

REPORT ON  
GRAVITY SURVEY  
FOR  
KIM EXPLORATION LIMITED  
IN  
YUKON TERRITORY  
BY  
CANADIAN AERO MINERAL SURVEYS LIMITED  
Project No. 9662

This report has been examined by  
the Geological Evaluation Unit.  
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Approved as to cost in the amount  
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RESIDENT MINING ENGINEER

Accepted as representation work  
under Section 53(4) Yukon Quartz  
Mining Act.  
[Signature]  
COMMISSIONER

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PROJECT NO. 9662

OTTAWA, ONTARIO,  
November 18, 1969

D. R. Vohra,  
Geophysicist.

## T A B L E O F C O N T E N T S

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### Accompanying this Report:-

- 2 Bouguer Contour Maps at the scale of  
1" = 400 feet  
1" = 500 feet.
- 1 Bouguer Density Profile.

REPORT ON  
GRAVITY SURVEY  
FOR  
KIM EXPLORATION LIMITED

I. INTRODUCTION

During the period 7th. July, 1969 to 1st. August, 1969, a gravity survey was conducted by Canadian Aero Mineral Surveys Limited on the Rae and Jo claim groups of Kim Explorations.

Mr. L. Pomerleau was the geophysicist in charge of the field party.

The aim of this survey was to indicate the prospective areas for lead and zinc mineralization.

Area Location & Accessibility

The surveyed areas of Jo and Rae claim groups are located 140 miles N.E. of Whitehorse.

The prospect may be reached by road transportation and may also be reached by air.

Survey Coverage

Summary of Time

Field Production	25 days
Weather and Wind	4
Travel Time	4
TOTAL	<u>33</u>

Total number of stations at 100' interval = 1404.

### Field Methods

The gravity survey was carried out using a Worden Gravity meter, Serial No. 620, having a scale constant of 0.0895 milligals per scale division. Stations were read at an interval of 100'. All the readings were reduced to datum having a value 105.23 milligals (meter reading multiplied by scale constant). The Datum station being the base station, all other stations were tied to it.

Once the base control had been established the survey proceeded in normal fashion with stations at every 100 feet and coming back to the base station every 2 to 3 hours.

### Density Information

A density determination for the rocks of the area was carried out by means of Nettleton's method of density profiling.

The Bouguer profile that showed no effect of topography was assumed to be the correct one, yielding a density of 1.45. ?  
Results of density determination are shown on plate I.

## II. CALCULATION OF RESULTS

The results of the gravity survey have been presented on maps and profiles as Bouguer gravity values. To arrive at such values a number of calculations must be made and corrections applied to the original meter reading. Such steps are noted and explained below.

### Drift Calculations

Every gravity meter of the Worden type is subject to drifting or more specifically constant adjustments. These adjustments vary according to temperature changes, amount and type of movement of the meter etc. and are assumed to be linear. By checking back to base stations at regular intervals the value of drift can be determined and plotted against time. From this graph the value of drift corrections for each station may be determined.

### Meter Constant

Every gravity meter has its own meter constant which has been determined by the manufacturer and allows the conversion from scale dimensions to milligals by multiplying the corrected reading by meter constant which in this case is 0.0895.

### Latitude Correction

The earth's deviation from a sphere derives from the oblate spheroid shape resulting from its rotation. This introduces a variation in the force of gravity which is a function of the latitude. This variation and the effect of centrifugal force of rotation are calculated as "Latitude on north-south correction". It is calculated by using the formula:-

$$\text{Latitude correction: } 1/194 \sin^2 \phi$$

$\phi$  being the latitude.

Terrain correction:- As it was initially proposed no terrain corrections were made. The terrain effects are well marked in both the claim group areas. This is further explained in the interpretation of the results.

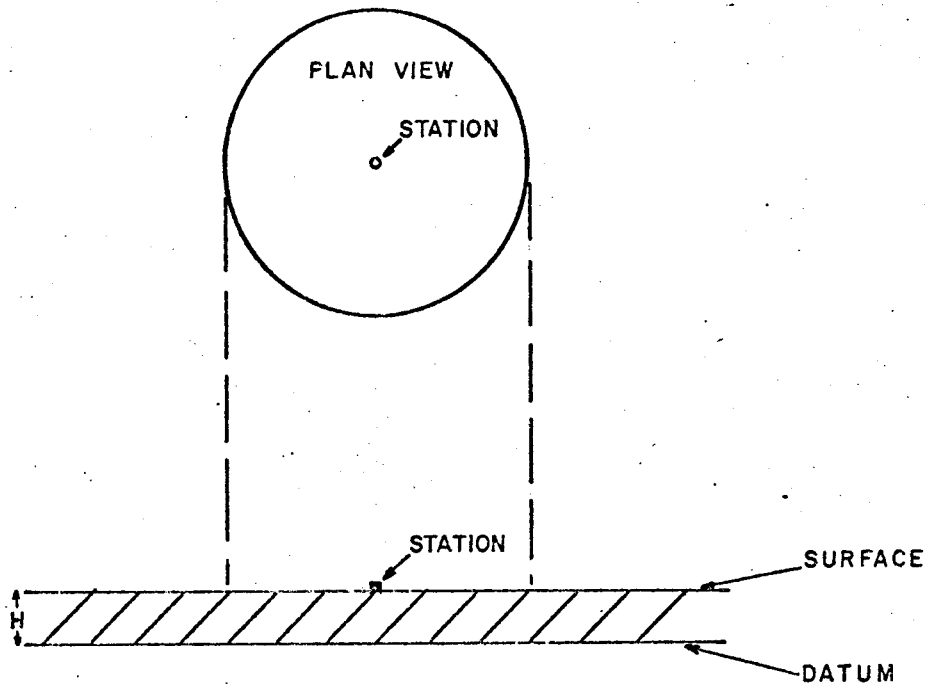
Free Air & Bouguer Corrections

In order to compare absolute values of gravity it is necessary to reduce the data to the datum.

The variation on gravity due to elevation of the field station above the datum is known as the elevation or free air correction. The correction is based on the assumption that no mass other than free air exists between the station and the datum. The constant for free air correction is 0.09406 milligals/feet.

Bouguer Correction

The correction for the effect of the mass of material between the station and datum can be derived by assuming some calculatable shape. The most convenient shape mathematically is a flat cylinder or a disc of material as shown in the following diagram.



The gravity station is assumed to be located at the center of the top surface of the cylinder. The height H of the cylinder is smaller than its radius which may be considered to be  $\infty$ , so that the correction takes into consideration all material from the station to datum.

According to Helmert that attraction of a mass of this shape on a lgm. mass at the station locations is:

$\Delta g = 2 \pi G d H$ . where  $\Delta g$  = the gravity effect of the cylindrical mass.

G = Gravitational constant.

d = Density of the material in the cylinder.

H = Height of the station above the datum or thickness of cylinder.

$$\begin{aligned} \text{As } g &= \text{G.M. } 1/R^2 = \frac{G \ 4/3\pi R^3 \sigma}{R^2} \\ &= G \ 4/3\pi R \sigma. \end{aligned}$$

M and R being the mass and radius of earth and  $\sigma$  is its mean density - G is the gravitational constant.

$$\frac{\Delta g}{8} = \frac{2\pi G d H}{G^{4/3} \pi R} = \Delta g = g^{3/2} \frac{d H}{\sigma R}.$$

This correction amounts to 0.0127 d.H. milligals/feet.

### III. INTERPRETATION OF RESULTS

The Bouguer gravity profiles of Rae and Jo claim groups indicate higher range of gravity values. These values range from 1.60 milligals to 5.96 milligals and 0.3 milligals to 5.7 milligals for Rae and Jo groups respectively.

The higher range of Bouguer gravity values is due to the topographical effects.

In Bouguer gravity profile of Rae group two well marked anomalies were located on line 40W. The nature of these anomalies indicates the presence of basic igneous intrusive material which warrants further investigation. Small isolated anomalies were seen occurring at 11S and 26S on line 36W, at 11S and 16S on line 32W, and at 40S on line 40W. These are mainly due to topographical effects.

In Bouguer gravity profile of Jo claim group three sets of anomalies were observed.

These occur at stations 96N to 120N on line 34W and 38W, 80N to 87N on line 38W, 105N - 108N on line 34W. These anomalies are partly due to the topographical effects and partly due to the changes in density. They are located in shear zones

which show chloritisation. Some of these anomalies also coincide with Geo-chemical anomalies. All these factors indicate the possibility of sulphide mineralization.

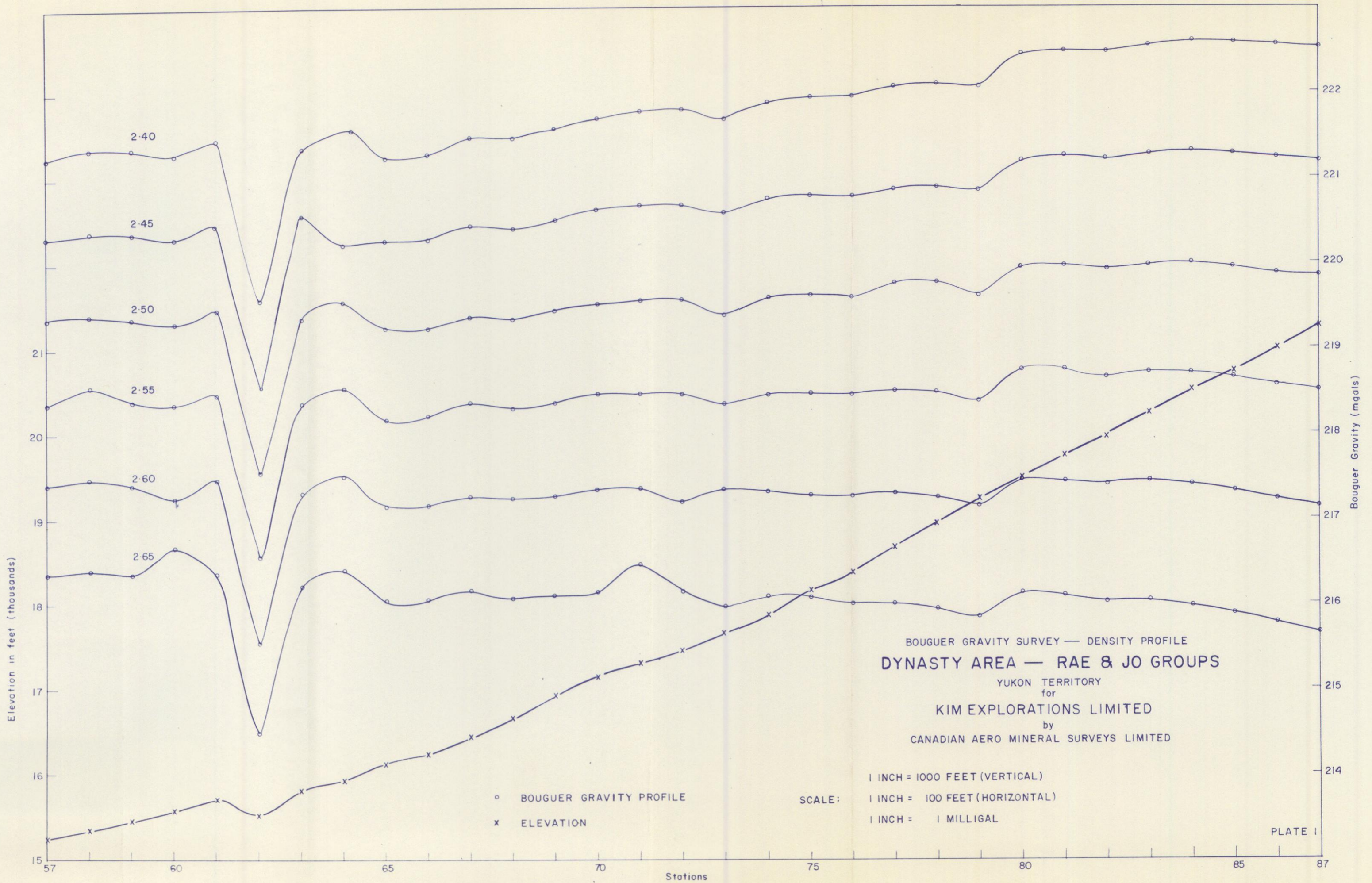
In order to further delineate the anomalies some other geophysical techniques such as E.M. or I.P. should be tried.

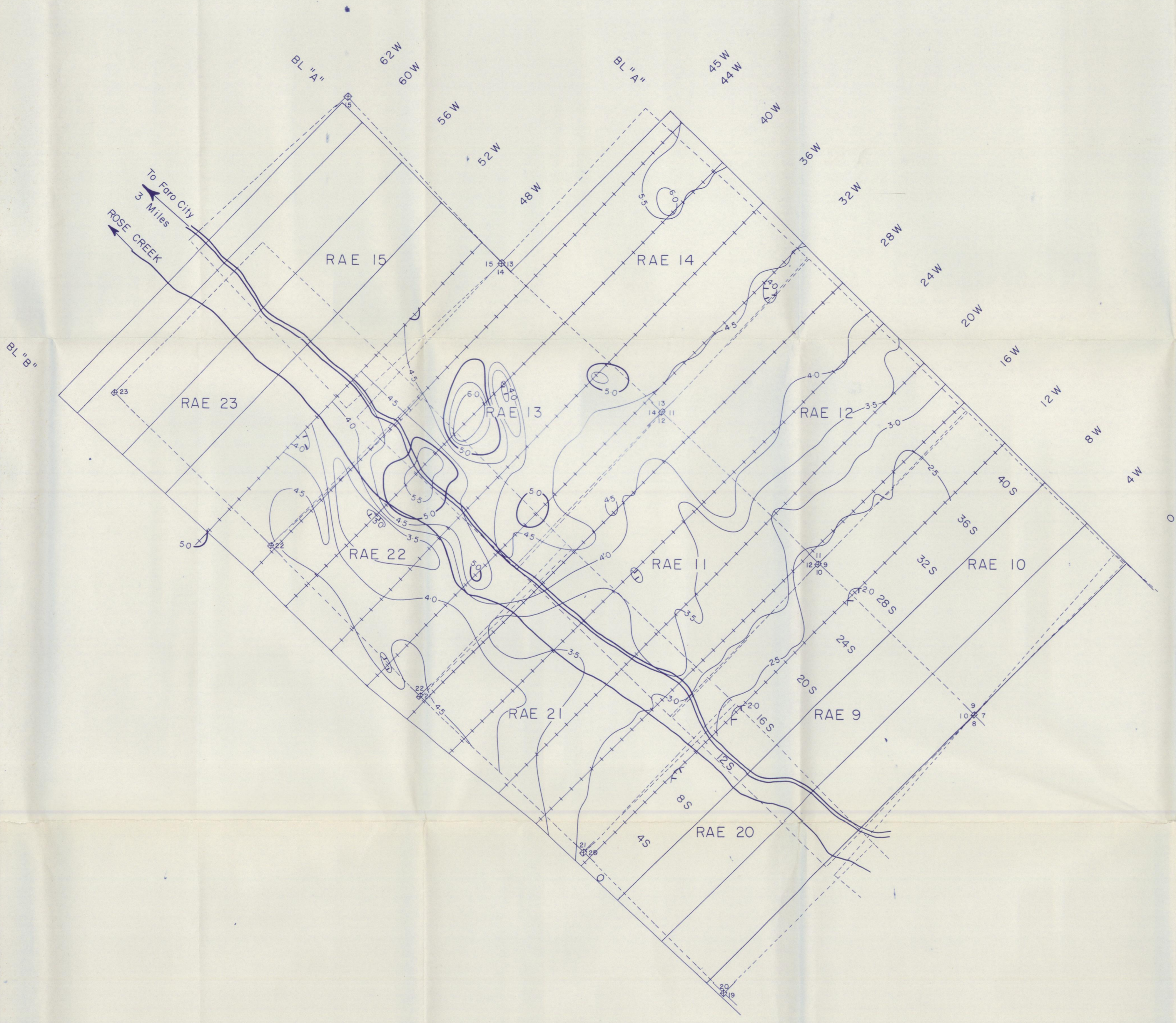
Respectfully submitted,



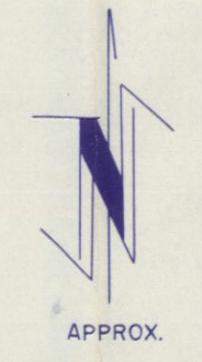
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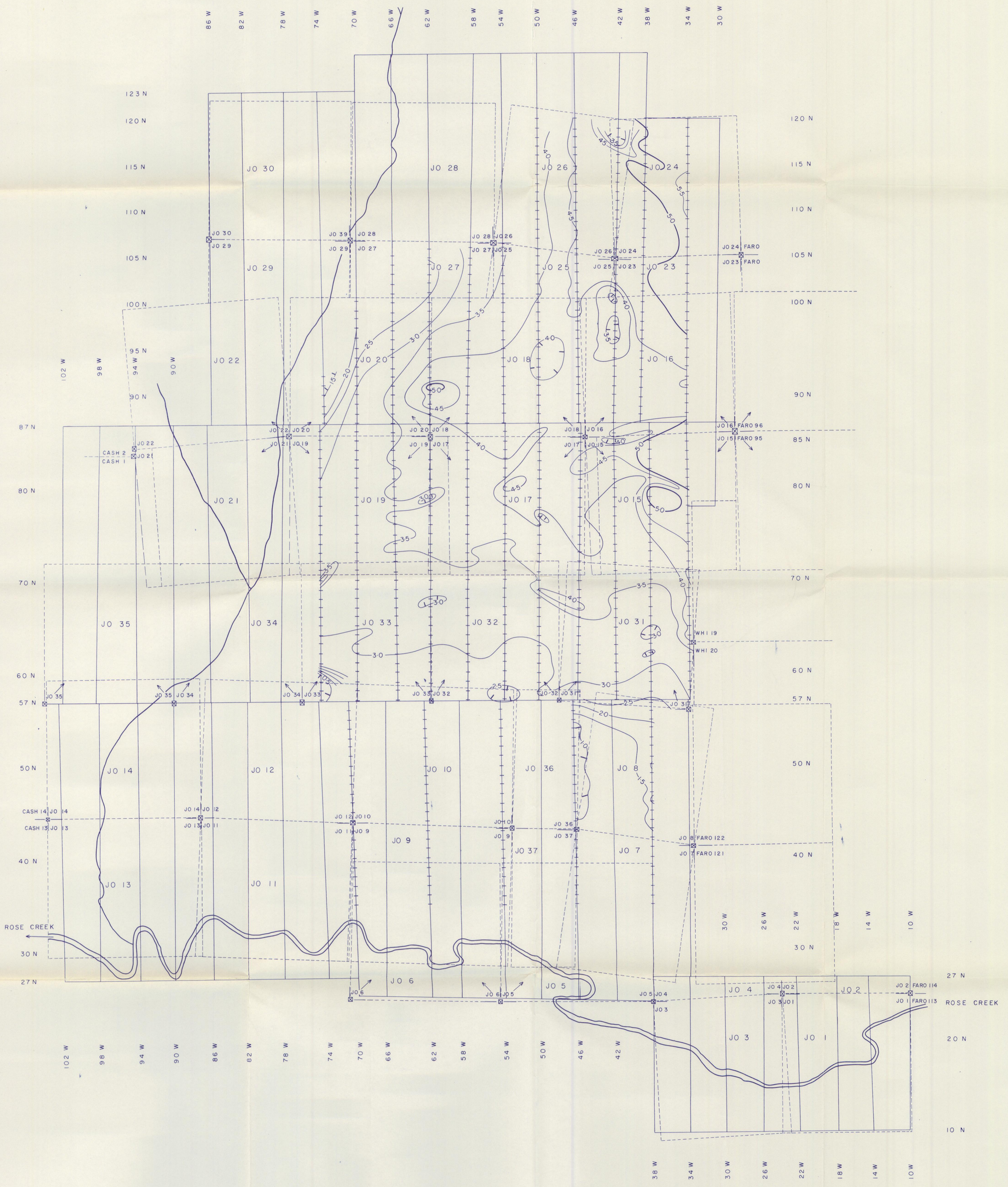
OTTAWA, ONTARIO,  
November 18, 1969.





BOUGUER GRAVITY CONTOUR MAP  
**DYNASTY AREA—RAE GROUP**  
 YUKON TERRITORY  
 for  
**KIM EXPLORATIONS LIMITED**  
 by  
 CANADIAN AERO MINERAL SURVEYS LIMITED  
 SCALE 1 INCH = 400 FEET  
 CONTOUR INTERVAL . . . . . 0.5 MILLIGALS





BOUGUER GRAVITY CONTOUR MAP  
 DYNASTY AREA—JO GROUP  
 YUKON TERRITORY  
 for  
 KIM EXPLORATIONS LIMITED  
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 SCALE 1 INCH = 500 FEET  
 CONTOUR INTERVAL ..... 0.5 MILLIGALS

