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SUMMARY REPORT

SULPHURETS CREEK PROJECT - 1975

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MITCHELL V. B.

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PART I. GENERAL INFORMATION

1. Introduction

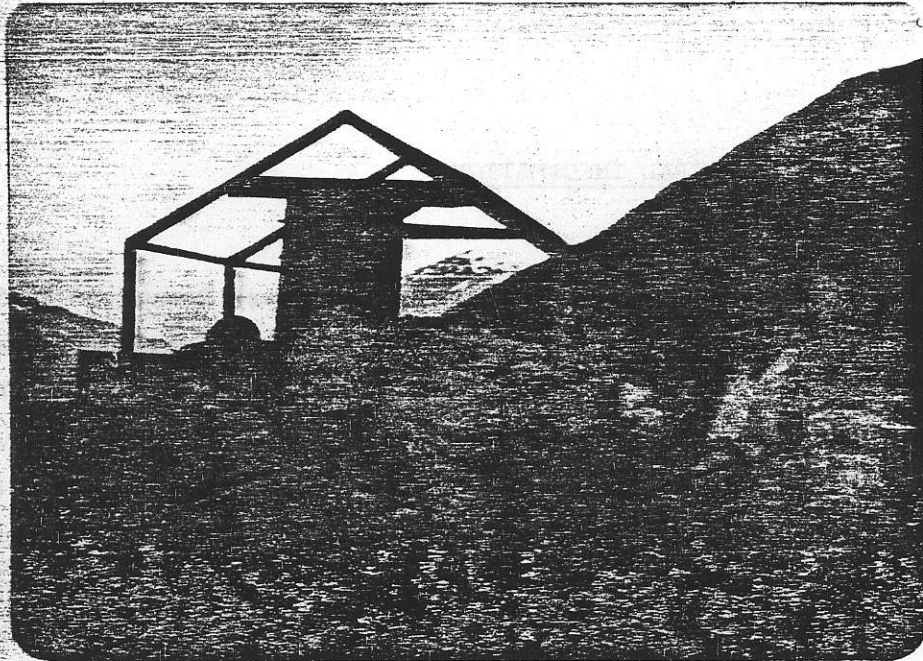
Summary Report - Sulphurets Creek Project - 1975 is a compilation of information obtained during 1975 in the field and laboratory. It updates the more comprehensive volume Summary Report - Sulphurets Creek Project - 1960-1974 prepared during winter 1974-1975. That report contains a description of the property and its recent history and an account of the program of geological mapping and geochemical sampling that was begun in 1974 and continued in 1975. That information is not repeated in this report.

2. Logistics

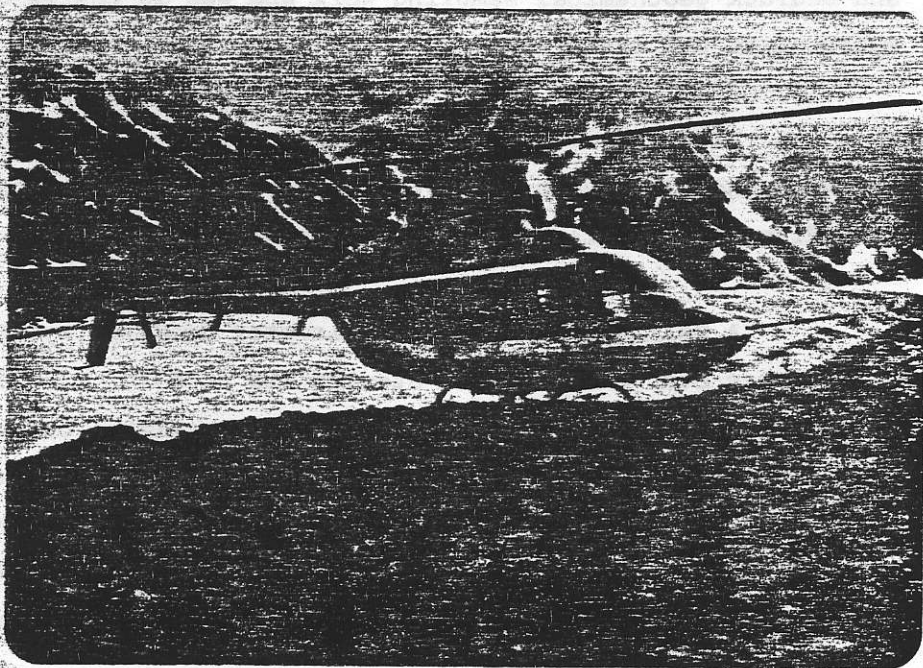
Field work for the 1975 program was done by Edward Kruchkowski, geologist, and Clarke Cherniwchan, helper, in the period July 4 through August 27, 1975. Erik Ostensoe participated in parts of the trenching and bedrock geochemical sampling work and was in charge of the claim abandonment and restaking.

Five campsites were occupied. Slight but welcome improvements in camp conditions were achieved by the provision of a plywood and lumber tent frame and an oil heater (photograph 1975 - 1).

A Bell Model 47G-3B-1 helicopter operated by Vancouver Island Helicopters Ltd. and based at Stewart was used for mobilization, camp servicing and camp moves. This machine is reliable but although less expensive on a per hour basis, is less efficient than the Alouette III helicopter used during the 1974 season. The claim restaking job had to be completed in the period July 30 to August 5 and was expedited greatly by the use of a Bell Model 206 (Jet Ranger) helicopter for a total of 11.7 hours.



Photograph 1975 - 1. Erecting Camp near Main Copper Zone, August 1975.  
Note the orange painted metal sleeves used to facilitate assembly of tent frame.



Photograph 1975 - 2. Bell "Jet Ranger" Helicopter at Mitchell Glacier, August 1, 1975.

### 3. Placer Miners

The placer miners' workings at the confluence of Mitchell and Sulphurets Creeks were inactive during 1975. Their comfortable log building was occupied by the Granduc crew for one night while claim restaking was in progress.

### 4. Work Done - 1975

500 rock geochemical samples, numbers 607 through 1106 inclusive, were collected from various parts of the Sulphurets Creek Project area. Fourteen bed rock trenches, totalling 230 feet in length, were excavated and sampled. Rock type and structural data were observed and recorded while rock sampling was in progress. All mineral claims were abandoned on July 30, 1975. 16 new claims consisting of 87 units were recorded on August 26. The area of the property was increased slightly.

At the end of the field season small pieces were cut from each rock sample for our permanent record. Thin sections from 22 of these pieces were examined by J. H. Montgomery, PhD., P.Eng., consulting geologist, and his petrographic reports are included, along with 18 similar reports of samples from 1974 work, as Appendix I of this Report. Statistical treatment of geochemical data has been investigated in preliminary fashion by means of simple computer techniques.

To facilitate reporting of data, place names have been attached to various parts of the Sulphurets Project area, supplementing the very limited number of existing geographical names. These newly created names are for our convenience only and are not necessarily intended to become permanent designations. (See Figure 1975 - 15 which follows page 19 of this report)

The initial campsite, occupied from July 5 through 14, was located at elevation 4400 feet in a grassy area one half mile north of



the toe of Mitchell Glacier. The 118 samples taken from this campsite provided coverage of the slopes illustrated in Photograph 2. Parts of the area are precipitous gulleys dangerous to work in, other parts are lush and grassy and still others are steep taluses. One 29 foot trench was drilled and blasted.

The second campsite was located at elevation 4200 feet south of Mitchell Glacier. This site provided convenient access not only to the Dawson Ross molybdenite area but also to some areas to the west that were revealed by 1974 work to be strongly anomalous in copper and gold. The latter areas were investigated by five trenches, totalling 71 feet in length and by 7 bedrock assay samples. 140 rock geochemical samples were secured.

The third campsite occupied in 1975 was located at elevation 4500 feet at tree line south of Sulphurets Glacier. A very large strongly gossaned zone to the west of the campsite was accessible but in many locations bedrock geochemical samples could not be obtained due to deeply weathered bedrock and the presence of morainal deposits. Two trenches, totalling 28 feet in length, were blasted in areas with secondary native copper mineralization. 78 rock geochemical samples were obtained.

Part of the claim relocation work was done from the campsite at 4700 feet elevation located about 2000 feet west of the Main Copper Zone north of Sulphurets Glacier. This site has been occupied many times. Bedrock trenches, totalling 122.5 feet in length, were excavated in the Main Copper Zone area and in several sites north, west and south-west of the campsite.

The last camp of the 1975 field season was located at 4600 feet elevation about three quarters of a mile south of the Hanging

Glacier. Gentler topography in this area facilitated rock geochemical sampling and geological reconnaissance of a large area. An arsenopyrite occurrence was trenched and several galena-sphalerite bearing outcrops were blasted.

5. Expenditures

Expenditures incurred to December 31, 1975 in conjunction with the 1975 field program are detailed below.

1.	All Wages and Payroll Costs, including WCB charges	\$15,354.27
2.	All Claim Rentals, Recording Fees, Abandonment Fees	2,129.50
3.	All Transportation Costs except Helicopter Service	1,060.71
4.	Helicopter Service	6,870.37
5.	Costs of Accommodation and Storage, Stewart Warehouse	1,276.77
6.	Telephone	169.21
7.	Groceries	1,038.57
8.	Equipment and Supplies	1,083.45
9.	Drafting and Printing	761.66
10.	Assays and Analyses	<u>4,222.11</u>
	Total Expenditures during 1975	\$33,966.62
	Project Total 1960 - 1974	\$248,900.00
	Including 1975	\$282,866.62

PART II CLAIM ABANDONMENT AND RELOCATION

As a result of work in the area, particularly plane table mapping in 1968 and 1970 and grid survey work in 1974, it was apparent that the Sulphurets Creek property claim block contained numerous irregularities, including areas of overlapping claims and open fractions between claims. Partly in response to recently amended claim regulations that increase the required annual assessment work expenditures and fees and hence penalize partial and unnecessary claims but facilitate the procedure for rectifying unsatisfactory claim configurations, and partly from a desire to obtain as secure a title as possible to the mineralized areas, the entire 76 mineral claims were abandoned as of July 30, 1975. Mineral Act Regulations provided a seven day period in which the subject area could be relocated by the Modified Grid System of staking.

The restaking was accomplished partly with the aid of a Bell Model 206 (Jet Ranger) helicopter and partly on foot. A total of 87 "claim units" were staked in 16 claims. The new claim units are larger than the old mineral claims (61.78 acres versus 51.65 acres).

In order to acquire a maximum of the area thought to be of value, an area larger than that previously held was staked. This included parts of the Dawson-Ross property where we undoubtedly over-staked some of Don Ross's still valid claims. His titles are not in any way infringed by our overstaking. A sketch map showing the locations of Dawson-Ross 1 and 3 mineral claims, based on field identifications of claim cairns, and the possible locations of Arbee 35, 39, 54 and 55 mineral claims, based on the Mining Recorder's map, and for which no claim cairns or posts have been located in the field, is included in this report as Figure 1975 - 1 (a) (follows page 5).

Additional ground was claimed south of Sulphurets Glacier where previously only a few claims were held and also in the eastern portion of the area, south and east of the Hanging Glacier (see Figure 1975 - 1). A slight reduction in coverage was achieved in the area east of the Main

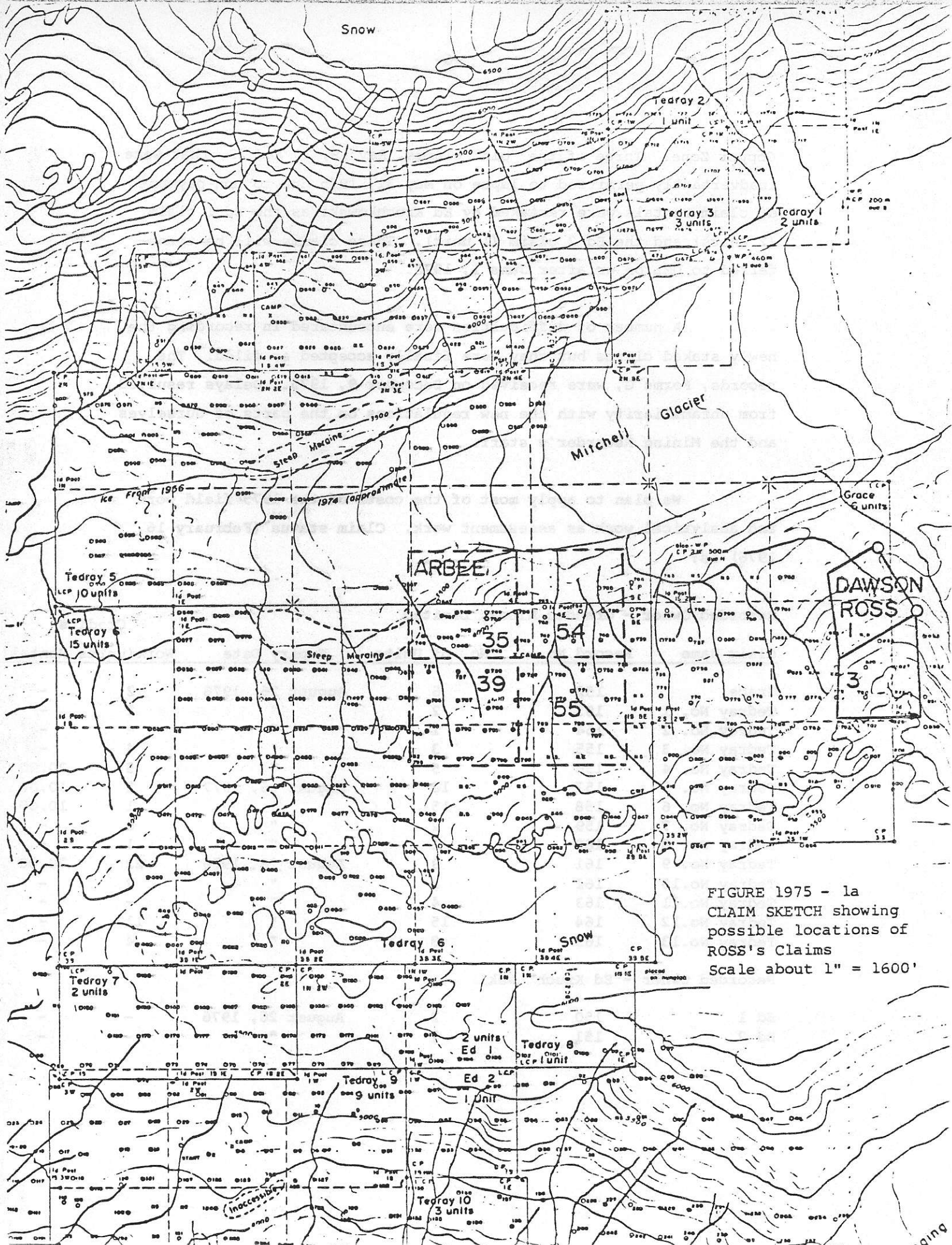


FIGURE 1975 - 1a  
CLAIM SKETCH showing  
possible locations of  
ROSS's Claims  
Scale about 1" = 1600'

Copper Zone. Three of the "old" claims, Ray 19, 20 and 22, that were inadvertently permitted to lapse on May 31, 1975 due to non-payment of claim rentals were restaked by Ed Kruchkowski as the Ed 1 claim (2 units) and the Ed 2 claim (1 unit). These claims will be transferred to GML on or after June 1, 1976.

A number of difficulties were encountered in recording the newly staked claims but they were finally accepted as filed. The records, Forms G, were received on December 9, 1975. Delays resulted from unfamiliarity with the new regulations on the parts of ourselves and the Mining Recorder's staff.

We plan to apply most of the costs of the 1975 field work and analytical work as assessment work. Claim status (February 16, 1976) is:

Recorded Owner - Granduc Mines, Limited					Credits	
Claim Name	Record No.	No. of Units	Expiry Date	Work (units)	Rental (\$)	
Grace	152	6	August 26, 1976	2	-	
Tedray No. 1	153	2	"	2	-	
Tedray No. 2	154	1	"	-	-	
Tedray No. 3	155	3	"	4	-	
Tedray No. 4	156	5	"	5	20.00	
Tedray No. 5	157	10	August 26, 1977	1	10.00	
Tedray No. 6	158	15	"	1	10.00	
Tedray No. 7	159	2	"	6	-	
Tedray No. 8	160	1	"	1	-	
Tedray No. 9	161	9	August 26, 1976	22	70.00	
Tedray No.10	162	3	"	2	-	
Tedray No.11	163	4	"	-	-	
Tedray No.12	164	15	"	11	-	
Tedray No.13	165	8	"	4	-	
Recorded Owner - Ed Kruchkowski						
Ed 1	150	2	August 26, 1976	-	-	
Ed 2	151	1	"	-	-	

PART III GEOLOGY AND GEOCHEMISTRY - 1975 PROGRAM

1. Introduction

The 1974 Sulphurets Creek property data was the basis for work in 1975. During 1974 600 rock samples were taken at 400 foot intervals within an area four miles by three miles, approximately centered on the Main Copper Zone on the south slope of the Sulphurets-Mitchell Creek ridge. Geological data and geochemical analyses for copper, molybdenum, silver, gold and lead were plotted on topographic base maps. Several mineralized areas were trenched and sampled. J. H. Montgomery prepared petrographic reports describing 18 rock samples (Appendix 1 a).

The 1974 work demonstrated the effectiveness of grid sampling and geochemical analyses in delineating the geological and chemical character of the Sulphurets Creek mineral zone. The program was therefore continued in 1975 to give complete coverage of the Granduc claims and to investigate some of the bordering areas. All results of the 1975 program have been added to the maps prepared in 1974 and the revised geology, figure 1975 - 2, and geochemistry maps, figures 1975 - 6 - 10, are enclosed with this report. Additional north-south vertical sections, figures 1975 - 11 (a) - 14 (b), and a map showing both the locations and the assays of trench and grab samples have been drawn, figure 1975 - 3, 4, 5. J. H. Montgomery prepared petrographic reports describing a further 22 rock samples (Appendix I b). Geochemical data was entered into a computer file and some simple statistical data was obtained and used to check our empirical assumptions.

2. Discussion of Data

a) North of Mitchell Glacier - Bishop and Iron Cap Zones  
118 rock geochemical samples were taken from the slopes north

of Mitchell Glacier. Grid sampling now extends to the edge of a gritty-textured unmetamorphosed sedimentary formation in the northwestern portion of the area. A sampling gap exists between the northeast and east limit of our grid, the Brucejack Fault and the high elevation glacier - snowfield that lies beyond the northmost exposure of the Sulphurets Creek mineral zone.

Rock samples from the north end of the grid appeared to be almost barren of valuable minerals but strong patterns of metal concentrations were revealed by geochemical analysis. The potentially important zone persists beyond the limits of the survey.

Geological work mapped an extended area of altered and silicified arenaceous rocks (unit 3c) and much granite (1c) was encountered, particularly in this area of steep broad gulleys. These gulleys may be developed on the northerly extensions of north-striking, steeply-dipping faults that were mapped in 1974 south of Mitchell Glacier. In most instances the existence of such faults north of the Glacier was not proven and only one such fault is shown on the 1975 Geology Map (figure 1975 - 2).

A narrow and well defined fault plane that dips gently to the northwest is located adjacent to the northside of Mitchell Glacier, close to ice level. It is tentatively correlated with a similar structure found at slightly higher elevation south of the Glacier. Granite occurs only on the hanging wall side of the fault but copper mineralization is present in rocks on both sides of the fault. North of the ice the foot wall rocks are moderately altered and are mostly arenites (unit 3b) whereas to the south of the Glacier strongly foliated sericitic, siliceous and pyritic rocks (unit 4b) are present immediately below the fault plane. The intensity of alteration decreases away from the fault.

The granite bodies (unit 1c) present on slopes both north and south of Mitchell Glacier are very irregular in outline. This appearance is probably accentuated by the topography (slopes are mostly 45°) but they are likely influenced too by the steeply dipping faults.

A small area of porphyritic syenite (unit 1a) was mapped in the northeastmost corner of the project area. Where mapped, this intrusive body appears to be enveloped by the strongly altered sedimentary rocks (unit 3c). It was not observed in contact with the overlying unmetamorphosed clastic sedimentary rocks (unit 3d). The syenite contains small amounts of copper mineralization but stronger mineralization is present at its contact. The syenite is pink and green with white feldspar phenocrysts up to 5 millimeters in diameter. It is very similar in appearance to porphyritic syenite that outcrops at much lower elevations near the snout of Mitchell Glacier. Narrow dykes of syenite similar in composition, but much more coarsely porphyritic in texture, occur in all formations near the north side of Mitchell Glacier.

The high metal content of rocks in the northeastern corner of the grid area was not anticipated and consequently both claim and grid coverage are insufficient. The area is clearly anomalous in copper, molybdenum, lead and silver content but is average in gold content.

b) South of Mitchell Glacier - Kirkham Zone

The 1975 work expanded coverage south of Mitchell Glacier to include the molybdenite area formerly all held by Don Ross and Associates and now partially held by the same group. Further work was done on



GML ground where anomalous quantities of copper and gold were indicated in 1974. A new area containing copper mineralization was recognized just west of the molybdenite area (sites D and E on figure 1975 - 3). Several small areas of massive-type copper mineralization were trenched but no really strong zones of such material were found.

Geological mapping expanded our coverage but did not significantly change previous data obtained from the 1968 plane table mapping. The molybdenite-bearing area is approximately coincident with the distribution of unit 4d, quartz sericite schist, and, predictably, is strongly anomalous in molybdenum but weak in copper. The geochemistry of silver, gold and lead, though apparently weakly anomalous, are not well defined.

The pattern of anomalous copper values is broken in the central part of the 1975 survey area south of Mitchell Glacier by a zone of relatively low copper values that possibly reflects the presence of granitic intrusive rock. Fine grained chalcopyrite and pyrite were observed in outcrops of altered arenite and wacke east of the granite and a strong copper anomaly with dimensions approximately 1500 feet by 1500 feet is indicated. The copper mineralization is obscured by pyrite and secondary copper minerals were not observed. One small cut was blasted; the only sample taken (site G on figure 1975 - 3) assayed 0.87% Cu, <0.001% Mo, 0.02 oz/ton Au and 0.44 oz/ton Ag.

d) South of Sulphurets Glacier - including Bornite Zone

Much of the extension of the Sulphurets zone of alteration and mineralization that lies south of Sulphurets Glacier was mapped and sampled in 1975. Because the dominant rock type, quartz pyrite sericite schist (unit 4b), is thoroughly weathered, frost-riven and leached, little copper and molybdenum mineralization was observed.

With the notable exception of the so-called "Bornite Zone" near samples 425 and 427 where bornite and chalcopyrite occur with pyrrhotite in and near a diorite dyke of unknown dimensions, the portion of the Sulphurets zone south of the Sulphurets Glacier has not revealed much copper mineralization. Effects of faulting and weathering are among the most severe found anywhere in the area and may have obliterated surface expressions of mineral zones.

East of the altered zone rocks are bedded sediments with only moderate amounts of faulting and alteration. Many dioritic dykes and a few trachytic bodies were recorded but no significant amounts of mineralization were found.

Trenches totalling 28 feet in length were excavated near the southmost end of the survey (site W on figure 1975 - 3). Only minor metal values were revealed despite the presence of specks of native copper. The host rock in this area is somewhat chloritic and pyrite is abundant. Similar rocks near the south side of Mitchell Glacier have similarly meagre metal contents.

d) South of Hanging Glacier

Rock geochemical surveys were expanded south and southeast of the Hanging Glacier to further investigate areas that, although not shown to be anomalous in copper by result of the 1974 work, were known to contain lead-zinc minerals and a scattering of occurrences erratically high in gold and gold-silver. 171 samples were taken and several lead-zinc pods and lenses were found. None of the latter have much potential but collectively they suggest that conditions

conducive to formation of worthwhile lead-zinc, etcetera, deposits exist. No such deposits were found but further searching is justified. In addition to geochemical samples several selected rock samples were assayed; the assays support previous evidence that an attractive silver content, from 0.8 to 6.74 oz/ton, may accompany the lead and zinc minerals.

The main rock formation south of the Hanging Glacier is well-bedded siliceous argillite, siltstone, and chert with much chlorite - epidote alteration and abundant quartz veinlets. This formation is cross cut by many small dioritic dykes and by larger trachyte porphyry masses. The latter contain 1 to 2% sulfides and frequently are enveloped by a pyrrhotite or pyrite halo developed in the adjoining sedimentary rocks. The formation strike is northwesterly with steep northeasterly dips.

Strongly foliated and altered arenite occurs immediately south and southeast of the Hanging Glacier. This rock is virtually barren of copper despite being closely similar in appearance to some of the copper-bearing silicified and pyritized arenite found elsewhere in the Sulphurets Creek project area.

The extreme southeastern portion of the 1975 work encompassed the lowermost Bowser assemblage rocks (Betty Creek member). The type locality of this portion of the Bowser formation is located at the south end of Tide Lake, 20 miles south of the Sulphurets Creek area. At Tide Lake the basal portion of this formation was described by Grove (B.C. Dept. of Mines, Bulletin No. 58) as consisting of "intercalated beds of non-marine red and green sandstone and conglomerate". Particles are typically angular to subrounded and small scale bedding features where recognizable are at best impersistent whereas gross bedding features, particularly color banding in red and green, are prominent and easily recognized even from a distance.

The hummocky tundra - like terrain that extends from Hanging Glacier to Brucejack Lake (located about two miles southeast of the map area) is bisected by the north-striking Brucejack Fault which appears to have depressed the Bowser Assemblage on the east relative to the older rocks that prevail west of Brucejack Fault. A similar relationship exists in the northern part of the area as is illustrated in photograph 1975 - 3.

Clusters of unmineralized quartz veinlets frequently occur in the lowermost portion of the Betty Creek member and it is interesting to note that the combined alteration-foliation so characteristic of the unit 3c arenite persists into the Betty Creek, though chiefly along fractures and most frequently close to the trace of Brucejack Fault. Anomalous metal values accompany this alteration but all mineral occurrences reported to date have been trivial. Several lenticular and pod-like occurrences of sphalerite, galena and coarse-grained marblized calcite were found in siliceous sedimentary rocks near the campsite. More persistent steeply-dipping but narrow veins and stringer zones of sphalerite and galena occur in similar rocks close to the edge of Sulphurets Glacier (Site U on Figure 1975 - 3). High values in gold and silver have been obtained from narrow widths of massive sulfides below the Hanging Glacier (Summary Report 1960 - 1974) and from an unrecorded location somewhere between Hanging Glacier and Brucejack Lake (reference personal communication, S.W. Barclay, 1960). The results of work to date are obviously inconclusive but in total they justify continued mineral search in the general area east of the Sulphurets Glacier. In contrast to the rather large copper and molybdenum "targets" in the main zone of alteration, objectives in the southeastern part of the Sulphurets Creek project area are likely to be higher unit value, smaller and more subtle mineral zones.

A narrow deeply weathered arsenopyrite vein with interesting gold content was located in 1974 and trenched in 1975. Although a

good attempt was made, unweathered vein material were not exposed nor were the previously indicated gold values confirmed. A small soil survey of the immediate vicinity gave inconclusive results (as reported in Appendix 3). Further search using hand tools and dynamite is not practical.

e) Main Copper Zone

Trenching and sampling operations were continued in the Main Copper Zone and at several sites southwest of the campsite. The west end of the trench that was first blasted in 1974 was extended a further 14.5 feet; the east end, a further 27 feet. The mineralized zone was found to persist and trench assays average 0.79% Cu, 0.016% Mo, 0.024 oz/ton Au, 0.11 oz/ton Ag across the 91.5 feet total length. Further extension of the trench by hand methods is not practical. A ten-foot long trench excavated 150 feet northwest of the main trench assayed 0.43% Cu, 0.006% Mo, <0.003 oz/ton Au, 0.07 oz/ton Ag; another ten-foot long trench assayed 0.29% Cu, 0.007% Mo, 0.005 oz/ton Au, 0.09 oz/ton Ag. It now appears that further trenching will not appreciably add to our data in this area.

f) Area West of Main Copper Zone

A number of small trenches were excavated between the Main Copper Zone and the west side of the Sulphurets alteration zone. Rock geochemical sample site No. 2 was blasted in an attempt to confirm the high gold geochemical value. A 5 foot sample assayed 0.04% Cu, <0.001% Mo, 0.126 oz/ton Au, 0.09 oz/ton Ag. Rock in this area is very shattered siliceous arenite with about 4% pyrite. Rock geochemical sample site No. 12 was trenched over a 27 foot length. Assays confirmed the rock geochemical values: 0.75% Cu, 0.008% Mo, 0.022 oz/ton Au, 0.11 oz/ton Ag over the 27 foot length. Bedrock is a mixture of syenite and andesite tuff with about 4% total sulfides, including veinlets of massive chalcopyrite-pyrite.

The so-called "Waterfall Zone" sample site "J" on Figure 1975 - 3 is located in a heavily forested area about 4000 feet southwest of the campsite in the vicinity of rock geochemical sample No. 185. An eleven-foot trench in thinly bedded tuff assayed 0.33% Cu, 0.006% Mo, 0.03 oz/ton Ag and 0.003 oz/ton Au. A five foot trench located 20 feet northwest of the above contained tiny massive chalcopyrite veinlets and assayed 0.75% Cu, 0.045% Mo, 0.27 oz/ton Ag, 0.003 oz/ton Au. These results are inconclusive. Further work, preferably including some drilling, is required to help determine whether a worthwhile mineral zone occurs in this area of favorable rock types but heavy cover.

### 3. Discussion of Geochemical Analyses

The 500 rock samples collected during the 1975 field season were analysed by Chemex Labs Ltd. using the same procedures as were followed in 1974. The resulting analytical values for Cu, Mo, Pb, Ag and Au were added to the 1974 base maps and data for the entire 1095 samples were contoured by hand methods using the same contour intervals as in 1974. The resulting maps, figures 1975 - 6 to 1975 - 10, are included with this report.

Lead, and to a lesser extent silver, values for 1975 samples are generally higher than those recorded in 1974. There are two obvious possible explanations: there was a change in laboratory standards or techniques, or the higher values result from the fact that the 1974 work was mostly in the "core" area relatively close to the trace of Sulphurets Fault and more of the 1975 work was in the "fringe" areas relatively distant from the Sulphurets Fault.

In 1974 gold values were measured to a minimum detection level of 30 ppb and in 1975, to a minimum of 15 ppb.

### 4. Computer Treatment of Geochemical Data

Interpretation of data is of critical importance in geochemical surveys of all types. The Sulphurets Creek project involves a rather large number of bedrock samples taken systematically from a grid imposed on an area of complex and poorly delineated geology further complicated by alteration, sulfide mineralization and weathering. Its objective was better definition of metal concentrations with respect to the geology.

Interpretation of the data on the basis of simple hand contouring methods does not necessarily result in the identification of the most significant areas of metal concentrations and, similarly, in areas of abnormally high backgrounds or overlapping of mineralizing events, spurious anomalies may be indicated.

As the first step toward resolving some of the problems of interpretation Montgomery Consultants Limited have entered geochemical data and sample site coordinates into a computer data file where it is now available for mathematical treatment. Initial determinations have included calculation and plotting of cumulative distribution curves, arithmetic histograms and logarithmic histograms for each element. Mean values were also calculated and it is interesting to compare our choice of the means, and for our purposes the lowest contour intervals, on the basis of the 1974 work only, to the mean values based on the total data:

	<u>Lowest Contour</u> <u>(1974 data)</u>	<u>Calculated Mean</u> <u>(1974 &amp; 1975 data)</u>
Copper	500 ppm	479 ppm
Molybdenum	10 ppm	18 ppm
Lead	20 ppm	37 ppm
Silver	1 ppm	1.46 ppm
Gold	100 ppb	107 ppb

The higher value of the calculated mean for molybdenum reflects the inclusion of many high values obtained in 1975 from the Dawson-Ross area; for lead, the generally higher values obtained in the "fringe" areas in 1975 and, more particularly, the zone of high lead content situated north of Mitchell Glacier in the north-east corner of the grid.



None of the above mentioned values considers the effect of mixed populations, that is, metal values resulting from more than one geologic factor or event. Gary Giroux of Montgomery Consultants Limited is at present working on further calculations that may enable a separation of the populations. If he is successful we may obtain computer drawn contour plans that will show the different populations.

As a demonstration of the type of data that they can provide Montgomery Consultants provided us with partial tables of ratios for each sample: Mo: Pb, Au: Ag, Ag: Mo, Cu: Mo, Cu: Pb. It is obvious that endless amounts of such data can be generated but we will require additional help to determine whether such information has practical application in the Sulphurets Creek Project area.

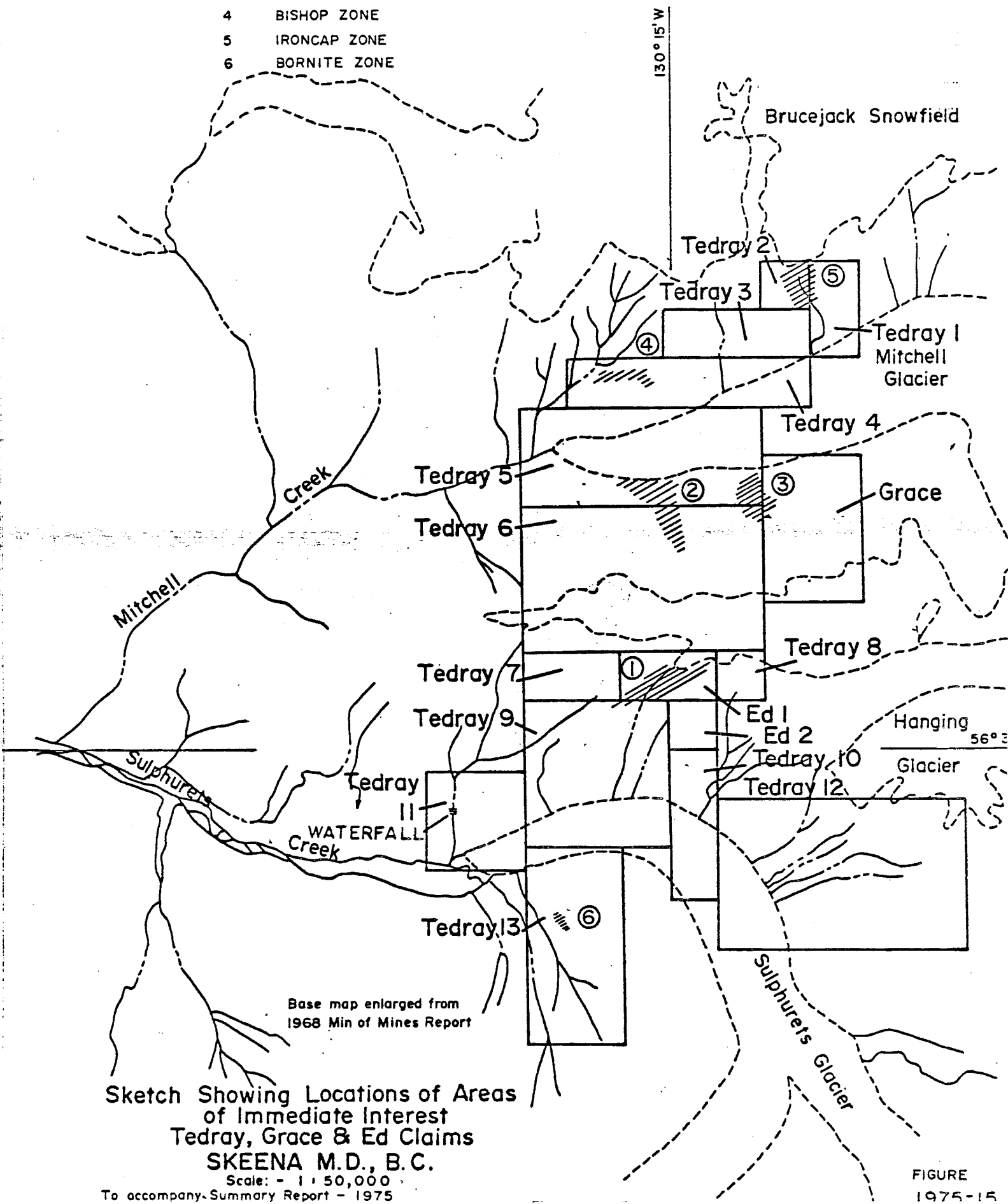
##### 5. Comments Regarding Petrographic Studies

Petrographic studies of 40 of the rock geochemical samples have now been completed by J. H. Montgomery Ph.D., P.Eng. and are included as Appendix 1 of this Report. The objective was to obtain some indication from microscopic studies of the accuracy of rock classifications and descriptions based on field and hand specimen observations.

Detailed comparisons of the two types of data are planned. A preliminary conclusion is that the earliest work in the area, i.e. 1960 - 1962, may have over-emphasized the volcanic rocks. In contrast, although much material of undoubted volcanic origin is present the rocks are largely sedimentary and plutonic.

A few trachytes were described and several "albite porphyries", of which many are likely to be metamorphic rocks and still others, dykes. Some rocks that were field mapped as granite have been classified on petrographic evidence as arkosic sandstones. This discrepancy is a shock at first sight and may require some further investigation.

- 1 MAIN COPPER ZONE
- 2 KIRKHAM ZONE
- 3 DAWSON ZONE
- 4 BISHOP ZONE
- 5 IRONCAP ZONE
- 6 BORNITE ZONE



Base map enlarged from  
1968 Min of Mines Report

Sketch Showing Locations of Areas  
of Immediate Interest  
Tedray, Grace & Ed Claims  
SKEENA M.D., B.C.

Scale: - 1 : 50,000

To accompany Summary Report - 1975

- 1 MAIN COPPER ZONE
- 2 KIRKHAM ZONE
- 3 DAWSON ZONE
- 4 BISHOP ZONE
- 5 IRONCAP ZONE
- 6 BORNITE ZONE

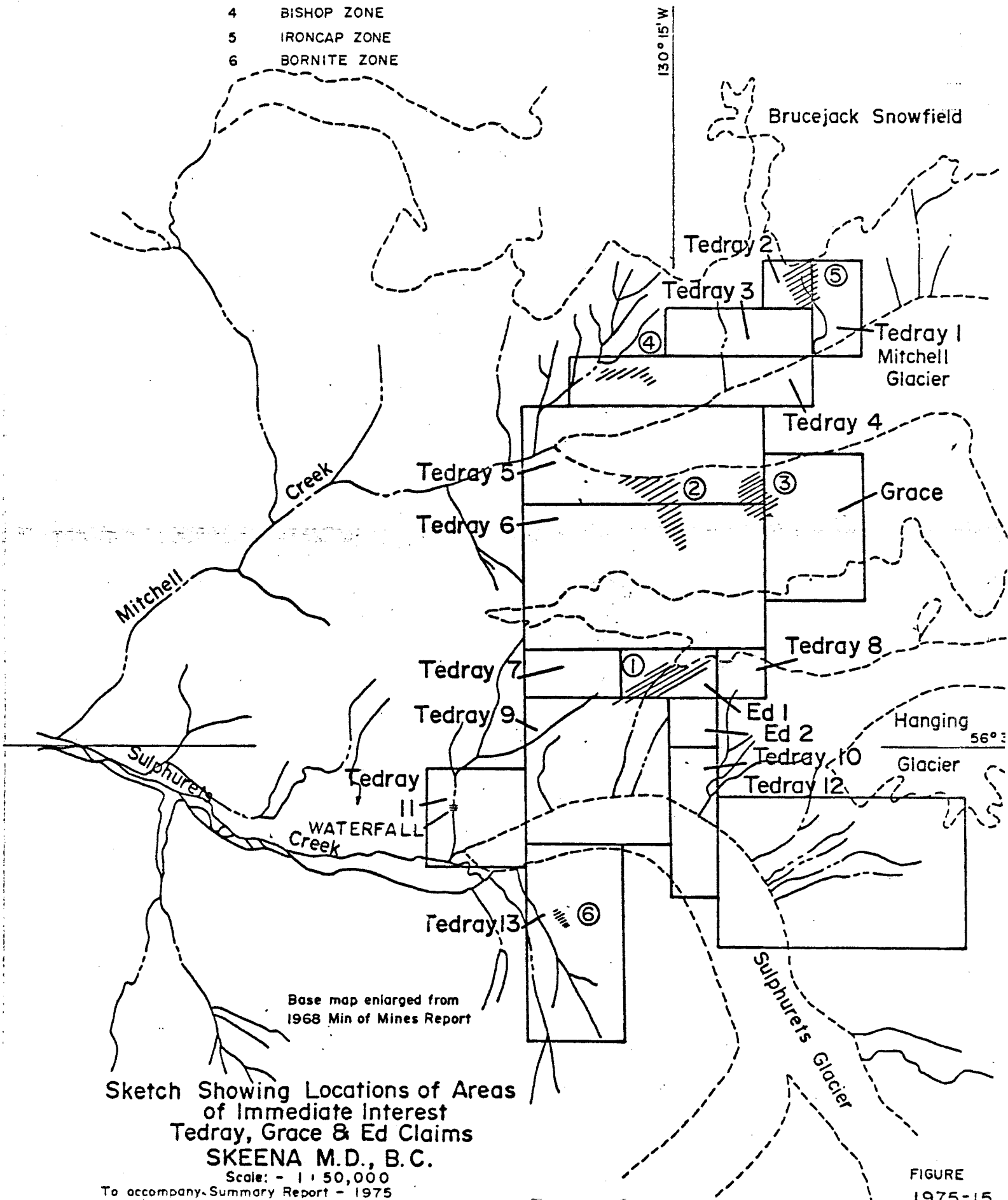


FIGURE 1975-15

In addition to the designated areas, several prospecting possibilities were indicated and should receive attention while work on the primary target areas is in progress. Concomitantly, the merits of all other mineral zones in the vicinity of Sulphurets Creek should be reviewed to determine whether they would be materially enhanced by possible future developments on the GML property and hence should be tied up now.

The following sections of this report offer recommendations for further work on each of the main areas of interest. The minimum cost of the first phase of such work in each area is likely to be \$ 25,000; the maximum, several hundred thousand dollars.

The Main Copper Zone is selected as the No. 1 area for further work because of the good results already obtained by drilling and trenching. It has large strike length, potentially a large down dip extension and good logistics relative to other areas. Areas 2, 4 and 5 require some detailed mapping prior to commencement of drilling. Area 6 has few outcrops and a mineral assemblage that is apparently unique in the Sulphurets area.

AREA 1      Main Copper Zone

In the Main Copper Zone, copper mineralization occurs in the hanging wall and footwall of the Sulphurets Fault over an east-west distance of 8000 feet in syenite, trachyte, andesite and arenite. Molybdenite and gold are important constituents. Previous work included mapping, packsack drilling and two diamond drill holes in the period 1960 - 1962, four diamond drill holes in 1968 and trenching, rock geochemical surveys and mapping in 1974 and 1975.

Best copper values occur in a broad zone of strongly sheared quartz sericite schist (silicified arenite). This zone has been drilled and trenched over a horizontal distance of 1200 feet. The minimum potential strike length is 3000 feet with further extensions obscured by snow to the northeast and by talus and steep terrain to the southwest. Dip of the zone appears to be 35° to 50° northwesterly but surface expressions of the zone are limited by the Sulphurets Fault and the mineral zone may extend a very long distance in the northwesterly direction. Thickness of the zone has not been determined but is indicated to be at least 90 feet.

The first stage of further work on the Main Copper Zone should include four 900 foot drill holes inclined - 70° southeast and spaced 400 feet apart, to extend present data to from 400 to 600 feet below surface. If the mineral zone is confirmed by this drilling, possibilities of a very sizeable ore deposit will emerge. If results of this limited amount of drilling were negative then the possibility of locating a significant deposit by further work would be greatly reduced.

AREA 2      Kirkham Zone

The Kirkham Zone is located about 3/4 of a mile north of the Main Copper Zone. It is on the north-facing slope of the Sulphurets - Mitchell Creek Ridge in an area of steep terrain, severe weather conditions and complex geology. Except in canyons and areas of recent glacial scouring, bedrock is obscured by moraines and grassy slopes. The area of high metal content coincides with an area of brecciated intrusive rocks and the trace of the Sulphurets Fault Zone. The actual fault plane has not been precisely

identified. Several high angle or vertical north-striking faults are also present and add to the difficulty of reconstructing the geology.

Copper mineralization is present in most outcrops and malachite staining is spectacularly present in several areas of rocks and boulders on the lower slopes. Pyrite is ubiquitous and fine grained magnetite is prominent in a small area near the permanent snowfield. Rocks that were field identified as of intrusive origin were later identified in microscope studies as altered arenites - indicative of the types of geological problems encountered.

A copper orebody with minor molybdenite, silver and gold may be present in the Kirkham Zone. Diamond drilling is required, firstly to help define the geologic units and structures and secondly to give more continuous and reliable assay data than can be obtained from surface work. The possibility that the Main Copper Zone is the south end of the same mineralization structure continuous with the Kirkham Zone and penetrating the width of the Sulphurets - Mitchell Creek Ridge would also be investigated.

Three holes totalling 1800 feet in length are proposed for the initial drilling test of the Kirkham zone. These holes would be collared at 800 foot intervals along the upper plate of the assumed Sulphurets Fault and would penetrate the Fault but likely would not reach the schistose rocks exposed in outcrops near Mitchell Glacier. Core recovery in the Fault is likely to be poor.

AREA 3 Dawson Zone

The Dawson Zone is a sharply defined area strongly anomalous in copper, lead and silver with peripheral molybdenum, located 3000 feet east of the Kirkham zone. The expression of this zone is vaguely a circle with a diameter of approximately 1500 feet. A bed-rock sample that may not be representative of the entire zone assayed 0.87% Cu, <0.001% Mo, 0.02 oz/ton Au and 0.44 oz/ton Ag. Due to favorable conditions the initial drilling of this zone would be readily accomplished. Two holes, each 400 feet in length, are proposed.

It must be noted that the boundary between the GML and Dawson-Ross properties in this area has not been defined (see Figure 1975 - 1 (a)). Some boundary determination would be required prior to commencement of work. This would likely involve delays of unknown duration and moderate costs in legal fees and legal surveys.

AREA 4 Bishop Zone

The Bishop Zone lies north of the lower portion of Mitchell Glacier between elevations 3500 and 5000 feet. It trends northeasterly and has strike length of 3600 feet, width of 1600 feet. The zone anomalous in copper appears to be peripheral to syenite and granite occurrences. The accompanying rock is strongly foliated quartz sericite schist. Copper sulfides are present in the majority of outcrops. Initial drilling would attempt to sample the schistose rocks overlying the intrusive rocks. Two holes are proposed, both are a maximum 1000 feet in length from elevations 4500 feet and 4300 feet and directed easterly at 50°. Because the underlying intrusive rocks, syenitic and granitic, are virtually barren of copper mineralization, the drill holes would be stopped when those rock types were encountered.

AREA 5 Iron Cap Zone

The Iron Cap Zone is situated at high elevation, i.e. above 4500 feet, on the same slope as, but one half mile northeast of, the Bishop Zone. Rocks are foliated quartz sericite schist with abundant pyrite but only minor amounts of chalcopyrite. Geochemical analyses suggest the presence of significant quantities of copper, silver, lead and molybdenum. Some leaching of near surface sulfides may have occurred.

The Mo appears to occur adjacent to the south of the Cu, Ag, Pb. This area had been prospected in some detail prior to the rock geochemical survey and had been written-off as having little potential. Very fine grained sulfides may occur with the abundant pyrite or some enrichment may have occurred in the form of unfamiliar secondary minerals. The area appears to extend northerly beneath the Treaty Glacier and its dimensions might be very large. The remainder of the exposed portion requires mapping, rock geochemical sampling and possibly trenching prior to a modest diamond drill test. Drilling is likely to require either two long holes or several short holes.

AREA 6 Bornite Zone

The Bornite Zone is situated between elevations 3000 and 3500 feet on the slope immediately south of the lower part of Sulphurets Glacier. Exposures consist of small outcroppings of what is apparently a dyke or small diorite intrusion that contains bornite and pyrrhotite in an area of heavy dirt, moss and forest cover. No work has been done to determine the dimensions of the mineralized material. Rock geochemical analyses are anomalous in copper and gold and suggest a probable minimum strike length of 1000 feet. Survey data of all types is incomplete.



Work on the Bornite Zone is in a very preliminary state and should be carried on somewhat differently from work on the larger zones. Mapping, soil sampling, trenching and possibly geophysical surveys are required.

#### 8. Other Exploration Work

The 1974 - 1975 rock geochemical and mapping project revealed several areas that do not qualify as priority targets for further work but nonetheless are deserving of further investigations. Notable among these are:

a) The area adjacent to the north side of the sharp band in Sulphurets Glacier. Rocks in the area are moderately anomalous in copper and gold. Outcroppings are heavily pyritic and are strongly weathered resulting in low pH conditions and the probability that copper minerals have been leached from the near-surface rocks. The area is particularly difficult to work but requires detailed prospecting.

b) The Waterfall area in the extreme western portion of the claims did not respond to the rock geochemical sampling technique but trench samples gave good indications. The occurrence of numerous stringers of massive chalcopyrite is interesting and further prospecting is required.

c) The arsenopyrite vein found in the southeastern portion of the claims did not respond to trenching and now appears to be merely a small lens in a fault or shear controlled quartz vein. Spectacular gold values obtained in 1974 from initial sampling probably represent enrichment. The continuation of the zone should be sought by a small amount of EM type surveying. Vegetation sampling might reveal other arsenopyrite occurrences.

d) Also in the southeastern part of the claims, a number of lead zinc occurrences were located. Together with similar occurrences below the Hanging Glacier they suggest possibilities for locating worthwhile lead-zinc-silver mineral zones. To date no such zones have been found but the search should be extended to the south and southeast with particular attention being directed to areas recently exposed by the retreat of the various glaciers.

e) Several areas north of Mitchell Glacier that have characteristics similar to the main Sulphurets Zone of alteration should be prospected and rock sampled.

#### 9. Possible Costs of Further Work

As discussed in the previous section, work is required in six specific parts of the Sulphurets Creek Project area. Further work is also required elsewhere but the objectives are not as clearly defined and the next stage of such work is likely to be of minimal cost.

Recommended first stage drilling is projected as follows:

1. Main Copper Zone	- 4 d.d.h., each 900 ft in length	- 3600 ft
2. Kirkham Zone	- 3 d.d.h., each 600 ft in length	- 1800 ft
3. Dawson Zone	- 2 d.d.h., each 400 ft in length	- 800 ft
4. Bishop Zone	- 2 d.d.h., each 1000 ft in length	- 2000 ft
Total drilling	11 holes	Totalling 8200 ft

A 1976 direct drilling cost of \$20/foot is assumed. This figure should include all contractor's charges: i.e. drilling, casing, supplies consumed, cookery, etcetera. Additional charges will include:

... of fuel and oil required to the property and ...  
 ... of equipment, cost of fuel, cost of suitable tents and camp  
 equipment, assay costs, costs of labor required for freighting,  
 camp and drill site preparation and core processing, costs of  
 surveying, geological control and project supervision. Two and  
 ... to this month's ...

... drilling cost	8200 feet at \$20/foot	\$164,000.
... truck and warehouse		6,000.
... helicopter-mob. & demob.	25,000.	
... -daily service	<u>50,000.</u>	81,000.
... supervisor		12,000.
... contingency		45,000.
... 1976 cost per foot	\$12.00	98,400.

... 1976 cost per foot of \$12.00 is based on ...  
 ... Additional charges will include ...