

#00013

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P.O. BOX 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

GEOLOGICAL MAPPING AND CHIP SAMPLING PROGRAM

ON THE

"6" 1-8, "3" 1-8 AND "8" 1-8

MINERAL CLAIMS

BENNETT LAKE AREA

YUKON TERRITORY

**This is Appendix "A" to
the application of Eagle
River Mines Ltd. (N.P.L.)
executed February 26th,
1971.**


President

60° 00' N LATITUDE

137° 05' W LONGITUDE

CLAIM SHEET 105-D-3

WHITEHORSE MINING DIVISION

BY

G.G. CARLSON, GEOLOGIST

R.G. HILKER, P.ENG.

OF

R.G. HILKER LIMITED

WHITEHORSE, YUKON TERRITORY

30 SEPTEMBER 1970

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 CHIP SAMPLE LOCATION MAP

 COPPER-MOLYBDENUM ASSAY MAP

INTRODUCTION

The Bennett Lake property of Eagle River Mines Ltd. (N.P.L.) was first inspected by Mr. George Wolanski in the early summer of 1969. The showing was located by tracing mineralized float, and the "G" 1-8 claims were staked over the initial showing. Molybdenum mineralization was discovered.

During September 1969, personnel from R.G. Hilker Limited, accompanied by Mr. Wolanski, visited the property twice. During these visits, the general property and the main showings were examined and rock samples, both from float and from outcrop, were collected for assay and for future geological reference.

Following this work, in October 1969, the "J" 1-8 and the "B" 1-8 claim groups were staked on either side of the initial claims.

A report, summarizing the findings of the property examination and the assay results, was prepared by R.G. Hilker and G.S. Zimmer and submitted to Eagle River Mines Ltd. (N.P.L.) on January 16th, 1970. This report describes a mineralized breccia pipe within a zone of generally explosive volcanic activity. Mineralization consists of pyrite, chalcopyrite, bornite and molybdenite with minor gold and silver indicated by assay.

In the conclusions of this report, a two-phase program was recommended for further exploration and development of the property. During the past summer, Stage 1 of the recommendations was implemented in part. This work included

the erection of a base camp, consisting of two wood-frame tents, surveying in the vicinity of the showing, and chip sampling and geological mapping over the surveyed outcrop area.

Surveying was carried out by personnel of Underhill and Underhill, plus one employee of R.G. Hilker Limited, between August 16th and August 22nd, 1970. This was a control survey, of second order, which tied in and contoured outcrop zones and the snowfield in and around the showing area.

Following this survey work, on August 22nd, 1970, a crew of two samplers and a senior technician from R.G. Hilker Limited travelled to the property to carry out the chip sampling program. On August 28th, the writer arrived at the property to supervise the remaining sampling program and to carry out geological mapping. Work was completed and the crew returned to Whitehorse on September 3rd. R.G. Hilker visited the property to supervise personnel, on August 16th, 22nd and 28th.

All transport to and from the property was by Trans North Turbo Air Jet Ranger, with the exception of the final withdrawal from the camp, when a truck was used for some of the personnel and gear between Carcross and Whitehorse.

PERSONNEL

The following personnel of R.G. Hilker Limited were directly involved in the chip sampling and geological mapping program on the "G", "J" and "B" claim groups:

<u>Name</u>	<u>Address</u>	<u>Position</u>	<u>Dates</u>
R.G. Hilker, P.Eng.	Box 1566 Whitehorse, Y.T.	Geologist - program supervision, report preparation	Aug. 16, 22, 28.
G.G. Carlson	Box 548 Whitehorse, Y.T.	Geologist - field supervision, geo- logical mapping, report preparation	Aug. 28 - Sept. 3.
B. Slater	Room 017 Rundle Hall Univ. of Calgary Calgary 44, Alta	Senior Technician- field supervision, chip sampler.	Aug. 13 - Sept. 3.
J. Greer	Box 422 Whitehorse, Y.T.	Sampler (trained by R.G. Hilker Ltd.)	Aug. 21 - Sept. 3.
A. Ashton	Box 56 Parry, Sask.	Sampler (trained by R.G. Hilker Ltd.)	Aug. 21 - Sept. 3.

The following personnel of Underhill and Underhill, Professional Land Surveyors and Professional Engineers, carried out survey work on the "G", "J" and "B" claim groups for Eagle River Mines Ltd. (N.P.L.) on the request of R.G. Hilker:

<u>Name</u>	<u>Address</u>	<u>Position</u>	<u>Dates</u>
T.E. Koepke P.Eng.	Box 3267 Whitehorse, Y.T.	Surveyor	Aug. 16 - Aug. 22.
B. MacLean	c/o Box 3267 Whitehorse, Y.T.	Rodman	Aug. 16 - Aug. 22.
D. Mason	c/o Box 3267 Whitehorse, Y.T.	Rodman	Aug. 16 - Aug. 22.

LOCATION AND ACCESS

The property is located in the south-central Yukon Territory immediately north of the Yukon Territory - British Columbia border. The claims are situated some 2½ miles south-east of the west arm of Bennett Lake in the vicinity of 60° 00' N latitude and 137° 05' W longitude, and are plotted on Claim Sheet 105-0-3.

The claims are located 18 air miles southwest of Carcross, Y.T. Carcross is connected by gravel road to the Alaska Highway. The road east from Carcross (33 miles) connects with the Alaska Highway at Mile 865. The road north from Carcross (to Whitehorse) extends for 31 miles to Mile 904.8 on the Alaska Highway. Total road distance from Carcross to Whitehorse is 64 miles.

The White Pass and Yukon Railway runs from Whitehorse to tidewater at Skagway, Alaska. The railway passes through Carcross and travels south along the east shore of Lake Bennett. Rail distance from Skagway to Carcross is 67.5 miles.

The claims are located at elevations from 4500 to 6500 feet above sea level in an area of high peaks and steep-sided cirques, several of which contain glaciers. As Lake Bennett has an elevation of 2152 feet above sea level, the claims are located from 2300 to 4300 feet above the level of the lake.

An access road (winter or all-weather) could originate either at Bennett, S.C., or at the junction of the Wheaton River Road and Partridge Creek. The northerly route from the Wheaton River Road would parallel Partridge Creek to its source and then follow the same general direction to the West Arm of Bennett Lake. The road would then parallel the shore of the West Arm to the vicinity of Munroe Lake (See Sketch #3). Total road distance by this route is approximately 30 miles.

The possible route from the south would originate at Bennett, on the railway at the south end of Bennett Lake, and follow a valley over a height of land north to Munroe Lake. The road would parallel the west shore of Munroe Lake to the proposed campsite at the north end of the lake. Total road distance by this route is approximately 22 miles.

CLAIMS

The following information was obtained from a search of records at the Mining Recorder's Office, Whitehorse Mining Division, Whitehorse, Y.T., on September 9th, 1970:

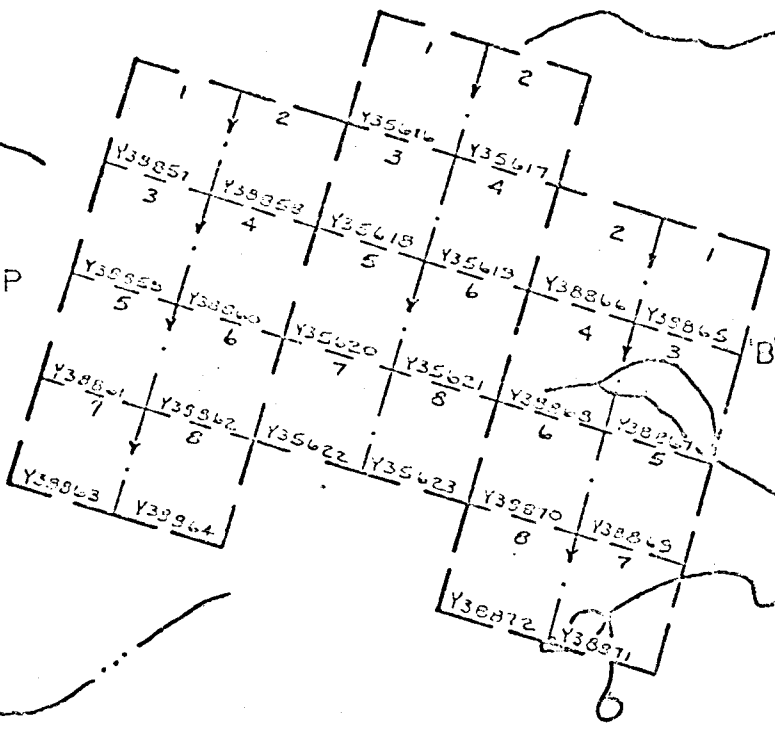
<u>Claim</u>	<u>Grant No.</u>	<u>Owner</u>	<u>Expiry Date</u>
"G" 1-8 (incl)	Y35616-Y35623 (incl)	Eagle River Mines Ltd. (N.P.L.)	Oct. 8, 1970
"J" 1-8 (incl)	Y38857-Y38864 (incl)	Eagle River Mines Ltd. (N.P.L.)	Oct. 20, 1970
"S" 1-8 (incl)	Y38865-Y38872 (incl)	Eagle River Mines Ltd. (N.P.L.)	Oct. 20, 1970

WEST ARM
BENNETT LAKE

'G' GROUP

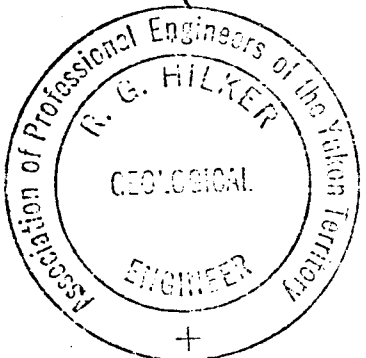
'J' GROUP

'B' GROUP



60°00'

135°05'



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CONSULTING GEOLOGIST
WHITEHORSE, YT

CLAIMS SHEET 105-D-3
 EAGLE RIVER MINES LTD. (NPL)
 CLAIM LOCATION SKETCH
 'B', 'G', and 'J' GROUPS
 DATE: SEPT 3/70 | SCALE: 1" = 1/2 mi.

SURVEY PROGRAM

The mineralized showings occur over four separate outcrop zones which are separated by a large snowfield, formerly a glacier. The glacier ice probably remains at depth under the snow, although there is no evidence on surface. Two of the exposures occur as rock "islands" within the snowfield on the lip of a major cirque to the east, while the two other outcrop zones are the cirque walls which form the north and south edges of the cirque lip. Most of these outcrop exposures are near-vertical rock faces and are accessible only at their base where they meet the surface of the snowfield.

The survey program was required to accurately tie in the four outcrop zones to aid further investigations. Firstly, a baseline was surveyed for a distance of 1900 feet in a southerly direction on the snowfield beneath and to the west of the outcrops. From this reference line, fifty stations, located along the base of the outcrops and covering the entire range of known mineralization, were located. These stations, numbered 1 to 50, are each separated by approximately 50 feet. They have been located on the rock faces using fluorescent spray paint. This data has been plotted and is displayed on the Plan of Control Survey, at 1" = 200 ft., and the Topographic Plan, at 1" = 100 ft. (see Pocket). The Topographic Plan has been used to locate and plot all geology and chip sample data.

GEOLOGY

INTRODUCTION

The localization of any mineralization in concentrations great enough to be potentially economically significant requires some form of control. Any geological investigation of a mineralized zone, aside from a visual estimate of the exposed extent and possible grade of metals present, must study the possible control or controls governing the emplacement and concentration of the metals within the rock in order to more fully understand and consequently to exploit the mineralized body during future exploration and development.

The present work involved a short, detailed geological mapping program. Although the extent and approximate concentration of the sulfide mineralization was noted, this particular aspect of the geology is secondary to the surveying and chip sampling programs.

Primarily, the mapping program sought a correlation between the type and occurrence of the mineralization and any other observable geologic features. However, very little structure or stratigraphy is evident on a small scale in this area. It is therefore necessary to study the regional geology, sparsely outlined to date by the G.S.C., and then to attempt a correlation with the mapped local geology of the showing itself.

REGIONAL GEOLOGY

The regional geology, as described below, is taken from the Geological Survey of Canada Papers 68-1A (page 32: "Wheaton River and Homan Lake, Yukon and British Columbia"; M.B. Lambert) and 59-1A (pages 21-23: "Study of Tertiary Cauldron Subsidence Complex Bennett Lake, British Columbia and Yukon Territory"; M.B. Lambert). (See "Reference to Published Geology").

The regional geology consists of a circular mass of volcanic rocks, named the Skukum Group, about 12 miles in diameter, completely enclosed by granitic intrusives. The area is considered by the Geological Survey of Canada to be a cauldron subsidence area with a history of explosive acidic volcanism and rapid subsidence resulting in the accumulation of great thickness of conglomerates, breccias, tuffs, and ignimbrites.

The oldest rocks in the area are the Precambrian Yukon Group (Map Unit 1) consisting of schists, quartzites, and gneisses with minor crystalline limestones.

The age of Map Unit 2, consisting of metamorphosed volcanic rocks, schists and gneisses, is listed as being unknown or uncertain in the Yukon Territory. The British Columbia map sheets date this unit as being pre-Permian, but questionable.

During the Cretaceous period, the area was regionally intruded by the Coast Range Intrusions (Map Unit 3),

consisting of granodiorite, granite, quartz monzonite, quartz diorite and hornblende granodiorite. The intrusives left only isolated patches of Unit 1 remaining in the general area.

Following the emplacement of the Coast Range Intrusions, a period of explosive volcanism occurred in which the intrusives were shattered and brecciated. Major faulting probably occurred at this time, which further shattered and brecciated the intrusives. The volcanism and faulting marked the initial stages of the subsidence of a central cauldron.

Products of the explosive volcanism accumulated on a "floor" of shattered and brecciated hornblende granodiorite (Coast Intrusion) to a thickness of approximately 3700 feet. Light colored breccias and tuffs (Map Unit 4a) account for the first 1500 feet above the hornblende granodiorite. A 2000-foot thickness of ignimbrites (Map Unit 4b) overlies the breccia and tuffs, followed by 250 feet of granitic fragment breccia (Map Unit 4a).

A period of erosion followed a decrease in the intensity of the volcanism. The erosion produced a sequence of unsorted boulder conglomerates (Map Unit 4a) which accumulated to a maximum thickness of 1000 feet. The conglomerate beds are interfingered with small tuff and ignimbrite units. The conglomerate sequence is overlain by coarse grained sandstones, containing the occasional poorly preserved plant fossil, and tuffaceous sandstones. Fault relations in the

area indicate that disruption occurred both during and after deposition of the sedimentary rocks.

Following the deposition of the conglomerates and sandstones, a major period of faulting occurred along fracture systems which paralleled the perimeter of the 12 miles diameter subsidence cauldron. This period of faulting was accompanied by three major events: (1) explosive volcanism, resulting in the deposition of thin layers of tuff; (2) extrusion of basalt lava flows (minor volume as compared to the pyroclastics); and (3) intrusion of a porphyritic rhyolite ring dike (Map Unit 5).

The ring dike forms the eastern and northern boundaries of the cauldron for a discontinuous length of 22 miles. The dike dips steeply outward and reaches a maximum thickness of 1500 feet with much pinching and swelling. Surface exposures of the dike are highly weathered to a rusty brown.

TABLE OF FORMATIONS

CENOZOIC

Quaternary

6 - Glacial Drift; Alluvium

Tertiary

5 - Porphyritic Rhyolite (Ring Dike)

CENOZOIC/MESOZOIC

Tertiary/Cretaceous

4 - Pyroclastics and sediments

4a Conglomerate, sandstone

4d Tuff, rhyolite, dacite

4c Tuff

4b Ignimbrite

4a Volcanic breccia

MESOZOIC

Cretaceous

3 - Coast Intrusions:
Granite, granodiorite, hornblende granodiorite,
quartz diorite.

PALAEOZOIC

Unknown

2 - Schist, gneiss, volcanics

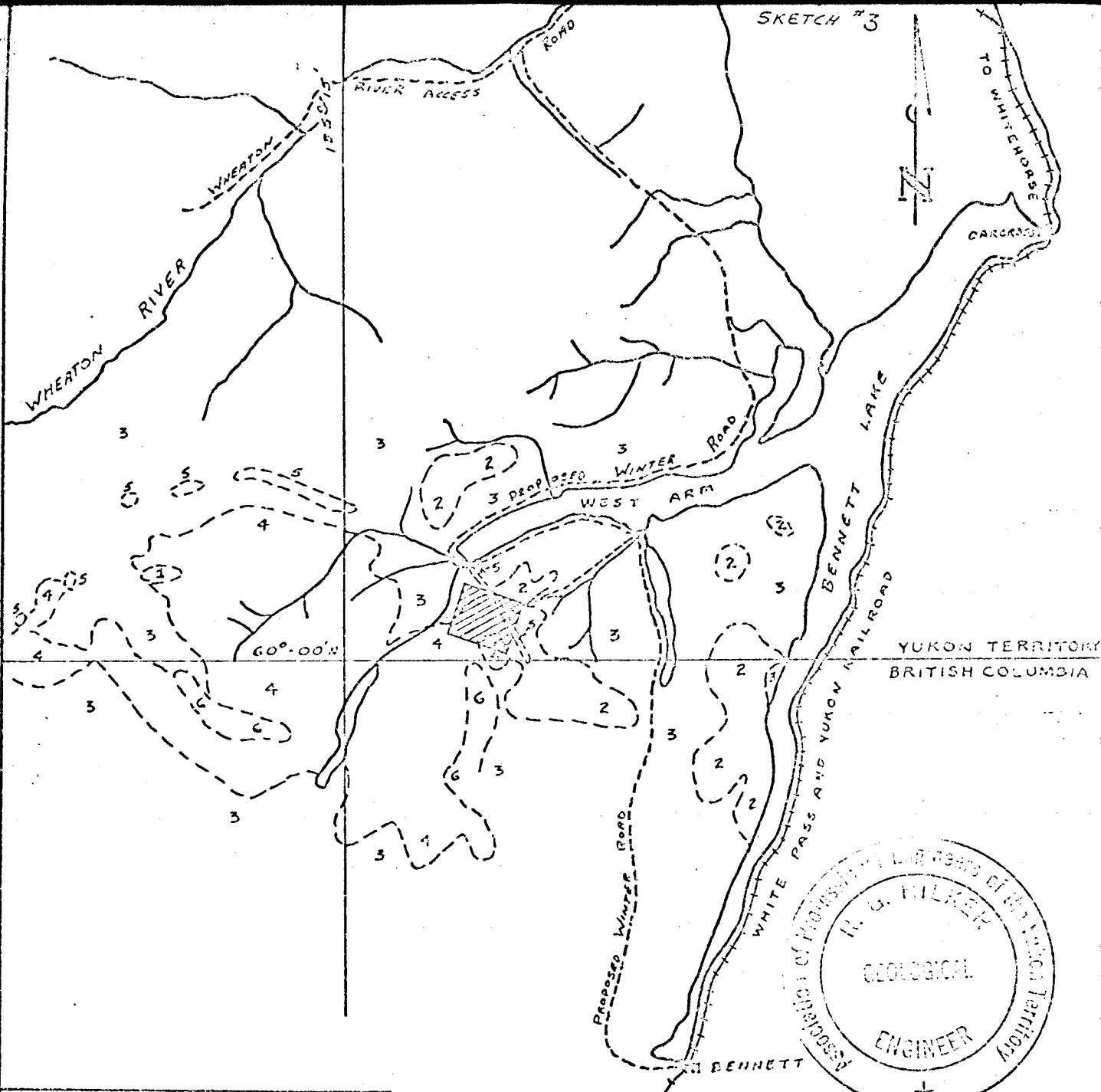
PRECAMBRIAN

Yukon Group

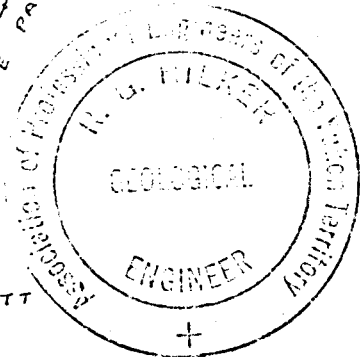
1 - Schist, gneiss, quartzite

After Lambert: G.S.C. Paper 69-1A.

SKETCH #3



YUKON TERRITORY
BRITISH COLUMBIA



LEGEND

- CENOZOIC**
- QUATERNARY
- 6 GLACIAL DRIFT, ALLUVIUM
- TERTIARY
- 5 RHYOLITE
- CENOZOIC/MESOZOIC**
- TERTIARY/CRETACEOUS
- 4 IGNEIMRITE, TUFF
- RHYOLITE TRACHYTE BRECCIA
- MESOZOIC**
- CRETACEOUS
- 3 COAST INTRUSIONS:
GRANITE, GRANODIORITE,
QUARTZ DIORITE
- PALAEOZOIC(?)**
- UNKNOWN
- 2 SCHIST, GNEISS, VOLCANICS
- PRECAMBRIAN**
- YUKON GROUP
- 1 SCHIST, GNEISS, QUARTZITE

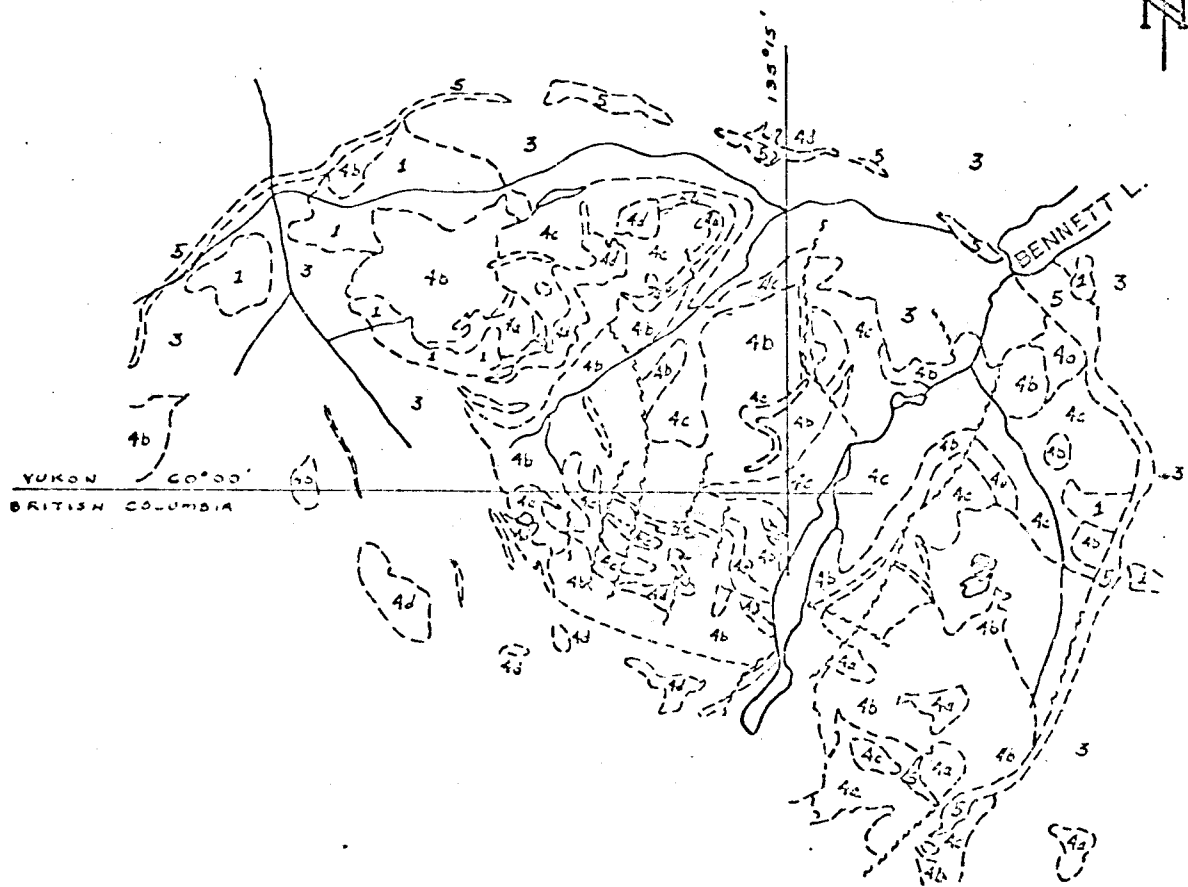
MAP AFTER G.S.C.
MAPS 19-1957 & 1025A

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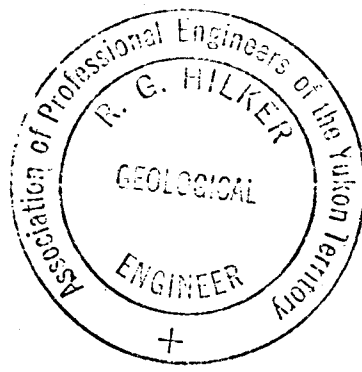
REGIONAL GEOLOGY
BENNETT LAKE PROPERTY

DATE-SEPT 30-70 | SCALE-1"=4 MI.



LEGEND

- CENOZOIC
 - QUATERNARY
 - 4 GLACIAL DRIFT; ALLUVIUM
 - TERTIARY
 - 5 PORPHYRITIC RHYOLITE (RING DYKE)
- CENOZOIC/MESOZOIC
 - TERTIARY/CRETACEOUS
 - 4 PYROCLASTICS AND SEDIMENTS
 - 4c CONGLOMERATE, SANDSTONE
 - 4d TUFF, RHYOLITE, DACITE
 - 4e TUFF
 - 4b IGNIMBRITE
 - 4a VOLCANIC BRECCIA
- MESOZOIC
 - CRETACEOUS
 - 3 COAST INTRUSIONS
 - GRANITE, GRANODIORITE,
 - HORNBLÉNDE, GRANODIORITE,
 - QUARTZ DIORITE
- PALAEOZOIC
 - UNKNOWN
 - 2 SCHIST, GNEISS, VOLCANICS
 - PRECAMBRIAN
 - YUKON GROUP
 - 1 SCHIST, GNEISS, QUARTZITE



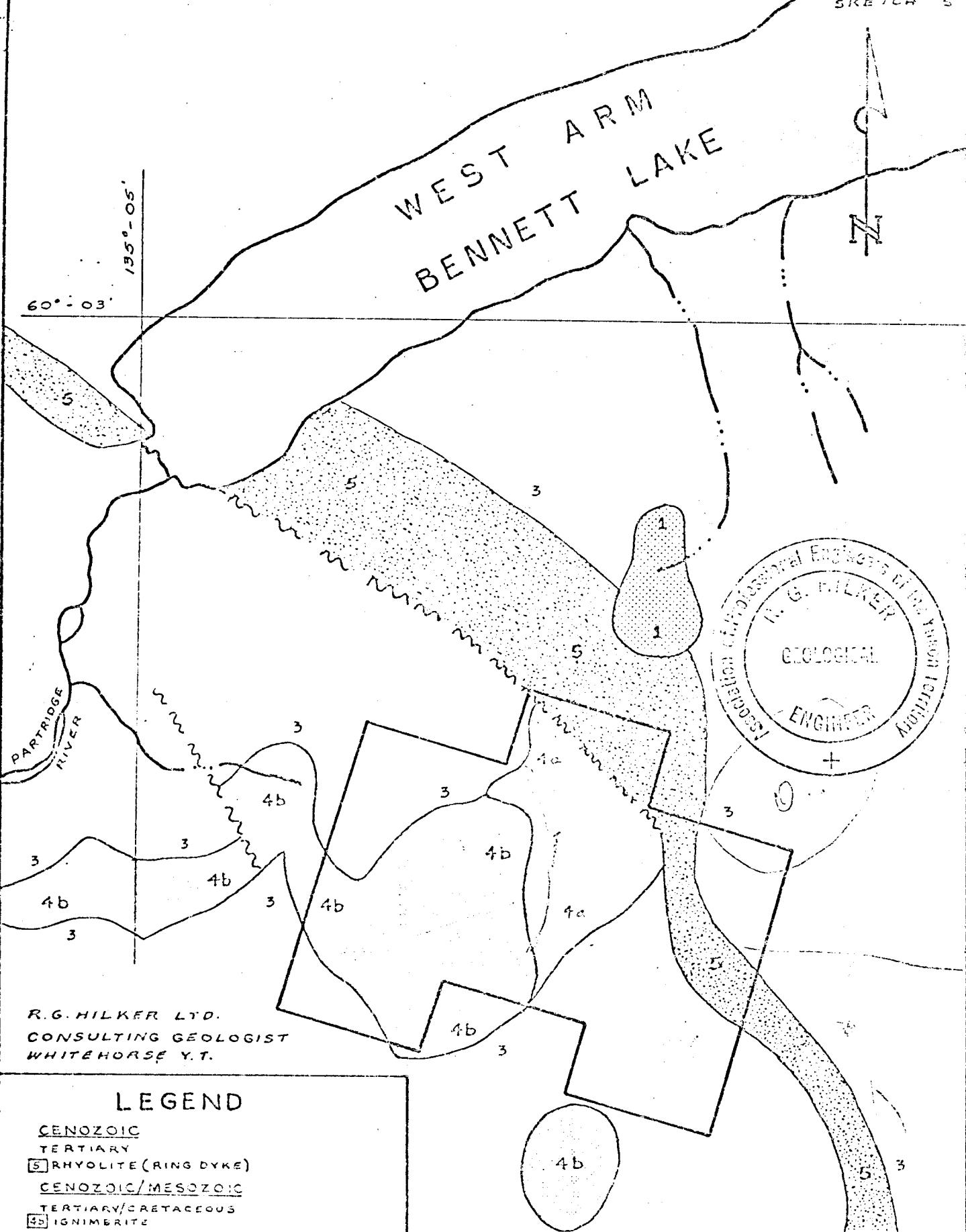
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EAGLE RIVER MINES LTD (N.P.L.)

REGIONAL GEOLOGY
OF SUBSIDENCE CAULDRON

DATE: SEPT 30 70 SCALE: 1" = 2.4 mi.

MAP AFTER G.S.C.
PAPER 69-1A



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CONSULTING GEOLOGIST
WHITEHORSE Y.T.

LEGEND

- CENOZOIC
- TERTIARY
- [5] RHYOLITE (RING DYKE)
- CENOZOIC/MESOZOIC
- TERTIARY/CRETACEOUS
- [4a] IGNIMBERITE
- [4b] VOLCANIC BRECCIA
- MESOZOIC
- CRETACEOUS
- [3] COAST INTRUSIONS: GRANODIORITE
- PRECAMBRIAN
- UNKNOWN
- [] YUKON GROUP SCHIST, GNEISS QUARTZITE

AFTER G.S.C.
PAPER 69-14

EAGLE RIVER MINES LTD (N.P.L.)

GENERAL GEOLOGY

DATE-SEPT 30 70 | SCALE-1/2" M.L.

DETAILED GEOLOGY

The geological mapping carried out within the surveyed area of the "G", "J" and "B" claim groups succeeded mainly in emphasizing the extremely complex nature of these rocks. The mapping itself consisted of collecting typical rock specimens, measuring any evident structural trends, and attempting to delineate the extent of mineralization and also the various rock types encountered. All data was tied in to the survey and sample stations (e.g., Location 5.4 would be a point on the outcrop approximately 40 feet beyond Survey Station 5, or 10 feet before Survey Station 6).

Rock samples collected have been subsequently examined megascopically, and their descriptions are included in the Appendix. A total of six rock types have been defined, and are described below (numbers correspond to those used on the detail Geology Plan - Pocket):

1. Andesite breccia - A dark green to black brecciated rock with generally over 50% fine grained, black, probably andesitic matrix and angular to sub-rounded fragments which include basic to intermediate fine grained to glassy crystalline rock, fine to medium grained siliceous material and subhedral to anhedral plagioclase crystals. The andesite groundmass may also have a glassy texture. Rock fragments average 1 to 2 cm in diameter and the plagioclase crystals 3 mm on the long axis.

2. Intermediate breccia - This may be a brecciated andesite breccia, although the matrix is difficult to define. It appears to be a medium grained intermediate (dioritic) rock enclosing fragments of the same type as those in the andesite breccia, plus some andesite breccia matrix material.
3. Siliceous breccia - The matrix here is light grey to white, fine grained, often glassy and highly siliceous, enclosing angular, fine grained, mafic feldspar porphyry fragments and subhedral to anhedral plagioclase crystals which are very similar to those occurring in the fragments and in the andesite breccia matrix.
4. Granite fragment breccia - This is a light colored medium grained intermediate crystalline rock with phases of slightly finer and coarser grain size. The coarser grained phases, which appear to be the remnants of granitic fragments, are slightly more siliceous. Boundaries between the two phases are not distinct. Some irregular quartz and euhedral plagioclase crystals, to 12 mm. in diameter, are also present. Secondary brecciation may also be present here, with the introduction of a chlorite-rich basic matrix material which comprises usually less than 3% of the total rock.
5. Conglomerate (?) - This rock is composed largely of rounded and sub-rounded fragments of granitic, intermediate and

mafic rock and quartz and feldspar crystals. The matrix, forming 10 to 20% of the rock, is pale green and quartzitic.

5. Dike rock - This rock is a very fine grained (sometimes glassy) dense, black intrusive which occurs in dikes ranging from one-half foot to 5 feet in width. Compositionally, these rocks are mainly basaltic, although one intermediate (dacite?) dike was noted.

Wheeler (3) divides the Skukum Group into three general divisions: "a basal division of mixed, but mainly andesitic rocks; a middle division of mainly felsic rocks; and an upper division mainly of basaltic rocks." All of the rock types described above, with the exception of the dike rocks, would appear to belong to the basal division of andesitic rocks. These also appear to correlate with Lambert's (1, 2) Unit 8 (Unit 4a on the accompanying Table of Formations). The dike rocks possibly correlate with Wheeler's upper division, although this is highly uncertain.

The fine grained to granitic intermediate and siliceous rocks form a minority of the total rocks examined on the property. They appear as minor phases within the main andesite breccia body. No distinct contacts were observed, and thus relations between the various rock types are quite obscure. However, fragments of the andesite breccia do appear in the intermediate and possibly also siliceous breccias, and boulders

of all rock types except the dike rocks are found in the conglomerate. Despite this, it is felt that most of these rocks are more or less contemporaneous.

Alteration is not a prominent feature in this area. Many of the fragments, especially those with a granitic texture, show varying degrees of assimilation with the matrix material. Feldspar and quartz phenocrysts which occur in the basic and intermediate fragments and matrix consistently have the same corroded appearance. They may be derived from the granitic rocks or they may have grown from the molten basic magma after emplacement and before final crystallization. There are very few signs of banding or any other flow structure and it is therefore assumed that the bulk of crystallization of the volcanics occurred in a large, heterogeneous mass. Local variations in matrix composition and varying degrees of fragment assimilation are possibly the result of secondary or continued activity around the volcanic centre.

Secondary alteration consists of narrow bands of silicification, possibly along early shear zones, and one large area, in the central part of the North Zone, of probably silicification accompanied by a fairly high degree of pyritization. This area now has a light rusty appearance. Epidote, with minor quartz, calcite and hematite, fills fractures and is abundant throughout many of the more basic rocks. These minerals are thought to post-date all others in the area.

Several fracture and joint planes, with minor faulting, are well defined through this area. These appear to be the most recent geological features here, and are associated with more regional faulting and possibly with the emplacement of the rhyolite porphyry ring dike.

MINERALIZATION

Mineralization consists of chalcopyrite, bornite and molybdenite with associated pyrite. These minerals were observed to occur throughout both matrix and fragments of all breccia types, with three basic modes.

Primarily, all minerals appear as fine disseminations throughout the rock mass, although slightly greater concentration may occur in the matrix. Bornite and molybdenite in this form are generally extremely fine grained and difficult to identify. Secondly, both bornite and chalcopyrite occur in what appears to be a fairly early system of fractures. These minerals now appear, sometimes with veined quartz, as irregular stringers and elongated blebs. These are usually less than 1/8" in width and show a very obscure preferred orientation. Finally, post-mineralization shearing appears to have mobilized some of the minerals, especially molybdenite, and localized them along the shear faces. These shear zones are again irregular and probably pre-date the now prominent shear and fracture system.

Mineralization control in this area is not extremely obvious. However, two features of the local geology show rough correlation with the mineralization.

The rocks in the South Zone, from Station 1 to 10, are more siliceous than average and show a greater variation than any other location except, perhaps, a few small areas in the North Zone. This suggests that the South Zone was subjected

to a greater amount of volcanic activity and is perhaps on or near a centre of eruption. This would result in a higher degree of fracturing and shattering of the rock, thus providing greater permeability for mineralizing solutions. Assuming direct association of the mineralizing solutions with the volcanic magma, the source of mineralization could be expected to be beneath this zone.

Secondly, of the recent structure which was mapped, shears and shear zones appear to be concentrated only in the areas of the highest degree of mineralization. If this correlation is correct, and these shears are thought to be associated with the most recent geological events in the area, a very late stage mineralization is suggested. Further field observation is necessary before this could be confirmed.

SUMMARY

The rocks within the "G" claim group are part of a zone of massive volcanic breccia. They appear to be derived from the first of several phases of regional and local subsidence of the Mesozoic Coast Intrusions in this area, coupled with explosive and probably highly gaseous volcanic activity. A few narrow and irregular beds of conglomerate and a minor amount of flow banding to the north and east of the main zone (within the North Zone) indicate that emplacement of the main breccia zone which is exposed here, occurred close to surface. Subsequent to this initial activity, further subsidence likely occurred, with minor re-brecciation of the main zone. The intermediate and siliceous phases of the breccia may be associated with this secondary volcanism.

Mineralizing solutions, which appear at this time to be associated directly with the volcanic magma source, were probably introduced into the highly shattered country rock during the final phases of volcanic activity.

Mineralized breccias are typical of many of the porphyry copper deposits in the Cordilleran Region and also of the massive sulfide deposits in the Noranda area of Quebec. In both cases, precipitation of the metal sulfides from solution is thought to be due mainly to a pressure drop, with less influence by temperature or chemical change in the environment. All of these deposits are formed at an appreciable depth, be-

fore mineralizing solutions would have access to the surface. If the mineralization in the breccia occurred during the passive final stages of volcanic or intrusive activity, as is typical of the above mentioned deposits, and if the present exposure is near the surface of the time of mineralization, a continuation and possible increase in the concentration of mineralization may be expected with depth.

The lateral extent of the mineralized zone is not defined; the shape appears to be irregular and the boundary of the zone may be obscured by the snowfield and inaccessible cliffs.

REFERENCE TO PUBLISHED GEOLOGY

The Bennett Lake area was first mapped on a reconnaissance basis between 1945 and 1955, by the Geological Survey of Canada. A report describing this work was subsequently written by J.O. Wheeler. A more recent investigation, by M.B. Lambert, also of the G.S.C., consists of a study of the volcanic complex within which the G, J and B claim groups are situated. This work has been summarized in G.S.C. Papers 68-1A and 69-1A, which are Reports of Activities, but the report itself has yet to be published.

1. Lambert, M.B., 1968: "Wheaton River and Homan Lake, Yukon and British Columbia; G.S.C. Paper 68-1A, p. 32.
2. 1969: "Study of a Tertiary Cauldron Subsidence Complex, Bennett Lake, British Columbia and Yukon Territory"; G.S.C. Paper 69-1A, pp. 21-23.
3. Wheeler, J.O., 1961: "Whitshorse Map-Area, Yukon Territory"; G.S.C. Memoir 312 (pp. 78-85).

CHIP SAMPLE PROGRAM

SAMPLING TECHNIQUE

Sampling of the rock face was carried out over the entire area of the surveyed base of the outcrop zone. Five samples were taken between each station from Station 1 to Station 43, resulting in sample lengths of approximately 10 feet. Due to the lack of any visible mineralization, only one 10-foot sample was taken from each mid-point between Stations 43 and 50. The sample distances were chained by the samplers previous to the actual sampling. In addition to these samples, a total of 12 samples were taken from boulders which occur in medial moraines on either side of the main showing. All samples are located on the Chip Sample Location Map (see Pocket).

Chip sampling of this nature is a difficult task, especially in an area such as this where the rocks are generally quite competent and outcrop faces are often very smooth. For a valid and representative sample over the rock surface, the following basic principles were adhered to as closely as possible. No bias should be involved in selecting sample material, each sample chip should be approximately the same size and the chips should be taken from an area which will give the best possible representation of the total sample area.

In the present program, in order to satisfy the first two conditions, one chip was taken every five inches in a line at shoulder height for the entire 10 feet of sample length.

As a rock chip was not available at each precise location, the sampler was given instructions to sample either above or below this location on a vertical line. A rock chip of approximately 1" x 1" x ½" was chosen as the optimum size and all chips collected conformed to this size as closely as possible.

Chips were taken from the outcrop using a 1½-lb. geology hammer and collected in 9" x 12" plastic sample bags. In addition, a pre-numbered sample ticket was placed in the sample bag listing the assays to be performed. A duplicate of this ticket, with the property name and sample location, was retained for files. At Whitehorse the samples were packed in cardboard boxes and shipped via C.P. Air Freight to Loring Laboratories Limited in Calgary, Alberta.

All copper and molybdenum assays were determined by atomic absorption spectroscopy.

The samples that were collected for assaying were assayed for copper, molybdenum, gold and silver. The assays have suggested that the property could be a molybdenum prospect, as only minor copper, gold and silver values have been discovered to date. It would be expected that the silver and gold values contained in the breccia host rock would be considered as a "sweetener" with the molybdenum mineralization present.

ANALYSIS OF RESULTS

The assay results obtained indicate that a part of the rock faces samples contained varying amounts of molybdenum mineralization. A few simple statistics calculations using the molybdenite assay values have been computed. These include arithmetic average value over specified intervals along the surveyed rock face. These calculations and results are listed as follows:

Survey Stations	Sample Numbers	n	$\sum x$	\bar{x}
1. 1 to 12	3051 to 3105 (incl) 3296, 3297	57	1.715	0.030
2. 1 to 12 (excluding 4 high values)	3051 to 3055 (incl) 3056 to 3085 (incl) 3087 to 3098 (incl) 3100 to 3105 (incl) 3297	53	0.660	0.012
3. 12 to 50	3106 to 3260 (incl) 3298 to 3304 (incl)	162	0.482	0.003
4. 1 to 50	3051 to 3260 (incl) 3298 to 3304 (incl) 3296, 3297	219	2.197	0.010
5. 1 to 50 (excluding 4 high values)	3051 to 3055 (incl) 3056 to 3085 (incl) 3087 to 3098 (incl) 3100 to 3260 (incl) 3297	215	1.142	0.005

Survey Stations	Sample Numbers	n	$\sum x$	\bar{x}
6. Samples from boulder train	3305 to 3316 (incl)	12	0.105	0.009
7. 1 to 11.3 (composites)	3051-75, 3076-97 3098, -02	3	0.095	0.032

where: n = number of values

$\sum x$ = summation of assay values (% MoS₂)

\bar{x} = arithmetic average of assay values (% MoS₂)

The twelve assay values from the boulder trains have been omitted from all calculations except where specifically noted. Four anomalously high assay values, greater than 0.050% molybdenite, corresponding to Sample Numbers 3056, 3086, 3099 and 3297 have also been omitted from some calculations, as noted. These anomalous high assays may distort the arithmetic average due to the total number of assays that are represented (e.g., 4 assay values in 57 between Stations 1 and 12).

Interpretation of MoS₂ Assay Averages

1. The samples between Stations 1 and 12 (\bar{x} = 0.030% MoS₂ with 57 samples) appear to indicate an increase in molybdenum concentration in the rock when compared with those between Stations 12 and 50 (\bar{x} = 0.003% MoS₂ with 162 samples).
2. Between Stations 1 and 12 four anomalous assay samples were omitted for the following MoS₂ averages: The samples be-

tween Stations 1 and 12 ($\bar{x} = 0.012\% \text{ MoS}_2$ with 53 samples) appear to indicate an increase in molybdenum concentration in the rocks when compared with those between Stations 12 and 50 ($\bar{x} = 0.003\% \text{ MoS}_2$ with 162 samples).

3. The MoS_2 content in the rock between Stations 1 and 12 and excluding the four high values ($\bar{x} = 0.012\% \text{ MoS}_2$ with 53 samples) indicates an increase in molybdenum concentration when compared with those between Stations 1 and 50 and excluding the four high values ($\bar{x} = 0.005\% \text{ MoS}_2$ with 215 samples).
4. The MoS_2 content in the samples taken from the boulder train ($\bar{x} = 0.009\% \text{ MoS}_2$ with 12 samples) is comparable to the average MoS_2 values between Stations 1 and 12 excluding the four high values ($\bar{x} = 0.012\% \text{ MoS}_2$ with 53 samples).
5. The average MoS_2 value obtained from the three composite samples between Stations 1 and 11.3 ($\bar{x} = 0.032\% \text{ MoS}_2$) compares closely with the average of the single ten-foot sample interval assay values between Stations 1 and 12 ($\bar{x} = 0.030\% \text{ MoS}_2$ with 57 samples).

Using the average value between Stations 1 and 12 (excluding the four anomalously high values, $\bar{x} = 0.012\% \text{ MoS}_2$) as a guideline, an interpreted zone of mineralization has been outlined. This outline is shown on the Copper-Molybdenum Assay Map and on the Detail Geology Map (see Pocket).

CONCLUSIONS

The "G", "J" and "B" claim groups are located over an area of volcanic rocks which have been emplaced rather violently. Subsidence of the area accompanied the volcanism. The rocks are highly brecciated, with evidence of two or more stages of brecciation.

Mineralization, consisting of pyrite, chalcopyrite, bornite and molybdenite, with minor gold and silver, appears to be associated with areas of the greatest amount of volcanic activity, perhaps a volcanic centre or pipe, and also with a fairly recent system of shears. This mineralization is believed to be derived from the volcanic magma chamber and its emplacement was probably during the final and relatively quiet stages of volcanic activity.

A comparison of the averages of the MoS_2 assay values over specific outcrop intervals, suggests an increase in the molybdenum concentration in some parts of the rocks. A zone of mineralization has been outlined using this data and is included on the accompanying maps.

RECOMMENDATIONS

Between Survey Stations 1 and 12 the breccia rock in the South Zone has been inferred to contain a greater content of molybdenum than the breccia to the east. The loose breccia rock in the boulder train below the South Zone mineralization contains visible molybdenum that occurs in hairline shears and disseminated within the breccia host rock.

It is recommended that before any large amount of funds are expended on the property, further sampling for molybdenum content should be done by conducting a modest diamond drilling program. Problems will be encountered in setting a diamond drill into the cirque and assembling the drill on the steep snow and ice slope below the South Zone.

Three diamond drill holes are recommended to be drilled below the South Zone molybdenum mineralization from the following location:

Hole No.	Latitude	Departure	Dip	Azimuth	Length
ER-1	24,660 N	25,290 E	50°	242°	500 ft.
ER-2	24,660 N	25,290 E	50°	197°	400 ft.
ER-3	24,660 N	25,290 E	50°	152°	350 ft.

Due to a fairly steep slope at the proposed collar of the three holes, the drill set-up location may require to be located a further 100 feet to the north. Therefore, a total

of 1550 feet of drilling is recommended for this stage of exploration.

The present collar location is at an elevation of 6165 feet and is a distance of 1730 feet from a small pond, at elevation 5620 feet, that can be used as a source of drilling water. It is suggested that the area around the collar location be blasted level to make a suitable bench for setting up a diamond drill. The drill may possibly be airlifted to the bench using a Bell 205 A-1 helicopter at a cost of \$600 per hour. The helicopter is sufficiently powerful to sling 3000-4000 pounds at 6000 feet elevation, using a 100-foot cable between the helicopter and the diamond drill.

Two sizes of drills have been considered to conduct the drilling below the South Zone mineralization. The drill is to be equipped with a "Swivel Ring Mast" that weighs approximately 300 pounds. The two drills considered are:

1. Boyles' 388-1 12AS equipped with Wireline and an AQ head. Weight approximately 1420 pounds, and screw-type feed.
2. Boyles' 388-1 123H equipped with Wireline and a BQ head. Weight approximately 1602 pounds, and with a hydraulic head.

It is recommended that the hydraulic head BQ drill be used, as a larger sample of core can be acquired, and if hole difficulties occur the hole may be reduced to AQ size.

Drilling costs will be required to be contracted on a cost plus basis, as the drill location has many variables that will effect the cost of drilling. The following is an estimate on the drilling costs:

AQ Wireline \$6.75/ft.

BQ Wireline \$8.00/ft.

Standby Time:

Man Hours \$5.75/hour

Machine Hour \$6.50/hour moving

Machine Hour \$3.25/hour idle

Walking Time - per man from camp.

Standby Time - weather conditions in cirque that includes high velocity winds and snow or rain storms with winds.

Water Line - possible frozen water lines and laying line.

Coil Heater - cost of fuel for heating water.

Camp Costs - two drillers, two helpers, one foreman, cook and geologist.

Mobilization and demobilization of drill, equipment and crew.

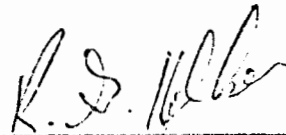
Service Transportation - any helicopter servicing of drill equipment and camp.

Therefore, due to the inaccessibility of the drill site and location at the 6000-foot elevation within a windy cirque, the drill costs are estimated at \$20.00 per foot.

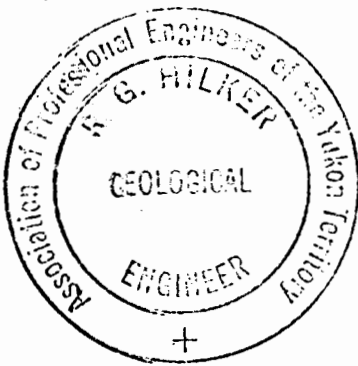
The following costs are expected to be incurred in drilling approximately 1550 feet of BQ size core from a

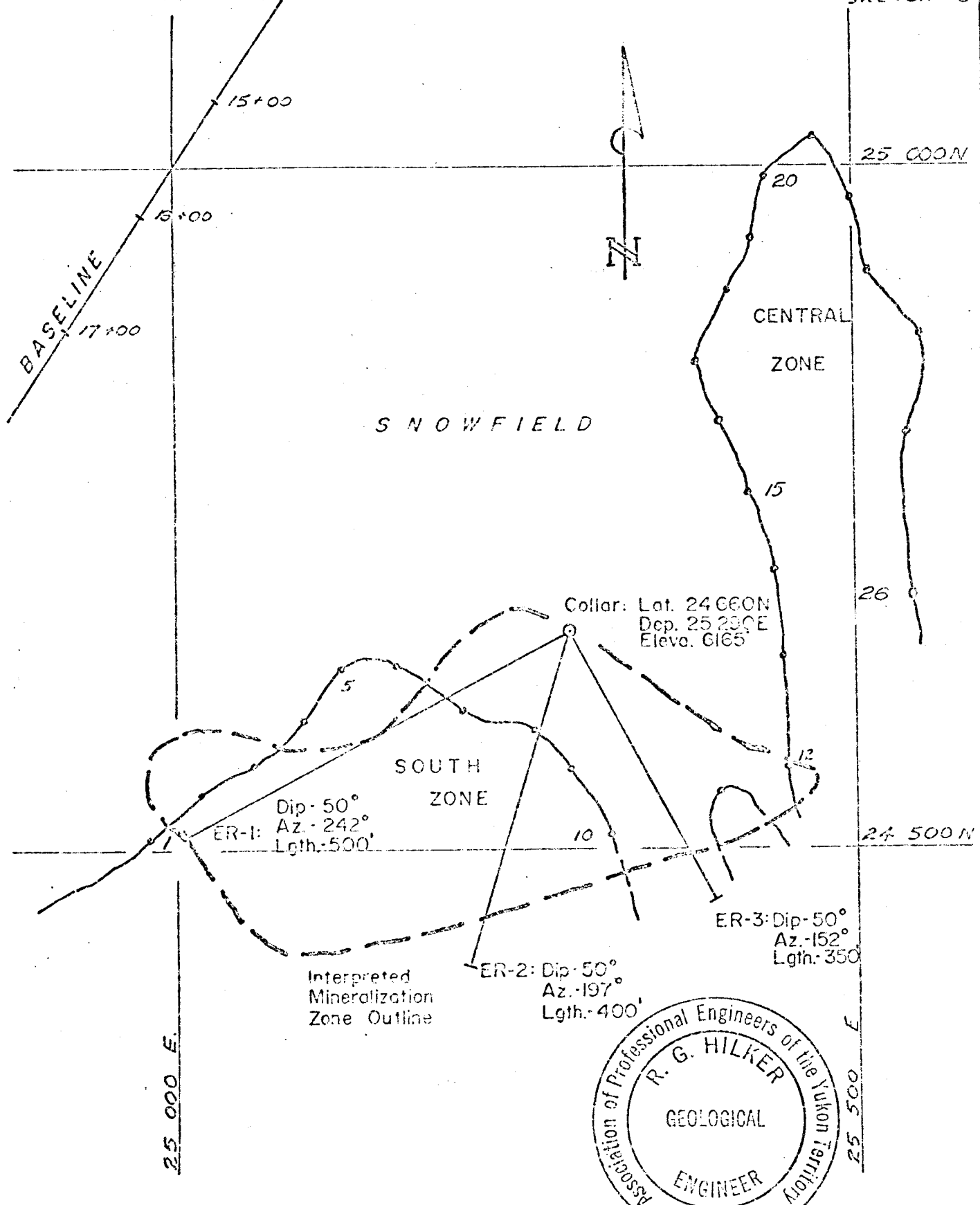
one drill set-up in the three drill holes:-

Drill Site Preparation	\$ 4,000.00
Diamond Drilling - 1550 feet @ \$20.00/ft	31,000.00
Assaying	2,000.00
Camp Costs	5,000.00
Transportation	5,000.00
Geological Supervision	3,000.00
Contingencies	<u>5,000.00</u>
TOTAL	<u><u>\$55,000.00</u></u>

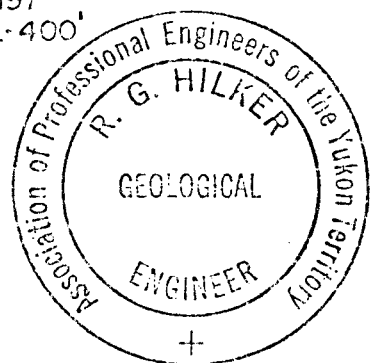


R.G. Hilker, P.Eng.
Whitehorse, Yukon Territory
September 30th, 1978





R. G. HILKER LTD.
 CONSULTING GEOLOGIST
 WHITEHORSE, Y.T.



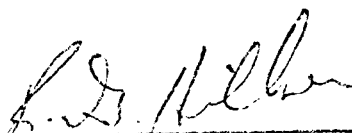
EAGLE RIVER MINES LTD (N.P.L.)	
Proposed Drill Hole Location	
DATE - SEPT 30 - 70	SCALE - 1" = 100'

CERTIFICATION

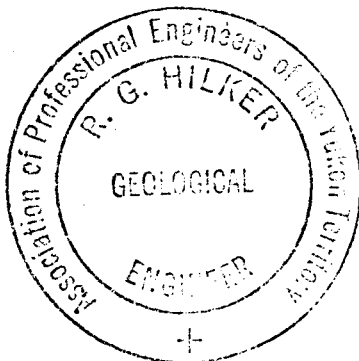
I, ROBERT G. HILKER of #6 Chalet Crescent, Hillcrest, in the City of Whitehorse, in the Yukon Territory, DO HERESY CERTIFY:

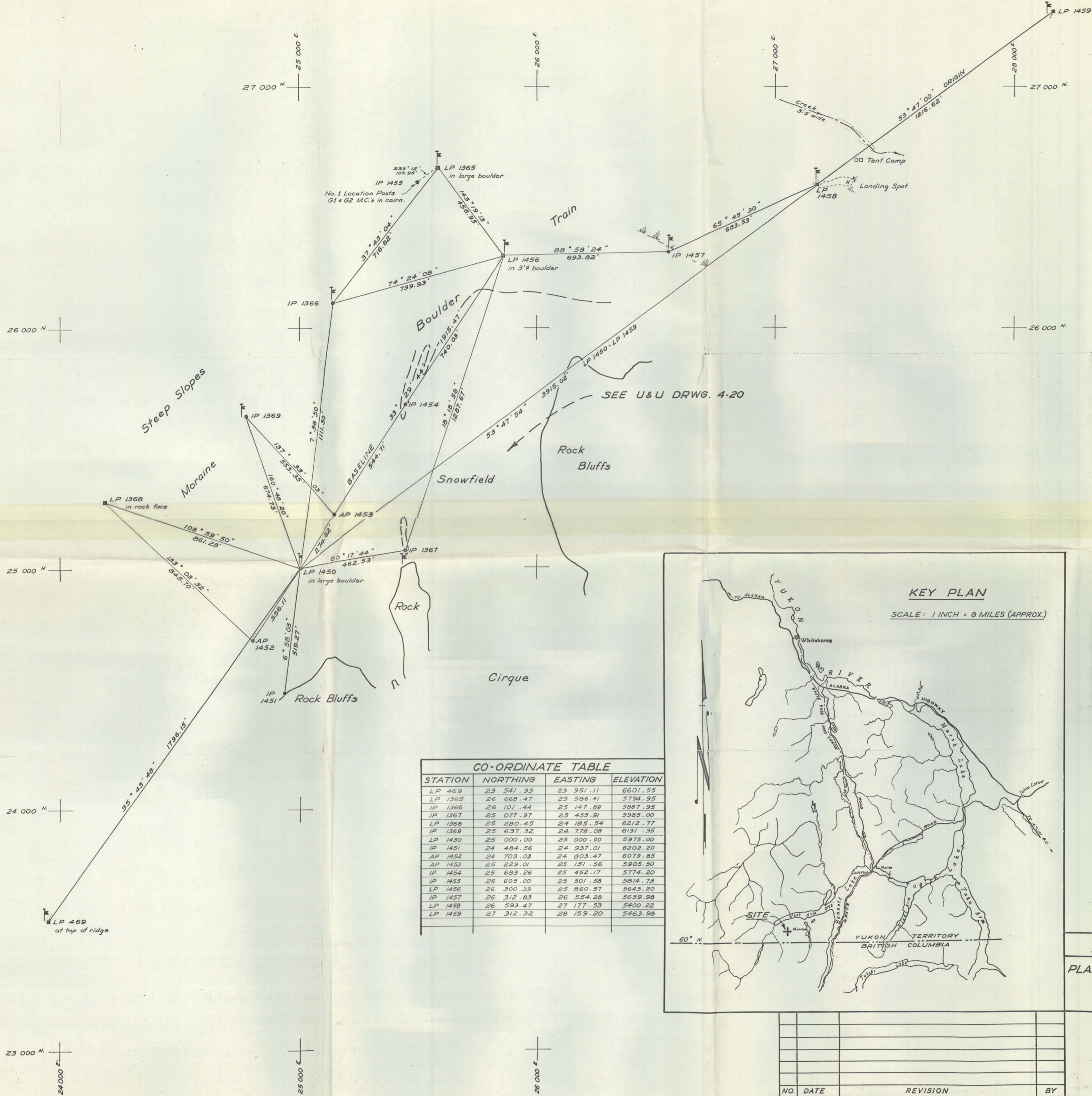
1. THAT I am a Consulting Geologist, with an office located at #8 Northern Metallic Building and postal address P.O. Box 566, in the City of Whitehorse, in the Yukon Territory.
2. THAT I am a graduate of the Michigan Technological University located in Houghton, Michigan, U.S.A., where I obtained a Bachelor of Science degree in Geological Engineering (Exploration Option) in 1962.
3. THAT I am a registered member in good standing of The Association of Professional Engineers of the Yukon Territory.
4. THAT I have practiced my profession as an engineer and geologist for the past eight years.
5. THAT I have personally supervised the geological-geochemical evaluation conducted by G.E. Carlson, geologist, on the G 1-8, J 1-8 and S 1-8 claim groups in the Whitehorse Mining Division of the Yukon Territory, from August 16th to September 3rd, 1970.
6. THAT neither I nor G.E. Carlson have any direct or indirect interest in any of the mineral claims, or in any of the securities held by Eagle River Mines Ltd. (N.P.L.), nor do we expect to receive any.

DATED this 30th day of September, A.D., 1970.



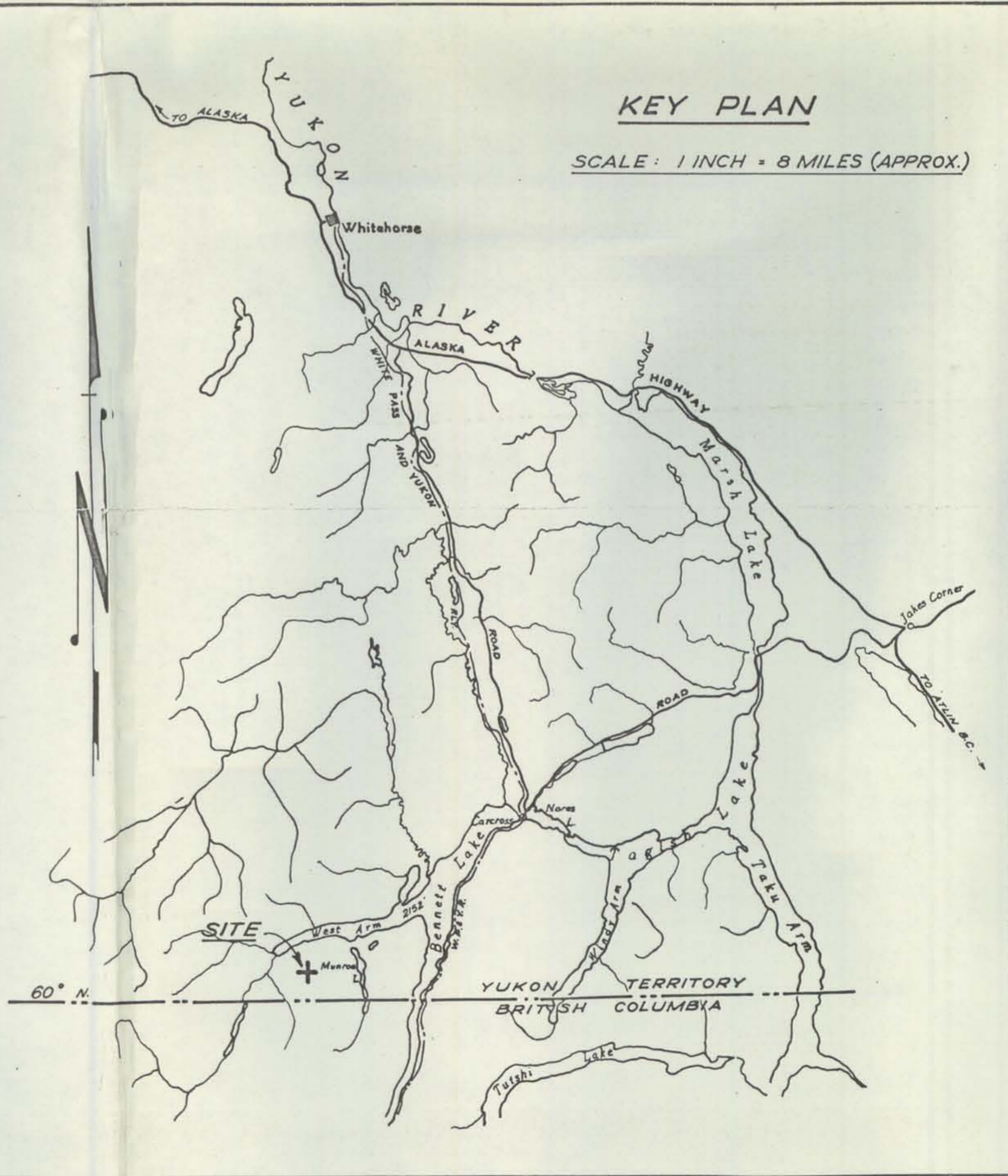
R.G. Hilker, P.Eng.





CO-ORDINATE TABLE

STATION	NORTHING	EASTING	ELEVATION
LP 469	23 541.93	23 951.11	6601.55
LP 1365	26 668.47	25 586.41	5794.95
IP 1366	26 101.44	25 147.89	5887.95
IP 1367	25 077.97	25 455.91	5985.00
LP 1368	25 280.45	24 185.54	6212.77
IP 1369	25 637.32	24 778.08	6131.35
LP 1450	25 000.00	25 000.00	5975.00
IP 1451	24 484.56	24 937.01	6202.20
AP 1452	24 703.03	24 803.47	6079.85
AP 1453	25 229.01	25 151.56	5905.50
IP 1454	25 683.26	25 452.17	5774.20
IP 1455	26 605.00	25 501.58	5814.73
LP 1456	26 300.39	25 860.57	5643.20
IP 1457	26 312.83	26 554.28	5639.98
LP 1458	26 593.47	27 177.53	5400.22
LP 1459	27 312.32	28 159.20	5463.98



LEGEND

- IP denotes galvanized iron bar 1/2" x 1/2" x 30" long.
 - AP " aluminum pipe 1/2" dia. x 5 ft. long.
 - ⊕ LP " lead plug drilled into rock and centered with copper nail.
 - ⊕ 5.0 ft. aluminum range pole, painted orange, anchored over point.
- Survey control point numbers (1450 etc.) refer to metal U&U identification tags affixed to points.

NOTES

Bearings are Astronomic derived from Stellar observations and are referred to the meridian through LP 1458.

Elevations are to approximate Geodetic datum derived from triangulation to the water level of Bennett Lake.

LP 1450 has been arbitrarily set as El. 5975.00.

Elevations given are measured to tops of IP's and AP's, or to tack in LP's.

Main control distances measured by Geodimeter.

REFERENCE DRAWING:
Underhill & Underhill Drawing No. 4-20 Topographic Plan

REFERENCE MAPS:
National Topographic Series Sheet 105 SW "Whitehorse-Teslin" 1:500,000
105 D "Whitehorse" 1:250,000
105 D/3 E 1/2 "Wheaton River" 1:50,000

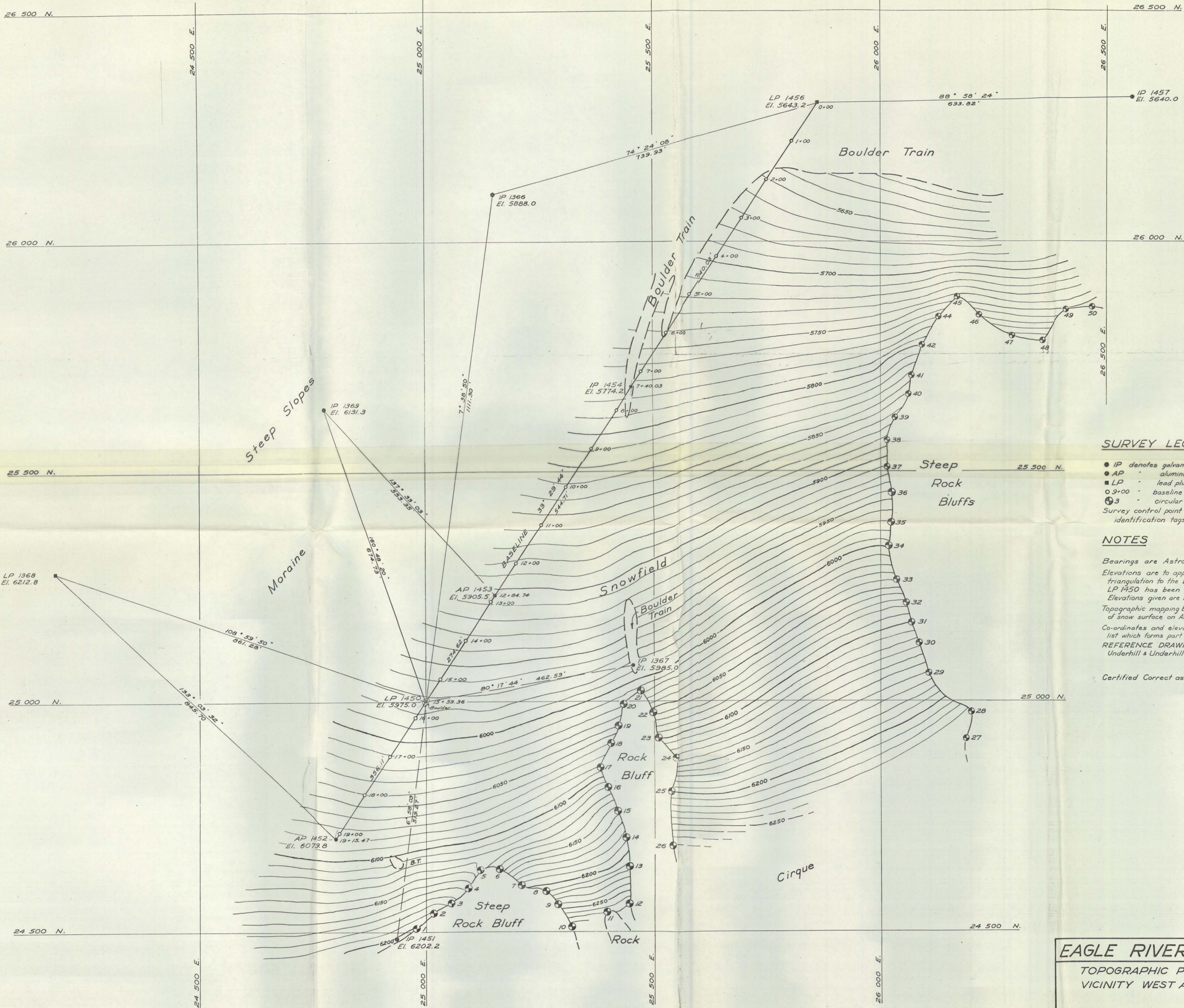
#00013

EAGLE RIVER MINES LTD. (N.P.L.)

PLAN OF CONTROL SURVEY FOR 'G' GROUP MINERAL CLAIMS
WHITEHORSE MINING DISTRICT
VICINITY WEST ARM BENNETT LAKE, Y.T.

SCALE: 1 INCH = 200 FEET	DATE: SEPT. 11, 1970	DWG. BY: JH
UNDERHILL & UNDERHILL		
PROFESSIONAL ENGINEERS - DOM. & B.C. LAND SURVEYORS		
DRAWING NUMBER		4-21
P. ENG., B.C.L.S.		

NO.	DATE	REVISION	BY



SURVEY LEGEND

- IP denotes galvanized iron bar 1/2" x 1/2" x 30" long
 - AP aluminum pipe 1/2" dia. x 5 ft. long
 - LP lead plug drilled into rock and centered with copper nail
 - 9-00 baseline station marked by wood lath
 - ⊕ 3 circular target painted on rock face with orange paint.
- Survey control point numbers (1430, etc.) refer to metal U&U identification tags affixed to point.

NOTES

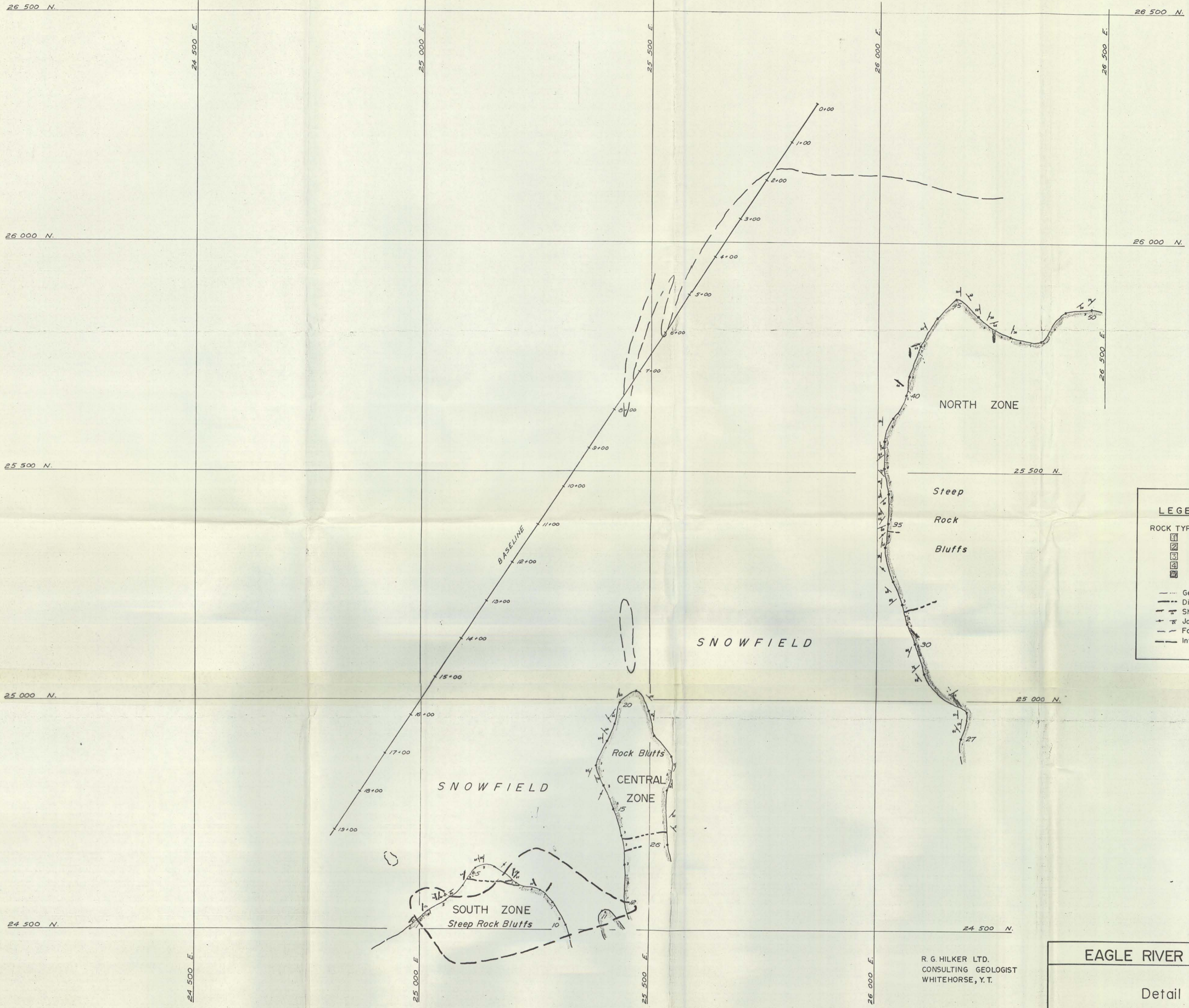
Bearings are Astronomic derived from Stellar observations
 Elevations are to approximate Geodetic datum, derived from triangulation to the water level of Lake Bennett.
 LP 1450 has been arbitrarily set as El. 5975.00.
 Elevations given are measured to tops of IPs or APs or to tack in LPs.
 Topographic mapping by stadia methods. Contours represent state of snow surface on August 22, 1970.
 Co-ordinates and elevations of rock targets are given on separate list which forms part of this Drawing.
REFERENCE DRAWING:
 Underhill & Underhill Drawing No. 4-21 - Control Survey Plan.

Certified Correct as to Survey and Survey Plan:

Jim L. Koepke R. ENG. B.C.L.S.

EAGLE RIVER MINES LTD. (N.P.L.)
 TOPOGRAPHIC PLAN OF "G" MINERAL CLAIMS
 VICINITY WEST ARM BENNETT LAKE, Y.T.

SCALE: 1 IN. = 100 FT.	DRAWN BY: <i>TK</i>	U&U DRWG. NO. 4-20
DATE: SEPT. 10, 1970		



LEGEND

ROCK TYPES:

- 1 Andesite breccia
- 2 Intermediate breccia
- 3 Siliceous breccia
- 4 Assimilated granite fragment breccia
- 5 Conglomerate (?)

- - - Geological contact (mapped, inferred)
- - - Dike (mapped, inferred)
- - - Shear (vertical, with dip)
- - - Joint (vertical, with dip)
- - - Fault (observed)
- - - Interpreted Mineralization Zone boundary

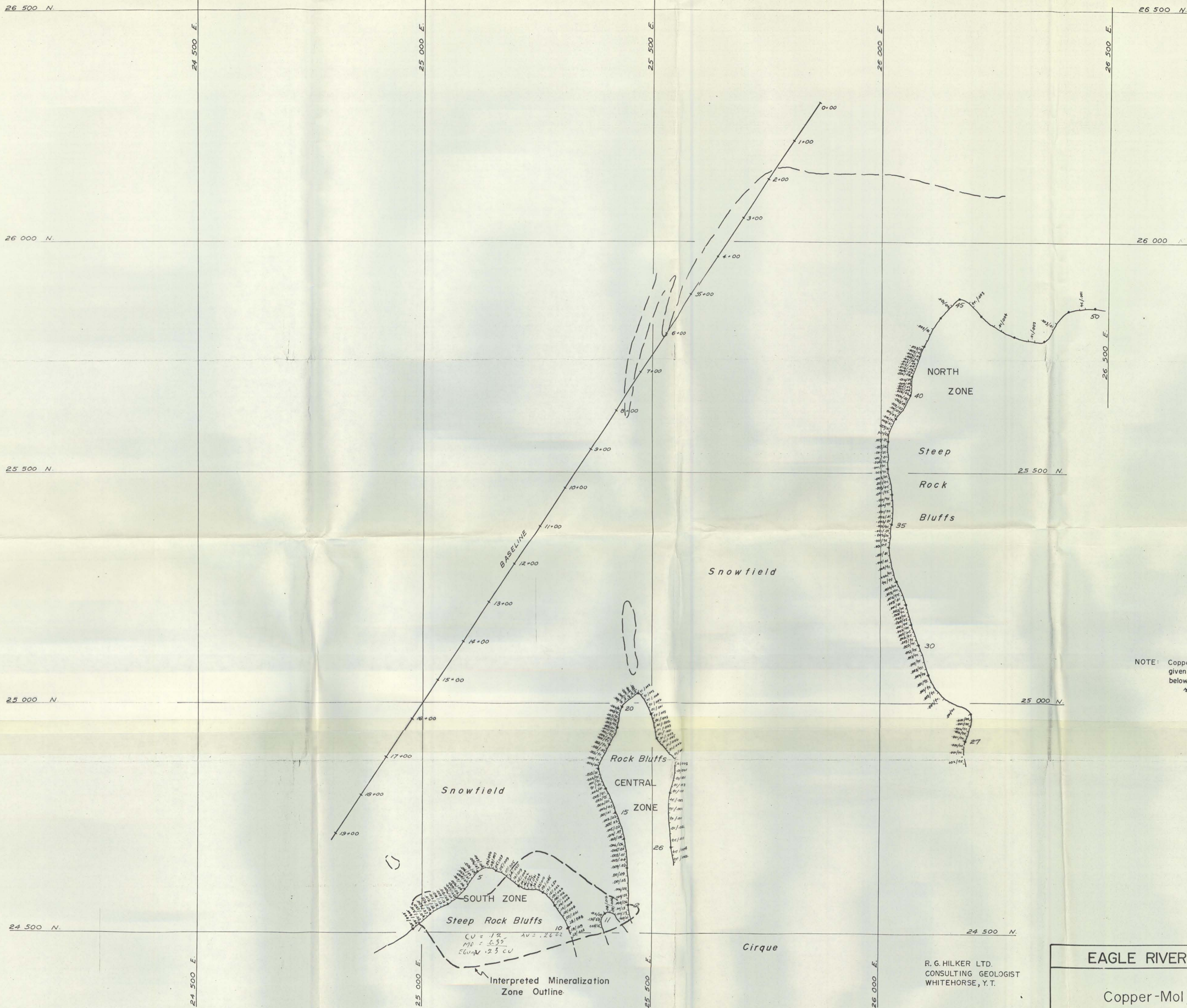


R. G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

EAGLE RIVER MINES LTD. (N.P.L.)

Detail Geology Map

SCALE: 1 INCH = 100 FEET DATE: 30 SEPTEMBER 1970



NOTE: Copper and molybdenite assays are given as percentages as indicated below:

$\frac{100}{\text{Cu}} \left(\frac{\text{Cu}}{\text{Cu}} \right)$ outcrop $\frac{100}{\text{Mo}} \left(\frac{\text{Mo}}{\text{Mo}} \right)$



R. G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

EAGLE RIVER MINES LTD. (N.P.L.)

Copper-Molybdenum Assay Map

SCALE: 1 INCH = 100 FEET DATE: 30 SEPTEMBER 1970