Box 8

GEOLOGICAL RECONNAISSANCE
SOUTH CARIBOO
P.N. 123
1970

Van. B.C.
Mar. /71

S.H. Pilcher

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I. INTRODUCTION

The South Cariboo project at the present time involves geologic compilations as well as field work. The compilation work is about 50% completed, and as described previously, involves the compilation of geology, structure, airborne magnetics and mineralization, over an area of about 29,000 square miles. This work is basic in any regional exploration programme, and in addition, it is hoped that some pattern of mineralization and/or structure may emerge which would be useful in planning future programmes. The compilations may be 75% completed by the 1971 field season.

Areas covered during 1970 are indicated on the index map (plate 1). This field season was the first opportunity the writer has had to travel fairly freely throughout the project area, and it was hoped that most of the season could be spent in becoming as familiar as possible with the geology and mineralization within the area; however, because of the large size of the area of interest, only a small portion of the total area could be covered. This reconnaissance is included under Section IIA of this report. Towards the latter part of the season a considerable amount of time was spent at the Murphy Lake property.

A total of four men were employed on South Cariboo field work for 1970. The writer plus an assistant, M. McPhail, made up one crew. The second crew, which included B. Calder and R. McGuire, was assigned an area of Mesozoic volcanic and intrusive rocks on the Bonaparte Lake and Quesnel Lake map sheets. Calder's report concerning this reconnaissance is included under Section IIB. This crew also

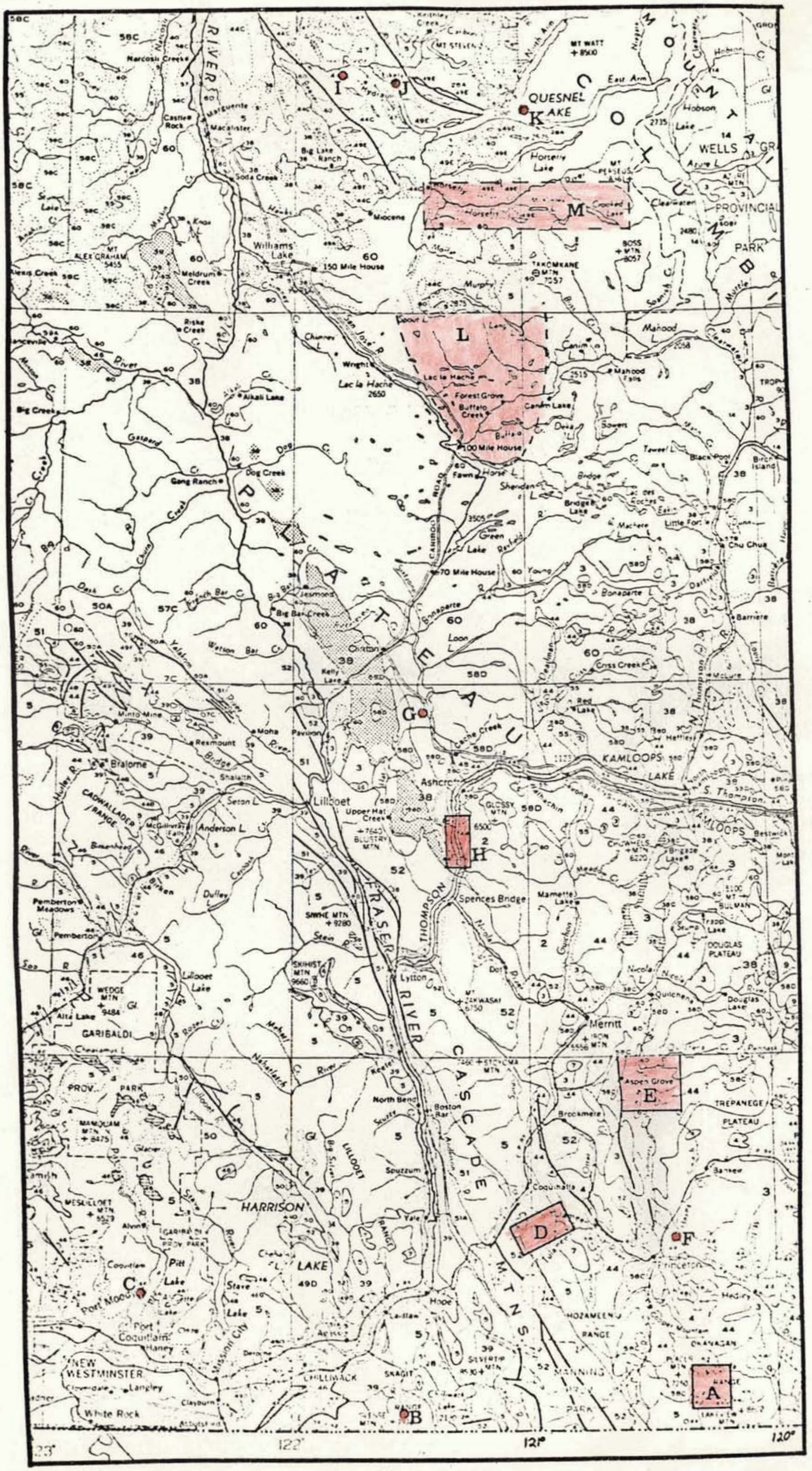


Plate 1 Index Map

discovered the mineralization which led to the staking of the Murphy Lake area. The Murphy Lake work is included in a separate report.

Section III of this report describes some sulphur gas surveys made over some known mineralized areas.

IIA. RECONNAISSANCE

Ashnola River Area (A)

Approximately ten days were spent in the vicinity of the Ashnola and Pasayten Rivers doing general geological reconnaissance, and collecting silt samples from the major drainages (map 123-70-1).

The Pasayten River drains an area containing Nicola group rocks and Coast intrusives. The Nicola rocks were here found to include schist and phyllite with minor limestone and quartzite. The intrusive rock is mostly a gneissic granodiorite. Several limonitic shears and a few narrow quartz veins carrying minor chalcopyrite, were noted. No significant structure, alteration or mineralization were found in this area.

Silts from seven small streams draining eastward into the Pasayten River, were sampled. Copper values of these ranged from 12 to 32 ppm, and all contained only trace amounts of molybdenum. One sample collected from the Pasayten itself carried 18 ppm copper and about 1 ppm molybdenum. These values are all within background level.

Point A, near the junction of the Pasayten and Similkameen Rivers is the old Roche-Pasayten property. This showing consists of a 1-2 foot quartz vein striking north-south and carrying minor pyrite, sphalerite and tetrahedrite. The vein exposed in two pits about 50 feet apart, cuts a silicified schist.

On a traverse across Placer Mountain, a previously unmapped

intrusive was located (point B). The rock is a quartz diorite, relatively fresh, which crops out over an area of about 500 feet square. Some outcrops contain a well developed fracture set striking N60°W. These are barren.

Point C on the same traverse is the Rick property, previously drilled by Kennco, and now held by Prism Resources. Prism was doing some trenching and I.P. work at the time the property was visited. The rocks here consist of a plug of quartz monzonite porphyry which is cut by dykes and irregular masses of quartz porphyry. Both rocks are extremely shattered and fractured. The quartz monzonite has been extensively replaced by later quartz and biotite, which form an irregular stockwork replacement. Iron staining and bleaching (argillic and sericitic alteration) are widespread. The mineralization appears to be mostly pyrite. Even though the geologic setting of the property is very favourable, copper and molybdenum values are very low. The property has been extensively trenched and only a few occurrences of chalcopyrite and molybdenite were noted. The one silt sample collected from McBride Creek which drains the mineralized area, contained only 4 ppm copper.

Several traverses were run along streams tributary to the Ashnola River, in areas of Coast intrusives. The rocks here are predominately medium-grained granodiorite, of relatively uniform composition.

Several iron stained areas were examined on the traverse up Wall Creek (points G & H). These were found to be deeply weathered granitic material with colouration due to breakdown of mafic minerals.

On Duruisseau Creek a platy quartz porphyry crops out at

points D & F. This porphyry is very similar to that which occurs on the Rick property, however, at this location there is no fracturing or associated mineralization and alteration.

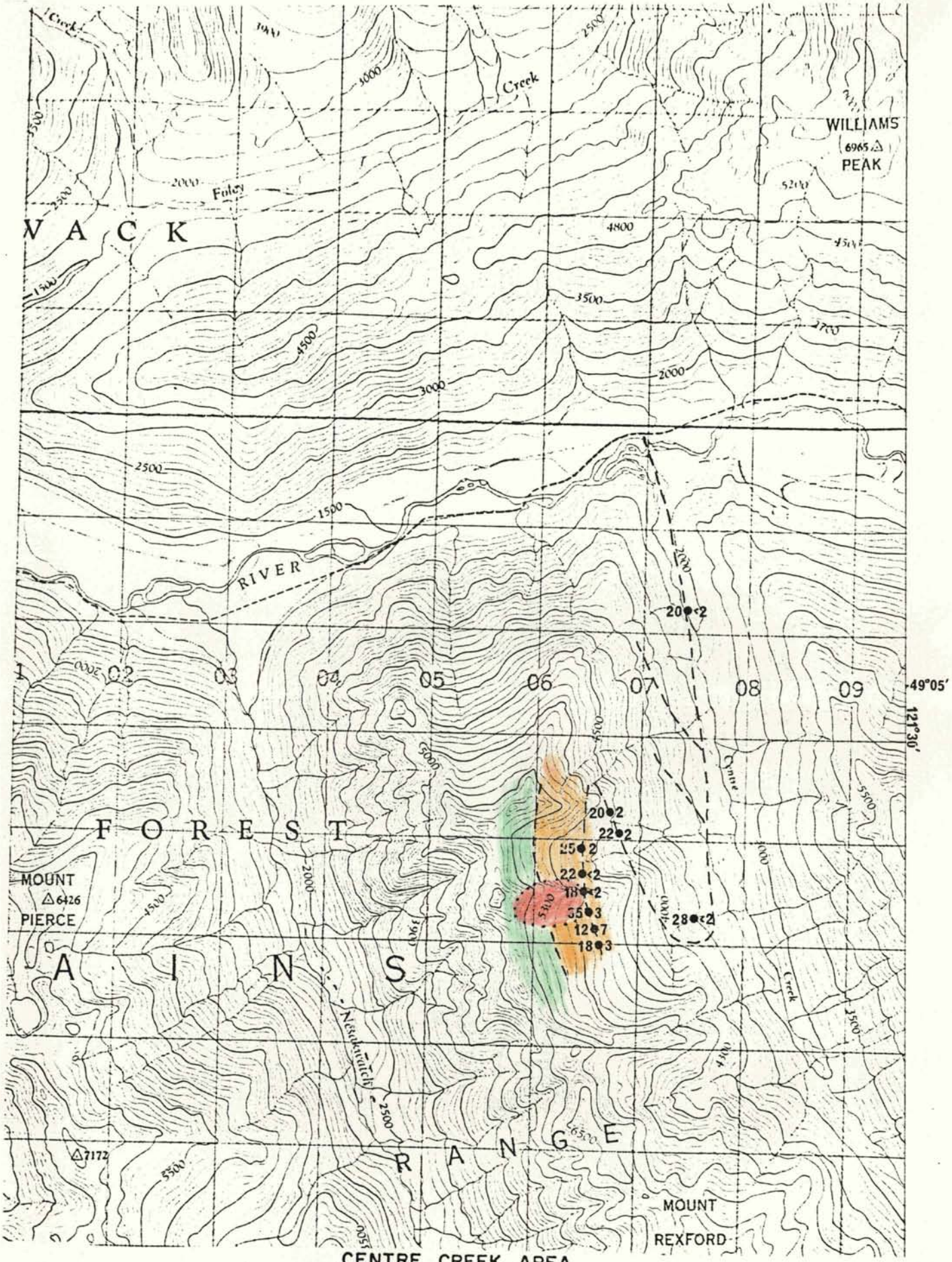
Several zones of intensely altered granodiorite were found at point I, just east of Ashnola River. The alteration appears to be primarily argillic and occurs in several zones, varying from 50 to 200 feet square along a half mile section of valley wall. The alteration is in part associated with a strong N80°E system of fractures. The fractures carry traces of magnetite. No evidence of any sulphides were found. A silt sample from the stream draining this area contained 13 ppm copper with traces of molybdenum.

A brief examination was made of the Forks claim, located near the east boundary of map 123-70-1 (point I). A 2-foot quartz vein is exposed along a contact zone between a granitic dyke and schist of the Bradshaw formation. Very minor amounts of molybdenite were noted in the vein. The vein trends east-west, parallel to that section of the Ashnola River immediately west of the showing. This relationship suggests a common controlling east-west structure.

Centre Creek Area (B)

One day was spent in examining this property in the company of the owner Mr. Charles Campbell of Chilliwack. The area is located about 25 miles south of Hope, and one mile west of Centre Creek, a north-flowing tributary of the Chilliwack River (plate 2).

The claim covers a contact zone between the Chilliwack pluton, a granodiorite of tertiary age, and rocks of the Chilliwack group, a mixed assemblage of sediments and volcanics, dated as Paleozoic.



CENTRE CREEK AREA

HORNFELS

FELDSPAR PORPHYRY

GRANODIORITE

cu ● mo GEOCHEMICAL SAMPLE

SCALE — 1:50,000

Plate 2

These latter rocks have been altered to hornfels in the contact zone.

Most of the claim group consists of fresh granodiorite with thin and scattered remnants of hornfels capping. The hornfels contain a few widely-spaced dykes of aplite and granodiorite. The granodiorite is cut by several small pegmatite dykes and quartz veins. These contain trace amounts of molybdenite.

Near the west side of the property the main north-south trending ridge is capped by several hundred feet of iron-stained hornfels. Minor amounts of pyrrhotite are present.

A small plug of feldspar porphyry cuts the granodiorite and hornfels near the central part of the property. The porphyry contains K-spar phenocryst up to 3/4 inches in length in a matrix of quartz, biotite and feldspar. No mineralization is associated with the porphyry.

One small outcrop of fine-grained quartz monzonite, possibly a dyke, occurs in a cliff section below the ridge. This rock contains up to 15% pyrite.

Soil samples collected along a logging road which cuts across the claim group, did not contain any interesting copper or molybdenum values.

Even though the intrusive rocks in this area appear interesting, there is no indication, either direct or indirect, of any significant mineralization.

Pitt Lake Property (C)

This property was examined by Mr. M. McPhail. The following is a report on his findings:

Name: Nissa Property

Location: Approximately one mile west of the southern end of Pitt

Lake. Access is by logging road and highway from Port Coquitlam.

Owner: Nick Biduik of Courtney, B.C.

Topography: The country is mountainous and there is moderate forest coverage. There are many sheer bluffs and the property itself is located at the bottom of a 300' precipitous bluff.

Geology: The mineralization is localized along a diorite - limestone contact where there is development of a skarn type mineralization. The mineralized zone trends N30E and is controlled by replacement along the contact zone and N30E shears. There is development of epidote, chlorite, garnet and other lime silicates, along the face of the bluffs for 20 feet, but there was only scattered sulphides in the gangue and small lenses confined to shears. The mineralogy of the deposit is as follows: Magnetite and chlorite and iron pyrites with some pyrrhotite with admixed chalcopyrite. MINF?

There does not appear to be any appreciable concentration of the chalcopyrite with the other minerals nor does there appear to be any significant quantity of mineralization developed.

Tulameen Area (D)

Several reconnaissance traverses were taken in accessible areas along the Tulameen River and tributaries, west of the town of Tulameen (map 123-70-2). Major drainages were sampled. Interest here is based on favorable geology and scattered showings of gold, copper and other base metals.

The major rock types include Nicola group rocks in contact with Coast intrusions to the west. In addition, a large mass of mixed ultrabasic rocks crops out in a belt extending southeastward from Grasshopper mountain. A narrow band of Nicola separates the ultrabasic rocks from the Coast intrusives lying further to the west.

In the Lawless Creek area, north of the Tulameen River, Nicola rocks consist mostly of andesite flows and agglomerates. At location B on this traverse, a highly altered fault zone is exposed along the road for about 100 feet. This zone, trending northeast, consists of crushed and shattered andesite, which has been bleached and heavily iron-stained. Traces of pyrite are present within blocks of the altered andesite. A sample of the limonitic material carried 63 ppm copper and 18 ppm molybdenum. This latter value is slightly anomalous, and some follow-up work may be done, however, such work would be of a low priority. Stream sediments collected in the vicinity of this shear zone carry 56-64 ppm copper and up to 7 ppm molybdenum.

Most silt samples collected from Lawless Creek contained 30-50 ppm copper, values which are apparently background. Molybdenum values are nil. Silt samples collected from Skwum Creek and vicinity, however, carried 70-80 ppm copper and 3 ppm molybdenum. These values are slightly anomalous and follow-up work would have been done had not the entire area been either staked or optioned by Copper Range. This company had a major program in progress at the time this area was visited.

Just south of the mouth of Skwum Creek (location C), a fracture zone about 200 feet in width cuts slaty argillite and a small plug of quartz-feldspar porphyry. These fractures contain some pyrite

and traces of chalcopyrite. Further to the south at an old copper property known as Laws Camp (location E), similar porphyry forms sills and dykes cutting a limestone member of the Nicola group. Closely associated with the porphyry are three separate lens-shaped massive sulphide replacement bodies, which were drilled by Cominco in 1960. The mineralization, consisting of pyrite, sphalerite, pyrrhotite and minor chalcopyrite, was found to be too narrow and too limited in extent along strike to constitute ore.

The same limestone horizon was located at points D and J. At D this member is about 100 feet thick, striking N10°E and dipping 25° west. The bed is only about 15 feet thick at J where it strikes N35°W and dips 65° to the southwest. At both these locations the limestone is barren and has been re-crystallized to coarse, white marble. North of J foot traverses were taken across Mount Britton, along the limestone-granite contact. The contact here was found to be completely barren. Minor disseminated pyrite was found in some chlorite schists on the east side of the mountain.

This narrow band of Nicola group rocks, bounded on the east by the ultrabasic mass and on the west by coast intrusives, extends southeast from location J for about 12 miles before it broadens out around the southern end of the ultrabasic mass. The area here is relatively inaccessible by helicopter and otherwise. However, because of the generally favorable rock types, several long traverses are planned here for the 1971 field season.

One property was examined near the south end of the ultrabasic mass (location A). The claims, owned by Mr. T. Doubt of Princeton, are

underlain by a coarse-grained gneissic granodiorite. The only known mineralization on the property consists of trace amounts of chalcopyrite disseminated in the granodiorite over an area of about 300 x 500 feet.

Continuing south along the Lawless Creek traverse, several features are worth a brief mention. At G, a 20-foot thick diorite dike is exposed near the road. The dike is highly altered and contains 3% pyrite disseminated throughout. No copper mineralization was noted. Location H is the old Rabbit mine, a small gold producer in which native and telluride gold occurs in a massive 3-foot quartz vein striking N40°E and dipping 10° northwest. The vein cuts slaty argillite and contains trace amounts of chalcopyrite, pyrite and galena. At I, a shear zone is exposed, striking N40°W and dipping 60° southwest, the zone is bleached and iron-stained. The El Alamein mine, located at F, also occurs along a northwest-trending shear zone, possibly the same structure as was noted at I. At the El Alamein mine a few scattered seams of quartz and pyrite are present within the shear zone. Gold values were extremely low and the mine had a very limited production.

Continuing to the southwest along the Tulameen River and tributaries, a highly altered and fractured intrusive crops out at K. This rock, a more uniformed textured variety than the normal Coast intrusive in the area, contains clots of disseminated limonite. The limonite plus other alteration features appear to represent relatively intense weathering rather than any hydrothermal activity. Geochemical values of silt collected nearby are well within background.

Location L represents a property held by Mr. T. Doubt of

Princeton. The showing, located on a steep slope south of Jim Kelly Creek, is a ten-foot shear zone trending east-west and containing vuggy quartz, minor chalcopyrite, and traces of hematite. The country rock is a fine-grained quartz-chlorite-sericite schist. This showing has no potential and is of no further interest.

Further south along Sutter Creek a very fine-grained intrusive is exposed in a small outcrop at M. The intrusive contains disseminated pyrite and quartz-pyrite veinlets. Geochemical values from Sutter Creek however, are well within background and no further work here seems warranted.

A brief examination was made of the Dornberg mine, one of several old silver-lead-zinc mines, located on or near Treasure mountain (N). All these mines had limited production from narrow fissure veins controlled by the Treasure mountain fault.

The Dornberg produced 1,088 tons of ore during the period 1929-1939. The average grade was 18% lead, 4% zinc and 36 ounces of silver. The silver values are reported to have varied considerably and the source was never identified.

Of all the sediment samples collected in this area, only two appear to be of enough interest to follow up. One sample collected from McGee Creek near it's junction with the Tulameen River, carried 12 ppm molybdenum. Another from Jim Kelly Creek carried 9 ppm molybdenum. Both these streams drain the same general area on the southeast flank of Coquihalla Mountain. Additional sampling and prospecting will be carried out here during the 1971 field season.

Aspen Grove Area (E)

Throughout this section of Nicola group rocks (map 123-70-3) numerous small copper showings occur, most of which are narrow fissure veins cutting volcanic units of the Nicola.

Several days were spent in this area, during which time brief examinations were made of some of these showings. In addition, reconnaissance was run over sections of volcanic and intrusive rock, the purpose being to determine whether a large scale mapping programme of these rocks and associated mineralization was warranted.

The Nicola rocks here were found to consist almost entirely of andesite flows, breccias and agglomerates. In some areas the development of epidote is intense and widespread. This alteration is mostly related to barren fractures of various trends. No obvious relationship is evident between the alteration and any mineralization.

The mineralization observed is all controlled by narrow shears and zones of fractures, these structures trending primarily east-west to northeast and north-south. Mineralization consists of chalcopyrite, bornite and chalcocite, accompanied by varying amounts of pyrite, magnetite, hematite, epidote, calcite, quartz and pink K-feldspar.

Because of the extreme difficulty of differentiating the volcanic rocks and the lack of any distinctive marker horizon, mapping of the Nicola, if possible at all, would be a very time consuming task and probably not worthwhile in regards to exploration. A more reasonable approach would be an air photo study of the fracture and shear systems and their relationship to the known mineralization. This study will be done in the course of the regional compilation for south-central B.C.

A few features worth a brief mention are discussed below.

In the vicinity of A the Nicola rocks consist of massive andesites and agglomerates. Several narrow zones of intense epidote alternation occur, controlled by fractures which generally trend N40°W. No sulphides were noted. At H the rock types are the same, but here the epidote is much more intense and widespread. A part is controlled by fractures trending N40°W, but fractures with other trends are also present. Again, no sulphides are present.

Just east of H, at the head of Alleyne Lake, about 10,000 feet of drill core are stored. Apparently this core belongs to Payco Mines, who drilled in the vicinity of H, during the period 1965-1967. Most of this core is volcanic, however, one section is of an extremely altered intrusive rock whose feldspars and mafics are nearly completely altered to clay and sericate. The core contains minor amounts of fine-grained sphalerite and galena. This rock does not crop out in the vicinity of the known drill holes and the source of the core could not be determined.

Point B represents the probable location of the old Copper Star showing. Here a 40 foot shaft has been sunk along a narrow shear zone which trends N70°E and dips 70° to the south. Minor amounts of malachite and native copper occur along the shear and disseminated in the surrounding volcanic rock.

At C, three shafts about 200 feet apart are aligned along a north-south trend. The only structures with this trend observed here are small hematite-filled fractures. Other fractures are present trending N75°E and which contain minor chalcopyrite, hematite and malachite.

On the Big Sioux showing, located at D, a 20-foot shaft has been sunk along a strong N85°W shear. This shear, though very narrow, contains considerable chalcocite, bornite and malachite in restricted lenses. Malachite is also present along fractures trending N15°W and N65°E.

At E a strong shear zone was noted, trending N80°E. Minor malachite is present within the zone.

A small body of granodiorite is cut by a north-trending shear zone at location F, where the rock is exposed for 350 feet along the creek. Within the shear the rock is highly altered, containing abundant clay and sericite. Also present are some irregular veinlets of pink K-feldspar and a few quartz veins, containing minor pyrite and molybdenite. East of the shear zone the rock is relatively fresh except for narrow envelopes of chlorite and altered feldspars around scattered fractures trending N50°E. Just south of the intrusive at G, some syenite dykes are exposed containing trace amounts of disseminated chalcopyrite.

The intrusive at I varies from a diorite to a syenite in composition. It contains up to 25% mafics, mostly hornblende, which is generally completely chloritized. The feldspars are slightly cloudy. No sulphides are present.

At J, the intrusive is an even-textured quartz monzonite part of which is deeply weathered. No evidence was found of any hydrothermal alteration or sulphide minerals. The rock becomes more basic towards its contact with the surrounding volcanics.

A small outcrop of syenite beside the road at K contains a few hairline quartz veins with traces of chalcopyrite. * undocumented

Joy Mines Property (F)

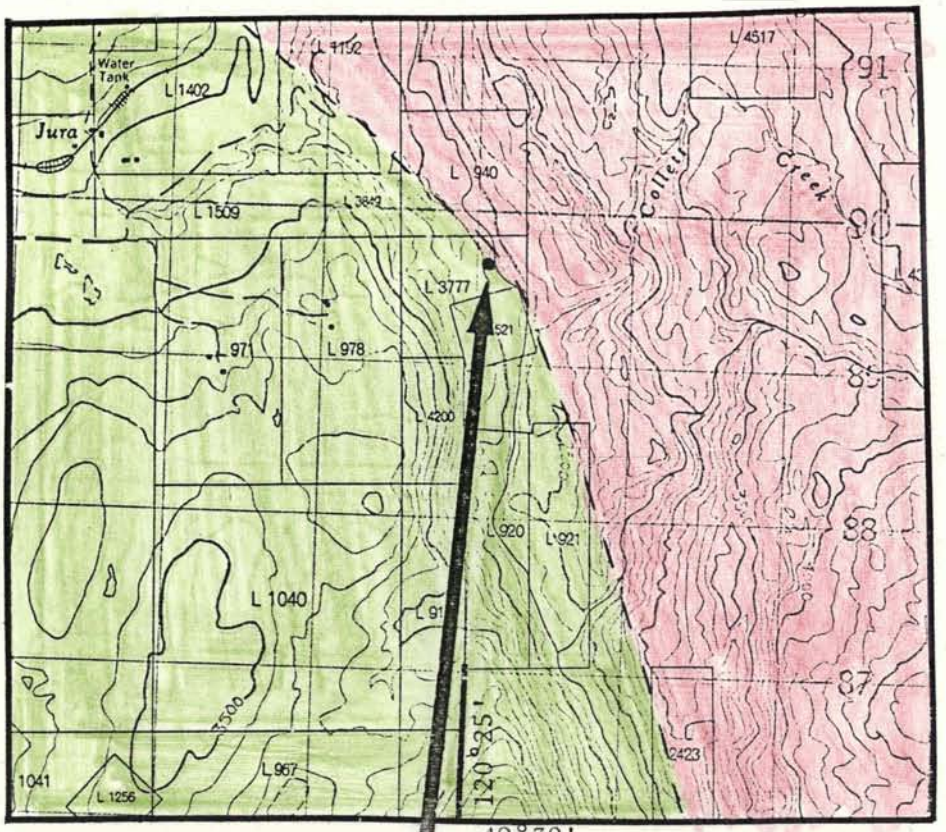
At the time of the examination this property was being promoted by Ralph Rooney, a well known "character" associated with the South Seas property in the Highland Valley.

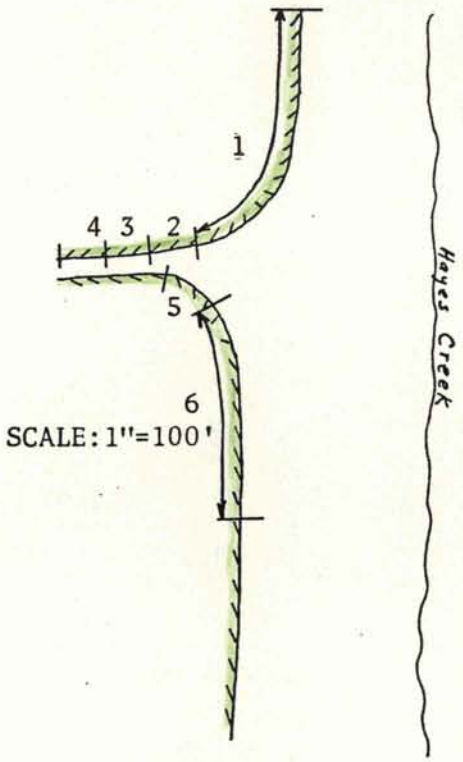
The main showing is exposed along a 350 foot trench (plate 3) which is adjacent to and parallels Hayes Creek. The trench cuts highly sheared Nicola volcanics near their contact with Coast intrusives. The shear zone itself probably trends northerly though it cannot be traced beyond the trench area. This trench was put in by Rooney during the summer of 1970.

Within the trench the andesite is highly fractured and bleached, and contains a considerable amount of malachite and some azurite, primarily as coatings on broken rock fragments. Minor amounts of pyrite and chalcopyrite are present in a few narrow zones where they occur as fine fracture fillings and disseminations. Copper values of up to 0.46% were obtained from continuous chip samples collected from the trench walls.

The showing itself is fairly impressive; however, almost all the mineralization is confined to this rather narrow shear zone. Intrusive rock on the east bank of Hayes Creek is well exposed, fresh and barren. Andesite a few hundred feet west and south of the trench, does contain a few odd specks of chalcopyrite, but is otherwise uninteresting. The only possible extension is to the north in an area of deep overburden.

According to Rooney, an old adit was present at the trench site. Also an old diamond drill hole is located along the creek just east of the trench. This may be one of several holes drilled by Silver Arrow in 1967.





Sample	Width	Copper(%)	Silver(oz.)
1	100'	0.15	0.1
2	25'	0.35	0.1
3	25'	0.40	0.2
4	25'	0.32	0.2
5	25'	0.46	0.3
6	100'	0.24	0.1

Plate 3. Joy Mines Property, Princeton area.

They did report a 70 foot section containing 0.7 to 0.8% copper.

This property does warrant enough additional work necessary to determine the extent of the mineralized zone. An I.P. survey here would probably be sufficient, and it would have been considered had a reasonable type of deal been possible; however, Rooney was promoting this property to the fullest extent and was playing the interested companies off against each other. The showing certainly does not justify this type of play. Apparently, Selco finally ended up with the option.

Maggie Mine (G)

The Maggie mine is an old property dating back to the early 1900's. Early work included about 1100 feet of drifting, part of which followed a northeast trending mineralized shear. The mine produced only about 50 tons of ore grading 8% copper and two ounces of silver.

The most striking feature about the property is the extent and intensity of silicification and pyritization. This alteration, affecting rocks of the Cash Creek group, occupies a north-south trending zone measuring one mile in length by 1/4 mile in width. The pyrite in the surface rocks is largely oxidized, resulting in a vuggy, leached, iron-stained gossan.

Kennco drilled several holes into this pyritic zone in 1952. The ground has been held by Bethlehem since 1968. They drilled five percussion holes on the property that year. Considerable drilling activity was noted on the property during the early part of the summer, 1970. In August, they announced an orebody measuring 2800 x 800 feet which contains about 100,000,000 tons, with a copper equivalent of greater than 0.4%. The orebody is reported to be just east of the gossan zone which is in fact, said to represent a pyritic halo around the ore.

Red Hill Area (H)

About 20 miles south of the Maggie mine, numerous gossan zones occur in the vicinity of Red Hill, in an area just west of the Guichon batholith (map 123-70-4). Most of the gossans are in Cache Creek rocks.

Because of obvious similarities with the Maggie, several days were spent in examining this area. Analytical results from some of the samples collected are shown on tables 1A and 1B.

The many gossans examined are probably in part controlled by faults and shears; however, this relationship is not readily apparent in most cases. Generally a controlling structure cannot be determined. The gossans occur in all shapes and sizes and their margins are usually sharply defined. Some are hard siliceous schists whose deep coloration is due to oxidation of disseminated pyrite. Others are earthy and soft and are characterized by red and yellow clays. These soft varities contain native sulphur, gypsum, sericite and iron sulphates, and appear to represent a hot spring type of deposit. Some gossans are barren of any sulphides whereas others contain disseminated or massive pyrite with localized concentration of chalcopyrite.

The entire area was staked at the time of examination. If this ground had been open, a detailed mapping and geophysical survey would have been considered. However, with the area divided up into numerous claim groups, a regional type of study was not feasible. There is current exploration activity on at least two claim groups, one held by Noranda and one by Lecanex.

A brief description is given below of some of the areas and properties examined.

One property owned by Mr. Larry Loring, includes some ground along Oregon Jack Creek (A). Several hundred feet along the north bank of the creek consist here of altered and sheared schists containing disseminated pyrite, minor chalcopyrite, gypsum, iron oxide, and jasper. Samples from this zone gave values of up to 0.01% copper (table 1A). Gossans on the west side of the road, locations B & C, are also on Loring's ground. These are pyritic zones in schist which contain up to 0.02% copper.

Red Hill itself (location D) contains several large and intensely coloured gossans. These are in highly sheared rocks, probably quartz porphyries or dacitic tuffs. The gossans are deep red and earthy. Some contain irregular zones of disseminated to near massive pyrite. Quartz veins of various trends are also present in some of the gossans. One sample collected here assayed 0.22% copper over 60 feet. This was from a well mineralized zone. Spectrographic analysis of two samples of the red earthy material revealed nothing unusual (table 1B).

Noranda held ground on Red Hill in 1962 and at that time did trenching, E.M. and geochemical soil surveys, and diamond drilling. During the period 1966-1968, the ground was held by Delkirk who optioned at least part of their claims to Quintana Minerals. Quintana did mapping, trenching and rotary drilling of four holes totalling 2600 feet.

Several gossans were examined along the east side of the river. The southermost of these, located at E, is in a siliceous argillite; though the gossan is small, measuring about 300 x 100 feet, the argillite is intensely stained, leached and vuggy. Some disseminated pyrite is present. One 10-foot chip sample assayed only

trace amounts of copper. A similar though larger gossan is present at F. Here an adit has been driven into siliceous argillites beneath the gossan zone. The argillite contains disseminated pyrite. Two samples of this material contained only trace amounts of copper. Another gossan 200 feet northwest of the adit has been cut by a 50 foot trench. The trench assays 0.18% copper. A large gossan at G, measuring about 1000 x 500 feet, consists of highly fractured and iron-stained argillite. Only trace amounts of copper are present. Another at H contains nearly massive pyrite, but with only trace copper values.

At I a shear zone parallels the contact between a diorite phase of the Guichon batholith, and green cherts and argillites of the Cache Creek group. For approximately 300 feet along the contact the Cash Creek rocks are heavily iron-stained. Within this zone epidote and garnet are also present. Pyrite is fairly pervasive and in some areas is massive. A very minor amount of chalcopyrite occurs with the pyrite. Alscope had this ground in 1962-1963 and did some trenching, I.P, and magnetometer work, and in addition drilled seven holes for a total of 2100 feet.

A possible extension of this same shear zone occurs along the contact at J. The shear here is about 5 feet wide and does contain a few irregular and discontinuous stringers of chalcopyrite. No pyrite is present. The granitic rock is relatively fresh though the feldspars do exhibit a slight pink coloration.

At K a barren quartz monzonite contains traces of pyrite along a northwest trending shear.

A traverse was taken across some Nicola rocks into border phases of the guichon batholith (location L). In this area the Nicola rocks consist of limestone, limy shales and cherts. The limestone

exhibits restricted zones of intense epidote alteration which is accompanied by minor amounts of magnetite and traces of chalcopyrite. The intrusive rocks at the head of the valley are relatively fresh and barren of any sulphides.

Back on the west side of the river at M, a large earthy yellow gossan zone is present. This earthy material consists of clay, native sulphur, iron sulphates and gypsum. Veins of solid gypsum up to 8 inches thick cut the earthy material. Ribs or bands of siliceous material containing disseminated pyrite are also present within the altered mass. The transition from this intensely altered material to relatively fresh rock is remarkably abrupt. Spectrographic analysis of several samples of the altered rock are given in table 2B.

The old Martel Mine was visited briefly (location N). The size of the dump indicates about 1000 feet of underground workings. The country rock here is slaty argillite. Some quartz vein material on the dump contains scattered pyrite, chalcopyrite, and molybdenite. Outcrops on the hill above the adit contain a few quartz stringers and lenses of various trends. No sulphides were noted. Apparently the adit followed a single quartz vein which contained thin platings of molybdenite along its walls. No production was ever recorded.

TABLE 1A- ASSAYS AND GEOCHEMICAL ANALYSES

Traverse Point	Assay Number	Type Sample	Width	Material	Silver	Copper
A	15456	Chip	20'	Altered Schist	Tr.	0.01%
	15457	"	5'	Jasper & Schist	Tr.	0.01%
	15458	"	50'	Jasper & Schist	Tr.	Tr.
	15459	"	4'	Oxidized vein	Tr.	0.01%
B	15454	Chip	10'	Altered Schist	Tr.	0.01%
C	15455	"	150'	Gossan	0.2 oz	0.02%
D	15460	"	3'	Oxidized vein	17 ppm	42 ppm
	15461	"	60'	Pyritic zone	Tr.	0.22%
E	15470	"	10'	Gossan	Tr.	Tr.
F	15471	" (adit wall)	10'	Argillite (pyritic)	17 ppm	20 ppm
	15472	"	15'	" "	17 ppm	23 ppm
	15473	"	50'	Gossan	-	0.18%
G	15474	Grab	-	Argillite (pyritic)	22 ppm	28 ppm
H	15475	Grab	-	Gossan	22 ppm	32 ppm

TABLE 1B - SPECTROGRAPHIC ANALYSES

Location	D	D	M	M	M
Number	15462	15463	15476	15477	15478
Material	Red soil	Red soil	Siliceous Gossan	Limonite	Siliceous Gossan
Major	Si	Si	Si	Si	Si
Intermed.	Al, Fe, Na	Al, Fe, Na	Al, Ca, Fe	Al, Ca, Fe	Al, Fe, Na
170	Mg	Ca, K	K, Na	K, Na	Ca, K
0.01 - 0.1%	Ca, Mn, K, Ti	Mg, Mn, Ti	Pb, Mg, Ti	Mg, Ti	Mg, Ti
0.001 - 0.01%	Cu, Pb, Va	Ba, Cr, Cu Pb, Ag, Va	Cr, Cu, Sr, Va	Cr, Cu, Pb Ag, Sr, Va	Ba, Cr, Cu, Pb, Va

Jack Pine Lake Property (I)

This property, owned by Ardo Mines, consists of about 100 claims located along the south bank of the Quesnel River, about two miles northwest of Moorehead Lake.

The only rock exposures on the property consist of limestone which occurs in scattered outcrops over an area of several hundred feet square. Several of the outcrops contain traces of malachite which has been derived from traces of very fine grained disseminated chalocite. Limestone exposed in trenches to the north and south of these is barren.

Though the known mineralization is very minor in extent, the property is in general favourably situated. A magnetometer and geochemical survey might indicate some interesting anomalies. No additional work has yet been done on this property.

Red Rock Property (J)

This property, also owned by Ardo Mines, consists of over 100 claims located just west of Likely and south of the Quesnel River.

I.P. and geochemical surveys have been done over parts of the claim group, and in addition, ten holes have been drilled.

The main showing is a ten foot shear zone in andesite exposed along the south bank of the river. The shear contains pyrite and minor chalcopyrite, hematite, magnetite, epidote and calcite. Hole #5 which cut the shear is reported to have assayed 0.54% copper over 50 feet. The shear is represented by a geochemical anomaly about 1200 feet long which contains up to 600 ppm copper.

Other holes have been drilled through the shear and into other I.P. and geochemical anomalies. The holes all cut andesite, and the only mineralization found was pyrite.

These northernmost claims in the group have been fairly

well explored. No work however, has been done on the southern claims. These contain no outcrop and the only thing favorable about them is their proximity to Cariboo Bell, which lies to the southwest of the property.

Eaglet Fluorite Property (K)

Interest in fluorite by Falconbridge was indicated in an inter-office memo from W.B.G. Walker, dated June 4, 1970. As a result a three day examination was made on this property, located on the east side of Quesnel Lake, two miles northeast of the junction of the North Arm of the main lake.

The property is owned by Mr. Bert Forster of Kamloops. Mr. Forster discovered the showing in 1946.

Fluorite mineralization is widely dispersed throughout an area measuring about 2000 x 3000 feet. The mineral is present to some extent in every outcrop within the area and it occurs as veinlets, irregular pods in breccias, as fracture coatings, and as disseminated grains in a quartz-feldspar gneiss. The control of the mineralization is not known but it may be related to a broad zone of northeast shearing. Some fluorite is present in northeast-trending quartz veins. Some of these also contain galena and pyrite.

The mineralization is open to the east. To the north the gneiss is overlain by a barren schist. To the south and west the property is bounded by the lake.

The property was held by Canex, who in 1966 did 8600 feet of trenching, built 5200 feet of access road, and drilled an unknown number of percussion holes.

The mineralization is exposed along four main northeast trending trenches, which are from 1500 to 2000 feet in length and about

SAMPLE	#1	#2	#3	#4
Aluminum	Major	Major	Major	Major
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	0.1	0.1	G 0.1	G 0.1
Beryllium	0.003	L 0.001	L 0.001	L 0.001
Bismuth	ND	ND	0.002	ND
Boron	L 0.001	L 0.001	L 0.001	L 0.001
Cadmium	ND	ND	L 0.1	ND
Cerium	0.04	0.02	G 0.1	L 0.02
Chromium	L 0.001	L 0.001	0.003	L 0.001
Cobalt	ND	ND	ND	ND
Copper	L 0.001	0.001	0.007	L 0.001
Dysprosium	ND	ND	ND	ND
Erbium	ND	ND	ND	ND
Europium	ND	ND	ND	ND
Gadolinium	L 0.001	L 0.001	0.005	ND
Gallium	ND	ND	ND	ND
Holmium	ND	ND	Detected	ND
Iron	Major	Major	Major	0.5
Lanthanum	L 0.1	ND	G 0.1	ND
Lead	L 0.01	L 0.01	L 0.01	L 0.01
Lutetium	L 0.001	L 0.001	L 0.001	ND
Magnesium	0.4	0.3	0.6	0.1
Manganese	0.005	0.03	0.05	0.003
Molybdenum	0.003	L 0.001	L 0.001	L 0.001
Neodymium	ND	ND	Detected	ND
Nickel	0.003	0.001	0.003	0.003
Niobium	L 0.01	L 0.01	0.01	L 0.01
Praseodymium	ND	ND	ND	ND
Samarium	ND	ND	ND	ND
Scandium	L 0.001	ND	L 0.001	L 0.001
Silicon	Major	Major	Major	Major
Silver	L 0.001	L 0.001	L 0.001	L 0.001
Sodium	L 0.1	G 0.1	G 0.1	G 0.1
Strontium	G 0.1	G 0.1	0.1	G 0.1
Terbium	ND	ND	ND	ND
Thullium	ND	ND	ND	ND
Tin	ND	ND	ND	ND
Titanium	0.1	0.2	0.3	0.1
Tungsten	ND	ND	ND	ND
Vanadium	0.01	0.01	0.01	0.01
Ytterbium	L 0.001	L 0.001	L 0.001	L 0.001
Yttrium	L 0.001	L 0.001	0.003	ND
Zinc	ND	ND	ND	ND
U_3O_8	.002	.004	.034	.003
CaF_2		2,63		

Table 2. Analyses of Eaglet Samples (All values in weight percent).

100 feet apart vertically along the hillside. Deep overburden was encountered and bedrock was reached only on some sections of the trenches. The trenches extend eastward to Wasko Creek. Fluorite is exposed along the walls of the creek valley for some 2000 feet, and the east wall is just as well mineralized as the west. No work has been done east of the creek.

Because of the irregular nature of the mineralization, an accurate determination of grade can be made only from large bulk samples. Also, the grade in outcrop is difficult to estimate because the fluorite becomes colorless upon exposure to sunlight. The Canex drilling is said to have averaged only 2% CaF_2; however, it is reported that considerable values were lost because of poor recovery techniques. One 300 foot section chip sampled along the creek wall is said by Forster to run 26% CaF_2. Another 90 foot section along one of the trenches assayed 11% CaF_2. One 50 foot section sampled by the writer assayed 2.63% CaF_2 (table 2). From the data available it is not possible to accurately estimate overall grade; however, it is the opinion of the writer that this property does hold potential for considerable tonnages of 15% material.

While on the property it was noted that the quartz-feldspar gneiss was unusually radioactive. Several samples of this material were analysed spectrographically for rare earths, and assayed for U_3O_8 (table 2). Minor amounts of U_3O_8 were detected in all samples. Relatively high values of cerium and lanthanum indicate the presence of allanite or monazite.

The writer does not qualify as an expert on the economics of the fluorspar industry, however, if Falconbridge is actually interested in

fluorite, he feels that this property was not given a proper consideration. Granted the potential grade is low and the material would have to be crushed and concentrated, this deposit is also amenable to open pit mining methods. It would seem that the critical factor is the location of potential markets and the closest one, the west coast aluminum industry, does not appear to have ever been considered. Kitimat is only about 400 miles from Quesnel by rail.

IIB. RECONNAISSANCE

Report on the Bradley Creek Intrusive and Surrounding Nicola Rocks by B. Calder

Clinton Mining District

N.T.S. - 92 - P/11
N.T.S. - 92 - P/14
N.T.S. - 92 - P/15

Location and Access

Bradley Creek is located about 14 miles NNE of 100 Mile House, and the area investigated is a triangular shaped region with 100 Mile House, Spout Lake, and Boss Creek at the apices (map 123-70-5).

Main access is via highway 97 to Lac la Hache and then up the Timothy Lake road, and via the Forest Grove - Boss Mountain road.

Geology

Geological mapping was carried out as part of a general reconnaissance of the area. The region investigated is separated into seven areas as follows:

1) Timothy Mountain
2) Nicola volcanics west of Bradley Creek
3) Nicola rocks east of Soda Lake
4) Coranex property and surrounding area
5) Bradley Creek intrusive
6) Buffalo Creek area
7) Hawkings Lake - Papoose Lake area.

Timothy Mountain

Timothy Mountain consists of two regions of the Skull Hill formation surrounded by the Triassic-Jurassic intrusives. Several volcanic flows make up the western summit and eastern edge of the mountain, and are known as the Skull Hill formation. The flows encountered were as follows:

a) Reddish brown, mostly fine grained, vesicular rhyolite.

b) Gray-green, fine grained rhyolite.

c) Two dark gray, fine grained rhyolite porphyrys.

Also found was a volcanic breccia which consisted of various volcanic flow fragments.

Surrounding the Skull Hill formation is a fine grained, creamy white, hornblende-biotite granodiorite. From here on, this intrusive shall be denoted as the Bradley Creek intrusive.

All the rocks seem to be slightly magnetic. However, at Station 6, magnetite is very abundant. A comparison with the aeromagnetic map reveals a very high anomaly shown in the region of Station 6.

No other mineralization was discovered.

Nicola volcanics west of Bradley Creek

The Nicola volcanics consist mainly of the "greenstone" pyroclastics. The name "greenstone" is used as individual fragments of the pyroclastic give the rock a greenstone appearance. The pyroclastic is gray-brown to dark green, mainly fine to medium grained, often slightly iron-stained and usually quite consistent in appearance. Sometimes fine to medium grained euhedral pyroxene crystals occur within the matrix. Also encountered was a light purple volcanic flow. The flow has a fine grained matrix and medium grained phenocryst of hornblende and quartz.

Mineralization is limited to fine grained pyrite as

disseminations and along small fractures. The pyrite, although quite sparse, was most abundant in outcrops west of Sand Hill Lake.

Nicola rocks east of Soda Lake

The Nicola rocks east of Soda Lake consist of a succession of sediments and volcanics. To the west a fine grained , grey-brown limestone occurs. The limestone contains large (up to several centimetres) crystals of calcite plus secondary veinlets of calcite. Iron staining is very apparent along fractures. As one traverses to the east, the following rock types are encountered:

a) Light grey, fine grained, volcanic tuff.

b) Dark grey-green fine grained greenstone.

c) Light grey, fine grained rhyolite which grades into a slightly metamorphosed flow with some parallel alignment of biotite and feldspar crystals.

d) Similar light grey, fine grained rhyolite. No mineralization was encountered.

Coranex property and surrounding area

The Coranex property is situated on the contact between the Nicola pyroclastics on the west and a syenodiorite (Bradley Creek intrusive phase) on the east. The syenodiorite is light grey and fine grained near the contact and becomes slightly coarser grained as one traverses eastwardly.

The contact provides the site of mineralization as copper is found in both rock types. Chalcopyrite, malachite, magnetite and pyrite occur as disseminations and fracture fillings. However, the mineralization seems localized.

Epidote and calcite are very common constituents especially

along fractures. Chalcopyrite is also found associated with numerous small aplitic and syenitic dykes, which cut both rock types.

Bradley Creek Intrusive

The Bradley Creek intrusive is mainly a hornblende-biotite granodiorite with local variations, from a hornblende-biotite granite to a similar quartz diorite. The intrusive is usually medium grained, white to pink in colour, with euhedral crystals of hornblende, biotite and plagioclase. Anhedral crystal of potassium feldspar and quartz form intersitially. Often, rounded xenolith of volcanic flows or more basic granitic rocks are encountered. Very localized areas can have mainly just one mafic mineral but usually both are found. The outcrops have little prominent jointing. No mineralization was found.

Buffalo Creek Area

The Buffalo Creek area consists of Nicola volcanics. The following rock types were discovered:

a) Dark green volcanic breccia with fine grained flow fragments.

b) White tuff.

c) "Greenstone" pyroclastic.

d) Vesicular rhyolite.

No mineralization encountered.

Hawkins Lake - Papoose Lake area

The Hawkins Lake - Papoose Lake area is mainly Nicola "greenstone" pyroclastics. The pyroclastic has a fine grained dark green matrix, often with medium grained euhedral pyroxene crystals. Fragments usually range from less than one millimetre up to several

centimetres. Most outcrops display some iron staining. In two instances, argillite, as chunks in a pyroclastic and as a separate outcrop, was found. Calcite and epidote stringers are common through many of the outcrops. Mineralization as disseminated pyrite was common with some pyrite also found in small fractures. A few specks of chalcopyrite and some disseminated magnetite was also seen.

Geochemistry

Stream samples were taken on every stream encountered on traverse. Also heavies (concentrate samples) were taken by panning the gravels of these streams. The results are very poor, and reveal no favourable area for more detailed exploration or follow-up work.

Properties visited

Coranex PEACH, TIM, FLY claims on Nicola-intrusive contact.

Mineralization - pyrite, chalcopyrite, magnetite and malachite as disseminations and fracture fillings. These minerals occur in both the Nicola pyroclastics and fine grained syenodiorite. Associated syenite and aplite dykes as well as much epidote and some calcite noted.

1500 ft. drilling plus at least five long trenches.

Anaconda FF claims.

Very minor pyrite disseminations found in Nicola pyroclastic.

Two trenches totalling approximately 60 ft.

Buffalo Lake

A few lines cut and some soil samples taken - no outcrop found.

A. Robinson ALF claims

A quartz vein - reportedly up to 5 feet thick before blasting.

It contains massive chalcopyrite and some pyrite. Very minor disseminated chalcopyrite in adjacent Nicola pyroclastic.

Other claim groups encountered

Asarco - PITT claims - east of Coranex property - occurs in syenodiorite.

Royal Canadian Ventures - RL claims - north of Roger Lake, occurs in Nicola volcanics.

Troy Silver - south of Christmas Lake, reportedly $7.50/ton silver plus copper values - two diamond drills on property - occurs in Skull Hill formation.

Various other local prospectors have claimed up areas near the Troy silver property.

Structure

The Nicola and the hornblende-biotite granodiorite, both have prominent jointings that trend to the north and northwest, dipping moderately to steeply. No folding of any kind was seen and very little faulting.

Conclusions

The intrusive appears very poor for any type of mineralization, for it is consistent throughout, except by Coranex Ltd's property. The Nicola pyroclastic appears favourable for some mineralization, especially on the east side of the intrusive.

Horsefly

We spent several days looking for old properties in the Horsefly area (map 123-70-6). The properties visited were the following:

a) Outcrop recommended by old prospector

b) Helicons G.I. claims

c) Helicon wood claims

d) Quartz vein near Elbow Lake

e) Helicons EN claims

Properties

A. Outcrop recommended by old prospector (labelled station 78 on map).

The outcrop consisted mainly of a grey green andesite cut by two dykes. The dykes included a fine grained granite and a porphyry. The only mineralization was pyrite as disseminations and along fractures in the andesite and granite dyke.

B. Helicons G.I. claims.

While on the road into the property, we encountered an I.P. crew on the road close to the property. Therefore we decided to leave. Work on the property is apparently being done by Chapman, Wood and Griswold Ltd., who are consulting for Magnum Consolidated.

C. Helicons Wood Claims.

The outcrop on the claims is a fine grained granodiorite which looks quite favourable for mineralization. However, no mineralization except for a bit of magnetite was found. The only "work" done on the property seems to be a five mile road put into the claims.

D. Quartz vein near Elbow Lake.

We could not find the original quartz vein on the property, probably because the area has been burnt off due to a forest fire. However, other small quartz veins in the area were barren.

E. Helicons EN claims.

The road into the claim group is washed out. We attempted to walk into the claims but gave up after walking several miles.

III. SULPHUR IN AIR AND SOIL GAS

Earth Sciences have developed an apparatus capable of detecting sulphur in air down to the range of 1-2 ppb. The principle of this equipment is not known. It consists of a pump, air flow regulator, and the detection unit which plots a reading every two seconds. The power requirements include one 12 volt and one 24 volt source.

The apparatus has been tried over known mineralization in the southwest porphyry district, and results to date indicate that it has considerable exploration potential in that area. Gaseous anomalies several hundred times background, have been detected on ground traverses. These have also been picked up from the air. This data will be presented at the AIME meeting in New York on February 26 of this year.

The writer had the opportunity to try out the apparatus in B.C. in the company of George Rouse from Earth Sciences. One day was spent in traversing various known deposits in a helicopter. These deposits include Copper Mountain, Ingerbelle, Craigmont, Bethlehem, Valley Copper, Brenda, Lornex and Highmont. No anomalous values were detected in the air over any of these deposits.

This work was followed by ground traverses across the Lornex deposit and across the entire Guichon batholith (plates 4 and 5). These readings were obtained by suction pumping soil gas through a hose and filter device buried 6-12 inches in the soil.

From a background of 1-3 ppb, the values increased to 5-9 ppb within five miles of the Bethlehem-Valley Copper-Lornex area. Directly over the Lornex orebody, values of up to 20 ppb were obtained.

Several months later, a second traverse was made across the batholith (plate 6). Anomalous readings were again obtained across the central part, however, several very high readings (11-13 ppb) were obtained in the area east of the main zones of known mineralization. The significance of these very high values is not known but it is interesting to note that they are centred over an area which was also relatively high on the previous traverse.

On the following day the weather was much cooler and the readings taken then, some from directly over the Lornex orebody, were much lower (plate 7). This would indicate considerable temperature control on the amount of sulphur in gaseous form being given off.

Two traverses were run across the Maggie mine which is located about 25 miles northwest of the Highland Valley (plates 8 and 9). The Maggie contains a zone of intense pyritic alteration. Only a few anomalous readings were obtained over this zone; however, the weather at the time of these readings was relatively cool and the SO_2 levels were undoubtedly depressed.

It is obvious that not enough test work has been done to properly evaluate this method of exploration. The levels of SO_2 being given off of deposits in B.C. are certainly much lower than those from similar deposits in the southwest. This is due to lower total sulphide contact, less severe oxidation, and to a cooler and wetter climate. Nevertheless, the Lornex - Valley Copper - Bethlehem area is definitely a regional "hotspot" for SO_2. This anomaly did reproduce on different days at different times of the year.

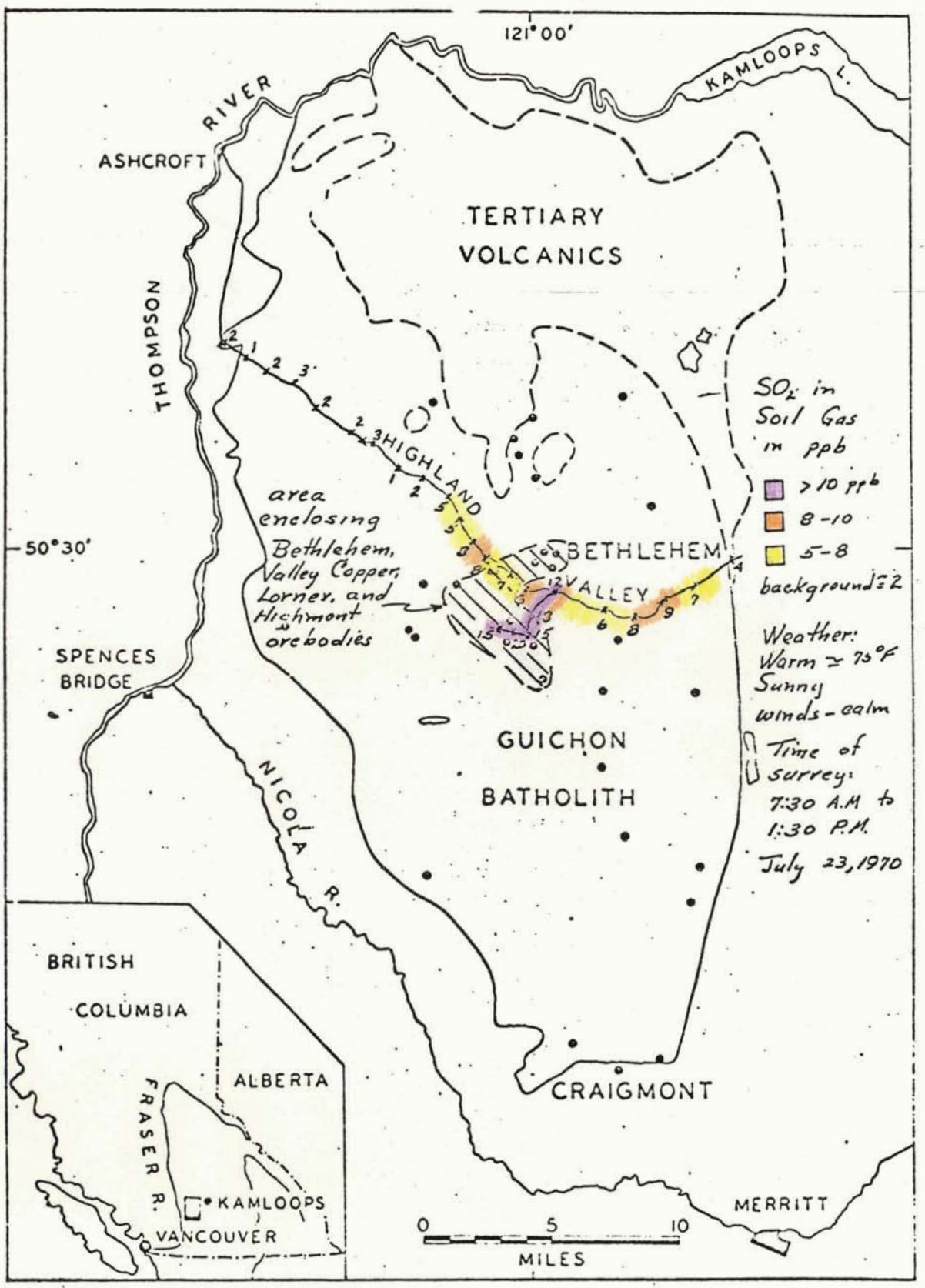


Plate 4 - Sulfur values in Soil Gas across the Guichon Batholith.

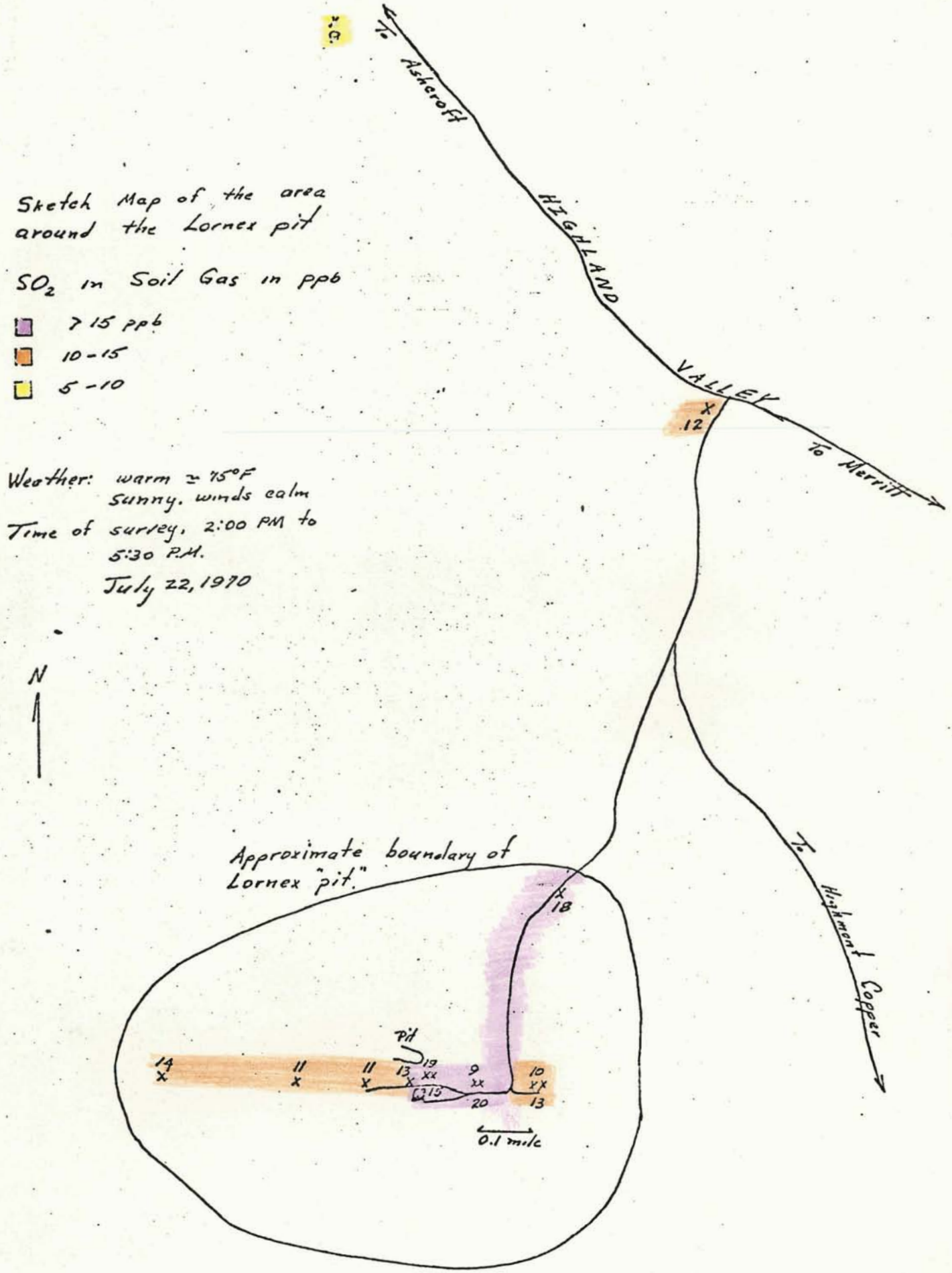


Plate 5 - Sulfur gas values in soil gas across the Lornex Deposit.

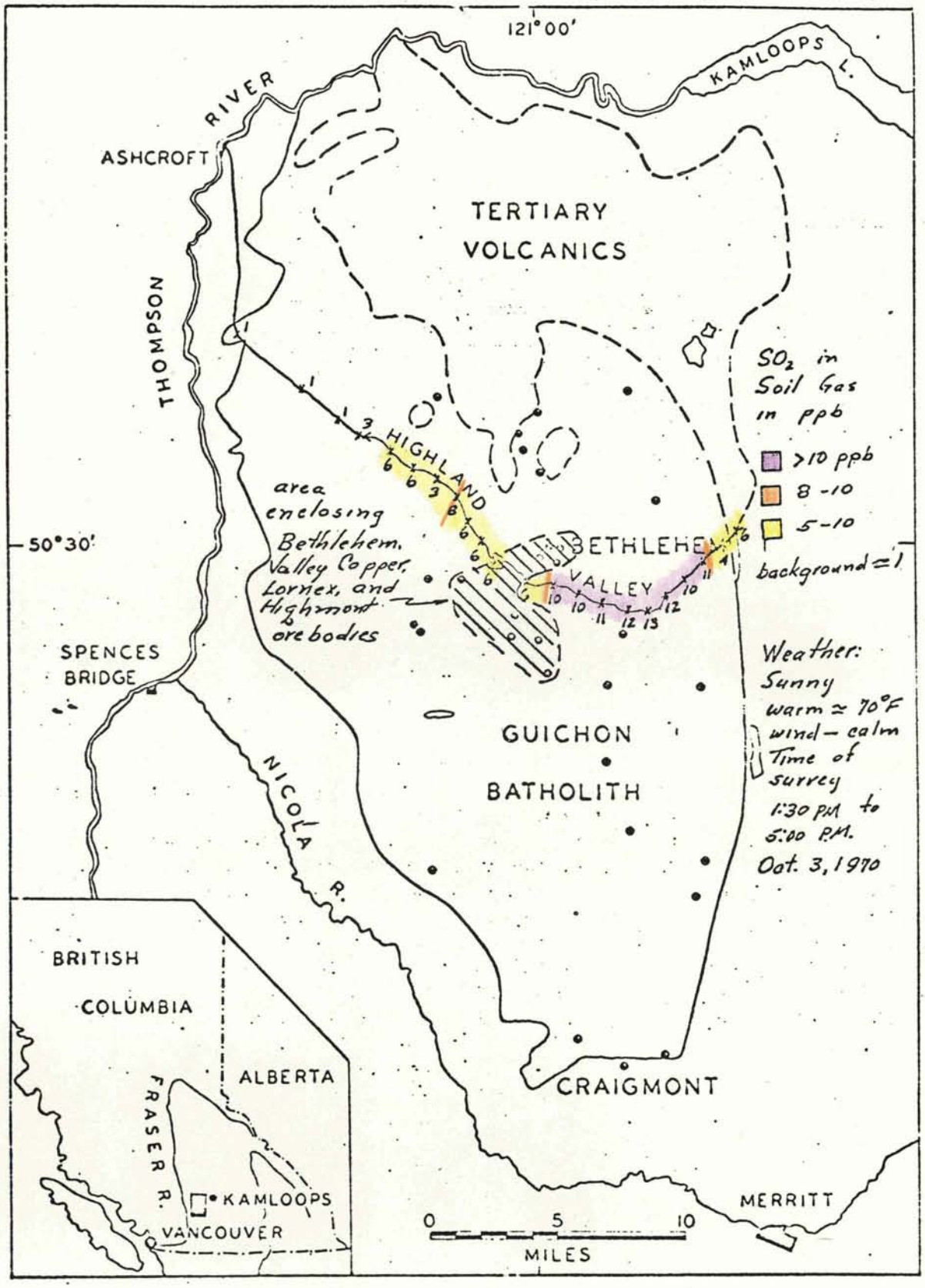


Plate 6 - Sulfur values in Soil Gas across the Guichon Batholith.

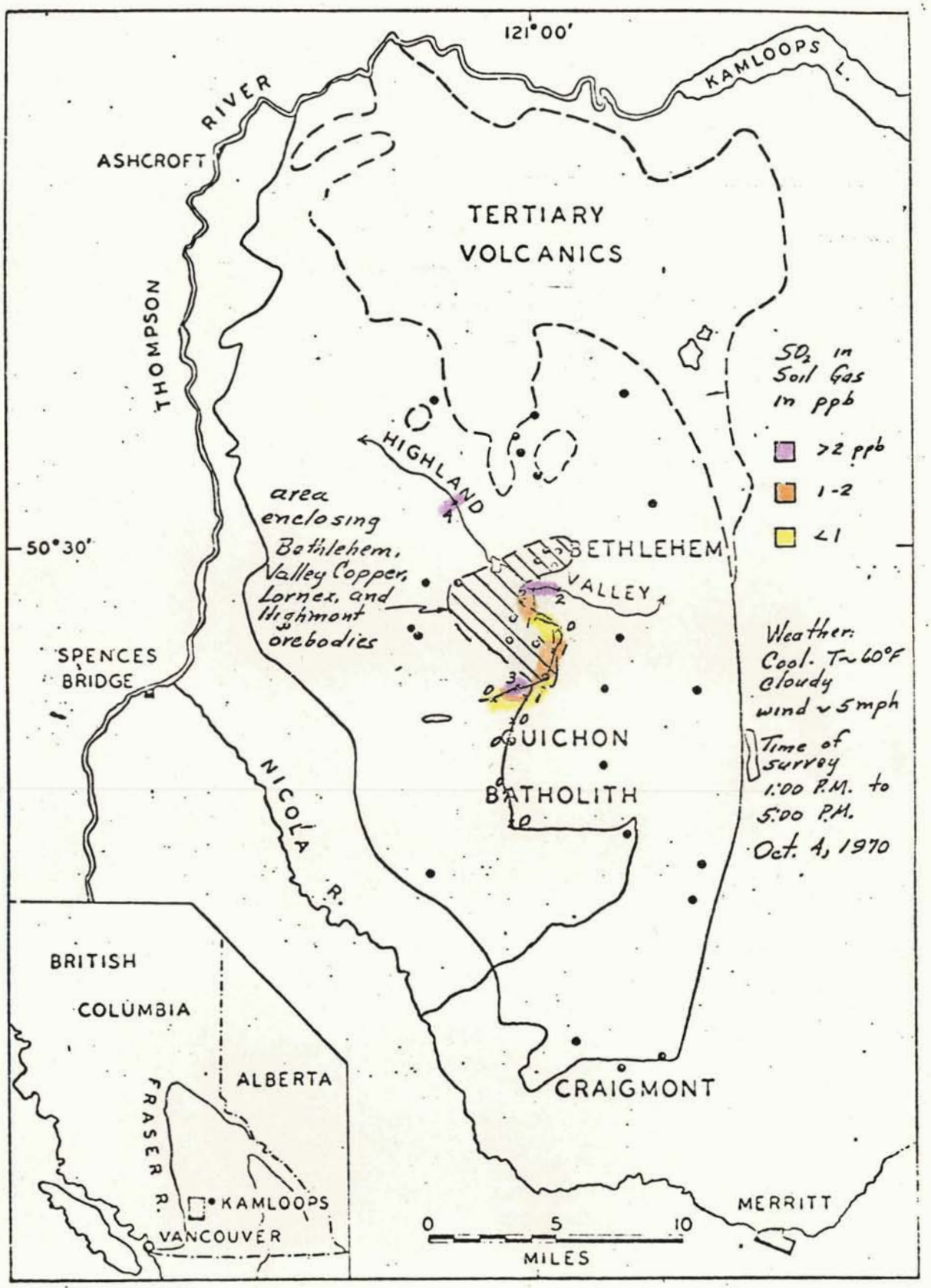


Plate 7 - Sulfur values in Soil Gas across the Guichon Batholith.

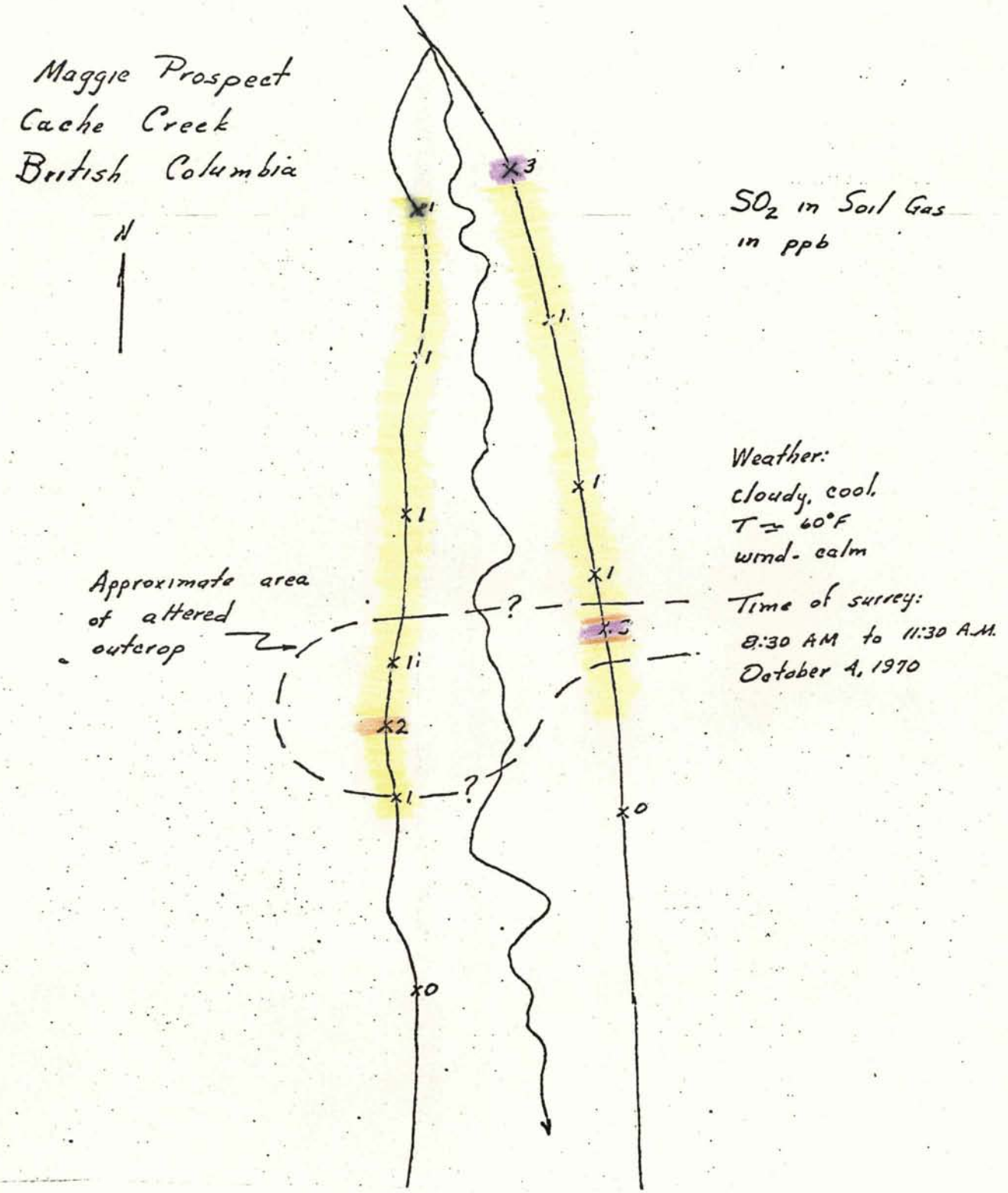


Plate 8 - Sulfur values in soil gas across Maggie Mine.
Scale approximately 1 mile to the inch.

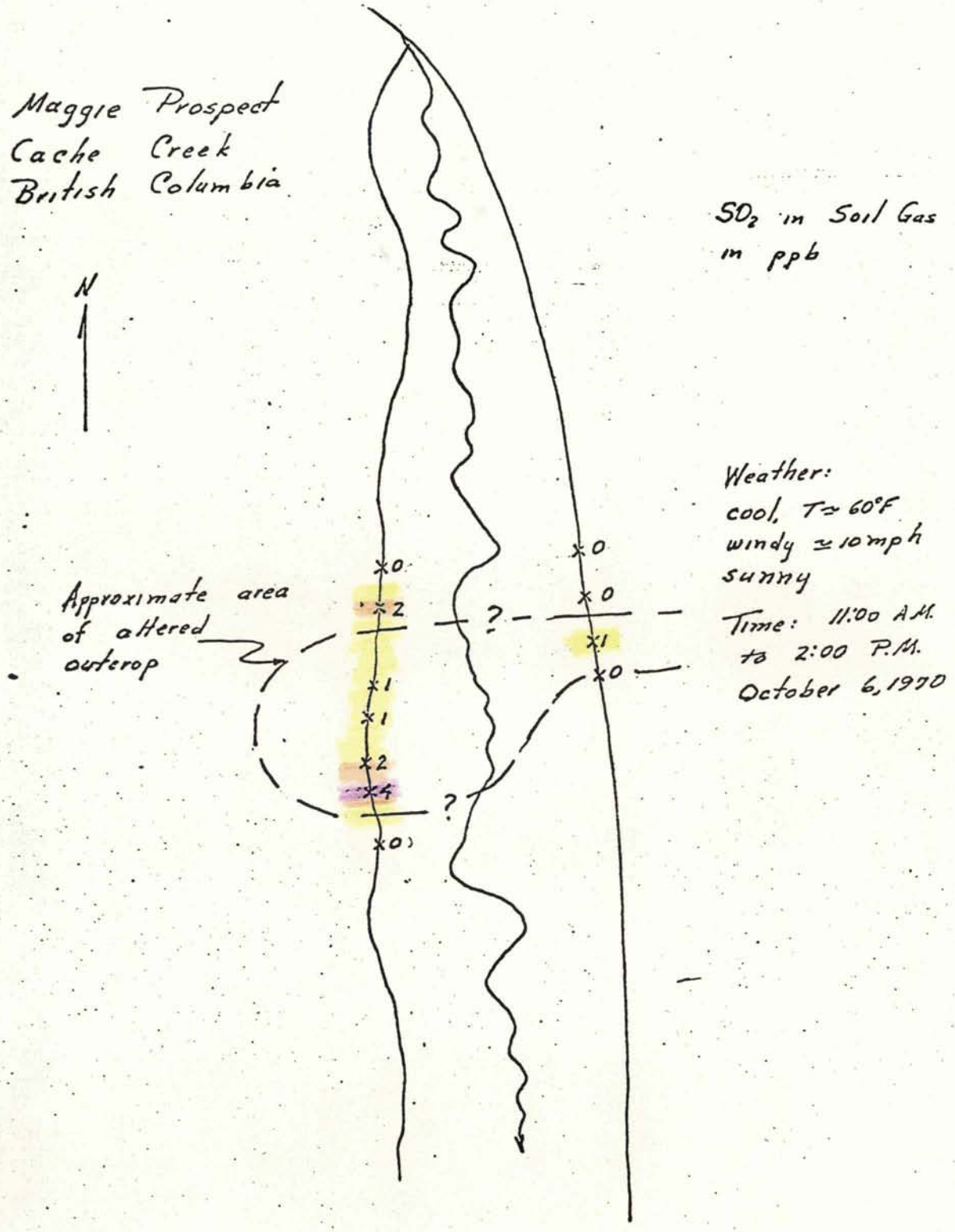


Plate 9 - Sulfur values in soil gas across Maggie Mine.
Scale approximately 1 mile to the inch.

The reason for the relatively large size of the anomaly within the Guichon batholith is a mystery. Possible explanations may be:

i) Undiscovered sulphide minerals in the valley beneath the till.

ii) SO_2 is being carried by the groundwater system down the valley from the major deposits.

iii) Sulphide minerals are present in the till as a result of glaciation of the existing deposits.

The work to date indicates that there may be some potential for SO_2 gas geochemistry in exploration in B.C.; however, a considerable amount of additional test work is needed.

No further test work is planned by the writer, partly because of problems related to participation requests by Earth Sciences, and partly due to a general lack of interest and scepticism of associates regarding the reliability of the instrumentation and operators, and the practicality of the technique.

IV. CONCLUSIONS AND RECOMMENDATIONS

The type of limited reconnaissance work done during the 1970 season seems to be a fairly successful method in south central B.C. at the present time. The areas to be investigated are determined primarily by rock types and distribution of known mineralization. The crews are encouraged to take their time and have a thorough look at the particular areas. By keeping the total crew fairly small, a better communication and control is obtained, and at the same time, the writer is more free of administrative work, and is thus able to devote more time to geology.

Eventually, new ideas and concepts will have to be employed in order to compete effectively in exploration in this area. These ideas and concepts can only be developed through compilations, study and research. It is hoped that the necessary time can be alloted to these tasks.

For the 1971 season, a total of six men will be employed. In addition to the geophysical work scheduled for Murphy Lake, reconnaissance work will be continued in areas of Mezozoic volcanic and intrusive rock on the Bonaparte River, Adams Lake, Taseko Lake and Princeton map sheets. Also follow-up work is planned for the Coquihalla area on the Hope map sheet. Other areas may also be investigated, depending on the outcome of the compilations completed by field season.

Vancouver, B.C.

S.H. Pilcher

March 31, 1971

S.H. Pilcher

APPENDIX 1

The total 1970 costs for South Cariboo through December 1970, were $53,823. This figure does not include the Vancouver office expenses. The breakdown of costs are included on the following budget sheets.

The anticipated 1971 costs are as follows:

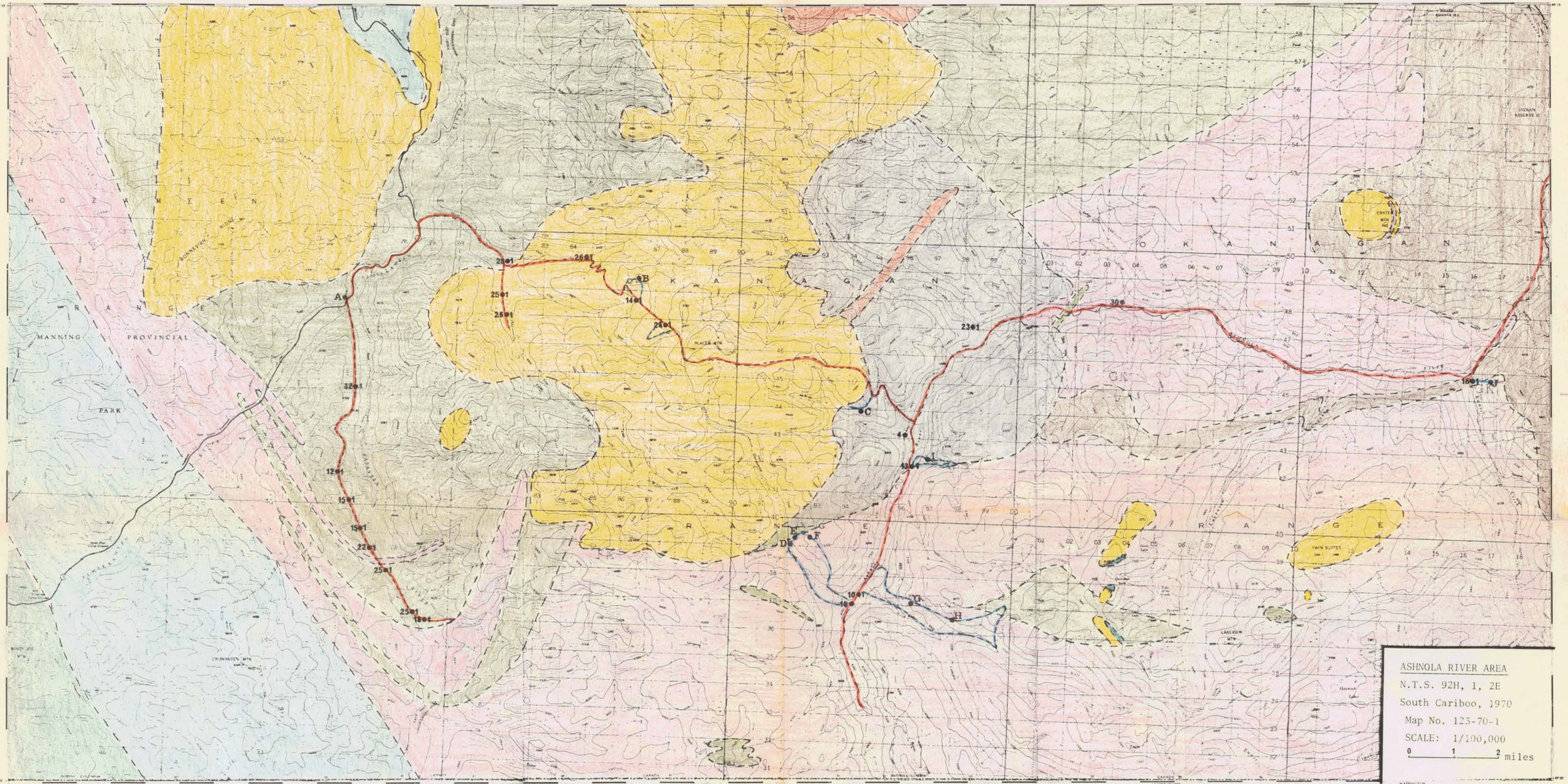
		$
Salaries		40,075
Field Equipment		5,300
Camp Operation		5,000
Hotels and Meals		2,400
Vehicles:	Rentals	1,800
	Operation	2,800
	Helicopter	6,000
Surveys		
I.P (Murphy Lake)		15,000
Line cutting (Murphy Lake)		4,000
Assays		800
Geochemical Analyses		4,800
		$87,975

BRITISH COLUMBIA | Project SOUTH CARIBOO | Location | Budget | PS 123

	CURRENT MONTH												YEAR TO DATE			
	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
PROPERTY AQUISITION																
Salaries & wages		-	-	-										-	-	-
Contract payments		-	-	-										-	-	-
Field Expenses		300	-	-										300	300	300
Transportation		-	-	-										-	-	-
Assays		-	-	-										-	-	-
		300	-	-										300	300	300
EXPLORATION & PROSPECTING																
Salaries & wages	(86)	142	-	(47)									1,500	1,642	1,642	1,595
Contract payments	-	-	-	-									-	-	-	-
Field Expenses	(61)	45	197	1,150									1,399	1,444	1,641	2,791
Transportation	234	1,272	225	172									2,010	3,282	3,507	3,679
Assays	-	20	-	218									70	90	90	308
	87	1,479	422	1,493									4,979	6,458	6,880	8,373
GEOLOGY																
Salaries & wages	4,295	3,970	2,498	1,396									26,821	30,791	33,289	34,685
Contract payments	-	-	-	-									2,715	2,715	2,715	2,715
Field Expenses	-	-	-	-									-	-	-	-
Transportation	9	-	-	59									9	9	9	68
Assays	-	-	-	-									-	-	-	-
	4,304	3,970	2,498	1,455									29,545	33,515	36,013	37,468
GEOPHYSICS																
Salaries & wages																
Contract payments																
Field Expenses																
Transportation																
Assays																
GEOCHEMISTRY																
Salaries & wages	281	-	-	(8)									281	281	281	273
Contract payments	-	-	-	-									-	-	-	-
Field Expenses	-	-	-	-									2	2	2	2
Transportation	-	-	-	-									-	-	-	-
Analysis - Geochem. Lab.	196	84	-	165									540	624	624	789
	477	84	-	157									823	907	907	1,064

BRITISH COLUMBIA | Project SOUTH CARIBOO | Location | Budget | Pg. 123

	CURRENT MONTH												YEAR TO DATE			
	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
DIAMOND DRILLING																
Salaries & wages	-		206	264											206	470
Contract payments			135	-											135	135
Field Expenses			262	-											262	262
Transportation			-	-											-	-
Assays			-	-											-	-
			603	264											603	867
PHYSICAL WORK																
Salaries & wages		-	-	-									-	-	-	-
Contract payments		-	-	-										-	-	-
Field Expenses		52	-	-										52	52	52
Transportation		-	-	-										-	-	-
Assays		-	-	-										-	-	-
		52	-	-										52	52	52
OPTION PAYMENTS & PARTIC.		-	-	-									-	-	-	-
DRAUGHTING	-	2	59	129									582	584	643	772
PROPERTY MAINTENANCE	440	-	-	-									690	690	690	690
VANCOUVER OFFICE EXPENSE	2,059	1,851	1,217	(631)									12,909	14,760	15,977	15,346
OTHER EXPENSES	-	-	-	-									-	-	-	-
	2,499	1,853	1,276	(502)									14,181	16,034	17,310	16,508
CAMP OPERATION																
Salaries & wages	-	-	-	-									-	-	-	-
Camp Supplies	476	224	89	8									1,553	1,777	1,866	1,874
Hotels & Meals	326	425	139	90									1,709	2,134	2,273	2,363
TOTAL	8,169	8,387	5,027	2,965									52,790	61,177	66,204	69,169
TRANSPORTATION																
Company Helicopter	-	-	-	-									972	972	972	972
Air Charter	-	-	-	-									-	-	-	-
Local Transportation	223	966	132	155									936	1,902	2,034	2,189
Trans. to/from field	20	306	93	76									111	417	510	586
	243	1,272	225	231									2,019	3,291	3,516	3,747



LEGEND

Cenozoic

- PRINCETON GROUP-sandstone, shale, conglomerate
- PRINCETON GROUP-andesite and basalt
- LIGHTENING CREEK INTRUSIONS-quartz diorite

Mesozoic

LOWER CRETACEOUS

- KINGSVALE GROUP-andesite and basalt porphyry, volc. breccia
- PAYSAYTEN GROUP-grit, shale, lava, tuff
- DEWDNEY CREEK GROUP-tuff, breccia, argillite, conglomerate
- COAST INTRUSIONS

UPPER TRIASSIC

- NICOLA GROUP-argillite, tuff, limestone, schist, andesite, volc. breccia

Paleozoic

- BRADSHAW FORMATION-argillite, andesite, limestone, schist, gneiss

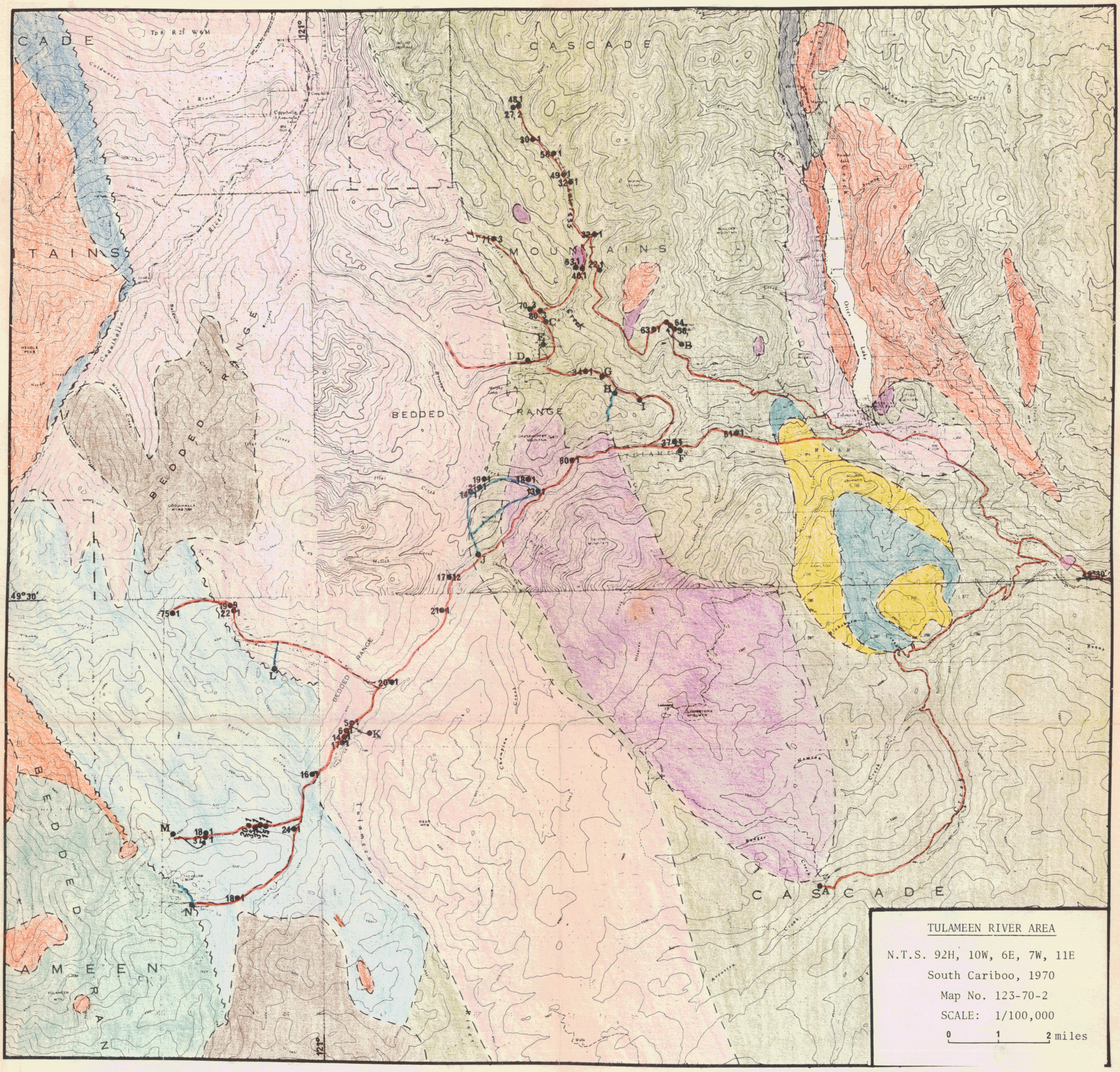
o1 Assay sample location

cu•mo Geochemical sample

•A Traverse point

Truck traverse

Foot traverse



LEGEND

Cenozoic

PLATEAU BASALT

MIOCENE OR EARLIER

PRINCETON GROUP-sandstone. shale, conglomerate

PRINCETON GROUP-andesite and basalt

GRANODIORITE, QUARTZ DIORITE

COQUIHALLA GROUP-basalt, rhyolite, tuff, agglomerate

Mesozoic

CRETACEOUS

KINGSVALE GROUP-andesite, basalt porphyry, volc. breccia

PAYSAYTEN GROUP-sandstone, conglomerate, pelite

JACKASS MTN. GROUP-sandstone,pelite, conglomerate

JURASSIC AND/OR LOWER CRETACEOUS

COAST INTRUSIVES-foliated graondiorite

PERIDOTITE, PYROXENITE, GABBRO

DEWDNEY CREEK GROUP-sandstone, tuff, pelite

LOWER AND MIDDLE JURASSIC

LADNER GROUP-pelite, volc. sandstone

TRIASSIC

NICOLA GROUP-argillite, tuff, limestone, schist, andesite, volc. breccia

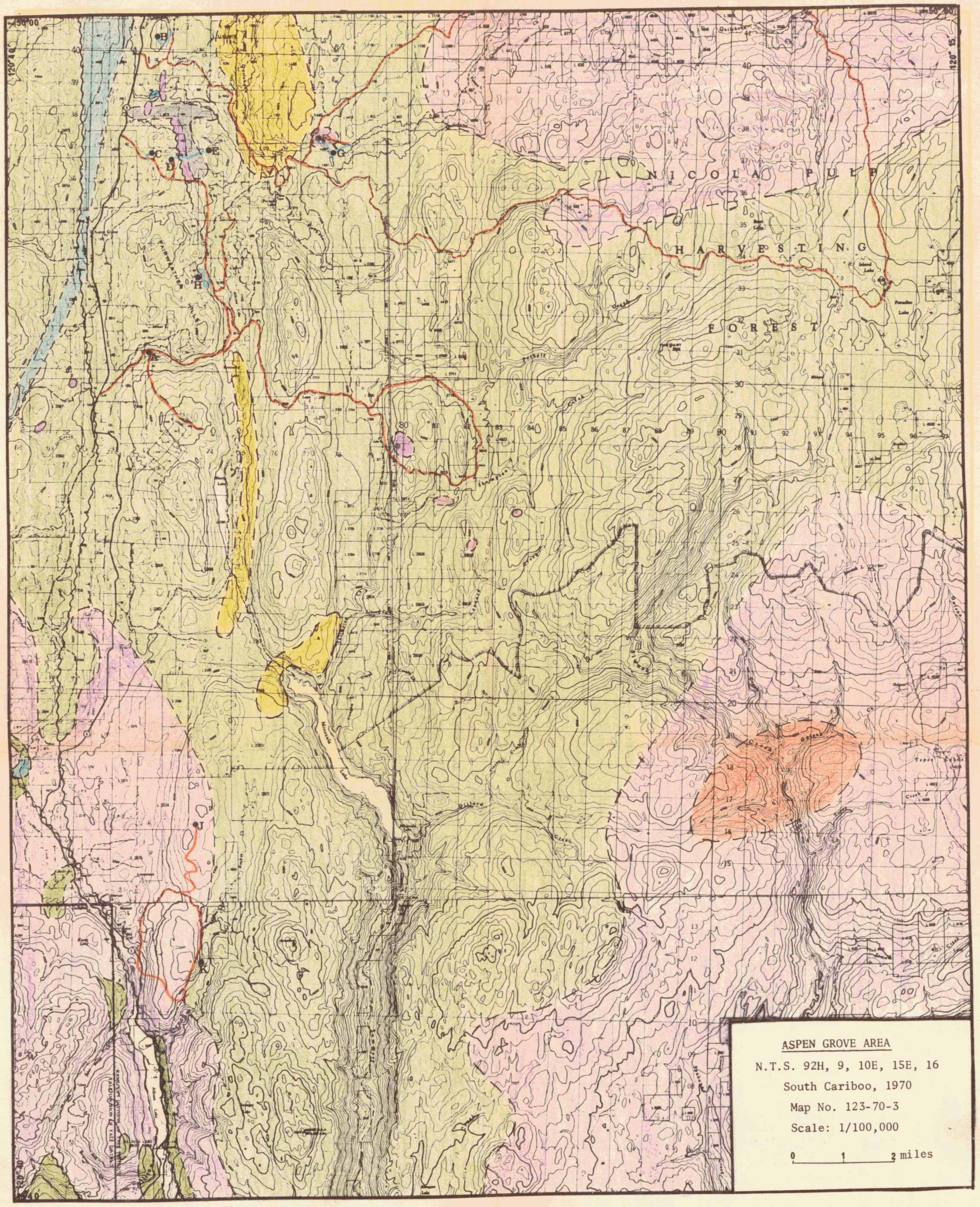
o1 Assay sample location

cu•mo Geochemical sample

•A Traverse point

Truck traverse

- - - - Foot traverse



LEGEND

Cenozoic

MIOCENE OR LATER
- VALLEY BASALT

MIOCENE OR EARLIER
- PRINCETON GROUP-sandstone, shale, conglomerate

Mesozoic

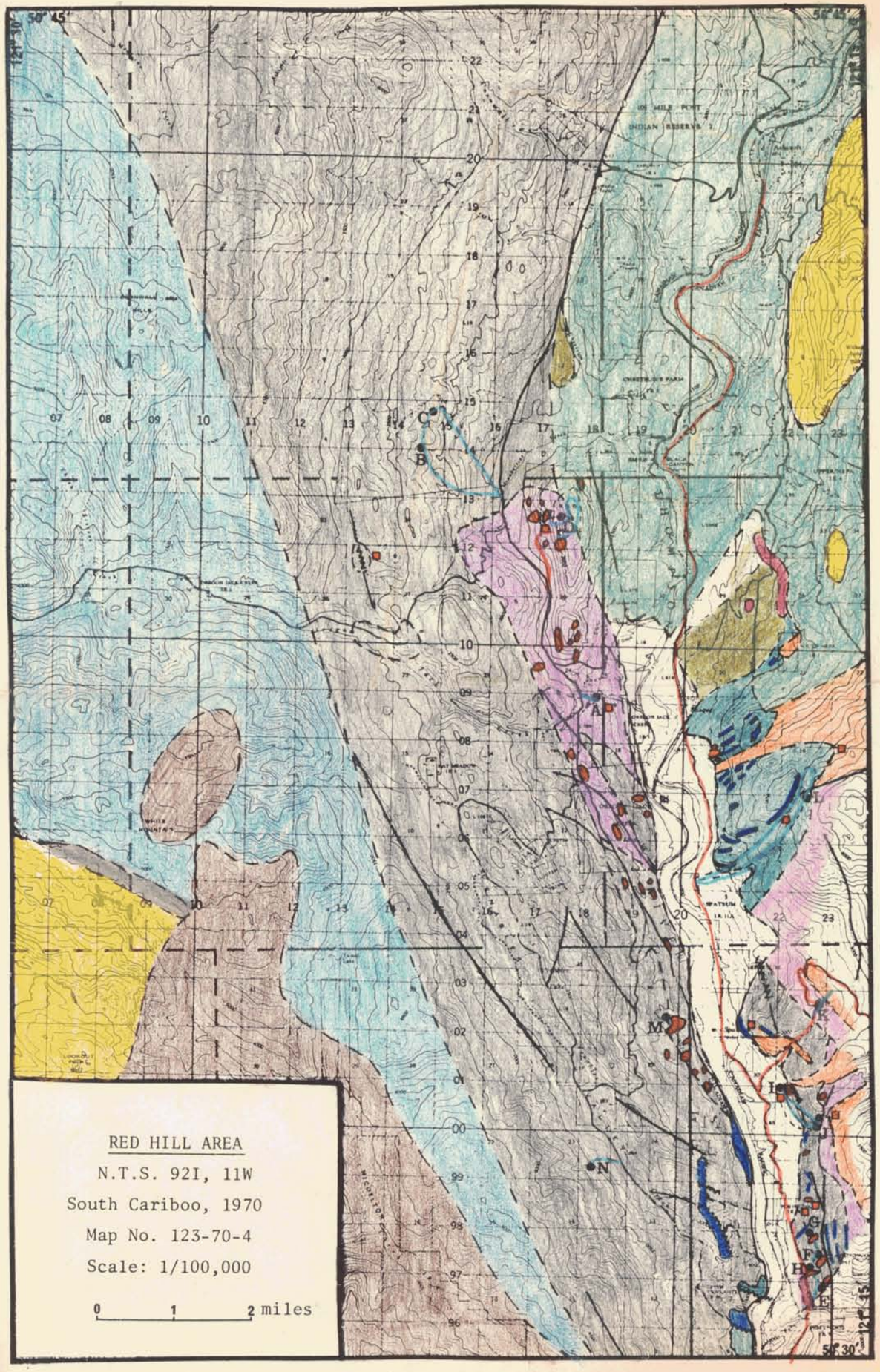
UPPER CRETACEOUS OR LATER
- OTTER INTRUSIONS-pink & gray granite & granodiorite

LOWER CRETACEOUS
- KINGSVALE GROUP-mainly volcanic breccia
- SPENCES BRIDGE GROUP-andesite & basalt

JURASSIC OR LATER
- COAST INTRUSIONS-mainly reddish coarse-grained granite & granodiorite

TRIASSIC
- NICOLA GROUP-argillite, tuff, limestone, schist, andesite, volc. breccia, agglomerate

01 Assay sample location
cu•mo Geochemical sample
•A Traverse point
Truck traverse
Foot traverse



Cenozoic

Mesozoic

Paleozoic

LEGEND

MIOCENE OR EARLIER

- KAMLOOPS GROUP - basalt, andesite, rhyolite

LOWER CRETACEOUS

- SPENCES BRIDGE GROUP - andesite, dacite, basalt, rhyolite, tuff, breccia, agglomerate, sandstone, conglomerate

JURASIC

- conglomerate, sandstone, shale, limestone

TRIASSIC

- GUICHON BATHOLITH - quartz monzonite
- GUICHON BATHOLITH - diorite, quartz diorite
- porphyry

NICOLA GROUP

- mainly greenstone
- mainly sedimentary rock
- mainly limestone

PERMIAN AND EARLIER

CACHE CREEK GROUP

- sedimentary rocks, greenstone
- mainly limestone
- Marble canyon Formation - limestone

Metamorphic Rock (Cache Creek Group?)

- Quartzite, hornfels, schist, gueiss, and highly sheared rock

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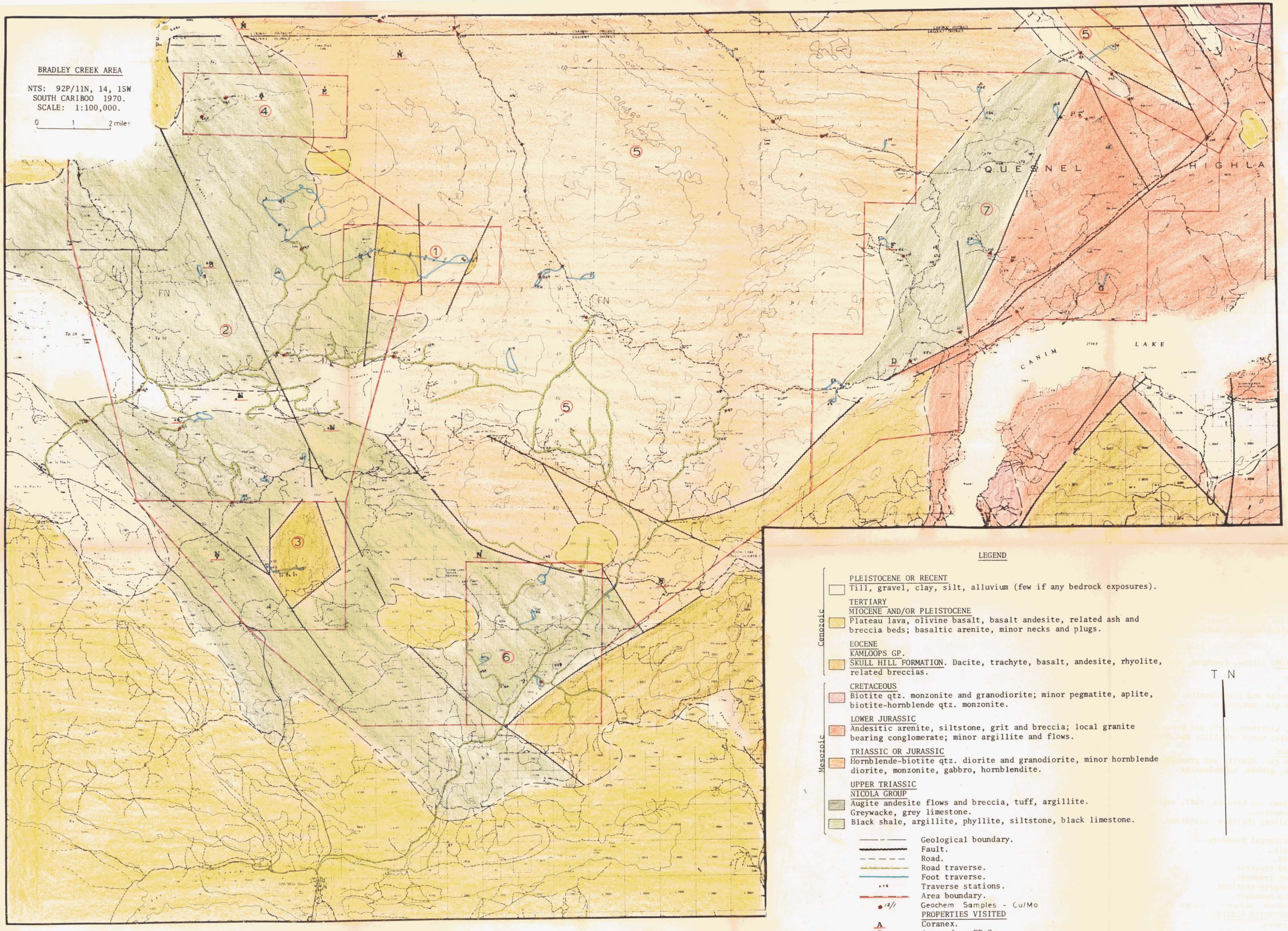
- Gossan
- Copper showing
- topographic lineament
- •A traverse point
- truck traverse
- foot traverse



LEGEND

Cenozoic

PLEISTOCENE OR RECENT
Till, gravel, clay, silt, alluvium (few if any bedrock exposures).

TERTIARY
MIOCENE AND/OR PLEISTOCENE
Plateau lava, olivine basalt, basalt andesite, related ash and breccia beds; basaltic arenite, minor necks and plugs.

EOCENE
KAMLOOPS GP.
SKULL HILL FORMATION. Dacite, trachyte, basalt, andesite, rhyolite, related breccias.

Mesozoic

CRETACEOUS
Biotite qtz. monzonite and granodiorite; minor pegmatite, aplite, biotite-hornblende qtz. monzonite.

LOWER JURASSIC
Andesitic arenite, siltstone, grit and breccia; local granite bearing conglomerate; minor argillite and flows.

TRIASSIC OR JURASSIC
Hornblende-biotite qtz. diorite and granodiorite, minor hornblende diorite, monzonite, gabbro, hornblendite.

UPPER TRIASSIC
NICOLA GROUP
Augite andesite flows and breccia, tuff, argillite.
Greywacke, grey limestone.
Black shale, argillite, phyllite, siltstone, black limestone.

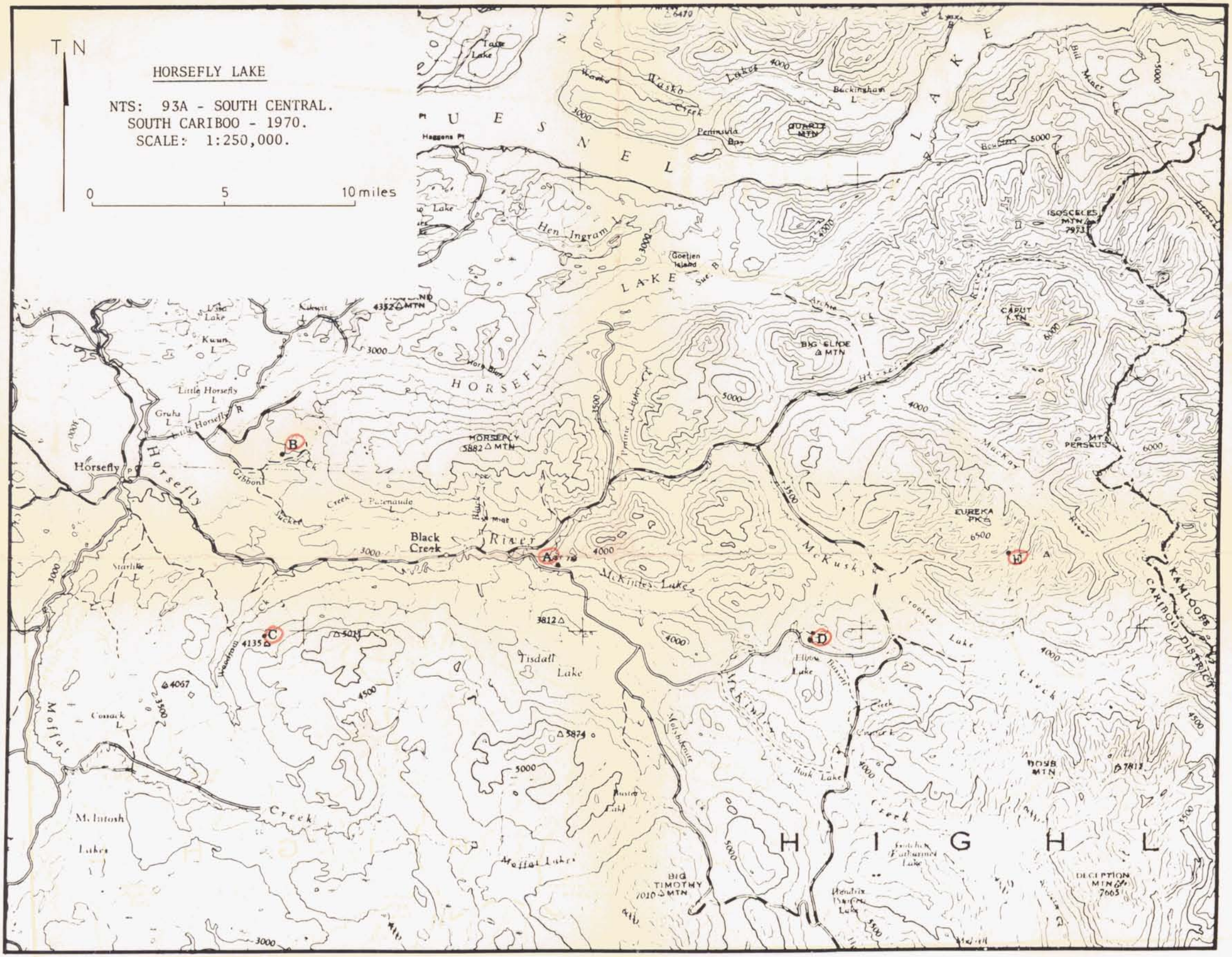
T N

Geological boundary.
Fault.
Road.
Road traverse.
Foot traverse.
Traverse stations.
Area boundary.
12/1 Geochem Samples - Cu/Mo

PROPERTIES VISITED
A Coranex.
B Anaconda - FF Gp.
C Buffalo Lake.
D Alf Claims.
E Asarco Pitt Gps.
F R.C. Ventures - R.L. Gp.
G Troy Silver.

N PROPERTIES NOT VISITED

AREAS REPORTED ON
1 Timothy Mountain.
2 Nicola-West of Bradley Creek.
3 Nicola-East of Soda Lake.
4 Coranex Prop. and Area.
5 Bradley Creek Intrusive.
6 Buffalo Creek Area.
7 Hawkins Lk.-Papoose Lk. Area.



LEGEND

A	OUTCROP OF PROSPECTOR.
B	G.I. CLAIMS.
C	WOOD CLAIMS.
D	QUARTZ VEIN.
E	EN CLAIMS.

BRITISH COLUMBIA
FOREST SERVICE

KAMLOOPS DISTRICT

PUBLIC INFORMATION
AND
EDUCATION DIVISION

Produced by Geographic Division, Surveys and Mapping Branch, Dept. of Lands, Forests, and Water Resources, Victoria, B.C.

OUR "GREEN GOLD"

The forests and grasslands of British Columbia are far more than just a source of beauty. They represent the province's greatest single source of wealth.

It's a "softwood empire", and last year the forest production of British Columbia accounted for more than one billion dollars -- approximately half of the entire provincial economy.

The forest industry also provided direct employment for more than 80,000 persons -- about 12 percent of the British Columbia work force.

Responsible for the protection, management and administration of our wood and grazing wealth is the British Columbia Forest Service. It was founded in 1912 and over the years has established and maintained one of the most practical and progressive forest policies found anywhere in the world.

For administrative and management purposes, the province has been divided into five forest districts.

KAMLOOPS FOREST DISTRICT

This pamphlet deals with the Kamloops Forest District -- located in south central British Columbia (see cover map), with headquarters in the city of Kamloops. The District covers about 52,584 square miles, and for more efficient administration has been sub-divided into 24 Ranger Districts.

THE 1968 HARVEST

The most valuable species of trees in the Kamloops Forest District are the Douglas fir, spruce and lodgepole pine.

In 1968, the forest harvest of the District was as follows:

Douglas fir	106,199,000 cubic feet
Spruce	51,571,000 cubic feet
Lodgepole pine	21,470,000 cubic feet

There are 273 sawmills in the Kamloops Forest District, and between them in 1968 they produced an estimated 1.3 billion board feet of lumber; and the District's four shingle mills that year produced about 1.4 million board feet of shingles.

Forest industries of the District provide employment for approximately 8,000 persons; and the total value of all forest products in this District is in excess of $110,000,000 annually.

GRAZING

Over 1,200 annual permits were issued in the Kamloops District in 1968 to livestock owners to graze 150,000 head of cattle, 3,700 horses and 5,800 sheep on public grazing lands.

Most ranchers in the District depend on the natural range resource for summer grazing. Grass and related livestock feed may be harvested annually only under careful management if its productivity is to be maintained.

The seeding of grass and legumes, the development of livestock watering sites, and the construction of trails and fences, are all part of the Forest Service plan to maintain and improve our rangeland wealth.

THE GREAT ENEMY -- FIRE

Despite the many and varied precautions taken, fire continues to be the forests' greatest single enemy. Because of human carelessness, together with Nature, great blazes destroy many acres of prime wooded land each year.

In 1968 there were 788 forest fires in the Kamloops Forest District. Forest Service authorities attach the blame for them as follows: lightning, 368; campers, hunters, smokers, etc., 139; railroad operations, 43; brush and range burning, 69; hydro, gas and telephone line operations, 6; industry, 52; incendiary, 14; and miscellaneous, 97.

WITH AN EYE TO THE FUTURE

The sustained yield policy of the British Columbia Forest Service calls for the replacement of all trees harvested by loggers, and those destroyed by fire, disease, and other causes. Nurseries for the production of seedlings have been established in several parts of the province, and one of these is located in the Kamloops Forest District -- at Rayleigh, near Kamloops.

In 1968 a total of 507,925 seedlings were planted over 991 acres in the District.

A GREAT HERITAGE

Ninety-three percent of British Columbia's forest land is publicly owned; and for the sake of the economy of the province, and for its people in all walks of life, it is imperative our timber resources be protected and perpetuated.

With proper care and good management, the forests will continue to be the backbone of our province's economy; and at the same time provide for our world-famous program of outdoor recreation.

The Forest Service appreciates your concern toward the protection of our woodland wealth. It's good business for everyone.