This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

$3,329.80

Resident Geologist or
Resident Mining Engineer

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act

Commissioner of Yukon Territory

GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

PEG 1-16 (Y35914-Y35929) and PEG 19-32 (Y35932-Y35945)

MINERAL CLAIMS

DAWSON RANGE AREA

YUKON TERRITORY

62°-45' N LATITUDE

138°-45' W LONGITUDE

N.T.S. DESIGNATION: 115-J-10 AND 115-J-15

WHITEHORSE MINING DIVISION

BY

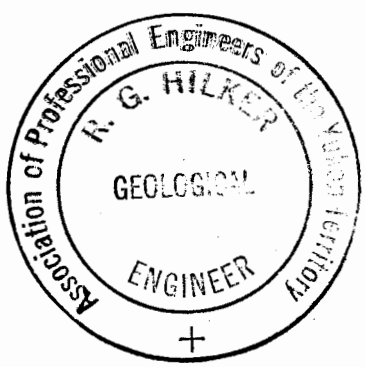
G.G. CARLSON, GEOLOGIST

R.G. HILKER LIMITED

WHITEHORSE, YUKON TERRITORY

UNDER THE SUPERVISION OF

R.G. HILKER, P.ENG.



21 AUGUST, 1970

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* * * * * * * * * *

INTRODUCTION

On July 16th, 1970, G. Carlson (geologist), J. Smith (soil sampler), and L. Roy (linecutter) were moved to the PEG claim group by helicopter from a previous project located 8 miles to the west. A camp was established on the evening of July 16th and the morning of July 17th. The afternoon of July 17th was spent locating claim posts to determine the grid orientation.

During the period of July 18th to 21st (inclusive), a program of linecutting, geological mapping, and soil sampling was carried out over the claim group. A total of 7.0 linemiles of picket lines were cut as a basis for the following geological mapping and soil sampling. Claim posts were tied into the grid system as encountered.

The major portion of the claim group is covered with heavy underbrush consisting of buckbrush, willow and other low deciduous trees. A baseline was cut for 10,500 feet down the centre of the claim group on a bearing of 017° azimuth. Grid lines were cut at right angles to the baseline and extended to both the east and west for ½ mile. The lines were spaced to reach an optimum arrangement whereby the maximum coverage could be obtained by a minimum amount of cutting in the shortest possible time. Accordingly, the line spacing varies between 1500 and 4500 feet.

Soil samples were taken for analysis on 100-foot intervals on both the grid lines and the baseline. Sampling

.../2

conditions were generally good, except for local areas of talus and swamp-muskeg. Frost boils were sampled where possible on the higher ground.

Geological mapping was carried out over the grid lines and baseline. Due to the lack of outcrop (less than 1% of the claims area), boulder trains, talus, and individual boulders were mapped to accumulate as much information as possible. As the area is generally non-glacial, the residual material is considered indicative of the sub-surface geology.

The geological, geochemical, and grid layout work was completed on the evening of July 21st and the crew was moved off the property on the following day.

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LIST OF PERSONNEL

The following personnel of R.G. Hilker Limited were directly involved in the geological and geochemical program on the PEG claim group:

Name	Address	Position
R.G. Hilker, P.Eng.	Box 1566 Whitehorse, Y.T.	Geologist - supervision and report preparation
G.G. Carlson	Box 548 Whitehorse, Y.T.	Geologist - field supervision and report preparation
J. Smith	c/o Box 566 Whitehorse, Y.T.	Soil sampler - field sampling
L. Roy	Box 3245 Whitehorse, Y.T.	Linecutter
G.S. Zimmer	Box 1293 Whitehorse, Y.T.	Geologist - report preparation

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LOCATION AND ACCESS

The PEG group of 30 claims is located in the west-central portion of the Yukon Territory within the Dawson Range. The Dawson Range is a low mountain belt, approximately 110 miles long by 20 miles wide, which trends approximately N 45° W between latitudes 62°-00' N and 62°-45' N and longitudes 137°-00'W and 140°-00'W. The Range is bounded on the north and east by the Yukon River, and on the northwest by the White River.

The claims are located in the immediate vicinity of 62°-45'N and 138°-45'W on Staking Sheet 115-J-10 and 115-J-15 in the Whitehorse Mining Division. The claims cover a portion of the divide separating the headwaters of Casino and Canadian Creeks at a distance of 2½ miles northeast of the Casino air-strip.

At present, the most practical access to the claim group is by fixed-wing aircraft to the Casino strip and by helicopter from the Casino strip to the property. Numerous fixed-wing aircraft are available for charter out of Whitehorse and several helicopters are more or less permanently based in the Casino strip - Dawson Range area. The Casino strip is located 194 air-miles northwest of Whitehorse.

Road access to the Casino Mines camp has been provided in the form of a winter road from the Burwash area (Mile 1097) on the Alaska Highway. Due to considerable areas of muskeg en route, this road is serviceable only in the winter months.

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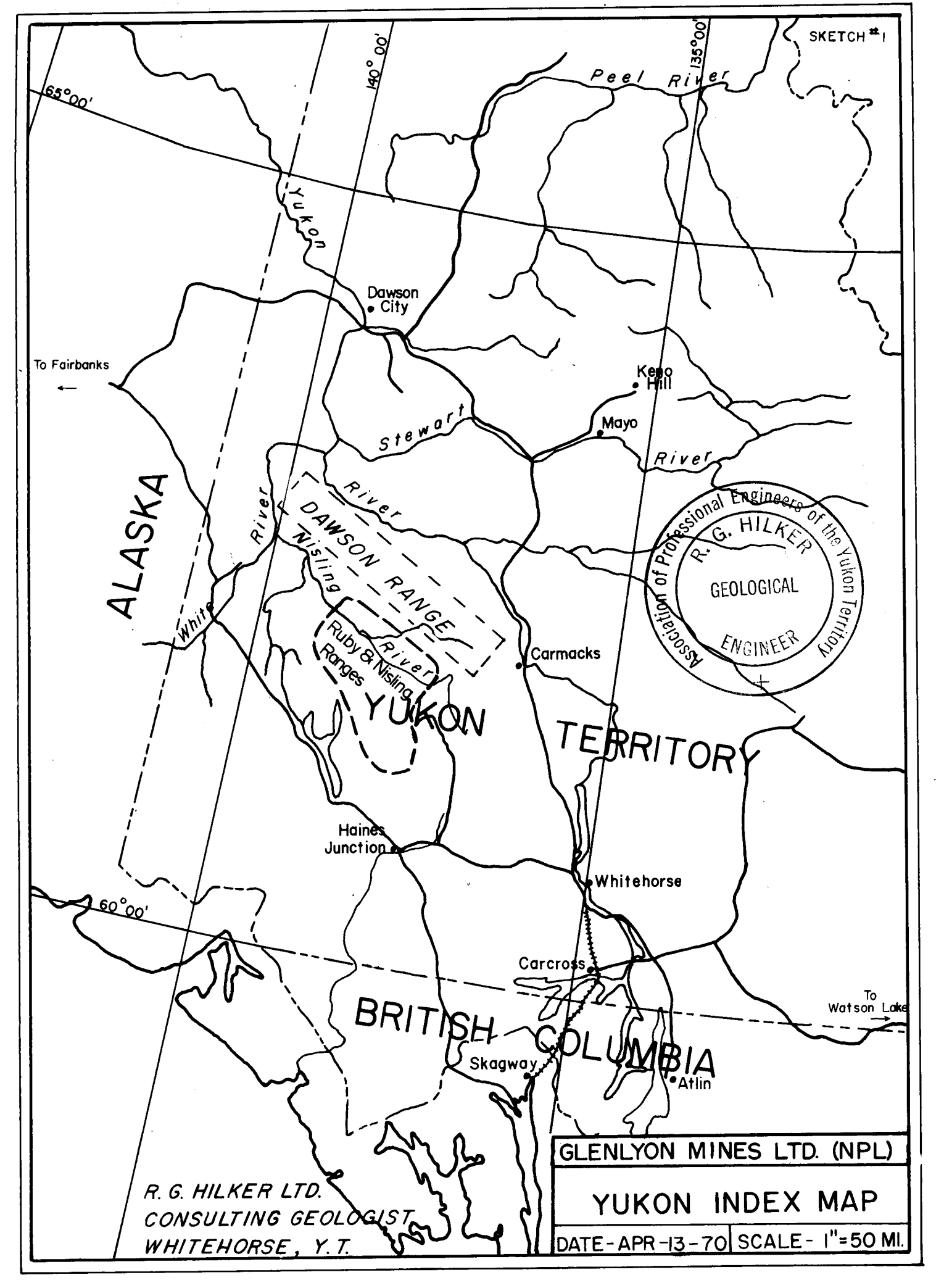
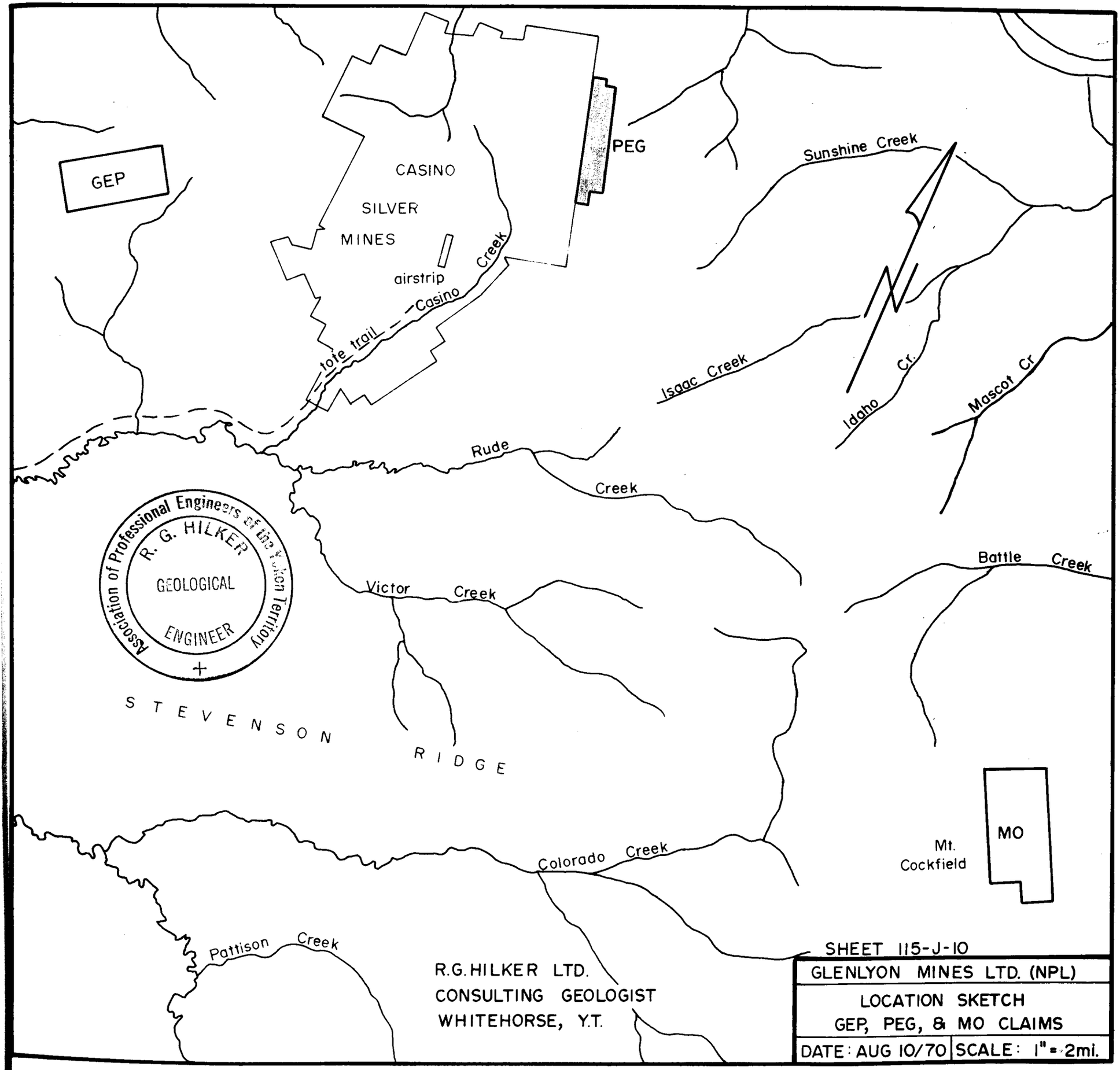

SKETCH # 1
65° 00'
140° 00'
135° 00'
Peel River
Yukon
Dawson City
To Fairbanks
Keno Hill
Mayo
Stewart River
ALASKA
White River
Nisling River
DAWSON RANGE
Ruby & Nisling Ranges
Carmacks
YUKON TERRITORY
Haines Junction
Whitehorse
60° 00'
Carcross
To Watson Lake
BRITISH COLUMBIA
Skagway
Atlin
Association of Professional Engineers of the Yukon Territory
R. G. HILKER
GEOLOGICAL ENGINEER
R. G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.
GLENLYON MINES LTD. (NPL)
YUKON INDEX MAP
DATE - APR - 13 - 70
SCALE - 1" = 50 MI.

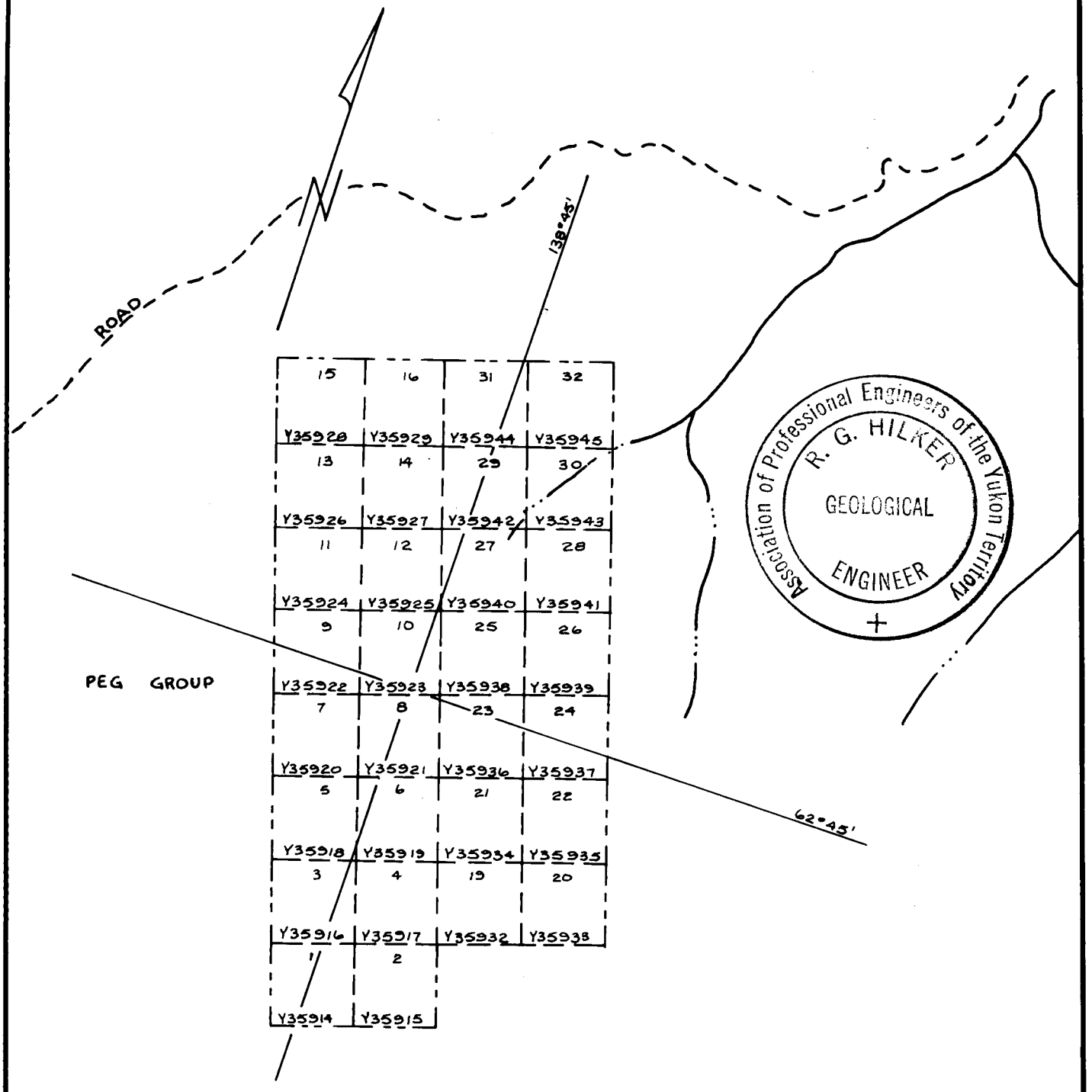

GEP
CASINO
SILVER
MINES
airstrip
PEG
Sunshine Creek
Casino Creek
tote trail
Isaac Creek
Idaho Cr.
Mascot Cr
Rude
Creek
Association of Professional Engineers of the Yukon Territory
R. G. HILKER
GEOLOGICAL
ENGINEER
Victor Creek
Battle Creek
STEVENSON RIDGE
Mt. Cockfield
MO
Colorado Creek
Pattison Creek
R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.
SHEET 115-J-10
GLENLYON MINES LTD. (NPL)
LOCATION SKETCH
GEP, PEG, & MO CLAIMS
DATE: AUG 10/70
SCALE: 1" = 2mi.

CLAIMS

The following information was obtained by a search of the records in the Whitehorse Mining Recorder's Office on August 18th, 1970:

Claims	Sheet No.	Grant Nos.	Anniversary Date	Recorded Owner
PEG 1-16	115-J-10/15	Y35914-Y35929	29 July 1970	H.C. Fromme
Peg 19-32	115-J-10/15	Y35932-Y35945	29 July 1970	H.C. Fromme

.../6



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

SHEETS 115-J-10 & 115-J-15

GLENLYON MINES LTD. (NPL)
CLAIMS LOCATION PEG 1-16, 19-32
DATE: JULY 2/70 | SCALE: 1" = 1/2mi

REGIONAL GEOLOGY - DAWSON RANGE

The Dawson Range occurs in the physiographic Yukon Plateau Province. It is a mountainous terrain, with peaks rising more than 2,000 feet from the level of the plateau, and elevations within the range varying from 3,000 feet to 6,600 feet. Almost all of the area has been left completely untouched by recent glaciation. Accordingly, the outcrops, which predominate on the mountain tops and ridges, are quite irregular. Exposed rocks are highly jointed, fractured and weathered due to frost action and wind erosion. Overburden may reach thicknesses greater than 50 feet in the lower areas, restricting outcrop occurrences to the steeper valley slopes.

The predominant rocks in the area consist of the Upper Cretaceous Coastal Intrusive granites which form a batholith intruding the Yukon group of sediments, Precambrian/Palaeozoic in age. These are also in contact with the Jurassic Mount Nansen group of volcanics and sediments. The Tertiary Carmacks volcanics overlie all of the earlier rocks in some areas.

The following is a general summary of the granitic rock types which occur in the coast range intrusive:

1. Granite Porphyry - composed of 40% orthoclase feldspar and 30% smoky quartz with biotite, augite and minor magnetite. Generally jointed and fractured and weathers a rusty brown color.
2. Granodiorite Porphyry - composed of 50 to 60% ortho-

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clase feldspar, 10 to 15% plagioclase feldspar, 15% clear quartz, augite, biotite and minor magnetite. Occurs in the Casino Creek area and is characterized by large phenocrysts.

3. Granodiorite - composed of 60% orthoclase feldspar and 20% plagioclase feldspar with augite and biotite. Fine to medium-grained texture.

4. Diorite - composed of plagioclase and orthoclase feldspar with approximately 30% augite and biotite.

5. Quartz Monzonite - composed of 50% plagioclase feldspar, 10 to 15% orthoclase fledspar, 15% clear quartz, augite and fine to coarse crystalline biotite.

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REFERENCE TO PUBLISHED GEOLOGY

The following listed publications and geological maps contain geological information in select areas of the Dawson Range, and reference was made to the information in the preparation of this report for Empire Mercury Corporation Ltd.:

1. D.D. Cairns 1916 - Klotassin Yukon Territory No. 1702 - Geology Map, scale 1" = 2 miles. Canada Department of Mines Geological Survey - 1918.
2. H.S. Bostock 1944 - Paper 44 - 34 Preliminary Map Selwyn River Yukon - Canada Department of Mines and Technical Surveys.
3. H.S. Bostock 1936 - Memoir 189 - Carmacks District Yukon - Geological Survey of Canada - Department of Mines and Technical Surveys.
4. J.R. Johnston 1937 - Memoir 214 - Geology and Mineral Deposits of Freegold Mountain, Carmacks District Yukon - Geological Survey of Canada - Department of Mines and Technical Surveys.

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TABLE OF FORMATIONS

CENOZOIC

Quaternary

[Q] - Alluvium, volcanic ash, ground ice.

Tertiary

Carmacks Volcanics

[9] - Thick flows, basalt, amygdaloidal flows, top of flows breccia, local brecciation and porphyritic flows.

MESOZOIC

Jurassic - Upper Cretaceous

Coastal Intrusives

[8] - Granite, granodiorite, quartz-monzonite, porphyry and breccia, altered (ore host rock).

[7] - Syenite and monzonite.

[6] - Diorite and gabbro.

Mount Nansen Group

[5] - Basalt, andesites and dacite flows, breccias and tuffs. Green-black color, contains sedimentary rocks consisting of sandstone, siltstone, pyritic arkose and argillites. Bands and bedding distinct.

Tantalus Formation

[4] - Conglomerate, sandstone, shale and coal seams.

Jurassic

[3] - Laberge Group

Triassic

[2] - Granite, monzonite.

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PRECAMBRIAN & LATER

Yukon Group

[1] - Limestone, shale, mica-quartz schist, chlorite schist, quartzite.

After Bostock; G.S.C. Paper 44 - 34.

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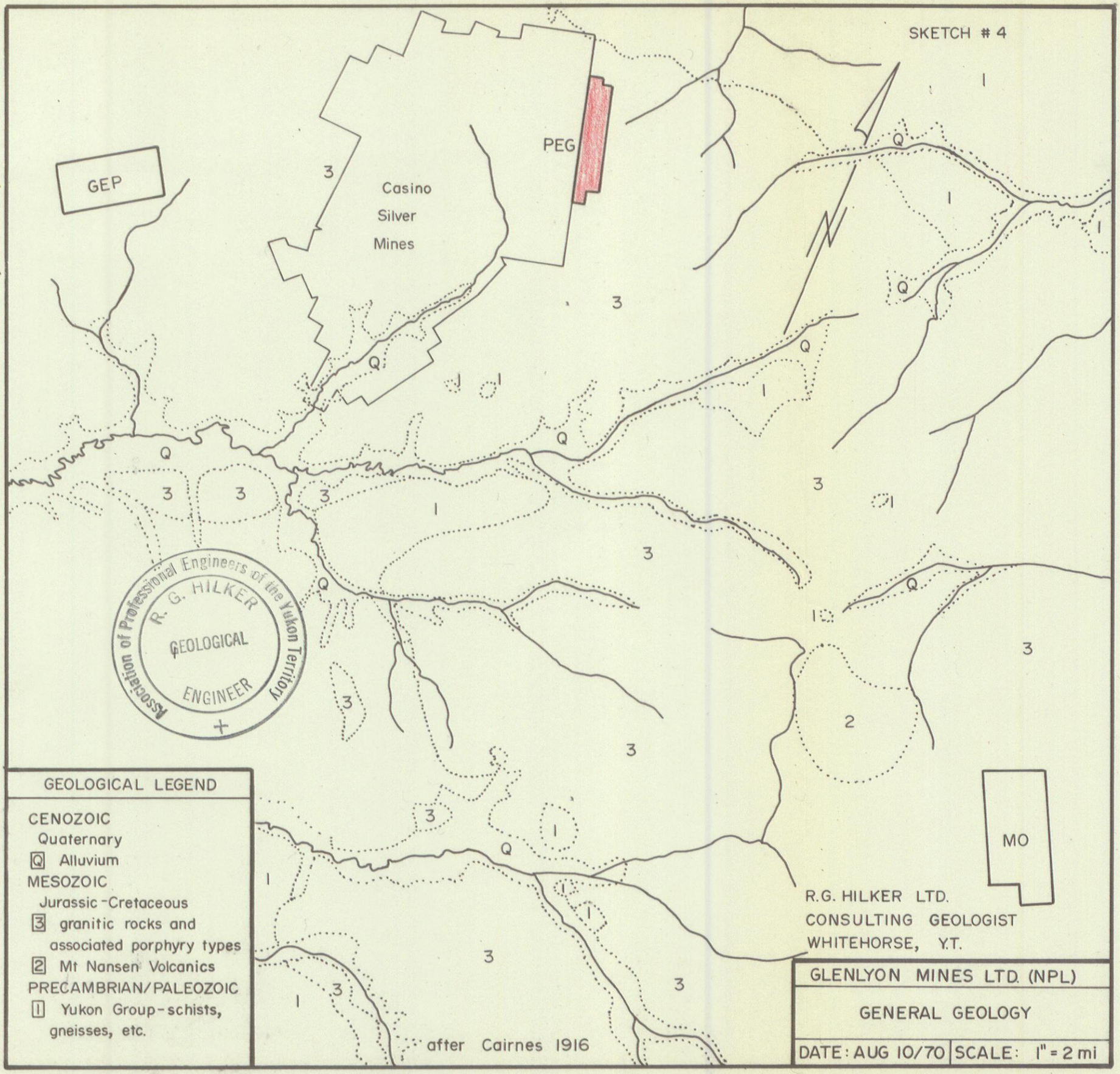
SKETCH # 4
GEP
PEG
Casino
Silver
Mines
MO
Association of Professional Engineers of the Yukon Territory
R. G. HILKER
GEOLOGICAL
ENGINEER
GEOLOGICAL LEGEND
CENOZOIC
Quaternary
Q Alluvium
MESOZOIC
Jurassic-Cretaceous
3 granitic rocks and associated porphyry types
2 Mt Nansen Volcanics
PRECAMBRIAN/PALEOZOIC
1 Yukon Group-schists, gneisses, etc.
after Cairnes 1916
R.G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.
GLENLYON MINES LTD. (NPL)
GENERAL GEOLOGY
DATE: AUG 10/70
SCALE: 1" = 2 mi

GENERAL GEOLOGY

The geology of the PEG, GEP and MO groups is quite typical of the Dawson Range area. The Table of Formations, which is listed on the following page, has been compiled both from previous observations in the Dawson Range area and from field observations made during the present survey. Geological mapping of the claim groups is to date only reconnaissance in nature, as the mapping was carried out mainly on or closely adjacent to the lines as they were cut. It is felt that most of the rock types in the various areas were observed, but a much more detailed investigation of the rocks themselves, their occurrence and their relation to each other, is necessary for a complete picture of the local geology within each claim group.

There are few outcrops in this area, with less than 1% surface rock exposure. However, talus and frost-heaved boulders occur extensively, and these may be used for mapping purposes. On the steeper slopes, talus is predominant, and this reflects mainly upslope geology, whereas the frost-heaved boulders on the gently sloping and flat areas may reflect bedrock geology more directly beneath the observed boulders. The area has not been regionally glaciated, but evidence of a small valley glacier was observed in the major valley at the south end of the MO group. However, the effects of glaciation would not appear to affect the geology, as mapped from the boulders, in any way.

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TABLE OF FORMATIONS - PEG PROJECT

CENOZOIC

Tertiary

[4] Carmacks Volcanics - basalt and related basic dikes

4a - related andesite-dacite porphyries

MESOZOIC

Jurassic - Upper Cretaceous

[3] Minor intrusives - granite-diorite, quartz-feldspar porphyries

3a - associated (?) aplite and pegmatite dikes

[2] Klotassin Batholith - hornblende-biotite-quartz granite, monzonite. Minor dioritic phases.

PRECAMBRIAN AND LATER

[1] Yukon Group - biotite-hornblende schists and gneisses

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The foregoing Table of Formations includes rock types found on all three claim groups. The Klotassin Batholith, which forms most of the Dawson Range, was intruded into the Yukon Group of sediments and volcanics during the Cretaceous period. The Yukon Group, Precambrian or Cambrian in age, was variously affected by this intrustion. In some areas, it has remained almost totally unaltered. Over most of the central area of the batholith, however, the sediments are evident only in a few remaining, highly metamorphosed roof pendant-like structures and in abundant smaller inclusions or xenoliths. The sediments appear now as biotite-hornblende gneisses which appear to grade into mafic lean granitic rocks. These are probably derived from the siliceous end members of the sediments. The distinction between these rocks and Unit 2 is very difficult in field observation, except in a few cases where relict sedimentary structures are still evident. No skarn minerals were observed. Epidote is quite common, either disseminated or in small veinlets, but it appears to be associated with the intrusive.

Unit 2, the main body of the Klotassin Batholith, is the dominant rock type over the three claim groups. Its composition is quite variable, apparently over even relatively short distances, and as a result its classification to date has been by its age, approximately 110 million year. It is predominantly a hornblende-biotite granite-granodiorite. Diorite and even

.../14

gabbro phases are evident, while other leucocratic varietites contain up to 50 percent quartz and less than 10 percent mafics. Biotite may be the dominant mafic mineral, but it is most often secondary to hornblende. Observed accessory minerals include epidote and pyrite.

Unit 2 is most readily identified by its texture, as its overall composition, especially the proportion of quartz and the various feldspars, is often difficult to determine in field examination. It is a coarse-grained rock with large subhedral hornblende crystals which have grown, in some instances, to over ½-inch in length. Large plagioclase crystals have roughly intergrown with quartz and orthoclase, producing large areas of semi-continuous cleavage face which are quite evident on fresh rock surfaces.

Alteration is present in most of these rocks, generally to a minor extent. This consists mainly of oxidation of iron minerals, chloritization of hornblende, and, to a lesser extent, sericitization of feldspars.

Unit 3, a second phase of the Klotassin intrusive, has been dated at approximately 70 million years. It again has quite variable composition, ranging from granite through quartz monzonite, granodiorite, quartz, feldspar and quartz-feldspar porphyries, monzonite and quartz diorite, and it is also best distinguished by its texture. It is a medium-grained, light-colored rock which may have rounded quartz and/or euhedral

.../15

plagioclase phenocrysts. Biotite and hornblende may or may not be present in the groundmass. Alteration of these rocks is similar to that of Unit 2, except that rust may be a little more abundant.

Unit 3a is most probably related to Unit 3, although this is uncertain. It consists of fine to medium-grained aplite dikes and, to a lesser extent, pegmatite dikes. Only one substantial sized body, on the GEP claim group, was observed. Compositionally, this rock type is very similar to the mafic lean granitic phases of Unit 3.

With refard to relative ages of the above three rock types, Unit 3a has been observed, in outcrop, intruding Unit 2. Units 2 and 3 were observed in close relationship, mainly in boulders, but no cutting relationships were observed.

The rocks of Unit 4 are the youngest rocks in the area, probably of Tertiary age. They are fresh, fine-grained gabbro dike rocks, probably associated with the Carmacks volcanic series. From one outcrop occurrence, the dikes were observed to be quite small (less than 3-foot width) and highly irregular and discontinuous. They appear to be associated with faulting and shearing. Unit 4a is most likely associated with the above Unit 4. It consists of fresh, dense, fine-grained andesite-dacite porphyry. The phenocrysts are quartz and/or plagioclase. This unit was observed only on the MO group, and its relations with all other intrusive rocks are yet very vague.

.../16

GEOLOGY - PEG 1-16 and 19-32 CLAIM GROUP

Approximately half of the PEG claim group, mainly to the south, is sparsely vegetated, with abundant boulders and a few outcrops. Here the geological mapping, at least on a reconnaissance basis, is quite straightforward. Unit 2 predominates, with a small area of Unit 1.

The inclusion of the Yukon Group, Unit 1, was observed in three outcrops, as mainly a poorly to well-banded hornblende-biotite-feldspar gneiss. No other minerals were positively identified, although quartz is probably present at least in the feldspar rich bands. Aside from this one major occurrence, Unit 1 was observed as small individual boulders or as xenoliths throughout the remaining map area.

The main intrusive, Unit 2, is relatively complex in this area. In outcrop occurrence, it is a typically fresh hornblende-biotite granodiorite-diorite. Traces of pyrite were observed in one outcrop specimen. In the boulders mapped, however, much more variety was evident. While the typical Unit 2, as above, is abundant, a fresh, coarse-grained biotite-rich variety, plus both of the above after varying degrees of alteration, are also present. Alteration here is not extreme, consisting of mainly weathering of iron minerals, probably pyrite, and hornblende. Pyrite is relatively abundant throughout the area, being observed in several specimens, but no pattern has been associated with its occurrence. This is mainly due to the fact

.../17

that a large percentage of the boulders mapped occur in talus slopes, thus preventing the definition of the more subtle contact or other geologic zones. Unit 2 also occurs at the north end of the grid, where it again dominates. It has a fresh, coarse-grained texture with hornblende crystals up to ½-inch in length. It differs from the rocks to the south in that an almost gneissic texture is sometimes evident. This is closely associated with elongated and highly metamorphosed inclusions of Unit 1, indicating that granitized Yukon Group sediments may indeed make up most of the rocks in this particular area.

The more recent intrusive rocks, of Units 3 and 4, are not abundant in the area. Aplitic and pegmatitic dikes, Unit 3a, occur in all areas, and in the north they contain a fairly high proportion of epidote. Unit 3, as a separate intrusive body, was not observed, although rocks from this unit may have been mistaken for certain varieties of Unit 2.

Unit 4 was observed only in a few boulders as a typically fresh, fine-grained gabbroic rock, sometimes displaying phenocrysts of biotite.

No information on the structural geology of the area was obtained. A close examination of the outcrop areas would definitely provide useful data, but again, due to the lack of bedrock exposure, the major structural features would be left to hypothesis.

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GEOCHEMICAL SURVEY

INTRODUCTION

The systematic sampling of soils and the subsequent analysis of these samples for trace amounts of copper and molybdenum has been successfully used throughout the Cordilleran region in the search for porphyry-type copper-molybdenum mineralization. This success has been extended to the Dawson Range, where several mineralized zones, including the Casino Silver Mines deposit, have been outlined by this technique.

For the successful application of a soil sampling survey, however, a careful study of all factors which might affect the geochemical characteristics of the soils, referred to here as the geochemical environment, must be undertaken. This environment is defined mainly by the characteristics of the soil. Basically, two distinctly different environments exist in the Dawson Range area, and are described below.

The "slope" environment exists mainly on slopes steeper than 5° and on the hill and ridge tops. The soil is residual or it has been transported a short distance down slope, and is composed mainly of weathered granite. A thin layer of humus and partially decomposed organic material may form the surface horizon. Vegetation may be completely lacking, but generally moss, grass and buckbrush are prominent, with minor spruce. Drainage in these areas is good, due to the slope and the general permeability of the soils.

.../19

The "bench" environment, by far the most predominant in this area, occurs over most of the flat or gently sloping areas. Here a thick humus, almost muskeg layer, has developed over the underlying soils. Drainage is poor, and the ground is often frozen quite close to surface. Vegetation consists of thick moss and grass with buckbrush and minor spruce. The underlying soils consist of alternating clay-rich and sand-rich horizons, which are partly colluvial (transported by gravity) and partly alluvial (transported by water).

Soil sampling conditions in "slope" areas are generally very good, except on very steep slopes where talus may be abundant. The "bench" environment, however, presents sampling difficulties. The humus layer is often very thick and hard to penetrate, especially if it is frozen at depth. A meaningful sample from this area, though, must be completely humus-free. As a result, during the survey, several "no sample" stations were encountered. Here, the ground in the vicinity of the station is either frozen or swampy, and a humus-free sample could not be obtained.

The soil samples are all taken from the upper "B" soil horizon, or the layer directly beneath the surface humus-rich "A" horizon. As the soils in this area have been transported only a short distance from the parent bedrock source, the samples collected are expected to reflect fairly accurately metal abundances in bedrock in the general vicinity.

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SAMPLE HANDLING, ASSAYS AND TREATMENT OF DATA

After collection, samples were wired in strings of 30 to 40 samples, they were partially dried, and then packed in burlap sacks for shipment to Whitehorse. At Whitehorse, the samples were crated and sent via C.P. Air Freight to Chemex Labs in North Vancouver, where they were analyzed for copper and molybdenum.

The analytical procedure at Chemex Labs consists of drying and sieving the samples, saving the -80 mesh fraction. One gram of this fraction is digested using perchlorate and is then dissolved in hot aqua regia. This solution is evaporated to dryness overnight. The residual is dissolved in hydrochloric acid and this solution is brought to volume for final analysis. The solution is run for copper and then molybdenum (using the Loring method) on a Techtron AA-5 Digital atomic absorption unit.

Results are returned to Whitehorse by First Class Mail. The copper and molybdenum values from this project have been plotted at 1" to 400 feet, and basic statistics, that is, the mean and standard deviation, of the copper values, have been calculated. The formulae used are as follows:

$$\bar{x} = \frac{\Sigma P.P.M.}{n}$$

$$s = ((n(\Sigma P.P.M.) - (\Sigma P.P.M.^2))/n(n-1))^{1/2}$$

where: P.P.M. = copper value in parts per million

n = total number of values

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$\bar{x}$ = arithmetic mean

s = standard deviation

As the majority of molybdenum values is zero, one would expect a mean of zero and standard deviation less than 1. Thus, values of 2 or 3 P.P.M. Mo are anomalous values for this survey.

.../22

INTERPRETATION

Copper and molybdenum values in the soils over the PEG claim group are very low and flat. The values for mean and standard deviation of the copper values are as follows:

$\bar{x} = 17$ $s = 11$

Only one low order anomaly, labelled Zone P1, occurs on the baseline near L0+00. The slope here is gentle and to the east and southeast, and yet the anomalous values do not extend along L0+00 either east or west. Both copper and molybdenum are present, and these metals are most likely derived from the outcrop area to the north and west of the anomaly. The rocks here are typically fresh Unit 2, with minor aplite and pegmatite stringers. A trace of pyrite was observed in one outcrop specimen of Unit 2 here. However, this anomaly does not appear to be significant, mainly because of its limited extent. Any major zone of mineralization, especially at this particular location which has good sample coverage and generally above average sampling conditions, would be expected to give a large and strong geochemical anomaly, both with copper and molybdenum. The small Zone P1 anomaly may be a result of minor copper-molybdenum mineralization in localized shears and possibly veins.

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CONCLUSIONS

The geology of the PEG claim group consists of an intrusive body of hornblende-biotite granodiorite enclosing roof pendants of hornblende-biotite-feldspar gneiss, representing granitized sediments of the Yukon Group. A few small acid dikes were observed within the granodiorite and were occasionally found to contain appreciable portions of epidote. Alteration was not pronounced within the claim group and consisted mainly of weathering of pyrite which is fairly abundant throughout the area.

Soil sampling has indicated that the claim group as a whole is characterized by very low values in copper and molybdenum. One small area, Zone P-1, and several individual sample stations, are statistically anomalous for copper. Zone P-1 extends for approximately 1000 feet north along the baseline from Line 0+00 and the anomaly is "open" to the northeast and northwest. Additional sampling will be required to define the extent and magnitude of the anomalous values. No appreciable anomalous values for molybdenum were indicated by the survey.

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RECOMMENDATIONS

The following program is recommended to further assess the potential of the PEG claim group:

Soil sampling and geological mapping should be conducted over an additional 20 miles of linegrid, consisting of ½-mile lines on a 500-foot spacing to fill in the existing grid system. Estimated costs are as follows:

Transportation (fixed-wing, helicopter, truck)	$ 550.00
Camp Costs (equipment rental, food, etc.)	600.00
Soil Sampling	2,000.00
Geochemical Analysis (1040 determinations for Cu and Mo @ $1.40)	1,450.00
Geological Mapping	1,000.00
Linecutting	1,700.00
Report Preparation	500.00
TOTAL	$7,800.00

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SUMMARY OF EXPENDITURES

The geological-geochemical program carried out on the PEG claim group was part of a project covering three blocks of claims on behalf of the same company, Glenlyon Mines Limited (N.P.L.). As the three claim groups (PEG, GEP and MO) were of similar size (either 30 or 32 claims) and as the programs were carried out consecutively, the various costs incurred have been divided by three for simplicity. Reference is made to Invoice No. 1035 - R.G. Hilker Limited - included in the Appendix of this report.

The following costs were incurred during the evaluation program on the PEG claim group:

Transportation:		
Fixed-wing aircraft	$227.25	
Helicopter	290.60	
Pickup truck	16.66	$ 534.51
Camp Costs (equipment rental, food, etc.)		300.00
Radio Rental		53.63
Geochemical Sampling (7.0 linemiles @ $100)		700.00
Geochemical Analysis - Chemex Labs (317 samples for Cu & Mo @ $1.40)		443.33
Geological Mapping		300.00
Linecutting (7.0 linemiles @ $85)		595.00

.../26

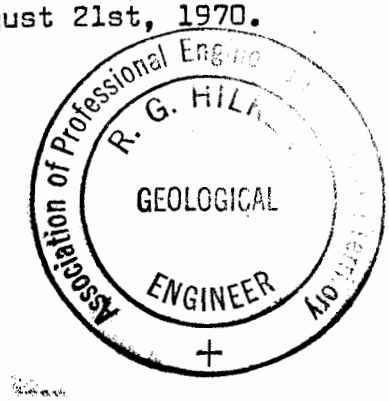
Report Preparation (includes both preliminary and final drafting) ..... $ 403.33

Total Costs claimed for Assessment Work $3,329.80

CERTIFICATION OF EXPENDITURES

I, ROBERT G. HILKER, P.Eng., do hereby certify that the statement of costs incurred during the geological/geochemical evaluation of the PEG claim group, as stated on Pages 25-26 of this report (total expenditures: $3,329.80) is a true statement to the best of my knowledge.

ROBERT G. HILKER, P.Eng.
Whitehorse, Yukon Territory
August 21st, 1970.



.../27

CERTIFICATION OF REPORT

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

1. THAT I am a Consulting Geologist, with an office located at #8 Northern Metalic 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, and am registered with a non-resident's license in The Association of Professional Engineers of the Province of British Columbia.

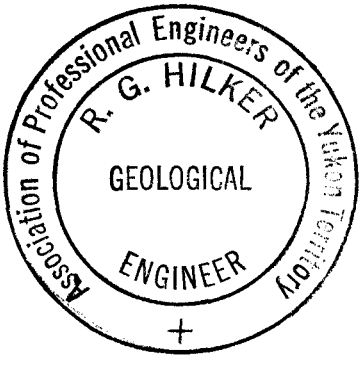
4. THAT I have practised my profession as an engineer and geologist for the past eight years.

5. THAT I have personally supervised the geological-geochemical evaluation conducted by G.G. Carlson on the PEG claim group in the Whitehorse Mining Division of the Yukon Territory, from July 16th to July 21st, 1970.

6. THAT neither I nor G.G. Carlson have any direct or indirect interests in any of the mineral claims, or in any of the securities held by Glenlyon Mines Limited (N.P.L.) nor do we expect to receive any.

DATED this 21st day of August, A.D. 1970.

R.G. Hilker, P.Eng.



A P P E N D I X

FIELD DIARY - PEG GROUP - G.G. CARLSON

Friday, July 17

Weather: Mainly sunny and warm all day, clouding over and showers in the evening.

Most of the day was spent fixing up the campsite. The bush is quite thick, mainly willows and other low-growing deciduous trees, and a four-hour traverse was required to uncover one claim post location. The western claim line, when finally discovered, was found to be well cut, considering the bush, but marked only with yellow flagging which has since faded so that it is quite unnoticeable.

The grid, as set out, would take at least seven days to cut. Therefore, it will be altered such that a maximum number of lines occur on relatively clear ground.

Saturday, July 18

Weather: High, broken cloud cover, sunny most of the day. Minor showers in the evening.

Cutting, chaining, sampling and geological mapping completed on L0, 26+40W to 26+40E (grid started at P1, PEG 3 & 4; P2, PEG 1 & 2 - 0+00N, 15+00W); L15S, B.L. to 26+40W and B.L., 15+00S to 45+00N (sampled only to 40N).

Very little cutting is required on all lines south of L30N, but north of this, the bush is very thick. Also, sampling conditions and rock exposure are both better south of L30N. For these reasons, most of the seven miles of grid are located on the south half of the claim group.

Soil Sampling: Over the upper portion of the grid, sampling conditions are good except in areas of concentrated run-off, where swamp-muskeg conditions often prevail, and in areas of talus, where no soil is available. The best samples are obtained from the few frost boils which are found on the high flat areas, or from the areas of thin soil and sparse vegetation generally over older buried talus.

Geology: The geology of this area is basically similar to that of the GEP group. The predominant rock type is a medium to coarse-grained biotite-hornblende granitic rock (probably granodiorite-diorite due to large % of mafics, more plagioclase

.../ii

than orthoclase and little quartz). Thick rock often contains visible pyrite in hand specimens. It is intruded by a very small number of aplite and pegmatite dikes. A second intrusive, a coarse-grained biotite granite, is evident in boulders, but its relation to the main intrusive is uncertain.

The third rock type, originally mapped as a medium-grained gabbroic intrusive, now appears to be highly metamorphosed Yukon Group sediments. They consist of mainly biotite-hornblende gneiss, with plagioclase (?) evident in some samples. These rocks occur as large to small pendants and xenocrysts within the intrusive, with irregular (apophyses) extending into the intrusive. Gneissic texture is poorly to well-developed. A rough, thick banding was observed in one outcrop. Apart from this one major outcrop occurrence, boulders are found scattered throughout boulders of the intrusive in areas mapped to this date.

Units on field map:
- 1 - main intrusive - biotite-hornblende granodiorite (?)
- 1a - altered - any intrusive or Yukon Group gneiss
- 1c - Yukon Group gneiss
- 1d - biotite granite
- 2 - aplite/pegmatite dikes
- 3 - Yukon Group gneiss (where previously mistaken for intrusive)

Sunday, July 19

Weather: Sunny with cloudy intervals in a.m., clouding over with hail showers and rain in p.m.

Linecutting, chaining, sampling and geological mapping carried out on L15N, 26+40E to 26+40W and on L30N, 26+40E to 26+40W. Of this two miles of line, 3/4 of a mile was heavy cutting, as will be the remaining lines on the grid.

Geology: There have been no new developments in the previously described geology. Although three distinct intrusive rock types have been noted and described (Units 1, 1d and 2), there appear to be gradations between 1 and 1d and also between 1d and 2 (possibly). Also, some occurrences of Unit 2 are massive and medium to fine-grained as separate boulders, and these may be more closely related to Unit 1c. Biotite is relatively abundant in some of these samples.

As previously noted, pyrite occurs in all rock types, but it is most evident in Units 1 and 1d, in both fresh and altered samples. Similarly, alteration appears to be confined mainly to these same two units.

.../iii

Monday, July 20

Weather: Cold, windy and overcast in a.m., clearing and warmer by noon.

Cutting, chaining, sampling and geological mapping carried out on L45N, B.L. to 26+40E. B.L. cut and chained from 45N to 90+60N. Sampled from 45N to 66N and mapped from 45N to 62N and from 75N to 90+60N. Very heavy bush has been encountered on all of the B.L. north of 45N and on most of L45N. Sampling conditions are generally poor in areas of heavy bush, especially on north-facing slopes. Therefore, wherever possible, a silt or alluvial sample is taken. This alluvial material, at least on the north-facing slope and south of the main creek, is derived from rocks within the PEG claims.

Geology: Rocks encountered north of 75N on the baseline are similar to Unit 1 except they are generally fresher, somewhat coarser-grained, have more predominant hornblende phenocrysts (similar to GEP), and show textural and compositional variations over a very short (5-10") range. (Almost gneissic plus basic Unit 1 to granitic Unit 1d). This suggests possible large scale granitization of sediments over this area. Also present here are xenoliths of now medium-grained gabbroic material, with infrequent plagioclase and hornblende phenocrysts. These are generally roughly elliptical in shape and range in size from 1/2" upwards.

Generally thin aplite and pegmatite veins are relatively common in these rocks. Some appear to be rich in epidote as are some of the slightly altered rocks of Unit 1.

Tuesday, July 21

Weather: Clear, very sunny and hot.

Work on PEG group completed. L75N cut and chained from 26+40W to 26+40E. Geological mapping carried out on all of L75N and B.L., 67N to 75N. Soil sampling carried out on all of L75N and B.L., 67N to 90+60N.

In evening, preparation made for move to MO group in a.m. Jet Ranger may not return to Casino until sometime in a.m.

PHONE: OFFICE 667-2819
RES. 668-2822
AREA CODE 403

R. G. HILKER
LIMITED
CONSULTING GEOLOGIST . . . PROFESSIONAL ENGINEER
P.O. Box 566
WHITEHORSE, YUKON TERRITORY
"LAND OF THE MIDNIGHT SUN"

Mr. Larry Reynolds
Glenlyon Mines Ltd. (N.P.L.)
c/o Pemberton Securities Ltd.
744 West Hastings St.
VANCOUVER, B.C.

JULY 27th, 1970

INVOICE NO. 1035

Transportation		
July 11 - Inv. 0210 - Globe Air Serv.	167.30	
July 24 - Inv. 0728 - Globe Air Serv.	168.30	
July 24 - Inv. 0226 - Globe Air Serv.	84.15	
July 11 - Inv. 3214 - Trans North T.A.	129.60	
July 11 - Inv. 19976 - Great Northern	262.00	
July 24 - Inv. 7560 - Trans North T.A. ..	174.35	
July 11 & 16 - Inv. 37370 - Trans North Turbo Air	567.86	1,553.56
R.G. Hilker Limited		
Camp Rental & Costs (Claims MO 1-32, GEP 1-32, PEG 1-32)		900.00
Truck Rental (for assessment work)		50.00
Rental of Radio - 1 Month	155.00	
- Batteries	5.90	160.90
Drafting Linegrids & Claim Location (Dawson Range)		70.00
Recording Fees - MO Group	160.00	
GEP Group	160.00	
PEG Group	170.00	490.00
Geochemical Sampling (MO, GEP & PEG Claim Groups)		2,100.00
Geological Mapping (MO, GEP & PEG Claim Groups)		900.00
Geological Assessment Work (Report on MO, GEP & PEG Claims)		1,140.00
Linecutting (21 linemiles)		1,785.00
TOTAL INVOICE		$ 9,149.46

INVOICE

CHEMEX LABS LTD. 212 BROOKSBANK AVE., NORTH VANCOUVER, B.C. TELEPHONE 985-0643/9

R.G. Hilker Ltd.,

Box 566,

Whitehorse, Yukon

GLENLYON PROJECT

DATE August 5, 1970

INVOICE NO. 3497

CERTIFICATE NO. 10308-10314

ATTN:

ITEM	DESCRIPTION	SUB-TOTAL	TOTAL
	270 samples analyzed for Copper, Molybdenum @ $1.40		$ 378.00

INVOICE

CHEMEX LABS LTD. 212 BROOKSBANK AVE., NORTH VANCOUVER, B.C. TELEPHONE 985-0643/9

R. G. Hilker Ltd.,

Box 566

Whitehorse, Y. T.

DATE August 4/70

INVOICE NO. 3489

CERTIFICATE NO. 10291 to 10307

ATTN:

ITEM	DESCRIPTION	SUB-TOTAL	TOTAL
	680 Samples analyzed for Copper & Molybdenum @ $1.40	$952.00	
			$952.00

CHEMEX LABS LTD.

NORTH VANCOUVER, B.C.
CANADA
TELEPHONE: 985-0648

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 10300

INVOICE NO. 3489

DATE RECEIVED July 29, 1970

DATE ANALYSED August 4, 1970

TO: R. G. Hilker Ltd.,
Box 566,
Whitehorse, YUkon

GLENLYON PROJECT

ATTN:

SAMPLE NO.:	ppm Copper	ppm Molybdenum
GEP 9667	26	0
9668	7	0
9669	41	0
9670	33	0
9671	20	0
9672	24	0
9673	3	0
9674	7	0
9675	28	0
9676	18	0
9677	21	0
9678	18	0
9679	10	0
GEP 9680	14	0
9681	18	0
PEG 9682	28	0
9683	21	0
9684	22	0
9685	26	0
9686	21	0
9687	20	0
9688	16	0
9689	26	0
9690	16	1
9691	22	0
9692	21	0
9693	12	0
9694	13	0
9696	12	0
9697	20	0
9698	24	1
9699	22	0
9700	22	0
9701	28	0
9703	28	0
9704	20	0
9706	26	2
9707	16	0
9708	31	0
9709	131	3
Standard Soil #22	54	17

Certified by .....

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CANADA
TELEPHONE: 985-0648

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 10301
INVOICE NO. 3489
DATE RECEIVED July 29, 1970
DATE ANALYSED August 4, 1970

TO: R.G. Hilker Ltd.,
Box 566,
Whitehorse, Yukon

GLENLYON PROJECT

ATTN:

SAMPLE NO.:	ppm Copper	ppm Molybdenum
PEG 9710	36	0
9711	21	0
9712	14	0
9713	22	0
9714	22	0
9715	28	2
9718	22	0
9719	18	0
9720	24	0
9721	13	0
9722	14	0
9723	16	0
9724	14	0
9725	16	0
9726	16	0
9727	16	0
9728	16	0
9729	22	0
9730	22	0
9731	14	0
9732	22	0
9733	22	0
9734	24	0
9735	24	0
9736	26	0
9737	24	0
9738	22	0
9739	30	0
9740	34	0
9741	22	0
9742	22	0
9743	20	0
9744	18	0
9745	14	0
9746	18	0
9747	18	0
9748	20	0
9749	16	0
9750	16	0
9751	20	0
Std #22	54	17

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CANADA
TELEPHONE: 985-0648

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 10302
INVOICE NO. 3489
DATE RECEIVED July 29, 1970
DATE ANALYSED Aug. 4, 1970

TO: R.G. Hilker Ltd.,
Box 566,
Whitehorse, Yukon

GLENLYON PROJECT

ATTN:

SAMPLE NO.:	ppm Copper	ppm Molybdenum
PEG 9752	14	0
9753	20	0
9754	12	0
9755	16	0
9756	20	0
9759	20	0
9760	14	0
9761	16	2
9762	26	0
9763	12	0
9764	12	2
9765	12	0
9766	30	1
9767	20	0
9774	20	0
9775	31	0
9776	30	0
9777	30	0
9778	28	0
9779	36	0
9780	40	2
9781	34	2
9782	30	1
9783	34	0
9789	10	0
9793	21	0
9794	20	0
9795	13	0
9796	20	0
9799	26	0
9800	26	0
9801	30	1
9802	20	0
9804	28	0
9808	21	0
9809	26	0
9813	26	0
9814	30	0
9815	14	0
9816	18	0
Standard Soil #22	52	17

Certified by .....

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CANADA
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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 10303
INVOICE NO. 3489
DATE RECEIVED July 29, 1970
DATE ANALYSED Aug. 4, 1970

TO: R.G. Hilker Ltd.,
Box 566,
Whitehorse, Yukon

GLENLYON PROJECT

ATTN:

SAMPLE NO.:	ppm Copper	ppm Molybdenum
PEG 9817	31	1
9818	24	0
9819	24	0
9820	24	0
9821	24	1
9822	24	0
9823	24	0
9824	26	0
9825	20	0
9826	18	0
9827	18	0
9828	16	0
9829	21	0
9830	14	0
9831	13	1
9832	24	0
9833	24	0
9834	14	0
9835	24	0
9836	22	0
9837	20	0
9838	13	0
9839	10	0
9840	8	0
9841	14	0
9842	16	0
9843	16	0
9844	14	0
9845	38	0
9846	20	0
9847	30	0
9848	21	0
9849	24	0
9850	13	0
9851	16	0
9852	24	0
9853	22	0
9854	21	0
9855	21	0
9856	22	0
Std #22	54	17

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CANADA
TELEPHONE: 985-0648

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 10304
INVOICE NO. 3489
DATE RECEIVED July 29, 1970
DATE ANALYSED Aug. 4, 1970

TO: R. G. Hilker Ltd.,
Box 566,
Whitehorse, Yukon

GLENLYON PROJECT

ATTN:

SAMPLE NO.:	ppm Copper	ppm Molybdenum
PEG 9857	20	0
9859	28	0
9860	28	0
9861	30	0
9862	24	0
9863	28	0
9864	26	0
9865	24	0
9866	26	0
9867	24	0
9868	28	1
9869	26	2
9870	20	0
9871	18	0
9872	12	0
9873	12	0
9874	13	2
9875	16	1
9876	18	1
9877	24	1
9878	24	0
9879	16	0
9880	16	0
9881	16	0
9882	18	0
9883	16	0
9884	12	0
9885	13	0
9886	18	0
9887	12	0
9888	12	0
9889	12	0
9890	16	0
9892	16	0
9893	12	0
9896	20	0
9897	31	0
9898	21	0
9902	20	0
Std #22	54	17

Certified by C. W. Bowen

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CANADA
TELEPHONE: 985-0648

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 10305
INVOICE NO. 3489
DATE RECEIVED July 29, 1970
DATE ANALYSED Aug. 4, 1970

TO: R.G. Hilker Ltd.,
Box 566,
Whitehorse, Yukon

GLENLYON PROJECT

ATTN:

SAMPLE NO.:	ppm Copper	ppm Molybdenum
PEG 9906	33	0
9907	28	1
9915	20	0
9917	26	0
9918	16	0
9919	41	0
9920	36	0
9921	22	0
9922	13	0
9923	22	0
9924	16	0
9925	18	0
9926	18	0
9927	24	0
9928	31	0
9929	18	0
9930	20	0
9931	18	0
9932	20	0
9933	22	0
9934	42	0
9935	21	0
9937	20	0
9938	22	0
9939	22	0
9942	33	2
9944	26	1
9946	20	0
9948	14	0
9949	10	0
9950	14	0
9951	20	0
9952	12	0
9954	12	0
9957	16	0
9958	10	0
9959	24	0
9960	26	0
9961	22	0
9962	13	0
Standard Soil #22	54	17

Certified by .....

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CANADA
TELEPHONE: 985-0648

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 10306
INVOICE NO: 3489
DATE RECEIVED July 29, 1970
DATE ANALYSED Aug. 4, 1970

TO: R.G. Hilker Ltd.,
Box 566,
Whitehorse, Yukon

GLENLYON PROJECT

ATTN:

SAMPLE NO.:	ppm Copper	ppm Molybdenum
PEG 9963	24	0
9964	10	0
9965	10	0
9966	13	0
9967	16	0
9968	13	0
9969	12	0
9970	10	0
9971	10	0
9972	12	0
9973	10	0
9974	12	0
9975	7	0
9976	10	0
9977	8	0
9978	8	0
9979	7	0
9980	7	0
9981	6	0
9982	8	0
9983	10	0
9984	7	0
9985	8	0
9986	10	0
9987	12	0
9988	13	0
9991	18	0
9992	13	0
9993	13	0
9994	13	0
9995	12	0
9996	13	0
9997	13	0
9998	14	0
9999	14	0
10000	14	0
10030	18	0
10031	16	0
10032	14	0
10033	16	0
Standard Soil #22	52	17

Certified by

CHEMEX LABS LTD.

NORTH VANCOUVER, B.C.
CANADA
TELEPHONE: 985-0648

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 10307
INVOICE NO. 3489
DATE RECEIVED July 29, 1970
DATE ANALYSED Aug. 4, 1970

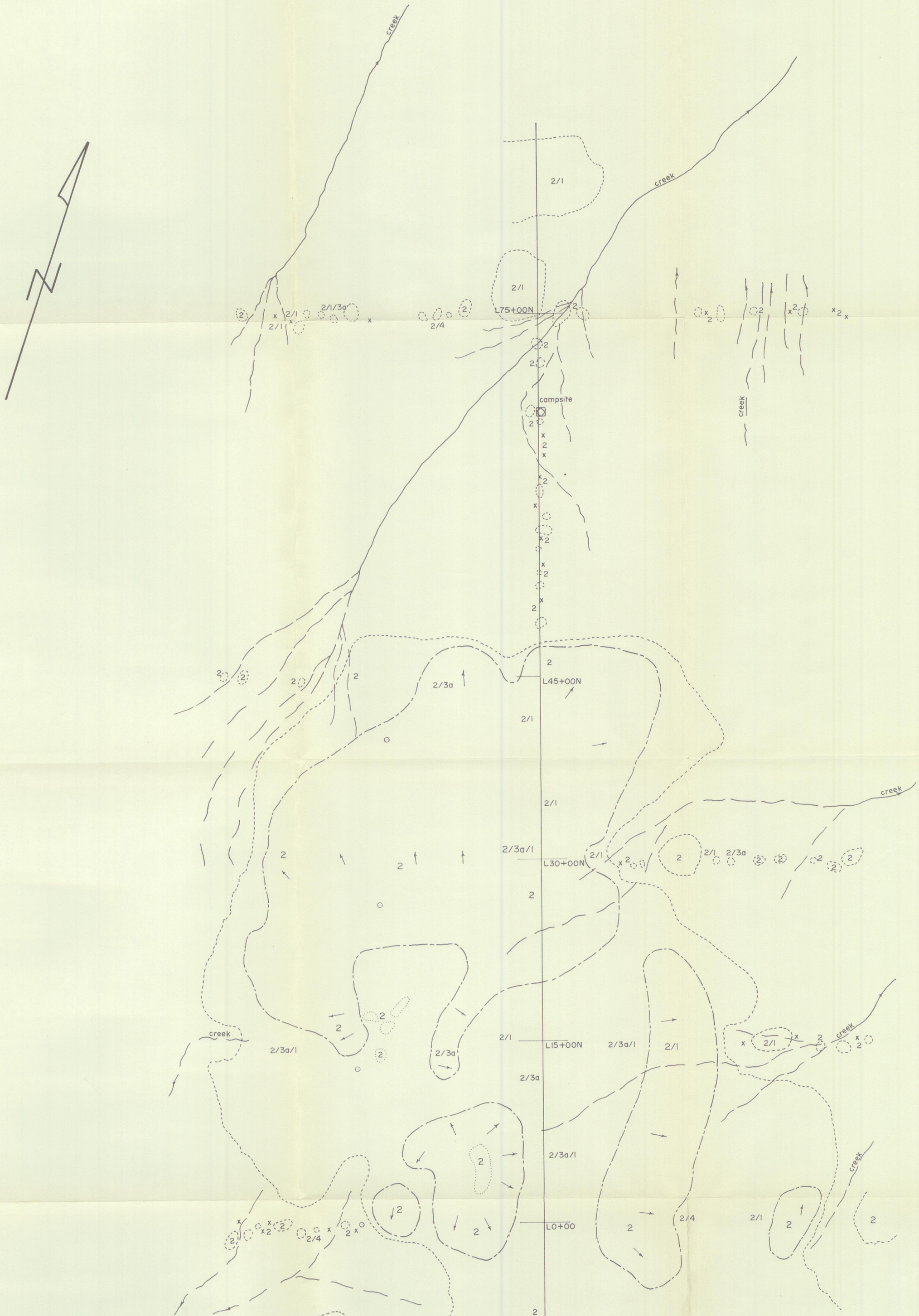
TO: R.G. Hilker Ltd.,
Box 566,
Whitehorse, Yukon

GLENLYON PROJECT

ATTN:

SAMPLE NO.:	ppm Copper	ppm Molybdenum
PEG 10034	14	0
10035	8	0
10037	10	0
10038	13	0
10039	4	0
10040	13	0
10041	14	0
10042	14	0
10043	12	0
10044	16	0
10045	16	0
10046	16	0
10047	12	0
10048	12	0
10049	13	0
10050	13	0
10051	14	0
10052	12	0
10053	21	0
10054	12	0
10055	12	0
10056	14	0
10057	14	0
10058	13	0
10059	13	0
10060	14	0
10061	16	0
10062	6	0
10067	10	0
10071	13	0
10072	10	0
10073	14	0
10077	13	0
10078	20	0
10079	8	0
10080	8	0
PEG 10081	7	0
10088	21	0
Mo 10089	21	0
10091	54	1
Std., #22	54	17

Certified by .....



GEOLOGICAL LEGEND

CENOZOIC

Tertiary

[4] Carmacks Volcanics - basalt and related basic dikes
4a - related andesite-dacite porphyries

MESOZOIC

Jurassic - Upper Cretaceous

[3] Minor Intrusives - granite-diorite, quartz-feldspar porphyries
3a - associated aplite and pegmatite dikes

[2] Klotassin Batholith - hornblende-biotite-quartz granite, monzonite. Minor dioritic phases.

PRECAMBRIAN and LATER

[1] Yukon Group - biotite-hornblende schists and gneisses

LEGEND

- x — isolated boulders
- boulder train
- outcrop
- talus with direction of slope
- assumed geological contact
- creek
- swamp
- claimpost
- campsite

Association of Professional Engineers of the Yukon Territory
R. G. HILKER
GEOLOGICAL ENGINEER

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

Sheets 115-J-10 & 115-J-15

GLENLYON MINES LTD. (NPL)

GEOLOGY
PEG CLAIMS

DATE: AUG. 10/70 | SCALE: 1" = 400'