
Queen Charlotte
Skidegate
Skidegate Mission
Robertson I
Lina Island
Legace I
Maude Island
GRAHAM PROV FOREST
G R A H A M
EAGLE I 373(6)
Van Pt
Marble Island
TRI STAR 347(10)
Ellis Pt
MOUNT RORY
Sandilands
Kwuna Pt
Alliford Bay
Newton Pt
Chaatl Island
Demariscove Point
MORESBY PROVINCIAL
M O R E S B Y I S L A N D
TWO BY TWO
Buck Pt
BUCKHORN 1-3
BATEAUX
Kitgoro Pt
FOREST
OVERPROOF
ENGLEFIELD BAY
HIBBEN ISLAND
Moresby Islets
Channel
Kuper Inlet
Barge Pt
Aero

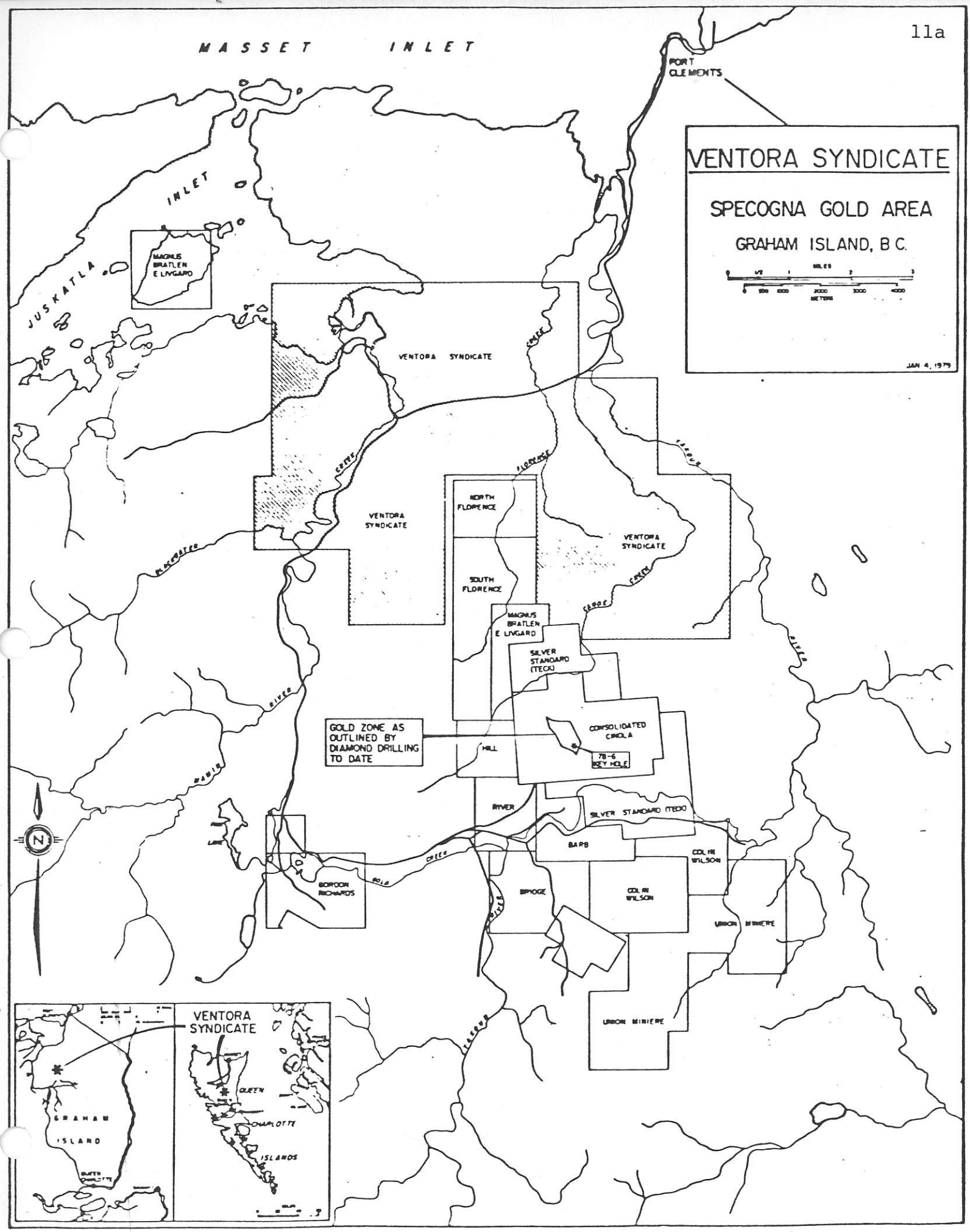


Figure 5a Recent staking around Specogna deposit
From George Cross News Letter No. 5 (January 8, 1979

CURRENT GOLD EXPLORATION

The prospective resurgence in gold exploration in the Queen Charlotte Islands is mainly a result of three factors:

1) rise in gold price making lower grade mineralization more attractive especially in ideal mining situations.
2) fabourable legislation by the present government.
3) persistence by a small group of individuals and a junior company in working on gold showings on the Islands.

Much of the credit for maintaining interest in the area and evolution of geological ideas must go to K. Sanders of Consolidated Cinola and J. Christie, G. Richards and W. Livingstone, all former Quintana Minerals employees who have continued prospecting on an individual basis. Current exploration holdings are tabulated in Table I and the corresponding claim groups are shown on Figure 5. Each of these properties will be discussed under the appropriate geological environment.

PROPOSED EXPLORATION PROGRAM

a) SKONUN Formation

The Skonun Formation is composed of marine and non-marine sands, sandstone, shale, lignite stringers and conglomerates of Mio-Pliocene age. It overlies Masset Formation usually with slight angular unconformity. Skonun rocks are generally friable and do not outcrop well, consequently much of the detail known about the unit are from sections in several exploratory wells drilled by oil companies. The areas underlain by Skonun Formation are shown in Figure 6.

The Specogna Gold deposit is at least partially hosted by Skonun sediments. It is difficult to precisely identify the age of the mineralized rocks because of intense silicification and introduction of rhyolite fragments through brecciation(intrusion?). However at the margins of the deposit, sections undoubtedly Skonun age (fossiliferous) are also silicified and carry anomalous Hg and Au.

TABLE I

CLAIMS IN GOOD STANDING *

QUEEN CHARLOTTE ISLANDS

August 30,1978

CLAIM	OWNER	STATUS
BABE	E. Specogna	Drilling by Continental Cinola (Specogna deposit)
SUN	C. Kowall	Tie on to Specogna
KEN	R. Schumacher	Tie on to Specogna
FIVE, Etc.	UMEX	South of Specogna, drilling in 1978
PENDULUM	R. Standbridge	Independent prospector
BONANZA	"	" "
OLD TRAIL	J.Christie, G. Richards	Former Quintana employees, optioned to Chevron, Yakoun Formation
MANY YEARS	"	" "
RILEY	"	" on Courte Sb trend
BUCKHORN	"	" in Kunga Formation
OVERPROOF	"	" "
TWO by TWO	"	" "
BATEAUX	"	Not optioned, in Kunga
KING	"	Optioned to Newmont. Yakoun
DOME	on Harrison Island	Masset Formation
STIB	UMEX	On Courte Sb trend - overstaking -

*over 500 units have been located in a staking rush after the Consolidated Cinola drill hole 78-6 announcement. See Figure 5a

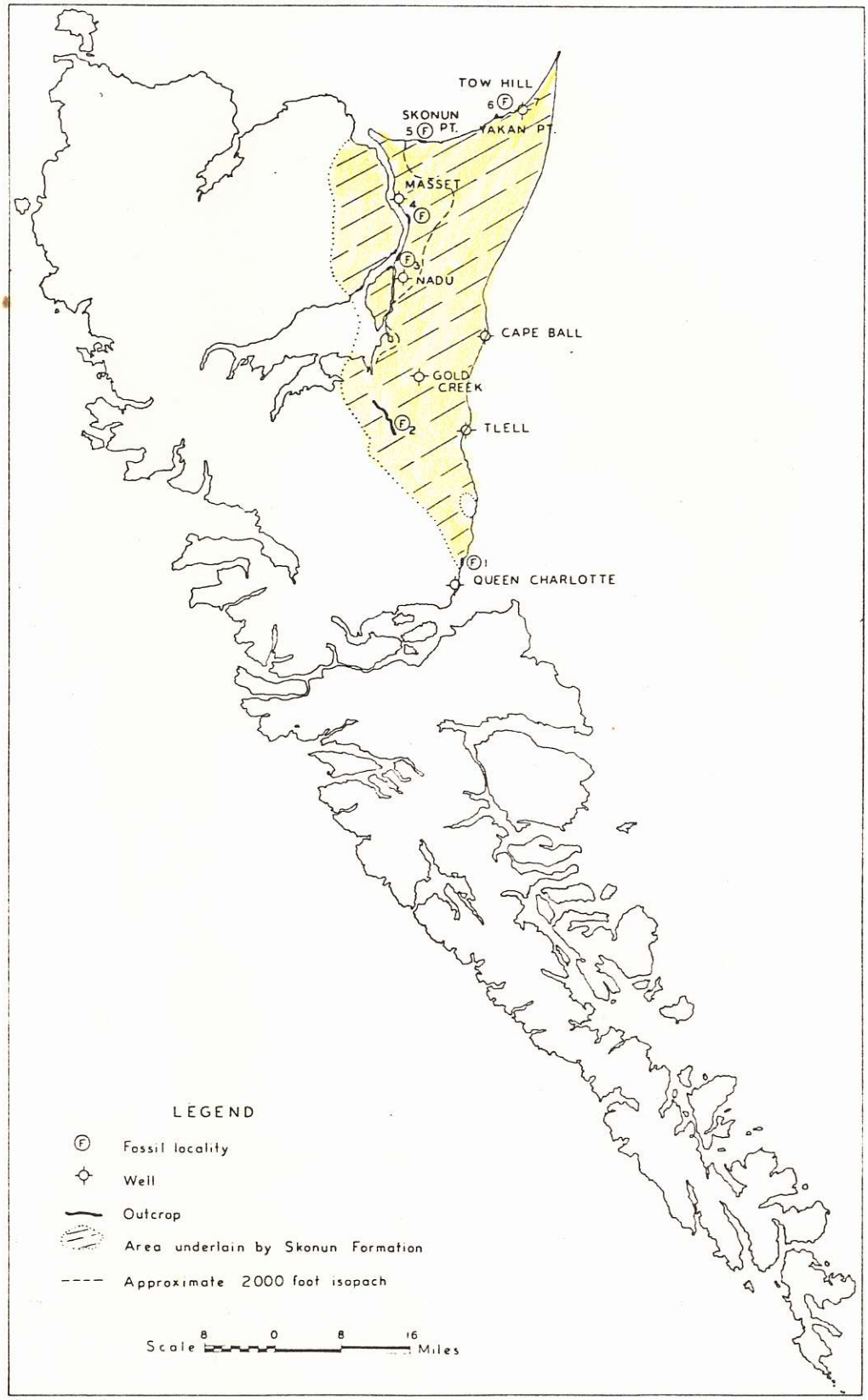


Figure 6 Skonun Formation: Distribution, wells and fossil location from Sutherland-Brown (1968)

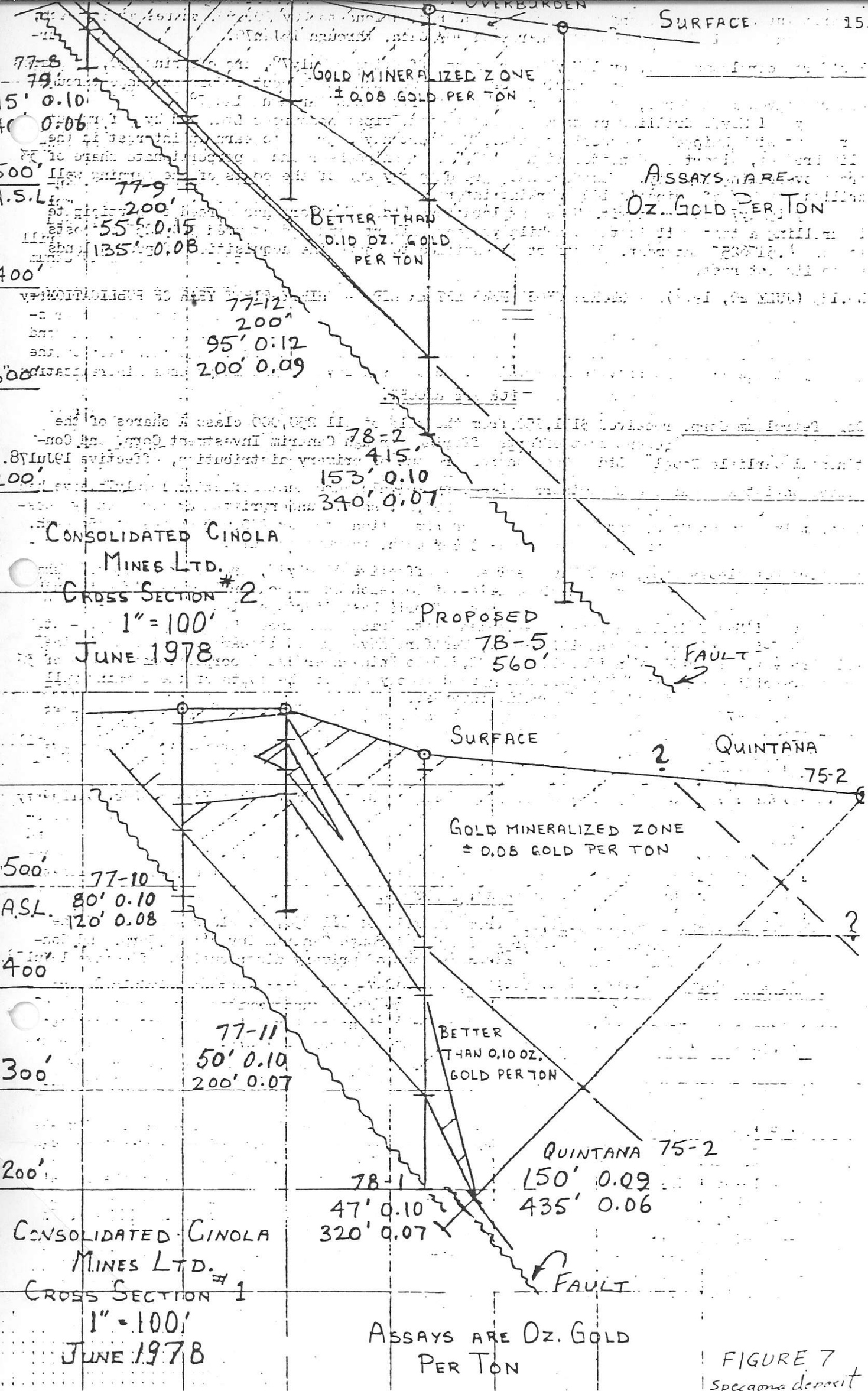


FIGURE 7
Spezgona deposit
Recent drilling by
Cinola

For details concerning the Specogna deposit refer to inter-office correspondence (J. Shearer, Dec. 29, 1977). A file on the Specogna deposit was assembled from Mr. K. Sanders, President of Continental Cinola, the present operator, and through discussions with M. Wolfhard of Superior Minerals, Reno, formerly with Quintana. In August 1978 the writer had the opportunity to spend 3 full days on the property with access to the core. Many rock samples were taken along with orientation soil lines. Since the Specogna deposit represents such an important part in any exploration rational for bulk tonnage gold mineralization a comprehensive report is planned (October '78) to document the more pertinent features. The essential broad features of the deposit are:

1) size: 50 million tons of 0.06 oz Au/ton at a 0.04 oz Au/ton cut off to a depth of about 200 feet.
2) localized along the Sandspit Fault between an eastward dipping (38°) fault ("Specogna Fault") that appears to limit the deposit at depth.
3) intense silicification, brecciation, introduction of rhyolitic material (extrusive felsic dome ??).
4) distinct trace element assemblage of As, Sb, Ba, Hg, Te, and Mo, Ag, W in core.
5) sericite alteration, near surface deposition of gold.

The 50 million ton estimate is only a minimum figure for a system that could conceivably be much larger. The area of 0.06 oz Au/ton is surprisingly uniform. Figure 7 shows the result of the 1978 drilling by Cinola to a greater depth than previous holes and the apparent emergence of a slightly higher grade wedge at depth (0.1 oz Au/ton) below the 0.06 to 0.08 slab.

The Skonun along the Sandspit Fault has been well prospected. New showings are reported on Moresby Island near Sandspit and should be investigated. Signs of silicification and trace element content should be noted on general reconnaissance traverses.

Drill programs along the Sandspit Fault proposed for 1979 are by UMEX and Consolidated Cinola.

SPECOGNA DEPOSIT

Some pertinent features of the Specogna deposit can be summarized as follows:

1) Spatially associated with the Sandspit fault, a structure with major vertical and horizontal movement.

2) Bounded by an east dipping fault at shallow depth, (Specogna Fault).

3) Extensive crudely concentric pervasive alteration zoning - silicification, vertical fissure filling plus pervasive, phyllic alteration, seritization.

4) Host rocks are; near Specogna fault - flow banded rhyolite breccia plus coarse to fine clastic stratigraphy outward of fault (to east).

5) Distinct trace element assemblage, As, Sb, Ba, Hg, Te, low silver, high As, Sb, Hg, (Mo, Ag? W? in core).

6) Extremely large hydrothermal system. 100-150 million tons of 0.02 oz Au/ton, estimates of 50 million tons of 0.06.

7) Zoning of Au; Structure - outward from Specogna Fault.
Stratigraphy - preferentially in certain beds.

Higher grade sections at depth.

A stratigraphic column for the Specogna area is illustrated in Figure 4. All previous workers tend to regard the rhyolite member as related to the Upper Masset Formation (or Eocene in age). However there is considerable confusion as to the age of the sediments. There are 3 major viewpoints

1) Honna equivalents.

2) Volcanoclastics of the Masset Formation.

3) Skonun age (Pliocene).

From observations in 1978 I would concur with Quintana findings (Richards (1975) and Wolfhard (1976)) that at least some of the gold bearing coarse clastic material is of Skonun age. Plant fossils similar to those dated as middle Tertiary in the Princeton Coal Basin were noted adjacent to highly silicified and Mercury rich conglomerate creek exposures approximately 1 km southeast of the main mineralized zone. This suggests a Skonun age for silicification or at least introduction of silica in Pliocene time related to vertical movement on the Sandspit Fault.

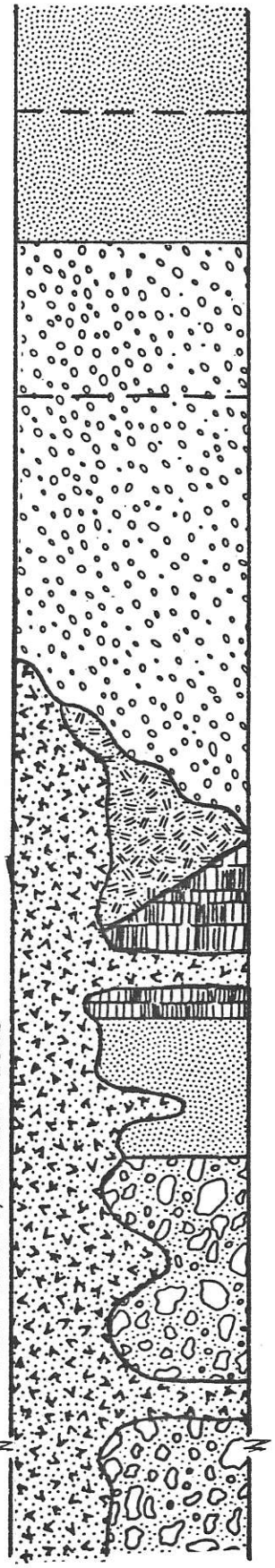
SPECOGNA DEPOSIT
Stratigraphic Column
(After G. Richards 1975)
FIGURE 7a

GOLD Content	Thickness		Lithology
			SILTSTONE, finely laminated, chocolate brown, few pebble layers
Good gold	(upper 50' pebble rich)		
Poor gold			
Upper 50' good gold			CONGLOMERATE: (abundant porphyritic andesite pebbles)
			Numerous 1-5 ft siltstone-sandstone 5-20% of section, beds
Lower 100' poor gold			Many Wood Fragments
	Unconformable (now thought to be conformable by G. Richards)		CONGLOMERATE: (Many porphyry pebbles)
Good gold	0 - 50'		DARK GREY SHALE
Poor gold	10'-30'		FELSIC SANDSTONE (intense bx & silicification)
Poor gold	30'		DARK GREY SILTSTONE
Good gold	60'		PEBBLE CONGLOMERATE
	Base not seen		

Possibly SKONUN Sediments

MASSET Dominately Acid Volcanics

Intercalacted Quartz Porphyry Flow Dome +/or Ash Flows



Entire section disrupted by vertical fissure filling drusy & chalcedonic quartz breccia

(Drawn by J.S. 1978)

A highly diagramatic sequence of events are shown on Figure 7 a to d.

There are several similarities between the Specogna deposit and Carlin-type mineralization as discussed by Wolfhard et al (1976). Similarities are:

1) Pervasive gold mineralization.
2) Structural and stratigraphic emplacement of metals (permeable host, vertical faults, channel ways).
3) Trace element assemblage.
4) Large size.

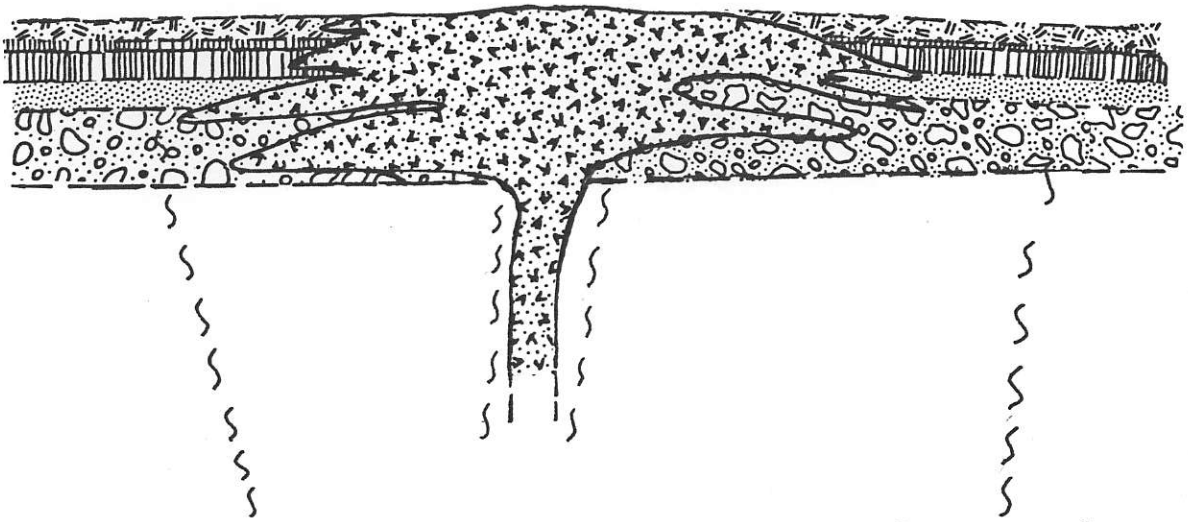
However there are also several notable differences in degree of silica introduction and host lithologies. From the limited preliminary studies at Specogna the acid volcanic component appears to have considerable genetic significance. The Specogna deposit could perhaps be more closely comparable to the precious metal - acid volcanic epithermal environment.

An exciting announcement was made on December 7, 1978 by Consolidated Cinola Mines Ltd. concerning high assays in DDH-78-6. The results are listed below:

Interval From To	Gold oz/ton	Interval From To	Gold oz/ton	Interval From To	Gold oz/ton
152 - 154 m	0.358	160 - 162 m	0.693	168 - 170 m	0.283
154 - 156 m	0.349	162 - 164 m	0.988	170 - 172 m	0.490
156 - 158 m	1.760	164 - 166 m	0.047	172 - 174 m	2.490
158 - 160 m	2.450	166 - 168 m	0.222	174 - 176 m	0.233

Drill hole 78-6 represents a step out of 800 feet from the previous Cinola drilling. (Figure 7 and maps to be presented at Syndicate meeting). The occurrence of high grade free gold sections at detph hosted by the regular stratigraphy greatly enhance the potential economic viability of the deposit.

WEST EAST



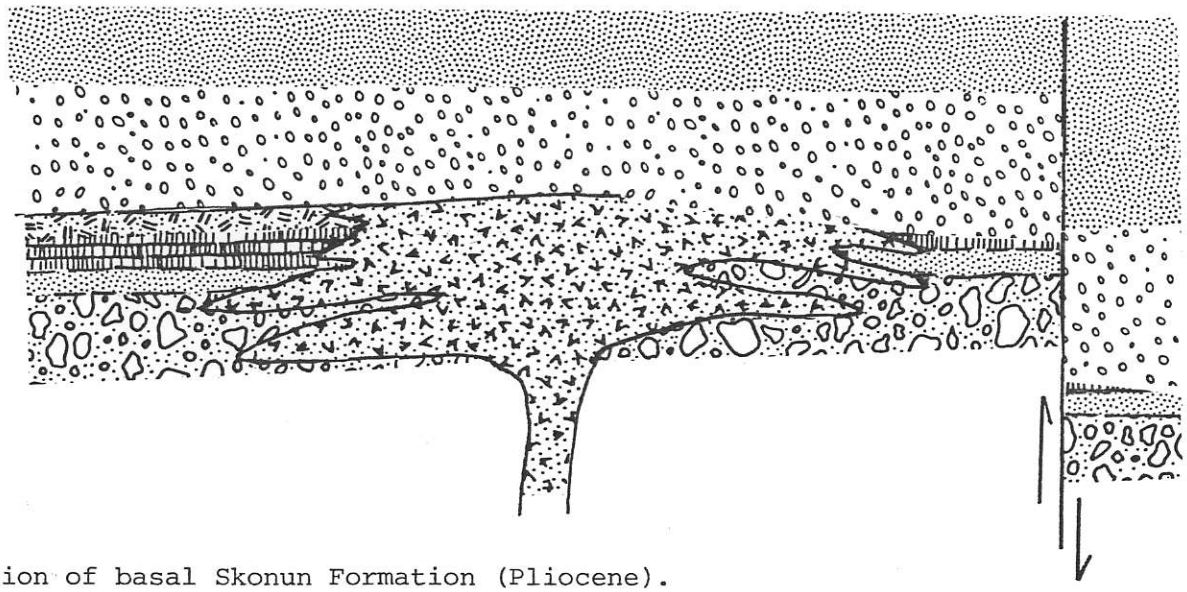
Masset time
Late Eocene

Precursor of
Sandspit Fault.

1) Development of rhyolite flowdome interdigitating with coarse volcanic clastic sediments (ignimbrites, tuff breccias) perhaps collapse breccias associated with subsidence of vent area?

FIGURE 7b

2) Tilting and minor erosion - Oligocene.



3) Deposition of basal Skonun Formation (Pliocene).

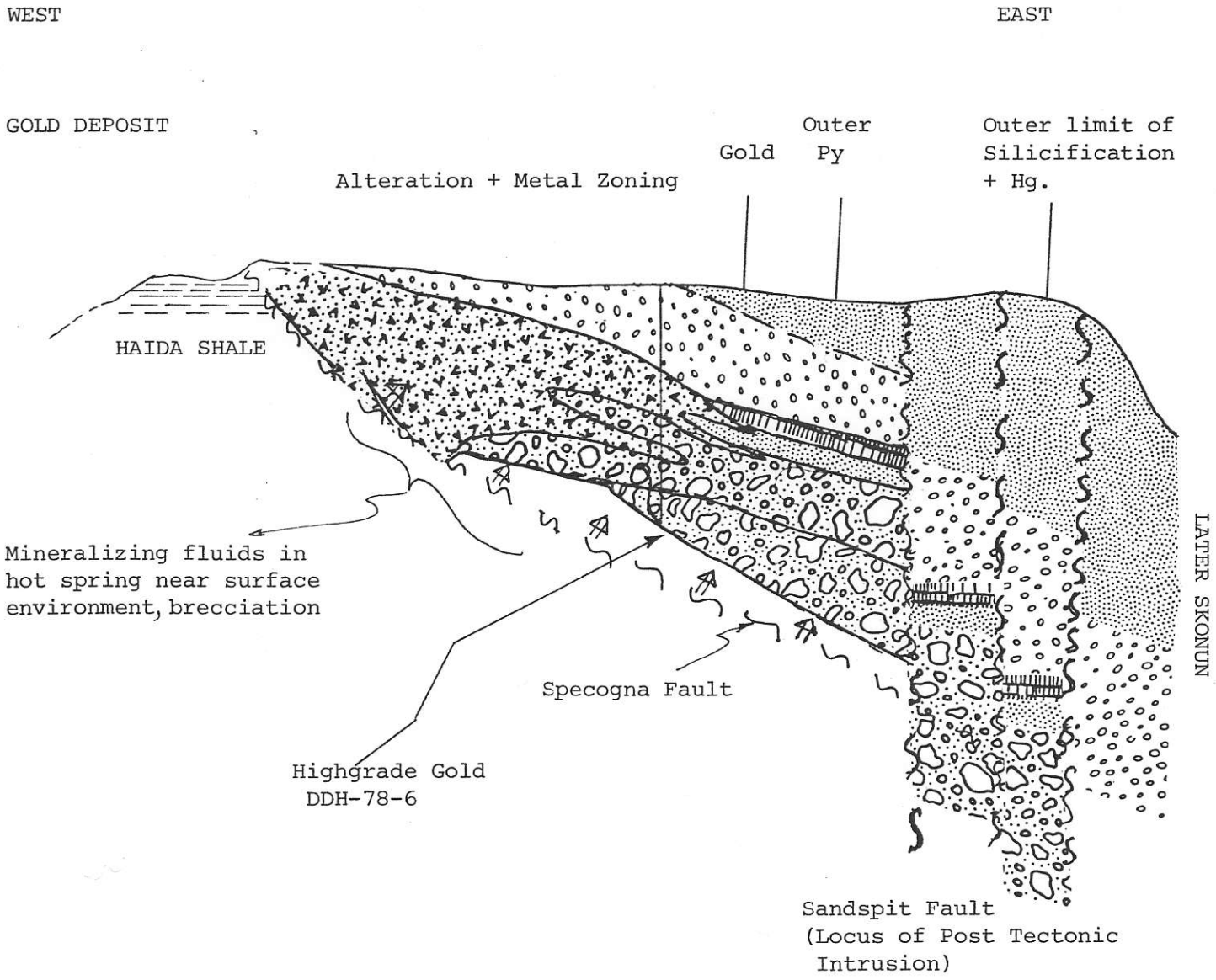
also horizontal
movement

FIGURE 7c

4) Downdrop on Sandspit Fault intrusion of Post Tectonic plutons associated with fumerolic activity.

Note: Key for lithologies corresponds to stratigraphic section.

(Drawn by J.S. Dec.1978)



5) Introduction of Gold, As, Sb, Hg, Silica, phyllic alteration, pyrite.

Note: Masset volcanics are known to be intruded and metamorphosed by post tectonic plutons.

Key for lithologies corresponds to stratigraphic section.

FIGURE 7d.

(Drawn by J.S. Dec. 1978)

b) KUNGA Formation

One of the keys in the recent discoveries and prospecting stategies is the recognition that because the Specogna mineralizing event was at least as young as Eocene and possibly Pliocene, not only Skonun Formation but all older rocks containing favourable porous host sequences that are juxtaposed along major structures are potential targets.

One of the most favourable host sequences which is abundant along the Rennell-Louscoone Fault system is the Kunga Formation. The Kunga Formation is composed primarily of limestone and argillite resting conformably on Karmutsen volcanics. The Kunga is repeatedly exposed over the whole length of the Islands as shown on Figure 8. The formation is divisable into three members of contrasting lithologies: a massive grey limestone member directly overlying Karmutsen Formation; a middle thinly bedded black limestone member; and an uppermost thinly bedded black argillite member. A detail description of the 3 members is contained in Sutherland-Brown (1968) pages 50 to 61.

The prospects within the Kunga environment are: (1) Buckhorn, (2) Bateaux, (3) Overproof and (4) Two by Two, all on Moresby Island along a strong east-west fault zone running through Inskip Channel and connecting with Cumshewa Inlet. All the claim groups, except Bateaux, have been optioned to Chevron Minerals sight-unseen. Due to a drastic cut back in Chevron's 1978 budget, no work was performed but funds have been set aside for the 1979 season. McIntyre examined the Bateaux Prospect in August (refer to Figure 9) and obtained silt samples running a maximum of 50 ppb. This (deleted) is considered anomalous for Au but very near the threshold of reproducibility. No rock samples were anomalous for Au but some were moderately high in As. On the basis of the scanty information available I cannot recommend that McIntyre option the Bateaux Prospect. However it is considered a favourable area for disseminated gold mineralization especially in view of reported anomalous carbonate bedrock samples in Au from preliminary work on the Buckhorn claims.

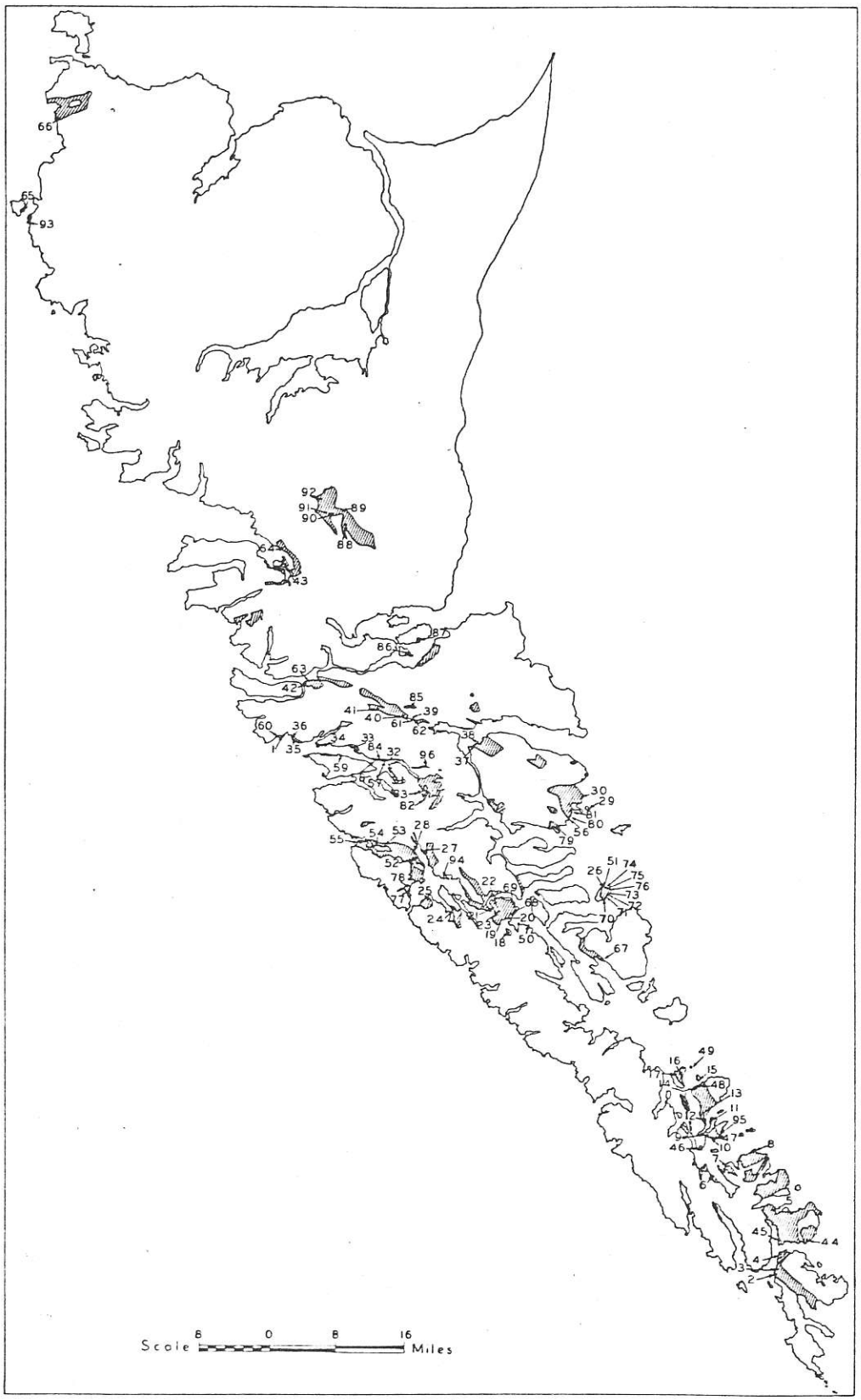


Figure 8 Kunga Formation: Distribution of fossil locailities
From Sutherland-Brown (1968) J.S., August 30, 1978

In summary the porous argillaceous carbonates of the Kunga Formation present favourable host rocks for disseminated gold mineralization when juxtaposed along deep seated fracture zones.

During Phase I a very interesting Au, As, Sb-Mo soil and rock anomaly was found on Moresby Island underlain by blocky weathering altered limestone in contact with pyritic basalt. The area is shown on Sutherland-Brown's (1968) map as Karmutsen Volcanics. A severely contorted thin bedded limy argillite was noted near the valley floor adjacent to the anomalous soil samples suggesting the presence of a major fault. A Masset age gabbro-diabase stock occurs to the north along a possible continuation of this major fault. The area requires detail follow-up work.

c) MASSET Formation

The Masset Formation is a very thick accumulation of volcanic flows and pyroclastic rocks of complex, diverse lithology in various parts of the Islands but primarily composed of alkali basalt and sodic rhyolite, as shown on Figure 10. Much of the prospecting rational to be disscussed in the Boundary District section applies to the Masset acid volcanics. The tertiary acid volcanism-precious metal association exeplified by many deposits in the Western United States contained in special structural settings such as cauldron collapse, graben or hot spring features is the guiding model.

The Masset Formation has been separated into three different facies:

1) oldest - Tartu Facies - plateau columnar basalts 18,000 feet thick.
2) middle - Kootenay Facies - welded rhyolite tuff breccias 4,000 feet thick.
3) top - Dana Facies - pyroclastic breccias of mixed basalt and rhyolite clasts, 5,000 feet thick.

The Masset is intruded and locally metamorphosed by post-tectonic plutons. Coarse basalt breccia near the bottom of a thick rhyolitic pile near Skelu Bay may indicate filled vent openings. A body of coarse accidental blocks occurs south of Bottle Point and should be investigated.

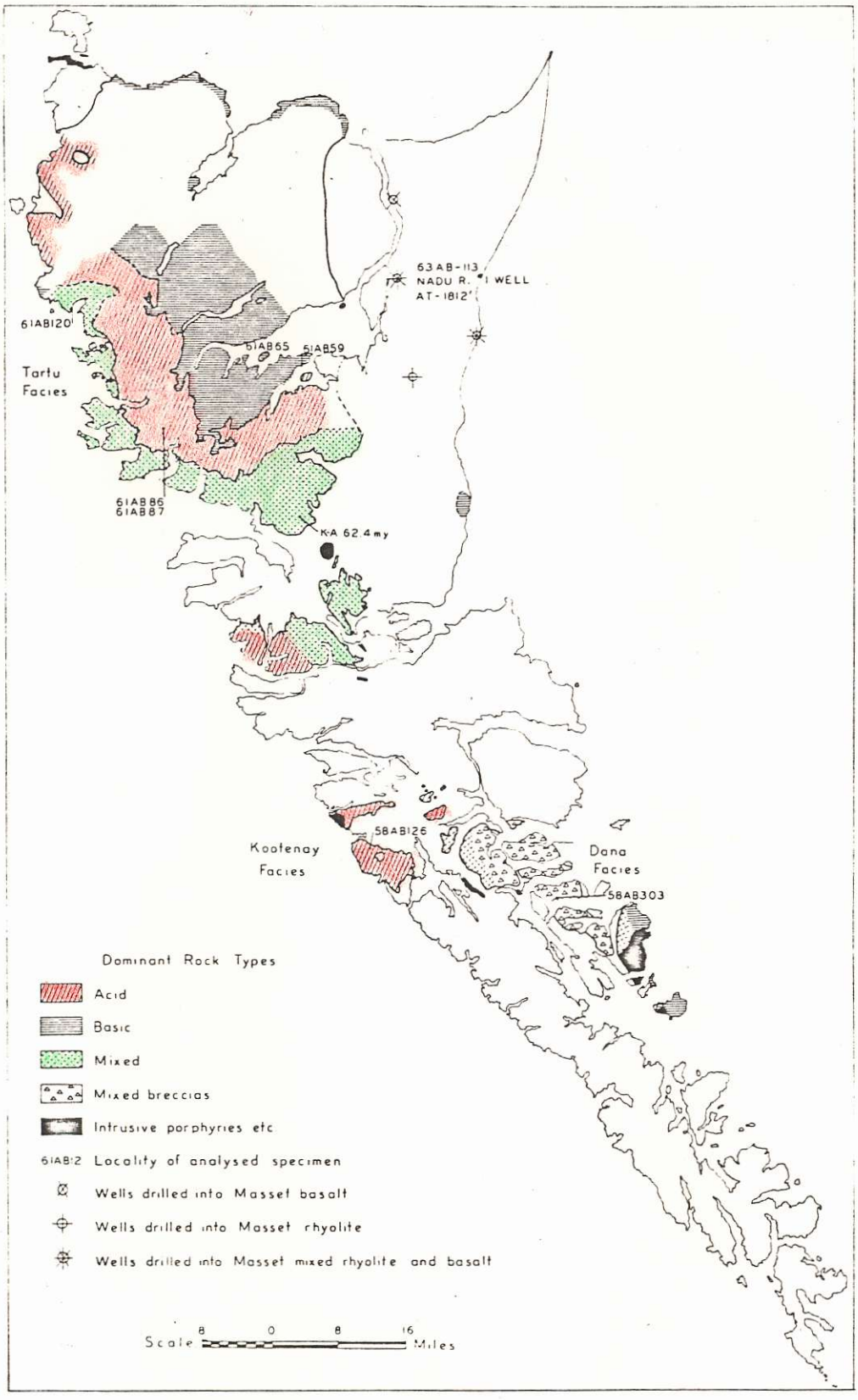


Figure 10 Masset Formation: Distribu tion, facies and special localities. From Sutherland-Brown,(1968) J.S. Aug.30,1978

The only known gold mineralization in the Masset Formation are some old showings on Harrison Island just north of Juskatla. These were recently restaked and are in Kootenay Facies rocks. Sutherland-Brown (1968) does not mention this occurrence. Information gained in the Boundary District Tertiary acid volcanics will probably be of assistance in unravelling the complexities of the Masset sequence and localization of favourable prospecting targets.

d) YAKOUN Formation

The distribution of the Yakoun Formation is shown on Figure 11. It is primarily a volcanic unit dominated by porphyritic andesite pyroclastic rocks. Interdigating with the pyroclastics and facies equivalents are volcanic sandstone, conglomerate, shale and minor coal.

Three of the old gold showings and several of the recent prospects are hosted by Yakoun Formation. One unifying characteristic is that all the showings are in Yakoun Formation near major fault zones. In summary the showings and main features are:

1) Southeaster - near Sandspit fault in slightly hornfelsed andesitic agglomerate, quartz vein, 1,000' X 2" to 20" wide.
2) Cumshewa - hornfeslic argillite and greywacke and minor agglomerate veins follow steep fault zones with quartz stringer and breccia zones.
3) Courte Antimony - Rennell Sound, Rumplestiltskin, (etc) altered porphyritic andesites, stibnite and low gold.

The Rumplestiltskin claims were examined by McIntyre in August 1978. A few silts were anomalous and one rock sample of "unaltered" siltstone ran 0.06 oz Au/ton. There appears little potential on the Rumplestiltskin but the structure that contains the Courte Antimony showing is exceptionally strong and sampling by Quintana indicates good disseminated gold prospects. Unfortunately the ground has a complicated ownership. Maps dealing with Courte showing will be re-drafted for clearer presentation.

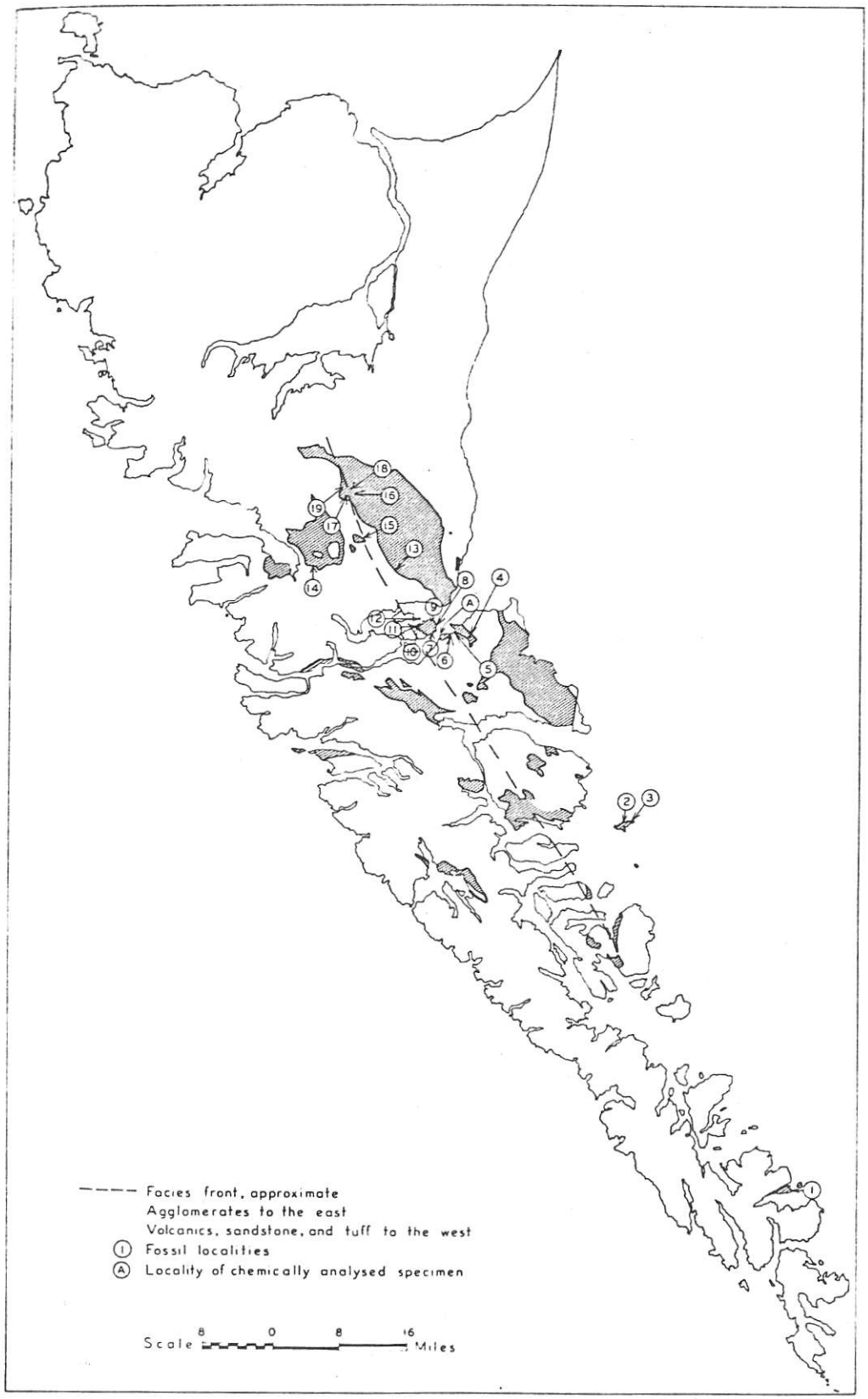


Figure 11 Yakoun Formation: Distribution and fossil localities. From Sutherland-Brown (1968) J.S. August 30, 1978

CONCLUSIONS AND RECOMMENDATIONS

The four lithological-structural environments identified in the exploration proposal have been evaluated by an initial preliminary program from Sept. 5 to 21, 1978. A significant Au-As, Sb soil and rock anomaly has been located in thick bedded, altered Kunga limestone within an area mapped as Karmutsen volcanics. This anomalous area requires systematic follow-up soil sampling in conjunction with detail geological mapping, The area should be protected by staking while sampling is in progress. These claims can be filed if results are sufficiently encouraging.

The very complex volcanic stratigraphy of the Masset Formation has been investigated by examination of all members and facies. Preliminary rock geochemistry indicates several target environments. Some of the rhyolite, basalt and related intrusive bodies (gabbro to feldspar porphyry) have anomalous gold content. This fact coupled with favourable physiochemical conditions of Au transport to sites of deposition analogous to the Specogna setting are the major ingredient needed in concentrating Au to economic levels. The Masset Formation volcanoclastics associated with the flows and highlevel intrusives could provide favourable host rocks for pervasive type Au mineralization along with the many linears apparent on Northwestern Graham Island. Very little attention has been given by an previous exploration programs, Quintana included, toward the large area underlain by Masset Formation between Yakoun Lake to Beresford Creek (an area of 750 square miles). All reported Masset-type intrusives and adjacent areas should be carefully prospected and sampled.

Priority areas that were not prospected in Phase I, as listed in the summary report, should be checked in light of the new data. These areas together with follow up work on delineated anomalies form the basis of the proposed 1979 program with an estimated all inclusive budget of $64,000.

Respectfully submitted,

J.T. Shearer

REFERENCES

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Drysdale, C.W., 1915 Geology of Franklin Mining Camp, B.C. G.S.C. Memoir 56

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Sutherland-Brown, A. 1968 Geology of the Queen Charlotte Islands, Bull 54, B.C. Dept. of Mines 226 pp

Also refer to data file of 15 references on Specogna deposit - Listed in Inter office Correspondence J. Shearer, Dec. 29, 1977.

APPENDIX I

ESTIMATED COSTS

APPENDIX I

ESTIMATED COSTS

QUEEN CHARLOTTE ISLANDS

1978 1) Preliminary reconnaissance September 5 to Sepber 27,1978 (High cost)

Fixed wing - 4 persons $175 return	$ 700.00
Food and Lodging for 21 days @ $32/day, 4 men	2,500.00
Transportation $19/day, .20/mile 900 mi	408.00
Helicopter - 45 hrs @ $330/hr	14,850.00
Assays - 300 samples @ $15.30/sample	4,650.00
Total	$23,108.00

1979 2) Follow up and extended grass roots program 12 weeks (Low cost) 4 amn camp - June 15 - Sept. 15,1979 (flexible)

Barge supplies from Rupert	320.00
Food and tent camp for 4 men - 12 weeks @ $16/day	5,376.00+
Canova boat operating expenses	1,200.00
25 h.p. motor	950.00
Helicopter time 21 hrs @ $360/hr	7,560.00
Assays 1200 silts @ 8.35 = 10,020.00 300 rocks @15.30 = 4,590.00	14,610.00
Transportation company vehicle 1500 mi @ .15/mi	500.00
Contingencies - 20%	6,100.00
Total	$36,619.00

Slightly lower cost if program did not start until July 1, 1979

Exclusive of salaries and fring benefits revised estimated budget attached.

All inclusive total $64,000.00

APPENDIX II

USEFUL NAMES AND ADDRESSES

APPENDIX II

USEFUL NAMES AND ADDRESSES

Budget Rent-a-Car Cook St., Masset, B.C.	626-5571
Beach Road, Sandspit, B.C.	637-5688 (800) 261-6050
Sea Raven, Box 43, Queen Charlotte City	559-4423
Canadian Cellulose Co. Ltd. Watson Island, Port Edward, B.C.	629-3671
Crown Zellerbach Canada Ltd. General Office, Sandspit Division	637-5323
Golden Spruce Motel, (Stewart & Mary Newcombe) Port Clements, B.C. (meals supplied by appointment)	557-4325
Haida Hotel, Queen Charlotte City, B.C.	
Hackett Car Rentals (Pick-up) P.O. Box 372, Masset, B.C.	626-3688
L.T.H. Motors Ltd, (boat & motor rental) Masset, B.C.	626-3776 637-5630
MacMillan Bloedel Industries Ltd. Skidegate, B.C. Operations	559-4224
Juskatla operations, Port Clements, (Mgr J. Peterson)	557-4212
Hecate Division, Sandspit, B.C. Engineer Glenn Venus	637-5391 557-4304
Dinon Bay Operations Box 10, Juskatla, B.C.	557-4455
Misty Islands Transportation Co. Queen Charlotte City (Mgrs. residence)	559-4485
Pacific Western Airlines Ltd. Air Cargo Reservations and Flight Information	637-5326 637-5416
Queen Charlotte Helicopter Ltd. (Ron Gunnell)	637-5344
Rayonier Canada (B.C. Ltd. Sewell Inlet (Sandspit phone)	637-2201

Rivtow Straits Ltd., Trumpeter Dr., Masset B.C.	626-3673
Superior Printers, 227-3rd St. Masset, B.C.	624-5227
Sea Raven Motel Ltd. Queen Charlotte City, B.C.	559-4423
Trans Provincial Airlines Prince Rupert, B.C. (Seal Cove)	627-1341
Vancouver Island Helicopters (Charles Mooney)	637-5665

Kathleen Whitmore, Public Accountant
Box 251, Queen Charlotte City, B.C. V0T 1S0

DATA INVENTORY

B.C. GOLD PROGRAM

McIntyre Mines Limited Files

(A) REPORTS

	Title	Date	Pages	By
1)	Progress Report on Data Compilation and Exploration Proposals	Feb.22/78	14	J.T. Shearer
2)	Notes on Gold Possibilities in 3 areas	Apr.24/78	17	D. Cochrane
3)	Exploration Proposal on Proserpine Prospect	June 30/78	9 & Maps	J.T. Shearer
4)	Compilation and Progress Report Proserpine Prospect	Aug. 30/78	18 & Maps	J.T. Shearer
5)	Exploration Proposal for Gold in Queen Charlotte Islands and Boundary District	Aug. 30/78	30	J.T. Shearer
6)	Geochemical Report on Howard Mine (Assessment Report)	Nov. 25/78	18 & Maps	J.T. Shearer
7)	Geochemical Report on Proserpine Prospect (Assessment Report)	Dec. 29/78	31 & Maps	J.T. Shearer
8)	Summary Report on Queen Charlotte Islands and Boundary Area Reconnaissance	Dec. 20/78	39	J.T. Shearer
9)	Summary Report on 1978 B.C. Gold Program (other than Howard, Proserpine, Queen Charlottes & Boundary)	being prepared		J.T. Shearer

(B) INTER-OFFICE CORRESPONDENCE

	Subject	Date	Pages	By
10)	Lawyers data review	Dec.19/77	9	J.T. Shearer
11)	Specogna Deposit	Dec.29/77	5	J.T. Shearer
12)	Copper Queen Joint Venture	March 3/78	4	J.T. Shearer
13)	Ladner Creek Deposit (Carolin)	March 31/78	2	J.T. Shearer
14)	Kleena Kleen Prospect	March 28/78	2	J.T. Shearer
15)	Cost estimate for B.C. Gold Program	April 4/78	4	J.T. Shearer
16)	Kleena Kleen Prospect	April 5/78	1	J.T. Shearer
17)	Proserpine Prospect	April 10/78	4	J.T. Shearer
18)	Indian River Area	April 14/78	4& Maps	J.T. Shearer
19)	Big Missouri Property	Dec. 13/78	2	J.T. Shearer

(C) DATA FILES

20) LANDSAT images of southeastern and northwestern British Columbia.

21) MINFILE printout and index of all gold occurrances in B.C.

22) Master Index of major B.C. gold occurrances (compiled from various sources).

23) Specogna File - 11 reports, numerous maps, drill logs, etc.

24) Lawyers File - 2 reports, drill logs.

25) PeLaire file - 3 reports, underground plans.

26) Carolin file - underground plans, assays, reports.

27) Amai file - 2 reports, assays, 1979 Assessment report.

28) Indian River - 2 reports, assays, location and sample data.

29) Northair - McIntyre reports, soils, etc.

30) Lillooet River - notes, maps, assay values, correspondence

* 31) Proserpine Prospect - 8 reports, underground plans, detail geology maps, etc., correspondence.

32) Black Dome Mountain - 3 reports, maps, sampling data, correspondence.

33) Howard Mine - Miscellaneous references, sampling data, etc., correspondence.

34) Lovitt Mine (Wenatchee) - Reports, orientation sampling, correspondence.

35) Dusty Mac - Published information, orientation sampling.

36) Republic District - Published data, correspondence.

37) Greenwood Camp - McIntyre File, numerous gold properties, correspondence.

38) Hixon Area - 3 reports, soil data, assay values, correspondence.

39) Big Missouri - 2 reports, notes, etc.,

40) Terrace Area - 8 reports, many detail maps, assay plans, correspondence.

41) King Group, Q.C.I. - 2 reports, maps, assay & soil plans, correspondence.

42) Fair Harbour - Easy Inlet - Compilation, sample data.

43) Monashee Area - 3 reports, sampling data, correspondence.

(D) RECONNAISSANCE PROGRAM DATA

44) Queen Charlotte Islands.
- a) assay values
- b) sample data sheets & notes, (soil silt and rock)
- c) location sketches
- d) 4 sets of 1:50,000 topographic maps.

45) Okanagan - Greenwood Area (Boundary Area)
- a) assay values
- b) sample data sheets and notes
- c) data compilation.
- d) topographic maps

(E) ROCK SAMPLES

46) Duplicate specimens were retained for all samples taken on property examinations (refer to Table I) and reconnaissance traverses. These are available for petrographic examination or to incorporate into lithotheque plates.

(F) PUBLICATIONS

47) Literature on disseminated gold mineralization and miscellaneous gold deposits - 71 short articles and reports.

CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

PRELIMINARY SERIES

SHEET 82E (East Half)

LEGEND

CENOZOIC

TERTIARY
MIOCENE(?)
11 Basalt, olivine basalt

PALEOCENE OR EOCENE
PHOENIX VOLCANIC GROUP
10 Andesite, trachyte; minor basalt; locally, interbedded tuff, shale, and/or siltstone

9 KETTLE RIVER FORMATION: rhyolite and dacite tuff; locally, conglomerate, sandstone, and shale; minor rhyolite flows and intrusive porphyritic rhyolite

PALEOCENE(?)
8 CORYELL INTRUSIONS: syenite; monzonite, shonkinite and granite

MESOZOIC

CRETACEOUS(?)
LOWER CRETACEOUS(?)
7 VALHALLA INTRUSIONS: granite, porphyritic granite

6 NELSON INTRUSIONS: granodiorite, porphyritic granite; diorite, monzonite, quartz monzonite

5 Ultrabasic intrusions, serpentinite

JURASSIC
ROSSLAND GROUP
4 Andesite, latite; agglomerate and flow breccia; minor greywacke

PALAEOZOIC

PERMIAN(?)
ANARCHIST GROUP
3 Greenstone, greywacke, limestone; paragneiss

PENNSYLVANIAN AND/OR PERMIAN
2 MOUNT ROBERTS FORMATION: greywacke, greenstone, limestone; paragneiss

PROTEROZOIC (?)

1 MONASHEE AND GRAND FORKS GROUPS
Paragneiss; minor crystalline limestone and pegmatite

Drift-covered area
Geological boundary (defined approximate)
Bedding (inclined, overturned)
Bedding (inclined, vertical; tops unknown)
Gneissosity (inclined, vertical)
Fault (defined, approximate, assumed)
Fossil locality (F)
Mineral property x11

INDEX TO MINERAL PROPERTIES

1. Waterloo (Paycheck Mining and Development Company Limited)
2. Mountain Chief (Renata Copper Company, Limited)
3. W. S. (Cascade Lode Mines, Limited)
4. Ore Denoro (Noranda Exploration Company, Limited)
5. Snowshoe and Old Ironsides (Phoenix Copper, Limited)
6. Stemwinder (Columbia Copperfield Mines, Limited)
7. Providence (W. Madden)
8. Gold Bug and D. A. (E. Ruzicka)
9. Greyhound (Salamet Mines Limited)
10. Mother Lode (Woodgreen Copper Limited)
11. Copper Queen (Aztec Exploration Limited)

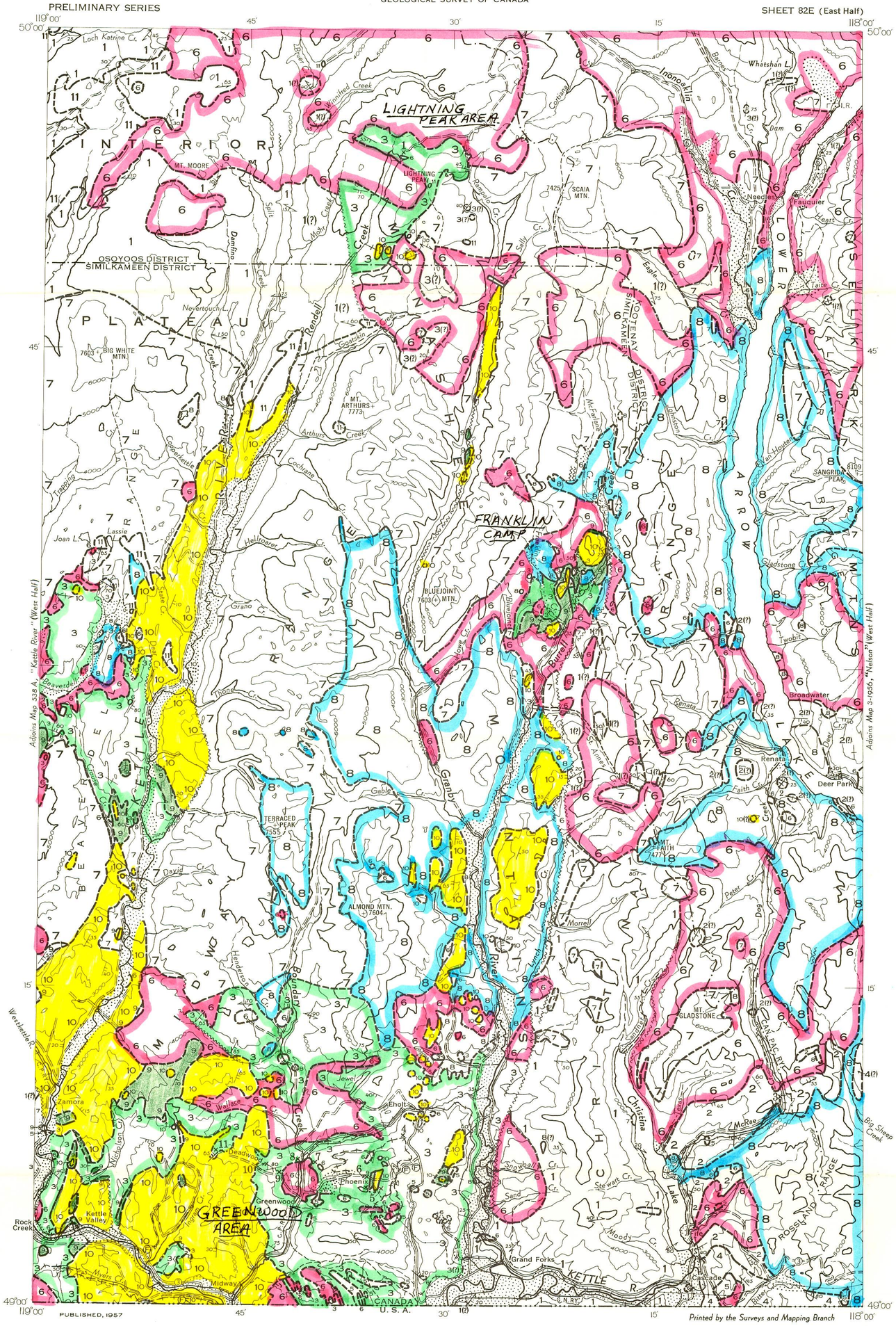
Geology by H. W. Little, 1953-1956

Cartography by the Geological Cartography Unit, 1957

Approximate magnetic declination, 22° 30′ East

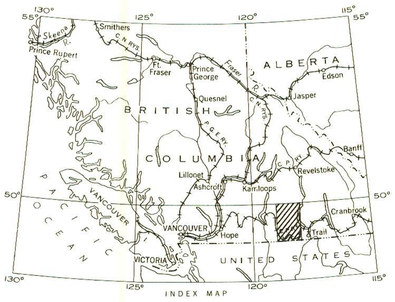
In response to public demand for earlier publication, Preliminary Series maps are now being issued in this simplified form, thereby effecting a substantial saving in time. There is no loss of information, but the maps will be clearer to read if all or some of the map-units are hand-coloured.

Air photographs covering this area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario



PUBLISHED, 1957

Printed by the Surveys and Mapping Branch



MAP 6-1957

KETTLE RIVER
(EAST HALF)

SIMILKAMEEN, KOOTENAY AND OSOYOOS DISTRICTS

BRITISH COLUMBIA

Scale: One Inch to Four Miles = 1/253,440

Miles 4 2 0 4 8 12

inches 0 1 2
centimetres 0 1 2 3 4 5

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

LEGEND

Main highway
Other roads
Trail
Abandoned railway
International boundary
District boundary
Power transmission line
Intermittent stream
Contours (interval 1000 feet) 5000
Height in feet above mean sea-level 7477

MAP 6-1957
KETTLE RIVER
BRITISH COLUMBIA

SHEET 82E (East Half)

FIGURE 18

DESCRIPTIVE NOTES

The oldest rocks within the map-area, the Monashee and Grand Forks groups (1), occur in the northwest and south-central parts, and may include some roof pendants of gneiss in other parts. They comprise paragneisses of pre-Pennsylvanian, presumably Precambrian age. Although their relationship to the younger strata is not seen within the area, to the north they underlie Permian rocks unconformably.

Rocks of the Mount Roberts formation (2) may occur in the east-central part of the map-area as well as where shown in the southeast. Fossils, probably of Pennsylvanian age, were found in them at Paterson, to the east of the map-area, but south of the International Boundary similar rocks are classed as Permian. The Anarchist group (3), restricted mainly to the west part of the map-area, is probably, at least in part, equivalent to the Mount Roberts formation (2), and near Phoenix contains fossils believed to be Permian. A few miles south of the International Boundary, however, a collection of Triassic fossils has been reported, and beds of this age may be included with those mapped as Anarchist group (3).

Volcanic rocks of the Rossland group (4), mainly or entirely of Jurassic age, occur along the International Boundary southeast of Christina Lake, and may be intimately mixed with rocks of the Mount Roberts formation (2) in McRae Creek Valley. Rocks exposed on the ridge east of Big Sheep Creek are tentatively assigned to the Rossland group (4).

Serpentinized ultrabasic bodies (5) intrude the rocks of Late Palaeozoic to Jurassic age, and are in turn cut by granodiorite and related rocks of the Nelson intrusions (6). Non-porphyritic granodiorite is the dominant phase of the Nelson intrusions (6), but a porphyritic granite phase is common in the northeast part of the map-area and near Mount Gladstone. In those localities Valhalla granite (7) is mainly gradational into the Nelson intrusions (6), but elsewhere cuts them. Except in the western part of the area where it commonly contains large phenocrysts of microperthite, the Valhalla granite (7) is non-porphyritic. It may be distinguished from the Nelson by the presence of smoky quartz, the rarity of hornblende, and an allotriomorphic texture, in contrast to the Nelson which is usually hypidiomorphic. The age of the Nelson and Valhalla intrusions is between latest Jurassic and middle Cretaceous.

Batholiths, of reddish to pale buff Coryell syenite (8) that grades locally into granite or shonkinite, are widespread. Some of the smaller bodies of Coryell intrusions (8) are composed of augite monzonite and one is of olivine syenite. The Coryell intrusions (8) cut all the above rocks as well as a conglomerate of Upper Cretaceous or later age that occurs to the east of the map-area.

The Kettle River formation (9) consists of acidic tuff, and local basins of conglomerate and sandstone. In the conglomerate the roundstones consist for the most part of rocks of the underlying formations exposed in the vicinity. In Franklin camp a little rhyolite is interbedded with acidic tuff and sandstone. In the southwest part of the map-area small plugs of porphyritic rhyolite with quartz phenocrysts apparently mark the vents from which some of the acidic tuff was emitted.

The Phoenix volcanic group (10) overlies the Kettle River formation with apparent unconformity, for in many places it lies directly upon older formations. It consists mainly of andesitic and trachytic lavas, but locally contains interbedded sediments. A few miles east of the mouth of Burrell Creek siltstones occur in the group, and along Kettle River Valley west of Midway tuffs and shales are well exposed in road- and railway-cuts. From the latter localities fossil plants of Paleocene or Eocene age were collected.

In the northwest part of the map-area extensive flat-lying flows of basalt and olivine basalt (11), commonly with columnar structure, rest upon all older formations. These basic lavas are correlated with those of Columbia Plateau, and are probably of Miocene age.

The drift consists of fluvial clay, sand, and gravel of Pleistocene and later age, and Pleistocene till that extends to great elevations. Glacial striae were observed as high as 6,000 feet above sea-level, but some of the higher peaks appear to have escaped continental glaciation. The ice movement was in general southerly.

All formations except the Miocene (?) have been folded, the Proterozoic (?) having experienced the most intense deformation. The main north-south valleys, those of Dog and upper McRae Creeks, Sandner Creek and Christina Lake, lower Granby River and Burrell Creek, upper Granby River, and Kettle River northward from Rock Creek, contain strong shear zones that were initiated after the intrusion of the Nelson batholith. Subsequent movement on these faults has sheared rocks of the Phoenix volcanic group. The most clearly defined faults occur in the Christina Lake-Sandner Creek and lower Granby River-Burrell Creek Valleys. Between these major faults a large block of Proterozoic (?) gneiss has been uplifted relative to the younger rocks.

Mining activity reached its peak during the early part of the present century when some 22 million tons of copper ore containing gold and silver were mined in the Phoenix and Deadwood camps. This ore supplied smelters at Grand Forks, Greenwood, and Boundary Falls. Current activity is mainly centred about the old productive copper properties, but none had reached a stage of continuous production in 1956.

These copper deposits (Ore Denoro, Snowshoe, Old Ironsides, Stemwinder, Greyhound, Mother Lode, and others) are large, irregular replacement bodies containing chalcopyrite, pyrite, and magnetite in skarn formed by the metamorphism of limestone of the Anarchist group. This limestone is known locally as the Brooklyn formation. The Copper Queen copper deposit, on the other hand, consists of a vein (or veins) that occurs in an oxidized shear zone in crystalline limestone. Cupriferous sulphides have been oxidized to azurite and malachite, with limonite.

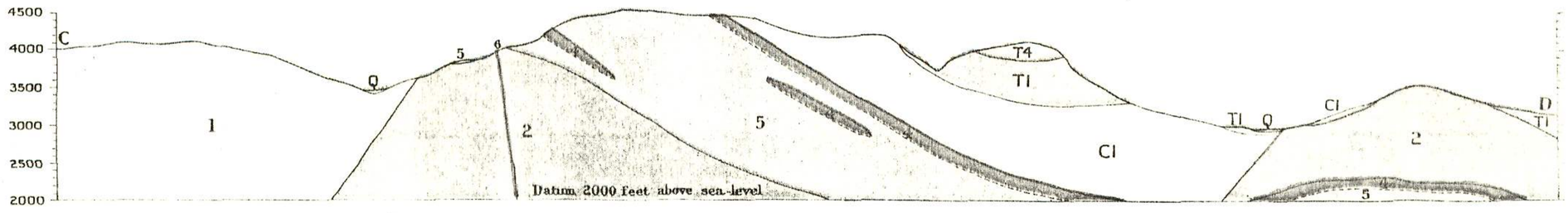
Gold and silver are the chief products of the Gold Bug property. Recent exploration has been devoted to the search for the continuation of the south vein beyond a dyke, against which it terminated. The Providence mine, which has operated intermittently since 1893, produces mainly silver and gold. The vein, which has been extensively explored, lies in altered argillaceous and volcanic rocks and in granodiorite. Ore minerals are gold, silver, proustite, tetrahedrite (?), sphalerite, and galena, with some pyrite and chalcopyrite.

The W. S. is primarily a silver-lead mine. The deposit consists of a main vein, with branch veins, that occurs in crystalline limestone of the Mount Roberts formation (2). The Mountain Chief copper deposit is in limestone within a huge roof pendant surrounded by Coryell syenite (8). Within the silicified limestone, chalcopyrite and pyrite occur, with malachite, azurite, and chalcocite (?).

The Waterloo vein is in a shear zone mainly in crystalline limestone. The vein varies in width along the strike for about 800 feet, and averages about 4 feet wide. It consists of quartz and carbonate with silver, argentite, ruby silver, stephanite, tetrahedrite, galena, and sphalerite.

Canada
Department of Mines
HON. L. CODERRE, MINISTER, R.W. BROCK, DEPUTY MINISTER

GEOLOGICAL SURVEY



Structural section along line CD
Scale, horizontal and vertical 2000 feet to 1 inch

LEGEND

- Q — Fluvio-glacial deposits
- 7 — Minette dykes
- 6 — Pulaskite porphyry and syenite porphyry dykes
- T4 — Trachytic flows, alkalic basalt, basaltic tuff
- T3 — Earlier trachyte

MIDWAY VOLCANIC GROUP

- 5 — Augite syenite (*intrusive equivalent of trachytic flows, T4*)
- 4 — Shonkinite pyroxenite (*intrusive equivalent of alkalic basalt, T4*)
- 3 — Porphyritic syenite (*intrusive equivalent of earlier trachyte, T3*)

FRANKLIN CHONOLITH

EOCENE
- 2 — Monzonite (*co-magmatically related to augite syenite*)

EOCENE OR
- T2 — Rhyolite and rhyolite porphyry

EOCENE
- TI — Kettle River formation (*conglomerate, arkosic grit, acidic tuff*)

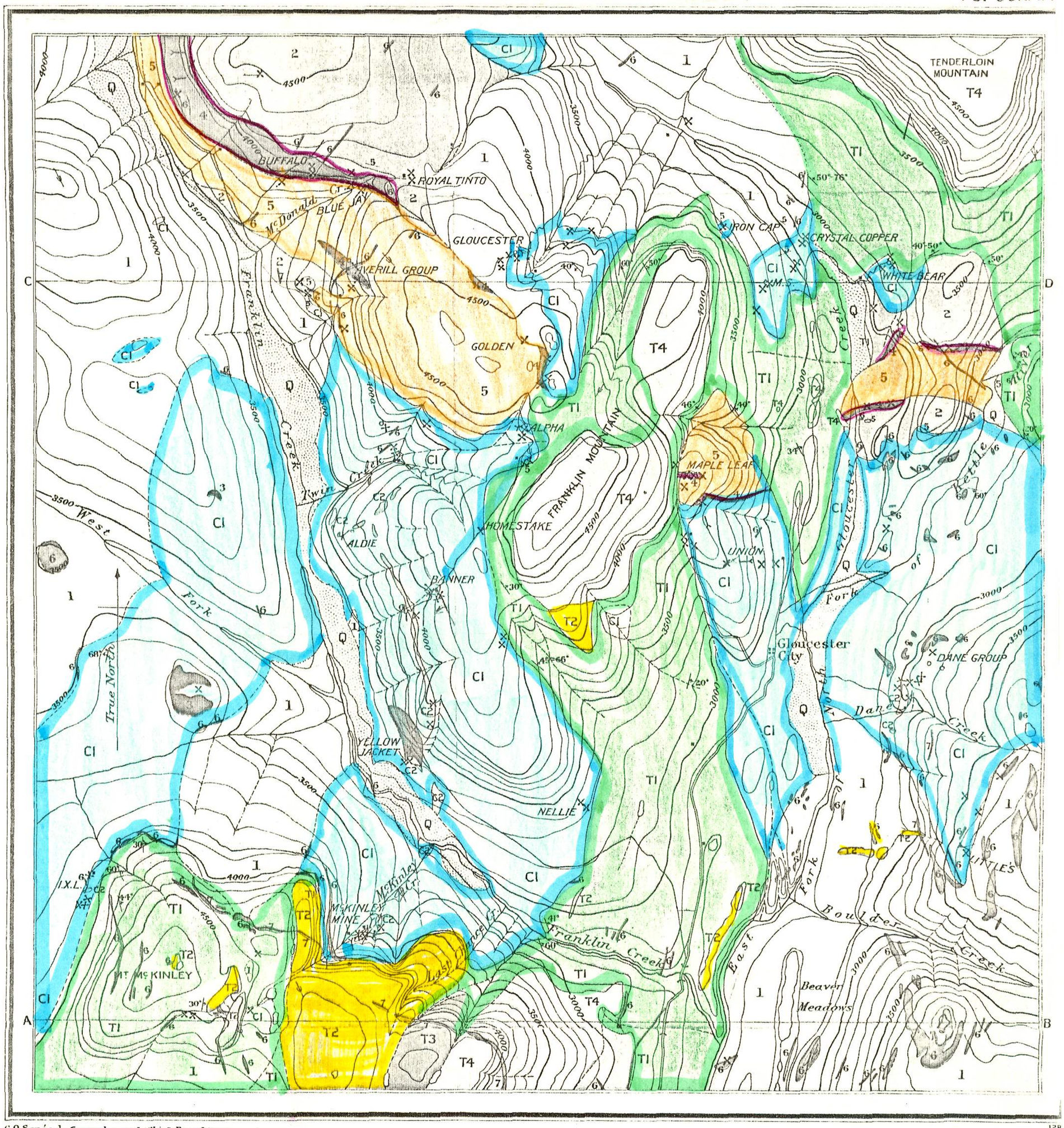
JURASSIC
- 1 — Granodiorite, gneiss

CARBONIFEROUS(?)
- C2 — Gloucester formation (*crystalline limestone*)
- CI — Franklin group (*greenstone, cherty quartzite, altered tuff*)

Symbols

- Fissure vein
- Geological boundary (*position exactly determined*)
- Geological boundary (*position determined within 20 feet*)
- Geological boundary (*position assumed*)
- Fault
- 30° — Dip and strike
- Glacial striae

GEOLOGY — TOPOGRAPHY



C.O. Senécal, *Geographer and Chief Draughtsman.*
A.McGregor, *Draughtsman.*

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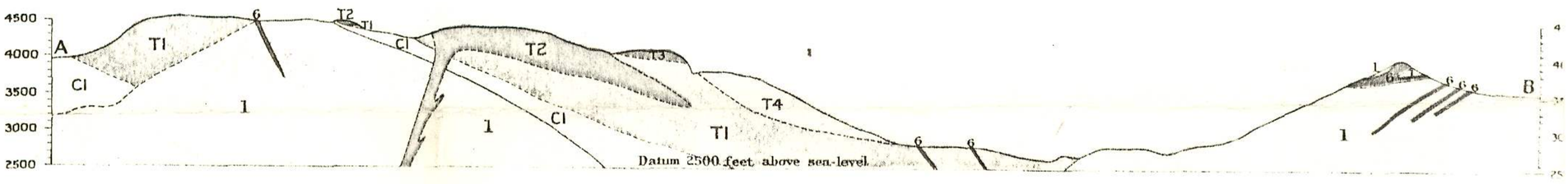

Structural section along line AB
Scale, horizontal and vertical 2000 feet to 1 inch

MAP 97 A
(Issued 1914)

FRANKLIN MINING CAMP

WEST KOOTENAY

BRITISH COLUMBIA

Scale, 1/24,000

Feet: 1000 0 1000 2000 3000 4000 5000

Metres: 500 0 500 1000

2000 FEET TO 1 INCH

Scale; 50 miles to 1 inch.

To accompany memoir by C.W. Drysdale

GEOLOGY

C.W. DRYSDALE, 1911.

TOPOGRAPHY

(Control and topography subject to revision)

C.W. DRYSDALE, 1911.

inches 0 1 2
centimetres 0 1 2 3 4 5

BRITISH COLUMBIA GEOLOGICAL SURVEY

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

FIGURE 19