

ARIS SUMMARY SHEET

District Geologist, Nelson

Off Confidential: 89.08.29

ASSESSMENT REPORT 18027

MINING DIVISION: Fort Steele

PROPERTY: Golden Five

LOCATION: LAT 49 45 00 LONG 115 31 00

UTM 11 5511672 606857

NTS 082G12E 082G13E

CLAIM(S): BG 1, King Solomon, Queen of Shieba, Big Bend Boy, Honey Comb

OPERATOR(S): Sutton, R.

AUTHOR(S): Morris, R.J.

REPORT YEAR: 1988, 28 Pages

COMMODITIES

SEARCHED FOR: Lead, Copper, Silver, Gold

GEOLOGICAL

SUMMARY: Proterozoic, Creston Formation overturned sedimentary rocks are cut by fracture-filling quartz veins. The quartz carries galena and chalcopyrite with associated(?) silver and gold values.

WORK

DONE: Geochemical

LINE 0.4 km

ROCK 9 sample(s) ;ME

SOIL 42 sample(s) ;ME

MINFILE: 082G

LOG NO: 1129	RD.
ACTION:	
28 p.	
FILE NO:	

FILMED

GOLDEN FIVE MINERAL CLAIMS
SOUTHEASTERN B.C.
82G/13E

GEOCHEMICAL ASSESSMENT REPORT
FOR WORK PERFORMED IN OCTOBER, 1987

GEOLOGICAL BRANCH
ASSESSMENT REPORT

18,027

GEOCHEMICAL ASSESSMENT REPORT
GOLDEN FIVE MINERAL CLAIMS

Fort Steele Mining Division

N.T.S. Map: 82G/13E

(centered at approximately)

Northings: 5 511 600 N
Eastings: 607 100 E
Elevation: 1 554 m
Latitude: 115° 31'
Longitude: 49° 45'

Owned and
Operated by: R.A. Sutton
326545 Rossland Place
Clearbrook, B.C. V2T 3S8

Consultant: Beacon Hill Consultants Ltd.

Author: R.J. Morris, M.Sc.

Date: October 30, 1988

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Appendix 2	Laboratory Techniques ✓		

SUMMARY

The BG 1 claim surrounds the "Golden Five" reverted crown grants. Located in the Wild Horse River drainage the claim group is 18 kilometers northeast of Fort Steele. The BG 1 (2967), King Solomon (5451), Queen of Sheba (5452), Big Bend Boy (5453) and Honey Comb (5454) are all owned by Robert A. Sutton of Clearbrook, B.C.

Previous work includes three exploration tunnels totalling 64 m, geological mapping by the G.S.C. and B.C. Geological Survey and a brief geological assessment of the Golden Five.

The claims cover a portion of the east, overturned, limb of an anticline. The anticline is a drag fold on thrust faults to the east. The host strata is the Proterozoic Creston Formation.

Preliminary soil sampling shows that gold in soil is anomalous below the old underground workings. Of interest, is a major anomaly to the north of the old workings. There does not appear to be any correlation of any other element to gold in soil.

It is recommended that detailed geological mapping, prospecting and soil sampling be conducted, followed, contingent on positive results, with a program of road building and trenching.

INTRODUCTION

This report summarizes a preliminary geochemical soil sampling program conducted on October 31, 1987. Soil sampling was completed around three old adits to test its effectiveness and to determine why the underground work was done.

The four reverted crown grants were purchased from William Luke of Cranbrook by the author on October 13, 1987. The BG 1 claim was staked July 27, 1987 to increase the property size. On October 13, 1987 the author sold all interest in the BG 1 and the four reverted crown grants to Robert A. Sutton of Clearbrook, B.C.

The four reverted crown grants and the BG 1 claim were grouped August 29, 1988 as the Golden Five group.

PROPERTY DESCRIPTION

Location and Access

The BG 1 and Golden Five mineral claims are located one kilometer north of the confluence of the Wild Horse River and its East fork. The claims cover a portion of the east ridge of Mount Ruault with elevations ranging from 1300 to 2300 meters, Figure 1.

The property is 18 km northeast of Fort Steele and is accessible via the Wild Horse River road. Good logging roads cross the south corner of the property to within 180 meters of the old workings, Figure 2.

Claim Status

The Golden Five group comprises the following claims:

Claim Name	Lot No.	Record No.
King Solomon	5451	777(9)
Queen of Sheba	5452	778(9)
Big Bend Boy	5453	779(9)
Honey Comb	5454	780(9)
BG 1	--	2967(7)

The claims are owned and operated by Robert A. Sutton of 32655 Rossland Place, Clearbrook, B.C.

Summary of Previous Work

In the late 1800's and early 1900's considerable underground exploration was conducted, at least 64 meters in three adits.

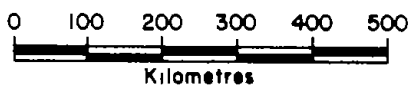
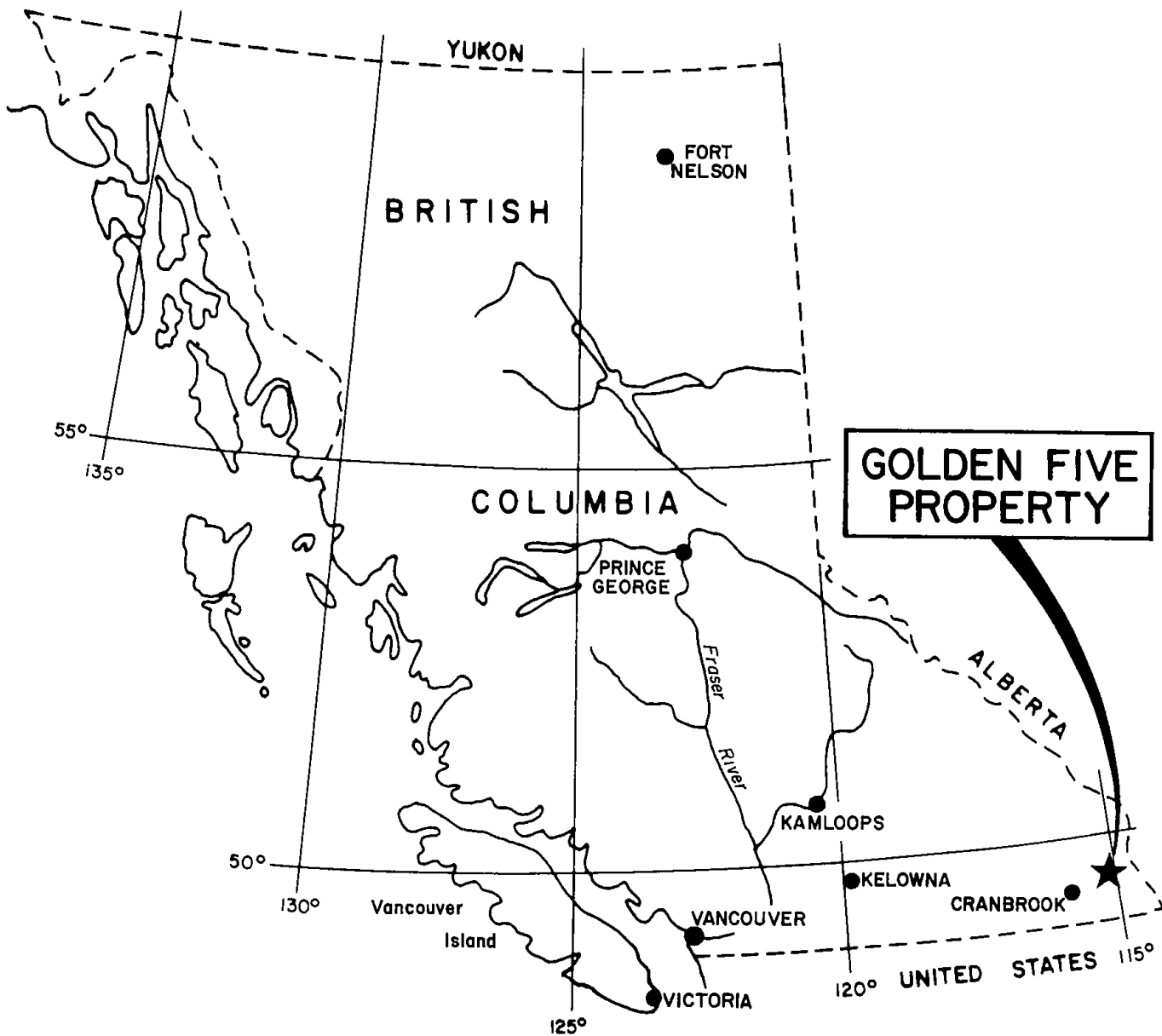
The area has been mapped by both the Geological Survey of Canada, Leach (1960) and by the B.C. Geological Survey, Höy (1978, 1979, 1984 and 1988).

A preliminary geological assessment by Morris (1987) is the only documented geological work specific to the property.

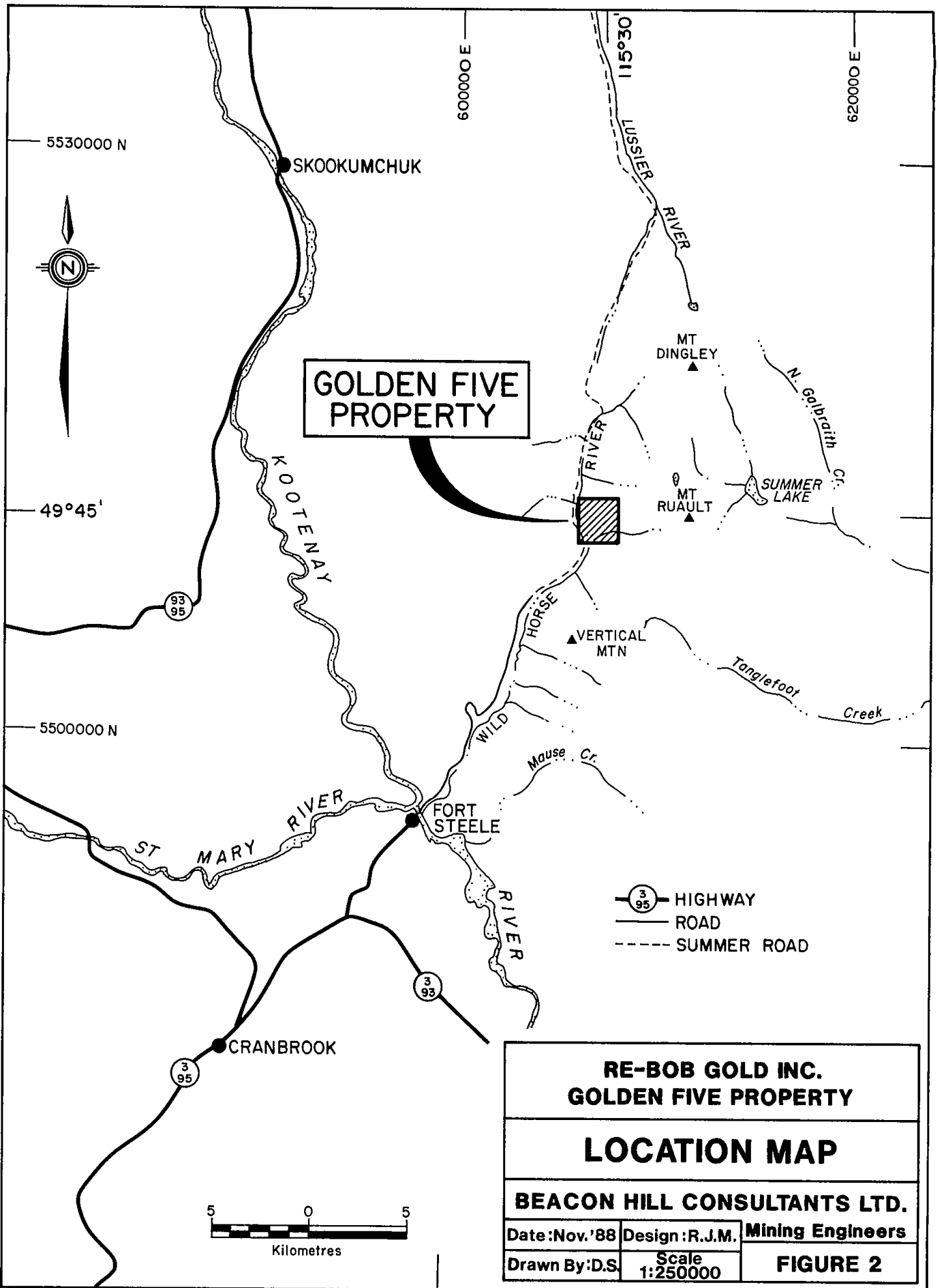
Summary of 1987 Work

As well as the geological assessment report on the Golden Five claims, Morris (1987), a preliminary geochemical survey was conducted.

The geochemical survey includes 42 soil samples and nine rock samples.



RE-BOB GOLD INC. GOLDEN FIVE PROPERTY		
INDEX MAP		
BEACON HILL CONSULTANTS LTD.		
Date: Nov. '88	Design: R.J.M.	Mining Engineers
Drawn By: D.S.	Scale 1:10,000,000	FIGURE 1



5530000 N

600000 E

620000 E

SKOOKUMCHUK

115°30'

LUSSEIER RIVER

RIVER

GOLDEN FIVE PROPERTY

MT DINGLEY

N. Galbraith Cr.

MT RUAULT

SUMMER LAKE

49°45'

93
95

KOOTENAY

HORSE
WILD
Mause Cr.

VERTICAL MTN

Tanglefoot

Creek

5500000 N

ST MARY RIVER

FORT STEELE

RIVER

3
95 HIGHWAY

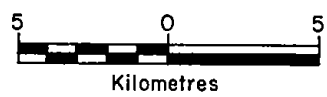
ROAD

--- SUMMER ROAD

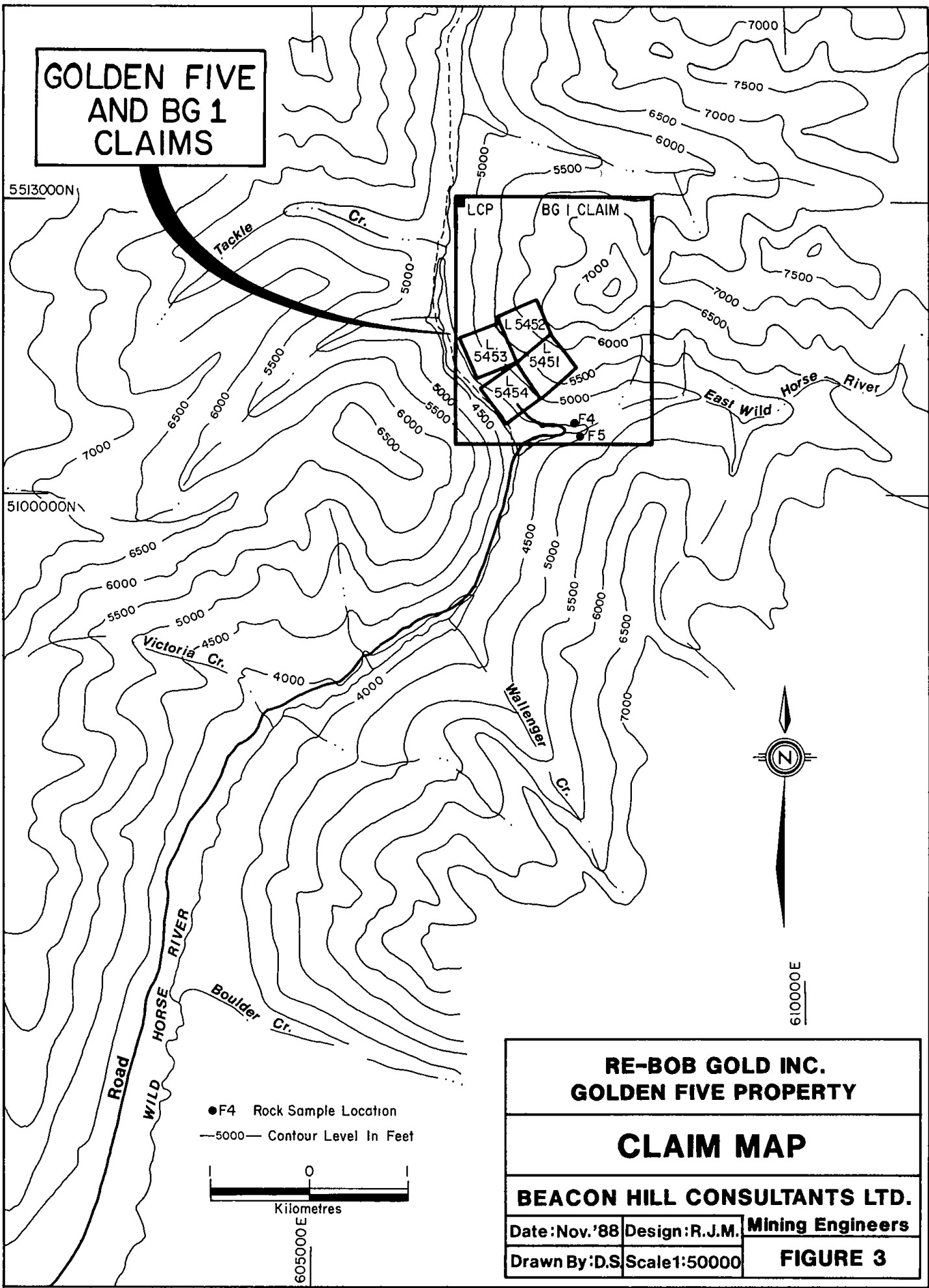
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95

CRANBROOK

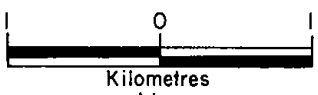
3
93



GOLDEN FIVE AND BG 1 CLAIMS



● F4 Rock Sample Location
 —5000— Contour Level In Feet



**RE-BOB GOLD INC.
 GOLDEN FIVE PROPERTY**

CLAIM MAP

BEACON HILL CONSULTANTS LTD.

Date: Nov. '88 Design: R.J.M. Mining Engineers

Drawn By: D.S. Scale 1:50000 **FIGURE 3**

GEOLOGY

Regional Geology

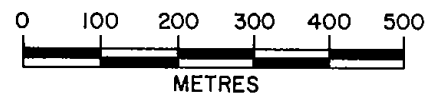
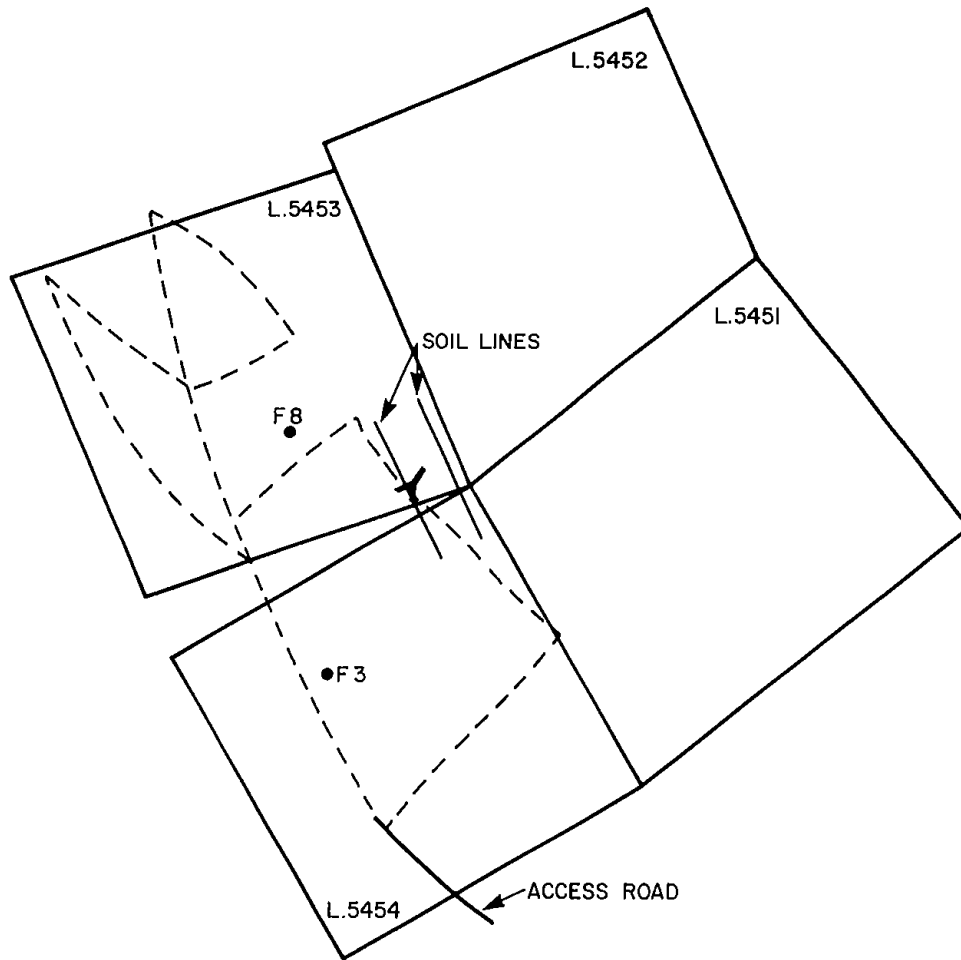
The Golden Five claims are within the main ranges of the Rocky Mountains and in close association with the Summer Lake intrusive.

The claims are underlain by Purcell Supergroup strata which is folded and overturned above thrust faults to the east. Intrusives include numerous dykes and sills and a quartz monzonite plug two kilometers to the southeast.

Detailed Geology

The claims are underlain by dark grey and green argillites of the Creston Formation. The strata are overturned and strike towards 200 degrees with dips 50 degrees to the west.

From the limited geological data gathered it appears that the underground exploration tested several preferred structures, a bedding plane with possible faulting and a vein system cross cutting the strata.



- ACCESS ROAD
- - - MAPPING TRAVERSES
- Y ADIT
- F3 ROCK SAMPLE
- SOIL SAMPLING LINES

RE-BOB GOLD INC. GOLDEN FIVE PROPERTY		
1987 WORK PROGRAM		
BEACON HILL CONSULTANTS LTD.		
Date: Nov. '88	Design: R.J.M.	Mining Engineers
Drawn By: D.S.	Scale 1:10000	FIGURE 4

THIS REPORT

		A	B	C	D	E	F	G	H			
		Pend Oreille Area	Dewar Ck-Summit Ck Areas	Kootenay-King Area	Mt Fisher-Moyre Lake Areas	Sage Creek ²	Northern Whitefish Range	Marias Pass ³	Southern Lewis and Clark Range			
MIDDLE PROTEROZOIC	BELT-PURCELL SUPERGROUP	Libby Fm	Mt. Nelson Fm									
		Striped Peak Fm		Dutch Creek Fm	Roosville Fm	Roosville Fm	Roosville Fm	Roosville Fm	unnamed	Garnet Range Fm		
		Wallace Fm	Siyeh Fm ¹		Phillips Fm	Phillips Fm	Phillips Fm	Phillips Fm	Phillips Fm	Red Plume Oz	McNamara Fm	
					Gateway Fm	Gateway Fm	Gateway Fm	Gateway Fm	Kintla Fm	Mount Shields Fm	Bonner Oz	
					Sheppard Fm	Sheppard Fm	Sheppard Fm	Sheppard Fm	Shepard Fm	Shepard Fm	Mount Shields Fm	Shepard Fm
					Nicol Creek Fm	Nicol Creek Fm	Nicol Creek Fm	Purcell Lava	Purcell Lava	Snowslip Fm	Snowslip Fm	
			Kitchener Fm	Kitchener Fm	Kitchener Fm	Siyeh Fm	Siyeh Fm	Siyeh Fm	Siyeh Fm	Helena Fm		
		St Regis Fm	Creston Fm	Creston Fm	Creston Fm	Creston Fm	Grinnell Fm	Grinnell Fm	Grinnell Fm	Spokane Fm exposed		
		Revelt Fm					Appekunny Fm	Appekunny Fm	Appekunny Fm			
		Burke Fm										
upper two mbr	upper unit	upper unit	upper unit	upper unit	Allyn Fm	base	not					
Prichard Fm	Aldridge Fm	Aldridge Fm	Aldridge Fm	Aldridge Fm	Waterton Fm							
					Fm 6							
					Fm 5							
					Fm 4							
					Fm 3							
Fm 2												
Fm 1												
base	not	exposed	base not	exposed								

¹ Use of the term 'Siyeh Formation' should be discontinued and be replaced by Van Creek and locally Nicol Creek Formations (McMechan et al, 1980)

² Formations 1 to 4 have only been identified in the Pacific-Atlantic No 1 well on Sage Creek

³ Harrison (1972) suggested replacing this terminology with that used in the Southern Lewis and Clark Range

Generalized lithostratigraphic correlation chart for the northern Belt-Purcell basin. Areas located in Fig. . except southern Lewis and Clark Range (47° 25'N, 113°W). Stratigraphic nomenclature after A - Harrison and Jobin (1963), B - Rice (1941), Reesor (1958), Glover (1978), C - Hoy (1979), McMechan et al (1980), D - Leech (1958), McMechan (1979), McMechan et al. (1980), E - Price (1962), F - Barnes (1963), Smith (1963), Johns (1970), G - Childers (1963), H - McGill and Sommers (1967)

from: McMECHAN, 1981

RE-BOB GOLD INC. GOLDEN FIVE PROPERTY		
STRATIGRAPHIC COLUMN		
BEACON HILL CONSULTANTS LTD.		
Date: Nov. '88	Design: R.J.M.	Mining Engineers
Drawn By: D.S.		FIGURE 5

GEOCHEMISTRY

Summary of Program

Two level lines were flagged using a compass and topo-fil chain. The lines were 20 meters apart with the lower one at the level of the lowest adit and the upper line at the level of the upper adit. Along the lines, sample stations were flagged every ten meters.

Samples consist of B-horizon material where soil is developed though station B8 represents a C-horizon sample.

The work party consisted of four men under the field supervision of Fred Gietz.

Appendix 1 lists the sample results while Appendix 2 describes the laboratory techniques.

Soil Sampling Results

A total of 42 soil samples were procured from two level lines to test the applicability of soil geochemistry as well as to determine the geochemical signature of the old underground workings.

Results indicate that there are three significant gold anomalies, Figure 7. The weakest anomaly surrounds the old working with high values twice threshold. A single sample anomaly is shown at site B14, this could represent the top of a larger anomalous area. The most significant anomaly is approximately 70 meters northwest of the old workings and includes four sample sites. Anomalous values are up to 54 times threshold. -

There does not appear to be any correlation between gold in soil and any other element.

Rock Sampling Results

A total of six rock samples were procured to determine the metal values of various rock types, Figures 3,4, and 7. The following describes the six samples:

- F1 - chip sample over 1.3 meter back wall of lower adit, approximately 13 meters from portal, Figure 7.
- F2 - grab sample from upper adit waste dump, Figure 7.
- F3 - float sample of quartzite and quartz veining, Figure 4.
- F4 - float sample of mafic volcanic, Figure 3.
- F5 - float sample of limestone breccia, Figure 3.
- F8 - outcrop sample of quartzite, Figure 4.

Samples F1 and F2 indicate high metal content in the quartz veins with high copper, lead, zinc, silver and significant gold.

THRESHOLD

RE-BOB GOLD INC.	
GOLDEN FIVE PROPERTY	
FREQUENCY HISTOGRAM	
GOLD IN SOIL	
BEACON HILL CONSULTANTS LTD.	
Date: Nov. '88	Design: R.J.M.
Drawn By: D.S.	Mining Engineers
	FIGURE 6

FREQUENCY

40

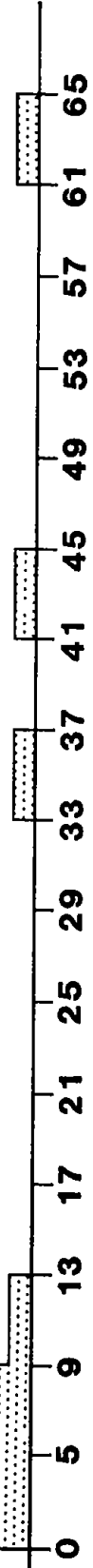
30

20

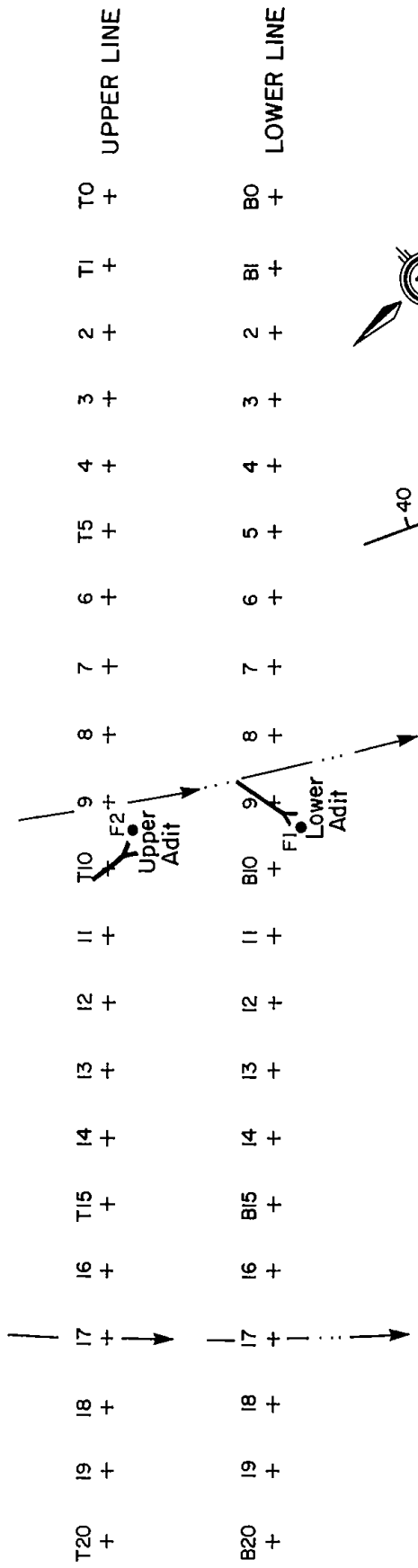
10

0

Sample Set = 42
Maximum = 270 p.p.b.
Minimum = 1 p.p.b.
Threshold = 5 p.p.b.

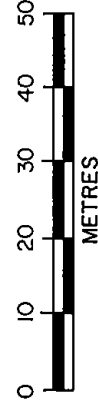


GOLD (p.p.b.)



B15
+
/ /
—
- - -
● F2

SOIL SAMPLE SITE AND NUMBER
APPROXIMATE STRIKE AND DIP OF BEDDING
ADIT
GULLY
ROCK SAMPLE



RE-BOB GOLD INC.
GOLDEN FIVE PROPERTY

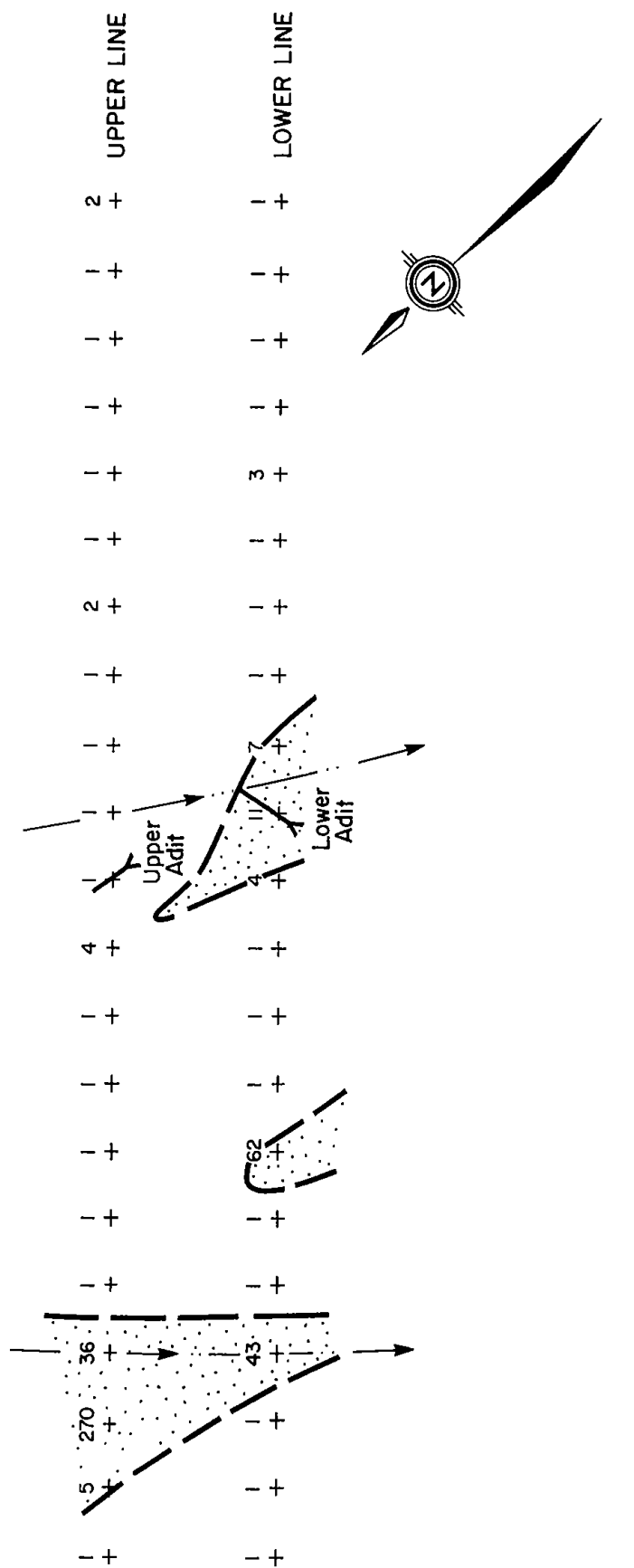
SOIL SAMPLE LOCATIONS

BEACON HILL CONSULTANTS LTD.

Date: Nov. '88 Design: R.J.M. Mining Engineers

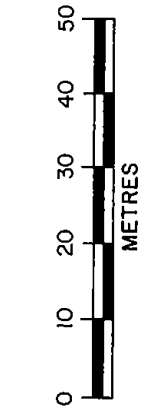
Drawn By: D.S. Scale 1:1000 **FIGURE 7**

RE-BOB GOLD INC. GOLDEN FIVE PROPERTY		
GOLD IN SOIL		
BEACON HILL CONSULTANTS LTD.		
Date Nov.'88	Design : R.J.M.	Mining Engineers
Drawn By: D.S.	Scale 1:1000	FIGURE 8



43 ← GOLD VALUE IN p.p.b.
+ ← SOIL SAMPLE SITE

OUTLINE OF ANOMALOUS AREA
ADIT
GULLY



CONCLUSIONS AND RECOMMENDATIONS

During 1987 prospecting, geology and soil sampling was started on the Golden Five mineral claim group. The preliminary geological work located three old adits which appear to have tested a bedding plane fault (thrust?) and associated vein system.

Preliminary soil sampling appears to be effective in locating gold anomalies. The old underground workings area is weakly anomalous in gold while two other areas are even more attractive. There does not appear to be any correlation between gold in soil and any other element.

It is recommended that a program of geological mapping, prospecting and soil sampling be conducted on the Golden Five group. Contingent on a successful phase 1 program a follow-up program of road building and trenching is suggested. The following itemizes the recommended two phase program:

Phase I

- Geological mapping: 10 days x \$400	\$4,000.00
- Soil sampling: 7 days x \$120 x 3 men	\$2,520.00
- Laboratory testing: 1500 samples x \$13	\$19,500.00
- Truck rental: 10 days x \$50	\$500.00
- Shipping, supplies:	\$500.00
- Report preparation, typing, drafting:	\$1,000.00
- Program evaluation and reporting: 10 days x \$400	\$4,000.00

Sub-total	\$32,020.00

Phase II

- Road building and trenching: 20 days x \$1,000	\$20,000.00
- Field supervision: 20 days x \$150	\$3,000.00
- Truck rental: 20 days x \$50	\$1,000.00
- Report preparation, typing, drafting:	\$2,000.00
- Program evaluation and reporting: 5 days x \$400	\$2,000.00

Sub-total	\$28,000.00
Phase I and II Sub-total	\$60,020.00

ITEMIZED COST STATEMENT

Field Crew -	Fred Gietz x \$125/day	\$125.00
	3 helpers x \$125/day	\$375.00
Transportation -	2 trucks x \$25/day	\$50.00
Geochem supplies and shipping		\$79.70
Geochemistry -	49 ICP analysis x \$6.00	\$294.00
	49 Geochem Au assay x \$4.25	\$208.25
	41 Soil sample prep. x \$0.75	\$30.75
	8 Rock sample prep. x \$3.00	\$24.00
Air photos		\$302.46
Map enlargement		\$54.00
Report preparation, drafting		\$770.00
R.J. Morris, 11 hrs x \$50/hr		\$550.00

		\$2,863.16

STATEMENT OF QUALIFICATIONS

I Robert J. Morris, Associate Consultant, 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 hold no interest, nor expect any, in the Golden Five group of mineral claims, or holding company.
- 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.

Vancouver, B.C.

R. J. Morris

R.J. Morris, M.Sc.

Beacon Hill Consultants Ltd.

88.11.15

Fred Gietz, Field Supervisor - Credentials

Fred Gietz is a high school science teacher in Fernie, B.C. and was field supervisor for the sampling program. His job included locating sample lines and sites and prospecting.

Fred's geological experience includes several summers with Kootenay Exploration (Cominco), and numerous field contracts with the author in mineral exploration.

REFERENCES

- Höy, T., 1978 Geology of the Estella - Kootenay King Area, S.E. British Columbia. B.C.E.M.P.R., Preliminary Map No. 28.
- Höy, T., 1979 Geology of the Estella - Kootenay King Area, Hughes Range, S.E. British Columbia. B.C.E.M.P.R. Preliminary Map No. 36.
- Höy, T., 1984 Geology of the Cranbrook Sheet and Sullivan Mine Area. B.C.E.M.P.R. Preliminary Map No. 54.
- Leach, G.B., 1960 Fernie Map - area, West Half. G.S.C. Map 11-1960.
- McMechan, M.E., 1981 The Middle Proterozoic Purcell Supergroup in the Southwestern Rocky and the Southeastern Purcell Mountains, B.C. and the initiation of the Cordilleran Miogeocline, southern Canada and adjacent United States. Bull. of Can. Pet. Geol., Vol. 29, No. 4, p. 583 - 621.
- Morris, R.J., 1987 Golden Five claims, assessment report no. 87-626-16444.

Soil Samples: BG 1 - Golden Five

SAMPLER	MO	CU	PB	ZN	AS	U	AU	TH	SR	CD	SO	BI	V	CA	P	LA	CR	MG	BA	TI	B	AL	NR	K	M	AUI
	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH
T16	1	12	14	63	.1	15	15	4	15	1	2	2	17	.22	.074	13	11	.27	384	.08	2	2.35	.02	.07	1	1
T17	1	8	15	42	.1	10	10	2	12	1	2	2	13	.22	.043	17	10	.27	236	.04	3	1.36	.01	.09	1	36
T18	1	14	15	40	.1	13	13	4	5	1	2	2	16	.06	.022	24	10	.39	143	.03	3	1.31	.01	.09	1	270
T19	1	15	6	59	.2	14	14	4	24	1	2	2	20	.38	.177	7	9	.20	302	.11	7	3.49	.04	.07	1	5
T20	1	13	18	81	.1	16	16	4	26	1	2	2	20	.40	.328	5	9	.20	576	.15	4	4.01	.04	.08	1	1
STD C/AU-5	19	60	38	133	7.4	70	29	39	48	18	17	20	59	.49	.082	40	61	.88	181	.07	37	1.86	.06	.14	11	52

- Duplicate F7

Rock Samples - BG 1 Golden Five

SAMPLE#	MO	CU	PB	ZN	AS	AG	NI	CO	MN	FE	AS	U	AU	TH	SR	CD	SB	BI	V	CA	P	LA	CR	ME	BA	TI	B	AL	MA	K	W	AU#	PPB
B8	1	20	31	224	.2	6	6	3	108	1.44	2	5	ND	6	4	2	3	2	3	.20	.028	21	4	.13	41	.01	2	.44	.01	.24	1	7	
F1	4	260	22031	29	171.1	4	4	4	43	3.07	12	5	ND	1	8	7	8	248	1	.10	.003	2	1	.01	22	.01	2	.04	.01	.01	2	590	
F2	13	2018	22413	9537	84.7	2	2	2	26	1.30	15	5	ND	1	14	144	118	74	1	.01	.002	2	1	.01	11	.01	2	.02	.01	.02	1	920	
F3	5	722	1085	28	2.4	9	4	4	911	2.54	2	5	ND	2	22	1	2	3	1	3.76	.041	4	3	1.20	231	.01	2	.16	.01	.11	1	12	
F4	4	21	1057	49	.9	5	5	5	197	.87	4	7	ND	2	52	1	3	2	5	20.38	.003	3	4	10.35	32	.01	11	.42	.01	.34	1	4	
F5	13	44	120	19	.4	10	10	7	420	5.83	158	5	ND	1	38	1	11	2	17	14.48	.005	2	2	9.31	22	.01	2	.01	.02	.02	1	1	
F6	14	77	116	47	.1	39	1	7	134	3.37	31	7	ND	3	25	1	3	3	16	1.86	.093	9	7	.75	70	.01	8	.49	.02	.27	1	1	
F7	1	1	11	72	29	.1	8	4	418	1.92	3	7	ND	5	11	1	2	2	10	.62	.068	17	8	.47	205	.04	3	1.28	.02	.21	2	1	
F8	1	8	108	17	.1	4	4	1	666	1.10	2	5	ND	1	3	1	2	2	5	.05	.012	2	3	.15	103	.01	7	.17	.01	.05	1	1	
F9	1	1930	27	5	.2	1	1	4	745	2.28	4	5	ND	2	547	1	2	2	1	.93	.010	10	2	.05	155	.01	2	.07	.01	.02	1	1	
E-4	3	48	18	9	.2	6	6	13	981	5.25	4	5	ND	2	107	1	3	2	1	.03	.015	17	3	.04	93	.01	5	.08	.01	.07	1	1	
STD C/MU-R	20	61	42	132	7.3	49	49	29	1050	3.98	42	21	7	38	48	20	17	22	40	.47	.041	41	59	.89	180	.07	36	1.94	.07	.14	12	510	

- Not from BG 1
 - Duplicate T16
 }not from
 }BG 1 Property

ASSAY REQUIRED FOR CORRECT



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 and 1000 times lower than ICP or flame AA. These detection limits are comparable to graphite furnace AA, but the mass spec can analyze up to 40 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. One 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 UVA 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 analyzed 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, Caprose Lake Trout Lake, Macleod, Red Mountain, Carolina, Cirque, Kinago River, Queanem, Tetra 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 50 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 top horizon gives good base metal responses. Supply about one cup of material in soil or paper envelope. The soil or paper should be treated in one of the 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.,
 140 - 11th 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. (I.A.T.)

Pap. of sludge concentrates are best treated by cyclone concentration and fire assay for total Au.



GEOCHEMICAL LABORATORY METHODOLOGY & PRICES - 1977

Sample Description	Price
#80 Soils or silts up to 2 lbs drying at 60 deg.C and sieving 30 gms -80 mesh (other size on request)	\$.75
#21 Saving part or all reject	.35
#20R Soils or silts - drying at 60 deg.C and sieving -20 mesh & pulverizing (other mesh size on request.)	2.00
#P Soils or silts - drying at 60 deg.C pulverizing (approx. 100 gms)	1.50
#R100 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
#R5100 Same as #R100 except sieving to -100 mesh and saving +100 mesh	3.75
#R5100 1/2 Same as above except pulverizing 1/2 the reject	2.50/lb
#R5100 A Same as above except pulverizing all the reject	2.50/lb
COP Compositing pulps - each pulp	.50
Mixing & pulverizing	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
M1 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	45 x 65	\$110.00/thousand
Plastic bags	70 x 100 with gusset	\$110.00/hundred
Plastic bags	70 x 100	\$20.00/hundred
Ties	12" x 20" @ 25	\$4.00/hundred
Assay tags	M/C	\$5.00/liter
10% HCl		\$1.00/each
Dropping bottles in test		\$10.00/each liter

Conversion Factors

1 Troy oz = 31.10 g
1 oz/ton = 34.3 ppm = 31.3 g/tonne = 34,300 ppb
1 g = 10,000 ppm



GEOCHEMICAL ANALYSES - Rocks and Soils

Group I Digestion

50 gram sample is digested with 3 ml 3-1-2 HCl-HNO₃-H₂O at 55 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, and very slight for refractory elements. Solubility limits for Pb, Sb, Bi, W for high grade samples.

Group IA - Analysis by Atomic Absorption.

Element	Detection limit	Element	Detection limit
Aluminum	2 ppm	Copper	1 ppm
Barium	0.1 ppm	Iron	2.01 ppm
Calcium	0.1 ppm	Lithium	2 ppm
Chromium	1 ppm	Manganese	5 ppm
Cobalt	1 ppm		

First Element \$2.25 Subsequent Element \$1.00

Group IB - Hydrolyze generation of volatile elements and analysis by ICP.
This technique is unsuitable for sample grading over 1% Ni or Cu.

Element	Detection limit
As	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 IC - 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 are retained for reanalysis. The reduced Hg is swept out of the solution and passed into the cell where it is measured by AA.

Group ID - ICP Analysis, same digestion

Element	Detection limit
Ag, Cd, Cr, Cu, Mn, Ni, Sr, Zn	0.1 ppm
Ba, Al, Fe, Pb, Si, S, Ti, V, Y	1 ppm
Li, Na, K, Rb, Cs, Sr, Ca, V, Ca, P, Al, Ca, Fe, K, Mg, Na, P, Ti	2 ppm
Any 2 elements	\$3.25
Any 5 elements	4.25
All 10 elements	5.25
All 30 elements	6.00

Group IE - Analysis by ICP/AAS

Element	Detection limit
Rb, 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 - Hg, Cu, Pb, Zn, Ag, Cd, Ni, Mn, Fe, As, Sr, Co, V, Ca, P, Li, Cr, Mg, Ti, Al, Na, K, Cs, Ba, Sr, Bi	\$8.00
P by Specific Ion Electrode - detection	20 ppb
U by UAJ - detection	.1 ppm
	1.50
	1.50

* Minimum 20 samples or \$5.00 surcharge for ICP or AA and \$15.00 surcharge for ICP/AAS. 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 LiBO2 dissolved in 50 ml 5% HNO3 and analyzed by ICP; (other whole rock elements are also determined)	10 ppm	\$3.50
Carbon	LECO (total as C or CO2)	.01 %	5.25
Carbon (graphite)	Carbon sulfur bath by LECO	.01 %	6.25
Chromium	HCl leach before LECO	.01 %	7.25
Chromium	0.50 gram samples are fused with 3 gm Na2O2 dissolved in 50 ml 20% HCl, analysed by 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
Zinc	1.00 gram samples are fused with KAlF4. 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 Na2O2 dissolved in 20 ml H2O, analysed by ICP.	1 ppm	3.25

Group 3 - Geochemical Noble Metals

Element	Method	Detection	Price
Ag	10.0 gram samples are ignited at 600 deg. C, digested with hot aqua regia, extracted by HMBK, analysed by graphite furnace AA.	1 ppb	\$ 4.25
Au, Pt, Rh	10.0 gram samples are fused with a Ag Inquest with fire assay fuses. After cupellation, the fuses are 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 LiBO2 and are dissolved in 50 ml 5% HNO3.
S102, Al2O3, Fe2O3, CaO, MgO, Na2O, K2O, MnO, TiO2, P2O5, Cr2O5, LOI + Ba by ICP.
Price: \$3.75 first metal \$1.00 each additional \$3.00 for All.

Group 4B - Trace elements

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

Group 4C - analysis by ICP/MS.

Be, Nb, I, 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

Element	Method	Price	Element	Method	Price
Aluminum	(Al)	7.50	Molybdenum	(H2O)	5.00
Antimony	(Sb)	7.50	Molybdenum sulfide	(Mo)	6.75
Arsenic	(As)	7.50	Niobium	(MoS2)	7.50
Bismuth	(Bi)	7.50	Nickel	(Ni)	10.00
Boron	(B)	7.50	Nickel (Non-sulfide)	(Pd)	7.50
Calcium	(Ca)	6.75	Phosphorus	(P)	12.50
Carbon (Total)	(C)	7.50	Potassium	(K)	7.50
Carbon (graphitic)*	(C)	7.50	Rhodium	(Rh)	12.50
Carbon plus sulfur (Total)*	(C)	11.00	Rubidium	(Rb)	7.50
Chromium	(Cr)	10.00	Selenium	(Se)	10.00
Cobalt	(Co)	6.75	Silver	(Ag)	6.75
Copper	(Cu)	6.00	Silver (Fire Assay)	(Ag)	9.00
Copper (non-sulfide)	(Cu)	6.00	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)	(Au)	6.75	Tellurium	(Te)	10.00
Gold plus silver (Fire Assay)	(Au)	11.25	Thallium	(Tl)	7.50
Indium	(In)	7.50	Thallium	(Tl)	6.00
Iron (Total)	(Fe)	7.50	Titanium	(Ti)	7.50
Iron (Ferrous)*	(Fe)	7.50	Tungsten	(W)	7.50
Lanthanum	(La)	7.50	Uranium	(U)	7.50
Lithium	(Li)	7.50	Vanadium	(V)	7.50
Lead	(Pb)	6.75	Xenon	(Xe)	10.00
Loss on Ignition	(LOI)	2.00	Zinc	(Zn)	6.75
Magnesium	(Mg)	7.50	Zinc	(Zn)	6.75
Manganese	(Mn)	7.50	Zirconium	(Zr)	20.00
Mercury	(Hg)	7.50	Zr isotope Ratio		

* Minimum 5 samples per batch
Other elements by Nass 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

S102, Al2O3, Fe2O3, CaO, MgO, Na2O, K2O, MnO, TiO2, P2O5, Cr2O3, 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
Placer conc. for total precious metal \$20.00
\$15.00