



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

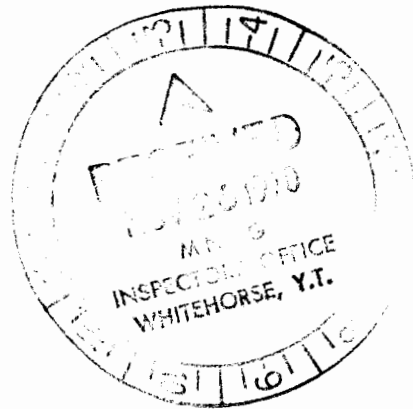
GEOLOGICAL AND GEOCHEMICAL REPORT
ON THE
CASH 1-24 (Y44126-Y44149)
AND
GUN 251-258 (Y44906-Y44913) AND GUN 281-288 (Y44914-Y44921)
MINERAL CLAIMS
DAWSON RANGE AREA
YUKON TERRITORY

62° 40' N LATITUDE
138° 52' W LONGITUDE
N.T.S. DESIGNATION: 115-J-10
WHITEHORSE MINING DIVISION

BY
G.G. CARLSON, GEOLOGIST
OF
R.G. HILKER LIMITED
WHITEHORSE, YUKON TERRITORY

31 AUGUST 1970

UNDER THE SUPERVISION OF
R.G. HILKER, P.ENG.



This report has been examined by the Geological Evaluation Unit and is recommended to the Government to be considered as a report of the Geological Survey of Canada in the amount of

\$4,497.76

J. B. Craig

Commissioner of Yukon Territory
Conducts Geological Evaluation work under
Section 5 of the Yukon Territorial Mining Act.

[Signature]
Commissioner of Yukon Territory

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
LIST OF PERSONNEL	2
LOCATION AND ACCESS	3
Sketch #1 (Location and Access)	
CLAIMS	5
Sketch #2 (Claims Location)	
GEOLOGY:	
GENERAL GEOLOGY	6
Sketch #3 (General Geology)	
REFERENCE TO PUBLISHED GEOLOGY	8
GENERAL TABLE OF FORMATIONS	9
CLAIM GEOLOGY	11
TABLE OF FORMATIONS (CASH & GUN CLAIMS)	13
GEOCHEMICAL SURVEY:	
INTRODUCTION	14
TOPOGRAPHY, VEGETATION AND SOILS	18
INTERPRETATION	20
CONCLUSIONS	24
RECOMMENDATIONS	25
SUMMARY OF EXPENDITURES	27
CERTIFICATION OF EXPENDITURES	27
CERTIFICATION OF REPORT	28
 APPENDIX:-	
ROCK SAMPLE DESCRIPTIONS	
INVOICE	
ASSAY CERTIFICATES	
 POCKET:-	
GEOCHEMISTRY MAP (includes Claim Post and Rock Sample locations)	

INTRODUCTION

A crew of one linecutter, one soil sampler and one helper arrived on the Cash claim group on August 22nd, 1970. The crew travelled from Whitehorse to the Casino airstrip using a Cessna 172 and a Cessna 206 from Globe Airways. The move from Casino to the campsite, in the north corner of the Cash claim group, was by Trans North Turbo Air using a Bell 206 Jet Ranger.

Between August 22nd and August 29th, a program of just under 8 miles of linecutting and soil sampling was carried out. The crew was returned to Whitehorse on August 29th, 1970, using the same transportation as for the mobilization.

The Cash and Gun claim groups are located within and on the west side of the Casino Creek valley, in the vicinity of its confluence with Dip Creek. A baseline and a parallel tie line were cut at 3,000-foot separation approximately along both claim location lines, for a distance of 15,000 feet each. In addition, two 6,000-foot crosslines were cut perpendicular to the baseline. Linecutting was commenced with the baseline which was cut in a southwesterly direction from Post #1, Cash 13 and 14.

Soil sampling was carried out at 100-foot spacings along the baseline, tie line and crosslines. At the same time, rock specimens were taken from all rock outcrops encountered and any claim posts located were tied in to the grid system.

LIST OF PERSONNEL

The following personnel of R.G. Hilker Limited were directly involved in the exploration program on the Cash and Gun claim groups for La Ronge Mining Limited (N.P.L.):

<u>Name</u>	<u>Address</u>	<u>Position</u>
R.G. Hilker, P.Eng.	Box 566 Whitehorse, Y.T.	Geologist - supervision and report preparation
G.G. Carlson	Box 548 Whitehorse, Y.T.	Geologist - report preparation
G. Hillson	St. Andrew's College Saskatoon, Sask.	Soil Sampler - trained by R.G. Hilker Limited
N. Marty	6216 - 150th St. N. Surrey, B.C.	Helper
L. Boucher	Box 3245 Whitehorse, Y.T.	Linecutter

LOCATION AND ACCESS

The Dawson Range lies in the west central part of the Yukon, between latitudes 62° 00' and 62° 45' north and longitudes 137° 00' and 140° 00' west. The range trends approximately N 45° W, with a length of about 110 miles and a width of 20 miles. It is roughly parallel to the Yukon River, which lies to the north and east, and is cut off by the White River on the northwest, and by the Donjek and Nisling Rivers on the southwest. Physiographically, it is bounded by the Klondike Plateau to the north and by the Lewes Plateau to the southwest.

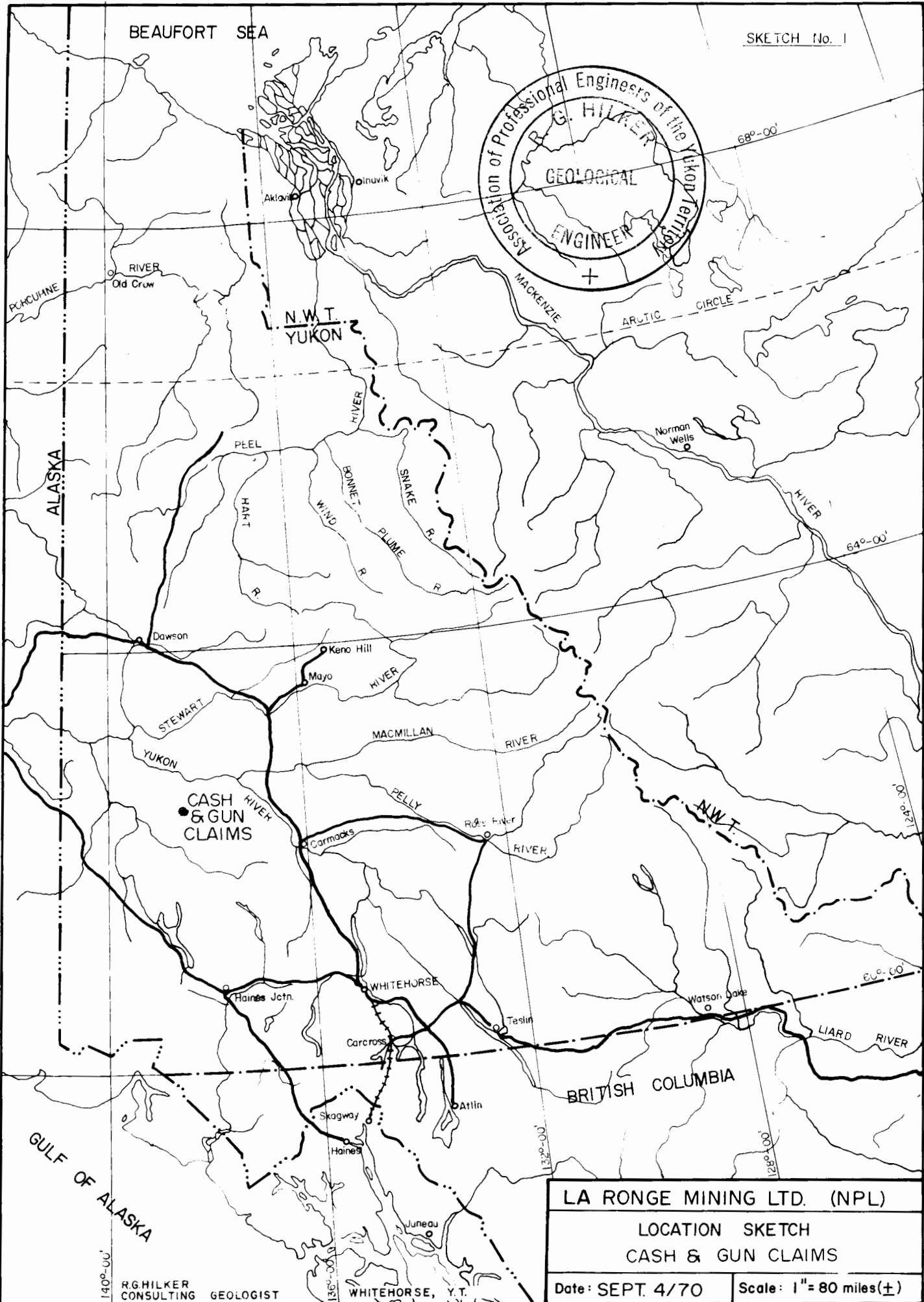
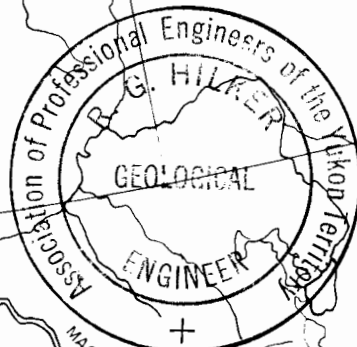
The Cash and Gun claim groups (Cash 1-24 inclusive, and Gun 251-258 and Gun 281-288 inclusive) are located at approximately 62° 40' north latitude and 138° 52' west longitude. The groups are located over the area of the confluence of Dip Creek and Casino Creek and along Casino Creek to the edge of the property of Casino Silver Mines. This is roughly six miles due south of the Casino Mines drill site. The claims are located within the Whitehorse Mining Division, on Claim Sheet 115-J-10, in the Dawson Range of the Yukon Territory.

The Casino Mines discovery has opened up access to the area to some extent. A winter road, leaving the Alaska Highway at Mile 1097, follows Dip Creek and then Casino Creek, through the Cash and Gun claims, to the Casino drill site. Because of some areas of muskeg, this route is impassable after

thaw. Best access to the area is by air. The Casino airstrip, 194 miles from Whitehorse, is in good condition and will accommodate fixed-wing aircraft as large as a DC-3. Here, Trans North Turbo Air is maintaining a helicopter base for access to outlying properties. Helicopter transportation may be taken directly from Whitehorse or Carmacks.

BEAUFORT SEA

SKETCH No. 1



LA RONGE MINING LTD. (NPL)	
LOCATION SKETCH	
CASH & GUN CLAIMS	
Date: SEPT. 4/70	Scale: 1" = 80 miles (±)

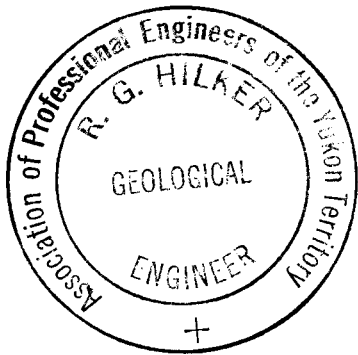
R.G.HILKER
CONSULTING GEOLOGIST
WHITEHORSE, Y.T.

CLAIMS

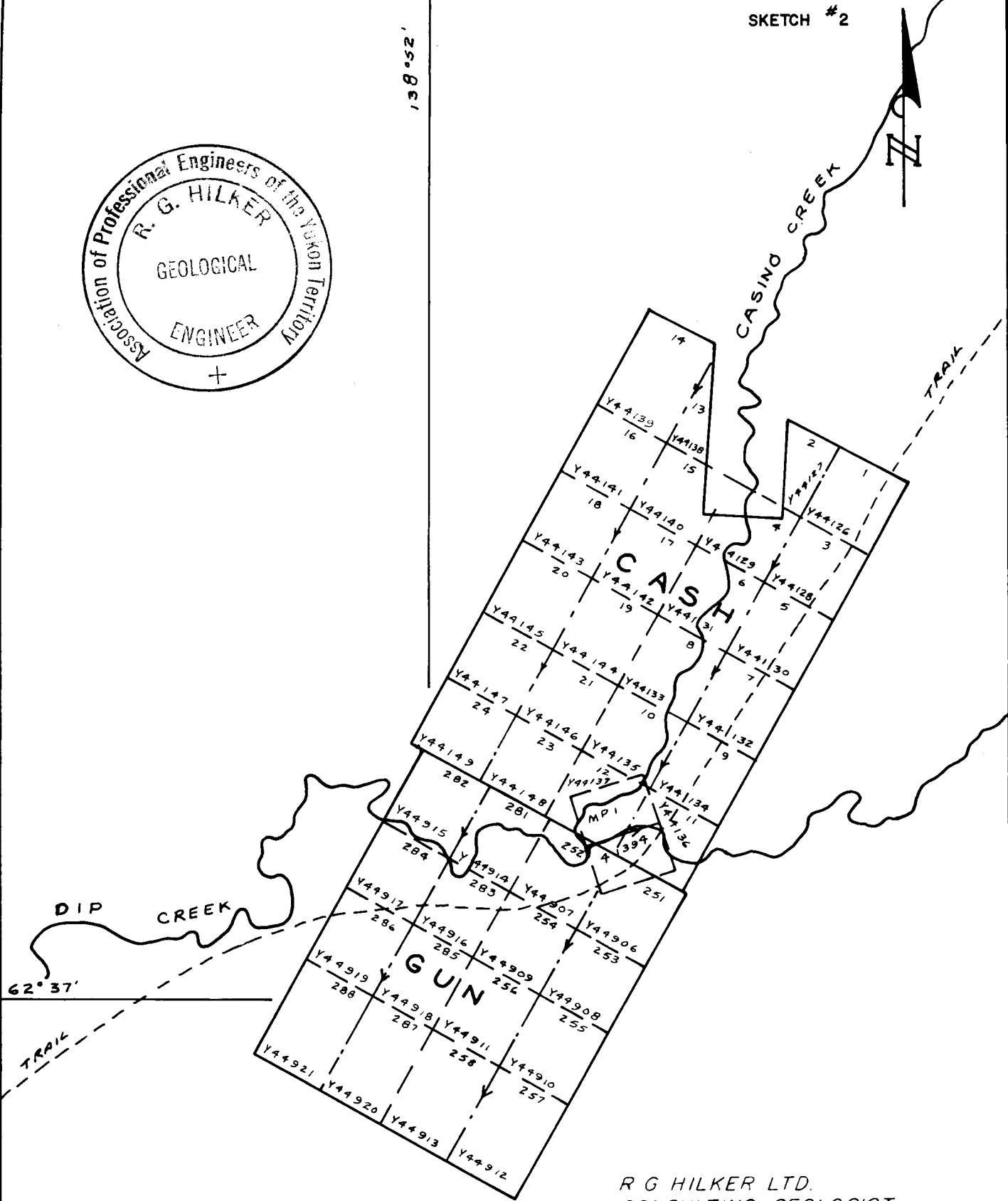
The following information was obtained during a search of the records at the Mining Recorder's Office, Whitehorse Mining Division, Whitehorse, Y.T., by G.G. Carlson:

<u>Claims</u>	<u>Grant Nos.</u>	<u>Anniversary Date</u>	<u>Recorded Owner</u>
Cash 1-24 (inclusive)	Y44126-Y44149 (inclusive)	Dec. 11, 1970	La Ronge Mining Ltd. (N.P.L.)
Gun 251-258 (inclusive)	Y44906-Y44913 (inclusive)	Dec. 17, 1970	La Ronge Mining Ltd. (N.P.L.)
Gun 281-288 (inclusive)	Y44914-Y44921 (inclusive)	Dec. 17, 1970	La Ronge Mining Ltd. (N.P.L.)

SKETCH #2



138°52'



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

SHEET 115-J-10

LA RONGE MINING LTD (N.P.L.)

CASH & GUN GROUPS

CLAIMS LOCATION

DATE-FEB-11-70

SCALE-1"= 1/2 MI.

GEOLOGY

GENERAL GEOLOGY

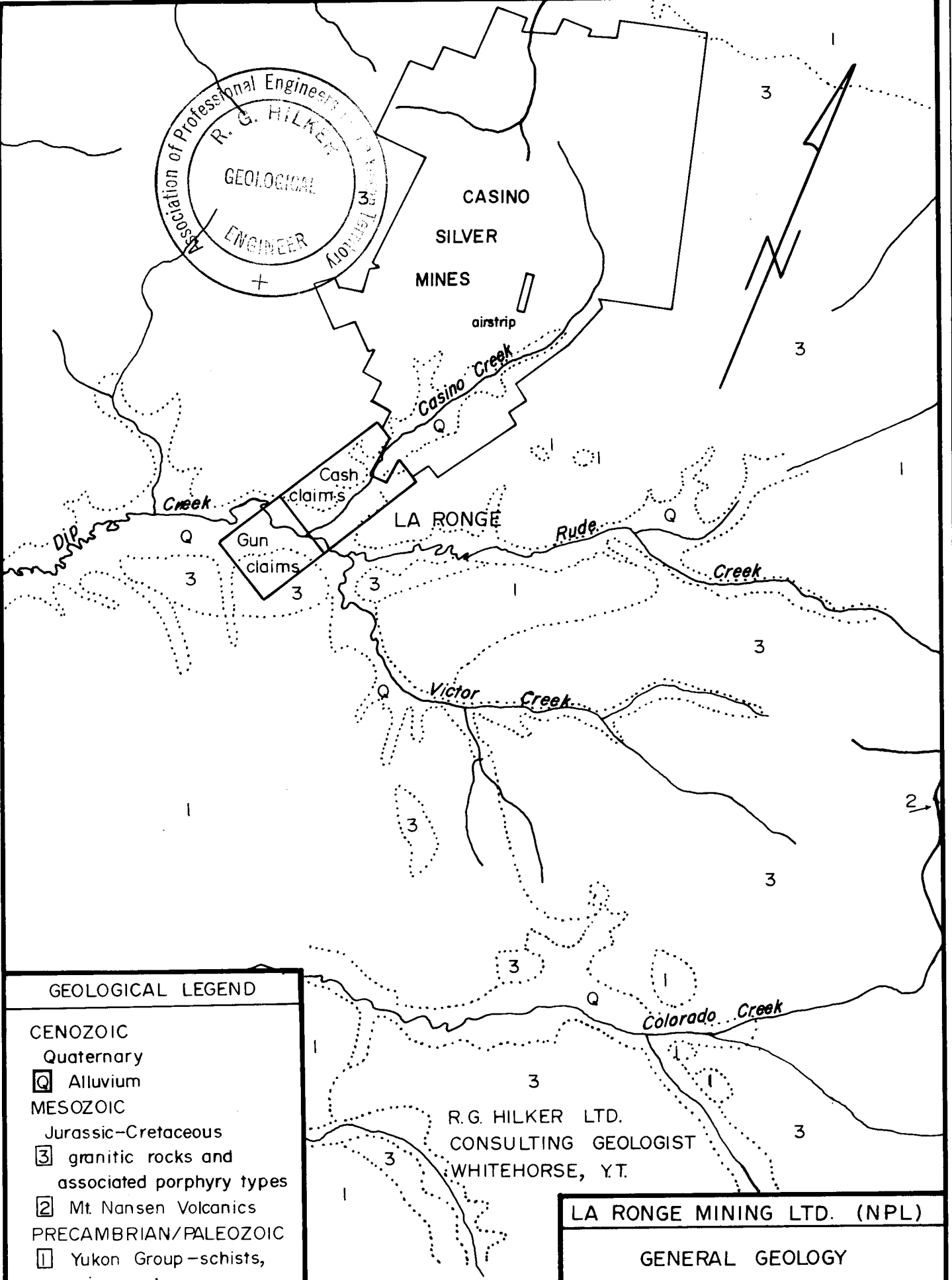
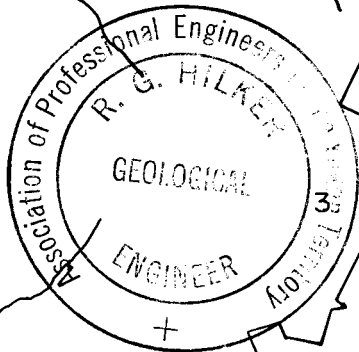
The Dawson Range occurs in the physiographic Yukon Plateau Province. It is a mountainous terrain, with peaks rising more than 2,000 feet from the level of the plateau, and elevations within the range varying from 3,000 feet to 6,600 feet. Almost all of the area has been left completely untouched by recent glaciation. Thus, the outcrops, which predominate on the mountain tops and ridges, are quite irregular. They are very jointed, fractured and highly weathered due to frost heaving 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 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 and 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% orthoclase 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 feldspar, 15% clear quartz, augite and fine to coarse crystalline biotite.



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

LA RONGE MINING LTD. (NPL)	
GENERAL GEOLOGY	
DATE: SEPT. 3/70	SCALE: 1" = 2 mi.

after Cairnes, 1916

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.

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 mi. 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.

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, andesite 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.

PRECAMBRIAN & LATER

Yukon Group

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

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

CLAIM GEOLOGY

Very little outcrop exists on the Cash and Gun claim groups. The geology that is available for inspection was not mapped during the present program, but rock samples were collected by the soil samplers. These were taken from all rock outcrops observed within the claim area, and a total of five samples were taken. The sample locations have been plotted on the Geochemical Survey Map (see Pocket).

All five rock samples are coarse grained and granitic, with little visible alteration except for minor rusty weathering. Magascopic descriptions of each sample have been included in the Appendix to this report. The average mineralogical composition is as follows:

(silicic) feldspar	55%
quartz	15%
mafic minerals	30%

The feldspars appear to be mainly orthoclase with some sodic plagioclase, although an exact determination is difficult as there are no well defined crystals and light rusty weathering obscures most surfaces. Quartz is mainly clear and the mafic minerals consist of approximately equal pyroxene (augite) and biotite. The pyroxene occurs often as quite large (to 15 m.m.), well-formed and highly impure stubby crystals, with inclusions of mainly biotite. A large proportion of these crystals, however, are elongated. These crystals may be either hornblende or

tourmaline, although both of these would be unlikely to occur in such proportions. No cleavage or typical end cross section is evident on these crystals, and they have therefore been classified with the pyroxene. An exact classification of these rocks is difficult without proper determination of the feldspars, but they would appear to range between quartz monzonite and granodiorite.

These rocks are typical of the Klotassin Batholith in this area. Other geological investigations in the general vicinity have produced a local Table of Formations which appears on the following page. According to the G.S.C. mapping, the two claim groups occur entirely within the intrusive body, while a large area of Yukon Group sediments occurs to the south. However, small sedimentary inclusions and xenoliths of the Yukon Group are probably abundant within the main intrusive in the area of the claims. Secondary minor intrusions of aplite and, to a lesser extent, pegmatite dikes, as well as basic dikes related to the more recent Carmacks volcanics, are probably also present here. These latter rocks are Units 3 and 4 respectively, on the Table of Formations for the claim groups.

The economic potential of this area may not be determined from the geology due to the lack of precise information on the actual rocks within the claim group and also due to the difficulty in observing any major structural features throughout this entire zone.

TABLE OF FORMATIONS - CASH AND GUN CLAIMS

CENOZOIC

Tertiary

- 4 - Carmacks Volcanics - basalt and related basic dikes

4a - related andesite-dacite porphyries.

MESOZOIC

Jurassic - Upper Cretaceous

- 3 - Minor Intrusives - granite to diorite, quartz-feldspar porphyries.

3a - associated (?) aplite and pegmatite dikes.

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

PRECAMBRIAN AND LATER

- 1 - Yukon Group - biotite-hornblende schists and gneisses.

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.

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 "C" soil horizon, or the layer directly beneath the surface humus-rich "A" horizon. As the soils in this areas 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.

After collection, samples were wired in strings of 30 to 40 samples, they were partially dried, and were 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" = 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:

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

$$s = \left(\frac{(n(\sum \text{P.P.M.})^2 - (\sum \text{P.P.M.})^2)}{n(n-1)} \right)^{1/2}$$

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

n = total number of values

\bar{x} = arithmetic mean

s = standard deviation

.../17

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.

TOPOGRAPHY, VEGETATION AND SOILS

The Cash and Gun claims are located in a generally low-lying region, roughly centred on the Casino Creek valley and extending into the Dip Creek valley. As a result a large proportion of the grid exists in a "bench" environment on the main wide and relatively flat creek valley floors. Soils here are mainly alluvial sand and clay, with a thick humus, moss and grass covering. Other vegetation consists mainly of buckbrush with scattered spruce. Sampling in this environment is difficult due to the thick organic and humus covering over the soils and often frozen soil conditions. In addition, anomalous metal values obtained from soils in this environment must be treated with respect, as the metal ions could well be derived from an upstream source.

A large portion of the baseline and the west side of the two crosslines occurs in the "slope" environment on the west slope of the Dip Creek valley. Vegetation here consists of mixed spruce and poplar with undergrowth and moss covering the soil. Soils are well drained and residual, consisting of mainly sand with clay and gravel fractions. Geochemically, these soils are quite well representative of bedrock conditions below and upslope from their present location. Actual sampling conditions are very good in these areas, except where boulders are overly abundant and soil is scarce.

Soil pH has been previously tested in this vicinity and throughout the Dawson Range, and values have been found to be generally slightly acidic. Values as low as 5.0 occur in the organic-rich soils in "bench" environments. However, it appears that pH is not an important controlling factor in the trace metal occurrences in the soils of this area.

INTERPRETATION

The soil assay values for copper and molybdenum, in parts per million, have been plotted on the grid map at a scale of 1" = 400'. In addition to this, the approximate boundaries of the edge of the valleys, or the division between the "bench" and "slope" environments, has been indicated by a dashed line.

The statistical evaluation has given a mean of 24 and a standard deviation of 12 for the copper values. The mean value indicates that the values are generally low. This is a typical background for surveys of this type in the Dawson Range area. The standard deviation is also low, indicating very little variance about the mean.

Theory and experiment have shown that values greater than the mean plus one standard deviation are "possibly anomalous", and values greater than the mean plus two standard deviation are "probably anomalous". Thus, copper values greater than 36 are possibly anomalous, greater than 48 are probably anomalous, and as previously mentioned, molybdenum values greater than 1 are probably anomalous. Using these values, statistical anomalies may be defined.

Two main statistical anomalies occur on the grid, and have been labelled Zones "A" and "B".

Zone "A" occurs along Line 30+00E from 31+00S to 48+00S and along Line 49+00S from 32+00E to 45+00E, where it is still

open. Within these anomalies, several values are "possibly anomalous", while an equal number are "probably anomalous". As is evident on the geochemical map, this anomaly occurs entirely on the floor of Casino Creek valley, or within the "bench" environment. The soils here are composed of either sand or clay, both of which are probably slightly acid. Therefore, copper in the soils here is probably quite mobile, and a source for the copper ions may be either local or distant. As both copper and molybdenum from the Casino deposit are also reported to be highly mobile, some contamination from this source would be expected along Casino Creek. However, Line 23+00S, which traverses the entire creek valley upstream from Zone "A", contains no anomalous values. The bedrock source of these copper ions, therefore, is expected to be either to the east or the west of Line 30+00E, east of the baseline, and between Lines 23+00S and 49+00S. This potential zone is open to the east, beyond the boundary of the claim group, and possibly also to the southeast. Very few anomalous molybdenum values are associated with Zone "A", possibly due to its poor mobility in an acid environment. This effect would not be expected in only slightly acid soils which are thought to exist at surface, but acidity may increase at depth.

The second anomaly, labelled Zone "B", occurs along Line 30+00E from 12+00N to 0+00N. This anomaly is very weak, and contains no anomalous copper values. The molybdenum values

are quite anomalous for this area, but they are still not strong. This anomaly occurs in a "slope" environment, and thus anomalous copper values should substantiate the molybdenum for a significant zone. Also, the anomaly occurs on a fairly steep slope, and the bedrock source of the molybdenum ions, due to groundwater flow, would be probably outside the claim group and to the northeast.

The Zone "A" anomaly, however, requires further investigation. It is a low grade anomaly, considering the relatively low anomalous values. The lateral extent is quite great, running 1500 feet in a north-south direction for 1300 feet in an east-west direction. This surface expression appears to be reflecting a bedrock condition which is not too distant from the anomaly centre and quite probably within the claim group. The nature of this bedrock source is very difficult to predict. Higher than normal concentrations of copper could be associated with any of the rock types which are found in this area, or trace amounts of copper mineralization could be associated with a shear or fault zone.

Substantiation of the strength and extent of this anomaly may be accomplished by means of a more extensive geochemical program with samples taken as deeply as possible using a hand or mechanical auger. The overburden covering here would be expected to be quite thick, frozen, and possibly largely alluvial. Therefore, it would be hoped that a more intensive

survey would strengthen the anomaly to provide a basis for geophysical investigation.

CONCLUSIONS

The Cash and Gun claim groups appear to be underlain by the major Klotassin intrusive. Since there is little rock exposure, and geological mapping has not been carried out, little comment may be made on detailed geology.

The soil sampling program has indicated two statistical anomalies. Zone "A" is an interesting, although low grade, copper anomaly with minor anomalous molybdenum. The cause of this anomaly is uncertain, but the bedrock source of these copper ions appears to be located within the claim group. The relatively low anomalous values here may be due to suppression by heavy clay-rich overburden.

The Zone "B" anomaly shows weakly anomalous molybdenum values, probably derived from a location outside the claim group, and no anomalous copper values. This zone does not warrant more detailed investigation at this time.

Further exploration over the Zone "A" anomaly, as detailed under the recommendations which follow, would be necessary to understand more about the bedrock source of the copper ions, its possible strength, and continuity.

RECOMMENDATIONS

A more closely-spaced soil sampling program, accompanied by geological mapping, would be necessary to more fully define the Zone "A" anomaly. This would be followed by a second phase program consisting of an I.P. survey if warranted.

A grid of lines spaced 400 feet apart should be cut over the Cash claim group. This would entail approximately 24 linemiles. These lines should be sampled at 100-foot intervals using either a hand or mechanical auger. Sample material should be taken from the deepest horizon possible. At the same time, geological mapping should be carried out at a scale of 400 feet to the inch, over the new grid system.

Should results of the first phase program warrant it, a second phase I.P. survey should be carried out. This would entail a program with 100-foot and 400-foot electrode spacings over the anomalous zone, plus expanders to determine overburden depth.

The following expenditures for the two-phase geochemical, geological and geophysical program for the Cash claim group are recommended:

Phase 1:

Linecutting (24 linemiles @ \$85.00)	\$ 2,040.00
Geological Mapping	2,400.00
Soil Sampling Program:	
Sample 24 linemiles @ \$100 ...	2,400.00
Determinations for Cu, Mo	
and PB @ \$1.65	1,272.00
Freight for samples	<u>150.00</u>
	3,822.00

Camp Costs	\$1,800.00
Radio Rental	300.00
Transportation	2,500.00
Report Preparation	1,000.00
Contingencies	<u>1,380.00</u>
TOTAL (Phase 1)	<u>\$15,242.00</u>

Phase 2 (if warranted):

Induced Polarization Survey:

I.P. Survey (10 linemiles @ \$350.00)	\$3,500.00
Transportation	1,500.00
Camp Supplies	500.00
Report	500.00

Contingencies	<u>600.00</u>
---------------------	---------------

TOTAL (Phase 2)	<u>\$ 6,600.00</u>
-----------------------	--------------------

TOTAL PROGRAM (Phase 1 and Phase 2)	<u>\$ 21,842.00</u>
---	---------------------

SUMMARY OF EXPENDITURES

The following costs were incurred during the evaluation program carried out on the Cash and Gun claim groups between August 22nd and August 29th, 1970 (invoices are included in Appendix of this report):-

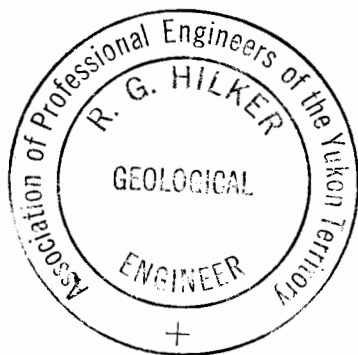
Transportation:		
Fixed-wing aircraft	\$ 738.65	
Helicopter	<u>359.11</u>	\$ 1,097.76
Linecutting		700.00
Camp Costs		600.00
Geochemical Survey:		
Geochemical Sampling	\$ 900.00	
Geochemical Determinations	<u>700.00</u>	1,600.00
Assessment Work Report		<u>500.00</u>
TOTAL		<u>\$ 4,497.76</u>

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 Cash and Gun claim groups as stated above, is a true statement to the base of my knowledge.



R.G. Hilker, P.Eng.
Whitehorse, Yukon Territory
August 31st, 1970

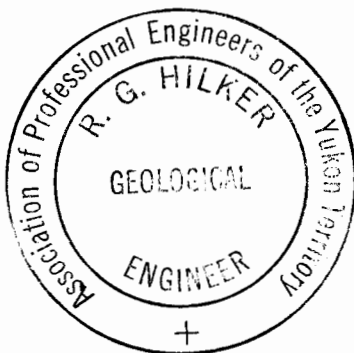


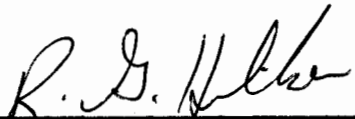
CERTIFICATION

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 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 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, geologist, on the CASH 1-24 and GUN 251-258 and GUN 281-288 claim group in the Whitehorse Mining Division of the Yukon Territory, from August 22nd to August 29th, 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 La Ronge Mining Limited (N.P.L.) nor do we expect to receive any.

DATED this 31st day of August, A.D. 1970.





R.G. Hilker, P.Eng.

A P P E N D I X

ROCK SAMPLE MEGASCOPIIC EXAMINATION

Sample No.	Description										
1	<p>Coarse grained, fresh, granitic - slight shearing gives minor foliation.</p> <table><tr><td>plagioclase)</td><td>60%</td></tr><tr><td>orthoclase)</td><td></td></tr><tr><td>quartz</td><td>10-15%</td></tr><tr><td>biotite</td><td>15%</td></tr><tr><td>pyroxene</td><td>10-15%</td></tr></table> <p>Note: Up to 50% of crystals defined as pyroxene are elongated in one dimension. These show no distinct cleavage or end cross section.</p>	plagioclase)	60%	orthoclase)		quartz	10-15%	biotite	15%	pyroxene	10-15%
plagioclase)	60%										
orthoclase)											
quartz	10-15%										
biotite	15%										
pyroxene	10-15%										
2	<p>Coarse grained, fresh, granitic - porphyritic, with impure stubby pyroxene phenocrysts to 18 m.m. - light rust on weathered faces.</p> <table><tr><td>plagioclase)</td><td>55-60%</td></tr><tr><td>orthoclase)</td><td></td></tr><tr><td>quartz</td><td>10%</td></tr><tr><td>pyroxene</td><td>20%</td></tr><tr><td>biotite</td><td>5-10%</td></tr></table>	plagioclase)	55-60%	orthoclase)		quartz	10%	pyroxene	20%	biotite	5-10%
plagioclase)	55-60%										
orthoclase)											
quartz	10%										
pyroxene	20%										
biotite	5-10%										
3	<p>Coarse grained, fairly fresh granitic rock - porphyritic with pyroxene phenocrysts to 12 m.m.</p> <table><tr><td>plagioclase)</td><td>50%</td></tr><tr><td>orthoclase)</td><td></td></tr><tr><td>quartz</td><td>20%</td></tr><tr><td>pyroxene (?)</td><td>15%</td></tr><tr><td>biotite</td><td>15%</td></tr></table>	plagioclase)	50%	orthoclase)		quartz	20%	pyroxene (?)	15%	biotite	15%
plagioclase)	50%										
orthoclase)											
quartz	20%										
pyroxene (?)	15%										
biotite	15%										
4	<p>Coarse grained, granitic, light rust throughout rock - porphyritic, with impure pyroxene phenocrysts to 12 m.m.</p> <table><tr><td>plagioclase)</td><td>45-50%</td></tr><tr><td>orthoclase)</td><td></td></tr><tr><td>quartz</td><td>20-25%</td></tr><tr><td>pyroxene</td><td>15%</td></tr><tr><td>biotite</td><td>15%</td></tr></table>	plagioclase)	45-50%	orthoclase)		quartz	20-25%	pyroxene	15%	biotite	15%
plagioclase)	45-50%										
orthoclase)											
quartz	20-25%										
pyroxene	15%										
biotite	15%										

Sample No.	Description
5	Coarse grained, mainly fresh granitic - phenocrysts of pyroxene less prominent - to 8 m.m.
	plagioclase) 55-60% orthoclase) quartz 10-15% pyroxene 15-20% biotite 15%



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

La Ronge Mining Limited
248 - 2nd Avenue
KAMLOOPS, B.C.

AUGUST 31st, 1970

INVOICE NO. 1053

Contract

Linecutting	\$700.00	
Geochemical Sampling	900.00	
Geochemical Determinations ...	700.00	
Camp Costs	600.00	
Assessment Work Report	<u>500.00</u>	\$3,400.00

Transportation

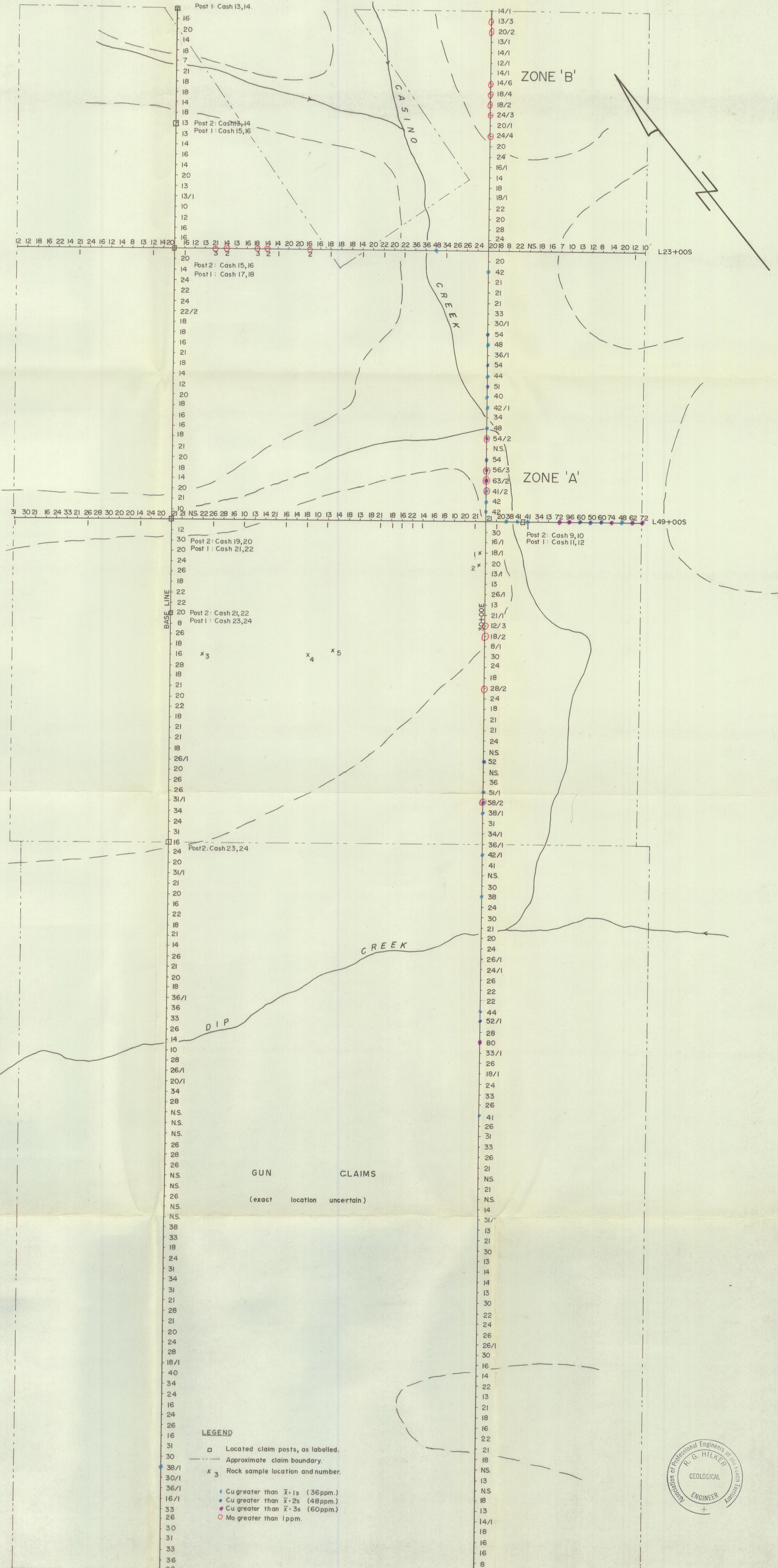
Aug. 22/70, Inv. No. 1395 (Ticket 253), Terrikon Enterprises Ltd	\$327.25	
Aug. 29/70, Inv. No. 1473 (Ticket 260), Terrikon Enterprises Ltd	243.10	
Aug. 29/70, Inv. No. 1474 (Ticket 280), Terrikon Enterprises Ltd	168.30	
Aug. 31/70, Inv. No. 53570 (Ticket 6340), Trans North Turbo Air Ltd	208.09	
Aug. 31/70, Inv. No. 54470 (Ticket 6342), Trans North Turbo Air Ltd	<u>151.02</u>	1,097.76

TOTAL INVOICE \$4,497.76

ASSAY CERTIFICATES

Certificates of Analysis for all soil samples tested, from Chemex Labs Limited in North Vancouver, are on file in the office of R.G. Hilker Limited, #8 Northern Metallic Building, Whitehorse, Yukon Territory.

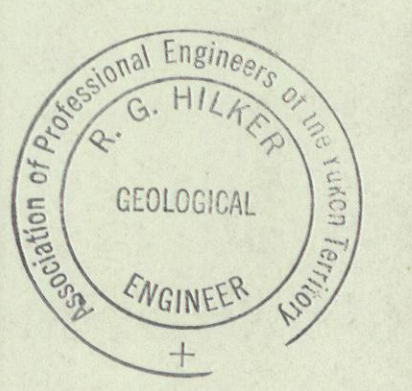
* * * * *



NOTE: Copper values are shown to the left, and moly to the right, as in 24/2. Along the cross lines, copper is shown above the line and moly below. Where moly is not indicated, its value is zero. All values are in parts per million. Approximate valley floor boundaries are indicated by a dashed line.

LEGEND

- Located claim posts, as labelled.
- - - Approximate claim boundary.
- x₃ Rock sample location and number.
- Cu greater than $\bar{x} + 1s$ (36ppm.)
- Cu greater than $\bar{x} + 2s$ (48ppm.)
- Cu greater than $\bar{x} + 3s$ (60ppm.)
- Mo greater than 1ppm.



R. G. HILKER LTD.
CONSULTING GEOLOGIST
WHITEHORSE, YT.

CLAIMS SHEET 115-J-10
LA RONGE MINING LTD. (NPL)
GEOCHEMICAL SURVEY
CASH & GUN CLAIMS
DATE: SEPT. 5/70 SCALE: 1" = 400'