MASTODON-HIGHLAND BELL MINES LTD.

CARIBOO PROJECT, British Columbia

1966

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1 9 6 6.

February 15th, 1967 Vancouver, B. C.

J. C. Stepehn

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7	Lemon Lake G.I. Group	1" = 600 ft.
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REPORT ON THE CARIBOO PROJECT - 1966

INTRODUCTION & CONCLUSION:

The Cariboo Project 1966 employed from two to six men in the central portion of British Columbia. The project included general prospecting, examination of properties, limited assessment work on existing claims and some experimental work with the Lemaire Mercury Detector. Much of the prospecting was based on soil sampling with field determinations for copper and heavy metals.

None of the mineral occurrences discovered or examined were deemed worthy of acquisition.

GENERAL GEOLOGY:

Geology of the area is shown on 4 mile map sheets published by the G. S. C. Attention was directed to areas of (1) granitic intrusives (2) Triassic and Lower Jurassic sediments and volcanics (3) ultra basic intrusives in Cache Creek sediments. Mineralization of some interest was found in all three environments.

Use was made of the 1 inch to 1 mile aeromagnetic maps where these are available.

Outline maps of the general geology and areas traversed and examined are included with this report.

DESCRIPTION OF PROPERTIES:

The following are brief descriptions of individual properties and prospect areas with individual sketch maps where applicable:-

Ahbau Creek Area - A large and relatively strong aeromagnetic anomaly on Ahbau Creek was examined. This anomaly lies in an area of sediments and volcanics south west of a large granitic intrusive. In the vicinity of the anomaly a number of feldspar posphyry and disritic dykes intrude the sediments and near the peak of the anomaly there are indications of an underlying basic intrusive - probably a dispite.

A number of gossan areas were located with only pyrite and pyrrhotite mineralization, but as indicated in Figure 2 some sphalerite (blackjack) mineralization was found occupying fractures near the P. G. E. railway and about a mile to the east a shear zone was found mineralized with chalcopyrite, pyrite and malachite. Neither of these showings alone appear to be of commercial significance.

Most of the area is heavily covered with clay making ordinary prospecting, geological mapping and soil sampling quite inefficient. The presence of large zones of pyrite and pyrrhotite, apparently devoid of economic mineralization, indicates that numerous bargen anomalies would be found by geophysical means.

In spite of these difficulties the favourable geology and presence of some interesting mineralization indicates that this zone warrants careful consideration. The proximity to power, water and transportation is another favourable factor. Mineralization appears

to be most interesting near the central part of the anomaly. Barren gossens and widespread pyrite mineralization were found generally at some further distance from the centre of the anomaly.

To further investigate this area it would be necessary to stake the central zone - an area three miles by one and one half miles or about 80 claims. Lines would be cut and a ground magnetometer survey run during the winter. Soil sampling should follow with more accurate geological mapping on the picket line grid. Further work would be depend on the results of this initial program.

Costs are estimated to be in the order of:-

Staking 80 claims × \$20	=	\$ 1,600.00
Linecutting 45 miles × \$88	*	3,950.00
Magnetometer survey - 45 miles × \$30		1,350.00
Soil Sampling - 42 miles x \$26		1,100.00
Assaying		1,000.00
		\$ 9,000.00

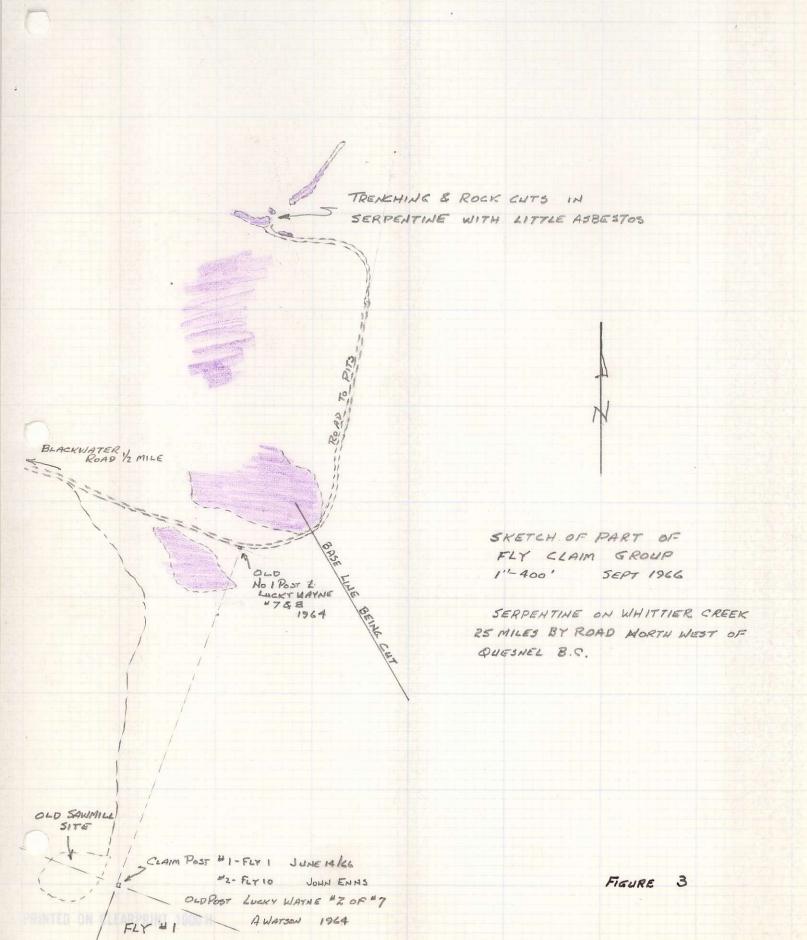
Fly & Ken Claim Groups -Blackwater Road

These claim groups are located between miles 24 and 25 on the Blackwater road we'll of Quesnel. The Fly 1-42 group was recorded in the name of John Enns, Dragon Lake, Quesnel. The area has been previously staked as the Lucky Wayne Group in 1964.

Outcrop areas seen, and location of bulldozer trenching and rock work are shown on the accompanying sketch. Where the main rock work had been done a few specimens of cross fibre up to $\frac{1}{2}$ long were found. Over those areas where no blasting had been done weathering had removed material from the fractures to some depth. Generally, however, fracturing is widely spaced and only a small percentage of these fractures actually contain asbestos fibre. It seems apparent that over the area examined no appreciable percentage of fibre is present.

No one was present on the property when visited, but a baseline had been started and further exploration was apparently planned.

An aeromagnetic anomaly approximately eight miles in length trends north west through the area and is apparently caused by the serpentine. Two traverses were made, one along the trend of the central portion of the anomaly for about two miles and one near the north end of the anomaly. Except for two pieces of barren serpentine float nothing of interest was seen. Portions of the zone of interest are covered by later Cretaceous or Tertiary sediments and volcanic flows.



Gerimi Claim Group -

Further investigation of the Gerimi Group was conducted during March with a limited EM and magnetometer survey in the Cantin Creek portion of the property.

In late May and early June trenching was carried out over the resulting EM anomaly. Trenches reached depths of 17 and 23 feet in hard clay without giving any indication of the possible cause of the anomaly.

Trenching was also conducted on the limestone zone originally staked. Very little mineralization was uncovered. The best section averaged 0.38% Cu across 40 feet.

Amsessment work was recorded on the following claims;-GERIMI 1 - 6; 19; 24; 38 Fr; 45 - 54; 64 - 73.

Soil sampling for copper and molybdenum was carried out over an area 4,000° \times 3,200° over a feldspar porphyry intrusive $3\frac{1}{2}$ miles north of the old Elgert mill site. No values of significance were encountered.

Coast Silver Mines conducted an IP survey over parts of the adjoining B.I. claim group. This survey covered the previously located, co-incident, geomag and weak EM anomalies, but found no indication of significant sulphide mineralization.

A trial IP line was run by Coast Silver along the logging road $3\frac{1}{2}$ miles north of the Elgert Spruce Mill site. This resulted in discovery of a large IP anomaly apparently associated with sediments south of the feldspar porphyry intrusive mentioned above. No outcrop is known within the area of the anomaly. Diamond drilling up to January 25th, 1967 failed to indicate any commercial mineralization. The anomaly is evidently due to heavy pyrite mineralization.

Blue Rose Claim Group - Limited prospecting and soil sampling on relatively widely spaced lines provided a better picture of the geology in this area. Figure 4 shows the general outline of the limestone with which mineralization was associated. Information gathered indicated mineralization to be too sparse to be of further interest.

The option was dropped and the owners duly notified.

Keno Lake - A showing of law grade copper mineralization is located two miles east of the east end of Keno Lake or about three miles south east of Haggens Point on Quesnel Lake. The property is reached by road east from the Horsefly-Haggens Point road.

Bulldozar stripping, diamond drilling, percussion drilling and related linecutting, mapping, etc. have been carried over a large area by Chapman Wood & Griswold.

Mineralization consists of pyrrhotite and chalcopyrite in scattered fractures and small replacement zones in tuff and argillitic sediments. The pyrrhotite is highly magnetic. Results of four samples were as follows:-

Sample No:	Description	Cu	Ni	Ag	Au	Zn
93048 49	Percussion drill cuttings. Massive pyrrhotite with	0.10	Tr.	Tr.	0.01	. •
50	chalcopyrite. White siliceous tuff-	0.67	Tr.	-	•	-
	chalcopyrite & pyrrhotite.	0.84	Tr.	. -	•	-
54026	Argillitic tuff - pyrrhotite & chalcopyrite.	0.34	Tr.	-	-	0.10

Prospecting was carried out in several areas extending south east from this vicinity in an attempt to locate other showings. Although minor pyrrhotite, pyrite and chalcopyrite mineralization can be found in the volcanics over a wide area, nothing of interest was located.

Potato Mountain - (Skulow Lake, Bunting Lake, Duck Group)

A cinnibar showing reported by Mr. Jim Carson, Williams Lake to Mr. Roy Lambert was visited on September 18th, 1966. This turned out to be the same zone seen in June 1964 when it was reported as a copper showing.

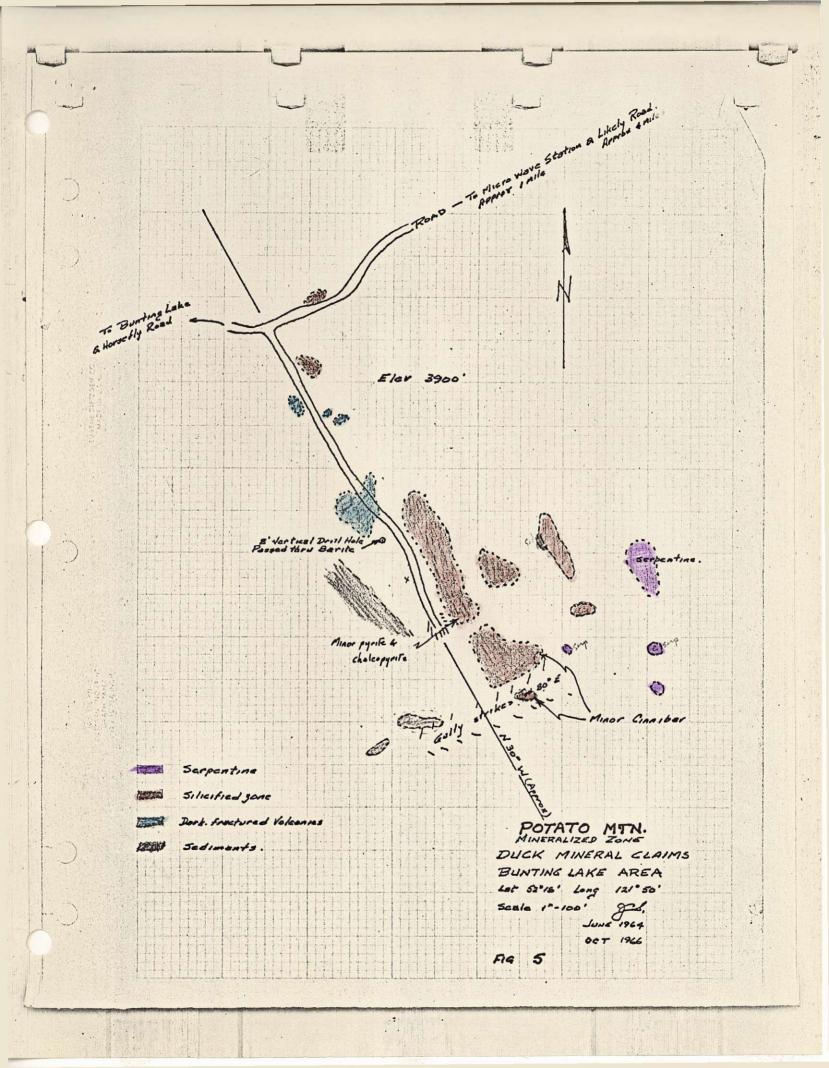
The accompanying sketch is a revision of that of 1964 showing additional trenching.

An assay of 0.15% Hg is claimed by the owners of the showing.

Although a few specks of cinnibar were seen in a few places close to the serpentine contact no mineralization of apparent economic importance was found.

It is possible that the general area between the Horsefly road and the Likely road might be worthwhile prospecting for mercury. A number of serpentine bodies are indicated on the aeromagnetic maps and soil sampling for mercury should show any related zones of interest.

The area generally is extensively covered by overburden, however, and no mercury showings of importance are known. Soil samples taken at one mile intervals along the road from Big Lake to 158 Mile House indicate a significant mercury anomaly at Skulow Lake and a weaker one three to four miles north east of 158 Mile House. (See General Location Map - Cariboo Project 1966.)

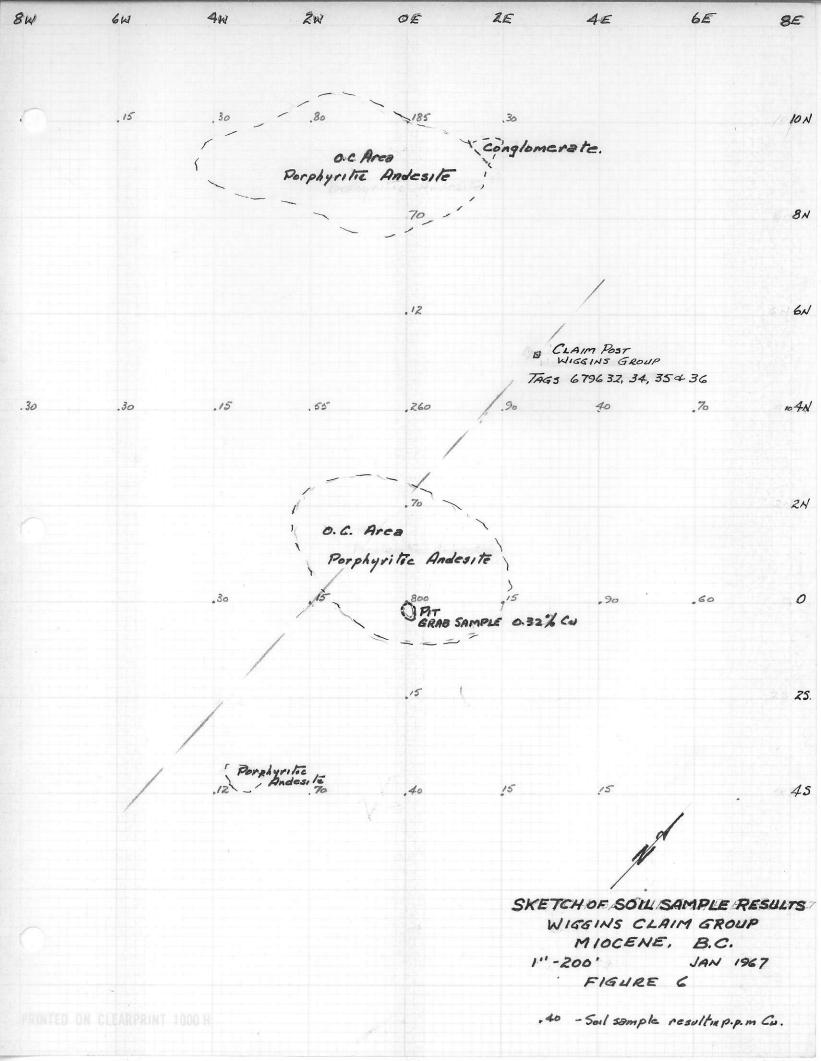


Wiggins & Thelma Groups, Miocene, B. C.

A reported discovery of high grade copper immediately north of Miocene was investigated. The showing occurs on a south east facing slope about one mile north of the Miecene post office. It consists of a few pieces of andesitic feldspar porphyry mineralized with chalcopyrite and malachite occuring as loose rubble on the hillside. The mineralization was found scattered over an area of about 50° × 20°. A number of very small pits had been dug to the underlying bedrock, the largest being about two feet deep, but these did not uncover any significant mineralization. Appearance of the largest pit suggested it had been filled in rather than caved and what bedrock could be seen on the walls was not mineralized.

A number of outcrops occur in the vicinity. Except for a small amount of conglomerate found, all outcrops were andesitic feldspar porphyry similar to that surrounding the showing. No alteration or structure could be seen except in those few mineralized pieces at the showing which are somewhat rusty, fractured and vuggy. My impression was that this might be part of a thin flow top. Assay of a representative sample of the rubble ran Tr - Au; Tr - Ag; 0.32% - Cu.

Some two miles to the west a zone of altered carbonate rock is staked as part of the Thelma group. No sulphide mineralization was found. A sample of this rock ran 0.02% - Cu.



Lemon Lake - G. I. Claim Group

This claim group was visited briefly on June 12th, 1966 for informational purposes. (See location 11 on General Location Map).

The group covers an area of intrusive rocks located about two miles south of the west end of Horsefly Lake. The claims were staked for Helicon Explorations and work was being conducted by Chapman Wood and Griswold. Access is by jeep road from the Horsefly Lake road.

Very meagre information was rather unwillingly supplied by

Bob Shuttleworth who was directing "tractor prospecting". Soil

sampling provided erratic copper anomalies and these had been trenched

with a D-7E and ripper. It is possible that a magnetometer survey had

been conducted as this would be an obvious step due to the nature of

the rocks. At the time of our visit an experimental reconnaissance

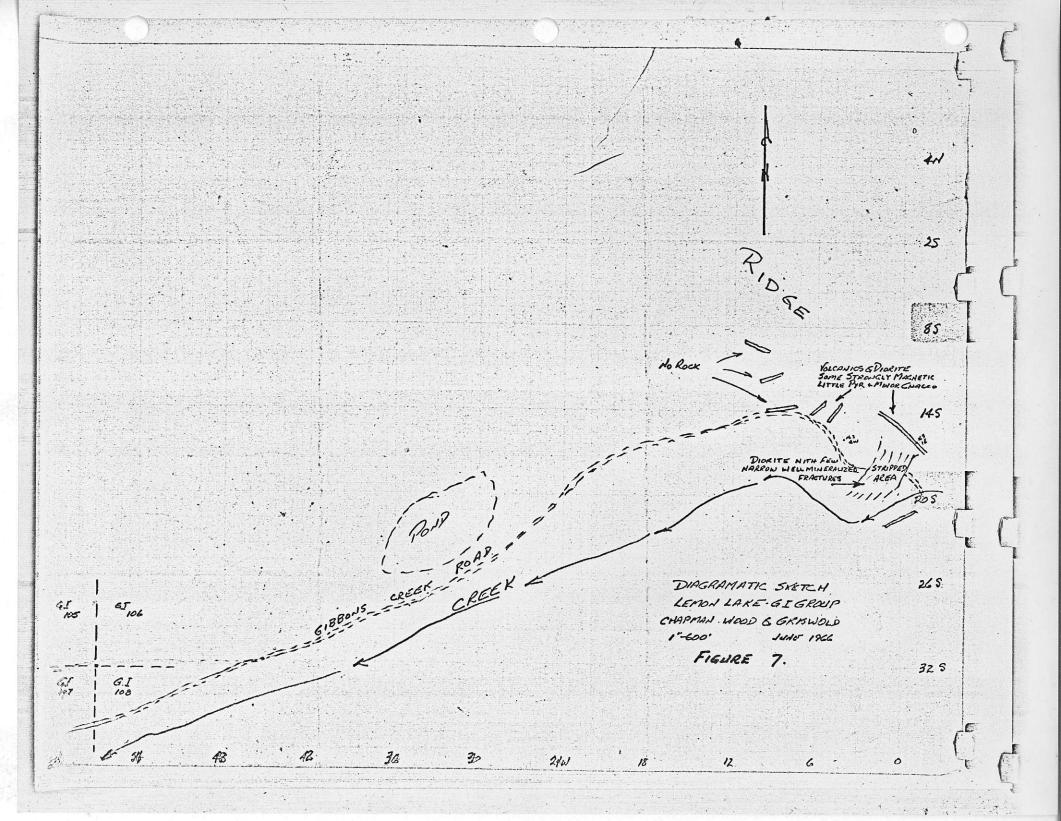
E.M. survey was being conducted using Crone REM equipment.

The trenching appeared to be somewhat haphazard - possibly due to the nature of the geochemical results, and a number of the trenches had been abandoned without reaching bedrock at depths of about 8 feet. In the area about 185 OE on the picket line grid a number of narrow fractures well mineralized with chalcopyrite and malachite had been encountered and this area had been stripped and ripped. It was not clearly exposed and the spacing and dimensions of these stringers could not be determined. It seemed too low grade to be of interest. No other showings of importance had been uncovered.

The area has relatively little outcrop. Dark green pyroxene bearing volcanics appear to be intruded by a dioritic stock. Some fractures and a few narrow zones up to a few feet wide show alteration and introduction of K feldspar and closely resemble the No. 2 zone at Cariboo-Bell.

These zones and some of the diorite are mineralized with scattered pyrite and rare chalcopyrite.

The showings seen are of no economic interest. Further prospecting in the area may yet encounter something of importance and work is continuing.



Suey Bay - A relatively small mass of hornblende diorite occurs on the north shore of Horsefly Lake near the east end of the lake and is shown on G. S. C. Map 1-1963.

This intrusive was examined on June 20th, 1966. Rather obvious melachite staining is visible from the lake, but examination of this area showed only very minor sulphide mineralization. Relative concentration of mineralization in this zone appeared to be related to more intense fracturing associated with faulting striking N70°W. The best material found assayed 0.27% Cu. Silt samples from small creeks in the vicinity of the intrusive tested no better than "very weak indicator" with the rubeanic acid test. The showing was not considered important enough to warrant staking.

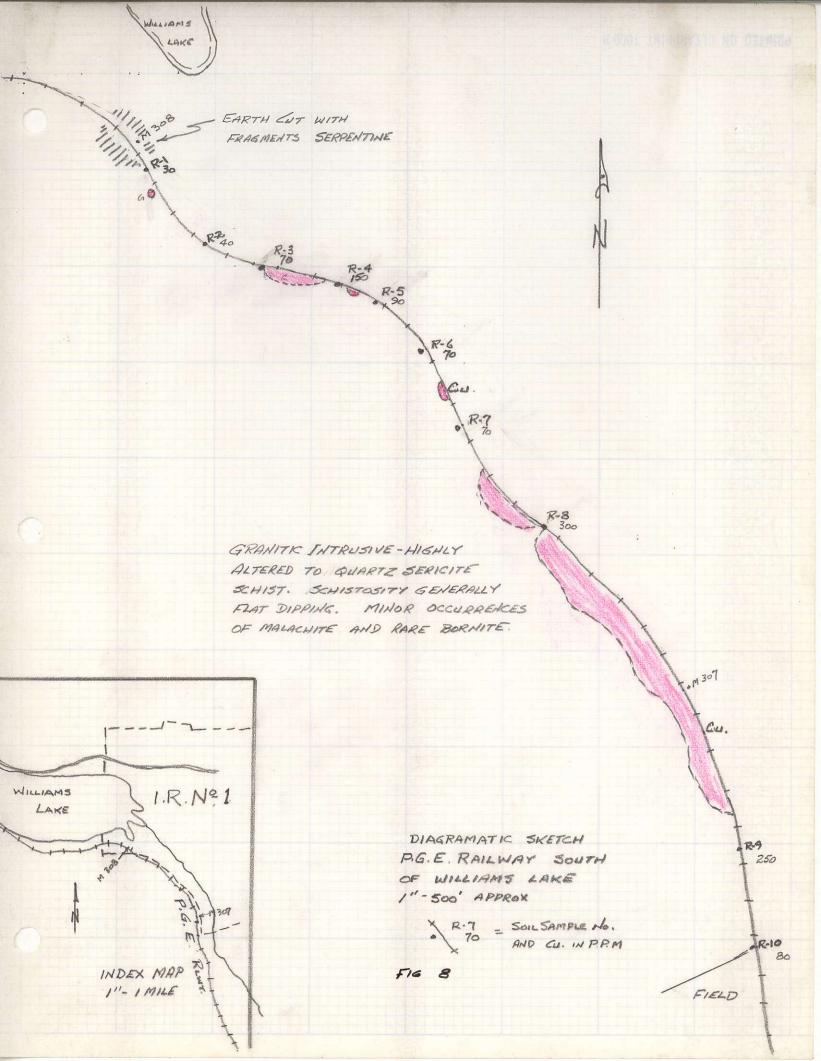
<u>Williams Lake</u> - A brief examination was made of the granitic intrusive at the south east end of Williams Lake. This rock is well exposed along the railway cut.

Extent of the rock cut and location of soil samples taken are shown on the accompanying sketch.

The intrusive is of interest because of its highly altered appearance and its similarity to some of the quartz sericite rock seen in core on the Gibralter property at Cuisson Lake some 30 miles to the north.

Schistosity in the intrusive is generally flat dipping suggesting that if any mineralized zones are present they to may be flat dipping.

Minor malachite and/or bornite mineralization was found at a number of places. Some of this mineralization was along flat lying shears, but in one case it was confined to a narrow vertical fault zone. This mineralization did not seem to warrant detailed prospecting, but the results of soil samples R-8 and R-9 suggest that the area above the railway which is apparently largely obscured by overburden might warrant further soil sampling.



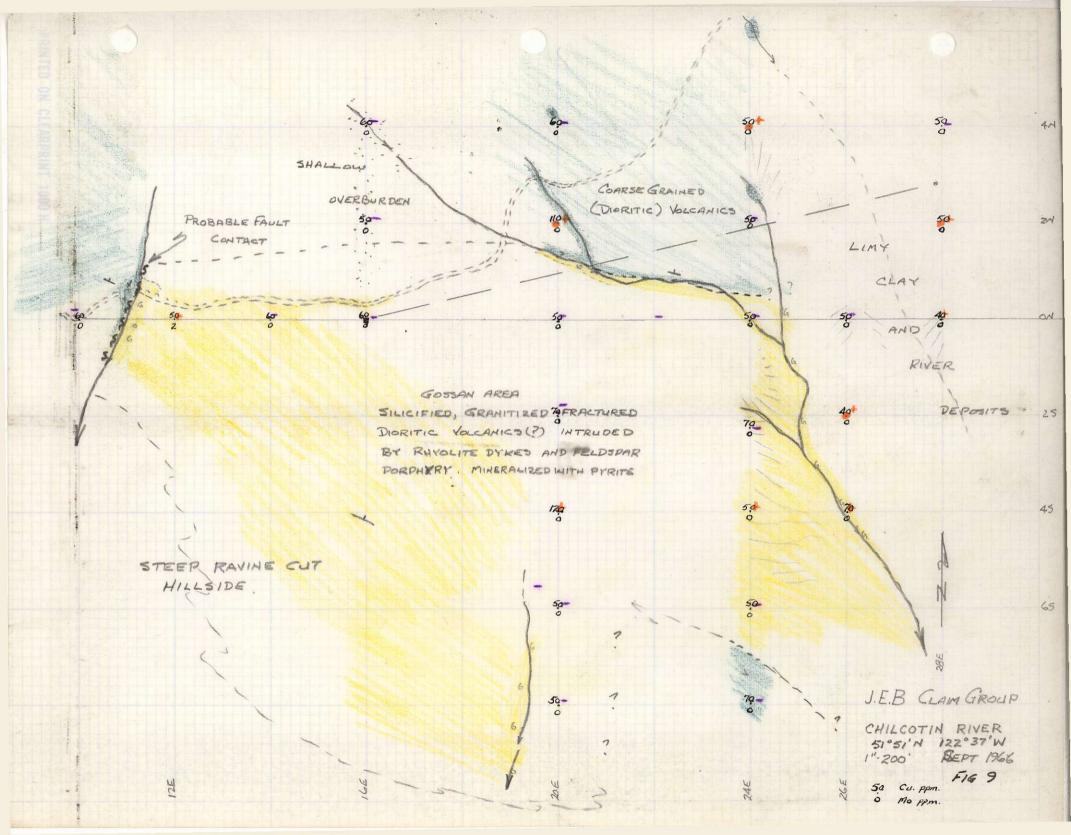
J. E. B. Claim Group - Chilcotin River

Examination of granitic intrusives in the north east portion of the Taseko Lakes map sheet led to discovery of a well developed pyrite gossen on the north side of the Chilcotin River at a point 12 miles north west of the confluence of the Chilcotin and Fraser Rivers.

The gossan was found to be covered by the four J. E. B. claims staked by Jim Carson of Williams Lake. These claims were shown on the claim map five miles south east of their true location.

Much of the gossan area is heavily oxidized and the rock type uncertain. It appears to be an area of altered volcanics intruded by feldspar purphyry and rhyolite dykes. It may in part be dioritic and related to nearby diorite masses.

The accompanying sketch indicates the general outline of the zone. Soil samples were run for copper and molybdenum with negative results. The only sulphide mineralization identified was pyrite.



Friendly Lake - Latremouille Lake Area

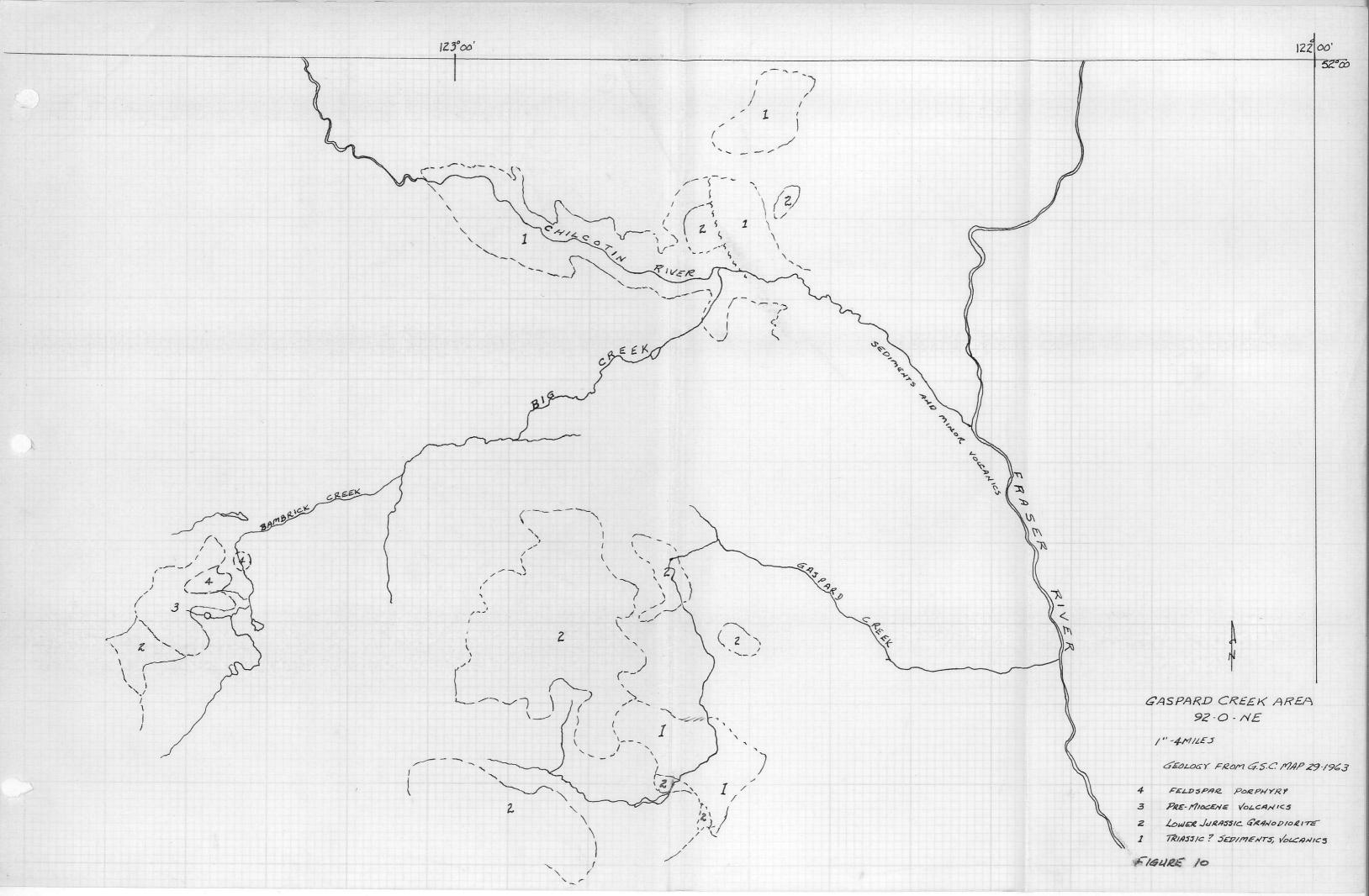
Mr. Sam McBeath spent the early part of the 1966 season in this area. He was considerably hampered by poor road conditions at that time. Much of the area of apparent interest was staked by Anaconda. Nothing of interest was found.

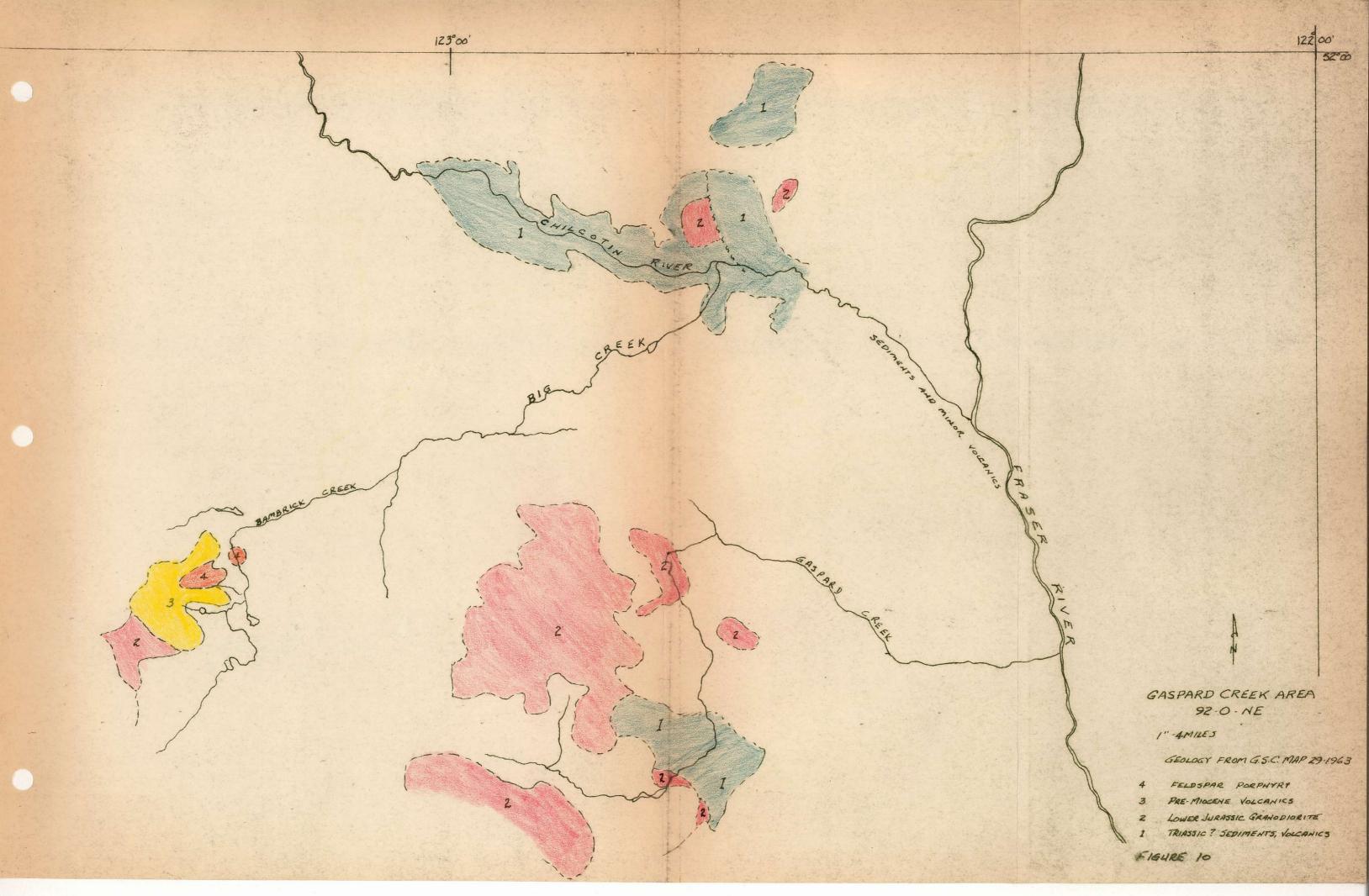
The writer, with one helper returned to the area for the period September 21st to 25th.

Outside the Anaconda claim groups no mineral showings of significance were found. A number of apparently anomalous areas occur along the road from Rock Island take to the Bridge take road. Some check sampling was done on these zones, but examination of outcrops and float failed to indicate a source for the anomalies. This experience seems to have been shared by the Anaconda crews. They were using seromagnetics, soil sampling, I. P., and geology, but in many cases had no adequate explanation for some anomalies.

No mineralization of interest was found.

Gaspard Creek Area - A reconnaissance of the area shown in Figure 10 failed to show mineralization of any interest whatever. Soil and silt sampling gave negative results. Those areas for which geology is shown were fairly well covered. The only mineralization of note was that covered by the J. E. B. claim group on the Chilcotin River described sleewhere in this report.





<u>Coquinalla River</u> - Six claims were staked by Mr. Roy Lambert on

September 1st, 1966 following discovery of copper molybdenum mineralization

by personnel of the B. C. Department of Mines.

These claims were examined early in October. They cover part of a dioritic intrusive and argillitic sediments to the north east.

No mineralization except minor pyrite was found. Soil samples were tested for copper and molybdenum. Results varied from 10 to 55 p.p.m.

Cu and 0 to 5 p.p.m. Mo in the intrusive area and from 35 to 135 p.p.m.

Cu and 1 to 5 p.p.m. Mo in the sediments.

Work in the area by Granby Mines and later information from the Department of Mines confirm that the original showing was extremely small and low grade. The claims staked are some distance above this showing. Since no mineralization of interest was found the claims should be allowed to lapse.

LEMAIRE MERCURY DETECTOR

A number of roads in the Cariboo area were sampled at one mile intervals in an attempt to assess the feasibility of the Lemaire mercury detector to outline possible areas of mineralization. See Figure 1.

Work by Dr. Sutherland-Brown of the B. C. Department of Mines indicated that significant anomalies could be located in the vicinity of major mineral deposits by taking samples at half mile intervals. It was known that the anomaly over a molybdenum deposit such as Endako would probably be very little over the background reading aurrounding a base metal deposit and would be lower than the probable background in an area of mercury mineralization.

A total of 567 wamples were run on the Lemaire detector. At least two determinations were made for each sample and the average of these determinations was that recorded on the accompanying map. Of these samples 119 were submitted to Barringer Research for determination of mercury content. An additional 17 samples were submitted to Barringer, but were not run on the Lemaire detector.

The accompanying Table I lists the samples run on both the Lemaire detector and by Barringer Research. There is a general correlation of values in that the more strongly anomalous samples are anomalous as a result of both methods of determination. There are, however, a few "below background" readings by the Lemaire detector which show anomalous results by the Barringer method. See samples 1-149, 1-164, 1-166, 1-221, 1-222, 1-312. No adequate explanation for this is apparent.

The initial traverses were along the Barkerville highway from the railway north of Quesnel to Mile 19 on the Swift River road and along the McLeese Lake road to Likely. The results from these samples seemed to indicate that this was a method capable of indicating areas of interest. On the Barkerville highway four anomalous zones were apparent. One of these was in the vicinity of the Mouse Mountain copper prospect and two were in the vicinity of ultrabasic intrusives near a major fault. No ready explanation can be given for the apparently anomalous area at Cottonwood.

On the McLeese Lake - Likely road anomalous results were obtained over the intrusive body in the region of the Gibralter copper showings. A single anomalous reading was obtained near Morehead Lake on the mineralized belt extending from Mouse Mountain through the Cariboo-Bell area. In addition two anomalies were indicated west of Beaver valley. Follow-up work over these two anomalies showed no significant metal values in silt and soil samples. Only a very few outcrops were found. These were all of Cache Creek sediments - argillite and limestone. No mineralization was found in these rocks. Very minor pyrite and chalcopyrite mineralization was found in the vicinity of the small granitic intrusive between the McLeese road and Big Lake. The aeromagnetis maps do not indicate the presence of buried ultra basic bodies. These anomalies are, therefore, still unexplained.

In later sampling in other areas results were indecisive. No anomaly was indicated over the formation in which the Keno Lake showings were found, but there are apparently anomalous results in the general vicinity of the Lemon Lake showings.

North of Murphy Lake along the Moffatt Lake road the mercury results were high enough to indicate possible molybdenite mineralization.

Outcrop was very restricted here, but prospecting failed to show any-thing significant.

At Bridge Lake the mercury anomaly seems to occur in an area of Tertiary volcanics and no mineralization is indicated. The nearby granitic intrusive is of some interest as an apparently complex intrusion of varied composition with some associated pyrite and rare chalcopyrite. Nothing of interest was discovered, however, and soil sampling failed to show significant values.

South of Big Lake anomalous areas are indicated which are probably associated with serpentine intrusives and possibly are caused by minor cinnibar mineralization. Further sampling would be necessary here to explore these anomalies.

A number of other isolated anomalous values are scattered through various areas and have not been specifically investigated.

The method appears to have some merit, but better facilities for sample treatment are necessary. It was impractical to attempt air drying of the soil samples in a constantly moving prospecting camp.

It was also found that dry cell batteries purchased from various sources were not always reliable.

It is suggested that this method is not adequate when used on a regional basis as was attempted this summer.

TABLE I

COMPARISON OF RESULTS FOR MERCURY CONTENT OF SOIL SAMPLES

SAMPLE NO:	LEMAIRE DETECTOR p.p.m.	BARRINGER RESEARCH p.p.b.
1-76	.04	3
1-77	. 20	82
1-93	.14	6
1-94	.12	15
1-95	.19	26
1-96	. 38	540
1897	. 28	88
1-102	.04	15
1-107	.16	14
1-110	.22	24
1-111	.12	20
1-112	.04	10
1-115	.18	23
1-117	.16	17
1-118	.05	12
1-122	.03	18
1-123	.15	18
1-124	.24	108
1-140	.34	44
19141	•30	92
1-146	.24	15
1-147	.25	37
1-148	.37	81
1-149	.10	38
1-150	.16	30
1-151	.20	25
1-152	.32	80
1-153	.50	319
1-154	.31	165
1-155	.30	155
1-156	.08	27

SAMPLE NO.	LEMAIRE DETECTOR p.p.m.	BARRINGER RESEARCH p.p.b.
1-160	.16	11
1-161	.24	84
1-162	.10	19
1-163	.18	80
1-164	.10	80
1-165	.16	12
1-166	•04	83
1-174	.30	245
1-193	.09	25
1-194	.32	28
1-195	•06	9
1-201	.25	89
1-209	.22	89
1-221	.15	160
1-222	.16	169
1-223	.08	12
1-224	.10	1
1-225	.18	23
1-226	.10	23
1-227	.20	13
1-228	.28	172
1-229	.08	15
1-230	.10	25
1-232	.16	25
1-277	.16	25
1-289	.03	10
1-290	.25	154
1-291	.10	4
1-292	.13	42
1-293	.13	9
1-294	.10	7
1-295	.18	41
1-299	.15	258
1-300	.30	35
1-301	.12	2

SAMPLE NOS	LEMAIRE DETECTOR p.p.m.	BARRINGER RESEARCH p.p.b.
1-302	.10	16
1-303	.16	23
1-304	.12	13
1-305	.42	438
1-306	.38	89
1-307	.18	32
1-308	.14	7
1-312	•16	106
1-313	.50	388
1-314	•20	12
1-320	.23	60
1-321	.12	8
1-324	•11	21
1-325	.25	37
1-353	.16	14
1-362	.16	18
1-365	•09	9
1-370	.15	17
1-371	.16	12
1-375	.37	34
1-376	.18	7
1-377	.07	7
1-378	.13	12
1-379	.10	5
1-380	.16	21
 1.381	.10	15
1-382	.30	140
1-383	.12	5
1-386	.07	1
1-387	.05	6
1-388	.09	9
1-389	.12	21
1-390	.09	21
1-391	.15	29
1-392	.07	22

Cottonwood Canyon Area - Preliminary prospecting in the area north west of the Ahbau Creek anomaly indicated some pyrite mineralization and apparently interesting rock structures.

Follow up soil sampling, however, was generally negative. A few scattered positive heavy metal results were had in field testing, but more detailed work failed to find anything significant.

Respectfully submitted,

February 15th, 1967 Vancouver, B. C.

J. C. Stephen

