82-176-10245

COMINCO LTD.

EXPLORATION NTS: 94E/13

WESTERN DISTRICT

ASSESSMENT REPORT

1981 GEOLOGICAL, GEOCHEMICAL AND TRENCHING REPORT

ON THE

BILL 1, 2, 3 and T-BIRD 1,2,3,4,5,6 MINERAL CLAIMS

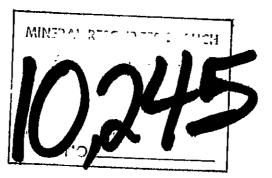
IN THE STIKINE RIVER AREA

LIARD MINING DIVISION, BRITISH COLUMBIA

LATITUDE: 57°45'N - LONGITUDE: 127°45'W

OWNER AND OPERATOR: COMINCO LTD.

PERIOD OF WORK: JUNE 17 - AUGUST 26, 1981



23 MARCH 1982

R.J. SHARP

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ATTACHMENTS

Appendix A: Exhibit "A" - Itemized Cost Statement 1. 2. Appendix B: Author's Qualifications Figure 1: General Location Map 3. Figure 2: Location Map 1:250,000 Scale. Figure 3: Claim Map. 4. 5. Plate B81-1: Geology 6. Plate B81-2: Soil Geochemistry, Au (ppb) 7. Plate B81-3: Soil Geochemistry, As (ppm) Plate B81-4: Rock Geochemistry, Au (ppb), As (ppm), Ag (ppm) Plate B81-5: Rock Geochemistry, Cu (ppm), Pb (ppm), Zn (ppm) 8. 9. 10.

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COMINCO LTD.

EXPLORATION NTS: 94E/13 WESTERN DISTRICT 23 March 1982

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BILL 1, 2, 3 and T-BIRD 1,2,3,4,5,6 MINERAL CLAIMS

IN THE STIKINE RIVER AREA

LIARD MINING DIVISION, BRITISH COLUMBIA

SUMMARY

- 1. The Bill and T-Bird claims are located 135 km southeast of Dease Lake, British Columbia and cover gold-arsenic anomalies in soils and rocks.
- 2. Work in 1981 consisted of geological mapping, rock and soil geochemistry, and trenching.
- 3. This work has shown a broad gold and arsenic soil anomaly overlying a sequence of Mississippian metavolcanic-metasedimentary rocks.
- 4. The rocks have undergone complex structural deformation resulting in shearing, faulting, folding and doming in the central part of the claims.

INTRODUCTION

This report describes the geology, soil and rock geochemistry at Cominco's Bill claims, 135 km southeast of Dease Lake, British Columbia (see Figures 1 and 2). This report is based upon field investigations by geologists R.J. Sharp, and P.D. Leriche and assistants A.D. Croft, J. Lavigne and M. Wawrchuk during the period June 17 to August 26, 1981. The work was supervised by Dr. R.Y. Watanabe.

The program this year consisted of geological mapping, soil and rock geochemistry and trenching. To establish sample control a N-S baseline was surveyed in using a transit and chain (employing terrain corrections) and E-W lines were extended from the baseline. All lines were marked by pickets. Sample locations and geology were plotted on a 1:5,000 scale topographic map.

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PROPERTY AND OWNERSHIP

The Bill claim group comprises 3 claims totalling 43 units and the T-Bird claim group consists of 6 claims totalling 100 units; all 143 units are 100% owned by Cominco Ltd. (see Figure 3). This report files credit for all 3 Bill claims and all 6 T-Bird claims, which are listed below:

<u>Claim Name</u>	Record Number	Assessment Credits	<u>Due Date</u>
Bill 1 Bill 2 Bill 3 T-Bird 1 T-Bird 2 T-Bird 3 T-Bird 4 T-Bird 5 T-Bird 6	1199 1200 1201 1891 1892 1893 1894 1895 1896	5 years 5 years	March 7, 1987 March 7, 1987 March 7, 1987 April 15, 1987 April 15, 1987 April 15, 1987 April 15, 1987 April 15, 1987 April 15, 1987

LOCATION AND ACCESS

The property is situated in the Liard Mining Division at 57⁰45'N and 127⁰45'W, NTS 94E/13, about 135 km southeast of the settlement of Dease Lake. Access is by helicopter either from Dease Lake or from Eddon-tenajon near Iskut on the Cassiar-Stewart highway.

The claims are situated in rugged terrain (1500 to 2000 m above sea level) in the Stikine Mountain Range. Most of the claims lie above treeline and are covered with grass and small shrubbery. North-facing slopes are steep cliffs while south facing slopes are moderately inclined and covered with overburden or talus.

SUMMARY OF WORK

Detailed geology and geochemical maps have been prepared on a scale of 1:5,000. Total area surveyed to is approximately 1575 hectares. A total of 353 soils were analyzed for gold, 351 soils analyzed for arsenic and 135 rocks were analyzed for Au, As, Ag, Cu, Pb, Zn; results are plotted in Plates B81-1,2,3,4 and 5.

DETAILED TECHNICAL DATA AND INTERPRETATION

Regional Geology

The Bill claims are underlain by an assemblage of metamorphosed volcanic and sedimentary rocks. Thorstad (1980) suggests a Mississippian age for these rocks. Upper Triassic rocks of the Takla Formation and Lower Jurassic rocks of the Hazelton Formation lie to the west and east of the claims. Lower Jurassic quartz monzonite and granodiorite underlie a large area to the north, east and south of the claims.

Detailed Geology

The detailed geology of the Bill claims and parts of the T-Bird claims is shown in Plate B81-1. This map combines all current geological data on the claim group and shows the lithologic and structural complexities of the rocks underlying the area.

The sedimentary and volcanic rocks underlying the claim group have been regionally metamorphosed to lower greenschist grade and have been subjected to at least two phases of folding. Shearing has transformed most of the volcanic and sedimentary rocks into schist and phyllite but numerous textures have been preserved allowing one to classify them according to original rock type. The volcanic rocks are mainly tuffaceous except for some massive or locally pillowed basalt. The sedimentary rocks are weakly to moderately carbonaceous siliceous siltstone, often associated with crinoidal limestone, and are found as layers or lenses intercalated with the intermediate to felsic tuffs. Calcareous sandstone and quartzite band represent a volcaniclastic stage of sedimentation which is locally gradational into carbonatized dacite to rhyolite tuff. A more distinctive sequence of sedimentary rocks made up of pelite and greywacke structurally overlies the volcanic stratigraphy and does not appear to be derived from erosion of the volcanic pile.

The extremely intercalated nature of the volcanic-sedimentary rocks as well as hydrothermal alteration and structural deformation makes mapping and correlation of lithologies difficult. To simplify mapping, 9 basic rock categories were defined and each category was subdivided based on lithology, texture, or composition.

Basalt (unit 1) forms the base of the volcanic pile and is overlain by a dominantly andesite tuff sequence; (unit 2, up to 110 m thick). A dacite crystal tuff horizon (unit 3, up to 125 m thick) contains intercalated rhyolite tuff to tuffite beds (unit 4, 1-5 m thick); minor beds of chemical or fine clastic sedimentary rocks (unit 5, 2-20 m thick); and abundant beds of carbonatized volcanic-sedimentary rocks (unit 6, 2-10m thick). This sequence, often over 100 m, composed of 1-2m thick dacite and andesite tuff beds, are highly variable in their dacite: andesite ratio and have been designated as a separate map unit (unit 7, 1-250 m thick) and subdivided as being dacite - or andesite-rich. Quartz veins (unit 8), 5 to 50 cm thick, are commonly found with sericitized or carbonatized rocks and usually carry specs to 1 cm thick veinlets of arsenopyrite or pyrite. Intrusive rocks are not abundant and generally occur as narrow (less than 1 m) dikes of rhyolite, and gabbro; a foliated diorite plug (75 m wide) is exposed in the center of the Bill claims.

Arsenopyrite is the most important metallic mineral. It occurs as fracture fillings in quartz veins and in hydrothermally altered tuffs and tuffites. Some 50 cm patches carry up to 15% arsenopyrite but the average abundance in such zones is commonly less than 2%, often showing in only trace amounts. Pyrite is scattered throughout the altered tuffs and tuffites, usually making up less than 1% of the rock, and is probably a primary sulphide precipitated on the sea floor when the rocks accumulated.

3.

Structural Geology

Nearly all rocks on the claim group exhibit some degree of foliation. The more massive basaltic rocks and the more competent siliceous siltstone lenses show much weaker foliation than do the altered felsic tuff and tuffites which are often highly sheared. Kink bands in the sheared felsic tuff indicates two periods of deformation. The rocks in the central part of the claims have been domed to form a NE-SW trending doubly plunging anticlinal fold. A syncline is evident in the southern portion of the claims. Prominent scarps have been produced by NW and NE trending high angle faults. Thrust faulting has displaced some of the western rocks toward the east in T-Bird 1.

MINERALIZATION

Auriferous arsenopyrite occurs as late stage fracture fillings in quartz veins and pods or along sericitized (<u>+</u> silicified) fractures in carbonatized felsic tuff and tuffite. Because of their less resistant nature, the host rocks have weathered away leaving clusters of quartz vein rubble in a mixture of disintegrated rock and soil. The podiform nature of the quartz veins makes it difficult to follow one mineralized trend. The mineralized sections are commonly narrow (<1 m wide) and short (<3 m long) and, although scattered over a wide area, do not appear to be interconnected at the surface.

GEOCHEMICAL SURVEY

Field and Analytical Techniques

The geochemical survey consisted of soil and rock sampling on the Bill and T-Bird claims. All soil samples were collected from either the B soil horizon at a depth of 15-25 cm below surface or from the "fines" at a similar depth on talus covered slopes. Rock chip samples weighing 3 kg were collected from outcrops (2-3 m in diameter) on the claim group, and were stored in labelled plastic bags. The soil samples were stored in large kraft sample envelopes and shipped to the laboratory for analyses.

All samples were analyzed at the Cominco Exploration Research Laboratory, 1486 East Pender Street, Vancouver, B.C. The soil samples were dried and sieved to -80 mesh then analyzed for Au and As. The rock samples were crushed, sieved to -80 mesh then analyzed for Au, As, Ag, Cu, Pb and Zn.

Copper, lead, zinc, silver and antimony were determined by atomic absorption spectrophotometry from solutions obtained by 20% nitric acid digestion of sieved material. Arsenic was released from the samples by pyrosulfate fusion and its concentration was estimated colorimetrically. Gold values were obtained by aqua regia digestion of sample material, followed by solvent extraction and atomic absorption spectrophotometry.

4.

<u>Results</u>

Analyses for gold in soil samples were made in duplicate. The value plotted in Plate 2 is the average value of each duplicate analysis. Results for arsenic in soils are plotted in Plate B81-3; results for rocks are plotted in Plates B81-4 (Au, As, Ag) and B81-5 (Cu, Pb, Zn).

The gold values shown in Plate B81-2 have been contoured at 100, 500, and 1,000 ppb intervals. A broad zone of auriferous soil is present in the central part of the claim group. Narrow and long, northerly trending anomalies are present within the broader zone.

The arsenic values shown in Plate B81-3 have been contoured at 100, 500 and 1,000 ppm intervals. A broad anomalous area generally coincident with the auriferous zone, is apparent. Smaller areas of high arsenic (greater than 1,000 ppm) soils are scattered throughout the broader zone and correlate with the highest gold zones in many cases.

Gold values are erratic in the rocks and range from a low of <10 ppb to a high of 15,800 ppb (See Plate B81-4). The central part of the claims show numerous samples with elevated gold contents in the rock; arsenic levels are also high in the rocks from this area. Silver values are generally less than detection limits (<0.4 ppm) but, weak enrichments of 1-2 ppm in the high gold-arsenic area.

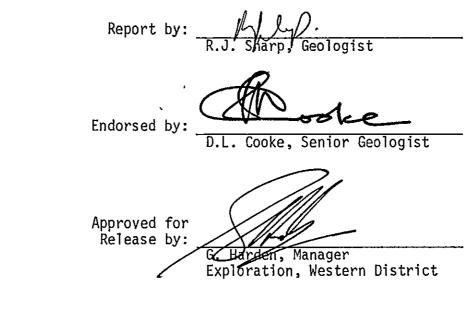
The base metal values (copper, lead and zinc, see Plate 881-5) in the rocks are insignificant with the exception of several lead anomalies (2530-7310 ppm) associated with sparse, narrow, galena-bearing quartz veins. The base metals do not significantly correlate with the gold-arsenic mineralization and are therefore of little use as geochemical pathfinders.

TRENCHING

Six trenches were blasted in an attempt to expose the bedrock source of arsenopyrite-bearing quartz vein rubble. In every case, it was found that the weathering extends more than 3 meters depth below the ground surface. What was exposed was mainly disintegrated rock fragments and soil. Sampling consisted of collecting representative samples of the rock fragments over approximately a 1 meter interval along the trench bottom and also collecting soil samples of the finer material at sites 1 meter apart. Sample results are given in Table 1. Rock results show low gold and arsenic values while soil results show much higher concentrations. There may be a concentration factor of the gold into the soil in this area but more work needs to be done to confirm this.

5.

Erratic and narrow quartz veins carrying arsenopyrite and weak gold mineralization, cross-cut carbonatized intermediate and felsic tuff and pelitic sedimentary rocks on the Bill and T-Bird claims. Gold and arsenic anomalies in rocks and soil have been delineated by geochemical sampling on the claims. Base metal mineralization is not associated with the auriferous zones.



RJS/1s Distribution

Mining Recorder (2) Western District (1)

TABLE 1

			In change moon							
Trench <u>Number</u>	Sample Type	Sample Interval (m)	Location	<u>Coordinate</u>	Au ppb	As ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm
1 1 1	Rock Rock Rock	1 1 1	E end Mid W end	0W 1W 2W	20 19 43	660	<0.4 <0.4 <0.4	7 6 9	32 <4 4	66 68 62
2 2 2	Rock Rock Rock	1.5 1.5 1.5	E end Mid W end	OW 1.5W 3W	<10 <10 <10	74	<0.4 <0.4 <0.4	22 4 13	<4 <4 <4	67 89 68
3 3	Rock Rock	2 . 1	Mid W end	2.5E 0E	<10 <10	58 406	<0.4 0.6	10 5	<4 <4	51 11
3 3 3 3 3	Soil Soil Soil Soil Soil	1.2 1.2 1.2 1.2 1.2	W end Mid E end	OE 1.2E 2.4E 3.6E 4.8E	570 80 420 151 363	4160 1640 3240 1880 2160				
4	Rock	Grab	Mid	1W	<10	48	0.4	10	12	121
5 5 5 5	Rock Rock Rock Rock	2 2 2 Grab	E end W end	0W 2W 4W 6W	<10 26 <10 320	1200 367	<0.4 <0.4 <0.4 <0.4	8 18	4 <4 <4 10	68 58 66 18
5 5 5 5	Soil Soil Soil Soil	1 1 1 1	E end W end	OW 1W 2W 3W	550 1820 1574 1415	4840 7600 9720 10120				
6 6 6	Rock Rock Rock	0.3 0.5 1	W end Mid E end	0E 3.5E 8E	<10 100 <10	1086	<0.4 1.6 <0.4	23	<4 7 4	88 31 83
6 6 6	Soil Soil Soil Soil	1 5 1 1	W end E end	1.5E 3.5E 6E 9.5E	200 360 176 70	2880 5320 2220 760				

Trench, Rock and Soil Geochemistry

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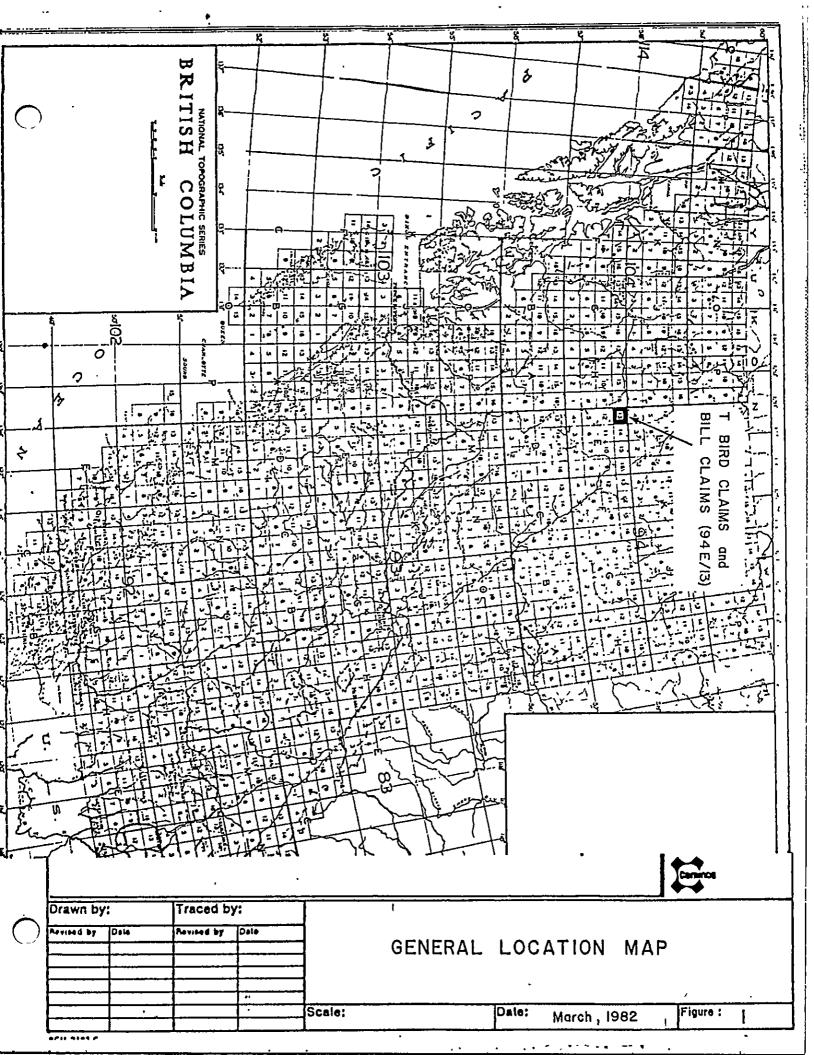
REFERENCES

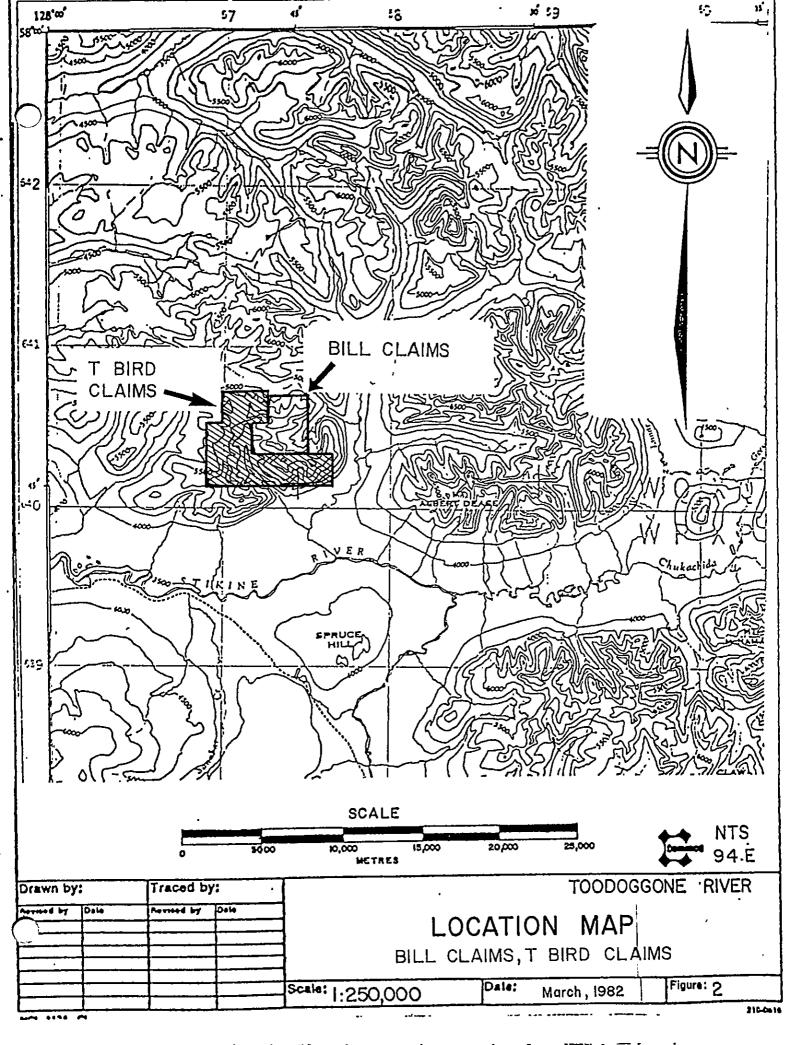
Thorstad, L., 1980. Upper Paleozoic volcanic and volcaniclastic rocks in northwest Toodoggone map area, British Columbia; in Current Research, Part B, Geol. Survey of Canada, Paper 80-1B, pp. 207-211.

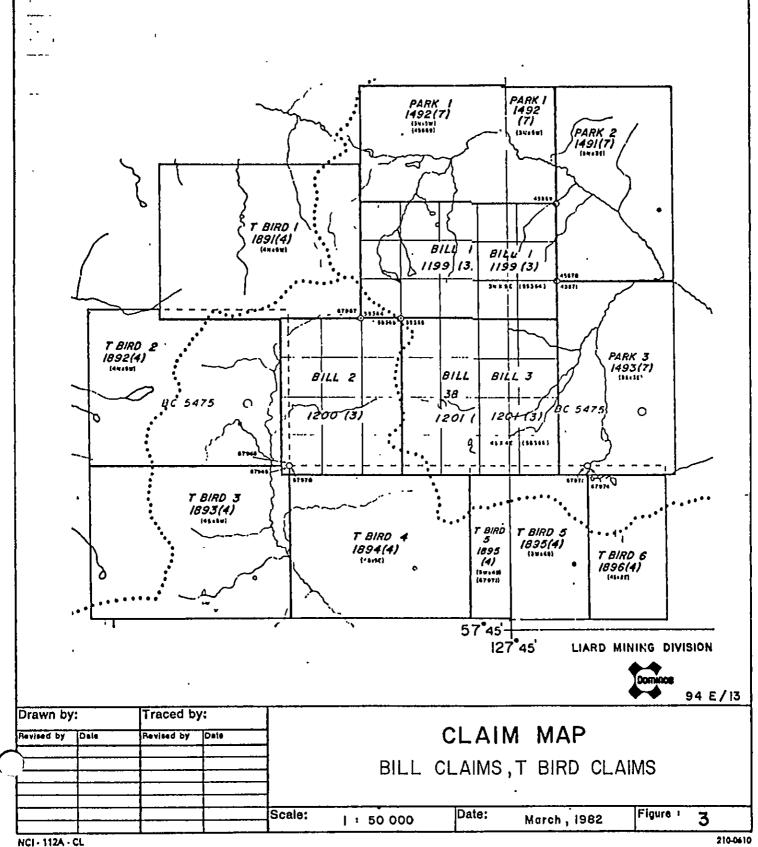
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APPENDIX "A"

EXHIBIT "A"

STATEMENT OF EXPENDITURES

ON THE BILL 1,2,3 AND T BIRD 1,2,3,4,5,6

MINERAL CLAIMS FOR 1981

GEOLOGY

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<u>Salaries</u> - <u>Field</u>

R.J. Sharp	June 17 to July 14, July 19 to August 2 August 15 to August 24. (53 days @ \$191.82/day)	\$10,166.99
P.D. Leriche	June 19 to 30, July 7 to August 9, August 23 to 26. (43 days @ \$105.60/day)	4,540.80
J. Lavigne	June 18 to August 8, August 23 to 26 (55 days @ \$87.12/day).	4,791.60
A. Croft	June 17 to August 18 (63 days @ \$87.12/day)	5,488.56
M. Wawyrchuk	June 29 to August 2, August 15 to 26 (47 days @ \$87.12/day)	4,094.64
• R.Y. Watanabe	July 12 to 20, August 14 to 19 (15 days @ \$264.40/day)	3,966.00
<u>Salaries</u> - <u>Office</u>	•	
R.J. Sharp Drafting	Report Preparation 15 days @ \$141.53/day 10 days @ \$125/day	2,122.95 1,250.00
Transportation	· ·	•
Truck Rental: 3 m	nonths x \$961.00/month	2,883.00
Fixed Wing		9,725.49
Helicopter	· ·	15,769.91
Freight		588,78
Fuel (Helicopter	and Fixed)	1,342.65
Fuel (Truck)	·	125.78 HJr.

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Cont'd.		
Expense Accounts (Mob, Demob for Crew)	:	\$2,600.00
Camp Supplies, Food, Geology Supplies		6,979.69
		9,381.42
Equipment		
Geochemistry		2,294.50
Soil: 353 x \$6.50 (Duplicate Gold)		1,316.25
351 x \$3.75 (Arsenic) Rock: 135 x \$12.50 (Au,As,Ag,Cu,Pb,Zn)		1,653.75'
Topographic Map		3,500.00
Pencil manuscript base map for Geology-Geochemistry on T BIRD Claims		
Radio (Rental, service charges)		1,771.51
		1,444.00
Expediting		3,549.10
Trenching ·	•	
TOTAL EXPENDITURE	\$	101,347.37

APPENDIX "B"

STATEMENT OF QUALIFICATIONS

I ROBERT J. SHARP, OF THE CITY OF VANCOUVER, BRITISH COLUMBIA, HEREBY **CERTIFY:**

- 1. THAT I AM A GEOLOGIST RESIDING AT 2764 WEST SECOND AVENUE, VANCOUVER, BRITISH COLUMBIA WITH A BUSINESS ADDRESS AT 700-409 GRANVILLE STREET, VANCOUVER, BRITISH COLUMBIA.
- 2. THAT I GRADUATED WITH A B.SC. DEGREE IN MINERAL ENGINEERING FROM THE UNIVERSITY OF ALBERTA IN 1975.
- 3. THAT I GRADUATED WITH AN M.SC. DEGREE IN GEOLOGY FROM THE UNIVERISTY OF ALBERTA IN 1980.
- 4. THAT I HAVE PRACTISED GEOLOGY WITH THE UNION OIL COMPANY OF CANADA LTD., MINERALS DIVISION, IN CALGARY ALBERTA FROM 1978 UNTIL 1980.
- 5. THAT I HAVE PRACTISED GEOLOGY WITH COMINCO LTD. FROM 1980 to 1982.
- 6. THAT I AM REGISTERED AS AN ENGINEER-IN-TRAINING WITH THE ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOLOGISTS AND GEOPHYSICISTS OF THE PROVINCE OF ALBERTA: MEMBER NUMBER 18311.

DATED THIS 23rd DAY OF March, 1982 , AT VANCOUVER, BRITISH COLUMBIA.

Signed: <u>hut</u> . Robert J. S

Sharp. M.Sc.

