

Geochemical, Geophysical and  
Geological Report on the  
Kel Claims 1 - 48  
Claim Sheet No. 115A-6  
Mush Lake, Yukon

Lat. 60° 15' - 60° 30' Long. 137° 00' - 137° 30'

This report has been examined by  
the Geological Evaluation Unit.  
Approved as to technical worth by:

*J. B. Gray*  
RESIDENT GEOLOGIST

Approved as to cost in the amount  
of \$ 4800.00 \*

*R. S. Redfern*  
RESIDENT MINING ENGINEER

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

*[Signature]*  
COMMISSIONER OF YUKON

\* This includes reports by Everett J. Lees  
dated May 14 Nov. 9, 1968 ~~AKH~~  
and R. J. Cathro dated August 27  
and Sept 9, 1968, R. J. R.

Wm. Dollery-Pardy, B.A.

July - September 1968.

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#### Maps and Sections

1. Geological & Geophysical Map
2. Cross Section and Geological Column
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### Introduction

From July to September, 1968, a preliminary exploration program on the Mush Lake claims of Kel-Glen Mines Ltd. (N.P.L.) was carried out.

The claims, 48 in number, are located north of the east end of Mush Lake, Yukon territory in the approximate location of latitude  $60^{\circ} 15'$  -  $60^{\circ} 30'$  and longitude  $137^{\circ} 00'$  -  $137^{\circ} 30'$ . They are printed on Claim sheet 115A-6 of the Department of Northern Affairs and National Resources.

The program was conducted from August 1st to September 30th by Wm. Dollery-Pardy, B.A., Geologist with a staff of 6 assistants. These included:

T. Fenton, Prospector	Wm. Dollery-Pardy, Geologist
D. Apps, Helper	C. Cote', Helper
E. Eagen, Helper	
J. Smarch, Helper	
T. Yardley, Helper	

The total number of man days worked in the season are as listed:

	Days	Total Wages
W. Dollery-Pardy	60	1760.80
T. Fenton	123	2090.95
C. Cote	23	374.40
E. Eagen	119	1760.80
D. Apps	125	1897.52
J. Smarch	43	656.58
T. Yardley	<u>26</u>	<u>429.19</u>
Totals	<u>519</u>	<u>\$8669.24</u>

#### Control Survey

The Mush Lake Group of claims have been tied in by the survey by Brunton and chain of the Mush Lake road and the subsequent new road to the upper prospect.

A bench mark was established on the southeast corner of the cabin on the north east corner of the lake. From here, the road was chained and compass directions to the east to a point considered to be well outside the claim group was established.

A set of co-ordinates based on 25+00N and 25+00E, the bench mark on the cabin, was set up with the theoretical 00+00 a minimum of 25,000 feet established to the south and west.

Stations were put along the road survey at approximately 800 to 1200' apart as reference points to the east and, after plotting on paper the co-ordinates, permanent posts were erected along the road as measured on the map.

Co-ordinates extend from the west at 20+00E to the east at 36+00E and the south 23+00N to 40+00N.

Lines were cut as centre lines for the 48 claims and for the geochemical and geophysical survey. These total a distance of 6 miles. Geophysical and geochemical lines totalling 22, 5000 feet were cut on claims Kel 1 - 8.

#### Road Construction

A tote road was built from the south end of the claims at 24+00N and 31+00E to 34+00N and 34+00E.

The work was done by a D-6 cat by G. Malone of Germal Construction of Whitehorse and consisted mainly of initial slashing and clearing.

From the lower section the entire road was surveyed by Brunton compass and chain and the total length computed to be 14,002 feet.

The top section was not cut through to the existing Dalton creek road although it was flagged through. This portion was covered by swamp and it was considered that extensive fill in work would be required to raise the surface above the seepage. In winter season this can be cut through by axe and run through without difficulty.

The D-6 was brought in by low deck troller and returned from the lodge by the same. Transportation costs were paid by the company under the agreement that it would be returned if less than 100 hours work were performed.

Costs for transportation	\$ 292.00
Costs for road work	<u>1188.00</u>
Total	<u><u>\$1480.00</u></u>

## Geology

### General

The Mush Lake volcanics have been described by Kindle, (Kindle, E.D., 1953 Dezadeash Map-Area, Yukon Territory, Mem 268 G.S.C.) as part of the assemblage of the Mush Lake Group. The belt extends continuously for 67 miles south easterly from the south side of Kimberley Creek in the north west to Mount Beaton a few miles west of the Haines Road on the British Columbia-Yukon boundary. The belt is 1½ miles wide south of Kimberley Creek and 8 miles wide at Mush Lake.

Fine-grained flows of green andesite, spotted with small dark hornblende crystals and with scattered calcite-filled amygdules, compose the most easterly outcrops on the north shore of Mush Lake. It is within this particular flow types that the writer has concentrated on obtaining samples and began an initial attempt to define the particular flows in relationship to the ore deposition.

Of the most prevalent andesitic types it became apparent after only the most cursory examination that the association of the ore was primarily concentrated in the zone of the amygdaloidal andesites which exhibited stress characteristics. This however, does not prove to be a conclusive definition as sampling done across an outcrop

(co-ordinates 24+00N and 30+00E) which appeared to be a basic sample ran by assay into only trace results.

Samples: KG-68-42 Tr

KG-68-43 Tr

It was possible to detect very minor amounts of native copper with the aid of a 10-power lens.

Between  $\frac{1}{2}$  and 2 miles east of Mush Lake, the road to the lake skirts a low mountain ridge composed of thick, massive flows of light green and black basalts lavas. Some of the basaltic rocks exposed along the road a mile east of the lake exhibit small spotted zones that are stained green with malachite as the result of the weathering of a little contained chalcocite. Several samples of epidotized andesite obtained from the top of the ridge contained finely disseminated native copper (Kindle).

#### Structure

The Mush Lake group is considered to be of Triassic or Jurassic age as the stratigraphic position underlies the Dezadeash Lower Cretaceous sediments.

The strike of the flows is northwest-southeast and dips steeply from  $75^{\circ}$  to  $85^{\circ}$  to the northeast and in places nearly vertical. Vertical examination of the

topography from the northern exposures to the southern shore of Mush Lake show quite strongly that the particular section of the volcanics in which the ore was deposited was the east limb of the Silver Creek anticline. The sediments of the Dezadeash group overlie with an unconformity; the volcanics with, in this section, the contact being sharply defined by Dalton Creek.

Much of the property is overlain by overburden much of which has been deposited by the withdrawal of the Quaternary glaciation. The more resistant and compact lava flows have produced a series of benches with limited outcrops but fairly defined ridges descending transverse to Little Dalton creek. Deposits of glacial till, cut by erosion, the east side of the creek have produced gulches through which intermittent streams and water passes occur. Minor mudslides, probably produced in the spring run-offs have denuded the hills in several places.

Little Dalton creek itself commences abruptly at the top section after meandering in a dendritic pattern through a swamp area. Although no definite evidence remains to indicate that the creek could be construed as a fault in this area, further down the sharply defined walls of a

small cut through which the creek descends in a small waterfall seems to point out that this possibility can be fairly assumed.

Small cross faults or fractures transverse the creek throughout its length. In most places they are characterized by gullies with few outcrops. There is no evidence of movement from examination of outcrop but again definite evidence may be hidden underneath the overburden.

Petrological examination of the andesite types does not reveal whether the flows are overturned within limited sections or the exact type of deposition. Further future investigation will no doubt clear up the question of the flow series and give more detailed information as to the ore deposition.

Shearing is not a prevalent feature of the area on a large scale although it can be found almost over the whole section in an inconsistent minor pattern. This may be due to the covering of the less resistant glacial removed shear zones by debris leaving only the harder massive andesites as outcrops.

## Petrology and Mineralogy

Within the area under examination no other type of rocks except volcanics were encountered. The mountain on the opposite side of the lake has been reported to contain a granodiorite stock which has a local zone of mineralization. If a granodiorite-volcanic contact exists on the property it is yet concealed by the overburden but may be found by future geophysical surveys.

On the outcrop designated by co-ordinates 24+00N and 31+00E a very light-grained feldspar porphyry extends 10-15 feet on each side of the outcrop. Although not personally examined, this has been reported to re-appear on the south face of the mountain at an elevation of 3500+ feet. This is clearly visible as a white band cutting across the face of the darker volcanics.

The andesites range from a very fine-grained fresh green massive form to heavily weathered light buff type with vugs and the vacuaes left by eroded calcite crystals often filled with secondary fillings of re-deposited calcites.

Within the range, at least six different forms or gradations of the andesite were noted. Hornblende crystals up to 2 mm in length were found. In a few samples olivine was clearly distinguishable from the ground mass. Physically it may be difficult to define which are the basalts or andesites of the area although a chemical analysis would define with certainty the limits of the flows.

No quartz was seen in any hand specimens or as fillings.

The process of epidotization appears at this stage to be in relationship to the ore genesis in one section 23+50N - 33+00E but its presence in the intermediate areas has not yet been an indicator of further deposits of ore.

Propylitization of the andesites remains in the early stage of alteration. The hornblende in the upper creek area has partially been replaced by chlorites and calcite. Kindle reports that plagioclase phenocrysts in some andesites are locally altered to a pale greenish-blue chlorite resembling malachite. Specimens of this mineral were identified as penninite of no commercial value. It was noted in the upper creek section in close contact with

a medium green andesite containing an unidentified mineral which resembles a hematite. This presents the rock with a mottled red-green appearance and renders its identification as a specific rock entity at this time as an unknown. It has not been found in any other area.

Ore genesis is not clearly defined in the upper creek section as it occurs as vein and fissure fillings as again in the lower Alder Creek. However, dissemination of very fine grained coppers also is a common feature throughout the area. Bornite, chalcocite and native copper are the dominant copper ores with extremely minor secondary malachite, azurite and what appears to be chrysocolla although the lack of silica in the district leaves this open to question.

The extreme rarity of the malachite as a weathering-out mineral remains one of the most difficult questions to answer. The survey of the property would be greatly aided by the use of the malachite guide but even after prolonged exposure of rock specimens, the amount of malachite observed was minor.

In the upper creek section the ore-bearing fissure or vein extends from a width of 8' - 10' at the base to a height of some 10' exposed in the lower part and to a 2' width

opened by blasting some 30' above the base with a nearly vertical dip. The depth and the lateral length of the vein is not known at this time and only by future development following the north west strike by geophysical methods will this be known.

The Alder creek section presents a series of divergent veins of chalcocite and bornite striking in part north west and most closely resembling fracture fillings of the earlier andesites.

Correlation of this area with the Little Dalton creek section remains a highly speculative proposition until the intermediate property has been thoroughly sampled.

Samples taken for assay for copper (see map) ranged from trace in outcrops sampled to determine width and length of the ore body through trace to 6.82% in the high grade sections. Chip samples taken over widths are reported as grab samples since the preliminary exploration was intended to delineate the extent of the mineralized zone. These are reported as follows:

Upper Claim Section (Claims - )	Upper Little Dalton Creek Section (Claims - )	Alder Creek Section (Claims - )
KG 68-15 .34	KG 68-1 .10	KG 68-9 2.20
KG 68-16 3.70	KG 68-2 .80	KG 68-10 3.08
KG 68-17 .60	KG 68-3 1.73	KG 68-11a 5.50
KG 68-20 Tr	KG 68-4 3.37	KG 68-11b 6.82
	KG 68-5 3.60	
	KG 68-6 2.80	
	KG 68-7 .30	
	KG 68-12 6.82	

In addition to the above samples taken as grab samples from blasting results. Sampling of the outcrops from over the map area are recorded on the accompanying map and range from Trace to .03.

Lack of further sampling has to date not proven or disproven the extent or range of the presumed mineralized zone.

## Geochemical Survey

Following the EM survey (dropped because the signal petered out at approximately 9:55 each day and too large a range between readings) a geochemical survey was attempted on the remaining two lines.

The method used was the trail kit from TSL laboratories (cold) with xylene and copper capsules.

The total results obtained were negative with two positives found on the 107.5 N-line.

On line 107.5 N at station 129 W + 67 line 100N at 134 W (centre line) was encountered at the line discontinued. The same on line 115 N at station 154 W + 72 the centre line 100 was also found at 158 W.

From this information it has become apparent that the centre line has not been cut at the prescribed azimuthal direction and as yet the posts have not been checked out to confirm the error.

At the present time it is considered that too little has been done on the ground to provide any actual real information in this particular field but there is the possibility that anomalies shown by EM or IP readings can be correlated by the geochemical method.

Appended are the results recovered and map.

## Results

Of the two lines cut and tested a total of 254 samples from 254 stations were collected over 8500 line feet.

The stations, situated 100' apart indicated negative results for all but 2 samples. These two samples taken at stations 105 and 108 on line 107.5N were taken in heavy bush on the southern slope of the minor mountain.

(Less than 1000' directly to the south blasting has revealed mineralization).

It is not known whether the samples taken overlies the specific flow in which the mineralization occurs or even if there is any relationship as rock samples were not collected from the outcrops in the immediate vicinity.

## Conclusions

To date, it is felt that insufficient sampling of the ground covered by the claims has been done to warrant a conclusion. A more detailed analysis of the area by geological methods preceding an extended geochemical program should be attempted. With this observation in mind repetitive sampling over areas considered to be in the ore-bearing

formation with the establishment of a "norm" can be attempted.

Closer spacing of the stations and lines in areas that indicate any anomalous conditions is also preferred in a future program.

A modified or different type of testing on a limited basis initially on areas that indicate the pressure of any anomaly as a check. If this does not coincide with previous methods, a selection of soil samples could be sent to Vancouver to professional geochemists for assay.

The territory previously sampled consisted of extremely heavy bush and brush. The geochemical method may not be particularly suited to this type of ground because of this combination and the extremely heavy rainfall in this part of the property. However, on the southern slope of the mountains comprising the most northerly claims, the ground is more suited to this type of exploration, and it is here that a program should be initiated..

Geochem Line 107.5

Geochemical Survey - Kel 1 - 8 Group @ 300° AZ

Line 107.5N S 100 W	-	(On this line at Station 129W+67'
101	-	Centre Line 100N at S134W -
102	-	indicates that the centre line
103	-	of the claims is off)
104	-	
105	+	
106	-	
107	-	
108	+	
109	-	
110	-	
111	-	
112	-	
113	-	
114	-	
115	-	
116	-	
117	-	
118	OC	
119	OB	
120	OB	
121	-	
122	OB	
123	-	
124	-	
125	-	
126	-	
127	-	
128	-	
129	-	

Geochem Line 115

Geochemical Survey - Kel 1 - 8 Group - West Line Running 300° AZ

		Results			Results
L 115N	S 100 W	-	L 115N	S 130 W	-
	101	-		131	-
	102	-		132	OC
	103	-		133	-
	104	-		134	-
	105	-		135	-
	106	-		136	-
	107	OB		137	-
	108	-		138	OB
	109	-		139	-
	110	OC		140	-
	111	-		141	-
	112	-		142	-
	113	-		143	-
	114	-		144	?
	115	-		145	-
	116	-		146	-
	117	-		147	-
	118	-		148	-
	119	-		149	-
	120	-		150	-
	121	-		151	-
	122	-		152	-
	123	-		153	-
	124	-		154	-
	125	-			
	126	-			
	127	-			
	128	?			
	129	-			

## Drilling and Blasting

Drilling and blasting of selected zones were begun by T. Fenton and J. Smarch on August 3rd and continued until the 23rd of the same month.

Three specific sites were chosen for drilling and blasting: These are sections 1, 2 and 3 located at co-ordinates:

1 - 37+00N and 25+00E to 27+00E

2 - 34+00N and 31+00E

3 - 23+00N to 24+00N and 31+00E to 33+00E

Equipment used was a standard lightweight cobra-type drill of Japanese make "Black Diamond" weighing approximately 60 lbs. Drill steels ranged from 1' to 2' to 4' in length with wing-tip heads.

Explosives used were 100 lbs of C.I.L. Forcite 40 with accompanying caps and black safety fuse. Because of the nature of the ground only vertical holes were drilled with the exception of several short holes at a 60° angle. Estimates of rock displaced are as follows:

Section	Sub-Section	Hole Dist.	Bed Rock	Rock Displaced	Assay No.	Result Cu%
1	A. Junction of	100' apart	Andesite	2 cu. yds.	KG 68-15	.34
	Claims Kel				KG 68-16	3.7
	21,22,23,24					
	B. Junction of	100' apart		2 cu. yds.	KG 68-20	Tr
	Claims Kel					
	19,20,21,22					
2	Upper Creek	Over 300 Sq.Ft.	Andesite	10 cu. yds	KG 68-6	2.8
					KG 68-7	.50
					KG 68-13	6.82
3	A. Alder Cr.Sec.	Over 300 Sq.ft.	Andesite	10 cu. yds	KG 68-11a	5.50
					KG 68-11b	6.82
	B. 1500' W	Over 16 Sq.ft.		1 cu. yd.	KG 68-28	Tr.

*Handwritten:*  
25 yds  
J.T.

## Results

The andesites blasted presented a difficult proposition in the initial drilling. It was found that the oil-gas mixture as required at sea-level was not adequate to the altitudes at which the drilling was being conducted. Later adjustments remedied this problem.

The number of holes drilled varied at each site. From 4 - 7 were the average with a depth up to 4 feet although some holes were abandoned at 2 feet because of caving.

Assay samples were taken as "grabs" and the results noted. It was not felt that the blasting revealed more ore than what had been previously taken as samples.

Section 1. Holes were drilled and blasted in close proximity to the claim posts of Kel 21, 22, 23, 24 within 100' of each other and Kel 19, 20, 21, 22, 1500' to the southeast. The results recovered were not suggestive to continuation of further drilling. The altitudes of 4250' and 4500' made this program difficult even though a helicopter lift was provided to bring the drill and powder up.

Further ground exploration may indicate better drilling and blasting sites since it is evident that some high grade ore does exist in the immediate neighborhood. Examination of the flow deposits may provide the clue to a more productive program in the future.

Section 2. Drilling and blasting on the upper part of Little Dalton Creek, source of the original prospect provided the most structural and ore information. The locale chosen was the north bank of the creek made up of a prominent andesite outcrop. There was evidence of shearing and the supposition that slight faulting was in the area. A strong highly decomposed vein structure striking northwest was uncovered. Although malachite was in a very minor amount when this was exposed, later investigation revealed that a substantial increase from exposure was the result.

Blasting revealed that this area could be the more important section of the claims in future exploration. Assays ranging from .50 to 6.82 were recovered.

Section 3(a). Although this section initially presented high assays from the first grab samples, blasting failed to expose any vein structures of significant value despite high grade grab samples. The major amount of blasting

in the program was done here with an approximate amount of 15 cubic yards of rock being removed.

The andesites freshly exposed in this section by the blasting were of a massive dark-green fine grained variety. There was little evidence of alteration or movement in the outcrop. Minor veins were exposed but no specific information was revealed by the rock, since it was not possible to correlate it with outcrops within the immediate area.

(b) A minor amount of blasting was done in this part since there was no evidence of mineralization exposed on the surface. However, the presence of the outcrop close to known mineralization could not be ignored in the view of information for future use.

### Conclusions and Recommendations

The Mush Lake property of Kel-Glen Mines Ltd. situated in the Yukon Territory was examined during the summer of 1968 from June to the end of September.

The writer did not come onto the property until the beginning of July and did not supervise either the geophysical or geochemical portion of the program but merely recorded the results of these operations.

The program, which at this time can only be described as the beginning of a preliminary exploration program did not commence until quite late in the season. Because of this, and the presence of extremely bad weather, it is felt that not enough evidence has been accumulated to warrant a definitive set of conclusions regarding it. The base work has been established to provide a firm foundation for a much expanded future program and the presence of some very high grade grab samples taken over the area appears to indicate that this should proceed in the next season.

Geologically the Mush Lake volcanics present an intriguing problem. It is known that the section examined is part of the east limb of the Silver Creek anticline and that these are unconformably overlain to the east by the

Dezadeash sediments. However, the deposition of the flows is the major problem in interpretation of the ore genesis. It has been shown that the ore is disseminated as native copper and very minor chalcopyrite within the andesites themselves and secondly as vein deposits penetrating these same deposits.

The amygdaloidal and epidotized andesites appear to have a direct relationship to the ore deposits. It is these that should be carefully examined particularly in areas where there is any evidence of structural deformation or movement.

The possibility that the ore deposit, while rich in content, are isolated pods within the flows cannot be discounted. Because of this, a complete examination by the methods previously described should be continued before a definitive second phase program of drilling be initiated. From the total results of the program drill sites could be selected on specific targets with fill-in drilling to determine whether there is continuity to the ore or whether it is not economically feasible to develop the property.

In short, it is felt that in such a short exploratory program season and with evidence of ore in the three isolated areas an extended program to fully define the economic value of the area in the next season.

*Wm Dollery-Pardy B.A.*

Wm. Dollery-Pardy, B.A.

October 1968.

Certificate of Qualifications

I, William Dollery-Pardy residing at 2704-1225 Robson Street in the City of Vancouver, British Columbia, certify that:-

I am a graduate in Geology from the University of British Columbia, holding the degree of B.A.

I have practised my profession since 1964 in North, Central and South America.

I am in possession of 1000 shares of the company, purchased through a Vancouver Brokerage house.

*Wm Dollery-Pardy B.A.*

Wm. Dollery-Pardy, B.A.  
Geologist.

October 15, 1968.

**KEL - GLEN MINES**  
**MUSH LAKE PROPERTY**  
 Y.T.

*Planning and Geology. Wm. Douglas & Sons, Ltd.*  
*July - Sept 1948* SCALE: 1" = 500'

**GEOLOGICAL & GEOPHYSICAL SURVEY**

AREAS BLASTED  
 (Approximate location)

ANDESITE OUTCROPS  
 (200' sample taken near west sample.)



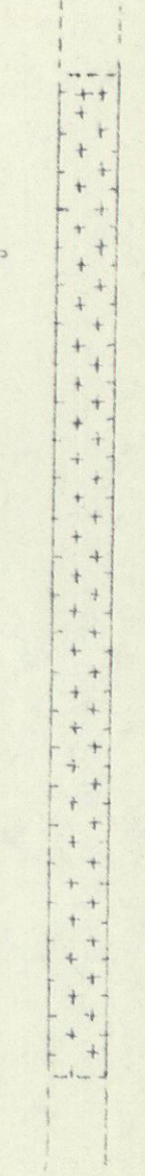
Cross Section A-B  
Geological Column



CROSS SECTION A-B  
NO DISTINGUISHING LAVA FLOWS  
OR FORMATIONS

KEL-GLEN MINES LTD  
JULY-AUGUST 1968  
Geology Mapping Wm Delory Parry B.A.  
TO ACCOMPANY MAP  
SCALE 1" = 500'

JURA-TRIASSIC  
MUSH LAKE GROUP  
7000 - 20,000' ±



**KEL - GLEN MINES**  
**MUSA LAKE PROPERTY**  
 Y.T.  
 Planning and Geology: Wm. C. GILBERT, P. ENG. A.S.  
 Date: July - Sept. 1948 SCALE: 1" = 500'

**GEOCHEMICAL SURVEY**

WREN CLAIMS



+ POSITIVE READING  
 - NEGATIVE READING  
 (including outcrops)

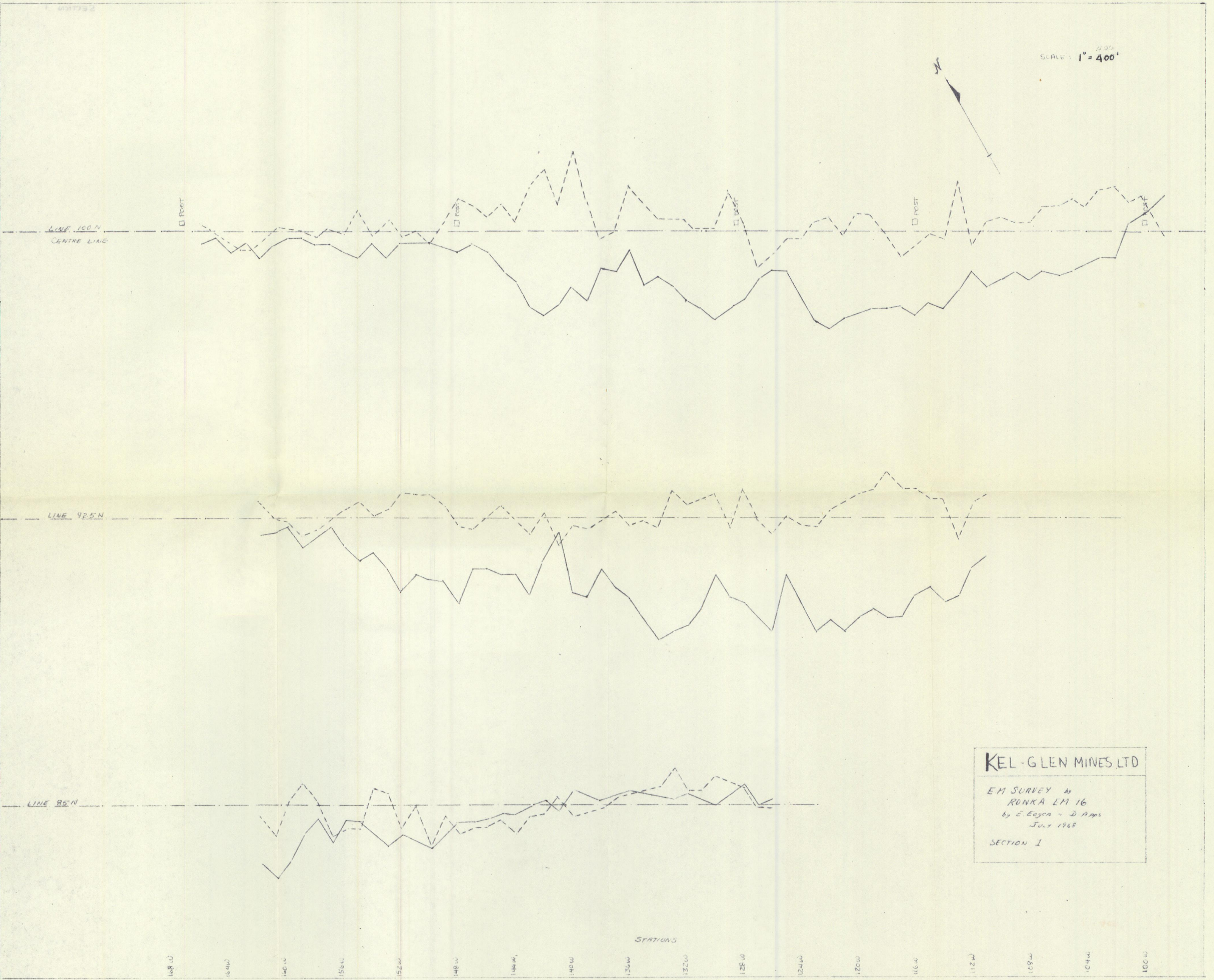
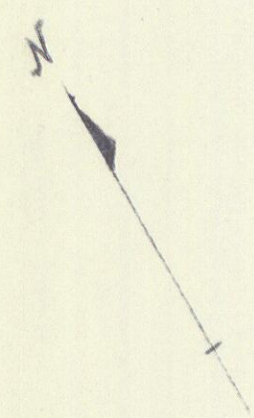


**MUSH LAKE**  
 ELEV. 2550'

20+00E 21+00E 22+00E 23+00E 24+00E 25+00E 26+00E 27+00E 28+00E 29+00E 30+00E 31+00E 32+00E 33+00E 34+00E 35+00E 36+00E

EM SURVEY  
SECTION 1

SCALE: 1" = 400'



**KEL-GLEN MINES LTD**

EM SURVEY of  
RONKA EM 16  
by E. Egera & D. Apps  
JULY 1968

SECTION 1

STATIONS

168 W 164 W 160 W 156 W 152 W 148 W 144 W 140 W 136 W 132 W 128 W 124 W 120 W 116 W 112 W 108 W 104 W 100 W

KEL GLEN MINES LTD

SCALE 1" = 100'

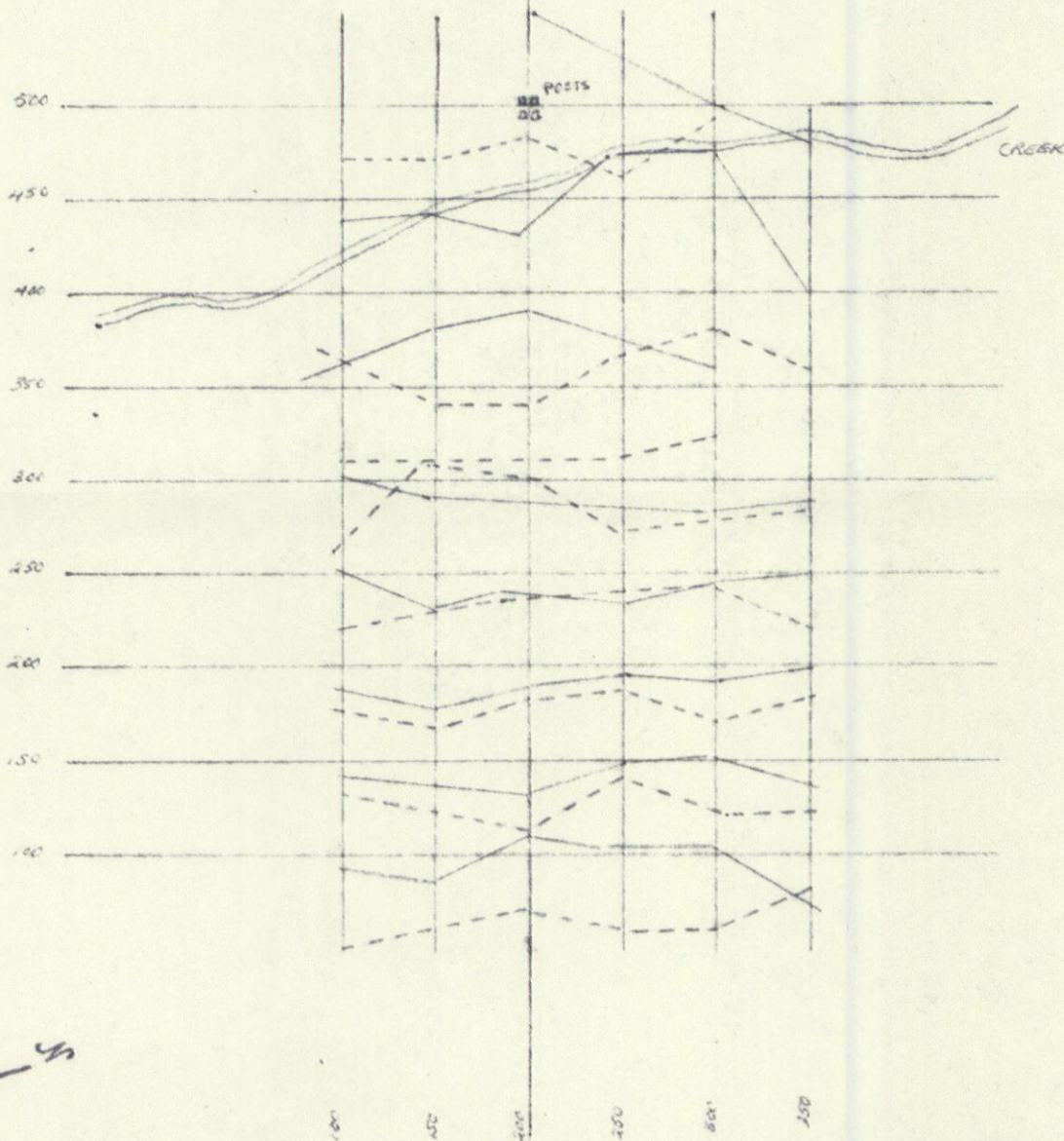
EM SURVEY

RONKA 16

AUG 1968 D. APPS  
T. YARDLEY

CENTRE LINE  
290°

SECTION 2



READINGS TAKEN  
FACING EAST

REVISION 2 M.B.  
SECTION 2

To The President and Directors,  
Kel-Glen Mines Ltd. (N.P.L.),  
1614-1030 West Georgia Street,  
Vancouver, B.C.



Dear Sirs,

Re: Mush Lake Property, Yukon

Herewith my report to supplement the report of your resident geologist, Mr. Wm. Dollery-Pardy B.A. on your Mush Lake Property, Yukon. His report covers geology, geochemical survey, prospecting, trenching and road bulldozing. My report covers in addition the geophysical work done to date, a summary and conclusions based on the work done and recommendations for further work.

The assays shown by Mr. Dollery-Pardy on the maps and in his report were mainly of grab samples.

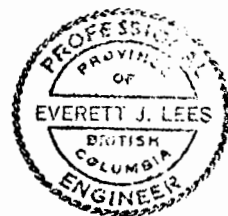


Respectfully submitted,

A handwritten signature in cursive script that reads "Everett J. Lees".

E. J. Lees, Ph.D., P. Eng.  
Geologist.

*See report by Wm. Dollery-Pardy May 1 - Sept, 1968*



ENGINEERING REPORT

(Including Geophysical Report)

Mush Lake Property, Yukon

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See back pocket  
W. Dallery-Pard  
Report.



## INTRODUCTION

As your company geologist and a director, I submit herewith an Engineering Report on the mineral holdings of Kel-Glen Mines Ltd. (N.P.L.) in the Mush Lake Area, Yukon. It is based upon general technical supervision and two personal examinations of the property one on July 25 and 26 and a second on September 8 and 9, 1968. During the two months of August and September the work was under the supervision of Wm. Dollery-Pardy, B.A. resident geologist for the company, and he has reported on the work carried out during that period.

## SUMMARY AND CONCLUSIONS

In the fall of 1967 Kel-Glen acquired 24 claims, 6 miles north of Mush Lake. No work was done on these claims and they were subsequently dropped, after a group of 48 contiguous claims Kel #1 to #48 inclusive, which were considered more desirable, were acquired immediately north of Mush Lake.

Malachite staining is widespread at a number of places on the Kel group of claims. Grab samples contain the copper minerals, bornite, chalcopryrite, chalcocite and native copper and assay up to several percent copper. The few comprehensive chip samples taken to date assay under 1% copper. The mineralization is related to the contacts of



volcanic flows, more commonly spoken of as "flow tops." These are in part amygdaloidal. Glacial gravels, sands and clays from an extensive overburden . Rock outcrops sparsely.

#### RECOMMENDATIONS

My original recommendations for the Mush Lake property were to prospect, blast rock trenches on some of the better "finds" and carry out line cutting, geophysical and geochemical surveys. Three showings were blasted into, a minor amount of line cutting, geophysical and geochemical surveying was done. My present recommendations are to carry out my original recommendations.

#### PROPERTY

Kel-Glen's property in the Yukon, consists of 48 contiguous mineral claims Kel 1 to 48 inclusive in the Whitehorse Mining Division.

#### LOCATION AND ACCESS

The Kel group of claims lie immediately north of Mush Lake, Southwestern Yukon, latitude  $60^{\circ} 16' N.$ , longitude  $137^{\circ} 20' W.$  They are twenty-five miles south of Haines Junction, on the Alaska Highway and twelve miles west of Dezedeash Lodge (Beloud Post) at the south end of Dezedeash Lake, on the Haines Road. Access is by way of Alder-Mush Lake



road, from the lodge. The road is passable by four wheel drive vehicles during summer months.

#### REPORTS

KINDLE, E.D., Dezedeash Map Area, Yukon Territory

G.S.C. Memoir 268, 1953, Canada Department of Mines and Technical Surveys.

CATHRO, R.J., P.Eng., Re: Mush Lake, Yukon Territory Property,

P.O. Box 1708, Whitehorse, Yukon Territory.

DOLLERY-PARDY, Wm., B.A. Geochemical, Geophysical and

Geological Report on the Kel Claims 1 - 48

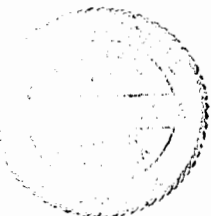
Claim Sheet No. 115A-6, Mush Lake, Yukon,

October 15, 1968.

#### TOPOGRAPHY

The property lies in the rugged Kluane Ranges. The group extends from an elevation of 2400 feet above sea-level at the junction of Alder and Frazer Creeks across the west end of a hill between Dalton and Little Dalton creeks and up to an elevation of 5600 feet on the south end of a mountain lying north of the east end of Mush Lake.

Alder, buck brush and poplar cover much of the property. The higher portions are above timber line.



GEOLOGY

Geological map 1019A, G.S.C. Dezeddash Map Area, shows that volcanics (andesites) of the Triassic and Jurassic, Mush Lake group forms the terrain on the property. The general strike is N. 30° W. and dip east. A few light coloured feldspar porphyry dykes cut the volcanics.

Table of Formations

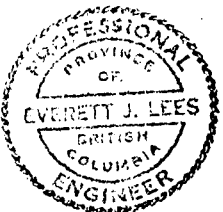
Age	Name	Lithology
Recent & Pleistocene	Overburden	Clay, sand, gravel.
Tertiary or Mesozoic		Feldspar porphyry
	Intrusive Contact	
Jura-Triassic	Mush Lake Group	Andesite

MINERALIZATION

Mineralization consists of the copper minerals, bornite, with subordinate chalcopyrite, chalcocite, native copper and malachite. The minerals were seen in pods of disseminated minerals and blebs and in fine disseminations.

STRUCTURE

The copper mineralization is related to the contacts of andesite flows or "flow tops", many of which are amygdaloidal with calcite and chlorite amygdules and blebs or amygdules of copper minerals. Such conditions have



formed the structure controlling some large ore bodies throughout the world (e.g. Keweenaw Peninsula on the south shore of Lake Superior).

### SHOWINGS

There are several "showings" on the claim group.

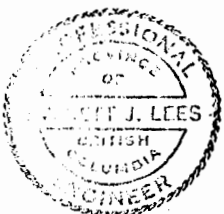
#### Road Showing

Copper stained rock fragments are present on the adjacent southern corners of claims Kel 1 and Kel 2 and at three other spots on claim Kel 1. All these are on the hillside 50 to 100 feet in elevation above the road along Alder creek.

The showing on the adjacent corners of claims Kel 1 and Kel 2 form a steep outcrop of andesite. Some jointing is present. Malachite staining and some blebs of bornite were noted before blasting. After blasting, little mineralization was seen and no structure was ascertained to which the mineralization appeared to be related.

#### Canyon Showing

One of the showings on Little Dalton Creek is situated on the north wall of the Canyon a few feet to 25 feet above the creek on claim Kel 14. An estimated 200 cubic feet of rock was blasted from it. The mineralization is located along a "flow top" along which there has been some



shearing. The strike, not clearly revealed, appears to be  $285^{\circ}$  and dip  $66^{\circ}$  N. Shearing and brecciation are about 5 feet wide and some calcite lenses are contained in it. The sheared brecciated section is mottled dark brown with iron oxide and green with chlorite and malachite. There is a green stained lens as large as a football with a fair quantity of bornite. There is also some disseminated bornite. The foot and hanging walls are of fine grained greenish andesite, which was noted to have a medium grained texture farther south in the canyon wall.

A chip sample across a width of three feet of the sheared rock taken by R.J. Cathro, an independent consultant, is reported by him to assay 0.87% copper. Chip samples taken by him over widths of six feet of the hanging wall and six feet of the footwall of this structure are reported to assay 0.16% copper and 0.15% copper respectively.

There are other showings farther down the canyon not yet blasted into.

#### Mountain Showing

Talus and rock outcrops show copper staining and bornite mineralization high on the south end of the mountain near the staking line of claims Kel 21, 22, 23, 24 and 25, and elsewhere. I examined some of these but was unable to climb to a showing where some blasting is reported to have been done



with the aid of a helicopter for transportation. The helicopter was available locally at the time the work was done.

#### ROADS

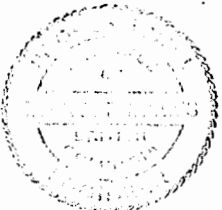
Some bull dozing was done to improve the twelve mile access road from Dezedash lodge to Mush Lake. Two and one half miles of road were bulldozed north from the access road towards the Canyon showing but has not reached it to date. This bulldozed road is not yet passable for four wheel drive vehicles beyond the first quarter mile. It does however serve as a trail.

A chain and Brunton compass survey has been made of these two roads within the limits of the property.

#### GEOPHYSICAL SURVEY

A geophysical survey of the property was started but a limited amount of work, only, was done before operations closed due to winter conditions setting in.

Three lines at 750 foot intervals for a total of 13,500 feet were chained in the southern portion of the property. One line, noted as 100N approximated the staking line of claims Kel 1 to 8, and the other two parallel ones 92.5N and 85N crossed claims Kel 2, 4 and 6. These lines trended  $300^{\circ}$ .



Readings were taken on them at 100 foot intervals with a Ronka E.M. 16 instrument and plotted as profiles. Signals came in on the crystal tuned to Maine, U.S.A. of sufficient strength for satisfactory use. Strangely enough, they came from the southwest. It is thought that this direction resulted from reflection. In a few days they faded each day in the early morning, and this portion of the survey was discontinued. No usable signals were obtained in this locality with the crystal tuned to Seattle.

One "cross-over" only was obtained. This was in the general vicinity of the Road Showing.

A detailed survey was started adjacent to the Canyon Showing extending southeasterly from it and covered a small section of claims Kel 13, 14, 15. A base line was extended from the common corner posts of these three claims and 8 parallel cross-lines, each 250 feet long were run at 50 foot intervals for a total of 2000 feet in a northeasterly direction. Readings were taken at 50 foot intervals on these lines with a Ronka E.M.16 instrument. Signals were received on the crystal tuned to Seattle, Washington. These were plotted as profiles.

No "cross-overs" were obtained in this detailed survey.



It is concluded that the surveys are too limited in scope to indicate whether ore is present or not. Detailed work would be required around the cross-over in the southern part of the property near the "Road Showings", and the detailed work at the Canyon showing should be extended to the north.

Recommendations are that the property be covered by the Ronka E.M. survey with lines at 750 foot intervals and readings on them every 100 feet. This recommendation is contingent on obtaining satisfactory signals. Detailed surveys should be carried out in the vicinity of all known copper showings and all favourable "cross-overs" obtained by the general Ronka E.M.16 survey. Should the E.M. survey not prove to be feasible possibly an I.P. survey should be substituted.

Mr. Don Apps acted as instrument operator and plotted the profiles of E.M. 16 readings. E. J. Lees, Ph.D., P. Eng. was in general supervision and interpreted the results.

#### GEOCHEMICAL SURVEY

A geochemical (soil sampling) survey was carried out on the southern part of the property on claims Kel 3, 5 and 7. Two lines were run, Nos. 107.5N and 115N at 300° 750 feet apart. They are parallel to and north of the three lines at the same interval used for geophysical work. A total

of 8400 feet of lines were soil sampled at 100 foot intervals and 84 samples taken. The samples were cold tested with a trail kit from T.S.L. laboratories with xylene and copper capsules.

Two samples gave positive assays. These were on line 107.5N - 105 W and 107.5N - 108W.

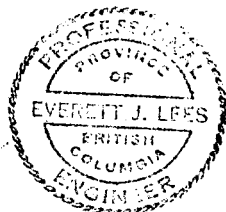
Some detailed chemical sampling, and also some detailed Ronka E.M.16 geophysical surveying should be carried out in the vicinity of the two positive geochemical determinations.

The geochemical survey should be continued.

Respectfully submitted,



Everett J. Lees, Ph.D., P.Eng.  
Geologist.



CERTIFICATE

I, Everett John Lees, of the City of Vancouver, in the Province of British Columbia, hereby certify:-

1. That I am a Geological Engineer, and my address is 1614-1030 West Georgia Street, Vancouver 5, B.C.
2. That I am a graduate of the University of British Columbia, with the degree of B.A.Sc. (1927) in Geological Engineering and of the University of Toronto with the degree of Ph.D (1931) in Geology.
3. That I am a registered Professional Engineer in the Province of British Columbia.
4. That I have practised my profession as Geologist for more than twenty years.
5. That I am a director of Kel-Glen Mines Ltd. (N.P.L.) and that I have been an employee of the company as Geologist in charge of technical programs and that I have a beneficial share interest in less than 5% of the company's stock.
6. That I have no direct or indirect interest in any company acquiring control or intending to acquire control of Kel-Glen Mines Ltd. (N.P.L.).

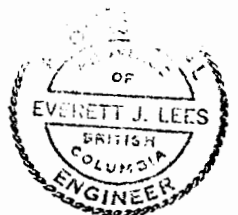


7. That the accompanying report on the Mush Lake, Yukon property of Kel-Glen Mines Ltd. (N.P.L.) is based on two personal examinations of the property on June 25th and 26th, September 8th and 9th, 1968 and on general supervision and interpretation of the geophysical survey.

Dated this 9th day of November, 1968.



Everett J. Lees, Ph.D., P.Eng.  
Geologist



## QUALIFICATIONS

of

### DONALD APPS GEOPHYSICAL INSTRUMENT OPERATOR

Mr. Donald Apps of Comox, B.C. was the instrument operator on the geophysical survey of the Mush Lake Property, Yukon of Kel-Glen Mines Ltd. (N.P.L.).

He was trained by E.J. Lees to operate the Ronka E.M. 16 instrument in the Spring of 1968 on another property. Lees spent two days in constant attendance with him on that property, supervising his every move. A check of his work was made by having him cover several lines unknown to him previously covered by another similarly trained operator, and a reasonable agreement in readings was registered.

The interpretation of the survey was made by Lees.

Qualifications of E. J. Lees are:

B.A. Sc., U.B.C., 1927 Geological Engineering.

Ph.D., U. of Toronto 1931 Geology.

P. Eng. B.C. 1939-1942, Ontario 1942-1965, B.C. 1967-1968.

Course Kirkland Lake Collegiate 1950 ? Electronics

Course B.C. Institute of Technology 1967-1968 Geophysics.

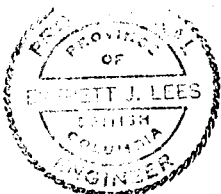
Over 20 years as mine, field and exploration geologist, with general use of geophysical reports.

Yours truly,

KEL-GLEN MINES LTD. (N.P.L.)

Per:

*Everett J. Lees*  
Everett J. Lees  
Geologist and Director.



HUSKY CLAIMS

Husky Claims

WREN CLAIMS

SHEET 115 A-6

DOUG CLAIMS

CABIN

MUSH LAKE

LITTLE DALTON CREEK

DALTON CREEK

ALDER CREEK

FRASER CREEK

