520381
Serb Creek
93L/12E

FILE NTS 93L.12E

93L 12E

REPORT OF EXAMINATION

CARIBOU MOUNTAIN
COPPER-SILVER PROPERTY
SMITHERS WEST REGION,
OMINECA MINING DIVISION, B. C.
FOR
CANVAN INVESTMENTS LTD.

"Serb Creek"

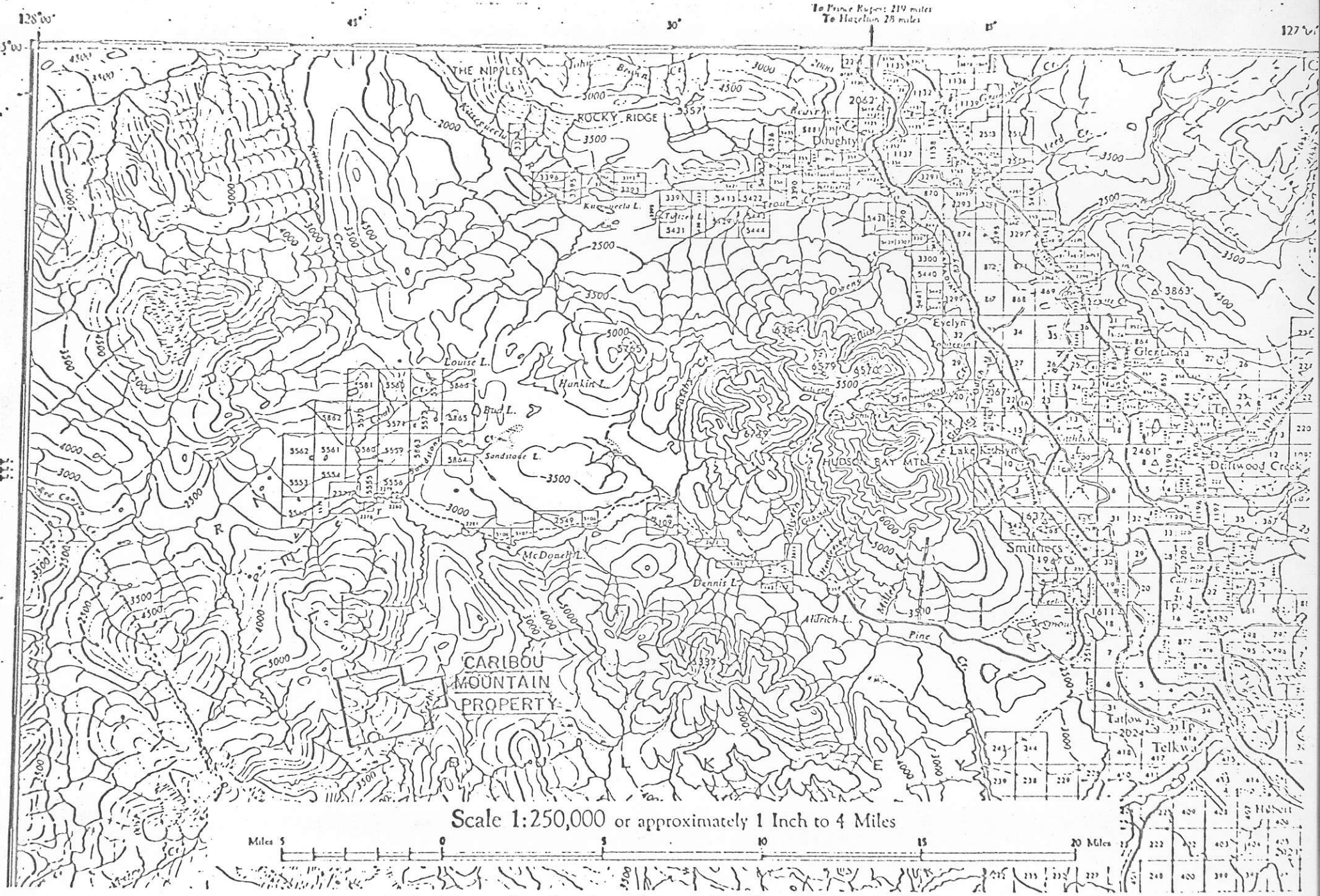
HEINO OPS 2 cover page - see NTS

Check claim records - 93L 12E

(1)

TABLE OF CONTENTS

ILLUSTRATION



Index map showing location of Caribou Mountain Property

I

INTRODUCTION

At the request of Mr. Daniel Small of Canvan Investments Ltd., P. H. Blanchet of Chapman, Wood & Griswold Ltd. visited the Caribou Mountain Prospect on September 26, 1967. He was accompanied by Mr. M. J. Beley, geologist for Manex Mining Ltd. The property was reached by helicopter from Smithers, B.C.

This report presents the observations made during that visit combined with a subsequent semi-detailed photogeological analysis of the property and the immediate surroundings. Also, prior to the property examination, a preliminary study of the air photos was made, which was found to be of considerable assistance in the field.

II

CONCLUSIONS AND RECOMMENDATIONS

1. The Caribou Mountain property clearly merits further work.

2. We consider as generally favorable

   a) its regional setting in easterly-dipping Hazelton Group (Jurassic) volcanics on the east flank of the Coast Range intrusive complex;

   b) its reasonable proximity (3 miles or less) to intrusive rocks, including granodiorite, quartz diorite and quartz monzonite, and younger NW-trending dyke swarms; (one large dyke is reported on the property); and

   c) its general association with a metallogenic belt of copper and molybdenum occurrences (Serb Creek, Hudson Bay Mountain, Rocher Deboulé, and others).

3. More specifically, the local structural/tectonic environment within and in the immediate vicinity of the property is considered to be favorable; that is, there appears to be present

   a) at least moderately strong faults and major fractures intersecting at strong angles, to serve as channel-ways or plumbing for metal-bearing solutions;

   b) at least moderately high fracture density, for permeability and porosity in the host rocks; and

   c) a reasonably high density of local warps, flexures, fracture and fault wedges and other local trapping features for promoting deposition and concentration of minerals.

4. Mineralization, consisting mainly of chalcocite with bornite, has been exposed by trenching in four zones over a distance of 1,000 feet along the northwest-facing cliffs. The A zone, at the southwest end, is considered to be the most significant of the four. Here, in 100 feet of chip sampling by Mr. Beley, along six of eight trenches, the copper averages between 2 and 3 percent with about 1.4 ounces of silver for each 1 percent of copper.

5. To the southeast, the mineralization passes and/or dips beneath a half-mile-wide plateau covered with alpine meadows. At the southeast edge of the plateau, several small outcrops were found with some copper mineralization similar in kind to that exposed along the cliffs. Between, a limited amount of geochemical soil sampling yielded some anomalous copper. Twenty-three hundred feet southeast of the A zone, from a creek draining the plateau, a silt ran 136 ppm copper.

6. It is thus concluded that the area of interest, as defined by the work done to date, is of the order of half a mile SE-NW by quarter of a mile NE-SW.

7. The vertical thickness of A-zone mineralization appears to be 40 to 60 feet, which is also the thickness of a bed of porphyritic flow rock dipping 20 to 30 degrees to the southeast. This bed appears to be a preferred host for higher grade copper mineralization.

8. This preferred host bed, if present throughout the area of interest defined in 6 above, would contain between 9 million and 14 million tons and is of sufficient size to contain a significant orebody at the grades indicated by preliminary sampling.

9. Because the mineralization in the A zone, as seen in outcrop or as exposed in the eight trenches, is

(a) either on cliff faces or on very steep, hazardous, sloughing ground;

(b) in very highly fractured, weathered rock; and

(c) oxidized and probably leached to various extents,

it is concluded that sampling the A zone by several diamond drill holes would probably yield more definitive answers as to grade, thickness, and extent of mineralization than further trenching and chip sampling along the cliff face.

10. Further, because the higher grade mineralization in the A zone can be seen to occur usually as vein-like bodies or as fracture fillings in shatter zones, and because the attitudes of these bodies appear to be more or less vertical and generally trending east to southeast, it is considered advisable to drill such exploratory holes inclined rather than vertical and bearing north to northeastwards or south to southwestwards.

11. It is therefore recommended that exploration be undertaken in stages, each succeeding stage to be contingent upon the results of the preceding one. A brief outline of the general program (given in greater detail at the end of this report) is as follows:

Stage I

Detail geologic and photogeologic mapping; sampling; orientation I.P. and Crone E.M. surveys across present targets; three 250-foot diamond drill holes in the A-zone target area as a means of sampling fresh rock; extension of present geochemical soil survey grid; and camp, helicopter support, evaluation allowance and 15% contingency $ 38,000

Stage II

I.P. or Crone E.M. follow-up; geochemical soil survey fill-in for detail; diamond drilling follow-up, and support costs, including 15% contingency, approximately $ 60,000

Stage III

Exploration diamond drilling, if warranted by Stage II evaluation, and supporting exploration and services as required $ 50,000 to 100,000

12. In our opinion, the expenditure of $38,000 of risk capital to carry out the first stage of the recommended program is clearly justified.

Respectfully submitted,

CHAPMAN, WOOD & GRISWOLD LTD.

P. H. Blanchet, P.Eng.

Reviewed, analyzed and approved:

E. P. Chapman, Jr., President

December 12, 1967

III

PROPERTY AND LOCATION

(Quadrangle NW54°127°NW)

The Caribou Mountain Prospect is located 22 miles west and 5 miles south of Smithers; 5½ miles SW of McDonell Lake; 60 miles NE of tidewater at Kitimat; and 35 miles ENE of Terrace. It lies 1½ to 2 miles west of Serb Creek, a tributary of the Zymoetz River, which in turn is a principal tributary of Skeena River. McDonell Lake drains westward into the Zymoetz River.

The property is on the eastern flank of the Hazelton Mountains, at an elevation of 4950 and below. The upper part of the prospect lies beneath alpine meadows, perhaps half a square mile in extent, but the main showings are along and in extremely steep and rugged cliffs and ravines facing NW and dropping off into a heavily forested valley. The floor of this valley closest to the prospect is about 1000 feet below the main showings. This valley is drained by another tributary of the Zymoetz River, locally known as Billy Creek.

The property can be reached by helicopter from Smithers (23 miles) or by vehicle and helicopter, using the old road south of Hudson Bay Mountain which has been extended west of McDonell Lake to Billy Creek and beyond. A short distance west of McDonell Lake is a heliport, constructed and used by Amax Exploration Inc. to service their Serb Creek molybdenite property 9 miles to the SW. From this heliport, reached by road from Smithers, to the Caribou Mountain property is 5 miles by helicopter. Construction of a road has been started, extending a couple of miles up Billy Creek, possibly

by logging interests or by the Forest Service.

Presently, the prospect is covered by 76 recorded mineral claims, including two fractions and the original 14 discovery claims, NH Nos. 1 to 14, held under option by Canvan Investments Ltd. These 76 claims are referred to as NH Nos. 1 to 48 and NH Nos. 57 to 82, and NH Fractions No. 1 and 2. (See accompanying map.) Neither the status of these 76 claims nor the nature of the option agreement have been looked into by Chapman, Wood & Griswold Ltd.

IV

HISTORY

It is believed by the prospectors who staked this prospect and brought it to Canvan Investments Ltd. that this is a new discovery, except for some relatively minor mineralization in outcrops on the plateau which one of the prospectors had known about for several years from hunting trips to the area. No evidence of old pits, trenches or old claim posts was seen during the examination to refute this claim, nor has a cursory search of the literature indicated that it was known before.

The original four claims, NH Nos. 1 to 4, were staked on April 21, 1967 and the balance of the 76 were staked during the summer.

During the period September 7 to 15, 1967, Mr. Beley conducted, very competently in our opinion, a preliminary geological mapping, trenching and sampling program for Manex Mining Ltd. on behalf of Canvan Investments Ltd. This program included ten drilled and blasted trenches (170 feet in aggregate length); chip sampling of the fresh (or fresher) rock along these trenches; geochemical soil sampling along three 500-foot grid lines, at 50-foot intervals, across part of the presumed southeastward extension of the main or A zone (across or under part of the alpine meadows); geochemical soil sampling along parts of the extensive (more than 9000 feet) of chain and compass traverses used to control the geological mapping; and geochemical silt sampling of some of the creeks flowing off the plateau or alpine meadows. It also included some ground magnetometer surveying along three grid lines and, of course, geological mapping.

This present report has drawn freely from Mr. Beley's data and in particular the assay results of his trench sampling. Time and weather conditions did not permit meaningful resampling or check sampling of the ten trenches. Because of the very steep slopes, sloughing has occurred in many parts of the trenches.

Contact prints of the B.C. Government aerial photographs (B.C. 1007-72 to 74) were in hand during this examination and were very helpful in following and evaluating the structure, faults and fractures while in the field. Subsequently, double enlargements (18 x 18 inches) have been obtained from Victoria of these same photographs and a semi-detailed photogeological analysis has been made. Particular attention was given to the faulting and fracturing, the fracture density and local to general structural/tectonic framework and setting of this prospect. Some aspects of this work are portrayed in the left-hand portion of the accompanying map, at a scale of 1 inch to 200 feet.

GEOLOGICAL ENVIRONMENT

1. The rocks exposed on the property, and in particular on the NW-facing cliffs, are a series or pile of porphyritic volcanic flow rocks interbedded with andesites and water-lain cherts, tuffs, volcanic breccias, and other pyroclastics. The porphyritic volcanics are probably best described as feldspar porphyries, with the phenocrysts usually small to moderate in size (usually less than quarter inch). Some of the flow rocks are amygdaloidal, with some of the amygdules filled with pink feldspar, some with epidote, and some with calcite or calcite and trace copper minerals. Rock colors range from red to maroon to green to purple.

2. This series of sediments, pyroclastics and flows strike between N20°E and N45°E and dip 20 to 30° to the southeast. Very locally, dips up to 35° and as low as 10° can be observed.

3. Presently known and mapped are four zones or local areas of mineralization, referred to and shown on the accompanying map as the A, B, C and D zones. To date, most trenching, sampling and other work has been done on the A zone because of its apparent greatest potential. Further work on the other three zones could conceivably improve their apparent potential.

4. In the A zone, eight trenches have been drilled and blasted and trenches Nos. 2 to 8 have been chip sampled by Mr. Beley over an aggregate length of 125 feet. In trench No. 1 the mineralized rock was still far too badly oxidized to permit meaningful sampling.

5. The results of assaying by T.S.L. Laboratories of the samples taken from trenches 2 to 8 are given on the accompanying map. From these the following weighted averages (weighted as to length of sample) have been calculated:

	Trenches	Assay Length (feet)	% Cu	Oz. Ag per ton	Apparent True Width (feet)
	2 to 8	125	1.96	2.85	45 to possibly 100
or	4 to 7	83	2.67	4.06	45
or	4 to 6	70	2.95	4.48	25
or	4 and 6	50	3.61	5.71	15

6. The mineralization in the A zone consists of very irregular, more or less vertical, east to southeast trending veins, veinlets, shatter zones and shear zones in the volcanics, with chalcocite and bornite being the principal minerals in evidence. Minor sphalerite and galena are reported but were not seen. Possible tetrahedrite is present but has not been confirmed. The most common gangue mineral is calcite. Little or no quartz is present. The sulphides occur as blebs, specks, and tiny veinlets and fracture fillings, and occasionally as irregular masses of chalcocite and bornite, more or less vein-like, with some of the masses up to fist-size. In the present trenches, the rock is highly shattered and not particularly fresh, making it difficult to determine how continuous the mineralization is across the zone. From the assay results it can be seen that the copper and silver values drop off as one proceeds northeastwards away from the A-zone creek. The better than one percent copper over 15 feet in trench 8 is higher than one would expect from visual examination. The mineralization possibly becomes finer grained and more disseminated northeastwards.

7. Immediately SE of trenches 4, 5 and 6, across the talus-filled creek ravine, no significant mineralization has been found. The evidence strongly suggests a fault, the surface trace of which approximately coincides with the A-zone creek, cutting off the mineralization. The various volcanic and chert marker beds on the NE side of the A-zone appear to stop abruptly at this creek. From the ground and from helicopter reconnaissance, the indications are that the vertical displacement of the fault could be in the order of 75 to 100 feet, up on the south side.

8. At the time of the field examination, it was thought that this fault was probably parallel to the B-zone fault, very evident on the aerial photos and striking about N50°W. However, on careful analysis of the air photo enlargements, the A-zone fault is seen to be almost certainly nearly east-west in strike and cutting across the B-zone fault, perhaps off-setting it a short distance left laterally. (See map.)

9. A reasonably strong geochemical soil anomaly crosses the three 500-foot grid lines (A, B and C) shown on the map. When the geochemical copper values are roughly contoured, the suggested trend is N50-60°W, about parallel to the B-zone fault. Geochemical values on this grid, plus those from traverse stations V to Z to the SW of the grid, range from 24 to 1160 parts per million (hot extraction, atomic absorption method). This area of geochemical highs could be the up-faulted, eastward-displaced continuation of the A-zone mineralization, on the south side of the A-zone fault.

10. The strike of the A-zone mineralization is not known but from the position of the eight trenches and from the relative position of the

copper geochemical high across the grid its strike is inferred to be about N48°W (312° azimuth).

11. The width of the A-zone mineralization is also not known, but if the inferred strike is correct then the width is probably not less than 45 feet and possibly double this amount or more. The general width of geochemical anomaly, south of the A-zone fault, is in the order of 700 feet, and still open to the SW.

12. The vertical thickness of the A-zone mineralization appears to be 40 to 60 feet. This is the thickness of the bed of porphyritic volcanic flow rock (dipping 20 to 30° to the SE) which seems to be the preferred host rock. Trenches 4 to 8 are in this unit and the samples average 2.43 percent copper with 3.58 ounces silver per ton over 98 feet of trench length in aggregate. On the other hand, trench 3 is in a higher unit but still averages 0.38 percent copper with 0.24 ounces silver per ton over 17 feet. Trench 2 is still further above the preferred unit and carries heavily oxidized but impressive mineralization (no assays available).

13. The strike length of the mineralized A zone, as determined by trenches 3 to 8, is 160 feet. If trench 1 mineralization, for which there is no assay, is included, this could possibly be increased to 240 feet. The geochemical anomaly, on strike to the SE and across the intersected A-zone fault, appears to make the inferred strike length 500 feet, open to the SE.

14. A possibly significant silt sample, running 136 ppm copper, was collected from the SE-flowing tributary stream, 2300 feet SE of the A-zone.

Malachite staining is present in the very shattered, fractured rock high on the east bank of this same creek. Five hundred feet farther east, several small outcrops were found with minor chalcocite and malachite.

15. In a distance of 1000 feet along the cliffs to the northeast from the A zone, three apparently smaller zones of mineralization have been found and opened up to a limited extent with some trenching. These are shown on the accompanying map as the B, C, and D zones. A 20-foot trench has been drilled and blasted in the B zone, exposing some veinlets of chalcocite and bornite with calcite, together with minor disseminated and fracture-fill mineralization. This occurs in a volcanic breccia which appears to have a fairly limited extent. Malachite is seen in many of the weathered fractures on the outcrop surface.

In the C zone, another 20-foot trench in very shattered and weathered rock poorly exposes what appears to be erratic mineralization. Present is one vein of massive chalcocite with bornite, 3 inches or more in width and locally swelling to 10 or 12 inches with calcite inclusions. In the D zone, no trenching has been done. Malachite and minor chalcocite and bornite are in evidence.

16. Assay returns for trenches 9 and 10 (of chip samples taken by Mr. Beley along these trenches), together with weighted averages, are tabulated on the following page.

Trench No.	Assay Length (feet)	% Cu	Oz. Ag per ton	Apparent True Width (feet)
9	0-10	0.50	0.72	
"	10-20	0.91	1.04	
	Average	0.70	0.88	10 ?
10	0-10	3.48	2.34	
	10-20	0.91	3.64	
	Average	2.20	3.00	20

Additionally, a very high grade sample taken across 6 feet of the best mineralization in trench 10 ran 9.16 percent copper and 1.02 ounces of silver per ton.

17. An examination of all the assay results indicates that ratio of ounces of silver per ton to percent copper content is in the order of 1.4 to 1 and is reasonably consistent.

18. Referring again to the geochemical work, the soil samples were also run for lead and zinc. On the three grid lines, the lead did not appear to be anomalous while the zinc gave an anomalous picture quite similar to the copper anomaly but with the suggested trend being closer to N30°W. This N30°W direction appears as a moderately strong fracture trend and may prove to be of some importance as a mineralization control.

19. Ground magnetometer was run on the grid, which is really too limited an area to be of much assistance. However, it yields a pattern that corresponds approximately to the signature one would expect for volcanics, yet here too we see a N30°W trend in evidence.

RECOMMENDED EXPLORATION PROGRAM

STAGE I

1)	Detail geologic and photogeologic mapping, and sampling as required		$ 3,500
2)	Orientation induced polarization and Crone E.M. surveys across present target area: three 2500-foot lines, including mobilization-demobilization and data reduction		3,500
3)	Diamond drilling: three 250-foot BQ or 750 feet @ $12+2+1 or $15 per foot	$11,300	
	Mobilization-demobilization plus helicopter transport	6,000	17,300
4)	Extension of geochemical soil survey 1500 x 2640 feet, 200-foot line spacing, 50-foot sample stations, including analysis 420 samples @ $3.35	$ 1,400	
	Off-grid new areas and silts 200 samples @ $3.00	600	2,000
5)	Camp installation		1,000
6)	Helicopter support 20 hours @ $140		2,800
7)	Travel expense		500
8)	Project engineer		1,800
9)	Evaluation allowance and reports		2,000
			$34,400
	Contingency, 15%		3,600
	TOTAL STAGE I		$38,000

STAGE II (contingent upon Stage I evaluation)

1) I.P. or Crone E.M. follow-up, whichever proved more suitable in Stage I;

2) Geochemical fill-in for detail and extensions if deemed necessary;

3) Diamond drilling follow-up; and

4) Other contingent expenses, including camp, helicopter support, project engineer, allowance for evaluation and reports, and contingencies

say ..... $ 60,000

STAGE III

Exploration diamond drilling and supporting exploration as required, including contingent expenses $ 50,000 to 100,000