810131

CATFISH PROPERTY

NORTHWEST B.C. (104 M/15 W)

GEOLOGICAL AND GEOCHEMICAL REPORT

R.J. Morris, M.Sc.
Beacon Hill Consultants Ltd.
December, 1988

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LIST OF ENCLOSURES

SUMMARY

The Catfish property is comprised of ten claims, totalling 76 units, and is located in the northwest corner of British Columbia along the west shore of Tutshi Lake. Access is via the Klondike Highway, a paved all season road, and by helicopter to the higher portions of the property.

Previous work includes regional geological mapping by the G.S.C. and B.C. Geological Survey as well as reconnaissance stream sediment and lithogeochemical sampling by the B.C.G.S. The property was explored for molybdenum in the 1970's and gold at the turn of the century as evidenced by a road on the north side of Paddy Pass creek circa 1970 (?), and four adits and trenching, circa 1900 (?).

The 1988 work program included air photo enlargements, topographic mapping, geological mapping, petrographic descriptions, and rock, soil, and stream sediment geochemistry.

The Catfish property straddles the contact of the Coast Plutonic Complex and the Intermontane Belt to the east. The Coast Intrusions comprise coarse granites and fine grained equivalents. Layered rocks include the basal Boundary Ranges metamorphics, Upper Triassic Stuhini Group, Lower Jurassic Inklin Formation, and a Middle to Upper Jurassic volcanic sequence. Structurally, the strata are folded and oriented at 340 degrees with the Llewellyn fault zone forming the east edge of the property.

Mineralization includes molybdenite in granite, a pyritized shear zone, an antimony rich tuff horizon, and important quartz veins with arsenopyrite. The arsenopyrite in quartz veins occur in fine grained intrusives and metamorphics. In the intrusive host, the mineralization is typified by arsenopyrite veins within a green-yellow alteration envelope, scorodite. In the metamorphics, the veins host coarsely disseminated and banded arsenopyrite with trace chalcopyrite. The veins are up to 3.1 meters thick in the intrusive, though sections up to 30 m thick host pervasive veining. Veins are up to 1.4 meters thick in the metamorphics. Maximum gold values of 1.4 oz/ton were observed within a mineralized zone which has a strike length of 2.5 kilometers.

Detailed soil sampling was completed to determine the geochemical signature of the quartz veins and their hosts. Arsenic and gold in soil is an effective tool to explore for extensions of the mineralized zones.

The recommended exploration program is divided into two phases. Phase I work is designed to determine grades of the intrusive hosted mineralization and the extent of the high grade veins. This work will allow an assessment of the mining potential of the property. With positive results from Phase I, a program of road construction and drilling is recommended.

INTRODUCTION

The Catfish property is owned by Mr. C.J.R. Hart of Whitehorse, and is under option to Frame Mining Corp., Whitehorse.

Between August 19 and September 9, 1988, a two man crew under the supervision of the author, completed a geological and geochemical reconnaissance of the property.

This report summarizes the results, conclusions and recommendations of the 1988 work.

PROPERTY DESCRIPTION

Location and Access

The Catfish property is located in the Boundary Ranges of the Coast Mountains, in the extreme northwest corner of British Columbia, Figure 1. The property is on the west side of Tutshi Lake and straddles Paddy pass, an east-west valley between Tutshi and Bennett Lakes.

The east side of the Catfish property is crossed by the Klondike Highway which traverses the west side of Tutshi Lake. The east, central portion of the property is 64 km by road north of Skagway, Alaska and 42 km by road south of Carcross, Yukon Territory, Figure 2. The Klondike Highway is a paved, all season, road which is used by Curragh Resources Inc. to move concentrate from its Faro lead-zinc mine to the ice-free port of Skagway.

Access on the property was gained by an old, overgrown, road on the north side of Paddy Pass which originates at the Klondike Highway. The road goes approximately three kilometers to the west, less that half a kilometer from the west edge of the property. It is proposed that the road was built in the 1970's to access molybdenite showings in the area.

Geological and geochemical work on the property was accomplished using helicopter support for day traverses and fly camps for detailed work.

Claim Status

The Catfish property consists of ten contiguous mineral claims comprising a total of 76 units, Figure 3. Table 1 lists the valid mineral claims.

TABLE 1

SUMMARY OF CLAIMS

Claim Name	No. of Units	Record No.	Expiry Date
Catfish	4	2640	June 24, 1990
Catfish 2	2	2755	Oct. 30, 1990
Catfish 3	3	2756	Oct. 30, 1990
Catfish 4	2	2757	Oct. 30, 1990
Catfish 5	15	3116	March 4, 1990
Catfish 6	8	3117	March 4, 1989
Catfish 7	20	3118	March 4, 1989
Iguana	12	3100	Jan. 5, 1989
Catfish 10	4	3433	Sept. 3, 1989
Catfish 11	6	3434	Sept. 6, 1989

Summary of Previous Work

The area has been mapped by the Geological Survey of Canada, Christie, 1957 and the B.C. Geological Survey, Mahalynuk and Rouse, 1988 a and b, and Rouse, Mihalynuk, Moore and Friz, 1988.

Prospectors first entered the study area in 1878 with the building of the White Pass and Yukon Railroad. The Klondike Gold Rush between 1897 and 1898 brought a large number of prospectors. The Catfish property hosts four old adits as well as numerous trenches indicating considerable time and effort was spent in the area.

More recent work includes molybdemen-copper exploration in the 1970's (?) which included the building of the three kilometer long road on the north mountain. The area was previously staked as "Linda" and more recently as "Friendship Silver". The B.C. mineral inventory lists "Linda" as a molybdenite occurrence.

In 1986, Hugh Copland of Whitehorse, Yukon Territory, completed a geological and prospecting program on the north mountain, Copland, 1987. In 1987, the B.C. Geological Survey mapped the area and did reconnaissance stream sediment and lithogeochemical sampling, Figure 4. The results indicate that the creek from Paddy Pass and its most easterly, south tributary are anomalous in gold, arsenic and antimony.

Summary of 1988 Exploration

The 1988 exploration program was designed to evaluate the entire Catfish property and to provide recommendations concerning its potential.

The field program was completed between August 19 and September 9, 1988. The scope of work was limited to a geological appraisal with geochemical sampling to provide reconnaissance coverage as well as detailed sampling where deemed necessary.

A summary of the 1988 work program is listed in Table 2 and shown on Figure 5.

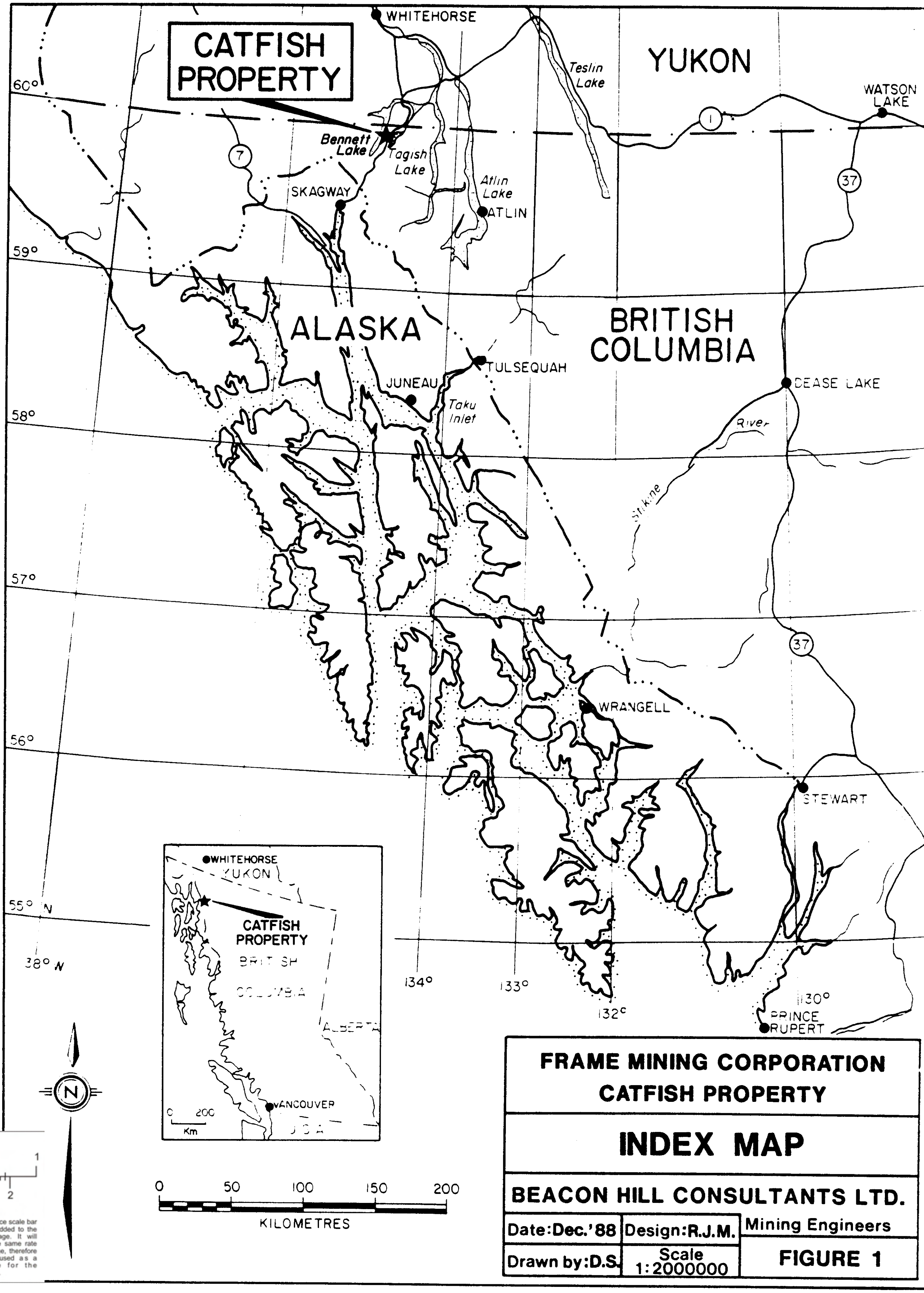
TABLE 2

SUMMARY OF 1988 EXPLORATION

The work completed in 1988 includes:

- nine day traverses.
- two fly-camps.
- twelve detailed soil sampling lines.
- a total of 297 soil and stream samples, 61 rock samples and 31 petrographic samples.
- air photo enlargements.
- 1:5 000 scale topographic base map from air photos; BC 5500 83-86, 132-135.

Able assistance was provided by Nick Morris who collected the majority of the soil and stream samples.



FRAME MINING CORPORATION
CATFISH PROPERTY

INDEX MAP

BEACON HILL CONSULTANTS LTD.

Date: Dec.'88	Design: R.J.M.	Mining Engineers
Drawn by: D.S.	Scale 1:2000000	FIGURE 1

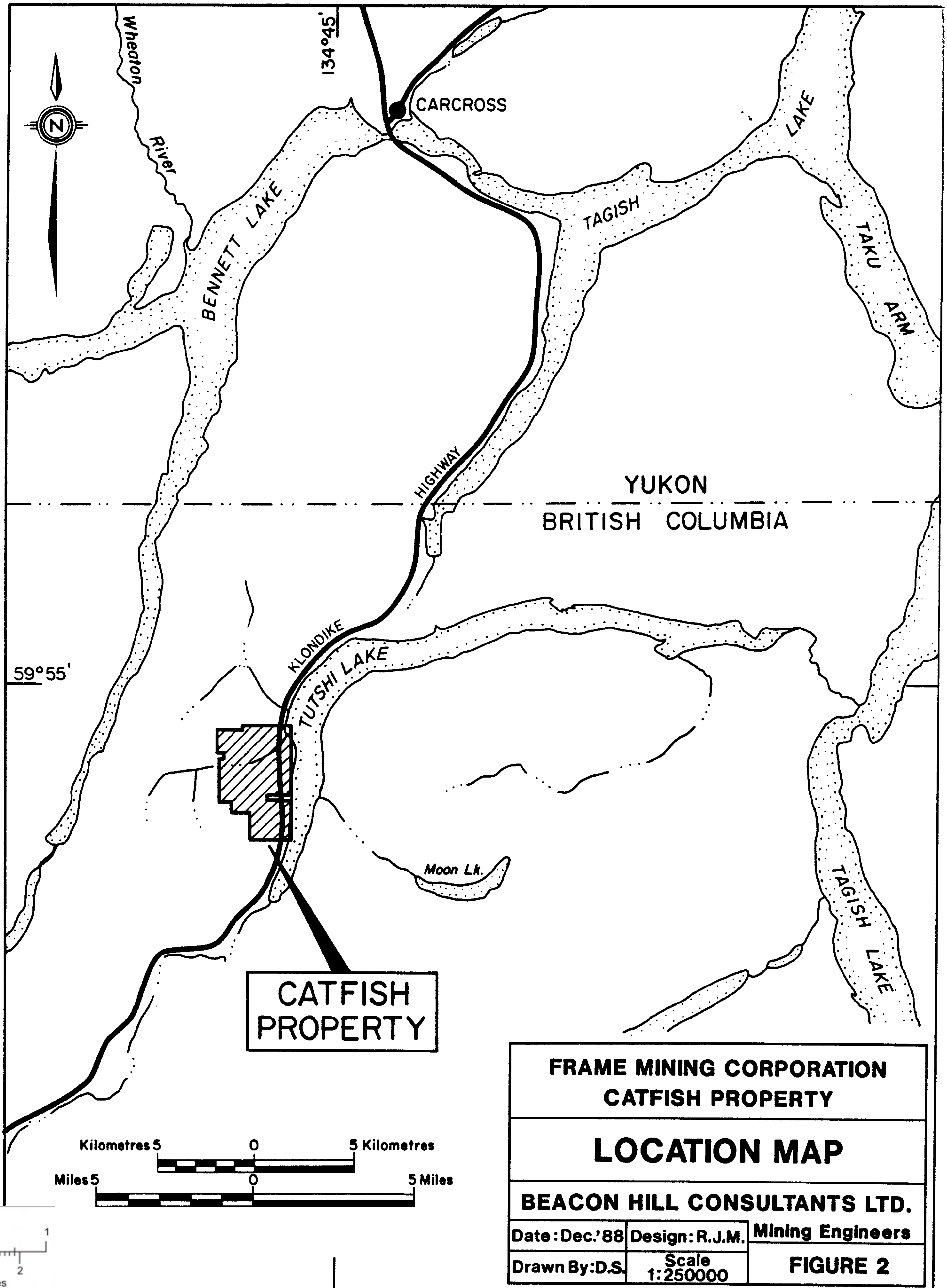

Wheaton River
134°45'
CARCROSS
BENNETT LAKE
TAGISH LAKE
TAKU ARM
HIGHWAY
YUKON
BRITISH COLUMBIA
KLONDIKE
TUTSHI LAKE
59°55'
Moon Lk.
TAGISH LAKE
CATFISH PROPERTY
Kilometres 5 0 5 Kilometres
Miles 5 0 5 Miles
FRAME MINING CORPORATION
CATFISH PROPERTY
LOCATION MAP
BEACON HILL CONSULTANTS LTD.
Date: Dec.'88
Design: R.J.M.
Mining Engineers
Drawn By: D.S.
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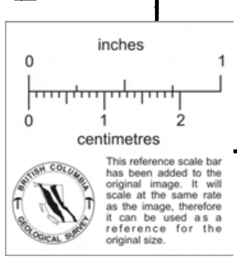
FIGURE 2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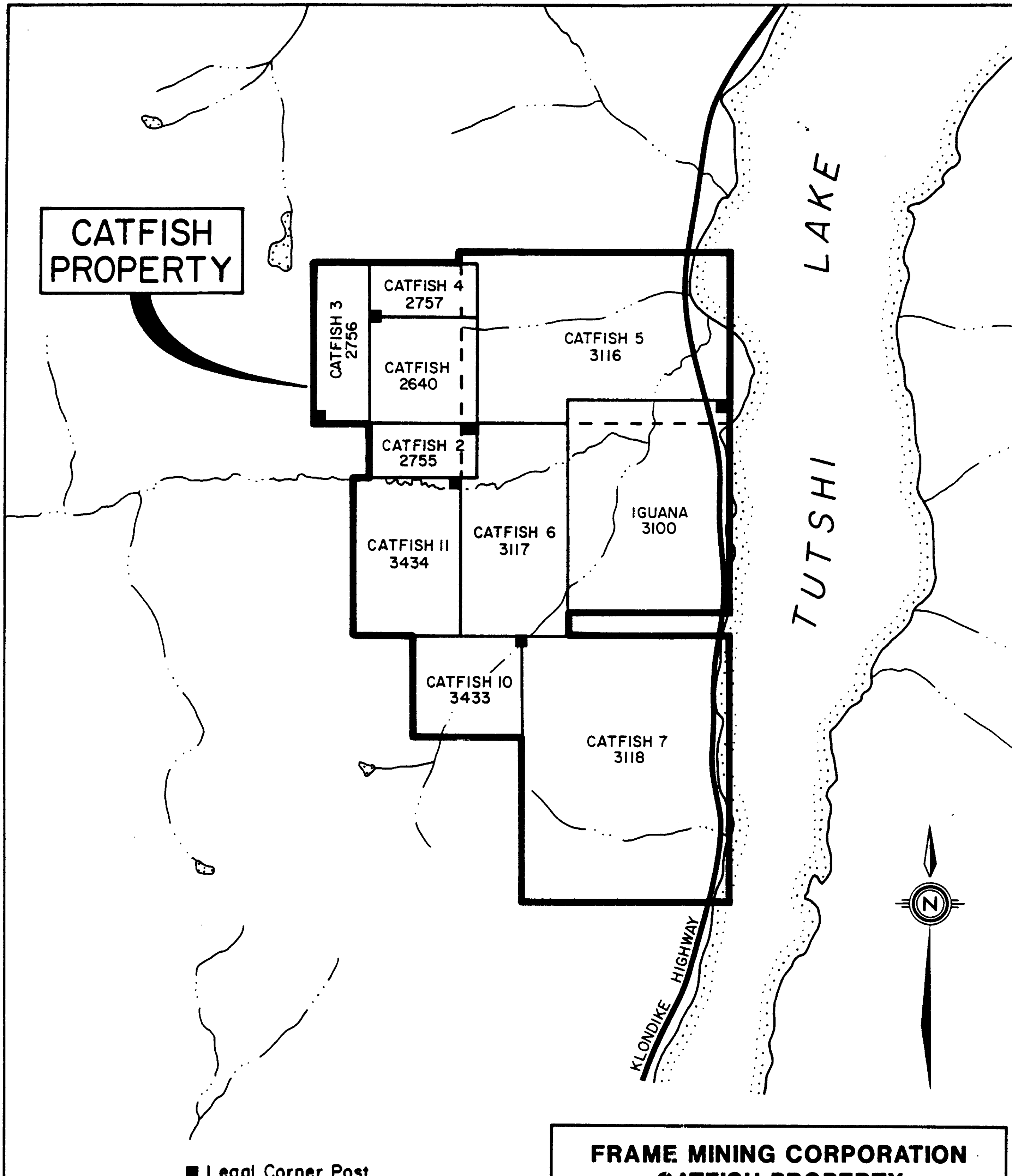
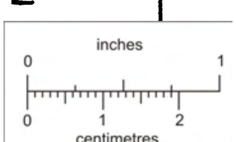
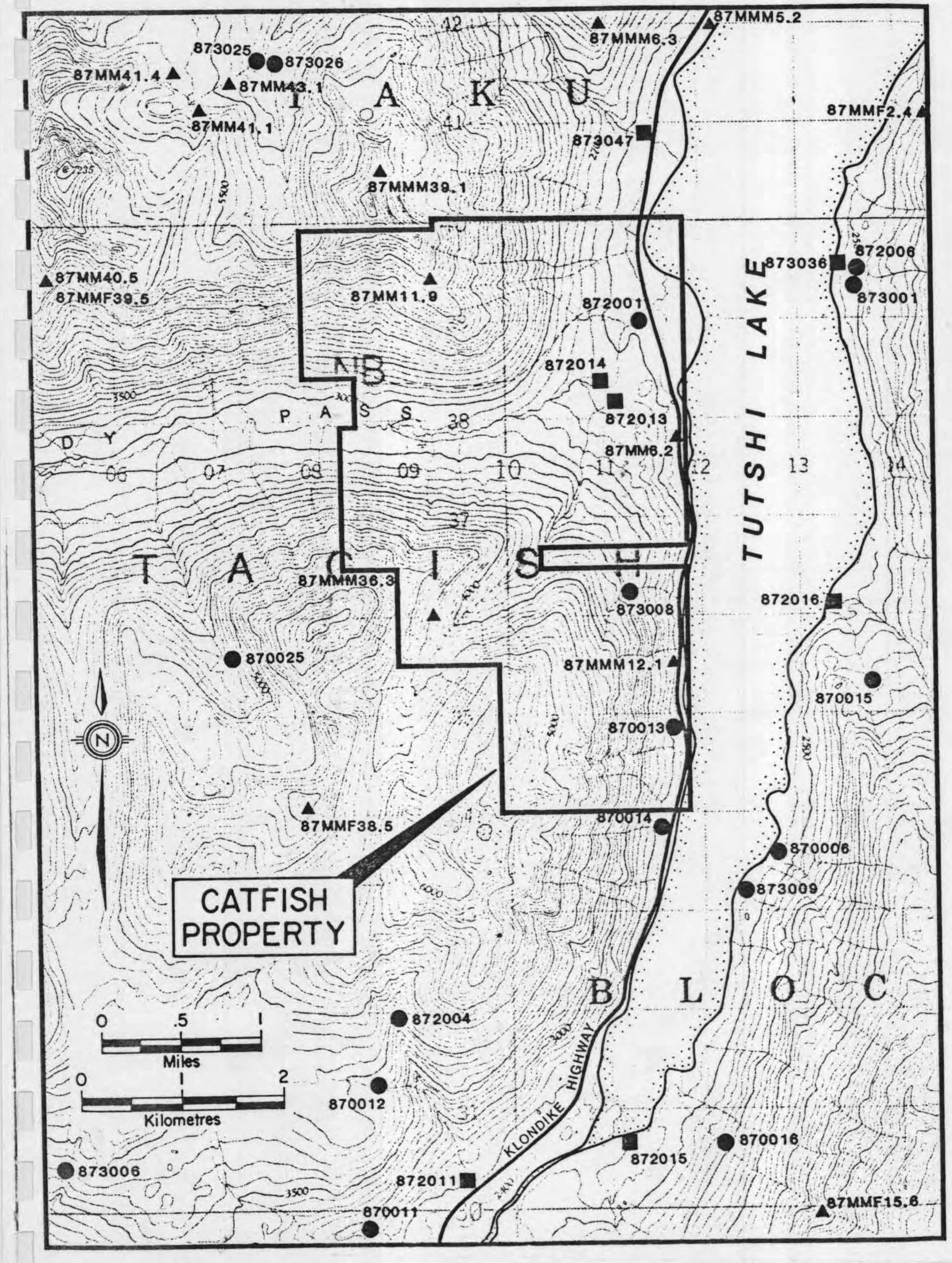
BRITISH COLUMBIA GEOLOGICAL SURVEY



FRAME MINING CORPORATION CATFISH PROPERTY		
CLAIM MAP		
BEACON HILL CONSULTANTS LTD.		
Date: Dec.'88	Design: R.J.M.	Mining Engineers
Drawn By: D.S	Scale 1:50000	FIGURE 3





STREAM SEDIMENT GEOCHEMICAL RESULTS

SAMPLE NO.	UTM E	UTM N	ROCK	REP	C	B	COMP	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	U ppm	Th ppm	Sr ppm	V ppm	Au ppb	Hg ppb	As ppm	Sb ppm	Bi ppm	Se ppm	Te ppm	LOI %	WT grams
870011	508450	6629800	GRNT	00	0	1	310	3	9	17	55	0.1	4	4	386	2.40	6	39	27	30	5	5	36.6	0.9	0.7	0.2	0.3	3.00	7.46
870012	508550	6631250	GRNT	00	0	7	211	4	4	21	73	0.5	2	3	375	1.66	69	17	26	13	6	20	7.2	0.4	0.4	0.2	0.2	8.90	14.12
870013	511700	6634900	BGRN	00	1	4	211	2	30	13	73	0.2	26	15	688	3.64	5	14	60	43	24	5	140.0	3.0	0.4	0.2	0.3	4.30	33.28
870014	511500	6633850	BGRN	00	0	4	211	4	56	21	135	0.1	16	22	1710	5.81	5	10	134	62	9	20	177.5	2.9	0.7	0.3	0.2	9.10	17.69
870015	513700	6635350	GRNT	00	0	7	311	3	32	16	101	0.2	16	8	662	2.42	10	2	84	43	1080	40	158.6	4.1	0.1	2.5	0.4	21.90	7.10
870016	512100	6630650	MSDM	00	0	1	311	9	95	30	271	0.3	80	22	745	6.57	5	4	169	88	11	5	155.0	7.9	0.1	2.4	0.3	12.60	32.27
870025	507100	6635650	GRNT	00	0	2	211	6	33	33	152	0.6	15	11	785	3.56	8	31	73	48	31	20	164.5	2.8	1.7	0.7	0.5	7.00	16.82
872001	511300	6639000	IEXV	00	0	7	211	4	14	10	51	0.1	6	4	324	1.40	5	20	24	17	2	5	63.8	1.7	0.7	0.2	0.2	2.40	59.95
872004	508750	6631900	GRNT	00	0	0	220	3	16	37	110	0.9	10	10	670	2.79	6	12	35	22	59	5	34.3	2.0	2.0	0.3	0.2	3.00	10.92
872006	513400	6639550	DORT	00	0	1	220	9	45	40	78	0.1	11	9	614	3.24	6	23	32	34	12	5	11.1	1.0	0.6	1.0	0.3	3.20	12.77
* 872013	511050	6638100	MSDM	10	0	2	211	1	31	28	69	0.1	16	10	514	3.07	5	9	68	49	240	40	275.4	5.8	0.2	0.4	0.2	5.40	20.39
* 872113	511050	6638100	MSDM	20	0	2	211	2	29	19	62	0.1	15	9	457	2.93	5	11	56	46	30	10	244.8	6.5	0.4	0.3	0.3	5.10	29.88
* 872014	510950	6638250	MSDM	10	0	2	211	4	15	10	56	0.1	7	3	422	1.57	13	21	26	18	2	5	76.0	1.9	1.1	0.3	0.4	3.70	29.72
* 872114	510950	6638550	MSDM	20	0	2	211	4	14	13	56	0.1	6	4	442	1.62	11	26	25	19	1040	20	72.7	2.1	1.1	0.2	0.3	3.70	25.32
* 872015	511800	6631500	GRNT	10	0	2	211	4	27	14	76	0.1	14	7	383	3.13	9	20	33	51	3	10	78.5	2.1	0.6	0.4	0.4	5.70	21.13
* 872115	511800	6631500	GRNT	20	0	2	211	4	31	22	88	0.2	18	9	436	3.44	15	15	39	57	9	10	94.2	2.5	0.6	0.5	0.4	7.00	21.07
* 872016	813200	6636050	TUFF	10	0	2	211	2	38	18	76	0.1	23	11	631	3.49	5	8	70	61	3	5	39.7	3.6	0.1	0.4	0.2	3.80	13.19
* 872116	513200	6636050	TUFF	20	0	2	211	3	33	9	80	0.1	26	11	742	3.31	5	11	71	57	19	10	43.9	3.7	0.1	0.6	0.5	4.50	32.98
873001	513550	6639375	ARGL	00	0	1	211	2	97	30	227	0.2	17	5	416	2.09	5	4	94	27	10	40	53.2	1.7	0.4	1.7	0.3	19.80	13.06
873008	511200	6636225	SCST	00	0	2	212	2	71	39	194	0.5	30	18	1158	4.82	7	5	85	61	4	30	248.5	10.7	0.3	1.6	0.4	14.80	14.14
873009	512350	6633225	ARGL	00	0	1	113	7	51	18	254	0.4	51	13	665	3.92	5	5	93	66	38	20	273.2	5.3	0.3	2.3	0.2	16.40	15.29
873025	507550	6641650	SCST	00	0	3	211	7	95	46	186	0.3	33	20	973	6.14	5	8	320	75	35	30	725.0	51.2	0.4	0.6	0.7	7.80	3.86
873026	507600	6641650	SCST	00	0	3	211	2	136	46	194	0.5	65	26	1116	5.81	5	6	120	99	45	20	500.9	20.6	1.9	0.6	0.6	9.20	43.65
DETECTION LIMITS								1	1	2	1	0.1	1	1	5	0.01	5	2	1	2	1	5	0.1	0.1	0.1	0.2	0.3		

EXPLANATION OF COLUMN HEADINGS

Sample No. Sample number is a six digit identification code. The first two digits represent the year of collection. The third digit is the collector identifier. Fourth to sixth digits are sequential sample identifiers.

UTM E and UTM N Universal Transverse Mercator coordinates for Zone 08 as easting and northing respectively. Normally accurate to within 50 m.

ROCK Bedrock type mnemonic code as listed in alphabetical order below:
ALRZ = alteration, ANDS = andesite, ARGL = argillite, BEXV = basic extrusive, BGRN = biotite granodiorite, DORT = diorite, GRCK = greywacke, GRDR = granodiorite, GRNT = granite, IEXV = intermediate extrusive, IMIV = intermediate intrusive, LMSN = limestone, MSDM = metasediment, SCST = schist, TUFF = tuff

REP Replicate status: 00 = routine sample site, 10 = first of duplicate pair, 20 = second of duplicate pair. Samples sites denoted as having been sampled in duplicate are also sites where 10 kg bulk samples and pan concentrates were taken -this data will be available in the near future.

C Contamination code: 0 = none, 1 = possible, 2 = probable, 3 = definite, 4 = mining activity

B Bank type: 0 = undefined, 1 = alluvial, 2 = colluvial, 3 = glacial till, 4 = glacial outwash, 5 = bare rock, 6 = talus, scree, 7 = organic

COMP Sediment composition as a three digit code representing abundance of sand (first digit, particles >0.125mm); fines (second digit, particles <0.125mm), and organics (third column) as follows: 0 = absent, 1 = minor (<33%), 2 = medium (33-67%), 3 = major (>67%).

LITHOGEOCHEMICAL RESULTS

SAMPLE NO.	UTM E	UTM N	Au ppb	Ag ppm	As ppm	Sb ppm
87MM6.2	511750	6637800	100	<0.5	11.2	3.3
87MM11.9	509200	6639400	<20	0.5	8.8	0.6
87MM40.5	505300	6639450	120	<0.5	1.3%	42
87MM41.1	506900	6641200	20	1	109	26
87MM41.4	506650	6641500	70	170	0.68%	2.0%
87MM43.1	507200	6641400	<20	230	725	555
87MMF2.4	514350	6641050	<30	1	12.2	<0.5
87MMF15.6	513125	6629950		<0.5	148	2
87MMF38.5	507900	6634050	<20	<0.5	10	1
87MMF39.5	505250	6639350	100	<0.5	0.37%	12
87MMM5.2	501215	6655000	<30	<0.5	8.3	<0.5
87MMM12.1	501175	6635500	40	0.5	31	26
87MMM36.3	508875	6636300	50	8	6	975
87MMM39.1	508700	6640500	<20	<0.5	636	99
DETECTION LIMIT			20	0.5	1	0.5

LEGEND

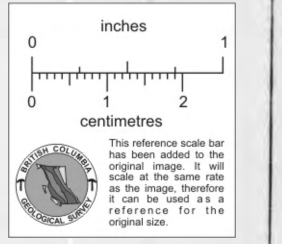
Rock Sample Site ▲ 87MMF1.6

Standard Sediment Sample Site ● 873033

Standard and Bulk Sediment Sample Site ■ 873133

NOTE: samples marked * are duplicate samples

Adapted From: Mihalynuk and Rouse
B. C. E. M. P. R. OPEN FILE MAP 1988-5

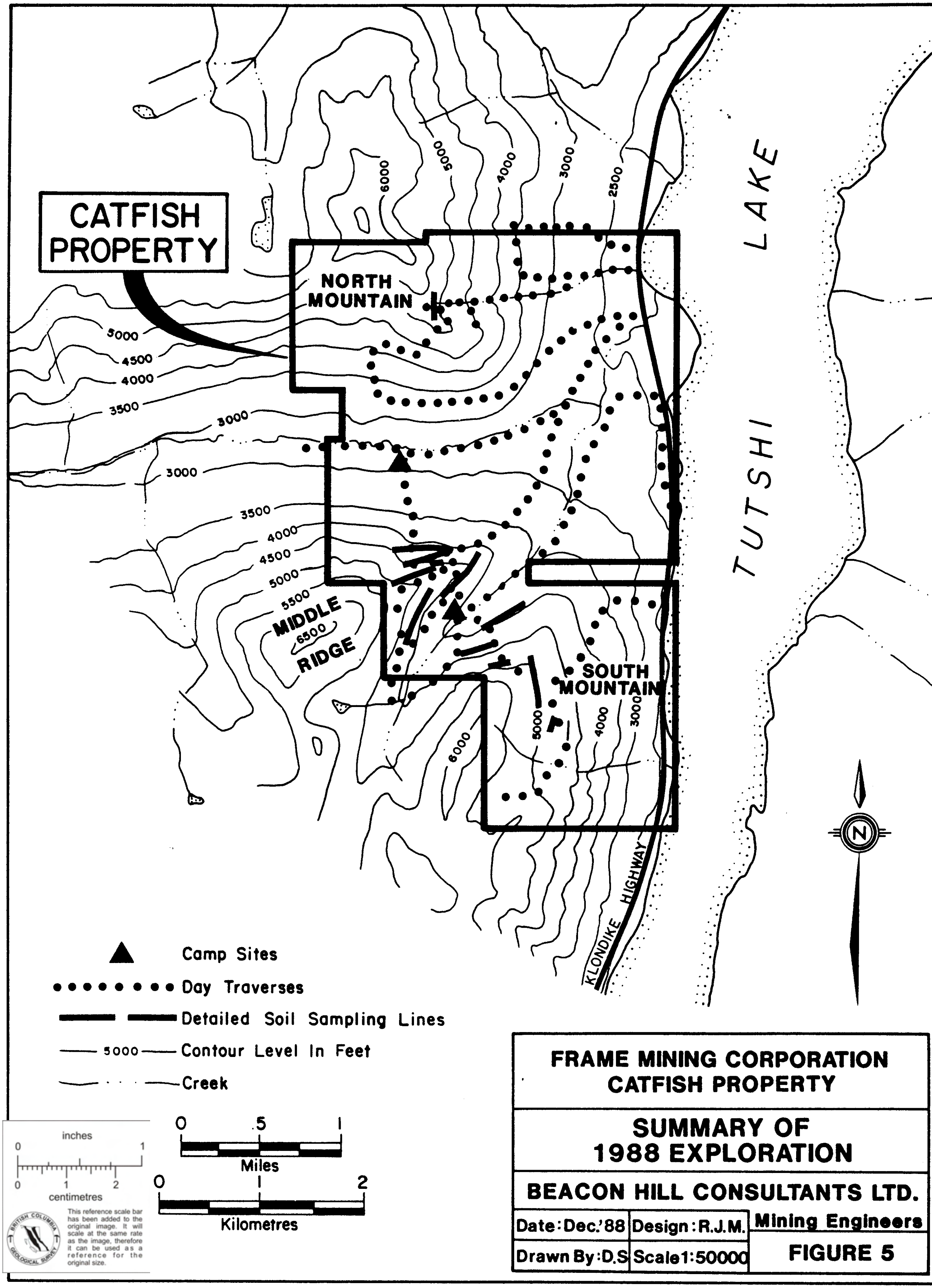


FRAME MINING CORPORATION
CATFISH PROPERTY

RECONNAISSANCE STREAM SEDIMENT AND LITHOGEOCHEMICAL SURVEY-1987

BEACON HILL CONSULTANTS LTD.

Date: Dec.'88	Design: R.J.M.	Mining Engineers
Drawn By: D.S.	Scale 1:50000	FIGURE 4


CATFISH PROPERTY
NORTH MOUNTAIN
MIDDLE RIDGE
6500
SOUTH MOUNTAIN
TUTSHI LAKE
KLONDIKE HIGHWAY
6000
5500
5000
4500
4000
3500
3000
2500
N
Camp Sites
Day Traverses
Detailed Soil Sampling Lines
5000 Contour Level In Feet
Creek
0 .5 1
Miles
0 1 2
Kilometres
inches
0 1
0 1 2
centimetres
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.
BRITISH COLUMBIA GEOLOGICAL SURVEY
FRAME MINING CORPORATION
CATFISH PROPERTY
SUMMARY OF
1988 EXPLORATION
BEACON HILL CONSULTANTS LTD.
Date: Dec.'88
Design: R.J.M.
Mining Engineers
Drawn By: D.S
Scale 1:50000
FIGURE 5

GEOLOGY

General Geology

The Tutshi Lake area marks the transition between the Coast Plutonic Complex and the Intermontane Belt to the east. Three terranes are evident, Stikinia, Nisling and Cache Creek. Stikinia is dominated by rocks of the Whitehorse trough and is separated from Cache Creek terrane to the northeast by the Nahlin fault and Nisling terrane to the southwest by the Llewellyn fault. Nisling terrane comprises metamorphic rocks called "Boundary Ranges",(Mihalynuk and Rouse, 1988 (a)). This metamorphic terrane is bounded on the west by granites and granodiorites of the Coast Plutonic Complex, Figure 6.

Property Stratigraphy

BOUNDARY RANGES METAMORPHICS

The oldest rocks covered by the Catfish property are the Boundary Ranges metamorphics, Table 3. These strata are strongly foliated and appear to be folded within northwest trending belts. Protoliths include basalt and siltstone as well as minor granite (?) and carbonate. Diorite dykes are common and appear to be confined to this sequence. Quartz veining within the unit was observed on both the north mountain and middle ridge. On the north mountain the veins are up to one meter wide and appear to be weakly mineralized. At the adit on the north mountain the west contact of the vein is highly silicified and altered over 1.5 meters. On the middle ridge the quartz veins are highly mineralized with arsenopyrite. The veins are very common and range in thickness from a centimeter to 1.5 meters. No

Nine samples of the metamorphics were collected for petrographic description, Table 4 lists the samples and a brief description.

TABLE 4

PETROGRAPHIC DESCRIPTIONS - BOUNDARY RANGES METAMORPHICS

Sample No.	Description	Sample Location
5P	Altered andesite; dark gray, pervasively altered	Middle Ridge
8P	Sheared wacke; green to black, foliated	Middle Ridge
9P	Andesite; dark green to black, vesicular	Middle Ridge
✓ 10P	Meta-arkose; dark gray, foliated	Middle Ridge
✓ 21P	Sheared feldspathic wacke; dark green strongly foliated	Middle Ridge

24P	Brecciated impure meta-chert; green	Middle Ridge
25P	Meta-basalt; dark green, foliated	Middle Ridge
27P	Chloritic wacke; green, weakly foliated	Middle Ridge
30P	Sheared metasediment; green, strongly foliated	Paddy Pass Creek

STUHINI GROUP

Stratigraphically (?) above the metamorphic terrane is the Upper Triassic, Stuhini Group. Within the Catfish property the Shuhini Group is dominated by lapilli and ash tuffs and green pyroxene porphyry tuffs. On the north mountain a prominent shear zone is exposed in one of the steep east drainages. The shear appears to be oblique to contacts and comforms with strong east-west jointing developed in the overlying sediments. Alteration within the shear includes carbonate and pervasive pyrite; with weathering massive, white, bleached layers and gossanous pods. Mineralization other than pyrite was not observed. No samples were collected for petrographic analysis.

Contact relationships between the Boundary Ranges metamorphics and the overlying Stuhini Group appears stratigraphic on the north mountain. Mihalynuk and Rouse 1988 (a) observed both stratigraphic and tectonic contact relationships on the north mountain. Detailed work in the area shows that the tectonic contact is probably a later structural feature which is exemplified by the shear on the east side of the mountain. wrong contact

INKLIN FORMATION

Above the Stuhini Group is the Lower Jurassic, Inklin Formation which is dominated by black, carbonaceous, siltstone and argillite within the Catfish property. The best exposure of the Inklin Formation is on the middle ridge where it is highly folded and occasionally cut by dykes. At the extreme northeast edge of the property the formation is coarser grained and a cleaner, more mature, sediment. No mineralization was observed in the Inklin Formation though associated alteration, with dykes, included pyrite. Rock sample 22 P is from the middle ridge and represents the Inklin Formation. It is described as a carbonaceous mudstone. Rock sample 23 P is described as a wacke with mudstone intercalations and is probably from the Inklin Formation, Appendix III.

The contact between the Stuhini Group and Inklin Formation on the north mountain is covered though Mihalynuk and Rouse (1988 a) believe it to be gradational. On the middle ridge the Inklin Formation overlies the Boundary Ranges metamorphic terrane. The contact does not include a basal conglomerate, as at other localities, but it could be faulted as it appears to be a conduit for a major intrusive.

MIDDLE TO UPPER JURASSIC VOLCANICS

muJv

Above the Inklin Formation is a Middle to Upper Jurassic volcanic sequence. Within the Catfish property the volcanic sequence is dominated by dark grey, bladed-feldspar porphyry flows and tuffs and cobble conglomerates. No mineralization was observed within the sequence though a rock sample collected by Rouse, Mihalynuk, Moore and Friz 1988 carried 975 p.p.m. antimony (sample no. 87MMM36.3, the sample location is incorrectly plotted on the published map, see Figure 4 for correct location).

Six rock samples from the volcanics were collected for petrographic analysis, a brief description is given in Table 5.

TABLE 5

PETROGRAPHIC DESCRIPTIONS - MIDDLE TO UPPER JURASSIC VOLCANICS

Sample No.	Description	Sample Location
1P	Altered andesite; grey, massive	South Mountain
2P	Altered rhyolite; grey, massive	South Mountain
4P	Andesite lapilli tuff; massive	South Mountain
15P	Andesite tuff; grey, massive	South Mountain
*16P	Hematitic chert; pink-red, iron rich	South Mountain
18P	Altered andesite; rusty, dark grey, some pyrrhotite	Middle Ridge
20P	Sericitized andesite;	Middle Ridge

*16 P is probably a sedimentary equivalent to the volcanics.

The contact between the Inklin Formation and the overlying volcanics is poorly exposed on the middle ridge. Mihalynuk and Rouse (1988 a) mapped the contact as undulating and erosional. Clasts within the cobble conglomerates of the upper sequence are composed dominantly of Inklin Formation.

INTRUSIVE ROCKS

Intrusive rocks are dominated by Upper Cretaceous, Coast Intrusions. The granites are mapped as medium to coarse-grained, equigranular and undivided, Mihalynuk and Rouse 1988 (b). On the middle ridge, detailed mapping located another mass of granite which is believed to be part of the same core as the main bodies to the north, south and west. Associated with the middle ridge granite is a fine crystalline equivalent which is believed to be the chilled contact. These fine intrusives host altered veins which carry arsenopyrite. One old adit as well as numerous trenches explored the mineralization within the intrusives on the middle ridge.

Six rock samples from the Coast Intrusives were collected for petrographic analysis, Table 6 provides a brief description.

TABLE 6

PETROGRAPHIC DESCRIPTIONS - COAST INTRUSIVES

Sample No.	Description	Sample Location
3 P	Aplite; yellow-white massive	South Mountain
11 P	Aplite; white, massive, quartz phenocrysts	Middle Ridge
12 P	Aplite; white, massive, quartz phenocrysts	Middle Ridge
19 P	Granite porphyry; white, coarse crystalline	Middle Ridge
*28 P	Granite porphyry; white, coarse crystalline	Middle Ridge
*29 P	Aplite; yellow-white, massive	Middle Ridge
98 P	Silicified rhyolite; white-yellow, massive, mineralized	Middle Ridge vblc.

*samples 28 and 29 P are in contact with one another.

Minor intrusives include a variety of rock types, Table 7 provides a brief summary.

TABLE 7

PETROGRAPHIC DESCRIPTIONS - MINOR INTRUSIVES

Sample No.	Description	Sample Location
6 P	Diorite porphyry; dark green-black, massive	Middle Ridge
7 P	Latite; yellow-white, massive	Middle Ridge
*13 P	Trachyte; yellow-white, massive	Middle Ridge
17 P	Monzonite porphyry; light grey	Middle Ridge
26 P	Monzonite porphyry; yellow-white	Middle Ridge

*13 P appears to be a structural inclusion within the metamorphics.

Mihalynuk and Rouse 1988 (b) have also mapped a Mesozoic, granodiorite intrusive on the eastern edge of the Catfish property which is closely associated with the Llewellyn fault zone.

TABLE OF FORMATIONS

Era	Period of Epoch	Formation	Lithology
Quaternary		Quaternary alluvium	Poorly sorted sands, gravels and till
Mesozoic	Upper Cretaceous?	Montana Mountain volcanics	Intermediate to felsic pyroclastics and flows; typically altered and orange weathering; crosscut by 64-Ma intrusive*
		Fault or intrusive contact**	
	Upper Cretaceous	Coast intrusions	K-feldspar megacrystalline granite varying to alkaline granite and granodiorite; dated at 77.9 and 89.5 Ma***
		Chilled intrusive contact	
		STIKINIA	
	Probable lower to mid-Jurassic	Volcanics	Dominantly variegated pyroclastic lapilli tuffs; rhyolitic tuffs; bladed-feldspar porphyry flows
		Unconformity and/or gradational	
	Lower Jurassic	Laberge Group, Inklin Formation	Siltstones, arenaceous wacks, argillites and conglomerates; rarely fossiliferous
		Erosional unconformity	
	Upper Triassic	Stuhini Group	Green pyroxene feldspar porphyry tuffs and breccias; variegated tuffs; minor tuffaceous sediments, limestone
		Erosional unconformity	
	Triassic?	Early intrusives	Polyphase granodiorite to alkali granite, typically sheared, foliated and/or altered
		Intrusive and/or faulted	
Paleozoic/Proterozoic		**NISLING TERRANE**	
	pre-Permian (maximum age unknown)	"Boundary Ranges metamorphics"	Argillaceous siltstones, greywackes, lesser basalts, felsic pyroclastcis and carbonates; variably-metamorphosed to upper greenschist grade
		Not observed — separate terranes assumed in fault contact, if at all	
		CACHE CREEK	
	Mississippian	Nakina Formation	Massive greenschist, altered basic flows and tuffaceous sediments

*Morrison *et al.* (1979)
**Observation of Roots (1980)
***Bultman (1979)

From: Mihalynuk and Rouse
B.C.G.S. Paper 1988-1

TABLE 3

Property Structure

The dominant structure within the Catfish property is the Llewellyn fault zone which is oriented at 340 degrees. All of the contacts and major structures follow this trend.

Eight bedding attitudes were measured, Figure 10, which show an average orientation of 156/52 W (strike/dip). These measurements conform with the overall trend of the map area.

Twenty-one foliation attitudes were measured, Figure 11, which show an average orientation of 348/73 E (strike/dip). These measurements represent prominant layers, though not necessarily bedding, and conform with the map trend.

Twenty-five jointing attitudes were measured, Figure 12. Two joint set are apparent, the most prominent is perpendicular to bedding and there is a weak set paralleling bedding.

Five shear structures were measured, Figure 13, all along the Klondike Highway. The average attitude of the shears is 245/75 NW (strike/dip). The shears represent vein and gouge zones, occasionally extremely rusty, and they conform to the vein orientations.

An analysis of thirty-eight vein orientations from the three main areas shows that the veins are approximately perpendicular to the 340 degree trend. Seventy-nine percent of the veins have an average orientation of 58/77 SE (strike/dip), Figure 14.

Mineralization

At least four types of mineralization was observed, molybdenum in quartz veins, in granite; a bleached, pyritized shear zone; a high antimony tuff horizon; and quartz veins with arsenopyrite. Only the latter is deemed to have economic importance at present.

The molybdenum in quartz veins was observed on the north mountain west of the main adit, and was not investigated further. The bleached, pyritized shear zone is in an east drainage of the north mountain. Although large gossans have formed, no mineralization other than pyrite was observed. The high antimony tuff horizon is an interesting though questionable target. where

The quartz veins with arsenopyrite are hosted by Boundary Ranges metamorphics and the fine grained granitic intrusions. The veins have been located on both the north and south mountains and the middle ridge. Four old adits along with numerous trenches were found.

On the north mountain, one major quartz vein up to one meter wide was traced for at least 100 meters on surface. The vein hosts an adit, 15 meters long, as well as several trenches. Sampling of high grade (?) material from the vein at the adit, an upper trench and the west contact at the adit, respectively, produced the following results:

TABLE 8

SELECTED SAMPLING - NORTH MOUNTAIN

Sample No.	Description	Au p.p.b.	Ag p.p.m.	Cu p.p.m.	Pb p.p.m.	Zn p.p.m.	Sb p.p.m.	As p.p.m.
		Results						
C8R 12R	high grade, grab, trench	6720	110.9	451	25215	159	12462	17162
C8R 13R	high grade, grab, adit	730	105.5	72	3462	8	619	3035
C8R 14R	chips over 1.5 m, west contact	1660	15.7	250	1915	262	121	11399

The mineralization occurs as coarse blebs within the vein while the west contact is essentially a stockwork of quartz veining with finely disseminated mineralization.

On the south mountain, mineralized quartz veins are confined to the fine intrusive host. The northeast contact with the metamorphics is a sharp linear feature which has been made more obvious by erosion and a gully. The veins are generally thin, 0.6 meters was the thickest vein noted. There appears to be some zoning within the host, between the elevations of 1400 and 1385 meters veining is scarce while above and below this zone veins are more common. Only one grab sample was taken on the south mountain with the following results:

TABLE 9

SELECTED SAMPLING - SOUTH MOUNTAIN

Sample No.	Description	Au p.p.b.	Ag p.p.m.	Cu p.p.m.	Pb p.p.m.	Zn p.p.m.	Sb p.p.m.	As p.p.m.
		Results						
C8R 10R	grab, high grade	13210	351.4	2153	14646	75	5292	43076

The mineralization is confined to quartz veins which have an arsenopyrite rich core and a green to yellow alteration envelope, scorodite.

On the middle ridge, the mineralized veins occur in both the fine intrusive and the metamorphics. The mineralization is of two forms, arsenopyrite rich cores with scorodite envelopes in the intrusive host and coarse arsenopyrite, with rare chalcopyrite, in quartz veins, with no alteration in the metamorphic host.

In the fine intrusive host there is one adit, 5 meters long, and two major trenches. On the south side of the middle ridge, the veins are up to 3.1 meters thick and have an overall east-west trend. On the north side of the middle ridge, from the ridge top down approximately 25 meters there is an altered, mineralized zone up to 1.6 meters thick which trends north-south. At approximately 1260 meters elevation on the north side there is a zone up to 30 meters thick with weak, pervasive quartz-arsenopyrite veining which trends east-west.

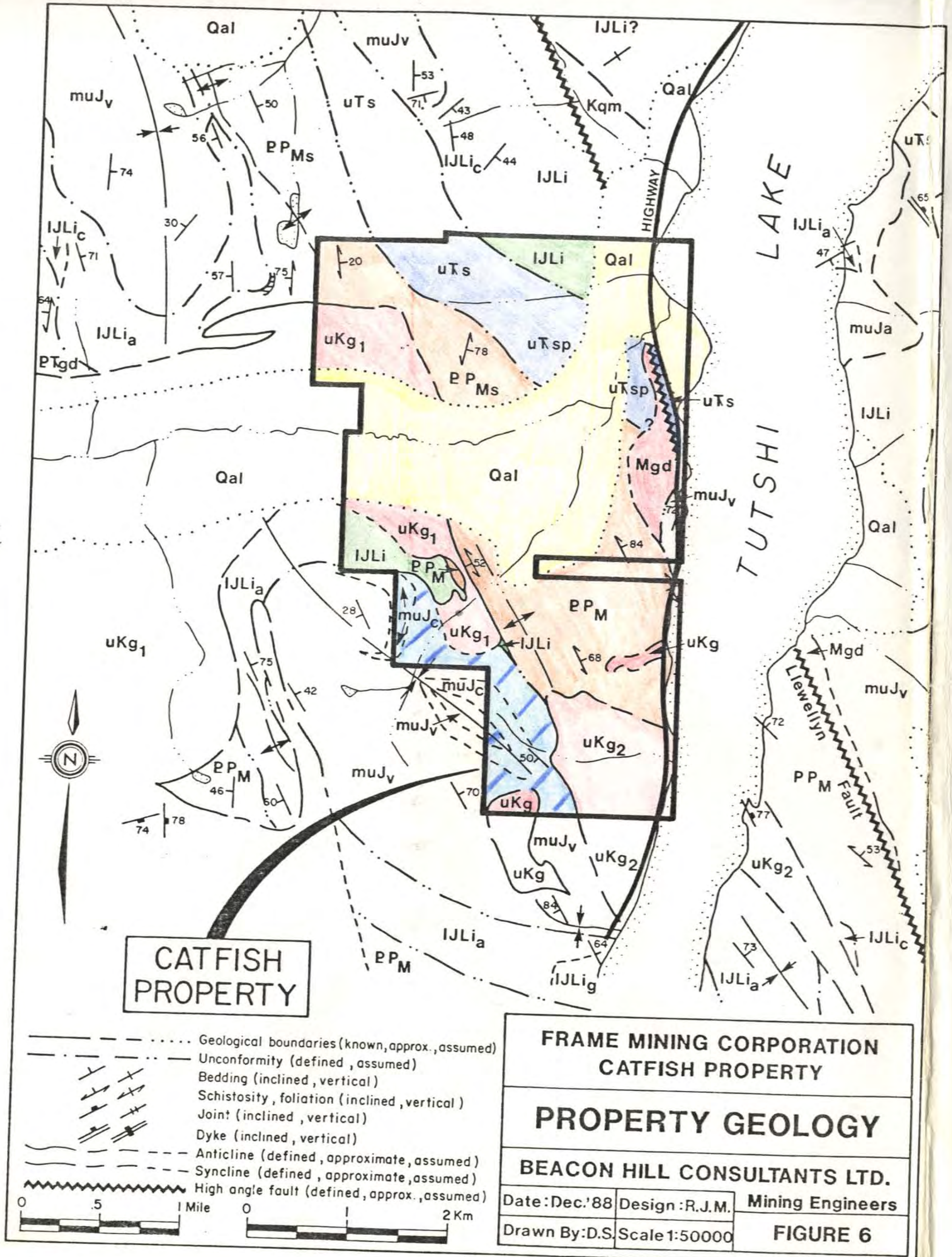
TABLE 10

MIDDLE RIDGE: INTRUSIVE HOST

Sample No.	Description	Results						
		Au* p.p.b.	Ag p.p.m.	Cu p.p.m.	Pb p.p.m.	Zn p.p.m.	Sb p.p.m.	As p.p.m.
C8R 4R	grab, high grade vein, 0.1 m	2420	20.9	614	29	56	186	42980
C8R 5R	grab, high grade vein, 0.1 m	16690	32.2	451	165	24	670	42779
C8R 54R	float, high grade	0.024	3.8	34	298	11	78	36131
C8R 55R	float, high grade	0.072	11.2	730	29	46	220	51538
C8R 56R	float, high grade	0.020	8.1	263	59	13	163	34784
C8R 60R	vein, 0.03 m	0.028	7.2	261	111	74	160	51072
C8R 61R	latite, host	92	0.1	15	13	25	12	4156
C8R 62R	vein, lower adit 0.1 m	0.157	6.0	19	37	17	563	50894
C8R 63R	vein, 0.35 m	525	1.0	7	11	11	816	99999
C8R 70R	grabs from 3.5 m vein	0.092	54.3	102	804	12	621	51076
C8R 85R	chips across altered zone, 1.0 m	245	147.1	190	13470	144	118	27414
C8R 86R	chips across rusty zone, 1.0 m	15	0.4	57	132	321	3	1166
C8R 87R	chips across rusty zone, 4.2 m	0.001	0.8	28	40	165	2	1093
C8R 88R	chips across vein, 1.6 m	0.051	9.3	206	136	41	36	24616
C8R 96R	chips across vein, 1.0 m	0.007	19.5	315	209	96	41	26680
C8R 98R	float	38	5.8	26	23	8	2	4472
C8R 101R	chips across vein, 1.0 m	1220	22.1	206	352	16	80	48314

* Results shown in decimal form are gold assay values in oz/ton.

Rock sample 98 P represents the mineralized fine intrusive and is described as a silicified rhyolite, Appendix III. Its origin is uncertain though it has a ghost proto-texture which suggests a metasomatic origin. The rock is from the same intrusive body as rock samples 3, 11, 12 and 29 P which are all described as apilites. A possible



GEOLOGY LEGEND

QUATERNARY

Qal — *Unconsolidated glacial till and poorly sorted alluvium*

MIDDLE TO UPPER JURASSIC (?)

4

muJv — *Variegated pyroclastic lapilli tuffs; bladed feldspar porphyry flows*

muJc — *Clast-supported conglomerate derived primarily from Inklin Formation siltstones and argillites*

LOWER JURASSIC

LABERGE GROUP, INKLIN FORMATION (where undivided denoted as lJLi)

3

lJLig — *Siltstones, arenaceous wackes (greywackes); may contain macrofossils*

lJLia — *Argillites (may be silty)*

lJLic — *Conglomerates; rarely contain macrofossils*

UPPER TRIASSIC

STUHINI GROUP (where undivided denoted as uTs)

2

uTsp — *Green pyroxene-feldspar porphyry tuffs and breccias characteristic of this group*

PALEOZOIC TO PROTEROZOIC (?)

BOUNDARY RANGES METAMORPHICS (where undivided denoted as PPM)

1

PPM — *A polydeformed metamorphic terrane of uncertain origin; variably metamorphosed to upper greenschist grade within the map area, and reported up to amphibolite grade to the south.** Protoliths in approximate order of abundance are:*

PPMS — *Argillaceous siltstones, feldspathic wackes and lesser felsic pyroclasts and carbonates (carbonate bands diagonally hatched)*

UPPER CRETACEOUS

COAST INTRUSIONS (where undivided denoted as uKg)

5

uKg1 — *Medium to coarse-grained hornblende and biotite granites are most characteristic of the Coast Intrusive rocks; with local gradations to potassium metasomatized alkaline granite (denoted "A") and lesser granodiorite (uKgd).*

uKg2 — *Equigranular uKg1 – lacking megacrystalline potassium feldspar with minor localized exceptions*

CRETACEOUS

Kgd, qm g,d — *Granodiorite, quartz monzonite, granite and diorite. Medium to coarse grained and typically more altered than uKg; may rarely be crosscut by ?uKg1,2. Commonly grades rapidly from one phase to another*

MIDDLE TO UPPER JURASSIC

muJa — *Hypabyssal andesites; medium grained andesitic feldspar porphyries commonly containing hornblende. Grey to green, weakly to strongly altered; probably coeval with muJv*

TRIASSIC (?)

Tgd, qm — *Porphyritic granodiorite to quartz monzonite; foliated with potassium feldspar phenocrysts and hornblende up to 20 per cent. Minor secondary chlorite, epidote and quartz*

MESOZOIC

Mgd — *Granodiorite; altered, sheared and brecciated felsic intrusive rocks primarily confined to the Llewellyn fault zone. May in part include rocks of PTgd*

PALEOZOIC? TO TRIASSIC

PTgd — *Altered and deformed intrusives. Typically altered and/or deformed weakly to strongly. Composition variable to leucogranite and quartz-diorite; may be silicified.*

FIGURE 6

Adapted From: Mihalynuk and Rouse B.C.E.M.P.R. OPEN FILE MAP 1986-5

explanation would see the siliceous solutions, carrying the arsenic and gold, invading the intrusive and totally replacing it. joint filling.

In the metamorphics, on the south side of the middle ridge there are two adits and one major trench. The lowest adit, at approximately 1200 m elevation, is 12 meters long and was driven to test a 1.35 m thick quartz vein exposed on surface. Approximately 85 meters above the lower adit a major trench and a partially caved adit were located. The trench exposed a quartz vein up to 0.85 m thick and the adit was started some five meters below. The adit is approximately seven meters long and was abandoned before it reached the vein, the entrance is almost totally caved with only a 0.4 m opening. The vein is highly mineralized with bands up to 0.2 m of massive arsenopyrite. To the northeast the vein runs at least 200 meters, where it is 0.4 meters thick, while it is exposed approximately 20 meters to the southwest where it thins to 0.4 m and appears to be truncated by the intrusive. On the north side of the middle ridge, within the metamorphics, several important quartz veins were located. One highly mineralized vein was located at approximately 1308 meters elevation in a steep gully. The vein trends 60 degrees and is at least 1.4 meters thick, with bands of massive arsenopyrite. Sampling of veins within the metamorphics produced the following results:

TABLE 11

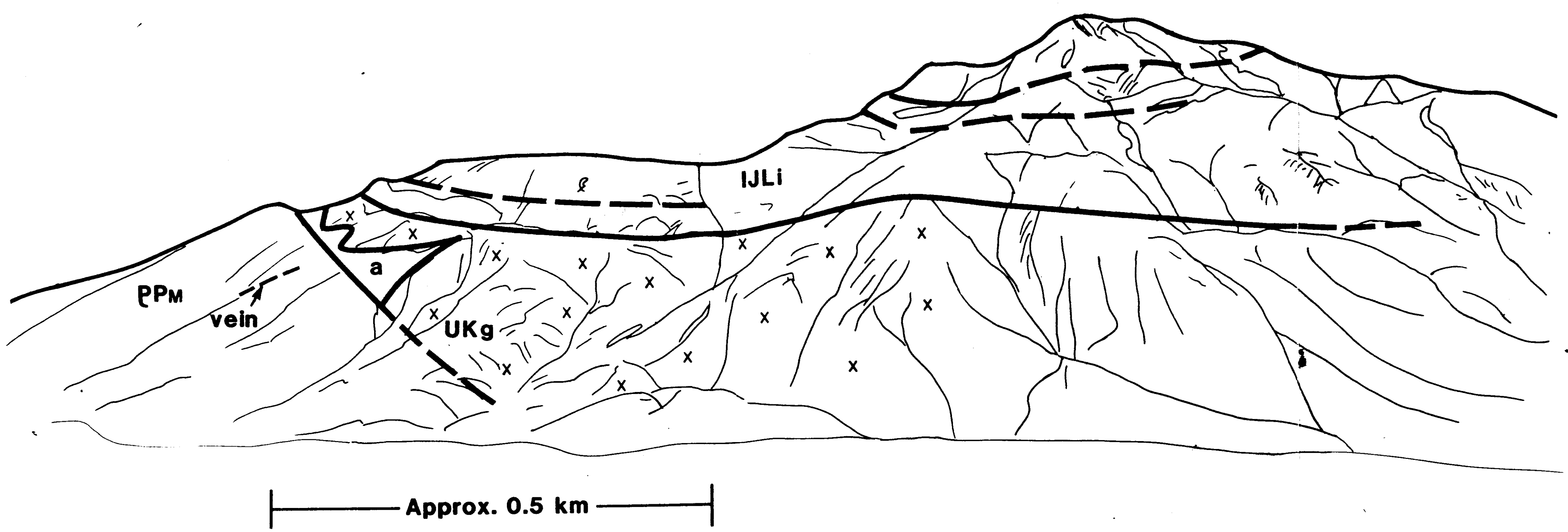
MIDDLE RIDGE: METAMORPHIC HOST

Sample No.	Description	Results						
		Au* p.p.b.	Ag p.p.m.	Cu p.p.m.	Pb p.p.m.	Zn p.p.m	Sb p.p.m.	As p.p.m.
C8R 57R	float, massive arsenopyrite	0.053	63.8	2681	178	44	522	51693
C8R 58R	vein, 0.03 m	0.002	1.7	82	26	46	5	5276
C8R 59R	metasediment host	32	0.1	19	12	104	2	100
C8R 64R	vein, 1.0 m	345	1.9	292	10	15	101	37054
C8R 65R	vein, 0.03 m	360	12.0	105	152	104	152	99999
C8R 66R	vein, 0.85 m	0.124	275.0	286	8195	28	3291	51311
C8R 67R	vein, high grade arsenopyrite	0.038	184.2	240	1025	153	744	51340
C8R 97R	vein, 1.2 m	26	0.2	6	22	44	2	84
C8R 99R	vein, 0.6 m	1.380	28.0	123	585	43	533	51241
C8R 100R	vein, 1.4 m	1.120	22.3	318	218	484	302	51338

* Results in decimal form are gold assay values in oz/ton.

One rock sample of the vein material was procured, sample 67 P, Appendix III. The rock is described as arsenopyrite with vein quartz. Accessory minerals are minor, 1% marcasite, trace chalcopyrite and trace tetrahedrite (?) or Pb-Sb sulfosalt. The sample assays at 0.38 oz/ton gold.

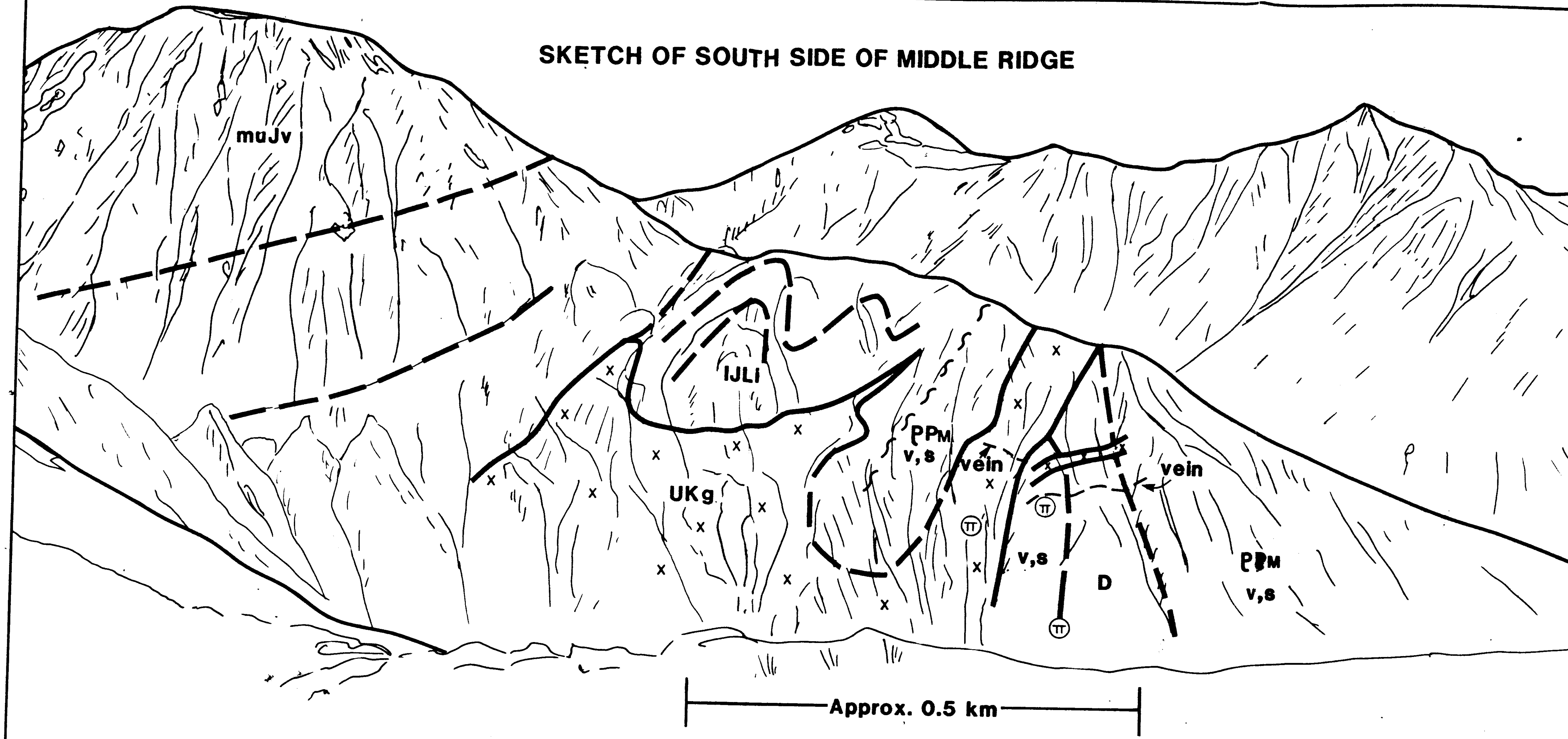
SKETCH OF NORTH SIDE OF MIDDLE RIDGE



lJLi - INKLIN Fm.
PPM - BOUNDARY RANGES METAMORPHICS - v,s - Volcanics, Sediments
D - Diorite
x x UKg - COAST INTRUSIVES
Structural Features
Major Vein
a = Mineralized Zone

FIGURE 7

SKETCH OF SOUTH SIDE OF MIDDLE RIDGE



muJv - UPPER JURASSIC VOLCANICS
IJLi - INKLIN Fm.
PPM - BOUNDARY RANGES METAMORPHICS - v,s - Volcanics, Sediments
D - Diorite
x x UKg - COAST INTRUSIONS
Structural Features
Adit (3 Portals)
Major Vein
Shear Contact

FIGURE 8

SKETCH OF NORTHWEST SIDE OF SOUTH MOUNTAIN

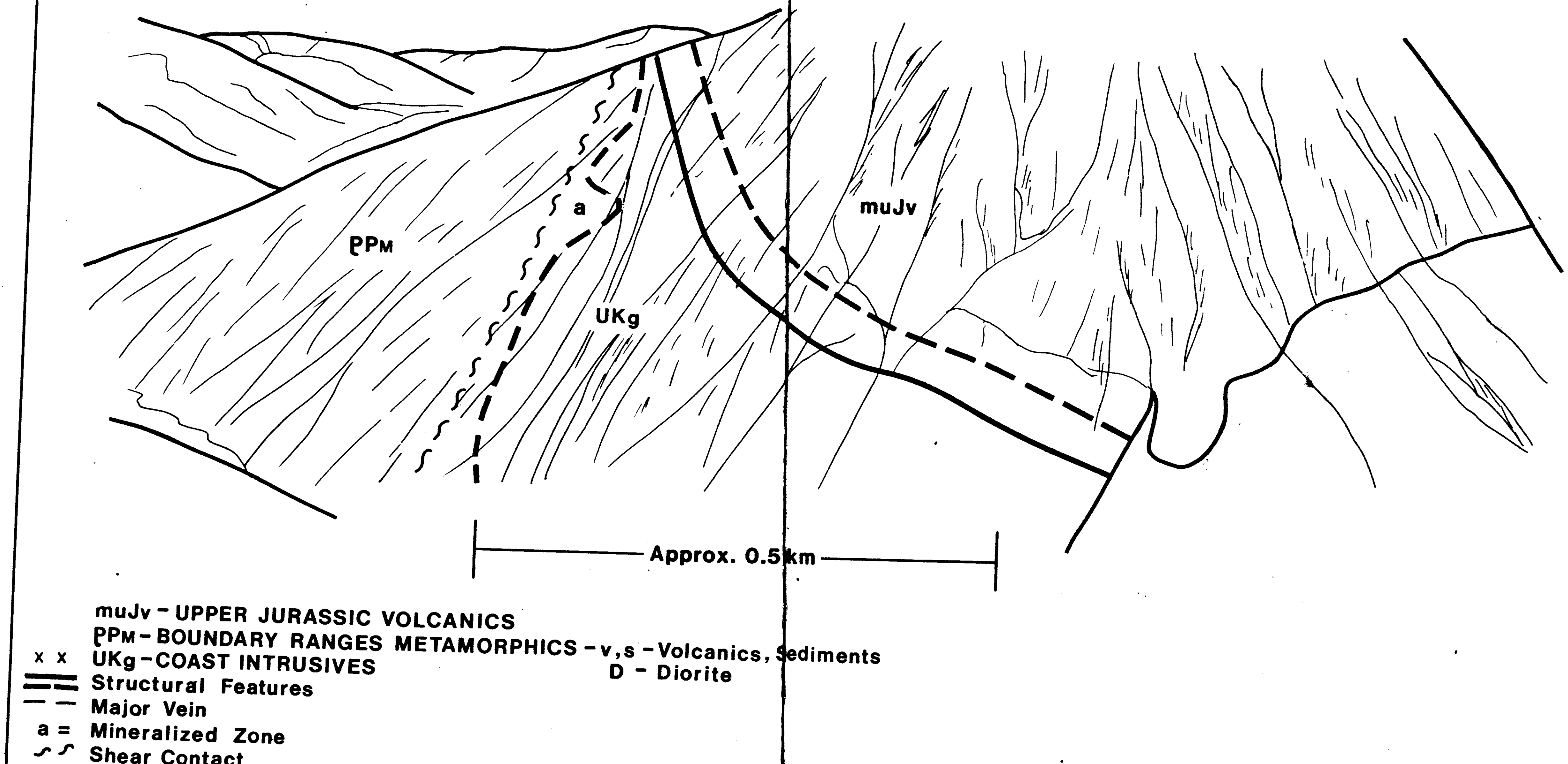
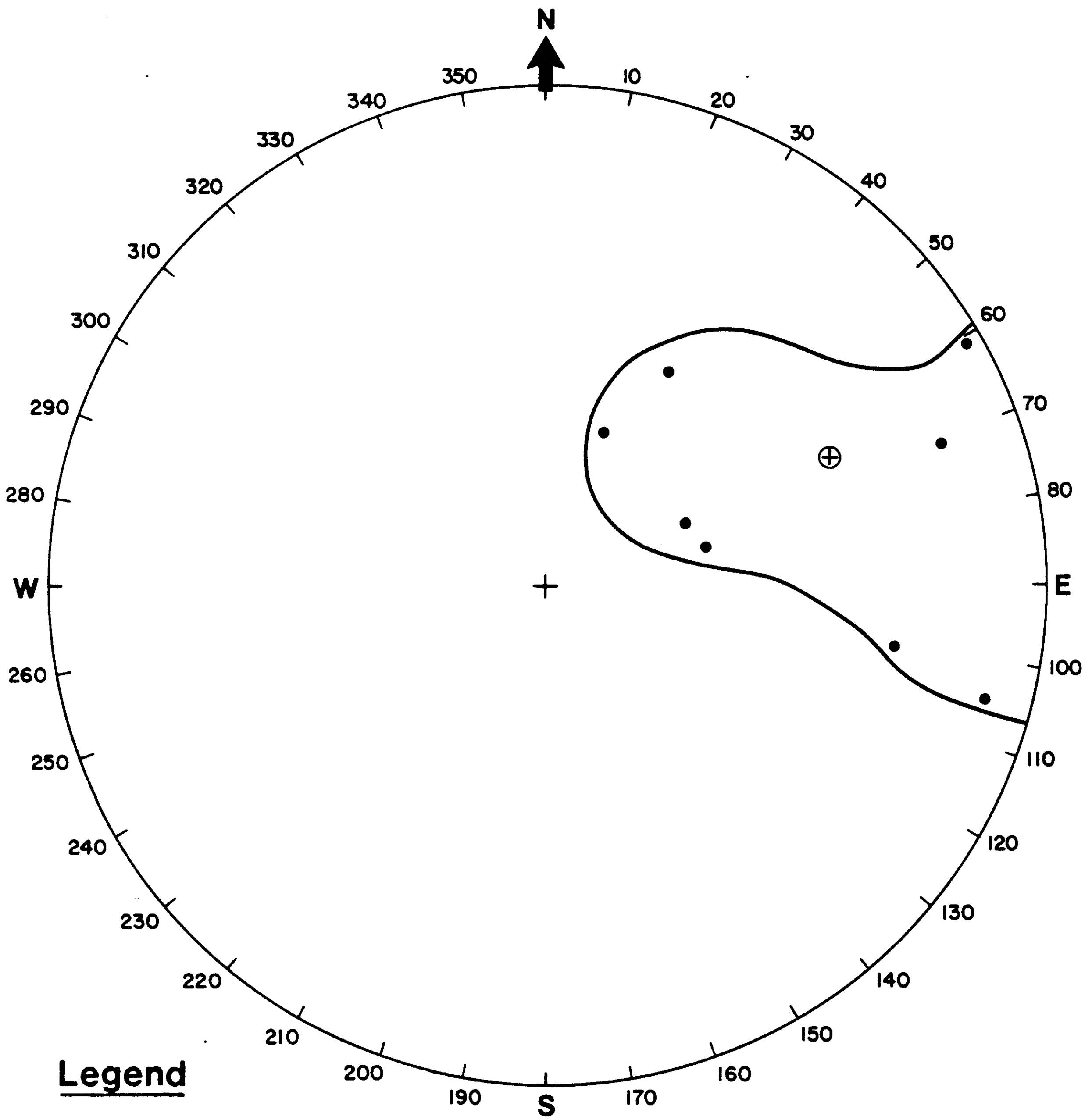


FIGURE 9

BEDDING ATTITUDES



Legend

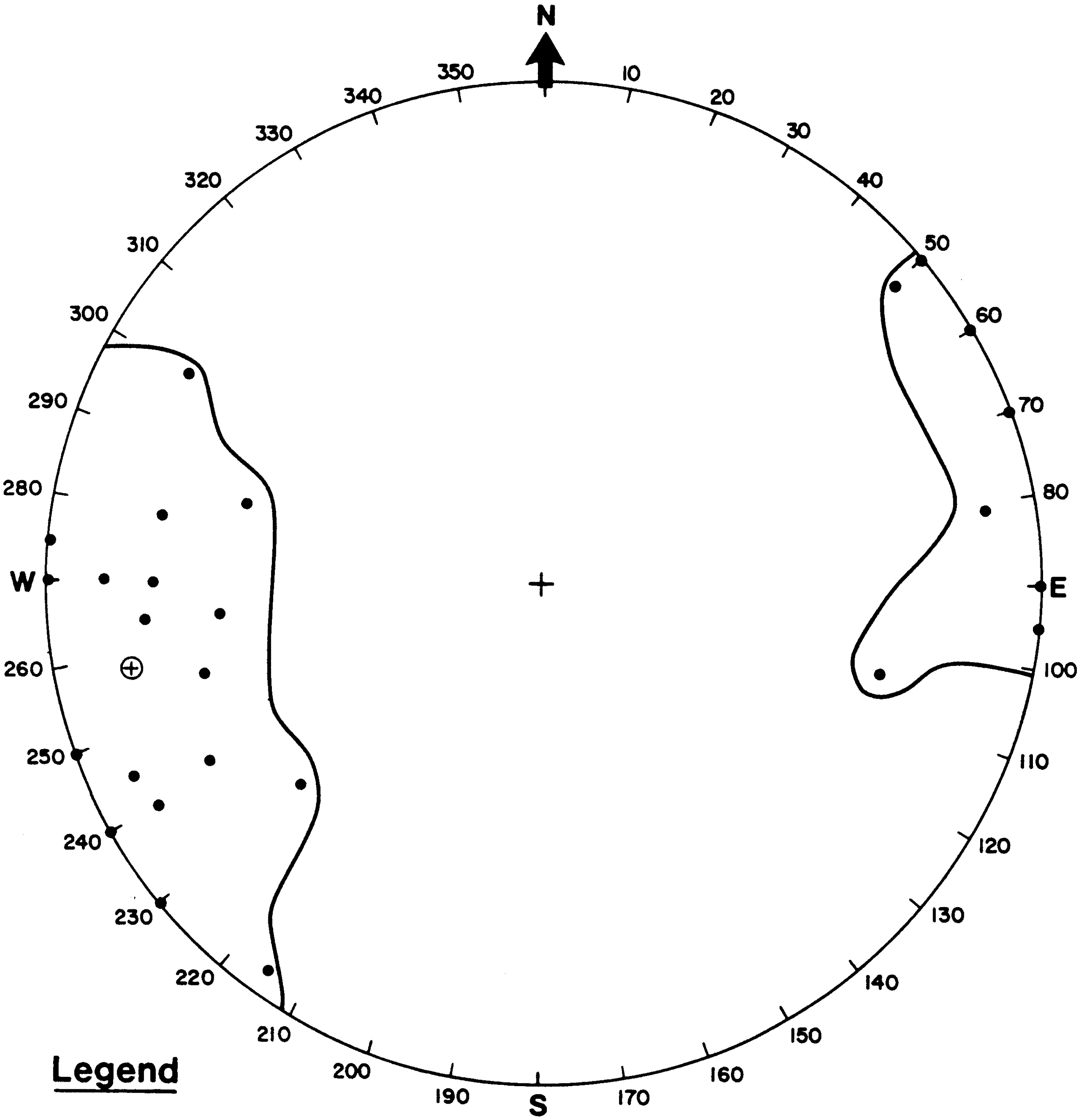
• POLE TO BEDDING

⊕ POLE TO AVERAGE BEDDING

N = 8

FIGURE 10

FOLIATION ATTITUDES



Legend

- • POLE TO FOLIATION
- ⊕ POLE TO AVERAGE FOLIATION

N = 21

FIGURE 11

JOINTING ATTITUDES

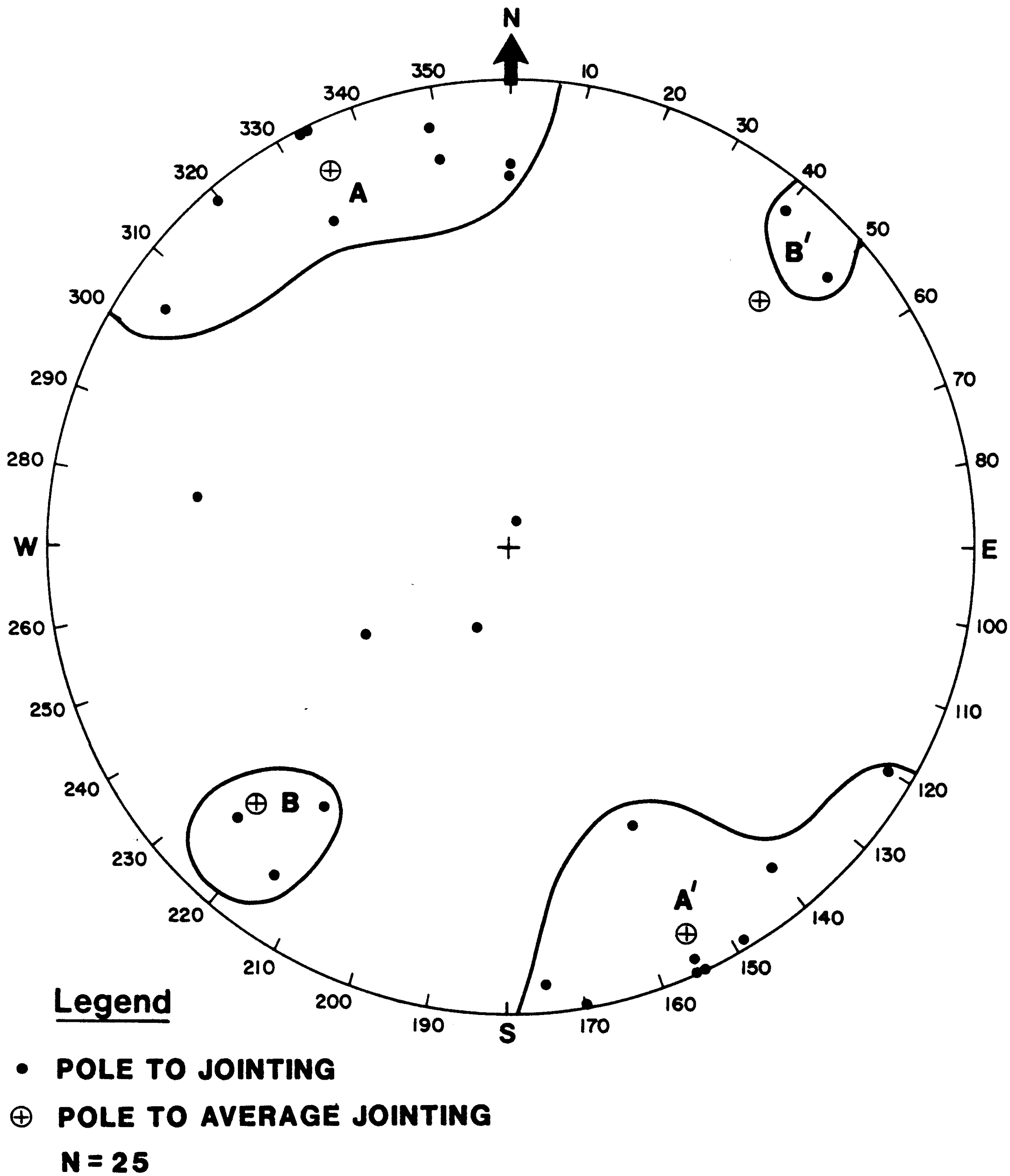
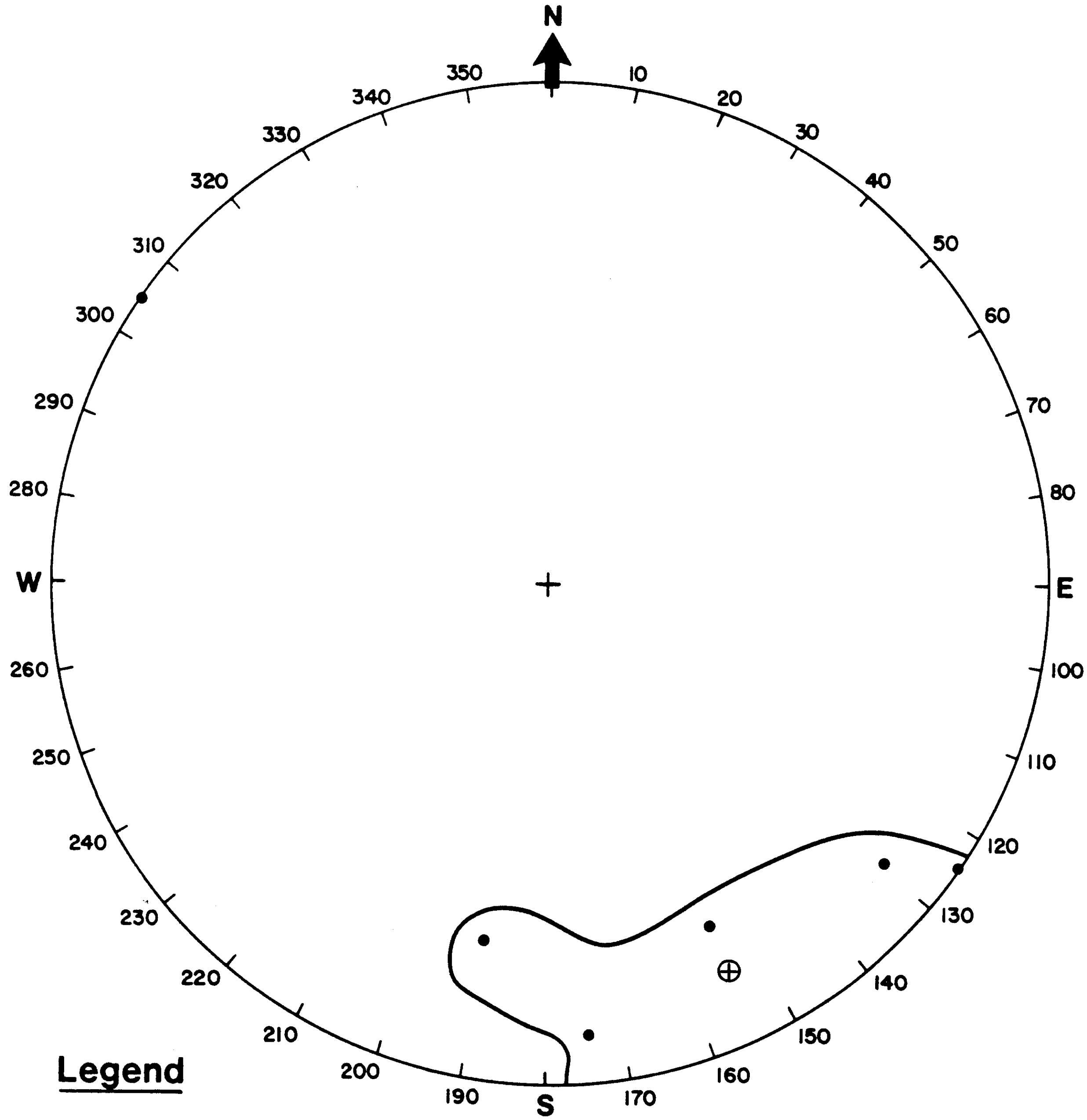


FIGURE 12

SHEAR ATTITUDES



Legend

- • POLE TO SHEAR
- ⊕ POLE TO AVERAGE SHEAR

N = 5

FIGURE 13

VEIN ORIENTATION

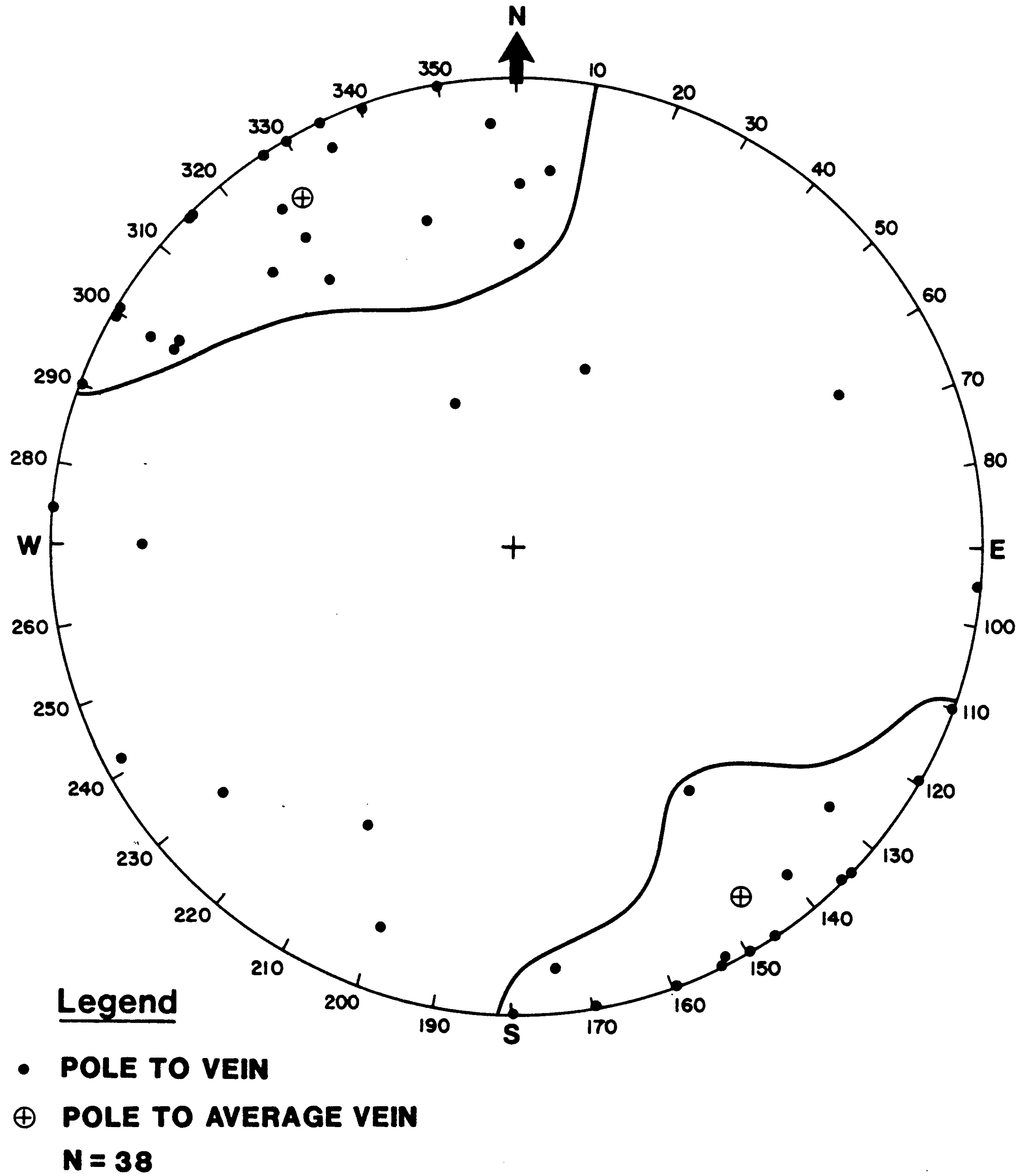


FIGURE 14

GEOCHEMISTRY

Sample Types

Three sample types were collected, soil, stream sediments and rock. The soil samples represent B-horizon material where available though generally soil is poorly developed at higher elevations. Where soil was not identified, the sample represents fine debris on scree slopes. Stream sediment samples represent fine material from the active portion of a stream. Rock samples are of several types, float samples, where the source is not known; grab samples, a sample from outcrop which may not be representative of the total outcrop; and chip or channel samples which have been collected to represent an outcrop or portion of an outcrop.

bad terminology

Discussion of Results

All sample locations are shown on Figures 15 and 16, while the results are listed in Appendix II. Figures 30 to 32 show sample locations, gold in soil, geology for three important areas.

Figure 17 to 20 are frequency histograms showing the distribution of antimony and gold in soil. Figures 21 and 22 are cumulative frequency distribution graphs of gold and arsenic in soil. The frequency histograms all show highly skewed distributions with an over abundance of low values. The cumulative frequency graph of gold, Figure 21, shows a background and an anomalous population with a threshold value of 120 p.p.b. gold. Using this threshold value means that 34% of the samples are anomalous. Figure 22 shows the cumulative frequency distribution for arsenic in soil. The graph shows two major populations, background and anomalous with a threshold value of 600 p.p.m. The anomalous population could possible be interpreted to contain several sub-populations.

Figures 23 to 28 show the correlation distribution of copper, lead, zinc, silver, arsenic and antimony versus gold. Only arsenic appears to have any correlation with gold, though the correlation factor would not be useable in exploration.

Stream sediment sampling by the B.C. Geological Survey in 1987, Rouse et al. 1988, showed that the creek draining east from Paddy Pass and its most easterly, south drainage are anomalous in gold, arsenic and antimony. Detailed stream sediment sampling by the author in 1988 can be used to locate mineralized areas. Samples from Paddy pass creek, C8R 104S, 105S and C8N 254S show very low values (maximum 3 p.p.b. gold) while the south creek, between the middle ridge and the south mountain, has values up to eight times higher (maximum 25 p.p.b. gold) samples C8N 61S, 110S and 111S.

The mineralized areas were located by prospecting while geochemistry was used to explore for extensions and to determine the geochemical signature of the mineralization.

Four days were spent on the north mountain, one day prospecting and sampling along the old road on the east and south slopes, a day on the east slope prospecting gullies, a day in the rusty gully on the east slope and one day on the ridge and around the old adit, Figure 5. Sampling on the east slope indicates no anomalous areas. Sampling along the ridge top as well as detailed work around the adit indicates no anomalies, Area A,

Figure 30. Sample C8N 80L shows up to 2 605 p.p.b. gold but represents dump debris from the old adit.

Three days were spent on the south mountain, one day prospecting and sampling to the south and along the east side, a day on the ridge and northwest side, a half day sampling and prospecting the lower northwest slopes and a half day along the Klondike Highway, Figure 5. Sampling in the southeast and northeast drainages produced no anomalies. Detailed sampling on the ridge and northwest side has outlined the mineralized area, Area B, as well as an extension to the southeast, Area C, Figure 32.

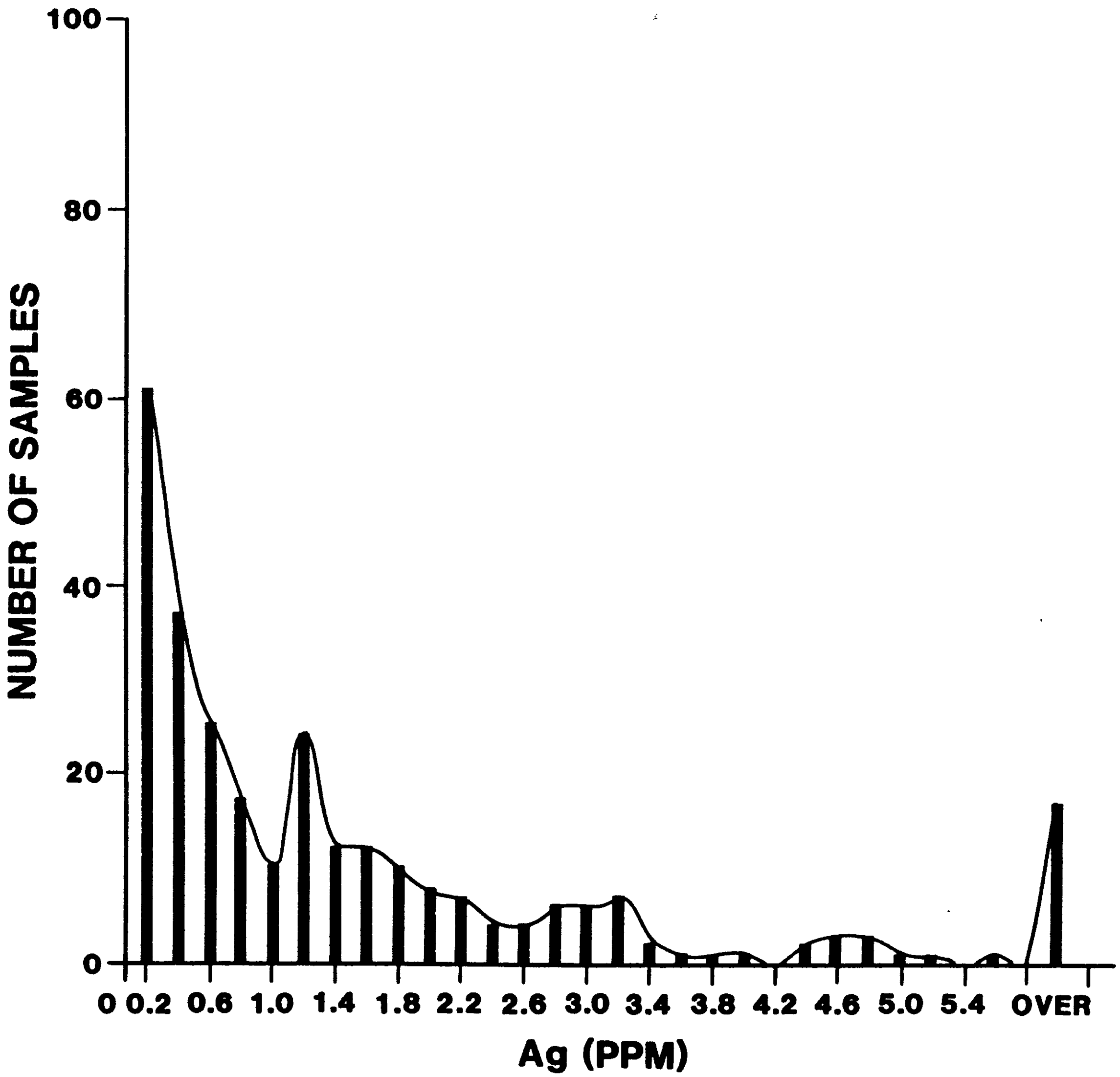
Area B, Figure 32, comprises three level soil lines designed to outline the extent of mineralization. The top line, shows only a single arsenic anomaly, C8N 12L. The middle sample line shows an extensive arsenic anomaly with results up to ten times background. Gold in soil is up to twice background though the anomalies are scattered. The anomalous zone is at least 250 meters wide with the southwest edge defined though sampling was not carried far enough to the northeast to define the anomalous zone. The bottom sample line was designed to test the northeast extent of mineralization. Results indicate a single weak gold anomaly but an anomalous arsenic zone up to 150 meters wide.

Area C, Figure 32, hosts a level soil sample line over a narrow intrusive body. Gold in soil is up to eight times background, sample C8N 104L, while arsenic values are up to 13 times background, sample C8N 105L. Area C is up to 750 meters southeast of area B and appears to represent an extension of the mineralized zone.

At least eight man days were spent on the middle ridge prospecting and sampling. Five detailed soil sampling lines were completed to outline the area of mineralization and explore for extensions. Two anomalous area, D and E, are outlined on Figure 31.

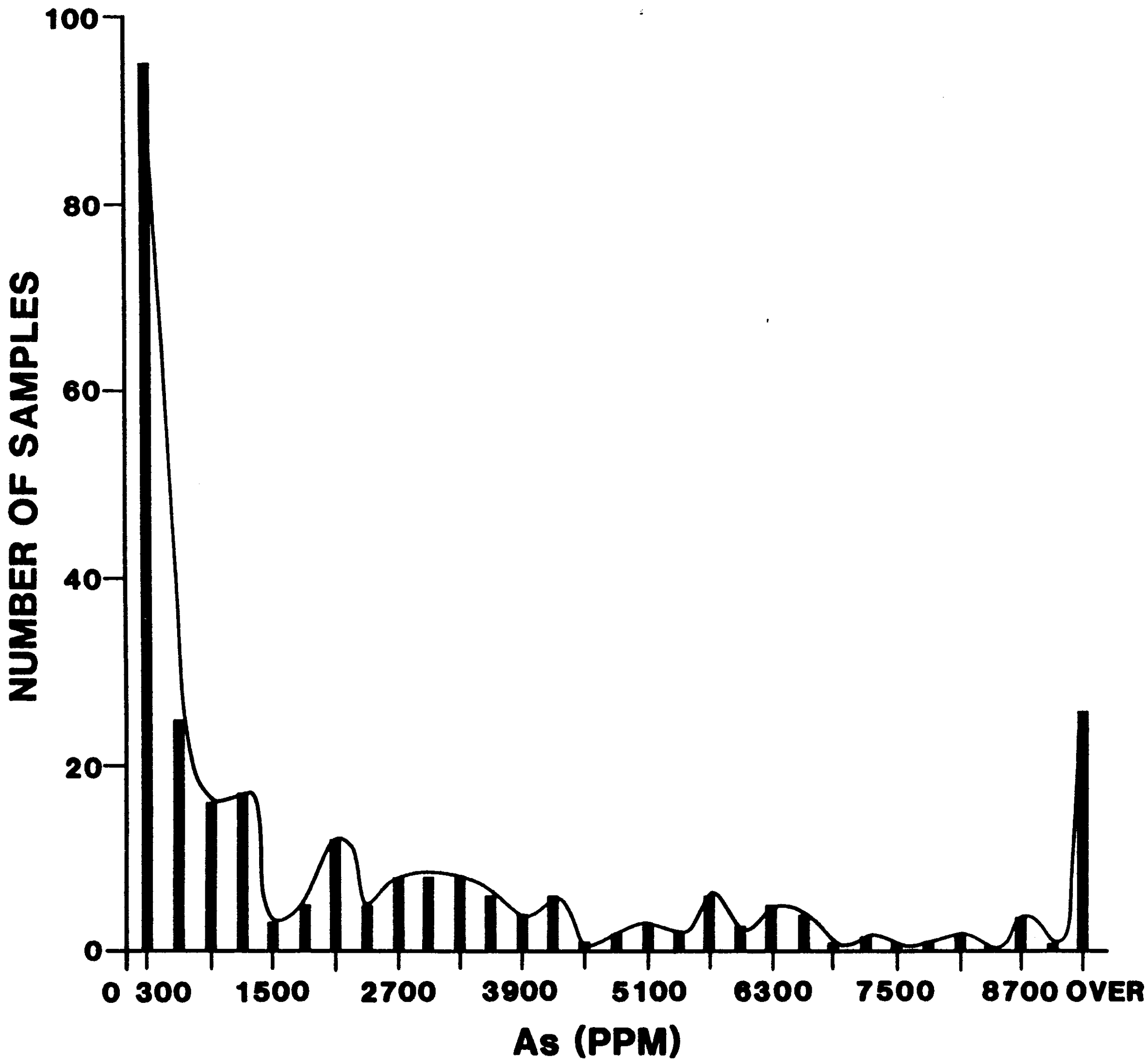
Area D, Figure 31, represents the main intrusive body on the middle ridge. Soil samples show up to 24 220 p.p.b. (0.71 oz/ton) gold, sample C8R 90L, 200 times background and up to 20 425 p.p.m. arsenic, sample C8N 140L, 34 times background. Gold in soil is effective in showing the extent of mineralization as shown by the southeast sample line, above the south creek. Arsenic shows a larger dispersion trend and indicates the whole middle ridge is anomalous.

Area E, Figure 31, represents the northeast end of the southeast sample line above the south creek. Gold values are up to 1 950 p.p.b., sample C8N 151L, and arsenic is up to 19 895 p.p.m., from the same sample. The samples indicate mineralized material above the line.



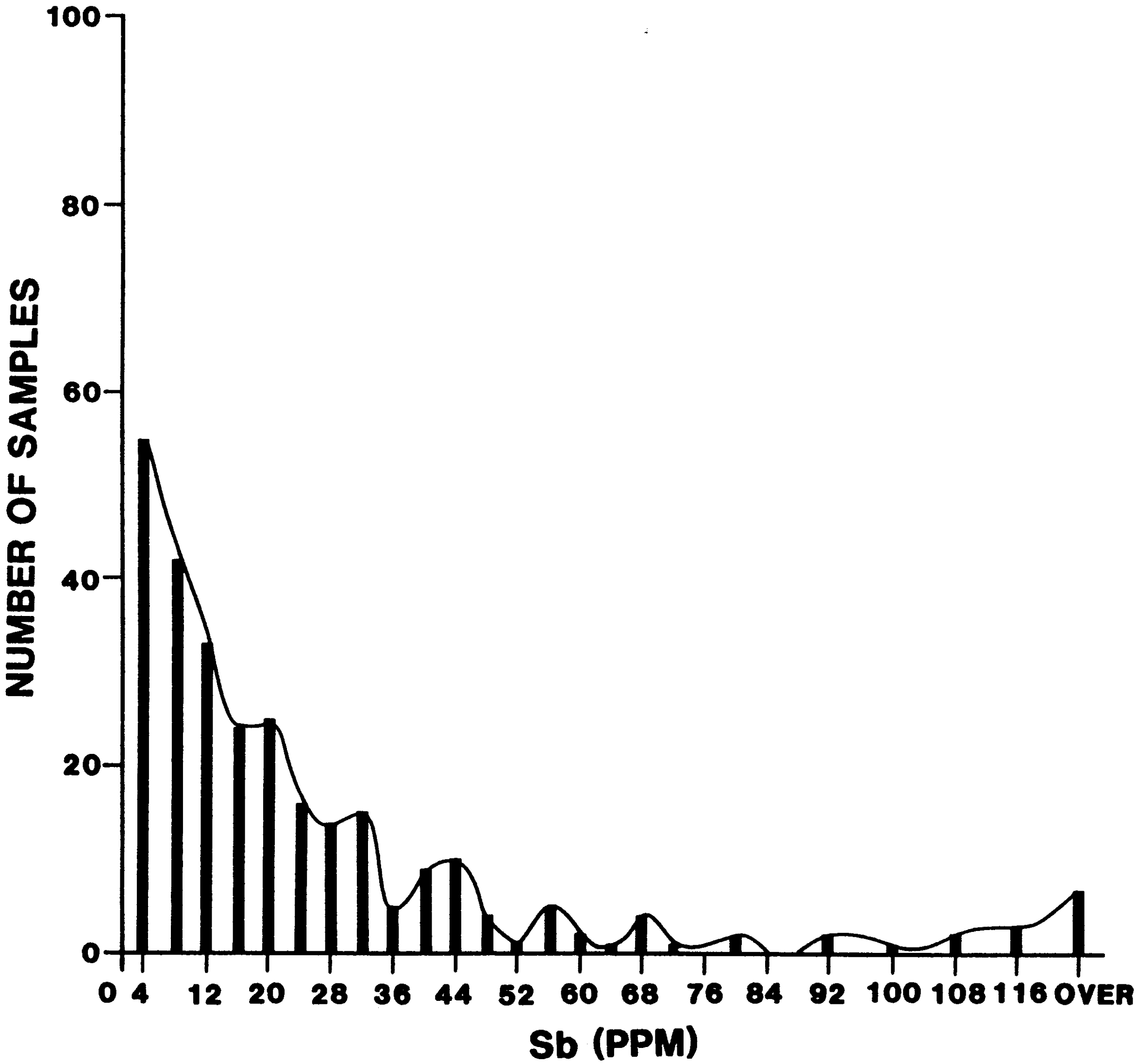
N = 283
MAXIMUM: 33.1
MINIMUM: 0.1
MEAN: 2.0
MEDIAN: 0.9
STANDARD DEVIATION: 4.2

FRAME MINING CORPORATION CATFISH PROPERTY		
FREQUENCY DISTRIBUTION SILVER IN SOIL		
BEACON HILL CONSULTANTS LTD.		
Date: Dec.'88	Design: R.J.M.	Mining Engineers
Drawn By: D.S.		FIGURE 17



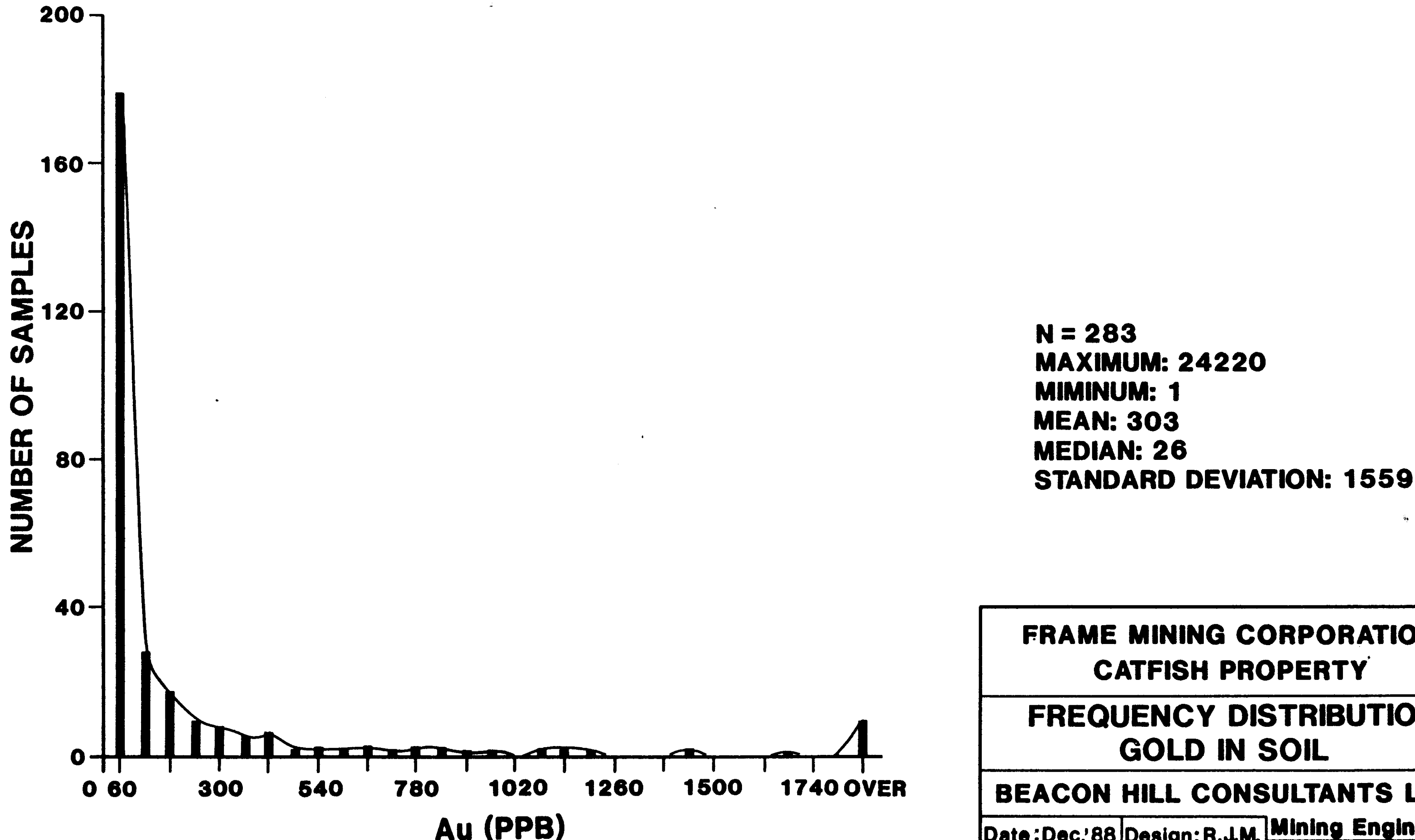
N = 283
MAXIMUM: 20425
MINIMUM: 31
MEAN: 3043
MEDIAN: 1016
STANDARD DEVIATION: 4476

FRAME MINING CORPORATION CATFISH PROPERTY		
FREQUENCY DISTRIBUTION ARSENIC IN SOIL		
BEACON HILL CONSULTANTS LTD.		
Date: Dec.'88	Design: R.J.M.	Mining Engineers
Drawn By: D.S.		FIGURE 18



N = 283
MAXIMUM: 253
MINIMUM: 2
MEAN: 24
MEDIAN: 14
STANDARD DEVIATION: 31

FRAME MINING CORPORATION CATFISH PROPERTY		
FREQUENCY DISTRIBUTION ANTIMONY IN SOIL		
BEACON HILL CONSULTANTS LTD.		
Date : Dec.'88	Design: R.J.M.	Mining Engineers
Drawn By: D.S.		FIGURE 19

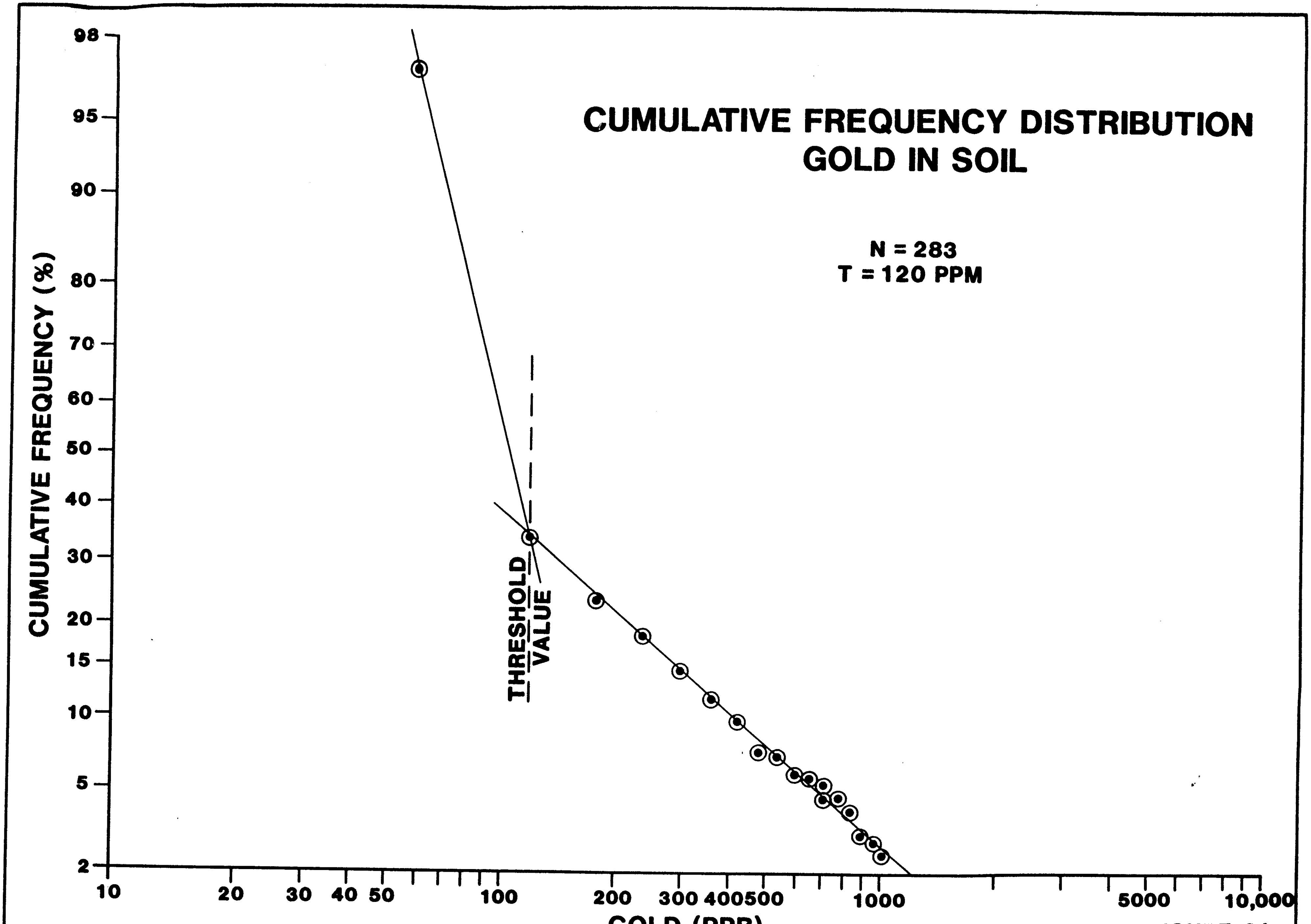


FRAME MINING CORPORATION
CATFISH PROPERTY

FREQUENCY DISTRIBUTION
GOLD IN SOIL

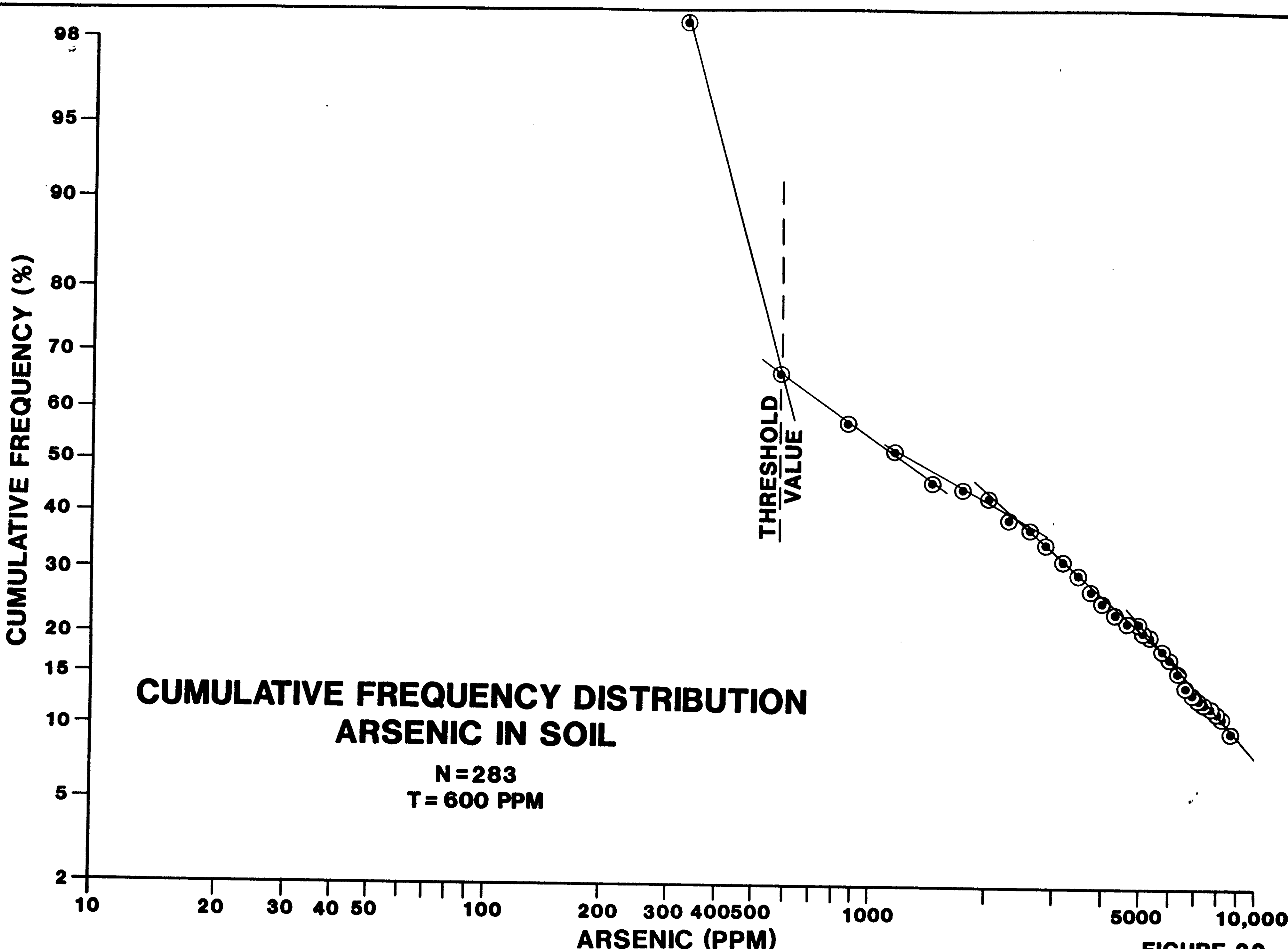
BEACON HILL CONSULTANTS LTD.

Date : Dec.'88	Design: R.J.M.	Mining Engineers
Drawn By: D S		FIGURE 20



CUMULATIVE FREQUENCY DISTRIBUTION
GOLD IN SOIL
N = 283
T = 120 PPM
CUMULATIVE FREQUENCY (%)
98
95
90
80
70
60
50
40
30
20
15
10
5
2
THRESHOLD VALUE
10
20
30
40
50
100
200
300
400
500
1000
5000
10,000
GOLD (PPB)

FIGURE 21



98
95
90
80
70
60
50
40
30
20
15
10
5
2
CUMULATIVE FREQUENCY (%)
THRESHOLD VALUE
CUMULATIVE FREQUENCY DISTRIBUTION
ARSENIC IN SOIL
N=283
T=600 PPM
10
20
30
40
50
100
200
300
400
500
1000
5000
10,000
ARSENIC (PPM)

FIGURE 22

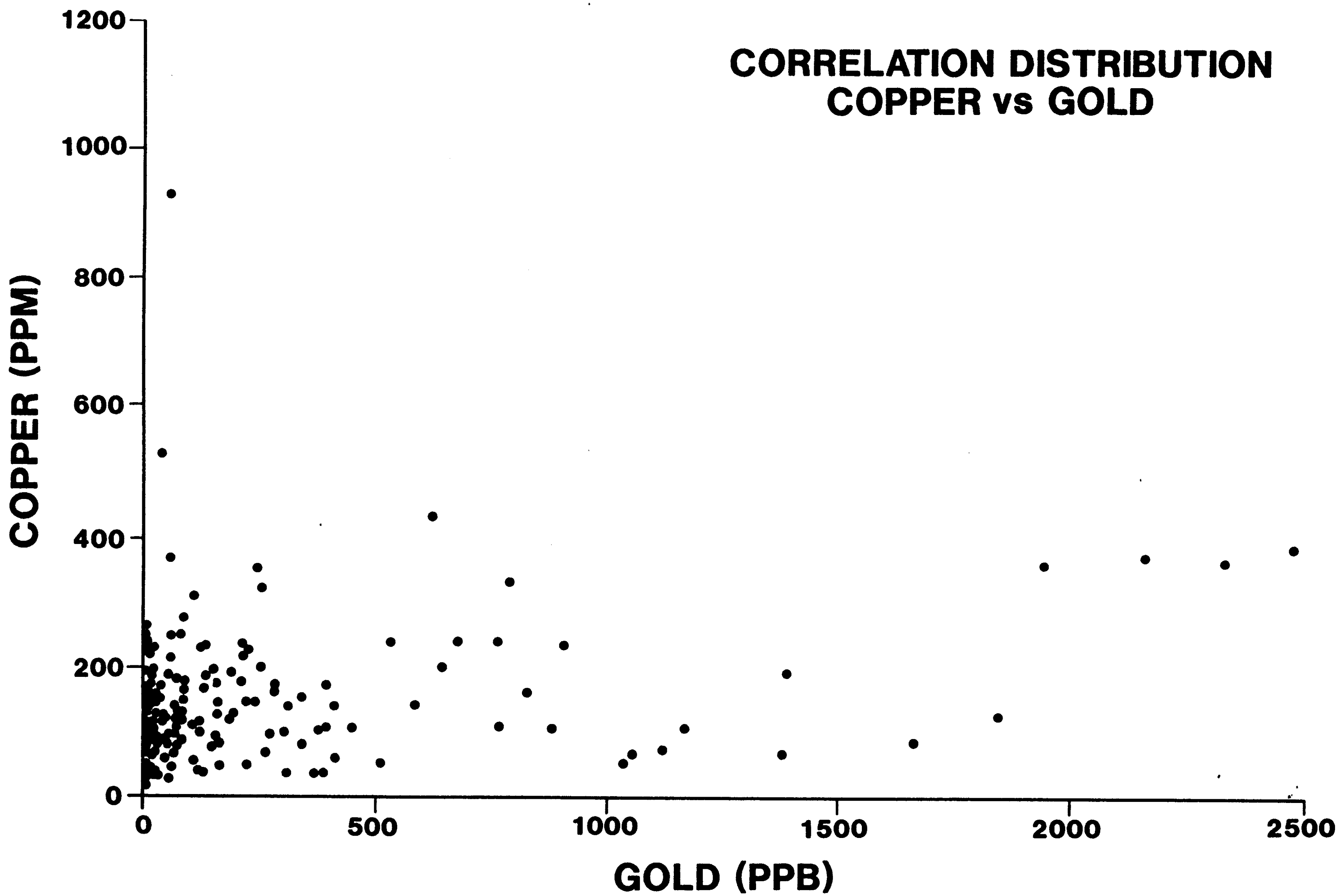
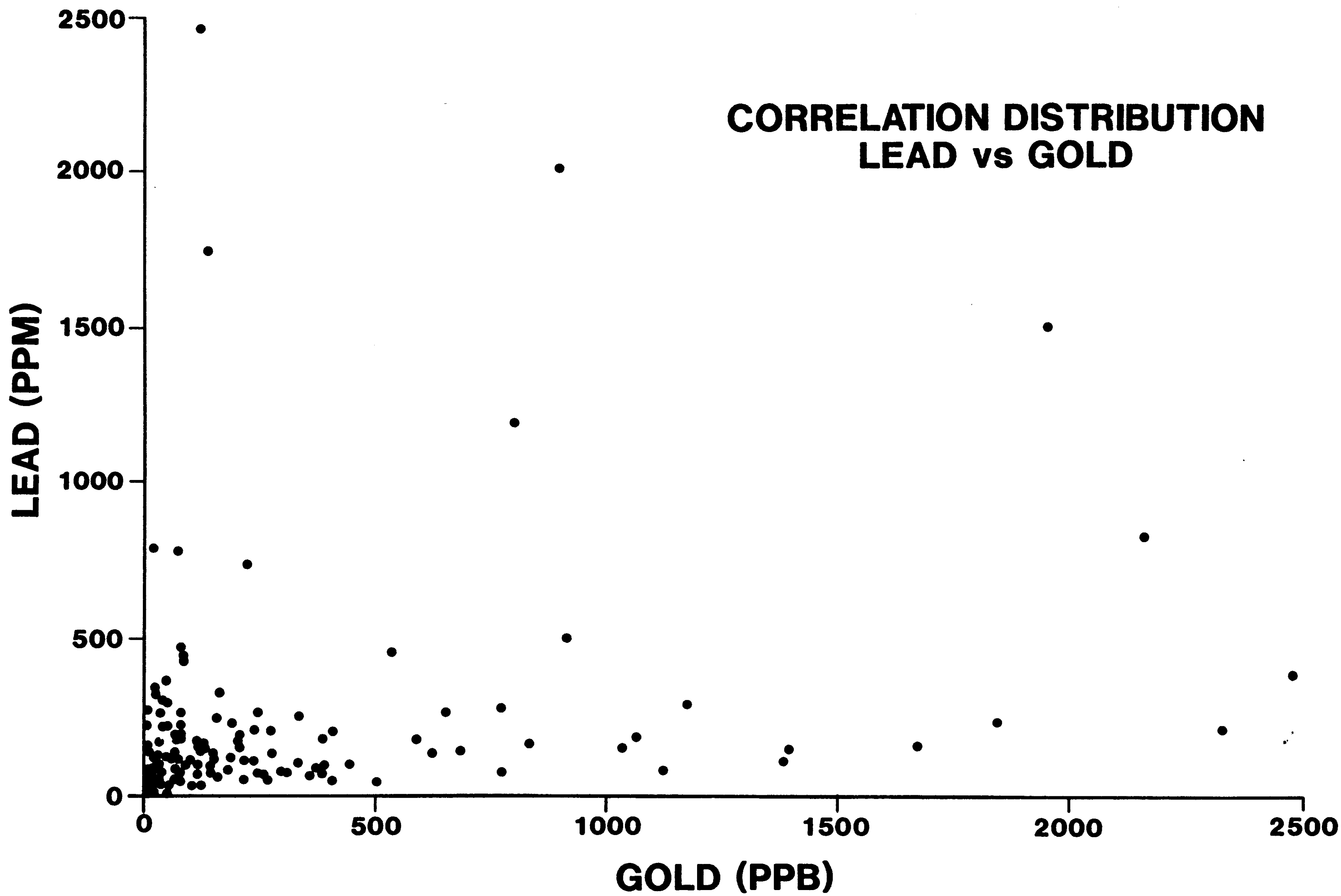

CORRELATION DISTRIBUTION
COPPER vs GOLD
COPPER (PPM)
0
200
400
600
800
1000
1200
0
500
1000
1500
2000
2500
GOLD (PPB)

FIGURE 23



CORRELATION DISTRIBUTION
LEAD vs GOLD
LEAD (PPM)
2500
2000
1500
1000
500
0
GOLD (PPB)
0
500
1000
1500
2000
2500

FIGURE 24

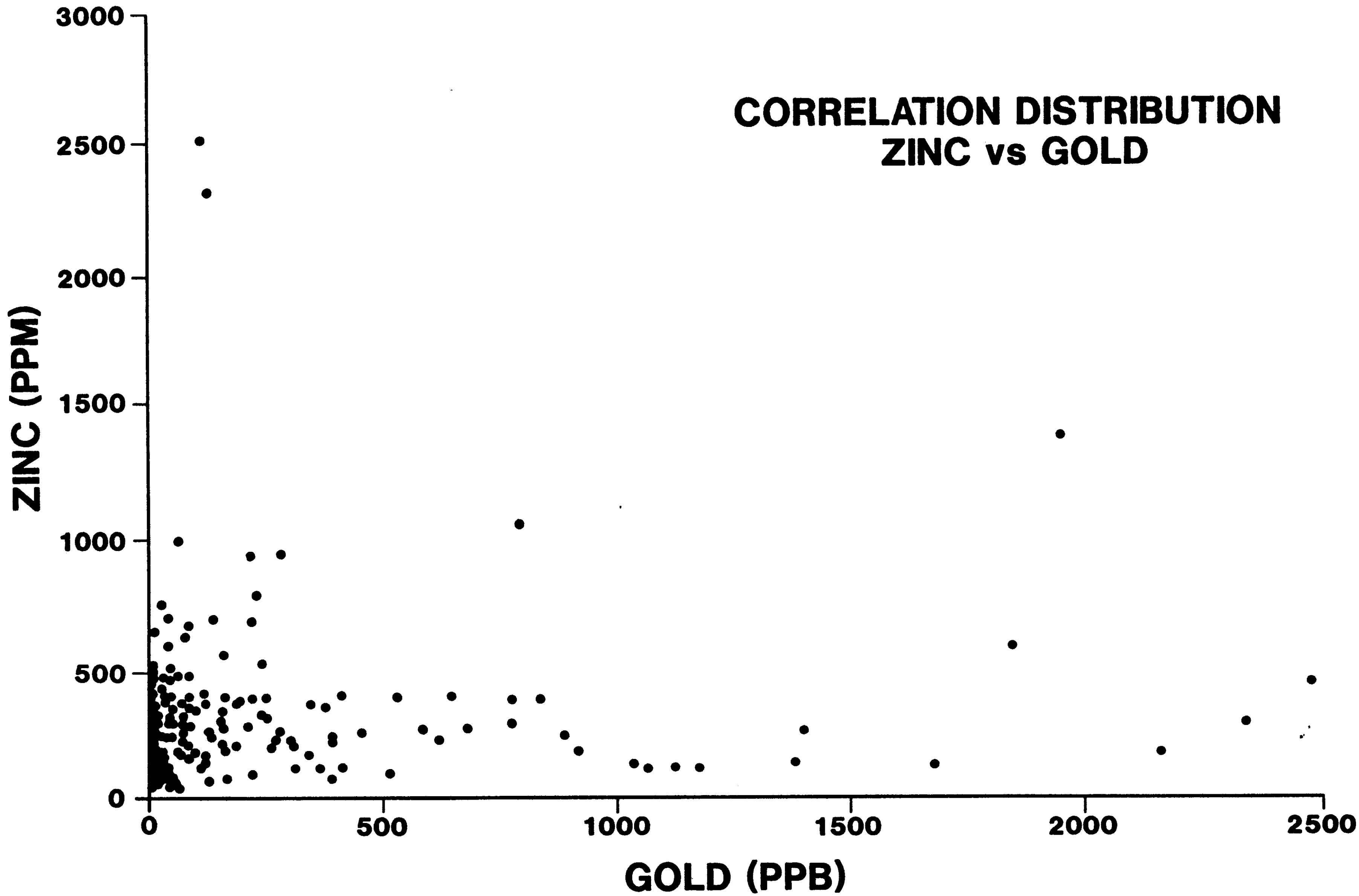

CORRELATION DISTRIBUTION
ZINC vs GOLD
ZINC (PPM)
3000
2500
2000
1500
1000
500
0
500
1000
1500
2000
2500
GOLD (PPB)

FIGURE 25

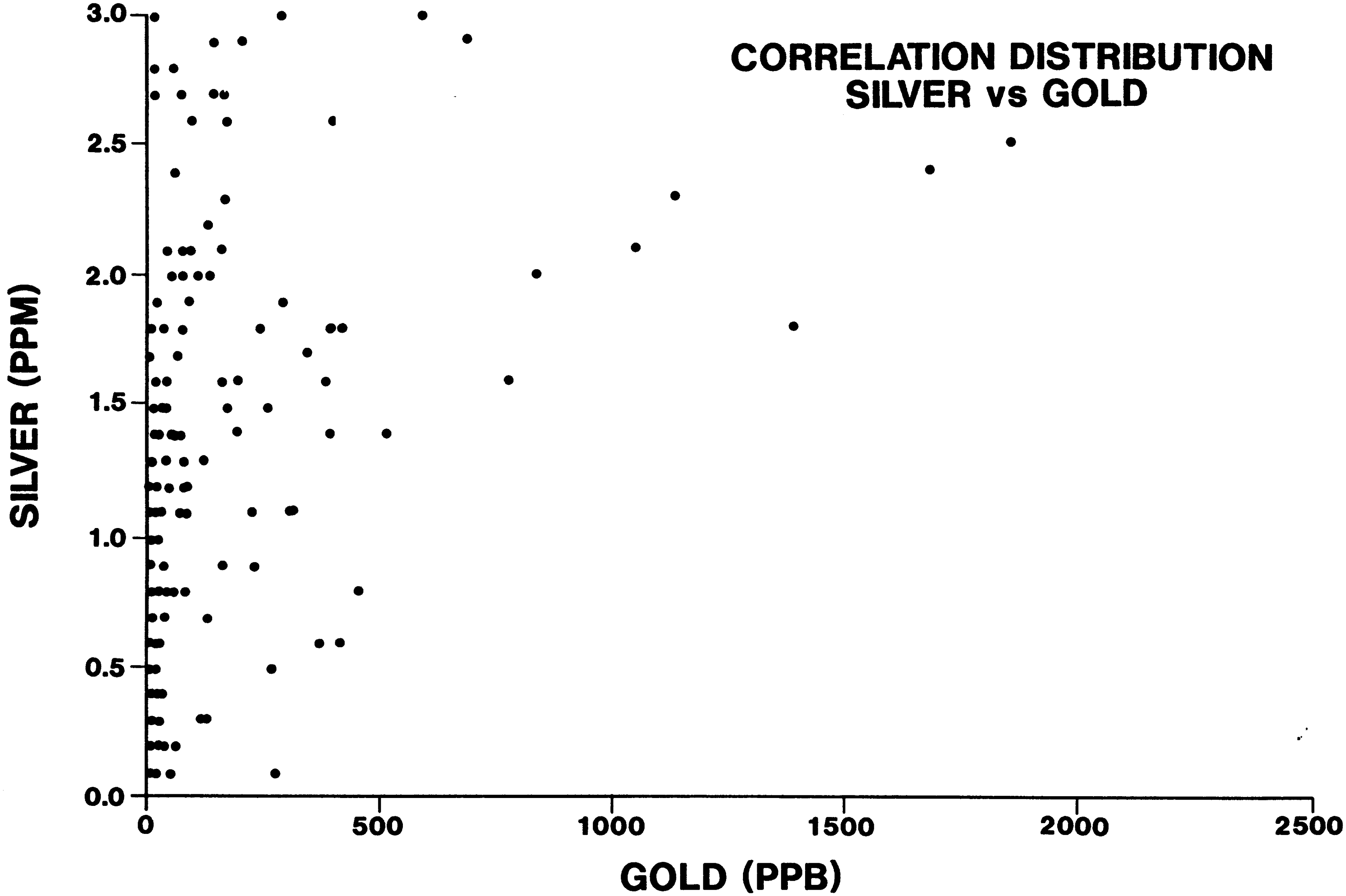

CORRELATION DISTRIBUTION
SILVER vs GOLD
SILVER (PPM)
GOLD (PPB)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
500
1000
1500
2000
2500

FIGURE 26

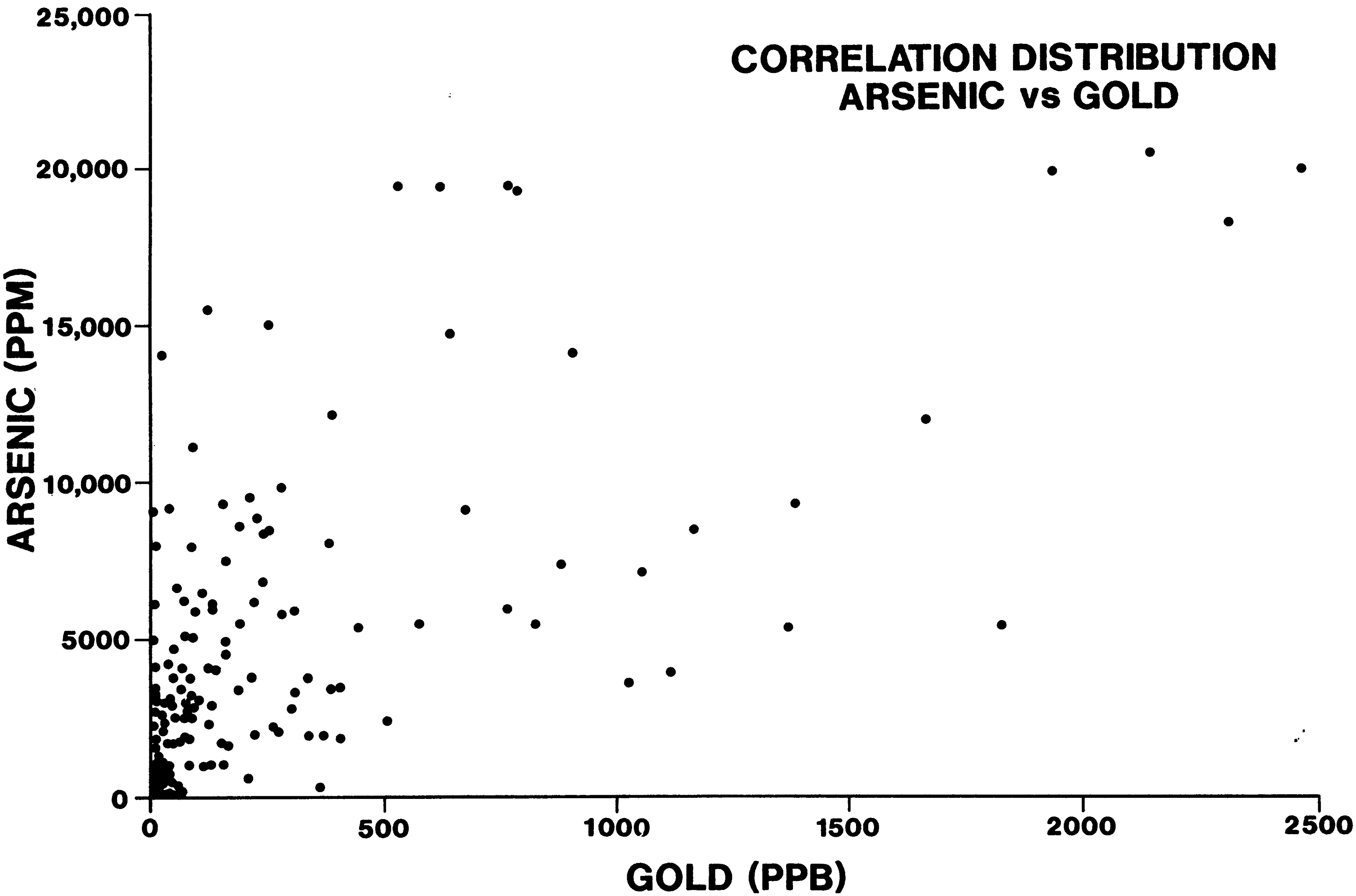

CORRELATION DISTRIBUTION
ARSENIC vs GOLD
ARSENIC (PPM)
25,000
20,000
15,000
10,000
5000
0
0
500
1000
1500
2000
2500
GOLD (PPB)

FIGURE 27

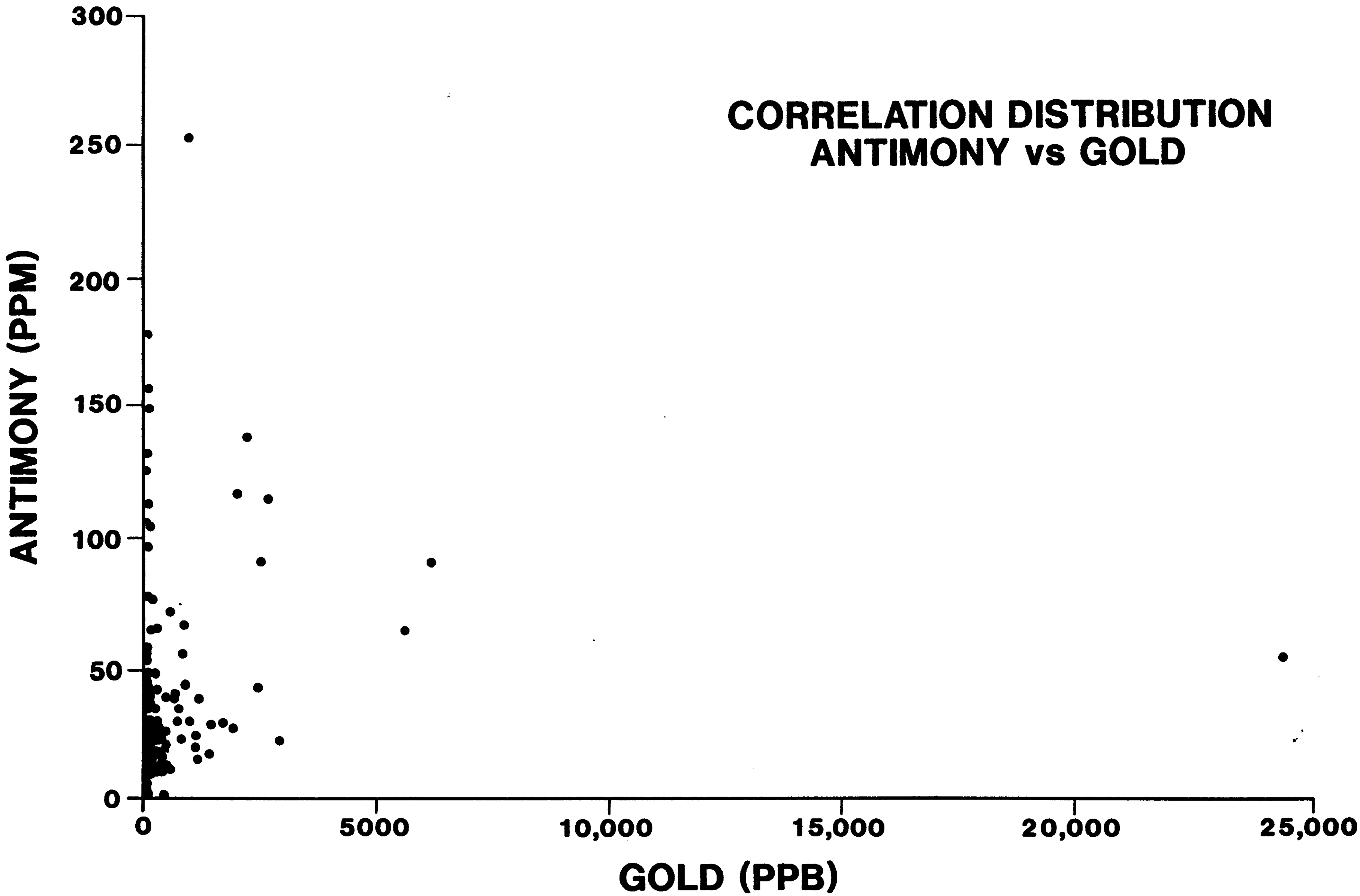
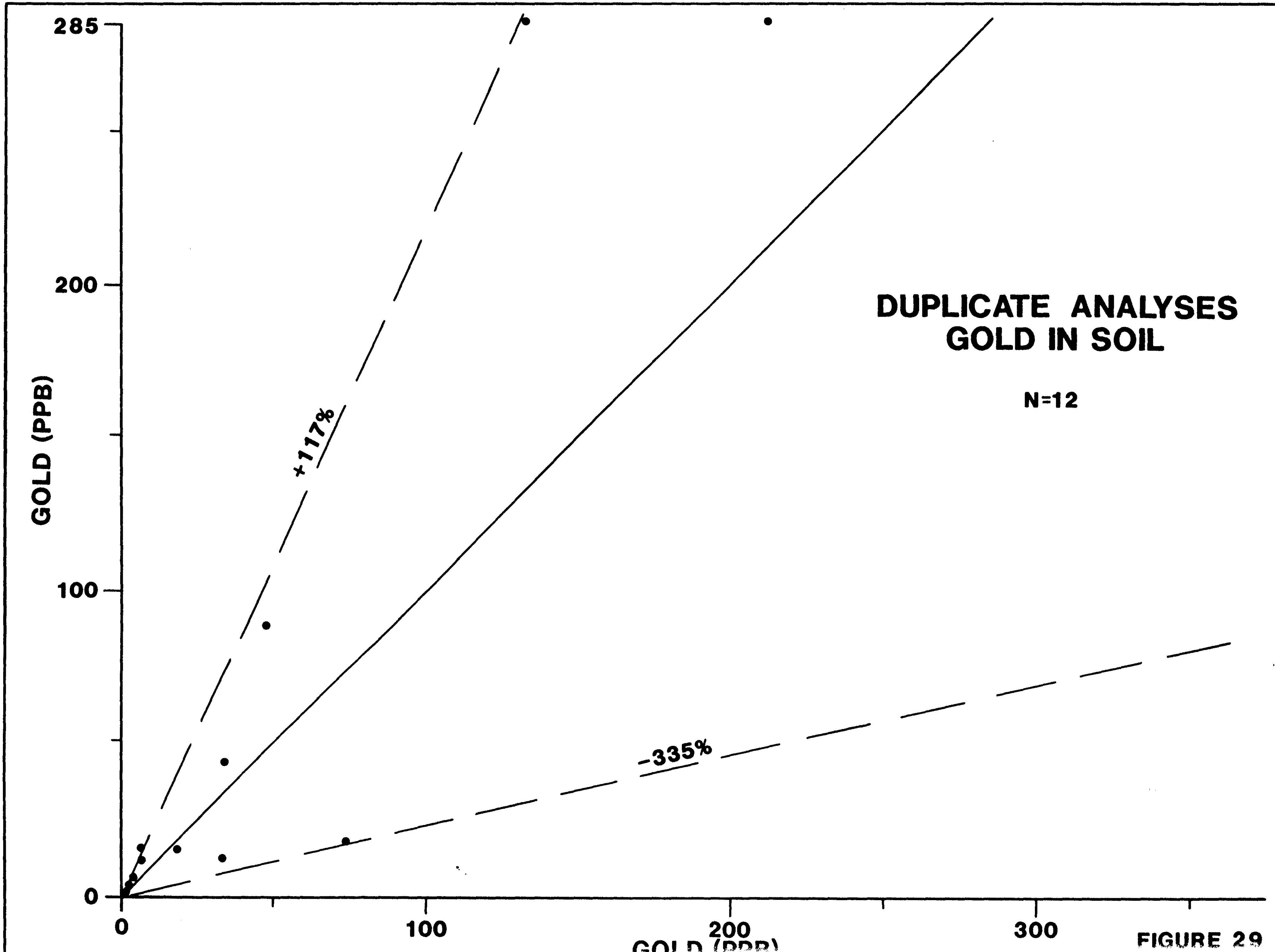

CORRELATION DISTRIBUTION
ANTIMONY vs GOLD
ANTIMONY (PPM)
300
250
200
150
100
50
0
0
5000
10,000
15,000
20,000
25,000
GOLD (PPB)

FIGURE 28



DUPLICATE ANALYSES
GOLD IN SOIL
N=12
GOLD (PPB)
285
200
100
0
+117%
-335%
0
100
200
300
GOLD (PPB)

FIGURE 29

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

It is apparent, from reconnaissance stream sediment sampling in 1987 by the B.C. Geological Survey that the creek draining east from Paddy Pass and its most easterly, south drainage are anomalous in gold, arsenic and antimony. The original Catfish claims covered an old adit which was probably driven at the turn of the century in the quest for gold. The enlarged Catfish property now covers three additional old adits as well as numerous old trenches.

A significant zone of quartz veining with arsenopyrite and gold values up to 47 325 p.p.b. (1.38 oz/t) was traced for 2.5 kilometers. The mineralized zone is within a fine grained intrusive which has intruded metamorphic terrane. Within the intrusive the mineralization is quartz veining cored by arsenopyrite with a green-yellow alteration envelope, scorodite. Separate veins are up to 3.1 meters thick and there are also sections with pervasive "stockwork" veining up to 30 meters thick. Within the metamorphics, the veins are up to 1.4 meters thick and carry massive arsenopyrite bands up to 20 cm.

Geochemistry has been shown to be an effective tool in exploration on the property. Arsenic appears to be weakly related to gold and shows broad anomalous zones with more discreet gold anomalies within. Five anomalous areas have been outlined, three of which B, C, and D, fit the known mineralized trend. Two anomalous areas deserve more detailed prospecting and sampling, areas A and E.

A preliminary deposit model would envisage the Coast Intrusives generating the heat to drive hydrothermal solutions which have migrated to favorable sites. The mineralizing solutions post-date the Upper Cretaceous granitic host and are thus related to the late-stage, low-temperature thermal aureole associated with the intrusions. Favorable sites for mineralizing solutions would have to be structurally and chemically attractive, the intrusives for example, a brittle host which provides ~~permeability and porosity~~ jointing. The metamorphics may have been the source of the metalliferous solutions.

from Mitch

Recommendations

A two phase exploration program is recommended for the Catfish property. The Phase I program is designed to physically test the mineralized area so that an assessment of the mining potential of the property can be made. The main objectives are to better define the known mineralized areas and to explore for extensions.

The known high grade quartz veins should be traced by prospecting and geochemistry to determine their size potential. The lower grade, though greater volume, intrusive host material should be sampled in detail to determine its grade potential. Possible extensions to the mineralization should be explored by prospecting, geochemistry and trenching.

The Phase II program will be contingent on positive results from Phase I. A road is recommended at this stage to access the mineralized areas. The road will greatly reduce future exploration costs, by limiting helicopter time.

A 600 meter drilling program is recommended at this stage to test the depth potential of surface exposures. The drilling will be helicopter supported with water being pumped from the creek between the middle ridge and the south mountain.

Multi element and gold analyses should be completed on all rock and core samples. A check assay program of one sample from every twenty should be continued. A preliminary metallurgical test program is recommended to estimate the total gold recovery. The test can be completed on coarse rejects from drill core intercepts.

PHASE I

Geologist,	20 days @ $450/day	$9,000.00
Assistant,	20 days @ $150/day	3,000.00
Laboratory,	500 soil samples @ $15.75 ea.	7,875.00
	250 rock samples @ $25.75 ea.	6,437.50
Truck Rental,	1 month @ $1,000/month	1,000.00
Helicopter,	20 hrs @ $600/hr	12,000.00
Expenses,	food, 40 mandays @ $25/day	1,000.00
	gas	1,000.00
	hotel and meals, 15 mandays @ $125/day	1,875.00
	camp costs	1,000.00
Reporting,	10 days @ $450/day	4,500.00
Report Preparation		1,500.00
	Sub-total	$50,187.50
	15% contingency	$7,528.00
	Total	$57,715.60
	Say	$58,000.00

PHASE II

Geologist,	40 days @ $450/day	$18,000.00
2 assistants,	80 mandays @ $150/day	12,000.00
Laboratory,	500 rock samples @ $25.75 ea.	12,875.00
	50 petrographic analyses @ $70 ea.	3,500.00
	3 metallurgical samples @ $1,500 ea.	4,500.00
Truck rental,	2 months @ $1,000/month	2,000.00
Excavator rental,	20 days @ $1500/day	30,000.00
Drilling,	600 meters @ $125/meter	75,000.00
Camp,	7 men, 40 days, @ $30/day	8,400.00
Helicopter,	20 hrs @ $600/hr	12,000.00
Camp construction and expenses		5,000.00

Reporting, 15 days @ $450/day	**6,750.00**
Report Preparation	**2,500.00**

Sub-total	**$192,525.00**
15% contingency	**$28,880.00**
Total	**$221,400.00**
Say	**$220,000.00**

REFERENCES

Christie, R.L. (1957): Bennett, British Columbia; Geological Survey of Canada, Map 19-1957.

Copland, H. (1987): Geological and geochemical report on the Catfish claims; Report on field work during the summer of 1986.

Hart, C.J. R. (1988): Summary report on the Catfish and Sal properties; Internal report.

Mihalynuk, M.G. and Rouse, J.N. (1988 a): Preliminary geology of the Tutshi Lake area, northwestern British Columbia; B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1987, Paper 1988-1, Pages 217-231.

Mihalynuk, M.G. and Rouse, J.N. (1988 b): Geology of the Tutshi Lake area; B.C. Ministry of Energy, Mines and Petroleum Resources, Open file map 1988-5.

Rouse, J.N., Mihalynuk, M.G., Moore, D. and Friz, P. (1988): 1987 Stream sediment and lithogeochemical survey results for the Tutshi Lake map area; B.C. Ministry of Energy, Mines and Petroleum Resources, Open file map 1988-5.

Shroeter, T.G. (1986): Bennett Project; B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1985, Paper 1986-1, pages 184-189.

CERTIFICATE

I, Robert J. Morris, Associate, Beacon Hill Consultants Ltd., do declare:

- THAT I graduated as a geologist from the University of British Columbia, Vancouver, with a degree of Bachelor of Science in 1973.

- THAT I graduated as a geologist from Queen's University, Kingston, Ontario, with a degree of Master of Science in 1978.

- THAT I am a Fellow of the Geological Association of Canada.

- THAT I have no direct or indirect interest in the subject property or in the securities of Frame Mining Corp. or its affiliates.

- THAT I personally wrote and supervised the preparation of this report.

- THAT I grant permission to use this report in raising funds for the exploration program described herein.

Dated December 20, 1988, in Vancouver, British Columbia.

R.J. Morris

R.J. Morris, M.Sc.
Beacon Hill Consultants Ltd.

ACME ANALYTICAL LABORATORIES LTD.
Assaying & Trace Analysis
852 E. Hastings St., Vancouver, B.C. V6A 1R6
Telephone: 253-3158

1987

Acme Analytical continues to update with mass spectrographic analysis which is now operational. In general, mass spec offers detection limits which are at least 100 fold lower than ICP or flame AA. These detection limits are comparable to graphite furnace AA, but the mass spec can analyze up to 60 elements simultaneously.

Acme has pioneered low cost multi-element ICP analysis which has better detection and precision than AA. Mass spec will further expand the range of elements and isotopes available to mineral exploration programs.

SPACE

Total laboratory, sample preparation and sample storage has been expanded to 12,000 square feet.

EQUIPMENT

1. Our ICP system has been expanded, and a fifth unit has been purchased which will allow us to determine up to 45 elements simultaneously.
2. AA spectrophotometers have been increased to 8.
3. Sample preparation, weighing and dissolution facilities have been increased.
4. A LECO Induction Furnace has been installed for determining Carbon and Sulfur simultaneously in geological and metallurgical samples.
5. An UA3 Laser Fluorometer from Scintrex is now used for determination of U in water to .01 ppb.
6. Two ICP mass spectrographs.

TECHNOLOGY

1. Fire Assay for Ag, Au, Pt, Pd, Rh, Ru & Ir,; the precious metal bead can be analysed by gravimetric, AA, ICP or Mass spec.
2. ICP multi element packages for water, geochem and assay programs have been developed.
3. Lower detection limits for some elements have been achieved by graphite furnace AA.

TECHNICAL ACHIEVEMENTS

1. Background corrected Atomic Absorption analysis of Ag and Au since 1971.
2. Best proven precision, accuracy and price for MoS2 assays in North America.
3. Pioneered geochemical analysis by ICP at or to better detection limits than AA, including Ag, As, U, Th and W.
4. First to offer Mass spectrographic scan analysis.

PROVEN PERFORMANCE

Our logistical and technical performance for our clients has been demonstrated on the Gambler, Capoose Lake, Trout Lake, Blackdome, Red Mountain, Carolin, Cirque, Minago River, Quesnel River, Terra Swede, Musto and other major projects. We are capable of handling up to 2500 samples per day.

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Suggestions for Effective use of Analytical Services

1. General Sampling

A. **Rocks** - In general 1/2 to 2 lb of sample is required. Large boulders should be broken down to chip size with a 20 lb sledge hammer. A representative sample is then taken from these chips. The lab will crush, split and pulverize.

B. **Cores** - Drill cores should be split into halves for assaying.

C. **Soils** - The organic "A" horizon gives good base metal responses. Supply about one cup of material in a soil or paper envelope. The soil is treated in one of three methods after drying :-
1) -80 mesh sieving (standard).
2) -80 mesh sieving + pulverizing.
3) pulverizing the whole sample.

Samplers must not wear any jewelry.

2. Shipping

A. **Local and Within Canada** - use Greyhound or Pacific Stage Lines. For large drill programs use a truck line.

B. **U.S. Customers** - for surface transport use UPS and address to :-

Acme Analytical Laboratories Ltd.,
c/o Pac Ex Services,
140 - 14th St.,
Blaine, Wash. 98230

Air freight shipments are addressed to :-

Acme Analytical Laboratories Ltd.,
c/o Cole McCubbin
Vancouver, B.C.

Shipments from the U.S. should be labelled "Geological Samples for Analysis - No Commercial Value".

3. Suggested Geochemical Analysis

A. **Rocks with No Visible Mineralization** - 30 element ICP + geochemical Au.

B. **Rocks with High Sulphides** - 16 element ICP Assay.

C. **Cores** - assays for elements of mineralization and possible 30 element ICP.

D. **Soils** - 30 element ICP + geochemical Au.

4. Samples with Possible Native Gold

For rocks and cores with nugget or native gold, request that the total sample be pulverized and sieved on a 100 mesh screen. Two fire assays are then required for each sample; one on the entire +100 mesh fraction for any possible native gold and one on the -100 mesh. (1 A.T.)

Pan or sluice concentrates are best treated by cyclone concentration and fire assay for total Au.

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GEOCHEMICAL LABORATORY METHODOLOGY & PRICES - 1987

Sample Preparation

S80	Soils or silts up to 2 lbs drying at 60 deg.C and sieving 30 gms -80 mesh (other size on request)	$ .75
SJ	Saving part or all reject	.35
S20R	Soils or silts - drying at 60 deg.C and sieving -20 mesh & pulverizing (other mesh size on request.)	2.00
SP	Soils or silts - drying at 60 deg.C pulverizing (approx. 100 gms)	1.50
RP100	Rocks or cores - crushing to -3/16" up to 10 lbs, then pulverizing 1/2 lb to -100 mesh (98%)	3.00
	Over 10 lbs	.25/lb
RPS100	Same as RP100 except sieving to -100 mesh and saving +100 mesh	3.75
RPS100 1/2	Same as above except pulverizing 1/2 the reject	2.50/lb
RPS100 A	Same as above except pulverizing all the reject	2.50/lb
COP	Compositing pulps - each pulp Mixing & pulverizing	.50 1.50
V1	Drying vegetation and pulverizing 50 gms to -80 mesh	3.00
V2	Ashing up to 1 lb wet vegetation at 475 deg.C	2.00
H1	Special Handling	16.00/hr

Sample Storage

Rejects - Approx. 2 lbs of rock or total core are stored for three months and discarded unless claimed.

Pulps are retained for one year and discarded unless claimed.

Supplies

Soil Envelopes	4" x 6"	$110.00/thousand
Soil Envelopes	4" x 6" with gusset	$130.00/thousand
Plastic Bags	7" x 13" 6 ml	$ 10.00/hundred
Plastic Bags	12" x 20" 6 ml	$ 20.00/hundred
Ties		$ 4.00/hundred
Assay Tags		N/C
10% HCl		$ 5.00/liter
Dropping bottles		$ 1.00/each
Zn Test	A & B	$ 10.00/each liter

Conversion Factors

1 Troy oz = 31.10 g
1 oz/ton = 34.3 ppm = 34.3 g/tonne = 34,300 ppb
1 % = 10,000 ppm

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GEOCHEMICAL ANALYSES - Rocks and Soils

Group 1 Digestion

.50 gram sample is digested with 3 mls 3-1-2 HCl-HNO3-H2O at 95 deg.C for one hour and is diluted to 10 ml with water. This leach is near total for base metals, partial for rock forming elements and very slight for refractory elements. Solubility limits Ag, Pb, Sb, Bi, W for high grade samples.

Group 1A - Analysis by Atomic Absorption.

Element	Detection	Element	Detection	Element	Detection
Antimony*	2 ppm	Copper	1 ppm	Molybdenum	1 ppm
Bismuth*	2 ppm	Iron	0.01 %	Nickel	1 ppm
Cadmium*	0.1 ppm	Lead	2 ppm	Silver	0.1 ppm
Chromium	1 ppm	Lithium	2 ppm	Vanadium	2 ppm
Cobalt	1 ppm	Manganese	5 ppm	Zinc	2 ppm

First Element $2.25   Subsequent Element $1.00

Group 1B - Hydride generation of volatile elements and analysis by ICP.

This technique is unsuitable for sample grading over 1% Bi or Cu.

Element	Detection
Arsenic	0.1 ppm
Antimony	0.1 ppm
Bismuth	0.1 ppm
Germanium	0.2 ppm
Selenium	0.2 ppm
Tellurium	0.3 ppm

First Element $4.00   All Elements $5.00

Group 1C - Hg   Detection limit - 5 ppb   Price $2.25

Hg in the solutions are determined by cold vapour AA using a F & J scientific Hg assembly. The aliquots of the extract are added to a stannous chloride/hydrochloric acid solution. The reduced Hg is swept out of the solution and passed into the Hg cell where it is measured by AA.

Group 1D - ICP Analysis, same digestion

Element	Detection
Ag	0.1 ppm
Cd,Co,Cr,Cu,Mn,Mo,Ni,Sr,Zn	1 ppm
As,Au,B,Ba,Bi,La,Pb,Sb,Th,V,W	2 ppm
U	5 ppm
Al,Ca,Fe,K,Mg,Na,P,Ti	0.01 %

Any 2 elements $3.25
5 elements 4.25
10 elements 5.25
All 30 elements 6.00

Group 1E - Analysis by ICP/MS

Element	Detection
Ga	1 ppm
Rh,In,Re,Os,Ir,Tl,Th,U	0.1 ppm

First Element $ 4.00
Additional Element 2.00
All Elements 15.00

(Minimum 20 samples per batch)

Hydro Geochemical Analysis

Natural water for mineral exploration

26 element ICP - Mo,Cu,Pb,Zn,Ag,Co,Ni,Mn,Fe,As,Sr,Cd,V,Ca,P,Li,Cr,Mg,Ti,B,Al,Na,K,Ce,Be,Bi			$8.00
F by Specific Ion Electrode	- detection	20 ppb	$3.50
U by UA3	- detection	.01 ppb	4.50
pH		.1 pH	1.50

* Minimum 20 samples or $5.00 surcharge for ICP or AA and $15.00 surcharge for ICP/MS.
All prices are in Canadian Dollars

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Group 2 - Geochemistry by Specific Extraction and Instrumental Techniques

Element	Method	Detection	Price
Barium	0.100 gram samples are fused with .6 gm $LiBO_2$ dissolved in 50 mls 5% HNO_3 and analysed by ICP. (other whole rock elements are also determined)	10 ppm	$3.50
Carbon	LECO (total as C or CO_2)	.01 %	5.25
Carbon+Sulfur	Both by LECO	.01 %	6.25
Carbon (Graphite)	HCl leach before LECO	.01 %	7.25
Chromium	0.50 gram samples are fused with 3 gm Na_2O_2 dissolved in 50 ml 20% HCl, analysed ICP.	5 ppm	3.75
Fluorine	0.25 gram samples are fused with NaOH; leached solution is adjusted for pH and analysed by specific ion electrode.	10 ppm	4.25
Sulphur	LECO (Total as S)	.01 %	5.25
Sulphur Insoluble	LECO (After 5% HCl leach)	.01 %	7.25
Tin	1.00 gram samples are fused with NH_4I. The sublimed Iodine is leached with 5 ml 10% HCl, and analysed by Atomic Absorption.	1 ppm	3.25
Tungsten	.50 gram samples are fused with Na_2O_2 dissolved in 20 ml H_2O, analysed by ICP.	1 ppm	3.25

Group 3 - Geochemical Noble Metals

Element	Method	Detection	Price
Au*	10.0 gram samples are ignited at 600 deg.C, digested with hot aqua regia, extracted by MIBK, analysed by graphite furnace AA.	1 ppb	$ 4.25
Au** Pd,Pt,Rh	10.0 gram samples are fused with a Ag inquart with fire assay fluxes. After cupulation, the dore bead is dissolved and analysed by AA or ICP/MS.	1 ppb 2 ppb	5.75 -first element 2.50 -per additional 10.00 -for All

Larger samples - 20 gms add $1.00
30 gms add $2.00

Group 4A - Geochemical Whole Rock Assay

0.100 gram samples are fused with $LiBO_2$ and are dissolved in 50 mls 5% HNO_3.

SiO_2, Al_2O_3, Fe_2O_3, CaO, MgO, Na_2O, K_2O, MnO, TiO_2, P_2O_5, Cr_2O_5, LOI + Ba by ICP.

Price: $3.75 first metal $1.00 each additional $9.00 for All.

Group 4B - Trace elements

Element	Detection	Analysis	Price
Co,Cu,Ni,Zn,Sr	10 ppm	ICP	$3.75 first element or
Ce,Nb,Ta,Y,Zr	20 ppm	ICP	$1.00 additional to 4A $6.00 for All.
Cs,Rb	10 ppm	AA	$1.50 each.

Group 4C - analysis by ICP/MS.

Be, Rb, Y, Zr, Nb, Sn, Cs, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, W, Th, U

Detection: 1 to 5 ppm   Price : $7.00 for first element
$20.00 for All.

* Minimum 20 samples or $5.00 surcharge for ICP or AA and $15.00 surcharge for ICP/MS.
All prices are in Canadian Dollars

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Regular Assay

Aluminum	(Al)	$ 7.50	Moisture	(H_2O)	$ 5.00
Antimony	(Sb)	7.50	Molybdenum	(Mo)	6.75
Arsenic	(As)	7.50	Molybdenum Sulfide	(MoS_2)	7.50
Barium	(Ba)	7.50	Niobium	(Nb)	10.00
Bismuth	(Bi)	7.50	Nickel	(Ni)	6.75
Boron	(B)	7.50	Nickel (Non-sulfide)		7.50
Cadmium	(Cd)	6.75	Palladium	(Pd)	12.50
Calcium	(Ca)	7.50	Phosphorus	(P)	7.50
Carbon (Total)	(C)	7.50	Platinum	(Pt)	12.50
Carbon (Graphitic)*		9.50	Potassium	(K)	7.50
Carbon plus Sulfur (Total)*		11.00	Rhodium	(Rh)	12.50
Cerium	(Ce)	10.00	Rubidium	(Rb)	7.50
Chromium	(Cr)	7.50	Selenium	(Se)	10.00
Cesium	(Cs)	10.00	Silica	(SiO_2)	7.50
Cobalt	(Co)	6.75	Silver	(Ag)	6.75
Copper	(Cu)	6.75	Silver (Fire Assay)		9.00
Copper (non-sulfide)*		8.00	Sodium	(Na)	7.50
Europium	(Eu)	10.00	Specific Gravity*	(SG)	6.00
Fluorine	(F)	7.50	Strontium	(Sr)	7.50
Gallium	(Ga)	7.50	Sulfur (Total)*	(S)	7.50
Germanium	(Ge)	7.50	Sulfur (Sulfate)	(S)	8.50
Gold	(Au)	6.75	Tantalum	(Ta)	7.50
Gold (Fire Assay)		8.25	Tellurium	(Te)	10.00
Gold plus Silver (Fire Assay)		11.25	Thallium	(Tl)	10.00
Indium	(In)	8.50	Thorium*	(Th)	7.50
Iron (Total)	(Fe)	7.50	Tin	(Sn)	8.00
Iron (Ferrous)*		9.00	Titanium	(Ti)	7.50
Lanthanum	(La)	7.50	Tungsten	(W)	7.50
Lithium	(Li)	7.50	Uranium	(U)	7.50
Lead	(Pb)	6.75	Vanadium	(V)	7.50
Loss on Ignition	(LOI)	2.00	Yttrium	(Y)	10.00
Magnesium	(Mg)	7.50	Zinc	(Zn)	6.75
Manganese	(Mn)	7.50	Zirconium*	(Zr)	10.00
Mercury*	(Hg)	7.50	Pb Isotope Ratio		20.00

* Minimum 5 samples per batch

Other elements by Mass Spec. on request.

Multi-Element Assay Price

Arsenic, Antimony, Bismuth, Cadmium, Cobalt, Copper, Gold, Iron, Lead, Manganese, Molybdenum, Nickel, Silver, Thorium, Uranium, Zinc.

Price : First element $6.75 Each Additional $3.00 All 16 elements $20.00

Whole Rock Assay Prices

SiO_2, Al_2O_3, Fe_2O_3, CaO, MgO, Na_2O, K_2O, MnO, TiO_2, P_2O_5, Cr_2O_3, LOI.

Price : First oxide $7.50 Each Additional $3.50 All 12 $20.00

Volume Discounts Available.

Special Fire Assay Prices

Gold, Silver, Platinum, Palladium, Rhodium	$20.00
Placer conc. for total precious metal	$15.00

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716

GEOCHEMICAL ANALYSIS CERTIFICATE

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL. AU DETECTION LIMIT BY ICP IS 3 PPM. *– ppb?*
- SAMPLE TYPE: SOIL/SILT AU* ANALYSIS BY ACID LEACH/AA FROM 10 GM SAMPLE.

DATE RECEIVED: SEP 2 1988 DATE REPORT MAILED: *Sept 12/88* ASSAYER. *C. Leong* .D.TOYE OR C.LEONG, CERTIFIED B.C. ASSAYERS

CURRAGH RESOURCES INC. File # 88-4172 Page 1

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8N 1S	4	406	45	276	.9	89	41	1113	8.23	555	5	ND	2	100	4	40	11	87	.89	.090	7	84	1.83	108	.06	2	3.71	.04	.36	55	41
C8N 2S	1	109	18	76	.3	29	17	586	3.51	153	5	ND	4	83	1	22	6	49	.77	.081	13	42	.88	72	.07	2	2.05	.03	.19	15	19
C8N 3S	1	161	28	107	.5	43	23	866	4.33	220	5	ND	6	94	1	24	2	65	.88	.082	14	64	1.25	95	.09	5	2.73	.04	.27	18	35
C8N 4S	1	143	28	150	.3	33	29	1276	5.36	396	5	ND	3	171	1	25	4	70	.73	.088	13	42	1.30	111	.06	3	3.36	.02	.27	11	41
C8N 5L	2	62	17	100	.2	32	24	855	5.33	358	5	ND	5	467	1	8	2	59	.60	.068	15	31	.91	153	.06	6	3.87	.02	.16	1	29
C8N 6L	2	63	20	100	.1	19	21	685	4.52	519	5	ND	2	285	1	6	2	68	.81	.077	11	25	.88	162	.06	4	4.53	.03	.20	1	54
C8N 7L	2	115	15	112	.1	21	44	1169	6.61	763	5	ND	5	556	1	6	2	69	1.23	.097	21	18	.86	142	.04	2	4.66	.06	.27	1	13
C8N 8L	28	104	17	232	.4	44	15	560	5.19	851	5	ND	7	647	1	22	2	63	.47	.069	20	24	.66	138	.04	3	3.24	.03	.13	1	9
C8N 9L	8	130	228	361	1.9	60	42	1973	8.47	2920	5	ND	4	311	5	150	2	80	.71	.105	15	56	1.57	134	.06	3	5.01	.02	.46	10	88
C8N 10L	10	123	174	611	.7	87	42	2350	7.55	1771	5	ND	6	153	4	53	3	89	.69	.086	41	146	2.06	149	.08	5	4.73	.02	.47	2	42
C8N 11L	15	190	428	315	4.6	29	19	912	5.85	5121	5	ND	19	115	11	42	5	60	.30	.088	31	32	.99	163	.07	4	3.18	.02	.30	7	91
C8N 12L	3	93	60	214	.5	23	55	4551	9.25	640	5	ND	4	54	1	9	2	70	.56	.118	31	9	.75	256	.01	3	2.96	.01	.10	1	11
C8N 13L	3	72	45	170	.1	27	48	3838	7.09	203	5	ND	6	33	1	11	3	60	.28	.098	32	11	.64	189	.01	3	2.50	.01	.06	2	4
C8N 14L	4	66	25	170	.1	28	56	2799	6.33	213	5	ND	7	33	1	9	2	43	.36	.114	38	6	.38	185	.01	4	1.90	.01	.04	1	8
C8N 15L	4	104	56	222	.1	26	63	4568	8.67	280	5	ND	7	41	1	9	2	69	.47	.146	39	7	.87	278	.01	2	2.89	.01	.07	1	7
C8N 16L	4	79	41	172	.1	31	59	4256	7.75	218	5	ND	8	40	1	7	2	62	.41	.127	36	10	.60	286	.01	2	2.36	.01	.06	1	6
C8N 17L	6	79	50	199	.1	32	63	5847	7.74	180	5	ND	7	48	1	7	5	64	.34	.119	32	11	.56	414	.01	2	2.52	.01	.07	1	5
C8N 18L	4	95	47	195	.1	32	64	5035	8.03	243	5	ND	6	39	1	7	2	75	.35	.136	35	9	.67	297	.01	2	2.61	.01	.08	1	7
C8N 19L	40	111	37	436	.1	98	35	2061	7.37	119	5	ND	5	32	1	8	2	71	.31	.125	27	15	.74	138	.01	2	1.98	.01	.06	1	5
C8N 20L	49	99	29	428	.2	121	24	1359	6.52	139	5	ND	6	29	1	13	2	56	.20	.115	22	16	.57	127	.01	4	1.30	.01	.05	2	4
C8N 21L	34	86	27	354	.1	101	22	1273	6.31	104	5	ND	6	35	1	8	2	66	.21	.123	22	18	.69	138	.01	3	1.67	.01	.07	3	3
C8N 22L	21	65	22	276	.1	73	17	959	4.82	76	5	ND	4	21	1	6	2	55	.15	.093	20	21	.66	133	.03	3	2.07	.01	.13	2	11
C8N 23L	2	33	22	100	.1	23	13	723	3.31	54	5	ND	6	21	1	6	2	45	.20	.073	19	24	.69	142	.06	3	2.30	.01	.20	1	6
C8N 24L	1	16	23	80	.1	15	9	573	2.85	31	5	ND	3	92	1	5	2	32	.28	.061	19	14	.65	98	.04	3	2.64	.01	.16	3	10
C8N 25L	9	100	2008	259	9.1	27	19	1028	5.83	7437	19	ND	49	140	16	253	5	37	.21	.069	49	13	.51	183	.01	2	1.72	.01	.14	1	890 —
C8N 26L	6	90	347	396	1.8	43	24	1840	5.48	929	5	ND	9	76	5	36	6	79	.30	.095	29	42	1.23	181	.06	3	3.55	.02	.24	1	33
C8N 27L	4	118	793	768	3.3	38	41	3246	5.73	1109	5	ND	9	151	18	41	3	83	.81	.090	24	39	1.38	175	.08	7	3.37	.03	.34	3	26
C8N 28L	5	230	1746	2329	8.7	44	49	2798	7.75	2995	5	ND	11	160	75	77	2	79	.48	.090	30	34	1.43	171	.05	3	3.23	.02	.32	9	129
C8N 29L	9	312	2459	2521	18.9	42	58	3779	10.41	6573	8	ND	9	71	95	97	8	58	.51	.104	49	21	1.20	158	.01	4	2.86	.01	.23	9	112
C8N 30L	4	89	317	416	1.6	44	25	1869	5.32	751	5	ND	8	69	5	30	2	76	.30	.093	27	41	1.20	175	.06	5	3.35	.02	.24	2	43
C8N 31L	9	96	124	310	1.4	46	33	1926	6.86	1741	5	ND	13	70	2	23	5	77	.44	.107	42	20	.96	200	.01	2	2.86	.01	.12	1	58
C8N 32L	11	78	120	415	1.1	44	17	1251	6.22	2575	23	ND	13	66	1	22	4	68	.31	.082	61	22	.91	168	.01	4	2.98	.01	.11	2	87
C8N 33L	11	97	101	399	1.3	50	26	1956	6.67	2412	7	ND	14	76	2	25	4	78	.40	.104	51	20	.97	216	.01	2	2.87	.01	.13	4	123
C8N 34L	12	101	91	381	1.6	57	26	2019	6.97	2034	5	ND	13	73	2	23	7	85	.41	.111	45	21	1.06	223	.01	3	3.05	.01	.14	1	380
C8N 35L	13	110	118	365	2.0	48	22	1625	6.52	3162	11	ND	36	121	4	30	2	65	.35	.085	52	20	.86	224	.02	2	2.52	.01	.14	3	106
C8N 36L	6	62	60	173	.6	34	17	1049	4.76	772	5	ND	7	55	1	15	2	59	.26	.084	27	21	.74	158	.03	6	2.50	.01	.13	1	22
STD C/AU-S	17	60	37	132	6.6	71	27	1129	4.24	42	18	7	36	47	17	17	20	57	.50	.091	37	57	.95	175	.06	33	1.95	.06	.14	12	51

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8N 37L	3	70	41	153	.9	31	17	1169	4.59	763	5	ND	9	55	1	8	2	63	.35	.078	29	25	.81	159	.04	3	2.48	.01	.14	1	2
C8N 38L	9	82	67	268	1.2	38	17	1503	4.99	1908	5	ND	24	89	3	17	2	56	.46	.077	36	23	.71	170	.03	4	1.98	.01	.13	1	81
C8N 39L	19	95	68	412	1.0	83	28	1708	6.32	949	5	ND	5	113	3	12	2	142	.34	.095	18	40	1.79	340	.02	5	4.61	.01	.17	1	26
C8N 40L	11	78	71	309	1.6	49	22	1576	5.93	1824	5	ND	9	79	2	20	2	66	.24	.078	34	24	.84	264	.02	2	2.89	.01	.13	2	157
C8N 41L	18	91	72	373	.9	70	27	1491	6.56	1075	5	ND	6	104	3	14	2	103	.38	.100	21	31	1.37	322	.02	2	3.90	.01	.15	2	159
C8N 42L	24	116	79	480	1.2	92	33	1606	7.40	1064	6	ND	8	183	4	12	2	111	.47	.096	22	32	1.56	393	.02	3	4.41	.01	.17	1	47
C8N 43L	25	125	57	537	.7	105	37	1607	7.82	628	5	ND	6	140	4	13	2	118	.39	.110	19	33	1.74	299	.03	2	4.94	.01	.16	1	16
C8N 44L	31	143	252	582	4.3	93	41	2971	8.90	4983	5	ND	18	157	9	30	10	87	.37	.081	39	26	1.21	332	.02	3	3.98	.01	.15	1	155
C8N 45L	25	117	82	467	1.2	94	33	1603	7.52	1069	5	ND	9	182	3	13	6	115	.47	.101	22	32	1.61	388	.02	4	4.57	.01	.18	1	89
C8N 46L	24	157	70	481	.9	92	46	2132	3.01	1778	5	ND	8	217	5	16	2	100	.59	.115	29	26	1.31	276	.01	4	4.06	.01	.14	2	34
C8N 47L	5	128	42	194	.3	45	49	2797	8.07	371	5	ND	4	65	1	11	2	97	.55	.128	31	22	1.38	207	.02	7	3.16	.01	.14	2	6
C8N 48L	55	213	198	705	3.2	139	59	2226	10.59	3900	5	ND	14	209	7	29	2	103	.35	.110	40	31	1.07	293	.01	2	4.62	.02	.17	7	220
C8N 49L	50	153	60	664	.8	120	41	1527	8.75	964	5	ND	6	237	5	15	2	95	.48	.102	22	31	1.25	284	.02	4	4.47	.02	.17	1	13
C8N 50L	20	152	42	419	.3	90	48	1640	7.38	309	5	ND	5	147	3	10	2	92	.43	.099	24	39	1.45	221	.04	2	4.19	.02	.21	1	4
C8N 51L	17	174	54	351	.5	81	59	2267	8.08	334	5	ND	7	299	3	9	2	102	.54	.104	27	28	1.47	298	.02	4	4.08	.02	.14	1	8
C8N 52L	3	141	47	164	.4	36	47	2546	7.90	301	5	ND	4	98	1	9	2	111	.73	.121	28	20	1.46	220	.02	6	3.49	.01	.16	1	3
C8N 53L	3	165	42	170	.4	38	47	2624	3.36	271	5	ND	4	87	1	9	2	127	.63	.126	28	24	1.50	226	.03	2	3.54	.02	.17	1	1
C8N 54L	5	187	53	167	.6	45	62	2304	8.82	297	5	ND	6	115	1	8	2	125	.41	.128	31	28	1.28	213	.02	2	3.88	.02	.16	1	3
C8N 55L	3	250	51	176	.7	34	62	2733	9.12	468	5	ND	3	122	1	6	2	132	.79	.111	27	18	1.44	213	.02	2	4.11	.02	.19	1	6
C8N 56L	2	76	32	110	.5	32	30	1186	5.64	183	5	ND	6	138	1	2	2	90	.56	.067	24	46	1.59	287	.07	2	3.68	.02	.35	1	4
C8N 57L	2	89	31	127	.6	33	33	1281	5.77	236	5	ND	7	119	1	2	2	91	.62	.098	24	47	1.55	375	.09	3	4.11	.03	.47	1	3
C8N 58L	2	100	39	134	.4	35	44	1472	5.57	166	5	ND	6	413	2	3	2	80	.89	.088	27	37	1.34	423	.04	3	4.66	.03	.32	1	19
C8N 59L	2	96	66	158	2.8	38	46	1755	6.42	531	5	ND	6	172	1	14	2	97	.61	.096	27	69	1.86	296	.06	2	3.93	.02	.38	1	12
C8N 60L	2	139	49	163	.6	39	46	2514	7.76	398	5	ND	4	106	1	8	2	110	.50	.117	26	27	1.86	240	.04	2	3.91	.02	.23	1	6
C8N 61S	2	44	31	112	.4	25	14	837	3.60	276	5	ND	4	65	1	7	2	55	.40	.081	23	29	.90	144	.06	2	2.43	.02	.22	1	25
C8N 62S	3	60	560	177	2.1	37	17	1312	4.52	335	5	ND	6	75	3	196	2	64	.43	.086	21	66	1.32	159	.09	5	2.81	.03	.45	1	16
C8N 63L	2	147	65	166	1.3	40	31	2906	5.43	293	5	ND	1	76	4	44	2	77	1.02	.166	18	39	.90	104	.01	2	2.87	.01	.29	3	8
C8N 64L	1	95	36	99	.6	29	14	1055	2.73	104	5	ND	1	374	1	7	2	71	3.32	.091	7	45	1.14	51	.02	2	4.77	.04	.32	2	6
C8N 65L	3	238	229	232	2.7	53	48	1506	5.96	278	5	ND	2	149	5	37	17	73	1.10	.120	16	36	1.01	121	.03	2	3.23	.02	.15	40	14
C8N 66L	2	199	101	154	.8	35	36	1339	7.22	329	5	ND	2	144	3	48	2	79	.95	.128	17	31	1.06	146	.02	2	2.91	.04	.20	8	28
C8N 67L	7	369	300	253	2.4	25	27	1110	9.09	413	5	ND	7	327	3	25	8	54	.34	.171	26	26	1.04	320	.04	2	4.56	.04	.31	59	58
C8N 68L	4	191	150	209	1.9	65	23	1296	5.25	89	5	ND	3	317	4	3	17	50	1.73	.062	12	98	1.51	125	.06	6	4.67	.02	.45	10	21
C8N 69L	7	213	122	201	1.7	60	23	1317	5.60	84	5	ND	1	88	2	10	35	99	.68	.078	13	102	2.04	134	.09	2	3.96	.01	.25	28	63
C8N 70L	12	928	224	313	5.9	60	38	2346	6.36	379	5	ND	3	123	5	18	136	97	1.12	.072	19	79	2.17	115	.12	3	4.92	.01	.38	48	56
C8N 71L	3	251	172	283	3.5	51	32	1377	5.19	290	5	ND	1	129	5	3	16	95	2.37	.091	8	68	1.92	107	.09	2	5.93	.01	.52	24	6
C8N 72L	48	198	96	323	2.1	116	32	1961	7.30	1037	5	ND	3	84	4	38	55	79	1.35	.093	16	154	2.01	194	.07	4	3.37	.03	.55	170	154
STD C/AU-S	19	62	40	132	7.0	71	28	1090	4.24	42	19	7	36	48	19	19	19	60	.48	.088	39	60	.94	180	.07	36	2.02	.06	.14	12	49

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8N 73L	27	234	165	311	3.9	100	30	1442	6.21	690	5	ND	2	49	3	35	39	106	.53	.077	10	141	2.36	153	.15	3	3.86	.01	.57	242	216
C8N 74L	10	164	62	308	.5	125	32	1499	5.32	227	5	ND	1	68	3	17	20	100	1.01	.080	7	209	2.89	319	.19	2	3.58	.02	.89	66	18
C8N 75L	3	228	173	258	3.0	49	30	1325	4.98	252	5	ND	1	119	4	14	9	91	2.19	.080	7	65	1.79	92	.11	3	5.48	.01	.44	33	11
C8N 76L	17	168	76	352	.6	125	35	1500	6.03	333	5	ND	2	57	3	19	23	106	.64	.089	9	220	3.01	207	.21	3	4.02	.02	1.00	75	15
C8N 77L	31	231	99	445	1.1	86	36	1999	6.87	588	5	ND	4	52	3	19	13	100	.38	.059	13	165	2.57	187	.19	2	4.39	.01	.88	60	27
C8N 78L	28	266	63	480	.4	75	40	2094	6.68	438	5	ND	3	73	7	15	18	95	.55	.080	14	125	2.35	189	.18	2	4.50	.02	1.00	55	9
C8N 79L	18	116	58	251	2.1	55	13	1000	3.86	247	5	ND	4	48	10	2	38	59	.59	.052	8	86	1.41	108	.10	2	2.39	.01	.27	82	74
C8N 80L	118	440	1358	515	30.9	53	17	1204	6.21	6134	5	ND	3	130	37	114	459	57	.43	.054	10	82	1.37	136	.09	2	2.65	.01	.38	98	2605
C8N 81L	16	59	222	75	4.6	8	4	189	.86	868	5	ND	1	17	6	24	43	9	.07	.009	2	14	.21	19	.01	2	.27	.01	.08	17	48
C8N 82L	20	115	56	238	.7	45	20	2231	4.17	183	5	ND	1	106	8	6	5	67	1.37	.104	8	79	1.53	365	.10	4	2.51	.01	.57	99	11
C8N 83L	22	173	48	188	.4	50	18	1393	4.71	206	5	ND	1	50	3	9	9	75	.58	.083	11	88	1.65	170	.13	2	3.12	.01	.51	88	24
C8N 84L	24	132	46	213	1.0	44	20	2004	5.18	225	5	ND	3	47	2	13	3	90	.48	.081	9	86	1.78	237	.15	2	3.16	.02	.54	106	9
C8N 85L	30	111	46	257	.2	43	21	2482	5.23	770	5	ND	1	50	3	12	18	84	.49	.102	12	87	1.73	242	.12	4	3.12	.02	.63	90	8
C8N 86L	29	530	112	252	2.1	65	32	1435	6.23	233	5	ND	3	51	3	17	72	109	.52	.084	12	116	2.24	166	.17	3	4.08	.02	.53	251	42
C8N 87L	4	99	37	109	.4	40	16	518	3.77	161	5	ND	2	49	1	12	4	61	.58	.044	9	69	1.04	65	.10	3	3.74	.01	.14	18	14
C8N 88L	2	143	41	104	.6	37	24	935	4.43	182	5	ND	3	177	1	23	4	67	1.98	.068	10	45	1.09	64	.07	2	4.08	.03	.22	9	24
C8N 89L	5	44	30	63	.2	12	21	525	6.04	69	5	ND	3	375	1	15	3	53	1.19	.105	9	14	.81	67	.08	4	4.05	.03	.21	5	67
C8N 90L	2	87	29	68	.4	20	16	601	3.87	76	5	ND	1	300	1	8	4	61	2.61	.075	6	30	.90	48	.07	2	4.49	.02	.16	2	18
C8N 91L	3	103	33	82	.6	23	21	824	4.18	94	5	ND	2	231	1	16	2	62	1.87	.077	9	32	.99	71	.07	2	3.68	.02	.18	5	23
C8N 92L	5	76	79	148	.8	29	32	1779	7.99	57	5	ND	4	109	1	29	2	44	1.01	.120	10	26	.86	108	.01	2	1.84	.01	.20	3	33
C8N 93L	13	44	80	154	1.1	15	22	1459	11.98	66	5	ND	6	136	1	57	10	49	.19	.216	15	14	.83	158	.02	6	2.02	.02	.27	3	31
C8N 94S	8	47	37	117	.3	16	14	931	5.92	73	5	ND	5	92	1	18	5	58	.49	.096	13	30	1.09	294	.05	2	2.46	.02	.31	2	17
STD C/AU-S	18	61	40	132	6.9	72	28	1103	4.12	40	18	8	36	47	19	17	20	60	.49	.087	39	61	.93	177	.07	33	1.96	.06	.13	13	51

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8R 1R	12	4	2	45	.1	5	2	5061	4.22	148	5	ND	3	223	1	32	2	8	24.80	.002	7	7	.37	13	.01	2	.85	.01	.01	3	6
C8R 2R	5	24	3	55	.1	11	3	632	3.74	81	5	ND	11	274	1	4	2	43	.69	.082	23	18	.50	149	.06	2	2.79	.05	.68	1	2
C8R 4R	9	614	29	56	20.9	1	2	22	13.89	42980	5	ND	23	2	5	186	119	1	.06	.001	2	9	.01	8	.01	2	.17	.01	.13	1	2420 -
C8R 5R	2	451	155	24	32.2	1	22	60	13.48	42779	5	7	12	1	2	670	130	1	.01	.001	2	25	.01	6	.01	2	.07	.01	.05	497	16690 -
C8R 6R	8	123	13	12	1.3	7	17	112	2.14	3333	5	ND	2	278	1	10	4	3	.73	.013	2	8	.21	31	.01	2	1.24	.12	.23	4	136
C8R 7R	264	54	11	16	1.1	6	9	71	7.09	1997	5	ND	1	98	1	10	5	13	.27	.015	2	51	.25	14	.03	2	.86	.09	.28	5	195
C8R 8R	5	12	14	17	.1	8	5	55	1.67	582	5	ND	2	74	1	2	2	3	.33	.034	4	7	.20	51	.01	2	.96	.08	.17	1	13
C8R 9R	146	277	13	83	1.1	6	6	800	4.48	241	5	ND	4	109	1	4	2	11	2.44	.020	5	38	.78	11	.01	4	1.01	.01	.32	1	112
C8R 10R	8	2153	14646	75	351.4	1	3	7	21.11	43076	24	5	123	19	10	5292	1734	1	.01	.001	45	15	.01	8	.01	2	.13	.01	.03	1	13210 -
C8R 11R	4	15	135	111	14.7	6	5	672	3.37	997	5	ND	4	99	1	17	8	20	.91	.088	6	17	.86	18	.03	6	2.63	.16	.76	1	132
C8R 12R	525	451	25215	159	110.9	9	1	34	2.65	17162	5	2	1	36	355	12462	96	1	.04	.003	2	7	.01	6	.01	2	.11	.01	.02	1	6720 -
C8R 13R	65	72	3462	8	105.5	7	1	32	.79	3035	5	ND	1	8	5	619	1186	1	.02	.002	2	44	.01	5	.01	2	.03	.01	.01	1	730 -
C8R 14R	141	250	1915	262	15.7	6	3	141	3.43	11399	8	ND	4	139	46	121	77	8	.13	.009	6	9	.08	25	.01	2	.57	.01	.25	4	1660 -
C8R 15R	2745	33	60	6	6.9	11	1	88	.45	795	5	ND	1	6	2	33	16	1	.12	.001	2	101	.01	6	.01	2	.01	.01	.01	1	35
C8R 16R	887	110	8329	6	325.2	12	1	93	.46	250	5	ND	1	2	39	1316	21072	4	.02	.002	2	12	.02	6	.01	2	.06	.01	.02	7	3720 -
C8R 17R	13	12	40	42	1.8	5	9	292	1.87	58	5	ND	5	239	1	5	15	41	1.89	.056	10	20	.71	294	.08	5	3.36	.13	.19	2	163
C8R 18R	8	10	42	31	2.4	4	5	195	3.91	106	5	ND	3	131	1	10	41	45	.48	.070	6	10	.52	29	.12	2	2.09	.03	.18	2	49
C8R 19R	4	8	19	30	.9	5	4	245	3.14	59	5	ND	4	107	2	4	6	45	.29	.074	12	17	.54	64	.05	6	2.27	.04	.29	1	56
C8R 20R	4	107	42	76	1.8	13	10	351	4.87	61	5	ND	3	98	1	8	3	89	.87	.066	4	22	1.09	113	.13	2	3.53	.01	.28	1	81
C8R 21R	3	5	20	10	.5	3	2	86	1.34	58	5	ND	4	87	2	2	2	4	.09	.024	17	26	.06	396	.01	4	.50	.03	.20	2	20
C8R 22R	2	19	18	72	.5	17	21	1275	6.14	29	5	ND	4	115	1	3	2	16	5.73	.096	4	11	.75	14	.01	3	.55	.01	.20	1	350
C8R 23R	5	12	28	56	.9	7	7	408	3.77	1499	5	ND	4	210	1	13	5	39	2.26	.083	5	34	.76	36	.05	3	4.20	.37	.33	1	11
STD C/AU-R	20	63	42	133	7.3	72	31	1041	3.99	40	20	8	40	50	20	17	19	61	.51	.085	42	60	.93	180	.07	32	1.95	.06	.16	13	475

- ASSAY REQUIRED FOR CORRECT RESULT for Pb As >10,000 ppm
Mo, Sb >1000 ppm
Ag >35 ppm

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716

GEOCHEMICAL ANALYSIS CERTIFICATE

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: P1-P6 SOIL P7-P8 ROCK AU* ANALYSIS BY ACID LEACH/AA FROM 10 GM SAMPLE. P -20, -45, Pulverized.

DATE RECEIVED: SEP 15 1988 DATE REPORT MAILED: Sept 22/88 ASSAYER. C. Leong ...D.TOYE OR C.LEONG, CERTIFIED B.C. ASSAYERS

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SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8R-3L	60	97	55	212	.3	29	15	367	11.21	20139	5	ND	7	1093	1	401	2	62	.21	.240	23	20	.57	24	.04	2	2.56	.02	.91	10	7
C8R-30L	1	36	26	123	.1	24	16	1090	4.43	161	5	ND	2	33	1	5	2	64	.18	.101	23	29	1.04	177	.06	3	3.58	.01	.23	6	6
C8R-31L	1	40	22	108	.1	21	16	947	4.32	127	5	ND	5	41	1	3	3	62	.24	.077	26	29	1.10	197	.08	3	3.47	.01	.23	4	7
C8R-32L	1	39	24	114	.1	24	17	1020	4.46	130	5	ND	7	31	1	2	2	63	.21	.089	25	30	1.08	180	.08	8	3.43	.01	.21	1	2
C8R-33L	1	32	10	80	.1	19	14	720	3.55	93	5	ND	8	101	1	2	2	47	.49	.079	24	19	.90	165	.10	2	2.33	.02	.27	1	3
C8R-34L	1	33	11	79	.1	23	15	735	3.90	65	5	ND	7	78	1	2	2	55	.39	.062	24	24	.89	193	.11	2	2.57	.02	.25	1	1
C8R-35L	1	41	12	101	.1	22	15	935	4.36	80	5	ND	8	42	1	2	3	62	.27	.090	28	28	1.10	208	.10	2	3.40	.01	.24	1	1
C8R-36L	1	30	16	80	.1	23	14	730	3.36	64	5	ND	6	78	1	3	2	55	.39	.065	24	25	.90	200	.11	3	2.57	.02	.26	2	1
C8R-37L	1	40	24	119	.1	25	16	819	4.82	129	5	ND	3	47	1	3	2	67	.19	.066	22	29	1.13	253	.06	2	4.71	.01	.25	6	3
C8R-38L	1	41	17	107	.1	27	16	886	4.65	113	5	ND	4	41	1	3	3	67	.23	.076	22	30	1.18	236	.09	2	4.08	.02	.22	2	1
C8R-39L	1	45	25	115	.1	27	18	1007	4.57	114	5	ND	5	47	1	2	2	63	.27	.084	27	31	1.12	255	.08	5	3.96	.02	.27	2	7
C8R-40L	1	37	22	99	.1	28	16	844	4.44	131	5	ND	5	34	1	3	2	62	.22	.079	23	28	1.09	209	.08	4	3.96	.02	.23	3	1
C8R-41L	1	31	16	91	.1	19	14	785	4.07	112	5	ND	3	40	1	2	2	55	.27	.078	25	25	.87	168	.06	2	3.18	.01	.21	3	1
C8R-42L	1	28	16	80	.2	18	13	677	3.59	72	5	ND	5	38	1	2	2	49	.28	.072	25	23	.80	169	.06	4	2.64	.02	.19	1	59
C8R-43L	1	32	16	91	.1	21	13	760	3.94	86	5	ND	5	36	1	2	2	54	.23	.076	26	25	.93	203	.08	2	3.20	.01	.24	2	3
C8R-44L	1	45	15	115	.1	29	19	859	4.54	156	5	ND	6	36	1	2	2	70	.26	.070	21	37	1.25	260	.11	2	4.26	.01	.34	4	5
C8R-45L	1	55	29	141	.2	37	21	895	4.56	343	5	ND	5	89	1	2	4	73	.65	.070	20	41	1.61	279	.13	2	4.58	.02	.39	5	1
C8R-46L	1	34	26	102	.1	25	12	676	3.71	153	5	ND	3	43	1	2	2	57	.37	.088	22	30	.99	185	.09	2	2.96	.01	.30	4	5
C8R-47L	1	37	11	96	.1	25	15	772	4.03	112	5	ND	4	67	1	3	2	62	.39	.077	19	34	1.30	224	.12	5	3.47	.02	.34	1	1
C8R-48L	1	34	9	92	.1	24	14	774	4.04	76	5	ND	4	64	1	2	2	62	.41	.071	23	32	1.20	180	.11	4	3.26	.02	.28	2	2
C8R-49L	1	28	13	80	.1	19	11	620	3.51	71	5	ND	7	50	1	2	2	52	.38	.076	22	26	.84	178	.12	2	2.55	.02	.26	1	5
C8R-50L	1	33	13	90	.2	24	13	769	3.97	80	6	ND	5	63	1	2	2	61	.40	.071	22	31	1.20	180	.11	2	3.22	.02	.27	1	4
C8R-51L	1	39	19	111	.2	29	17	927	4.48	105	5	ND	3	43	1	2	2	66	.27	.074	22	32	1.20	233	.09	3	4.20	.01	.28	2	5
C8R-52L	1	38	16	105	.2	27	14	746	4.13	114	5	ND	5	64	1	2	4	61	.42	.067	24	30	1.14	233	.11	3	3.62	.02	.31	1	1
C8R-53L	1	28	19	79	.2	19	11	638	3.42	93	5	ND	8	54	1	2	2	48	.39	.079	25	28	.82	134	.09	3	2.02	.02	.26	1	3
C8R-68L	2	1264	1252	1234	23.6	46	43	3306	12.41	20258	5	6	6	142	90	64	108	62	.43	.118	28	33	1.30	77	.02	2	3.39	.01	.31	3	5520
C8R-69L	4	375	379	447	14.3	45	50	2264	9.73	19923	5	3	6	295	9	91	73	89	1.26	.087	26	58	1.66	189	.06	4	4.32	.03	.54	3	2480
C8R-71L	7	152	57	334	1.1	32	61	3131	9.38	1305	5	ND	5	224	1	4	2	79	.67	.104	30	23	1.20	573	.04	2	4.44	.03	.23	3	24
C8R-76L	3	70	18	123	.4	16	30	940	7.34	272	5	ND	5	487	1	4	2	54	1.60	.126	18	10	.71	233	.04	5	5.79	.04	.35	7	7
C8R-77L	5	79	24	105	.3	14	21	629	12.16	303	5	ND	7	339	1	2	2	56	1.02	.151	14	14	.81	182	.05	2	4.73	.03	.26	6	1
C8R-78L	5	104	23	129	.4	17	31	968	10.01	256	5	ND	6	490	1	2	2	51	1.84	.130	13	10	.67	196	.05	2	6.84	.03	.31	3	5
C8R-79L	13	120	126	223	1.6	34	27	835	7.01	3495	11	ND	47	177	1	17	3	41	.41	.077	52	18	.69	146	.03	2	2.54	.02	.15	2	192
C8R-80L	17	167	101	195	3.1	41	38	1020	8.75	5955	6	ND	27	444	1	105	2	51	.18	.146	46	21	.55	537	.02	2	2.72	.02	.16	1	99
C8R-83L	8	101	116	184	1.4	31	19	802	5.40	4121	9	ND	22	95	2	28	3	61	.23	.080	25	36	.94	132	.07	2	3.38	.02	.23	6	72
C8R-84L	33	109	176	186	3.7	26	14	622	6.33	15545	6	ND	62	244	2	36	15	34	.19	.071	80	19	.53	120	.03	3	2.18	.04	.36	3	122
C8R-89L	10	106	179	398	1.1	43	26	1254	6.70	3113	9	ND	6	236	5	47	2	64	.44	.087	31	38	1.12	151	.05	2	3.85	.02	.26	6	79
STD C/AU-S	18	59	39	132	7.1	68	31	1049	4.21	43	18	8	37	47	17	17	17	58	.48	.089	39	55	.91	176	.06	34	1.97	.06	.13	13	47

CURRAGH RESOURCES FILE # 88-4527

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8R-90L	9	109	281	395	9.7	49	25	1184	8.02	10336	6	24	4	268	7	53	7	71	.31	.091	27	81	1.36	149	.05	2	3.64	.02	.37	2	24220
C8R-91L	11	147	110	349	1.8	51	32	1352	7.67	8486	7	ND	14	254	5	66	2	68	.47	.108	27	40	1.22	160	.05	2	3.92	.02	.36	3	245
C8R-92L	11	167	178	287	2.1	44	25	981	7.15	8059	8	ND	19	227	3	39	13	63	.26	.074	35	41	1.14	147	.05	2	3.46	.02	.26	2	89
C8R-93L	17	234	171	260	2.9	42	19	607	8.03	6091	11	ND	17	200	2	65	16	64	.22	.124	24	26	.98	162	.05	2	3.42	.02	.28	3	137
C8R-94L	13	148	445	175	2.6	23	13	511	5.48	11200	11	ND	81	212	3	41	19	35	.15	.063	77	15	.58	113	.03	3	2.31	.02	.30	8	90
C8R-95L	14	119	230	505	2.0	35	27	1221	6.76	4699	5	ND	8	151	11	29	2	69	.28	.092	29	25	.99	134	.05	4	3.32	.02	.24	2	53
C8R-10[illegible]	5	154	166	144	3.2	19	13	490	4.68	6451	9	ND	54	169	5	23	25	38	.29	.049	48	16	.55	148	.05	2	2.16	.02	.24	4	2820
C8R-104L	2	5	6	34	.1	4	3	227	1.15	41	5	ND	8	14	1	2	2	10	.13	.017	12	4	.17	31	.03	3	.53	.01	.08	1	1
C8R-105L	2	15	12	54	.4	6	4	325	1.90	64	5	ND	27	24	1	2	3	23	.29	.053	40	8	.26	37	.03	2	.82	.01	.08	20	3
C8N-95S	1	42	27	104	.8	27	16	973	3.84	88	5	ND	12	161	1	5	2	45	.54	.065	28	23	1.15	238	.06	3	2.76	.02	.34	2	5
C8N-96S	1	26	17	73	.6	18	10	604	3.38	65	5	ND	9	99	1	3	2	44	.40	.065	23	20	.85	194	.07	2	1.90	.03	.32	1	1
C8N-97S	2	41	21	129	.6	36	38	765	4.97	689	5	ND	5	59	1	2	2	30	.33	.091	25	8	.35	212	.01	2	1.90	.01	.09	1	1
C8N-98S	3	71	27	108	.9	88	40	1642	7.35	438	5	ND	4	53	1	13	3	50	.55	.113	26	35	.47	308	.01	2	1.81	.01	.11	1	1
C8N-99S	1	46	17	95	.9	36	27	1097	4.40	109	5	ND	7	93	1	2	2	55	.75	.079	24	27	1.10	261	.04	2	2.45	.02	.24	1	3
C8N-100S	4	79	75	157	1.5	29	31	1661	8.36	66	5	ND	4	108	2	20	2	44	.98	.131	11	20	.87	94	.01	2	1.93	.01	.23	4	12
C8N-101S	1	61	28	107	.9	28	32	1101	4.76	122	5	ND	9	73	1	2	2	61	.63	.109	32	20	.93	283	.03	2	2.41	.02	.22	1	2
C8N-102[illegible]	12	110	32	383	1.6	67	41	963	6.09	190	5	ND	8	84	3	3	2	103	.41	.110	24	25	1.17	248	.02	2	3.54	.01	.21	3	14
C8N-103[illegible]	13	79	89	314	1.8	57	28	1185	5.68	1898	5	ND	11	52	4	16	2	75	.22	.107	25	21	1.11	223	.03	2	3.43	.01	.18	3	75
C8N-10[illegible]	9	52	158	140	2.1	14	26	1179	4.48	3694	7	ND	36	26	2	20	2	37	.09	.068	39	11	.49	133	.02	3	1.95	.01	.12	1	1040
C8N-105[illegible]	5	36	77	97	1.4	11	14	931	4.35	8150	5	ND	16	32	1	13	2	38	.09	.061	32	11	.54	194	.02	2	2.21	.01	.15	2	390
C8N-106[illegible]	5	37	81	134	1.1	13	15	1231	3.89	3441	6	ND	16	41	1	13	2	32	.14	.054	45	11	.52	188	.02	3	2.04	.01	.14	1	315
C8N-107[illegible]	1	33	88	155	.4	16	12	1701	3.92	785	5	ND	8	39	1	2	2	43	.20	.073	59	15	.71	152	.02	2	3.02	.01	.17	1	36
C8N-108[illegible]	1	34	73	134	.6	15	14	2001	4.04	382	5	ND	21	25	1	2	2	44	.13	.058	45	14	.73	141	.03	2	2.77	.01	.16	1	370
C8N-109S	1	53	60	109	.9	26	19	1506	5.07	94	5	ND	3	24	2	3	2	67	.33	.081	19	27	1.49	345	.03	3	2.87	.01	.25	1	14
C8N-110S	1	37	18	92	1.2	26	16	617	4.90	105	5	ND	8	65	1	2	3	73	.67	.105	23	29	1.17	151	.08	2	2.70	.04	.32	1	10
C8N-111S	1	56	30	117	1.0	19	21	815	4.45	278	5	ND	9	97	1	3	2	70	.80	.124	35	21	1.03	222	.11	2	3.00	.06	.40	3	12
C8N-112S	1	68	59	159	1.1	16	24	1512	5.28	317	5	ND	6	269	1	3	2	73	.71	.101	31	17	1.26	170	.06	2	4.44	.03	.31	4	4
C8N-113L	1	75	38	138	1.2	18	24	1431	5.65	117	5	ND	3	319	1	2	3	80	1.14	.128	20	19	1.49	235	.09	3	4.21	.04	.42	4	11
C8N-114L	1	78	35	129	1.2	20	25	1237	5.32	164	5	ND	5	221	1	2	2	75	.62	.114	20	20	1.38	191	.09	3	4.17	.04	.30	2	1
C8N-115L	1	70	8	84	1.7	22	18	870	3.88	49	11	ND	7	263	1	2	2	56	.69	.074	13	26	1.45	160	.07	2	2.45	.02	.21	1	3
C8N-116L	1	117	21	106	1.2	39	25	1292	5.50	60	5	ND	3	351	1	2	2	82	.93	.109	16	49	2.11	230	.10	2	4.12	.04	.26	3	4
C8N-117L	4	78	32	106	.8	14	27	669	9.94	173	5	ND	8	622	1	3	2	43	.65	.156	20	9	.63	179	.02	2	5.09	.08	.22	2	6
C8N-118L	2	73	31	123	.9	13	35	934	6.80	244	5	ND	6	539	1	2	2	54	1.52	.108	21	8	.73	205	.03	2	5.55	.03	.37	4	7
C8N-119L	1	94	32	120	1.1	21	31	995	5.76	174	5	ND	3	378	1	2	2	70	.93	.107	23	15	.95	200	.04	2	4.33	.03	.30	4	9
C8N-120L	1	122	32	135	1.2	31	38	1042	6.81	482	5	ND	10	243	1	4	2	73	.81	.100	39	16	.80	153	.02	2	4.16	.01	.23	2	46
C8N-121L	1	125	37	129	1.5	28	41	1264	6.65	579	5	ND	9	311	1	11	2	78	.70	.123	32	18	1.06	159	.04	2	4.00	.02	.27	5	29
STD C/AU-S	18	61	36	132	7.1	67	31	1022	4.22	44	21	8	37	48	18	16	22	60	.49	.096	40	55	.94	183	.07	34	2.06	.06	.15	12	47

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8N-122L	5	81	38	134	.3	23	30	1218	6.28	305	5	ND	9	278	1	6	2	71	.74	.117	29	19	1.08	183	.07	3	4.02	.03	.30	2	33
C8N-123L	5	143	64	187	1.4	47	41	2051	6.78	962	5	ND	12	207	2	8	2	72	.50	.112	52	21	.88	137	.04	2	3.28	.01	.23	2	14
C8N-124L	5	154	68	160	1.2	44	44	1666	6.62	1256	5	ND	17	274	2	10	2	65	.56	.095	40	21	.85	128	.03	4	2.99	.02	.17	1	25
C8N-125L	11	144	135	254	3.3	43	38	1606	6.86	3038	5	ND	22	205	2	37	2	50	.35	.119	46	16	.68	247	.02	3	2.79	.02	.19	1	35
C8N-126L	13	141	115	224	2.7	43	34	1310	7.09	3498	5	ND	25	186	1	47	2	47	.28	.096	42	14	.59	255	.02	2	2.41	.01	.16	1	71
C8N-127L	27	117	80	349	1.3	55	26	1179	7.26	2855	5	ND	18	142	2	21	2	59	.38	.090	58	15	.59	129	.02	3	2.69	.01	.15	1	78
C8N-128L	55	248	53	1009	.8	217	59	1970	14.75	6769	5	ND	7	295	7	113	2	77	.66	.176	14	15	.77	266	.02	2	4.77	.01	.22	4	63
C8N-129L	63	171	51	718	.7	166	46	1388	11.00	9204	5	ND	7	271	6	157	2	76	.51	.180	16	17	.86	314	.03	2	4.07	.01	.23	5	41
C8N-130L	5	72	30	124	.2	17	34	997	6.72	282	5	ND	6	513	2	4	2	52	1.44	.103	21	9	.69	201	.03	4	5.16	.03	.35	6	15
C8N-131L	31	131	65	395	1.1	80	27	1018	7.97	6373	6	ND	11	202	3	48	2	74	.31	.145	29	20	.84	228	.03	6	3.94	.01	.20	4	74
C8N-132L	27	127	123	422	2.3	77	28	1305	8.26	7579	5	ND	9	197	4	31	2	79	.42	.134	24	21	.87	138	.03	2	3.88	.01	.19	1	163
C8N-134L	30	199	77	410	1.5	91	47	1435	13.60	8574	6	ND	16	193	2	66	2	68	.55	.159	17	17	.83	239	.04	2	4.98	.02	.31	2	255
C8N-135L	21	193	86	391	1.4	62	38	1582	9.77	8647	7	ND	15	255	7	49	2	66	.63	.166	32	19	.91	234	.03	4	4.31	.02	.34	4	192
C8N-136L	17	188	53	377	.8	70	46	1596	12.14	3875	5	ND	8	264	3	36	4	74	.48	.143	17	21	1.04	98	.05	2	4.96	.02	.47	1	54
C8N-137L	9	148	141	301	1.5	47	37	1507	8.60	3247	5	ND	4	287	4	56	2	74	1.22	.134	15	29	1.29	110	.06	2	4.18	.02	.54	3	44
C8N-138L	1	144	25	186	.6	56	33	1368	6.23	1134	5	ND	2	173	1	8	2	102	1.91	.090	7	60	2.09	153	.11	3	5.75	.06	.93	2	30
C8N-139L	5	148	119	419	1.1	40	35	1775	7.19	6342	5	ND	9	167	10	25	15	73	.62	.100	20	38	1.26	183	.06	2	4.00	.02	.38	7	225
C8N-140L	11	362	825	172	33.1	20	14	475	9.09	20425	12	3	139	112	5	139	377	28	.14	.046	56	16	.42	117	.02	2	2.22	.02	.23	62	2160 —
C8N-141L	6	236	461	416	6.7	41	32	1566	7.88	19504	9	ND	41	182	11	72	41	73	.80	.064	32	46	1.21	216	.06	2	3.33	.03	.45	73	535 —
C8N-142L	2	352	213	545	4.9	75	46	2590	8.77	6947	5	ND	5	105	10	19	21	125	.79	.087	21	94	2.83	201	.10	2	4.54	.04	.66	9	245
C8N-143L	4	236	283	401	10.4	41	31	1470	7.09	19471	8	ND	29	133	18	56	87	72	1.33	.099	28	54	1.59	142	.06	4	3.03	.03	.52	14	775 —
C8N-144L	5	175	191	948	3.1	47	55	1566	7.92	9654	5	ND	11	131	22	24	12	94	.55	.081	38	68	1.83	154	.10	4	3.89	.03	.39	7	213
C8N-145L	3	199	270	414	7.3	58	32	1639	6.94	14745	5	ND	18	155	9	30	45	90	1.30	.091	23	81	2.05	155	.08	2	4.01	.04	.59	14	650 —
C8N-146L	3	127	117	331	1.4	94	29	1396	5.78	2929	5	ND	8	100	4	6	2	74	.62	.073	20	233	2.30	158	.14	2	4.96	.03	.55	3	49
C8N-147L	7	187	149	713	2.7	47	30	1486	5.96	4132	9	ND	6	100	8	10	5	72	.61	.091	24	65	1.50	135	.10	2	3.97	.02	.36	8	139
C8N-148L	5	227	741	806	5.6	49	37	1340	7.13	8916	5	ND	11	160	22	30	2	87	.89	.090	23	73	1.86	213	.09	2	4.00	.04	.60	20	226
C8N-149L	3	127	232	398	2.9	58	28	2386	5.08	5612	5	ND	5	124	8	19	16	62	.99	.086	16	106	1.59	222	.09	3	3.31	.03	.43	8	199
C8N-150L	1	330	1195	1076	18.5	89	40	1696	8.70	19304	5	ND	4	185	35	67	20	102	1.11	.107	15	86	2.25	175	.09	3	4.07	.04	.74	15	795 —
C8N-151L	1	352	1501	1382	27.5	89	52	2035	10.84	19895	5	ND	3	178	54	116	32	110	1.17	.106	16	83	2.30	151	.07	2	4.13	.03	.75	11	1950 —
C8N-152L	7	171	211	952	3.0	48	54	1557	7.91	9887	5	ND	11	130	22	25	15	92	.54	.076	37	67	1.83	148	.10	2	3.87	.03	.35	19	285
C8N-153L	3	151	259	387	3.1	81	33	1317	6.96	3832	5	ND	9	128	6	11	2	91	.84	.074	17	196	2.21	183	.17	2	5.58	.06	.76	13	345
C8N-154L	4	277	265	416	3.2	72	36	1456	7.34	3902	5	ND	6	112	5	16	2	100	1.07	.073	14	111	2.36	230	.18	2	5.55	.07	.98	4	88
C8N-155L	7	249	475	689	4.7	59	33	1249	7.40	5169	5	ND	7	121	7	21	2	84	.39	.059	17	81	1.91	176	.12	2	4.90	.02	.45	9	86
C8N-156L	3	183	785	643	4.8	78	33	1412	6.34	5098	5	ND	5	123	9	31	5	73	.47	.073	17	104	1.74	179	.09	3	4.02	.02	.50	13	74
C8N-157L	6	138	210	419	1.8	53	27	1285	5.78	3600	5	ND	4	122	4	20	2	68	.49	.064	17	72	1.44	137	.09	4	4.18	.02	.37	10	415
C8N-158L	4	77	203	308	1.2	40	15	910	4.77	2633	5	ND	1	89	3	27	2	61	.28	.070	14	56	1.19	132	.07	2	3.19	.01	.26	11	75
STD C/AU-S	18	60	41	132	6.6	67	30	1062	4.14	37	18	8	37	47	18	18	21	58	.48	.089	39	55	.90	175	.06	33	1.92	.06	.13	12	50

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8N-159L	3	68	140	234	2.0	94	21	1107	5.70	2032	5	ND	4	94	2	12	2	78	.33	.075	13	131	1.91	149	.12	2	4.10	.01	.44	9	74
C8N-160L	6	52	36	201	.1	30	12	991	4.57	1375	9	ND	8	73	1	5	2	66	.39	.076	37	26	1.04	179	.05	3	3.05	.02	.21	4	6
C8N-161L	5	50	31	156	.3	31	15	1095	4.53	1048	5	ND	8	67	1	4	2	62	.34	.076	23	21	.83	160	.04	2	2.56	.02	.18	1	8
C8N-162L	12	115	163	420	2.2	65	29	1945	5.75	4187	5	ND	15	95	6	19	2	91	.53	.099	33	38	1.32	214	.04	4	3.23	.02	.31	5	125
C8N-163L	12	81	333	412	2.1	47	25	1599	5.82	2440	5	ND	17	56	10	26	2	66	.40	.097	37	19	.90	184	.03	4	2.24	.02	.21	2	36
C8N-164L	11	82	369	414	2.3	46	25	1481	5.66	2628	5	ND	17	68	11	29	2	63	.34	.091	37	18	.86	176	.02	5	2.16	.02	.17	1	56
C8N-165L	2	66	138	270	1.6	64	20	1048	5.42	1971	5	ND	4	95	2	12	2	74	.32	.067	14	120	1.78	141	.11	4	3.89	.01	.41	12	15
C8N-166L	3	36	111	269	.7	61	29	1206	5.55	636	5	ND	5	56	3	6	2	96	.55	.093	13	60	1.56	197	.12	2	4.05	.04	.51	2	5
C8N-167L	2	124	51	142	.4	39	22	813	4.96	273	5	ND	5	36	1	6	2	88	.32	.066	20	41	1.37	152	.12	7	4.21	.02	.33	2	4
C8N-168L	2	31	46	110	.2	24	11	610	3.49	152	5	ND	1	23	1	9	2	50	.22	.068	21	21	.70	123	.05	4	2.30	.01	.19	4	5
C8N-169L	3	30	39	112	.3	20	9	479	3.45	165	5	ND	1	46	1	6	2	53	.21	.082	16	23	.71	114	.03	4	2.22	.01	.14	4	3
C8N-170L	2	58	46	174	.3	47	20	1120	4.74	273	5	ND	7	76	2	8	2	67	.60	.082	23	60	1.58	229	.11	3	3.37	.04	.60	5	6
C8N-171L	2	23	30	86	.1	19	10	562	3.03	83	5	ND	3	35	1	6	2	42	.26	.078	21	18	.64	115	.05	6	1.76	.02	.18	1	2
C8N-172L	1	29	28	85	.1	24	12	705	3.55	90	5	ND	6	42	1	5	2	49	.32	.087	27	20	.76	154	.07	4	2.23	.02	.23	1	1
C8N-173L	2	31	38	101	.2	24	12	774	3.67	114	5	ND	2	32	1	6	2	53	.19	.082	22	22	.81	136	.06	4	2.86	.01	.20	2	3
C8N-174L	2	44	47	122	.4	35	14	894	4.06	162	5	ND	6	39	1	7	2	56	.30	.093	24	36	1.11	179	.08	2	3.07	.02	.32	2	5
C8N-175L	2	30	49	94	.2	25	12	648	3.57	131	5	ND	8	44	1	7	2	49	.36	.073	27	28	.82	123	.07	2	1.94	.02	.23	1	3
C8N-176L	1	43	36	117	.2	32	14	718	3.34	152	5	ND	6	71	1	3	2	63	.71	.115	22	42	1.21	164	.10	5	2.71	.06	.50	3	16
C8N-177L	1	31	32	94	.2	23	12	720	3.57	100	5	ND	5	40	1	2	2	51	.30	.079	23	24	.92	146	.07	2	2.51	.02	.30	1	38
C8N-178L	1	24	30	35	.2	18	11	660	3.73	100	5	ND	2	47	1	6	2	54	.30	.064	19	22	.76	128	.06	4	2.65	.01	.23	2	10
C8N-179L	2	42	33	108	.3	28	12	758	3.79	147	5	ND	10	78	1	7	2	56	.63	.097	23	36	1.07	161	.09	3	2.18	.05	.37	3	22
C8N-180L	1	47	31	116	.2	31	20	907	4.46	147	5	ND	8	79	1	5	2	69	.58	.080	24	40	1.32	201	.11	3	3.00	.04	.37	2	5
C8N-181L	1	26	30	81	.3	21	9	444	3.39	102	5	ND	4	41	1	6	2	46	.31	.077	23	27	.80	115	.07	2	2.00	.03	.21	1	4
C8N-182L	1	33	32	113	.3	30	13	308	3.78	94	5	ND	9	40	1	4	2	54	.35	.089	24	42	1.16	162	.09	3	3.01	.02	.40	1	12
C8N-183L	1	38	29	101	.2	23	12	719	3.66	134	5	ND	14	77	1	2	2	53	.66	.094	26	27	.98	151	.11	4	2.15	.04	.30	2	8
C8N-184L	4	60	38	134	.3	54	29	1014	5.50	1075	5	ND	6	93	1	17	2	71	.43	.050	16	44	1.33	122	.08	4	3.91	.01	.27	2	11
C8N-185L	15	80	151	249	.7	27	22	1320	8.26	4150	5	ND	2	206	2	132	3	59	.31	.111	16	19	.76	166	.04	7	2.73	.01	.32	6	12
C8N-186L	12	89	73	197	.6	31	17	777	6.79	2813	5	ND	2	150	1	59	2	55	.20	.144	17	21	.73	139	.03	3	3.27	.01	.22	3	13
C8N-187L	1	30	50	88	.2	25	11	617	3.46	152	5	ND	5	42	1	8	2	48	.33	.073	25	28	.80	121	.06	4	1.93	.02	.24	1	6
C8N-188L	15	75	70	199	.6	26	14	742	7.71	3513	5	ND	1	179	1	78	2	58	.23	.136	14	17	.77	155	.03	2	2.81	.01	.29	5	9
C8N-189L	10	72	110	203	1.1	29	14	703	6.30	3039	5	ND	2	98	3	37	2	61	.23	.115	14	26	.79	136	.04	7	2.81	.02	.25	2	35
C8N-190L	12	239	71	252	1.1	47	33	1109	13.49	5035	5	ND	7	247	1	54	2	67	.36	.153	12	20	1.17	91	.07	2	5.31	.02	.55	4	5
C8N-191L	15	144	60	277	.5	60	34	2144	11.89	1789	5	ND	6	197	2	29	2	62	.76	.139	18	20	1.04	73	.07	5	5.30	.07	.45	6	14
C8N-192L	6	136	38	263	.3	58	40	1317	9.84	976	5	ND	5	187	2	13	2	84	.53	.106	14	25	2.05	111	.09	2	5.00	.04	.91	1	18
C8N-193L	5	140	25	238	.3	48	45	1756	8.21	2390	5	ND	5	554	2	12	2	74	1.32	.083	15	27	1.83	155	.06	4	5.46	.03	.89	4	8
C8N-194L	25	194	50	223	.6	69	52	1777	15.11	6249	5	ND	7	742	2	43	2	78	.61	.223	14	21	.80	171	.06	4	4.85	.03	.58	9	6
STD C/AU-S	18	58	37	132	6.5	66	31	1054	4.16	39	17	8	38	47	18	20	17	58	.46	.091	39	54	.91	174	.06	33	1.93	.06	.14	13	51

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8N-195L	10	66	27	135	.2	34	15	582	5.64	2713	5	ND	6	108	1	26	2	53	.15	.069	19	21	.72	195	.05	2	3.08	.01	.20	2	27
C8N-196L	12	130	51	260	.6	61	31	899	11.60	1953	5	ND	6	776	1	37	8	93	.91	.123	14	30	1.40	60	.10	2	4.40	.03	.87	2	12
C8N-197L	5	131	31	254	.1	52	39	1158	9.91	1016	5	ND	5	196	1	14	4	84	.53	.104	13	29	1.99	115	.08	2	4.83	.04	.89	2	15
C8N-198L	36	82	31	181	.3	33	12	550	6.51	8082	5	ND	5	312	1	106	5	63	.16	.135	20	22	.64	449	.03	2	2.64	.02	.21	4	12
C8N-199L	27	67	31	180	.4	30	13	703	6.58	9233	5	ND	2	337	1	125	2	48	.20	.151	14	16	.46	414	.02	2	1.85	.01	.20	3	4
C8N-200L	61	67	119	105	1.4	11	5	142	4.33	14148	5	ND	13	757	1	179	2	33	.04	.181	22	10	.09	139	.01	2	.67	.01	.32	13	25
C8N-201L	29	116	25	246	.3	49	20	625	6.87	2506	5	ND	14	349	1	22	4	64	.20	.086	36	26	.63	108	.03	2	2.80	.01	.12	2	19
C8N-202L	6	61	25	104	.3	23	13	615	4.13	817	5	ND	12	67	1	10	2	60	.18	.045	27	26	.82	165	.07	2	2.94	.01	.19	2	8
C8N-203L	15	129	18	133	.2	39	15	687	5.80	2801	5	ND	7	100	1	20	2	69	.16	.077	39	33	.69	102	.04	2	2.83	.01	.12	3	5
C8N-204L	12	126	31	160	.3	48	25	791	5.74	3146	5	ND	3	151	1	26	2	68	.29	.135	31	30	.71	146	.03	2	2.85	.01	.19	6	13
C8N-205L	5	64	22	120	.2	28	14	588	4.09	612	5	ND	9	89	1	6	2	59	.26	.073	21	25	.80	145	.07	2	2.99	.02	.19	3	2
C8N-206L	2	42	16	85	.2	19	11	506	3.22	313	5	ND	8	49	1	2	2	46	.18	.049	20	20	.66	117	.06	2	2.58	.01	.15	1	3
C8N-207L	11	86	337	208	2.6	22	10	460	6.14	4612	5	ND	7	106	1	28	11	60	.11	.064	27	32	.77	131	.04	2	3.23	.01	.15	9	166
C8N-208L	6	65	189	386	1.1	32	23	898	5.41	3295	5	ND	4	130	12	21	6	73	.42	.095	17	62	1.29	176	.05	2	3.15	.02	.27	8	89
C8N-209L	6	57	135	269	.5	19	14	643	4.26	2328	5	ND	1	143	5	19	2	50	.71	.104	12	33	.71	162	.02	2	1.72	.01	.36	2	5
C8N-210L	3	151	268	519	1.3	37	32	1303	6.58	4254	5	ND	8	279	17	16	6	94	.69	.069	19	56	1.43	190	.09	2	3.95	.03	.46	1	45
C8N-211L	4	40	67	164	.3	17	11	567	4.00	1190	5	ND	2	52	1	11	3	50	.14	.077	18	25	.65	113	.04	2	2.97	.01	.16	2	125
C8N-212L	9	224	87	320	.4	40	40	979	7.32	2486	5	ND	5	135	2	17	5	81	.38	.080	23	50	1.44	185	.08	4	4.38	.02	.32	9	19
C8N-213L	9	109	80	267	.5	38	24	705	6.23	2196	5	ND	5	185	2	20	4	74	.36	.071	17	46	1.22	163	.08	2	3.81	.02	.27	9	28
C8N-214L	6	66	74	220	.5	54	28	910	4.89	2269	5	ND	3	309	2	18	6	69	.91	.086	11	85	1.43	145	.06	2	4.47	.02	.27	4	265
C8N-215L	8	99	277	540	1.8	31	21	1090	6.09	3280	5	ND	8	162	9	18	10	74	.67	.078	33	47	1.34	144	.06	2	3.97	.02	.30	4	12
C8N-216L	17	323	270	338	5.1	28	15	775	6.84	15072	13	ND	18	139	6	43	23	51	.18	.064	38	32	.82	132	.04	2	2.90	.01	.23	13	255
C8N-217L	13	166	140	276	2.0	28	21	862	6.04	6213	5	ND	47	139	5	23	10	60	.33	.064	36	36	1.06	120	.06	2	3.11	.02	.27	5	133
C8N-219L	12	105	105	272	.8	39	21	986	6.32	5455	5	ND	17	207	3	27	4	57	.27	.062	33	41	1.01	155	.05	2	3.16	.02	.21	3	455
C8N-220L	13	172	103	231	1.8	42	21	882	7.02	12243	8	ND	22	205	2	40	26	57	.20	.057	33	47	.94	177	.05	2	2.84	.02	.23	5	395
C8N-221L	13	431	136	247	4.8	42	22	1094	7.43	19471	6	ND	30	241	3	39	48	55	.30	.063	39	50	1.03	167	.05	2	3.07	.02	.23	9	625
C8N-222L	11	176	141	234	2.7	49	24	956	6.47	9434	5	ND	8	244	3	44	51	62	.57	.076	32	66	1.13	166	.06	4	3.26	.02	.26	6	158
C8N-223L	11	137	80	227	1.1	33	17	953	6.07	5983	5	ND	8	198	3	24	24	57	.19	.065	36	44	.89	209	.05	2	2.96	.01	.18	1	315
C8N-224L	11	159	169	405	2.0	45	29	1266	7.61	5569	5	ND	13	349	8	44	3	64	.70	.089	29	37	1.23	152	.05	2	3.86	.02	.37	4	835
C8N-225L	7	106	75	312	1.6	56	21	1328	6.13	6064	5	ND	7	246	4	24	17	59	1.05	.071	28	72	1.36	124	.05	2	3.35	.02	.26	2	775
C8N-226L	11	119	233	592	2.5	44	24	1429	6.39	5439	5	ND	8	256	12	28	7	56	.64	.071	33	47	1.23	135	.05	2	3.76	.01	.24	3	1850
C8N-227L	12	160	142	273	1.9	31	22	866	5.94	5876	5	ND	47	136	5	23	14	59	.33	.062	35	36	1.06	118	.06	3	3.14	.02	.27	4	285
C8N-228L	14	237	147	291	2.9	34	22	987	7.09	9197	5	ND	20	277	7	35	11	58	.36	.077	42	30	.93	183	.05	2	3.37	.02	.25	4	685
C8N-229L	12	352	208	291	4.6	43	30	1017	8.20	18172	5	ND	26	375	5	43	36	58	.73	.069	35	38	1.10	165	.05	2	3.59	.03	.35	14	2335
C8N-230L	12	187	151	269	3.2	42	29	1042	7.35	9347	5	ND	26	272	3	29	10	59	.43	.095	36	27	.99	168	.05	2	3.77	.02	.28	4	1395
C8N-231L	17	353	1372	198	26.1	25	15	603	6.97	19360	5	12	36	235	6	90	20	46	.23	.060	52	22	.67	164	.04	2	2.74	.02	.27	7	6115
STD C/AU-S	17	59	36	132	7.1	68	30	1015	4.21	44	22	8	37	47	18	16	19	58	.48	.090	39	55	.91	179	.07	33	1.96	.06	.14	13	53

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8N-232L	13	140	183	294	3.0	47	30	1355	7.10	5578	5	ND	15	324	4	41	9	66	.51	.084	23	33	1.14	154	.06	2	4.32	.02	.37	2	585
CSN-233L	14	231	504	200	7.1	32	19	913	6.33	14159	15	ND	39	277	3	30	11	47	.37	.082	26	32	.80	146	.04	2	3.35	.02	.25	3	915
CSN-234L	4	64	110	153	1.8	18	10	517	3.91	5421	5	ND	10	59	2	18	3	41	.18	.055	22	24	.59	97	.04	3	2.77	.01	.12	1	1385
C8N-235L	7	63	189	130	4.4	18	10	668	4.44	7183	5	ND	14	93	2	25	8	47	.21	.047	21	26	.58	99	.05	3	2.24	.01	.16	2	1065
C8N-236L	3	49	54	112	.9	23	12	620	3.64	2054	5	ND	16	69	1	11	2	46	.26	.046	25	28	.73	101	.07	2	2.40	.02	.18	1	225
C8N-237L	6	76	159	135	2.4	18	10	515	4.53	12040	5	ND	27	105	3	29	9	41	.22	.044	29	23	.61	128	.05	2	2.17	.01	.19	1	1675
C8N-239L	3	51	52	112	1.4	19	11	634	3.40	2519	5	ND	10	93	2	12	5	44	.35	.055	26	21	.65	95	.06	2	2.25	.01	.19	1	515
C8N-240L	5	67	81	127	2.3	18	10	542	3.97	3984	5	ND	14	72	3	16	7	45	.18	.043	27	23	.64	117	.05	2	2.61	.01	.20	4	1125
CSN-241L	3	48	62	95	1.5	16	10	542	3.20	1727	5	ND	9	65	1	10	2	43	.27	.042	23	22	.61	117	.05	2	2.17	.01	.18	1	169
C8N-242L	6	58	51	138	.6	15	9	574	3.75	1924	5	ND	15	81	2	13	2	37	.19	.057	33	18	.50	91	.04	3	2.00	.01	.13	1	415
C8N-243L	4	36	39	87	.7	17	9	464	3.19	1024	5	ND	10	68	1	11	2	39	.23	.047	19	19	.51	84	.05	2	1.97	.01	.15	5	131
C8N-244L	10	95	49	238	.1	13	10	674	4.50	2155	11	ND	36	53	3	12	2	27	.16	.041	36	14	.42	72	.03	2	1.93	.01	.12	1	275
C8N-245L	7	97	83	237	1.1	45	26	1270	5.73	2872	5	ND	14	251	2	27	5	57	.80	.081	23	36	1.08	126	.06	2	3.85	.02	.34	1	305
C8N-246L	2	37	26	108	.2	20	11	600	3.17	451	5	ND	15	60	1	7	2	39	.38	.060	28	16	.56	104	.06	2	1.83	.02	.17	3	26
C8N-247L	5	105	184	252	2.6	46	20	994	5.44	3531	5	ND	14	255	4	19	5	55	.66	.084	20	59	1.14	115	.07	2	4.47	.01	.30	1	395
C8N-248L	6	100	294	129	6.8	17	8	434	4.24	8564	5	ND	9	89	2	39	25	42	.16	.052	31	24	.61	146	.04	2	2.50	.01	.16	2	1175
C8N-249L	4	81	112	187	1.7	30	15	812	4.35	1997	5	ND	15	118	2	16	6	52	.43	.054	25	27	.84	109	.07	8	3.18	.02	.24	1	345
C8N-250L	5	56	36	139	.3	27	16	709	4.04	1040	5	ND	13	165	1	11	2	49	.80	.074	25	20	.77	94	.07	2	2.84	.02	.25	2	114
C8N-251L	6	91	54	230	.8	43	22	893	5.77	1903	5	ND	7	208	2	12	2	60	.59	.085	21	31	1.05	163	.06	4	3.37	.02	.23	2	86
C8N-252L	7	72	39	159	.3	34	18	775	4.92	779	5	ND	9	118	1	10	2	60	.42	.084	21	25	.86	123	.07	2	3.43	.02	.25	1	15
C8N-253L	9	97	53	205	.4	41	22	1015	6.56	1393	5	ND	9	155	1	18	2	72	.46	.117	19	29	1.10	135	.08	2	4.70	.02	.36	3	19
C8N-254S	5	15	14	63	.1	7	4	320	1.69	81	6	ND	14	27	1	2	2	17	.27	.035	22	8	.31	38	.04	2	.92	.01	.08	5	2
STD C/AU-S	17	58	42	132	6.6	68	29	1037	4.13	41	17	6	36	47	18	16	18	57	.50	.091	38	56	.92	175	.07	33	2.07	.06	.13	11	47

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au* PPB
C8R-24R	1	249	12	105	.6	54	27	920	5.75	34	5	ND	1	461	1	2	2	157	7.34	.090	4	92	2.66	58	.02	2	2.75	.01	.19	1	6
C8R-25R	2	39	21	57	.2	11	7	206	3.76	17	5	ND	4	212	1	2	2	58	3.71	.062	4	15	.43	61	.06	2	4.24	.10	.22	1	6
C8R-26R	4	6	12	17	.1	7	9	176	4.27	50	5	ND	2	72	1	2	2	15	1.58	.099	4	5	.41	41	.01	6	2.67	.13	.25	1	15
C8R-27R	1	14	11	52	.1	36	11	2763	2.76	90	5	ND	1	397	1	2	2	29	10.54	.037	6	28	1.55	73	.01	2	.88	.01	.06	1	11
C8R-28R	2	127	28	72	.6	22	20	979	24.19	2244	5	ND	5	21	1	9	2	178	.45	.043	3	23	.53	6	.01	2	3.22	.01	.03	1	222
C8R-29R	12	50	39	99	2.6	23	14	980	10.93	189	5	ND	14	53	1	8	2	116	.62	.064	21	27	.54	72	.02	2	3.42	.01	.10	1	28
C8R-59R	1	19	12	104	.1	104	20	861	9.13	100	5	ND	4	55	1	2	2	135	.59	.125	11	378	4.06	807	.26	2	6.46	.09	2.75	2	32
C8R-61R	6	15	13	25	.1	6	5	50	1.10	4156	5	ND	13	4	1	12	2	1	.03	.004	14	42	.04	32	.01	2	.36	.01	.20	1	92
C8R-63R	4	7	11	11	1.0	40	206	11	12.18	99999	5	ND	15	13	1	816	3	1	.01	.001	8	3	.02	19	.01	2	.26	.01	.16	1	525 –
C8R-64R	3	292	10	15	1.9	12	27	36	4.65	37054	5	ND	1	2	1	101	6	1	.01	.005	2	84	.01	13	.01	4	.06	.01	.03	1	345
C8R-65R	8	105	152	104	12.0	10	19	19	14.82	99999	5	ND	1	1	4	152	44	3	.01	.003	2	5	.03	8	.01	2	.09	.01	.04	1	360
C8R-72R	3	33	20	42	.1	6	7	125	4.69	722	5	ND	11	66	1	2	2	15	.40	.098	13	10	.19	95	.02	2	1.06	.07	.18	2	7
C8R-73R	1	10	10	42	.1	12	5	527	5.62	416	5	ND	8	46	1	2	2	18	.08	.061	15	20	.37	62	.02	2	2.63	.03	.14	1	9
C8R-74R	1	4659	7	16	5.3	9	2	501	1.40	67	5	ND	1	250	1	64	2	27	8.02	.018	2	23	.20	21	.03	3	.51	.01	.01	1	845 –
C8R-75R	4	37	19	56	.1	8	17	634	6.28	110	5	ND	3	149	1	2	2	11	.78	.042	7	3	.32	33	.01	2	2.48	.22	.10	1	10
C8R-81R	12	127	5	41	.1	24	5	542	5.10	17437	5	ND	1	19	1	203	2	36	.07	.011	2	20	.25	42	.03	4	.92	.01	.18	1	2
C8R-82R	2	49	27	21	.2	5	2	78	2.48	25227	5	ND	4	15	1	136	2	3	.05	.013	19	13	.01	25	.01	3	.26	.01	.17	2	8
C8R-85R	59	190	13470	144	147.1	6	1	30	3.39	27414	9	ND	13	27	7	118	322	5	.02	.027	25	15	.02	31	.01	2	.47	.01	.22	62	245
C8R-86R	3	57	132	321	.4	9	5	366	4.13	1166	9	ND	10	21	12	3	3	52	.27	.073	32	24	.92	207	.07	2	2.83	.02	.71	1	15
C8R-97R	4	6	22	44	.2	13	3	195	1.14	34	5	ND	2	21	1	2	2	17	.35	.029	5	12	.33	73	.02	2	.32	.03	.19	2	26
C8R-99R	2	26	23	8	5.8	3	1	22	.60	4472	5	ND	7	1	1	2	5	1	.01	.001	3	35	.01	16	.01	2	.28	.01	.22	3	38
C8R-101R	6	206	352	16	22.1	9	1	24	4.38	48314	5	ND	4	5	1	80	85	1	.01	.002	2	10	.01	4	.01	2	.08	.01	.04	43	1220 –
C8R-103R	18	169	86	21	3.2	4	2	48	1.75	10460	8	ND	25	184	2	11	6	1	.03	.003	48	39	.01	12	.01	2	.24	.02	.14	1	355
C8R-106R	1	7680	11	19	8.1	7	1	411	1.14	152	5	ND	1	229	1	36	2	21	7.51	.002	2	4	.08	7	.01	2	.38	.01	.02	1	315
C8R-133R	2	84	16	9	1.5	3	5	22	5.35	60631	5	ND	8	3	1	326	8	1	.04	.001	2	26	.01	17	.01	2	.13	.01	.09	1	415
STD C/AU-R	18	59	43	133	6.8	67	29	1056	4.18	41	21	7	37	43	18	18	18	59	.50	.093	38	58	.92	177	.07	33	2.01	.06	.14	11	525 –

– ASSAY REQUIRED FOR CORRECT RESULT for As > 10,000 ppm
Ag > 35 ppm

SAMPLE#	Mo PPM	Cu PPM	Pb PPM	Zn PPM	Ag PPM	Ni PPM	Co PPM	Mn PPM	Fe %	As PPM	U PPM	Au PPM	Th PPM	Sr PPM	Cd PPM	Sb PPM	Bi PPM	V PPM	Ca %	P %	La PPM	Cr PPM	Mg %	Ba PPM	Ti %	B PPM	Al %	Na %	K %	W PPM	Au OZ/T
C8R-54R	2	34	298	11	3.8	6	2	21	3.05	36131	5	ND	1	1	1	76	2	1	.01	.001	2	36	.01	1	.01	2	.01	.01	.01	1	.024 —
C8R-55R	6	730	29	46	11.2	1	1	11	21.19	51539	5	ND	8	1	1	220	84	1	.01	.001	2	7	.01	7	.01	2	.05	.01	.06	1	.072 —
C8R-56R	1	263	59	13	8.1	4	2	33	2.98	34784	5	ND	3	1	1	163	30	1	.01	.001	2	36	.01	10	.01	2	.11	.01	.09	2	.020 —
C8R-57R	7	2681	178	44	63.8	1	99	6	30.57	51693	5	4	23	1	1	522	149	1	.01	.002	2	15	.01	3	.01	2	.01	.01	.01	1	.053 —
C8R-58R	2	82	26	46	1.7	5	3	296	3.49	5276	5	ND	11	20	2	5	2	29	.11	.046	15	48	.63	81	.10	7	1.12	.03	1.16	3	.002
C8R-60R	20	261	111	74	7.2	4	16	20	8.72	51072	5	ND	15	2	3	160	20	1	.01	.002	11	6	.01	17	.01	2	.22	.01	.16	1	.028 —
C8R-62R	2	19	37	17	6.0	10	105	17	9.51	50994	5	ND	3	1	1	563	27	1	.01	.001	2	36	.01	12	.01	2	.05	.01	.04	1	.157 —
C8R-66R	8	296	8195	28	275.0	8	19	27	23.34	51311	5	ND	3	2	20	3291	11817	3	.02	.016	3	11	.02	7	.01	2	.09	.01	.05	1	.124 —
C8R-67R	3	240	1025	153	194.2	16	33	31	26.10	51340	5	ND	3	2	6	744	1089	4	.01	.019	2	25	.03	13	.01	3	.14	.01	.09	1	.038 —
C8R-70R	4	102	804	12	54.3	6	26	18	12.01	51076	5	ND	8	1	1	621	176	1	.01	.001	2	8	.01	10	.01	3	.08	.01	.08	1	.092 —
C8R-87R	3	28	40	165	.8	4	1	41	.97	1093	5	ND	22	21	1	2	2	1	.05	.007	20	4	.04	30	.01	2	.62	.02	.10	1	.001
C8R-88R	18	206	136	41	9.3	2	2	18	2.37	24616	5	ND	21	23	5	36	19	1	.01	.002	13	14	.01	19	.01	2	.20	.01	.13	2	.051 —
C8R-96R	57	315	209	96	19.5	8	1	36	2.39	26680	5	ND	10	19	15	41	34	1	.01	.006	6	6	.02	23	.01	2	.33	.01	.18	1	.007
C8R-99R	3	123	585	43	28.0	1	6	38	14.13	51241	5	42	3	5	1	533	105	5	.02	.037	4	16	.03	16	.01	2	.17	.01	.07	1	1.380 —
C8R-100R	2	318	218	484	22.3	8	21	270	19.60	51338	5	31	5	4	20	302	60	11	.07	.033	4	30	.33	23	.01	3	.73	.01	.11	1	1.120 —
STD C	18	58	42	132	7.2	66	28	1042	3.80	41	18	7	36	48	20	17	17	55	.45	.088	36	57	.83	174	.06	33	1.80	.06	.14	11	-

Copy to: R.J.Morris, Fernie, B.C.

Vancouver Petrographics Ltd.

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Report for: Greg Jilson,
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117 Industrial Rd.,
Whitehorse,
Yukon,
Y1A 2T8

Invoice 7649

October 7th, 1988

Samples:

31 rock samples, submitted by Bob Morris, for sectioning and petrographic description.

Samples are all suffixed "P" and consist of numbers 1 - 13, 15 - 30, 67 and 98.

Samples 1, 5, 7, 8, 11, 21, 23, 25 and 67 were prepared as polished thin sections to allow observation of opaques; the remainder were prepared as conventional thin sections.

Summary:

The rocks of this suite can be classified in four main categories, corresponding to those used for the field identifications given in the covering letter: i.e. intrusives, volcanics, tuffs and sediments.

Although the presence of these four groups is confirmed, the petrographic study - not surprisingly - reveals a fair degree of mis-classification in the assigned field names, especially as regards the last three groups. Identification of a few samples is uncertain, even with benefit of the microscopic data.

1. INTRUSIVES

a) Medium grained, porphyritic.

i) Granite porphyry (major proportions of quartz, plagioclase and K-feldspar). Samples 19, 28.

ii) Monzonite porphyry (K-feldspar > plagioclase; quartz minor). Samples 17, 26.

iii) Diorite porphyry (mainly plagioclase; quartz and K-spar minor). Sample 6.

b) Fine-grained, virtually non-porphyritic

i) Aplite (abundant quartz and K-spar; accessory plagioclase). Samples 3, 11, 12, 29.

ii) Latite-Trachyte (K-spar > plagioclase; quartz minor). Samples 7, 13. VOLC (syenite)

The coarser, abundantly porphyritic rocks (Group 1a) have textures typical of minor intrusives, such as marginal phases or satellite plugs associated with batholiths.

The finer, non-porphyritic rocks (Group 1b) have homogenous textures characteristic of dykes or chilled margin phases.

2. VOLCANICS

a) Andesitic

i) Mafic-poor (mainly plagioclase and sericite). Samples 1, 18, 20.

ii) Mafic-rich (include major biotite, chlorite, or hornblende). Samples 5, 9, 25.

b) Rhyolite(?)

Quartz-rich, with plagioclase and/or sericite. Samples 2, 98.

The samples classified as volcanics are a somewhat diverse group. They are fine-grained and sometimes porphyritic. They lack fragmental features which might indicate a pyroclastic origin, and are typically non-foliated. They mostly show strong pervasive alteration (to sericite, biotite and secondary amphibole, and - in the rhyolites - quartz). The andesites often contain notable amounts of finely disseminated sulfides.

3. TUFFS

Samples 4, 15.

Tuffs are much less common in the suite than the field naming suggests. The above two rocks are unquestionably andesitic lapilli-tuffs, consisting of abundant, vari-sized lithic clasts and plagioclase crystals in a fine biotitic matrix. They are non-foliated and show well-preserved primary textures.

4. SEDIMENTS

a) Unmetamorphosed

i) Wacke. Sample 23

ii) Carbonaceous mudstone. Sample 22

iii) Hematitic chert. Sample 16

b) Foliated

i) 'Sheared wacke'. Samples 8, 21, 27.

ii) Siliceous sediments. Samples 24, 30.

iii) Amphibolite. Sample 10.

This is a varied group, some of which are of ambiguous character.

Those of sub-group a) are unequivocal and, like the majority of rocks of the suite, show a notable lack of regional metamorphic features. Sub-group b) includes all the rocks of the suite having more or less strongly foliated fabrics - in part of recrystallized and/or cataclastic aspect.

The 'sheared wackes' are of quartzo-feldspathic composition, and could be of felsic volcaniclastic affinities. Sample 27P differs from the first two in lacking K-feldspar and having chlorite (rather than sericite and/or biotite) as the principal accessory.

Sub-group b) ii comprises siliceous sediments, poor in feldspar. It includes a possible impure meta-chert and a dolomitic quartzite.

The remaining sample (10P) is quartz-free, and has the mineralogy of an amphibolite (plagioclase-hornblende), but a similar meta-clastic fabric to group b) i. It could be a metacalcareous arkose or, more likely, a recrystallized andesitic crystal tuff.

Individual petrographic descriptions are attached

SPECIFIC QUERIES:

Sample	Field name	Comment
1P	Hornfelsed(?) sediment	This is an altered andesite. The biotite could be of hornfelsic origin. It may well be related to the tuffs, 4 and 15. The other samples you list are not tuffs.
2P	Altered volcanic	This is a silicified rhyolite. It is of totally different composition to the tuffs (which are andesitic).
3P	Rhyolite dyke	Actually quartz-latite composition: has textural characteristics of an aplite. Yes, similar to 11P, 12P (and also 29P).
4P	Tuff, in contact with 3P	Yes: this is an andesite lapilli-tuff.
5P	Meta-sediment	Not a metasediment. This is a mafic-rich andesite - altered, but not obviously metamorphosed (except possibly in a thermal sense).
6P	Diorite dyke	Yes: this is a diorite porphyry
7P	Rhyolite dyke	Not of rhyolitic composition. This is the quartz-poor type of fine-grained felsic rock (latite/trachyte). i.e. different composition to 11P, 12P (more similar to 13P).
8P	Metasediment	Yes: this is one of the sheared wackes.
9P	Meta-basalt	One of the mafic-rich andesites: could be basaltic. Somewhat similar to 5P (though 5P contains no amphibole), but unrelated to 8P.
10P	Metasediment	This is a foliated, crypto-clastic amphibolite - possibly metasedimentary or a meta-andesitic tuff.
11P	Rhyolite dyke	See comment for 3P.
12P	Rhyolite dyke	See comment for 3P.

13P	Rhyolite dyke	Different composition to 11P, 12P. Quartz-free, K-rich: trachyte. More similar to 7P.
14P	No sample	
15P	Tuff	Yes: this is an andesite lapilli tuff. The biotitic composition of the matrix (as in 4P) could be a hornfelsic effect.
16P	Tuff	No: this is a chert, composed almost entirely of quartz. Red stain is hematitic.
17P	Tuff	No: this is a porphyritic latite or monzonite, texturally intermediate between 7P and 26P. Unrelated to 15P (though possibly intrudes it?)
18P	Tuff	No: this is one of the mafic-poor andesites. It has a high content of sulfides (pyrrhotite with traces of pyrite, marcasite and sphalerite). No obvious source of Sb: could be undetected traces of tetrahedrite.
19P	Granite	Yes: granite porphyry. Not altered or metamorphosed. Texture more typical of minor satellite plug than of 'normal' (batholithic) Coast Intrusives.
20P	Tuff	No: this is another altered andesite, without fragmental features. It is similar to 18P, but strongly sericitized. It is unrelated to 22P (carbonaceous mudstone).
21P	Metavolcanic	Probably not. This is one of the 'sheared wackes'. Could be felsic volcaniclastic.
22P	Black argillite	Yes: carbonaceous silty mudstone. Appears essentially unmetamorphosed No relation to 1P, 20P (andesites).
23P	Rhyolite dyke	No: this is totally unlike the other 'rhyolite dyke' samples (aplites, trachytes). It is a non-foliated, argillaceous wacke with mudstone intercalations.

24P	Metavolcanic	No: this is a foliated siliceous rock with plagioclase-sericite segregations: possibly an impure meta-chert.
25P	Metavolcanic	Yes: volcanic, mafic-rich - essentially an amphibolite, possibly meta-basaltic. Compositionally and texturally unlike 21P.
26P	Granite	Not strictly. This is a quartz-poor porphyry of monzonitic composition. Similar composition to 7P, 17P rather than to 19P or 26P.
27P	Metavolcanic	No: strongly foliated, wacke-textured. Probably related to 8P, 21P. Could be volcaniclastic.
28P	Granite	Yes: granite porphyry. Similar to 19P, but not to 28P (low quartz). Yes: compositionally similar to 11P, 12P, 29P: these could be fine-grained equivalents.
29P	Rhyolite dyke	Yes: aplite. Could be fine equivalent of 28P; similar to 10P, 11P.
30P	Metavolcanic	No: this is a metasediment of calcareous quartzitic type. Yes, could be related to 27P, 21P.
67P	Quartz vein	Yes: mainly homogenous arsenopyrite No gold seen.
98P	Rhyolite dyke	Quartz-sericite rock. Could be a silicified form of the fine-grained (aplitic) intrusives - though no K-spar. No actual sulfides in slide. Saw some scorodite, after arsenopyrite; this is presumably the 'green yellow stain'.

J.F. Harris Ph.D.

(phone: (604) 929-5867)

Sample 1P **ALTERED ANDESITE**

Estimated mode

Plagioclase	68
K-feldspar	1
Quartz	2
Sericite	15
Phlogopite	10
Tourmaline	trace
Apatite	trace
Rutile	trace
Pyrite	4
Pyrrhotite	trace

This is a fine-grained, altered rock of volcanic affinities.

It consists predominantly of an even, minutely fine-grained matrix of felsitic plagioclase, strongly pervasively dusted with micron-sized sericite.

Scattered throughout this matrix are diffuse, wispy to more distinct, sub-prismatic patches of slightly coarser felsite and/or felted micas, the latter often being a pale brown variety of apparent phlogopitic composition.

These features range in size from about 0.2 - 2.0mm, and appear to represent totally altered phenocrysts. They exhibit a partial preferred orientation which may represent a primary flow feature.

A common variant of the altered phenocrysts consists of prismatic forms defined by micron-sized opaque dust and/or clusters of tiny subhedral pyrite grains, locally with minor interstitial pyrrhotite. Others consist of felted phlogopite with diffuse patches of microgranular quartz and/or sulfides.

Accessories are tiny, randomly distributed euhedra of apatite, and scattered, tiny subhedra or acicular sheafs of green tourmaline.

The rock contains no recognizable lithic fragments, and the fabric - of scattered, discrete, sub-oriented, sub-prismatic patches in a homogenous felsitic matrix - is more suggestive of origin as a porphyritic flow than a tuff.

Sample 2P **ALTERED RHYOLITE**

Estimated mode

Plagioclase	37
K-feldspar	4
Quartz	42
Sericite	5
Phlogopite	10
Sub-opaque dust	2

This is a rock of similar general texture to the previous sample, but of notably different mineralogy. It is an altered volcanic of strongly siliceous composition, possibly gradational in character with 98P.

It consists predominantly of a matrix of brownish, turbid, cryptocrystalline, feldspathic material, strongly pervaded by microgranular quartz of grain size 20 - 50 microns.

The abundance and grain size of the quartz varies in a diffusely patchy manner, and it is often possible to recognize a pseudomorphed, pellety/cuspate fabric typical of a glassy rhyolite.

Scattered, more or less discrete, clumpy concentrations of coarser quartz, with intergrown meshwork flakes of sericite and pale brown phlogopitic mica, probably represent replaced phenocrysts. Finer grained sericite occurs as a pervasive dusting of the cryptocrystalline feldspathic glass matrix, and, together with phlogopite, forms small, random, diffuse wisps and patches delineating relict vitric features.

The cryptocrystalline felsite component appears to represent original glass. It is partially potassic in composition (see stained cut-off block) and is often impregnated by micron-sized, brownish, sub-opaque material (leucoxene?). This clearly distinguishes it, in thin section, from the superimposed pervasive silicification (probably of late magmatic/deuteric origin).

This rock is an altered, sparsely porphyritic, glassy rhyolite. There is no petrographic evidence to indicate that it is a tuff.

Sample 3P **APLITE**

Estimated mode

Plagioclase	20
K-feldspar	46
Quartz	30
Sericite	3
Limonite	1

This is an evenly microgranular rock of essentially identical type to several others of the suite (e.g. 29P, 12P etc.).

It consists of an anhedral mosaic of quartz, of grain size 0.1 - 0.3mm, within which are developed abundant smaller sub-prismatic grains, and coalescent grain clusters, of K-feldspar and lesser plagioclase. The feldspars are essentially fresh. The resultant texture can be described as saccharoidal, locally grading to micro-graphic.

Rare microphenocrysts of quartz and plagioclase, 0.5 - 2.0mm in size, are seen.

Mafics are sparse, as in all the rocks of this type, and consist of scrappy grains of sericite, often impregnated with limonite. These may represent altered biotite.

The rock is of granitic composition and has the texture of a minor intrusive (dyke rock). It is probably an aplite.

Sample 10P **META-ARKOSE? (AMPHIBOLITE)**

Estimated mode

Plagioclase	60
K-feldspar	trace
Hornblende	32
Biotite	2
Sericite	3
Epidote	2
Sphene) Rutile)	1

This is a rock of simple mineralogy, composed essentially of plagioclase and hornblende.

The plagioclase occurs as abundant, individual, equant, rounded to sub-prismatic grains, 0.05 - 0.3mm in size, or aggregate mosaic clumps of such grains.

Generally the plagioclase is clear and unaltered, and has the aspect of a partially recrystallized arkose. Rarely it shows a light dusting of sericite.

Sericite also occurs locally as an intergranular network, possibly representing remnants of a pervasively altered felsitic matrix.

The other main component is green hornblende, as very fine-grained, fibrous/felted aggregates, locally grading to prismatic clumps. The hornblende forms an intimately pervasive, intergranular phase, and concentrates as abundant irregular pockets and networks.

Minor proportions of fine-grained biotite, granular epidote and flecks and granules of rutile and sphene are associated with the hornblende.

A weak preferred orientation is apparent in the reticulate distribution of the hornblende matrix or cementing phase, and the elongation of clumps and individual grains of plagioclase.

The nature of this rock is obscure. The fabric has a distinctly metasedimentary aspect, but the mineralogy is atypical. The hornblende may be a metamorphic development from an original limey matrix in an arkosic wacke - though the total absence of quartz is atypical. Alternatively, this could be a partially recrystallized andesitic crystal tuff. The mixture of individual, discrete plagioclase grains and aggregate clumps suggests a partial cataclastic element in its formation.

Sample 11P **APLITE**

Estimated mode

Quartz	33
K-feldspar	45
Plagioclase	20
Sericite	2
Rutile	trace

This sample is essentially identical, in composition and texture, to 3P and the other rocks of the suite classified as aplites.

It consists of an equigranular mosaic of anhedral quartz, of grain size 0.1 - 0.3mm, which acts as a matrix to abundant small subhedral/prismatic grains of K-feldspar and plagioclase. The latter sometimes coalesce as irregular interlocking clusters.

This rock shows occasional clumps and elongate segregations of coarser quartz and plagioclase, of grain size to 0.5mm, and is cut by rare hairline veinlets of these minerals. It also contains a few individual euhedral microphenocrysts of quartz, to 1.0mm in size.

Accessories are scattered, small, ragged grains of sericite with flecks of rutile and ferruginous material - possibly representing altered biotite.

Sample 12P **APLITE**

Estimated mode

Quartz	30
Plagioclase	20
K-feldspar	47
Biotite	3

This rock is closely similar to the previous sample (q.v.) and is one of several such essentially identical rocks in the suite.

It consists of an evenly microgranular intergrowth of anhedral quartz, K-feldspar and plagioclase, in the grain size range 0.05 - 0.3mm. Grain boundaries are sharply defined, and the texture is an interlocking, saccharoidal aggregate. Feldspars are fresh and clear throughout.

Sparsely scattered microphenocrysts of quartz and plagioclase, 0.5 - 2.0mm in size, are present, as in the other aplite samples.

This particular example of the aplite lithotype differs from most others in that the accessory biotite - as randomly scattered, irregular flakes, 0.1 - 0.5mm in size - is mainly fresh.

Sample 13P **TRACHYTE**

Estimated mode

K-feldspar	84
Plagioclase	8
Quartz	1
Sericite	4
Carbonate	3
Epidote	trace
Rutile	trace

This is another fine-grained, K-rich rock. Though superficially similar to the aplites, such as 11P and 12P, it is seen, in thin section, to be of significantly different type.

The principal distinguishing feature is the paucity of plagioclase and virtual absence of quartz. It closely resembles 7P, but has a slightly higher K-spar/plagioclase ratio.

The rock is composed essentially of K-feldspar. This forms a felsitic aggregate, of grain size 10 - 50 microns, within which are developed relatively abundant coarser grains (to 0.2mm), showing a radiate or eutectoid/micrographic internal texture.

Rare, tiny pockets and elongate clumps of quartz are seen, and the stained cut-off block indicates the presence of a minor proportion of intergrown plagioclase (etched white).

Accessories are diffuse flecks and pockets of sericite and minutely fine-grained carbonate. Rare microgranular epidote is a possible additional trace component.

This rock has the mineralogical composition of a trachyte. It shows no flow textures or other features diagnostic of extrusive origin; however, its very fine grain size and sub-spherulitic texture seem atypical of an intrusive.

Sample 15P **ANDESITE TUFF** lapilli tuff

Estimated mode

Plagioclase	77
Quartz	trace
Sericite	5
Biotite	15
Epidote	1
Rutile) Opaques)	2

This is another of the relatively few undoubted tuffs of the suite. It is similar, in many respects, to sample 4P, though the clasts tend to be a little smaller (mostly in the range 0.2 - 3.0mm) and include a higher proportion of crystal vs lithic fragments. Also, this rock lacks the weak tendency for flow orientation seen in 4P.

Clasts are of various felsitic, meshwork-textured and strongly porphyritic andesites, and derived disaggregated plagioclase crystal clasts. The felsitic groundmass material and the plagioclase crystals show pervasive fine-grained sericitization to a greater or lesser degree. Plagioclase phenocrysts and clasts occasionally show pervasive epidotization.

Lithic clasts are sub-equant in shape and often ragged. The slide includes one rather ill-defined lithic clast to 10mm in size.

The clasts are randomly packed, with the smallest ones (down to 0.05mm or less) filling interstitially between the coarser ones. The whole aggregate is set in an evenly distributed matrix or cement of cryptocrystalline felsite, strongly pervaded by minutely fine-grained, felted biotite.

Minor flecks granules and micron-sized dust of rutile and opaques occur both within some clasts and in the matrix.

A few lithic clasts show diffuse wisps of biotitization - suggesting that this mineral is of post depositional, possibly metamorphic origin.

Sample 16P **HEMATITIC CHERT**

Estimated mode

Chert	92
Sericite	1
Carbonate	3
Secondary biotite(?)	1
Barite	trace
Hematite	3

Macroscopically, this sample is an aphanitic red rock, structureless but for an obscure mottling, cut by a micro-stockwork of veinlets and hairline fractures.

In thin section, it is found to be a chert, consisting of an even, interlocking aggregate of quartz, of grain size 5 - 20 microns.

The overall red colour is apparently due to sub-microscopic hematite, which is recognizable as an even dispersion of opaque dust throughout.

Partial redistribution and segregation of the hematitic pigmentation is seen. Some hairline fractures and quartz veinlets show 'de-hematization', with expulsion of opaques from the immediate fracture, and concentration as diffuse marginal envelopes.

The hematitic dust tends to aggregate as tiny, disseminated, acicular forms up to 200 microns in length. These have a pseudomorphous appearance, but are often quite diffuse. They may represent a process of incomplete diffusive crystal growth in a ferruginous silica gel medium. Locally, hematitic segregations are in the form of clusters of pellety or ovoid forms.

The veinlets are principally of quartz and carbonate. Minor accessories in the veinlet phase are sericite, a brown mineral which may be a form of biotite (or possibly just Fe-stained sericite), and barite - which forms segments alternating with carbonate in some of the thinnest, hairline veinlets.

Sample 17P **MONZONITE PORPHYRY**

Estimated mode

Plagioclase	18
K-feldspar	67
Quartz	2
Sericite	9
Carbonate	1
Biotite	3
Chlorite	trace
Rutile	trace

This is another of the quartz-poor type of felsic igneous rocks of the suite. Samples 7P and 26P are of similar composition.

It is noticeably porphyritic, and phenocrysts constitute approximately 10% of the rock. They are mainly of euhedral plagioclase, 0.5 - 3.0mm in size. Rare, rounded to amoeboid quartz phenocrysts are also seen.

The plagioclase phenocrysts typically show a rather even, mild to moderate, pervasive dusting of minutely fine-grained sericite and carbonate.

The groundmass is a somewhat diffuse-margined, blocky, microgranular aggregate of grain size 0.02 - 0.1mm, composed of anhedral K-feldspar with intergrown subhedral plagioclase and possibly a little very fine-grained quartz. The K-feldspar shows occasional incipient development of the feathery, granophyric texture characterising sample 26P.

Accessories consist of small, irregular to sub-prismatic patches of felted, secondary-type brown biotite with inclusions of rutile and opaques. Tiny intergranular wisps of minutely fine-grained sericite are dispersed throughout the groundmass.

Rare pseudomorphs (sericite-rutile-carbonate) of mafic phenocrysts are also seen.

The rock has the composition of a latite. Its sparsely porphyritic texture could be that of a flow or a minor intrusive.

Sample 18P **ALTERED ANDESITE**

Estimated mode

Plagioclase	85
Sericite	10
Rutile	1
Pyrrhotite	4
Pyrite	trace
Marcasite	trace
Sphalerite	trace

This is an andesitic volcanic of somewhat similar type to sample 1P, but with primary phenocrysts better preserved. It also lacks the phlogopitic biotite component of that sample.

It is notably lacking in mafics, and consists largely of plagioclase, in the form of abundant, randomly oriented phenocrysts in a felsitic groundmass.

The phenocrysts are mainly 0.1 - 1.0mm in size (rarely to 3.0mm), and are subhedral, prismatic in shape. They are often clumped. The groundmass is of grain size 5 - 20 microns.

Both phenocrysts and groundmass are more or less strongly altered.

Phenocrysts are patchily turbid and sometimes show wispy and dusty sericitization. They are typically rather ill-defined, and tend to merge with the groundmass - in part by virtue of actual peripheral or core replacement/assimilation by groundmass felsite, and in part because of the overlap of pervasive groundmass seritization into the phenocrysts.

The groundmass is strongly pervaded by minutely wispy, reticulate sericite. The latter shows a weak preferred orientation throughout the whole rock, and may have developed under conditions of mild regional metamorphism.

The rock contains rather abundant disseminated pyrrhotite and traces of other sulfides. The pyrrhotite occurs as clusters of tiny irregular granules, commonly (though not exclusively) concentrated within plagioclase phenocrysts and small altered mafic phenocrysts composed of sericite and reticulate rutile. Its distribution appears to be without structural control.

Sample 19P **GRANITE PORPHYRY**

Estimated mode

Quartz	20
Plagioclase	25
K-feldspar	45
Sericite	5
Chlorite	trace
Carbonate	5
Rutile	trace

This is a prominently porphyritic rock consisting of abundant euhedral phenocrysts of quartz and plagioclase, and occasional K-feldspar, 0.5 - 5.0mm in size, in a microgranular groundmass composed largely of K-feldspar. Phenocrysts make up about 50% of the rock.

The plagioclase phenocrysts seldom show good twinning, but are tentatively classified as of oligoclase composition. They are mostly turbid and show weak to moderate pervasive alteration to very fine-grained sericite. Occasionally they show patchy replacement by carbonate.

A few glomerophenocrysts are seen. These are composed of clusters of small, prismatic plagioclase crystals, sometimes with a few included grains of altered mafics.

Mafics are minor. They appear to have originated as biotite, in the form of individual euhedral grains, 0.2 - 1.0mm in size. They are now totally pseudomorphed by lamellar intergrowths of sericite, carbonate and rutile.

The groundmass consists of an interlocking aggregate of anhedral to subhedral K-feldspar, with lesser intergrown quartz and plagioclase. It is of grain size 0.02 - 0.2mm. A herringbone-textured, eutectoid variant (a form of granophyre) is very common - particularly (though not exclusively) as fringes to the larger quartz phenocrysts. This is clearly a product of the rapid, simultaneous crystallization of the groundmass phases.

The groundmass feldspar is typically fresh.

Carbonate occurs as scattered, random pockets and rare hairline veinlets, as does felted chlorite.

Sample 20P **SERICITIZED ANDESITE**

Estimated mode

Plagioclase	20
Sericite	72
Quartz	trace
Apatite	trace
Opaques	8

This is an intensely altered rock which now consists essentially of a minutely felted mass of compact sericite, of grain size 1 - 10 microns. Minor proportions of remnant plagioclase are sometimes diffusely recognizable within the sericite mass, as are pseudomorphous textures clearly indicating that the latter represents the almost total alteration of a sub-trachytic, minutely microlitic to glassy volcanic groundmass.

Scattered relict phenocrysts are recognizable as clumps of prismatic forms, 0.3 - 2.0mm in size, composed of slightly coarser felted sericite.

Quartz, as tiny grains and microgranular pockets associated with the altered phenocrysts, and apatite as rare relict euhedra, are trace accessories.

The other principal constituent(s) are fine-grained opaques. These occur rather evenly dusted throughout, as individual, minute granules, 5 - 15 microns in size. These commonly show clustering, and tend to aggregate as small, sub-prismatic patches, clearly pseudomorphing micro-phenocrysts (original mafics?). Some of the coarser sericitized phenocrysts - assumed to have been mainly plagioclase - are also more or less strongly impregnated by the fine-grained opaques. The denser concentrations of the latter are recognizable in the cut-off block as pyrrhotite, though some rutile or Fe-Ti oxides are probably also present.

The rock appears to be a pervasively sericitized volcanic, probably of andesitic composition. It shows no sign of structural deformation or metamorphic recrystallization.

Sample 21P **SHEARED FELDSPATHIC WACKE**

Estimated mode

Quartz	27
Plagioclase	43
K-feldspar	10
Sericite	14
Biotite	3
Chlorite	3
Amphibole	trace
Carbonate	trace
Apatite	trace
Rutile	trace
Magnetite	trace

This is a strongly foliated, quartzo-feldspathic rock of similar type to sample 8P.

It consists essentially of a recrystallized mosaic of anhedral, locally flattened grains of quartz and plagioclase, 0.02 - 0.1mm in size. The stained cut-off block indicates that a proportion of the feldspar (largely untwinned) is of potassic composition.

The rock exhibits a strongly foliated, platy, deformational fabric, whereby thin laminar and micro-lenticular slices of the quartzo-feldspathic aggregate are separated by semi-continuous schlieren of well-oriented sericite flakes, and by flattened reticulate networks of fine-grained, felted/fibrous, green biotite and chlorite. The latter also forms partial intergranular wisps within the quartz-feldspar.

Occasional clusters of acicular amphibole are seen, and may be present as an incipient development in some of the diffuse biotite/chlorite schlieren.

Local crumpling of the foliation is common. Some clumpy, augen-like segregations of coarser plagioclase may be of micro-structural (remobilized) origin, or may represent recrystallized primary, clastic features.

The rock is tentatively classified as a sheared feldspathic wacke. Alternatively, it could be of meta-intrusive or felsic volcaniclastic origin.

Sample 22P **CARBONACEOUS MUDSTONE**

Estimated mode

Quartz	6
Sericite) Carbonaceous pigmentation)	94

This is a minutely fine-grained, black rock which, in thin section, is clearly revealed as a silty carbonaceous mudstone.

It consists of a foliated matrix of minutely fine-grained sericite, strongly and evenly impregnated by sub-microscopic black pigmentation - almost certainly of carbonaceous character. For the most part, this renders the matrix essentially opaque to transmitted light.

The lensy features seen on the etched cut-off block are areas of less intense carbonaceous impregnation, in which the cryptocrystalline sericitic composition of the matrix is clearly recognizable.

The rock contains a minor silt-sized component of individual, sub-angular quartz grains, 10 - 100 microns in size. These occur evenly scattered throughout, together with tiny lenticles and flakes of carbon-free sericite.

The more elongate silty particles show a consistent preferred orientation which defines a distinct, undisturbed foliation. The sedimentary origin of this rock is unquestionable.

Sample 23P WACKE, WITH MUDSTONE INTERCALATIONS

Estimated mode

Quartz	20
Plagioclase	22
K-feldspar	trace
Sericite	49
Biotite	5
Tourmaline	trace
Rutile	1
Pyrrhotite	2
Pyrite	1
Marcasite	trace

This is a rock of distinctive textural type not seen elsewhere in the suite. It is clearly of sedimentary origin and shows the typical, poorly sorted, vari-granular fabric of a rather fine-grained wacke.

Unlike other rocks of related type in the suite, it is non-foliated and shows little or no recrystallization or metamorphic effects. Original clastic textures and sedimentary structures are perfectly preserved.

It consists of angular to sub-rounded, individual grains of quartz, 0.05 - 0.5mm in size, randomly scattered through an abundant matrix of minutely felted sericite. Much of the latter is distinguishable, on close examination, as almost totally sericitized felsitic lithic clasts of a similar size range to the quartz. Occasional remnants of crystalline plagioclase are also seen, representing original feldspathic sand grains.

Brown biotite, as diffuse fine-grained, felted wisps and clumps, is a common accessory. It may represent the alteration of more mafic lithic clasts. Acicular tourmaline, as sheafs of tiny needles, is a common trace associate.

The presence of biotite may indicate some degree of thermal metamorhpism, but the totally non-foliated fabric indicates a total lack of dynamic effects.

The rock shows a central zone of heterogenous intermingling with a much finer sericitic mudstone, devoid of sandy clasts. This incorporates torn-off fragments of the coarser sandy phase, and probably represents the effect of slump-type, soft sediment deformation.

Finely disseminated sulfides (pyrrhotite and pyrite) are widespread in the coarser wacke. They form minute flecks, 10 - 20 microns in size, commonly aggregating as small clumps. They are often (though not exclusively) associated with the biotite and tourmaline.

Sample 24P BRECCIATED IMPURE META-CHERT(?)

Estimated mode

Quartz	65
Plagioclase	12
K-feldspar	2
Sericite	17
Biotite	1
Amphibole	3
Chlorite	trace
Carbonate	trace
Sphene	trace

This is a rock of highly siliceous composition and uncertain origin.

It is composed predominantly of a fine-grained, crenulate-margined, strain-polarized aggregate of anhedral quartz, of grain size 10 - 150 microns. This has the aspect of a quartzite, showing extensive intergranular granulation/recrystallization, or is possibly a recrystallized chert.

The quartz aggregate shows a weak laminar structure defined by sub-parallel wisps and flecks of sericite, fibrous/acicular green amphibole and more or less sericitized felsite (plagioclase and minor K-spar). Similar wisps also cement a local micro-fragmented fabric.

The same constituents form relatively extensive, discordant, irregular veniform to pockety masses which appear to follow a coarser fracture pattern and may represent remobilized (soft-sediment/diapiric?) tuffaceous intercalations. These segregations are composed primarily of rather coarse foliaceous sericite, and sericitized and biotitized feldspar.

The slide includes a hairline veinlet of chlorite which cuts both the chert matrix and the sericitized segregation.

Sample 25P **META-BASALT**

Estimated mode

Plagioclase	18
K-feldspar	trace
Amphibole	55
Sericite	22
Epidote	3
Carbonate	trace
Apatite	trace
Sphene) Rutile)	1
Pyrite	1

This is a fine-grained, streakily foliated to clumpy-textured rock of quartz-free, mafic rich composition. It is clearly of volcanic affinity.

It consists predominantly of amphibole. This ranges from minutely fine-grained, pale-coloured or sub-opaque, felted aggregates, to compact masses of sub-oriented, tiny, prismatic grains, to 0.1mm in size, showing the typical green colour of hornblende.

Cryptocrystalline to granular epidote is a common minor accessory intergrown with the amphibole. Epidote also forms rare hairline veinlets. Rutile and sphene form sub-oriented needles and granules.

The other main constituents are sericite and plagioclase. The sericite typically occurs as groups of small (0.1 - 0.2mm), discrete, sub-equant to rounded patches of fine-felted material, scattered through the hornblende aggregate. These have the appearance of pseudomorphs or altered amygdules.

Sericite also locally forms a matrix or interstitial phase to densely disseminated amphibole needles.

The sericite most likely represents an altered form of primary, possibly felsitic, plagioclase. However, the rock also contains a component of essentially fresh plagioclase, as clumps of subhedral prismatic grains, 0.5 - 3.0mm in size. These are often twinned, and have the composition of labradorite, confirming the intermediate to mafic character of the rock.

Possibly these fresh plagioclase clumps represent remnant phenocrysts, whereas the totally sericitized material is original groundmass?

Pyrite occurs as a few segregated clumps of skeletal, poikilitic euhedra, heavily sieved with matrix silicate inclusions.

Sample 25P cont.

The rock shows streakily banded textural variations, chiefly defined by the grain size and colour of the amphibole and the proportion of intergrown sericite. The coarser amphibole zones show an oriented grain fabric.

There is no specific evidence for tuffaceous origin, and this rock is tentatively classified as a weakly sheared, possibly flow banded, meta-basalt.

Sample 26P **MONZONITE PORPHYRY**

Estimated mode

Quartz	3
Plagioclase	26
K-feldspar) Granophyre)	65
Biotite	4
Amphibole	trace
Sericite	1
Sphene) Rutile)	1

This is a potassic granitoid of somewhat similar macroscopic appearance to the granite porphyries, 19P and 28P. However, it differs in having generally smaller and less abundant phenocrysts. In particular, the prominent euhedral quartz crystals of those samples are lacking.

Compositionally it equates to the fine-grained latite, 7P.

Phenocrysts make up about 30% of the rock. They consist mainly of plagioclase, as euhedral crystals, 0.5 - 2.0mm in size. These are fresh but for a patchy, brownish turbidity and a very light dusting of sericite. They have the composition of oligoclase.

Minor quartz phenocrysts are also seen. These are smaller (0.2 - 1.0mm) and range from equant/subhedral to amoeboid in shape. Occasional plagioclase phenocrysts have graphically intergrown quartz.

The groundmass is an equigranular, anhedral aggregate of K-feldspar, mainly in the range 0.05 - 0.2mm, but with some finer, felsitic patches. It typically shows a strong, feathery/eutectoid, internal texture which is a form of granophyre, and presumably includes a substantial proportion of intimately intergrown quartz and/or plagioclase. It closely resembles 19P in this respect. The rock may thus be more siliceous, overall, than the minor content of quartz phenocrysts suggests.

Mafics are sparse. They consist of small, scrappy patches and wisps of olive-coloured biotite. Much of this is a very fine-grained felted type, of secondary aspect, locally intergrown with minutely acicular amphibole. Small granules of sphene and diffuse, sub-opaque rutile/leucoxene are often associated with the mafic patches.

This rock is probably a minor intrusive of monzonite to quartz-monzonite composition.

Sample 27P **CHLORITIC WACKE**

Estimated mode

Quartz	22
Plagioclase	48
K-feldspar	trace
Chlorite	20
Sericite) Biotite)	8
Carbonate	trace
Apatite	trace
Rutile) Sphene)	2

This is a weakly foliated rock consisting predominantly of plagioclase and quartz as individual grains and microgranular clumps and lenses in a foliaceous matrix of chlorite.

Plagioclase occurs as individual, randomly oriented, stumpy subhedra, 0.2 - 0.7mm in size. These are fresh and clear and appear to represent crystal clasts. Quartz occurs as clumpy/lensy, microgranular aggregates of grain size 20 - 200 microns. Plagioclase grains - largely untwinned - are intergrown with the quartz in uncertain proportion.

Plagioclase also occurs as diffuse, granular mosaics often showing pervasive sericitization, and having the appearance of a devitrified glass. This material occurs as patches, 0.5 - 2.0mm in size, possibly representing remnant lithic clasts.

These quartzo-feldspathic components are intergranularly cemented by chlorite, which forms flaky pockets and irregular networks outlining the trains of plagioclase crystals and quartz aggregate lenses. The chlorite exhibits a general preferred orientation and defines an irregular 'lumpy' foliation.

Very fine-grained sericite and or biotite locally occurs intergrown with the chlorite, and pervasively permeates some fine felsitic patches (altered lithic clasts).

Flecks and wisps of sphene and rutile are closely associated with the chloritic interstitial phase.

The textural aspect of this rock is of a mildly sheared volcaniclastic or wacke, in which the chloritic matrix has been partially recrystallized, but the primary clastic outlines are still well preserved. It is probably of related type to the sericitic wackes 8P and 21P, but is of less potassic composition.

Sample 28P **GRANITE PORPHYRY**

Estimated mode

Quartz	33
Plagioclase	28
K-feldspar	38
Sericite	1
Biotite	trace
Jarosite	trace

This is a rock of similar general type to 19P, though differing in some particulars.

It is made up of phenocrysts of quartz, K-feldspar (microcline microperthite) and plagioclase, 0.5 - 5.0mm in size, in a finer grained groundmass.

The feldspar phenocrysts show pervasive mild turbidity and, in the case of plagioclase, are sometimes flecked with sericite.

Mafics are extremely sparse, being limited to rare, tiny grains of altered biotite. These are variably replaced by sericite, rutile and a brownish cryptocrystalline material which may be jarosite. The latter is also seen as rare hairline veinlets.

The groundmass is of distinctive texture. It consists of abundant, blocky, subhedral grains of microcline and minor plagioclase, 0.02 - 0.2mm in size, densely disseminated through a continuum of rather coarser, anhedral quartz. Locally this fabric approaches a graphic texture. The feathery eutectoid groundmass textures seen in 19P are not present here.

Like that sample, however, the rock is notably devoid of trace accessories or opaques. It is a typical siliceous, felsic porphyry of minor intrusive aspect.

Sample 29P **APLITE**

Estimated mode

Quartz	31
Plagioclase	18
K-feldspar	48
Sericite	2
Biotite	1
Rutile	trace
Limonite	trace

This sample is an evenly fine-grained igneous rock of strongly potassic composition (see stained cut-off block).

Its texture is essentially identical to that of the groundmass in sample 28P, and it is probably of related origin. It lacks coarse phenocrysts characterising the previous sample, and is evenly microgranular but for rare, euhedral, microphenocrysts of quartz, to 0.5mm in size.

It consists of K-feldspar, quartz and minor plagioclase in intimate intergrowth. The quartz forms an anhedral mosaic, of grain size 0.2mm, within which abundant, smaller (0.02 - 0.1mm) blocky, prismatic grains of feldspar are developed - often concentrating as clumpy segregations. Occasional areas of aggregated K-spar show incipient development of the feathery eutectoid texture seen in 19P.

Mafics are rare. They consist of scattered tiny flakes and shreds of biotite, sometimes altered to sericite and rutile. Diffuse flecks of limonite staining are also noted.

The composition of this rock is in the granite/rhyolite field. Its texture is atypical of an intrusive than granite or an extrusive rhyolite, and it is tentatively classified as an aplite.

Sample 30P

SHEARED METASEDIMENT (DOLOMITIC SILICEOUS WACKE)

Estimated mode

Quartz	48
K-feldspar	1
Sericite	28
Carbonate	20
Chlorite	3
Apatite	trace
Rutile	trace

This is a strongly foliated rock composed of a matrix of granular quartz with abundant schlieren and networks of intergrown sericite and carbonate.

The quartz is of grain size 0.02 - 0.1mm, and consists of a crenulate-margined aggregate of anhedral grains, 0.02 - 0.1mm in size. The grains are more or less flattened, strongly strained and partially recrystallized.

The fabric has the aspect of a sheared, fine-grained, impure quartzite.

Minor amounts of K-feldspar are present, as sporadic felsitic wisps and flecks, but the rock does not appear to contain plagioclase.

Sericite forms abundant, close-spaced, anastomosing wisps and semi-continuous, sinuous schlieren, made up of partially coalescent flakes to 0.3mm in length.

Minutely fine-grained carbonate (unreactive to dilute acid and probably dolomitic) forms irregular clumps and semi-continuous networks, partly intimately intergrown with the sericite, and partly independent of it: some of the larger carbonate clusters have intergrown very fine-grained chlorite.

This is a dynamically metamorphosed, impure (argillaceous/dolomitic) quartzite or siliceous wacke.

Sample 67P **ARSENOPYRITE WITH VEIN QUARTZ**

Estimated mode

Quartz	26
Sericite	1
Scorodite	trace
Arsenopyrite	72
Marcasite	1
Mineral X	trace
Chalcopyrite	trace

This sample is a strongly mineralized rock consisting essentially of coarse-grained arsenopyrite with a quartz gangue.

The sulfides consist of homogenous, compact arsenopyrite, mainly of grain size 0.2 - 3.0mm. Grain size tends to be smaller at the peripheries of the sulfide masses, where the quartz gangue acts as an interstitial cement. Minor hairline veinlets and pockety segregations of quartz are seen throughout the coarse arsenopyrite clumps.

Accessories are minor. Marcasite and secondary pyrite (possibly after pyrrhotite) occur as small segments in some of the hairline quartz veins and interstitial pockets. Traces of chalcopyrite are sometimes also associated.

Mineral X is light grey and resembles tetrahedrite, but sometimes shows a weak birefringence. It may be a Pb-Sb sulfosalt. It occurs as rare, irregular pockets in quartz, peripheral to the arsenopyrite.

Rare flecks of scorodite (secondary Fe arsenate) are associated with some of the hairline quartz veinlets, or form threads in their own right.

The gangue is varigranular, anhedral, strained quartz of typical vein aspect. Minor sericite occurs as localized felted-textured pockets and discontinuous linear zones.

Sample 98P **SILICIFIED RHYOLITE(?)**

Estimated mode

Quartz	75
Sericite	24
Scorodite(?)	1

This is a rock of simple mineralogy but uncertain origin.

It consists essentially of quartz, as an equigranular, anhedral mosaic of grain size 0.1 - 0.3mm.

Sericite is the other constituent, occurring as clusters and networks of randomly oriented, tiny flakes, 0.02 - 0.05mm (rarely to 0.1mm) in size, evenly distributed throughout and mainly developed in the grain boundaries of the quartz mosaic.

The latter is unstrained, and sometimes shows traces of an apparent, more finely granular proto-texture in ghost form, defined by minute inclusions. It may, therefore, be of metasomatic origin, representing a totally silicified rock - possibly a rhyolite. Rare coarser quartz grains, to 2.0mm in size, clearly represent relict phenocrysts.

The rock is cut by occasional hairline veinlets (healed fractures) of quartz, and by irregular, anastomosing threads, small pockets, and tiny euhedral pseudomorphs of a brown, felted-textured mineral which appears to be the Fe-arsenate scorodite (the typical secondary breakdown product of arsenopyrite).

No sulfides are present in the slide, but the cut-off block includes a few tiny euhedral casts, one of which contains traces of arsenopyrite. It seems likely that these all represent the sites of original disseminated arsenopyrite, now leached out and/or plucked during slide preparation.