

GEOCHEMICAL REPORT ON THE
ROCKLAND GROUPS
49°, 117° SE SLOCAN MINING DIVISION
Rockland, White Little
OF
ROCKLAND MINING LIMITED (NPL)
410 500 W Hastings Street,
Vancouver 1, B.C.
Aylwin Creek near Silverton, B.C.
Slocan Mining Division
October 16 - 20
D.K. Mustard, P.Eng. (B.C.)
37 E/14 W

1185

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410 500 W Hastings Street,
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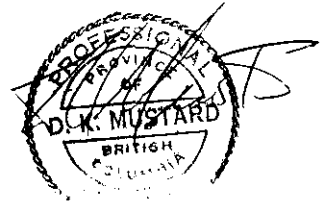


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Geology and Geochemistry - Mo -----In Pocket

INTRODUCTION

This report embodies the results of work carried out on the Rockland Mining Limited (N.P.L.) property located on Aylwin Creek near Silverton, B.C. in the Slocan Mining Division.

For information on the history, topography and geological setting of the property the reader is referred to reports by J.F. McIntyre, P.Eng. dated May 17th, 1967 and January 31st, 1968.

During the period October 16th - 20th, 1967 the following persons carried out reconnaissance geochemical soil, silt, water and rock chip sampling on the Rockland Property.

W. Deans, Prospector, Box 619, Lake Cowichan, B.C.

B. Fenwick-Wilson, Prospector, R.R. #1, Osoyoos, B.C.

E. McGibbon, Labourer, P.O. General Delivery, Silverton, B.C.

T. Kamin, Labourer, R.R. #2, Oliver, B.C.

The work was under the supervision of D.K. Mustard, P. Eng., 601 - 535 Thurlow Street, Vancouver 5, B.C.

Snow conditions restricted the work to lower portions of the properties.

GEOCHEMICAL SAMPLING

A total of 271 samples were collected.

Sample types were as follows:

Soil	219
Stream sediment (silt)	17
Water	10
Rock	<u>25</u>
	271

The location of these samples are shown on the attached plans and are related to the claim situation as defined by CM & S 1965.

Soil samples were collected at 200 foot intervals along access roads and on two traverses running parallel to Aylwin Creek. Samples were generally collected in the "B" horizon which was reached by digging with a mattock. Thick glacial overburden screens lower levels of the property.

The 271 samples were analysed for copper and molybdenum at the Burnaby Geochemical Laboratory by the procedures attached.

Results are shown on the accompanying plan Rockland Cu-MoS₂ Property Geological and Geochemistry.

A statistical analysis was made of the results and values were graded as follows:

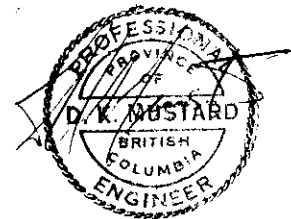
	<u>Volcanic</u>	<u>Granitic</u>
Background	200	325
Positive 1	201-300	326-450
Positive 2	301-400	451-575
Anomalous	400	575

Soils (ppm Mo)

Background	14
Positive	15-19
Anomalous	19

CONCLUSIONS

Results indicate that geochemical sampling is of use on the property. The general area of known mineral occurrence on the Rockland, Idler and Little Daisy claims is indicated by anomalous geochemical values and other anomalous areas justify investigation.



BURNABY GEOCHEMICAL LABORATORY

SAMPLE HANDLING PROCEDURE

Vancouver Office

August 1967

I. Rokus

STREAM SEDIMENTS AND SOILS

Drying and Sieving

Sample boxes should be opened as soon as they arrive in the laboratory. If dryer is full, spread samples to air dry. As soon as possible, samples should be placed in dryer.

After drying, samples are to be sieved to minus 35 mesh. As much -35 material as possible is recovered from sample. Dump the -35 mesh material on a square of brown paper and mix by rolling several times. Place mixed -35 mesh material in a coin envelope and place envelope in original sample bag. Arrange samples in units of 40, if possible, and in numerical order.

ROCK AND CORE SAMPLES

General Handling

Rock or core samples need, usually, to be only air dried. If samples seem particularly wet they may be force dried by placing in numbered pans in the drying oven. No attempt is made to completely dry rock samples, that is, expel all the water from the pores of the rock. The samples are ready to crush when the outside surfaces are dry.

Crushing and Pulverizing

Rock and core samples are to be processed in such a manner that a representative 1/2 gram sample can be obtained. The entire amount of each sample is to be passed through the jaw crusher. At jaw crusher size the smallest sample that can be split out is 5 pounds. If sample is five pounds or less in size, pass the entire sample through pulverizer with plates set to

produce material of a maximum 8 mesh size. If sample is larger than 5 pounds then pass sample through Jones splitter to produce a sample of approximately 5 pounds. Pass this sample through pulverizer to produce -8 mesh material as above.

When the approximate 5 pound split has been pulverized to -8 mesh, then sample can be split to smaller size for final pulverizing. Using the Jones splitter, split sample down until a portion weighing 100 - 200 grams is obtained. This portion is then passed through the pulverizer, with plates pulled up tight so that product will pass 100 mesh screen. Regular checks, by screening, should be made to be sure the pulverizer, with plates pulled up tight, is producing a product 95% of which will pass a 100 mesh screen. After pulverizing, the sample should be mixed by rolling on brown paper or rubberized cloth. Rejects should be saved according to instruction from sampler.

WEIGHING FOR COPPER AND MOLYBDENUM

Digestion tubes (100 x 16 mm) should be marked at 5 ml level. Using diamond pencil, mark each tube carefully at bottom of meniscus.

Samples for digestion and analysis should be handled in units of 40 where possible. Prepare a laboratory data sheet for each batch of 40 samples.

Weigh accurately on balance 1/2 gram sample and put in marked test tube.

DIGESTION AND DILUTION FOR COPPER AND MOLYBDENUM

To each of the samples prepared above add 1:1 HNO₃ to the 5 ml mark. Place samples in the digestion racks in order. Adjust heat so that samples are gently boiling. Digest for three hours at this gently boiling rate. Remove from digestion rack and bring volume back to 5 ml with demineralized water. Mix well and then centrifuge for 1 minute. Use clear upper layer for copper and molybdenum determination.

MOLYBDENUM TEST

Procedure for Silt, Soil and Rock

1. Transfer a 1 ml aliquot of digested solution from above into clean test tube for determination.
2. Add 1.0 mls KSCN shaking gently - 5%
3. Add 1.0 mls SnCl₂ shaking gently - 15% in 2NHCl
4. Make up to 10 mls with water.
5. Add 1 ml isopropyl ether, add stopper and shake for 45 seconds.
6. Match colour of ether layer with standards against a white background and record ppm.

Standard Molybdenum Solutions

Stock Standard Solution (100 μ /ml) - Dissolve .015 gms of MoO₃ in 5 ml conc. NaOH and make up to 100 ml with demineralized H₂O. This solution must be made up bi-monthly.

Working Standard Solution (10 μ /ml) - Pipette 10 ml of 100 μ /ml stock solution in a 100 ml volumetric flask and make up to 100 ml with demineralized H₂O.

Molybdenum Standards for Soil, Silt and Rock Chip - based on 1/2 gm sample aliquot.

1. Take 15 clean 100 x 16 test tubes which are calibrated to 5.0 ml mark by a diamond pencil.
2. Pipette the following aliquots;

	10 γ /ml	gammas	Factor Used	ppm
a)	0.2 ml	2 γ	} X 2	4
b)	0.4 ml	4 γ		8
c)	0.6 ml	6 γ		12
d)	0.8 ml	8 γ		16
e)	1.0 ml	10 γ		20
<u>100 γ/ml</u>				
f)	0.125 ml	12.5 γ	} X 2	25
g)	0.150 ml	15 γ		30
h)	0.20 ml	20 γ		40
i)	0.30 ml	30 γ		60
j)	0.40 ml	40 γ		80
k)	0.50 ml	50 γ		100
l)	0.75 ml	75 γ		150
m)	1.00 ml	100 γ		200
n)	1.50 ml	150 γ		300
o)	2.00 ml	200 γ		400

3. Make up to 5 ml mark with distilled water.
4. Now take 15 clean 150 x 16 test tubes calibrated to the 10 ml mark. With a pipette take 1 ml out of each of the previous test tubes and pipette them into the new set of test tubes.
5. (A) To the set of 16 x 150 mm test tubes then add the following:
 - a) 1 ml HCl 6N
 - b) 1 ml 1% FeCl₃ - add more if color development is poor
 - c) 1 ml 5% KSCN
 - d) 1 ml 15% SnCl₂
 - e) Make up to 10 ml mark with demineralized water.
 - f) 1 ml iso-propyl ether.
 - g) Shake for 20 - 30 seconds.
 - h) Allow to settle and read.
 (B) Save the original 16 x 100 test tubes with the remaining solutions in them. Stopper them by corks on which the respective concentrations are marked in ppm. Use these in future preparations.

BIQUINOLINE COPPER TEST FOR SILT, SOIL AND ROCK CHIP

This test is selective for copper and is not subject to any metal interferences. Reference: U.S.G.S. Bulletin 1152.

Reagents

1. Buffer solution: dissolve 400 gms sodium acetate and 100 gms sodium tartrate and 20 gms of hydroxylamine hydrochloride in 1 litre of water. Adjust to pH 6.5.
2. Biquinoline solution: add .2 gms 2,2' biquinoline in 900 mls isoamyl alcohol. Heat on hot plate to dissolve. Cool and make to 1 litre with isoamyl alcohol.

Procedure

1. Take a 1 ml aliquot from digestion solution above and transfer to large test tube for determination.
2. Add 10 mls copper buffer.
3. Add 2 mls biquinoline-isoamyl alcohol solution.
4. Stopper tube and shake vigorously for 45 seconds.
5. Allow phases to separate, then compare colour to standards against a white background and record ppm.

Standards

Stock Standard Solution (100 γ /ml) - Dissolve .2 gms blue CuSO_4 in 400 mls H_2O . Add 5 mls conc. HCl and H_2O to 500 mls.

Working Standard Solution (10 γ /ml) - Dilute 10 mls stock standard and 1 ml conc. HCl to exactly 100 mls with H_2O

Preparation of Standards

This procedure is the same as the preparation for molybdenum standards except for 5 (A). The section 5 (A) which applies to the preparation for standards of copper is as follows:

- 5 (A) To a set of 16 x 150 mm test tubes then add 1 ml 1:1 HNO_3 , 10 ml copper buffer, 2 ml 2,2' - Biquinoline in isoamyl alcohol. Shake for 5 minutes vigorously. Allow to settle, then read.

THM (Total Heavy Metals) TEST

Test mainly sensitive to zinc, copper and lead (especially zinc). Reference: Bloom, H., Economic Geology, Volume 50-1955.

Reagents

1. Demineralized H_2O

2. Dithizone (diphenylthiocarbazone) Reagent grade.
3. Dithizone/chloroform 0.1% solution, dissolve 0.147 gm dithizone in 100 mls chloroform. (Dithizone is more soluble in CHCl_3 than in Benzene).
4. Dithizone stock solution .01% - Dilute 10 mls of 0.1% solution to 100 mls with Benzene.
5. Dithizone working solution .001%: dilute 10 ml of stock solution to 100 ml with benzene; should be made daily; yellow hue indicates breakdown of dithizone.
6. Buffer solution: take 50 gms of ammonium citrate and 8 gms hydroxylamine hydrochloride, making up to 1000 mls with water; adjust pH to 8.5 w/conc. NH_4OH ; purify w/dithizone solution if necessary.

Procedure

1. Measure out with volumetric scoop .5 gm of sample into a test tube.
2. Add 5 mls buffer then 5 mls .001% dithizone solution.
3. Shake for 30 seconds.
4. Observe color against a white background and record ppm from standard chart.

pH MEASUREMENTS

Soil and Silt Samples

The soil and silt samples should be dampened with demineralized water to a pasty consistency. Demineralized water should be used for this purpose because it is thought that water deprived from its ionic content has a low buffer capacity and thus will not influence the pH of the sample.

Experience has borne out the fact that 30 seconds time is sufficient for the meter to come to a reasonable stability. The meter needle will keep on drifting slowly but this will be much slower than at the beginning and therefore can be ignored.

Store electrodes in buffer overnight. When starting in the morning allow 15 minutes warm up for the instrument.

Water Samples

You may use either a sample aliquot from the bottle or simply measure pH right in the bottle by using a combination electrode. If the latter method is chosen, take care that samples have already been analyzed for Mo to avoid contaminations by the

electrode. Use 30 second intervals here as well as between each consecutive measurement.

MOLYBDENUM IN WATER

1. Transfer 50 mls. of sample into 125 ml separatory funnel.
2. Add 10 mls dilute (1:1) HCl
3. Add 1 ml 1% ferric ammonium sulphate or FeCl_3
4. Add 3 ml 10% KSCN and shake.
5. Add 3 ml 15% SnCl_2 in 2NHCl
6. Add 2 ml isopropyl ether, shake for 30 seconds and allow phases to settle.
7. Drain off water layer, retaining organic ether layer in funnel with a little of the aqueous layer remaining.
8. Drain small amount of water plus organic layer into 16 x 150 mm test tube. Compare with standards against white background.

Molybdenum Standards - label 12 clean test tubes 0, 2, 4, 10, 16, 20, 30, 40, 50, 60, 70 and 80 ppb. To the respective tubes pipette the following volumes of 1% /ml Mo work solution.

<u>mls of 1% /ml Mo Solution</u>	<u>ppb</u>
.20	4
.50	10
.80	16
1.00	20
1.50	30
2.00	40
2.50	50
3.00	60
3.50	70
4.00	80

After the standard solutions have been added, make up to 50 ml mark with demineralized water then add the following:

1. 10 ml 1:1 HCl solution.
2. 1 ml of 1% FeCl_3
3. 1 ml of 10% KSCN solution.
4. 1 ml of 15% SnCl_2 solution.
5. 2 ml of isopropyl ether.
6. Stopper and shake for 45 seconds.

Standards must be made up at least three times a week.

ROCKLAND MINES LTD. Cu - MoS₂ PROPERTY - SILVERTON

GEOCHEMICAL SAMPLING

PERSONNEL EMPLOYED AND SALARIES

W. Deans, Prospector, Box 619 Lake Cowichan, B.C. October 16 - 20, 1967	5 days @ \$18.81/day	\$ 94.05
B. Fenwick-Wilson, Prospector, R.R. #1, Osoyoos, B.C. October 16 - 20, 1967	5 days @ \$18.81/day	94.05
E. McGibbon, Labourer, P.O. General Delivery, Silvertton. October 16 - 20, 1967	5 days @ \$16.00/day	80.00
T. Kamin, Labourer, R.R. #2, Oliver, B.C. October 16 - 20, 1967	5 days @ \$18.00/day	90.00

BOARD

20 man days at \$5.50/day	110.00
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GEOCHEMICAL SAMPLES

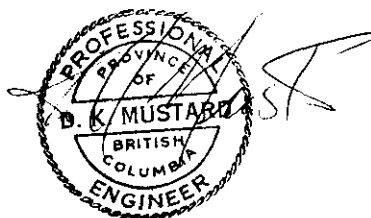
271 samples at \$2.00/sample	542.00
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MAP PREPARATION

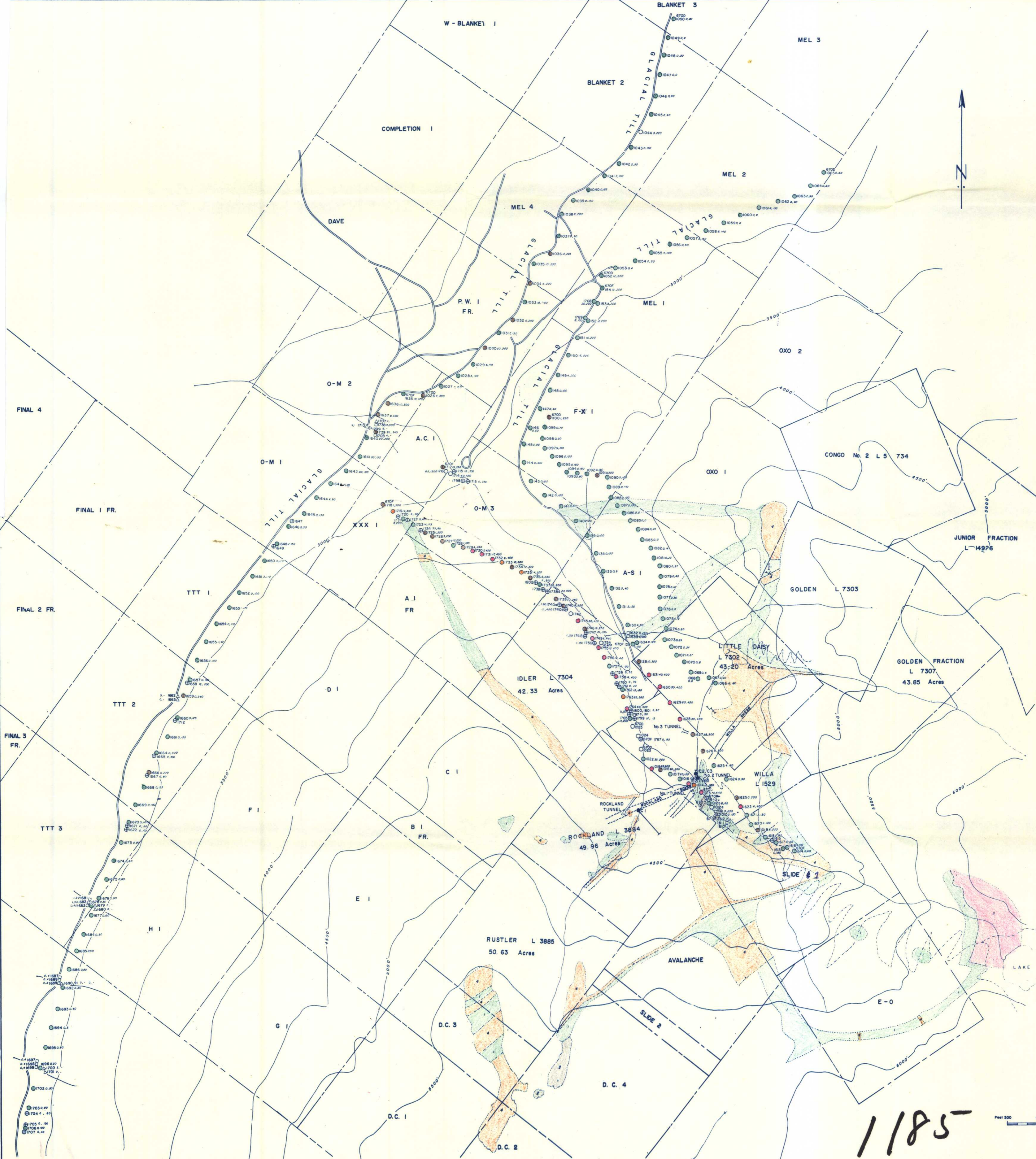
50.00

TOTAL	<u>\$1060.10</u>
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WORK UNDER THE SUPERVISION OF D.K. MUSTARD, P. Eng.



Please see stamps over page.



LEGEND

- Diabase
- CRETACEOUS NELSON PLUTONIC ROCKS**
- Quartzite Porphyry
- Granite
- TRIASSIC SLOCAN GROUP**
- Altered Sediments
- Volcanics (Andite Porphyry)

SYMBOLS

- Old Tunnel
- Shear Zone
- Diamond Drill Hole
- Adit
- Trail
- Claim Line
- Creek
- Soil Sample Number, ppm. Mo, ppm. Cu
- Soil Sample Number, ppm. Mo, ppm. Cu
- Water Sample Number, ppm. Mo
- Rock Chip Sample Number, ppm. Mo, ppm. Cu

GEOCHEMICAL RESULTS

SOILS (ppm. Cu.)	
VOLCANIC	GRANITIC
< 200 ppm Cu. Background	< 325 ppm Cu. Background
201-300 ppm Cu. Positive 1	326-450 ppm Cu. Positive 1
301-400 ppm Cu. Positive 2	451-575 ppm Cu. Positive 2
> 400 ppm Cu. Anomalous	> 576 ppm Cu. Anomalous

SOILS (ppm. Mo.)

- < 142 ppm Mo. Background
- 5-19 ppm Mo. Positive
- > 20 ppm Mo. Anomalous

NOTE:

Geology As Mapped By The Consolidated Mining And Smelting Company Of Canada Limited 1965
 Geochemistry By Amex Exploration Inc. 1967



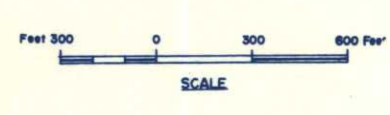
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J. F. McINTYRE, P. ENG.
 CONSULTANT VANCOUVER, B.C.

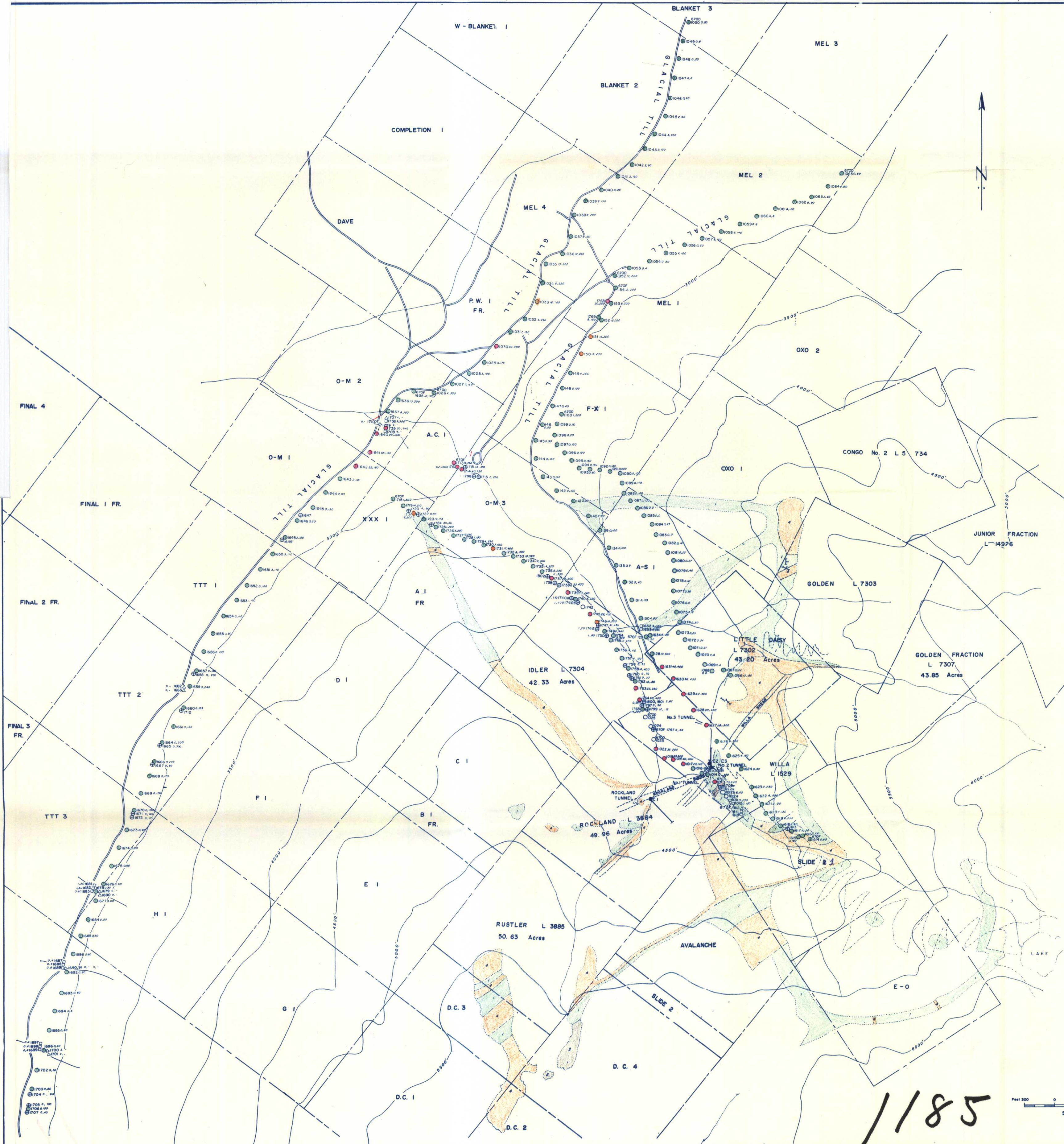
ROCKLAND MINING LTD. (N.P.L.)

GEOLOGY & GEOCHEMISTRY - COPPER

JANUARY, 1968 SCALE: 1" = 600' FIG. 2



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LEGEND

- Diabase
- CRETACEOUS NELSON PLUTONIC ROCKS**
- Quartz Eye Porphyry
- Granite
- TRIASSIC SLOCAN GROUP**
- Altered Sediments
- Volcanics (Augite Porphyry)

SYMBOLS

- Old Tunnel
- Shear Zone
- Diamond Drill Hole
- Adit
- Trail
- Claim Line
- Creek
- Soil Sample Number, ppm. Mo, ppm. Cu
- Soil Sample Number, ppm. Mo, ppm. Cu
- Water Sample Number, ppb. Mo
- Rock Chip Sample Number, ppm. Mo, ppm. Cu

GEOCHEMICAL RESULTS

SOILS (ppm. Cu)	
VOLCANIC	
○ < 200 ppm. Cu Background	○ < 325 ppm. Cu Background
○ 201-300 ppm. Cu Positive 1	○ 326-450 ppm. Cu Positive 1
○ 301-400 ppm. Cu Positive 2	○ 451-575 ppm. Cu Positive 2
○ > 400 ppm. Cu Anomalous	○ > 576 ppm. Cu Anomalous
SOILS (ppm. Mo)	
● < 14 ppm. Mo Background	
● 15-19 ppm. Mo Positive	
● > 20 ppm. Mo Anomalous	

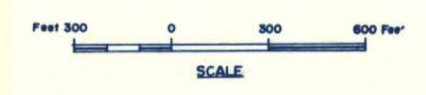
NOTE

Geology As Mapped By The Consolidated Mining And Smelting Company Of Canada Limited 1965
 Geochemistry By Amex Exploration Inc. 1967



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CONSULTANT	VANCOUVER, B.C.
ROCKLAND MINING LTD. (N.P.L.)	
GEOLOGY & GEOCHEMISTRY - M04Y/30EN4M	
JANUARY, 1968	SCALE: 1"=600'
SCALE	FIG. 3



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