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## GEOCHEMISTRY REPORT

## LIME MOUNTAIN AREA

## WINDY ARM

## YUKON TERRITORY

BY

F.M. SMITH, B.Sc.

WHITEHORSE, Y.T.

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Summary

During the last of August and early September the claim group at Lime Mountain was soil sampled by line cutters.

From statistical interpretation of the copper and molybdenum contour intervals were determined and the two maps contoured according to the understanding of the significance of the values.

From the contours pattern it becomes evident there are three significant anomalies. The first, zone A, on the Moly map is characterized by a ring halo common to copper-moly porphyry granite stocks; the second, zone B, is either an alteration due to this stock or a small subordinate stock; the third, zone C, is important in that it suggests more mineralization further up hill on Lime Mountain.

From the interpretation it is suggested that zone A be examined by drilling and/or trenching to determine economic potential. That zone B be further sampled to delineate the shape and significance of this anomaly. That further exploration be carried out further up hill to determine if more mineralization occurs.

Since Anomaly A is open sided on the lake side, it is suggested that more effort be expended by sampling this area as soon as is practical to determine where this anomaly terminates.

## Introduction

Between the 21st of August and September 15th, approximately 1,650 soil samples were taken along cut lines 400' apart, at 100' spacings on the claim group. This group is situated on Lime Mountain, Claim Sheet 105D1, i.e., the Jubilee Mountain sheet.

Samples consisted of borings from below moss using an auger. Samples were collected in kraft bags. Three samplers completed the task.

The only problems evident from the data are as below:

The samplers were unfamiliar with the sampling method and proceedure and may have accidently caused erroneous values due to contamination.

No effort was taken to determine, pH, water content of soil, local slope, local vegetation, soil composition and colour. All these factors should have been noted, their lack makes the conclusions somewhat qualified due to a lack of control features of the possible anomalies. All these factors are pertinent to understanding the importance of an anomaly. For example, and most importantly, the pH controls the mobility of the molybdenation and cupridion. If the soil is acidic then moly does not move except by purely mechanical means (soil creep). Copper is effectively leached from the soil. The opposite is in effect in a basic soil. Sometimes soil cover over rocks may have very little to do with subcroping rocks, i.e., the soil over a limestone maybe acidic due to its own composition and in spite of local limestone.

## Problems of Interpretation

From a perusal of the data it became evident that there are some possible errors in the values. This is especially noticeable in the rather poor repeatability of any sample site value from double (accidental) sampling. This poor repeatability may be due to many factors some are noted below:

a. Improper sampling i.e., non uniformity of sample depth.

b. Contamination.

c. Poor assay repeatability.

Because future work is suggested it is recommended that more effort be spent at defining all pertinent parameters (as noted earlier) affecting sample values. This does not require much more time, energy, knowledge <u>or</u> money but leads to a more reliable picture of the sample value relation to the real value at the sample site.

## Interpretation of Analysis

From the values of the two analysis an idea of the significance of unusual or anomalous values must be obtained. That is to say, one must be able to note how anomalous any given value is and what the average value is. This requires some simple but labourous mechanical arithmetic. The average used is the arithmetic means i.e., the sum of the values divided by the number of values - as follows:

$X = (\Sigma (PPM)/N$ where $\bar{X}$ is the means, $\Sigma$ means to sum all inside the bracket, PPM stands for the values and N the number of values.

Interpretation of Analysis (cont'd)

The next important value is the standard deviation of the sample values - from the mean. This is the sample variance of the values. It is a measure of the spread of the values from the mean, as below:

$S = \sqrt{(\Sigma(PPM - \bar{\bar{x}})^2)/N-1}$ This "S" then is the standard deviation (variance) of the sample. These two values must be determined if one is going to attempt to compare the contours on the Copper and Moly map.

If arbitrary contour values are choses it is similar to using two altimeters both possibly in error to try to compare the altitude of two mountains. You know the mountains are there and they are high but you are not sure which altimeter is showing a measure of the true height.

Thus by converting the contours to the statistics of each sample you can compare the outlines of each contour on the basis of how high it is in relation to the basis (mean) of each sample.

From the plot of the frequency of occurence of values of Moly (the copper being almost the same) it is possible to note why the contour interval was chosen. The first contour represents the mean; the second contour represents the first standard deviation. If one takes the area under the frequency curve, the means divides the area in two. The first standard deviation means only about 16% of the area is above this value. The usual meaning to these lines is that the mean differentiates back ground.from potential anomalous areas. The area inside the second line represents probably anomalous values.

There the mean for Moly was 4.0 ppm and the standard deviation is 4.8 ppm. and the mean and standard deviation for copper are 30.0ppm and 61.8ppm.

Interpretation of Analysis (cont'd)

Not all areas equal to over 4.0 ppm were contoured. The areas contoured have some significant shape and/or continuation. The areas not contoured appear to be random highs and lows.

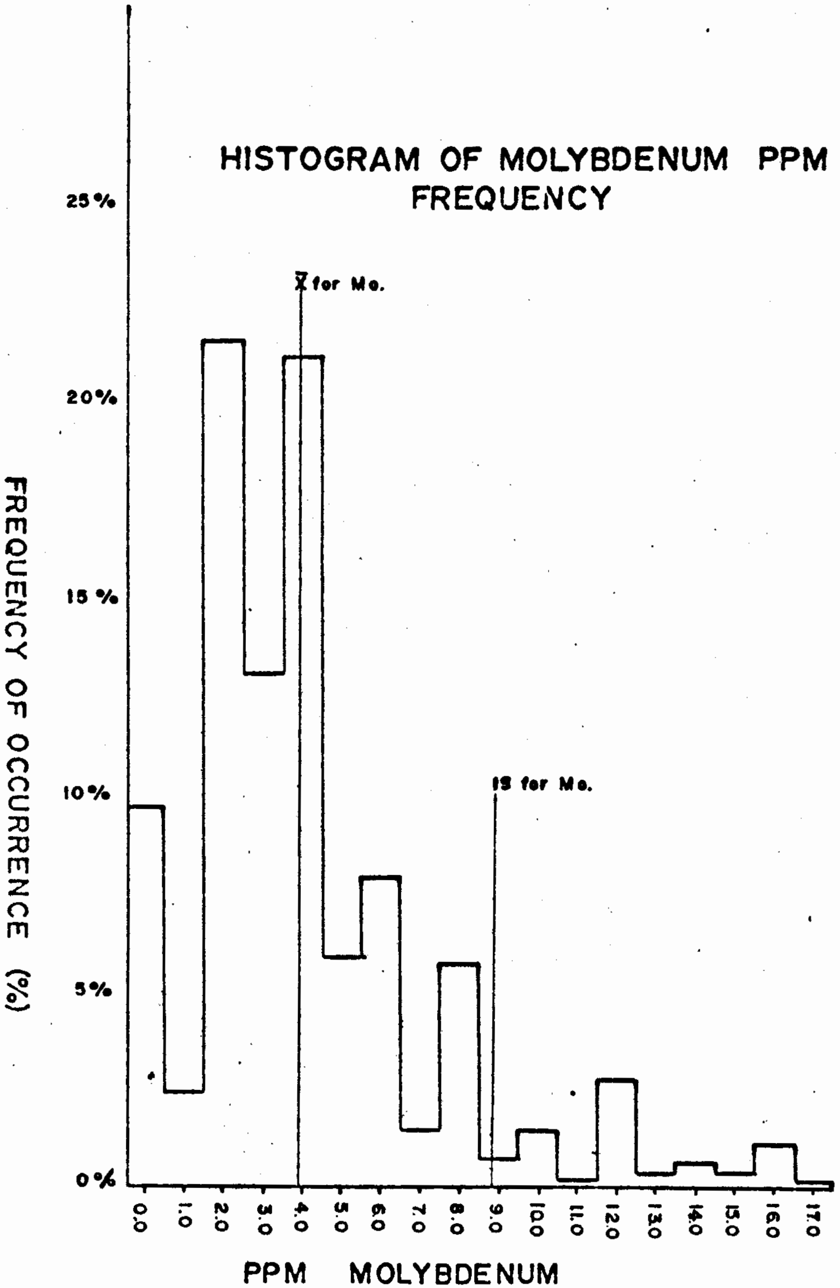
Interpretation of Anomalies

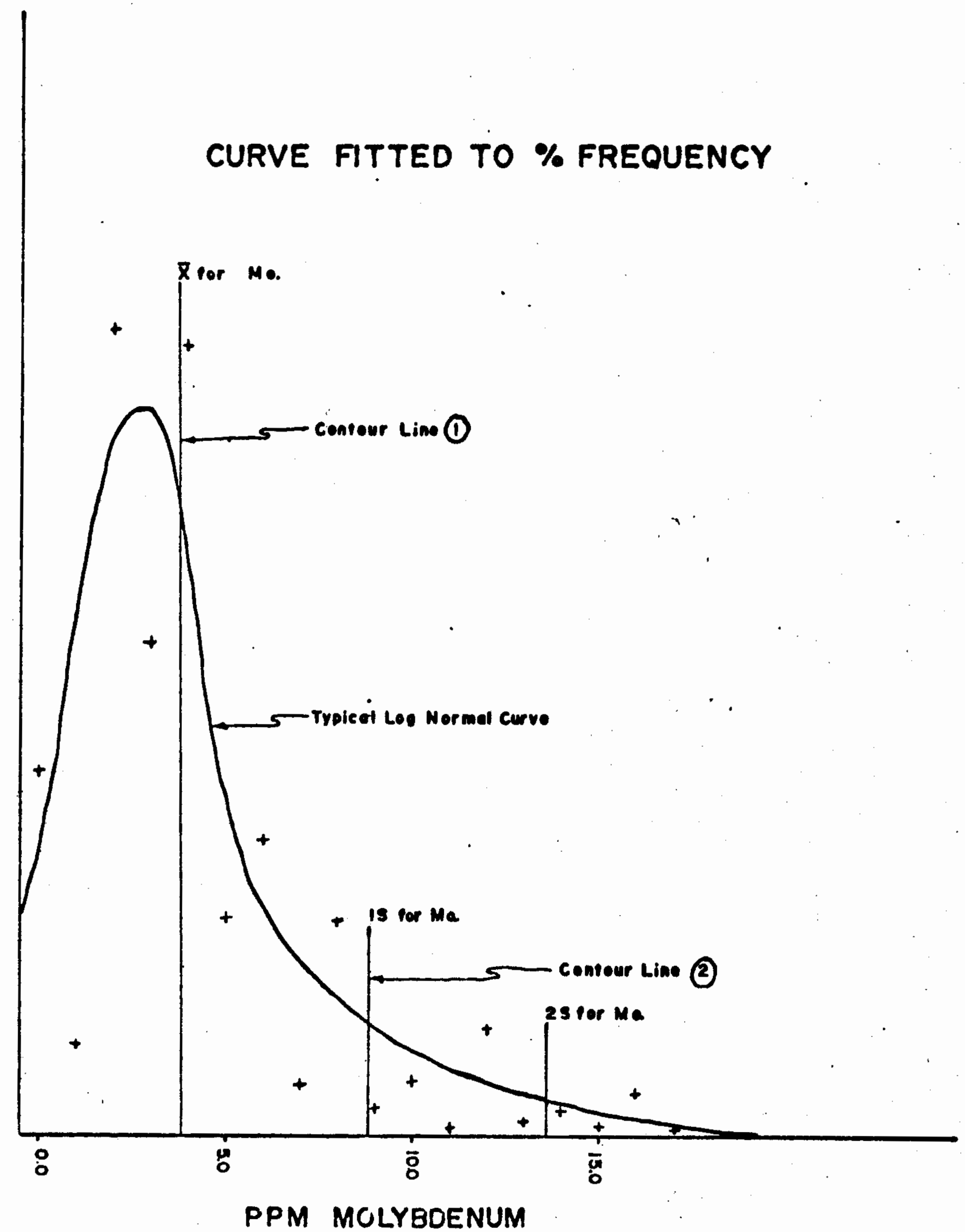
It is the opinion of the writer that there are three significant and a few possibly significant anomalies shown by the contouring of copper and moly values.

The Moly map is the best map for delineation of the anomalous zone, this will be explained later.

Anomaly A, on the Moly map shows a characteristic halo effect common to copper-moly porphyries. This effect is very often noted. It has a richer zone of copper and moly around the edges of a stock producing a circular zone of mineralization. The copper anomaly in the same area outlines most of the band of Moly anomaly above one standard deviation. But as is noted the copper is not as rich in this area as the moly. This anomaly when compared to the geology map shows a slight down hill shift from the area interpretated as having sub crop of intrusive.

Anomaly B, appears to lie over the extrusive rocks up hill from the intrusive rocks (3). It may be an alteration in the extrusives or, since the moly is quite high in the rocks that it represents a small stock off shoot from the stock downhill (under anomaly A).


HISTOGRAM OF MOLYBDENUM PPM FREQUENCY
FREQUENCY OF OCCURRENCE (%)
25%
20%
15%
10%
5%
0%
$\bar{X}$ for Mo.
1S for Mo.
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
PPM MOLYBDENUM


CURVE FITTED TO % FREQUENCY
$\bar{X}$ for Mo.
Contour Line (1)
Typical Log Normal Curve
1S for Mo.
Contour Line (2)
2S for Mo.
0.0
5.0
10.0
15.0
PPM MOLYBDENUM

Interpretation of Anomalies (cont'd)

The third major anomaly, C, lies in the upper edge of the map. The main interest in this area is that it is suggested it represents a solufluction off of the hill of moly oxides in soil. From the solubility properties of Moly and Copper it becomes evident in this area that copper is being leached rapidly from the soil and moly is remaining. This occurs under strong acid conditions. In spite of the limestone bed rock I suggest that because the copper anomalies are much lower and less significant than the moly that acid soil conditions prevail and this zone C, thus is important in that it points to possible mineralization further up hill.

Proof of the acid soil hypothesis is based on the poor copper values below and along lines 8400N. There is shown from the geology work that visible copper float was found but there is no appreciable copper retained in the soil. This copper float may be an expression of the moly solufluction from further up hill.

Thus in only one area is there no coincidence of copper and moly anomalies. This latter case has been covered above. As a result, it is suggested that a significant anomaly of copper and molybdenum has been determined by soil survey.

The only other significant point is that the zone of relative high moly values of which zone A is a part, is open sided on the bottom or lake and stream side. This means that the other side of this area must be sampled to determine where the large area of anomalous moly values is terminated i.e., Zone A must be terminated, its boundary must be defined before the true significance of this area can be determined.

## Recommendations

### Zone A

This area has been sufficiently defined and delineated by the present work. The only follow up that should be done is drilling and/or trenching of this area to determine actual rock mineralization. The only work in this area being sampling the other side of the creek to be carried out.

### Zone B

This area should be re-done at tighter spaced sampling, i.e., a 50' x 50' grid to tighten down the boundary and significance of this anomaly.

### Zone C

Exploratory work should be undertaken further up this hill to see if other stocks intrude in this area with the aim of tying down more mineralized zones.

### Remaining small possibly insignificant anomalies.

The other small discontinuous anomalies should be thigh grid sampled to either reject or further enlarge their anomalous significance. This grid should be at least 50' x 50' spacing with the grid lines re-sampled.

There are too many of these to be listed but if further work is undertaken all these areas should be double checked by resampling to check for possible mineralized zones.

<u>**AUTHORIZATION**</u>

1. I the undersigned, am a geologist, graduate of the University of Toronto, 1967.

2. I have practised my profession as a geologist in mapping and geochemical exploration for the last four summers.

3. My home address is Box 548, Whitehorse, Yukon Territory.

4. I am familiar with the geology and geochemistry of the Lime Mountain Area, Windy Arm, Yukon Territory.

F. Marshall Smith, B. Sc.

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