GEOPHYSICAL REPORT

ON 94E/6E

INDUCED POLARIZATION AND MAGNETIC SURVEYS

ON THE

MOOSEHORN PROPERTY

BY

TAKEO YOKOYAMA, M.Sc., GEOPHYSICIST

JUNICHI MORITA, M.Tech., GEOPHYSICIST

AUGUST 18th., 1972

CLAIMS SURVEYED

WAS: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,
16,17,18,19,20,21,22,23,24,25,26,27,
28,29,30,31,32.

PIT: 69,70,71,72,73,74,75,76.

LOCATION

ELEVEN MILES SOUTHWEST OF CHUKACHIDA LAKE, B.C.

LAT. 57°N; LONG. 127°W

FIELD WORK

JULY 7th-22nd, 1972

4062

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CONTENTS

I. Introduction

The Moosehorn property was staked last year as anomalies were found by the reconnaissance geochemical survey. Following the last years results, an exploration programme including geological, detailed geochemical and geophysical surveys was carried out in July, 1972.

Seventeen lines (total line-mileage is nine) were prepared for geophysical surveys on and around the reconnaissance geochemical anomalies. As the result of the I.P. survey, several lines (total line-mileage is 1.5) were added, to delineate the anomaly in the south-western end of the property.

The geological features of this property appear to be very simple. Andesite lava is distributed in the whole property. Little mineralization was evident except one showing besides the creek which contained some extent of pyrite and few lead and zinc minerals. Although geochemical anomalies obtained last year were quite noteworthy, the expected ore type was not obvious.

The I.P. work as well as a detailed geochemical survey, planned to detect and delineate the zone of mineralization.

Magnetic and resistivity surveys were expected to outline the geological structure and rock distribution. These are sometimes useful to indicate the mineralization for some type of ore bodies.

II. I.P. and Resistivity Surveys

An induced polarization survey was carried out from July 10th to 22nd. I.P. measurements were made by means of the variable frequency method using the McPhar Induced Polarization System, Model 654. Frequencies of 5 Hz and 0.3 Hz were used on the survey. The pole-dipole configuration of 200 ft. separation and 200 ft. spacing were adopted throughout the survey, although 400 ft. separation and 400 ft. movement were planned. Based on the geological information, 200 ft. separation was considered to be preferable for a narrow vein-like body.

At the start, the I.P. crew often had difficulty in getting a good ground contact on account of very dry ground, but later rainy weather helped the crew out of these difficulties. However the rainy weather resulted in much lost time, and little progress with the work. As for a reconnaissance survey, the gradient array by means of the time domain method seems to be more applicable for a dry country.

To set forward the reconnaissance survey, the measurements were done on every other line in the western* part for it became clear that any anomaly that could be expected would be dike-like. As a few anomalous reading was observed at the end of the survey in the south-western edge of the property, the lines were extended to the west and the south. Several claims were staked and additional I.P. work was made to investigate the size of anomaly. A total of eight line-miles was covered by the I.P. survey including the extra 1.5 line-

* Directions are referred to grid north which is about N 35°E true.

miles on the southwest corner of the property.

The data obtained from the I.P. survey are expressed as frequency effect (unit = %), apparent resistivity (unit = ohm-feet/2π) and metal factor. Metal factor is calculated as follows:

$$M.F. = \frac{\rho_{0.3} - \rho_5}{\rho_5^2} \times 10^5 = \frac{F.E.\ (\%)}{\rho_5} \times 10^3$$

$$F.E. = \frac{\rho_{0.3} - \rho_5}{\rho_5} \times 10^2$$

$\rho_{0.3}$ = apparent resistivity at 0.3 Hz

ρ_5 = apparent resistivity at 5 Hz

The data are presented as contoured plans of apparent resistivity, frequency effect and metal factor for 200 ft. separation using a scale of 1" = 400'. No section profiles were presented because the measurement was made with only 200' separation.

1) RESISTIVITY (See Fig. 211-GP-1)

Apparent resistivity is high (300-1500 ohm-ft/2) in the middle part of the property and low (60-300) in the eastern part (line 44E-64E) and the south-western part. The features of the apparent resistivity look very similar to a porphyry copper area, that is, where the granitic intrusive rock (high resistivity) is surrounded by volcanic or sedimentary rocks (low resistivity).

Geologically, andesite lava is distributed throughout the whole area. It is hard to clasify this andesite except at the top of the hump at the northern end of line 24E-36E. In eastern part of the creek, pyritized and silicified andesite are distributed. In south-western part, some sulphide minerals are expected from the I.P. results.

There are two possibilities for an explanation of the resistivity distribution. The first one is that there may be three types of andesite and that a high resistivity andesite is surrounded with low resistivity one in addition to andesite lava flow on the top of the hump. Another idea is that there may be only one type of andesite, except for the one on the top of the hump, and scattered pyrite yields a lower apparent resisitivity.

The apparent resistivity itself has little significance as a direct tool for a disseminated type of ore body, though it can indicate a large quartz vein (very high resistivity) or a massive ore body (very low resistivity). However, the resistivity result contributes to the exploration by outlining the rock boundaries and delineating argilized and/or pyritized zones unless rough topography prevents the geophysist from discriminating.

2) FREQUENCY EFFECT (See Fig. 211-GP-2)

The back ground value of the frequency effect is quite low. The highest value observed in this property is 5.5%. Values of more than 2% could be called anomalous. Four anomalies were detected in the property, these were named A,B,C and D from the west to the east.

i) Anomaly A

This anomaly is situated at the south-western corner of the property. As three anomalous values were observed on the last day of the survey, the line was extended towards the south and west to the brook to examine the shape and size of the anomaly. This is the strongest and largest anomaly in the property. Its size is at least 1300 x 2500 feet, lies NW-SE, and is still open at both ends.

No outcrop is expected because the area is completely covered with overburden. Although the results of soil sampling are not obtained yet, this area is considered to be the most important from a geophysical point of view. The higher I.P. values could indicate a higher sulphide content and the size is big enough for an open pit mine if the causative body comes up to ore grade. It is impossible to distinguish economically valuable materials from scattered pyrite by geophysical prospecting.

In order to investigate the possibility of an economic deposit, two drill holes are recommended.

ii) Anomaly B

Though the I.P. readings are not very high, this anomaly is considered to be noteworthy because it coincides fairly well with the geochemical anomalies in shape and place. This anomaly is different from anomalies A and C in two points. First, it extends to E-W or WNW-ESE. Second, it is situated in a high resistivity area. The causative body is presumed to be a narrow dyke-like one. Only one pyritized showing was found at 13N-28E at the northern edge of the anomaly. Though smaller content of sulphides is expected than in Anomaly A, and the shape of the anomaly is not supposed to be suitable for an open pit mine, the anomaly could be considered important if the precious metal content is high enough. Two drill holes are recommended in order to check the I.P. and geochemical anomalies.

iii) Anomaly C

The anomaly extends to the north-west along the creek, which is the same direction as Anomaly A.

Porphyritic volcanic rock running parallel with this anomaly is found to the north beyond the lines. The NW-SE direction is considered to be that of a main geological structure and the mineralization is thought to be associated with a fault or a dyke along the creek. As scattered pyrite with a small quantity of other sulphides is observed in some places along the creek, the anomaly is considered to be mainly caused by pyrite.

One drill hole is recommended to examine the quality of the causative body.

iv) Anomaly D

As the anomaly is situated at the edge of the grid, its shape is not clear. The causative body seems to be similar to that of Anomaly C in quality and direction. The anomaly is not considered to be very important unless ore grade mineralization is discovered on Anomaly C. No drilling holes are recommended.

3) METAL FACTOR (See Fig. 211-GP-3)

The writers do not use the metal factor very often. This factor is sometimes affected too much by the apparent resistivity and misleads the reader into the exploration of the pyrite zone or the areas where volcanic rocks are distributed.

In this property, the metal factor is calculated and presented as a contoured plan map for reference.

Only two anomalous zones were detected by it. Anomaly B disappeared due to high resistivity. Though Anomaly A remained still in almost the same shape, Anomaly C merged into Anomaly D and consequently the shape of anomaly was changed in the eastern part of the grid.

Values of the Metal Factor between one and ten are usually regarded as a back ground for unmineralized basic rocks.

Due to a high resistivity in general, the value of the metal factor anomaly in the property is not very high (max. 36). The higher values could indicate a small to moderate amount of disseminated sulphides.

III. Magnetic Survey (See Fig. 211-GP-4)

A magnetic survey was carried out from July 8th to 17th, 1972 on the Moosehorn property. The vertical component of the magnetic field was measured by using a McPhar M-700 portable flux-gate type magnetometer. The accuracy of the instrument itself is 20 gammas. Observations were made every 100 ft. along the grid lines and every 200 ft. on the baseline. The total number of line miles were about 10, including the baseline.

The base station was set at 52E, 16N near the camp. A reading was taken at the base station at least twice a day. No big variation was found on any measuring day. Diurnal variation at the base station was observed every 15 minutes between 9:00 and 21:00 hours, on June 25th (incompletely) and July 3rd at McClair Creek Property, a few miles southeast of this property. The variation was less than 80 and 60 gammas respectively. It is shown in Fig. 211-GP-5. The diurnal variation is unexpectedly low in this area considering the high magnetic latitude.

As magnetic anomalies were quite high (more than 1,000 gammas) in this property compared with the diurnal variation, the correction for it was omitted. It would not have a significant effect on the interpetation.

Generally speaking, readings were low (less than 200 gammas) in the eastern part of the grid (between 44E-64E), and the south-western part. It coincides fairly well with the resistivity result. In the middle of the grid, three belts of high magnetic anomalies running east and west were detected.

Andesite lava is distributed throughout the whole area, and a non-magnetic andesite of a different type is observed at the top of the hump in the north. The north end anomaly is considered to be caused by the rock boundary. The other two anomalies lying in the middle and in the south are presumably caused by dyke-like bodies containing a large amount of magnetite, which are thought to dip towards the south and north respectively. The relationship between the mineralization and these anomalies is not evident.

From a geophysical point of view, the anomalies due to the magnetic andesites can be discriminated from the others. The fromer include a considerable amount of magnetite and show high resistivity, the latter are less magnetic and exhibit low resistivity. On the whole, the magnetic andesite in the middle part of the property appears to plunge slightly towards the west or northwest. The relationship between mineralization and magnetic anomalies was not investigated further.

The magnetic survey is not a direct tool at all in this property because a great amount of magnetite is found in exposures and floats of andesite on the hill side.

IV Conclusions

Geophysical prospecting seemed to be very useful and effective in this property. Claims were extended towards the south to cover the projection of I.P. anomaly A.

Magnetic and resistivity results were helpful to interpret geological structures.

Four anomalous zones were detected by the I.P. survey. They were named A,B,C, and D from west to east which is also the order of their importance. All of them coincide with geochemical anomalies, except that geochemical results on A anomaly are not yet available.

Anomaly A, with a direction of NW-SE lying at the south-western corner of the grid, is the strongest and largest of them all, and is considered to be most promising.

Anomaly B, running east-west in the center of the grid is supposed to indicate a dyke-like body, but it is noteworthy considering the geochemical results.

Anomaly C, lying along the creek, shows the same direction as Anomaly A, and geophysically has certain points of similarity although it is narrower and weaker.

Although promising outcrops are not found, these anomalies are considered to be worth while investigating. It is possible that the anomalies are mainly caused by scattered pyrite, but no geophysical method can distinguish useful metal minerals from pyrite. It is also impossible to know gold and silver contents by geophysics.

Five inclined drill holes are recommended in order to examine the grade of these causative bodies (two for anomaly A, two for anomaly B and one for anomaly C).

If the results of this drilling are successful, it is then recommended that a detailed I.P. survey be carried out in the vicinity of the mineralization and strongly recommended that the reconnaissance I.P. survey be extended.

The following personnel were associated with the geophysical surveys:

TAKEO YOKOYAMA	GEOPHYSICIST AS I.P. OPERATOR
JUNICHI MORITA	GEOPHYSICIST AS I.P. AND MAGNETOMETER OPERATOR
MOHAN RAMALINGASWAMY	MAGNETOMETER OPERATOR AND I.P. HELPER
DOUG HOPPER	I.P. HELPER
RON BRITTEN	I.P. HELPER
BRIAN CHENEY	I.P. HELPER

AUGUST 18, 1972
VANCOUVER, B.C.

RESPECTFULLY SUBMITTED

Takeo Yokoyama

Takeo Yokoyama, M.Sc.
Geophysicist

Junichi Morita

Junichi Morita, M.Tech.
Geophysicist

Approved: G. R. Hilchey P.Eng

STATEMENT OF QUALIFICATIONS

I received a Bachelor of Science degree from Kyoto University in 1960 in Geology.

I received a Master of Science degree from Kyoto University in 1962 in Physical Geology.

I have been continuously employed on most type of geophysical surveys and related work, since graduation, for Sumitomo Metal Mining Co. Ltd.

Takeo Yokoyama

Takeo Yokoyama

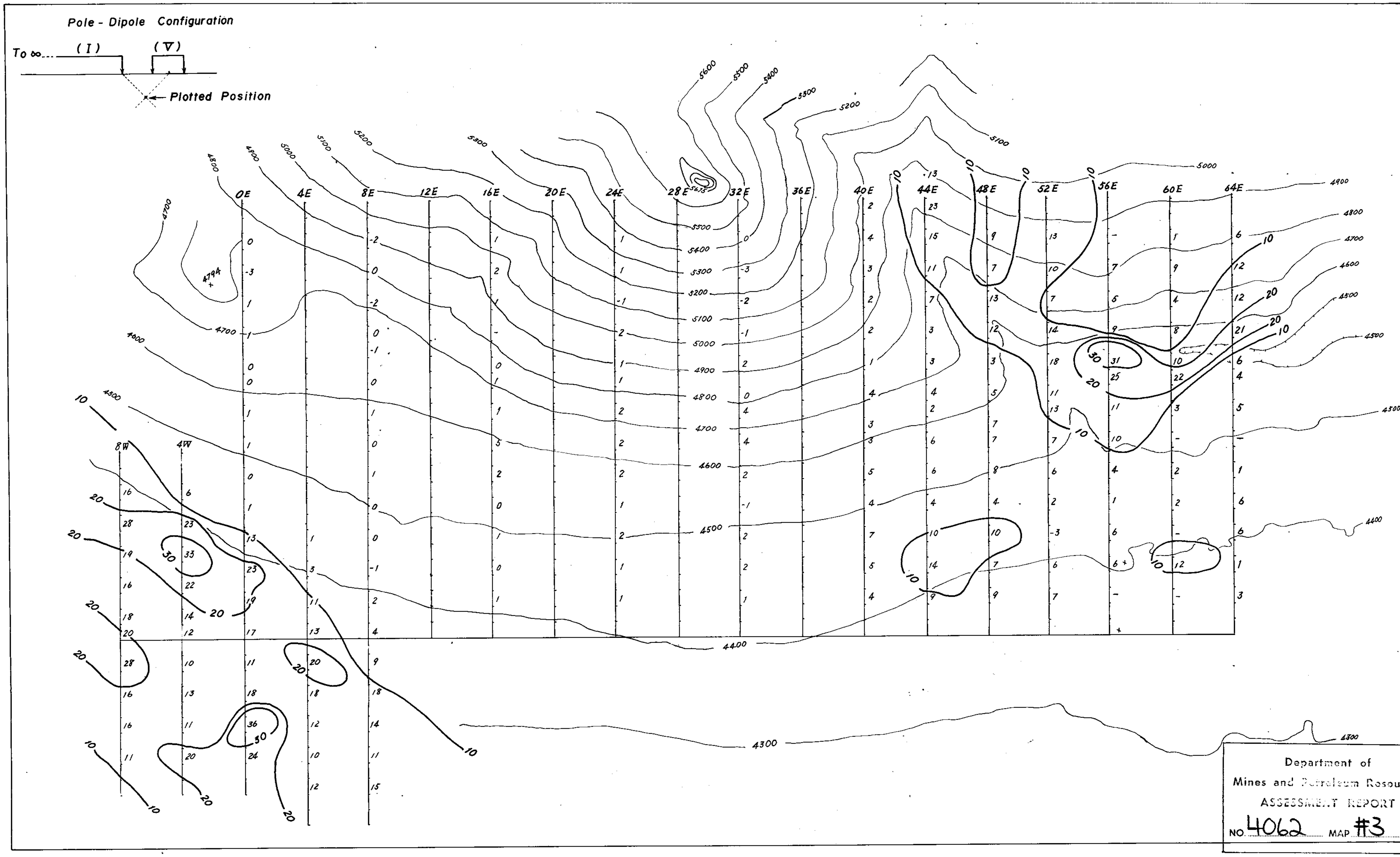
I received a Bachelor of Technology degree from Kumamoto University in 1969 in Mining Engineering.

I received a Master of Technology degree from Kumamoto University in 1971 in Applied Geophysics.

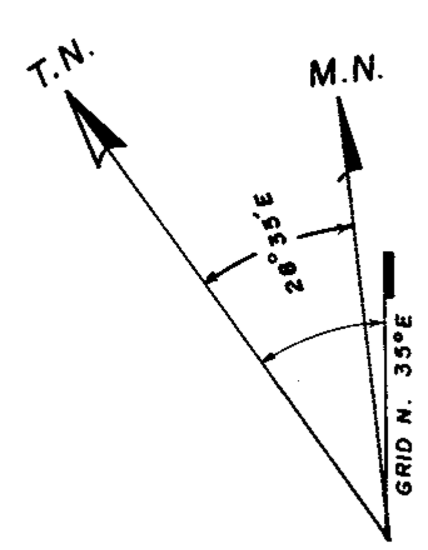
I have been employed on most type of geophysical work, since graduation, for Sumitomo Metal Mining Co. Ltd.

Junichi Morita

Junichi Morita



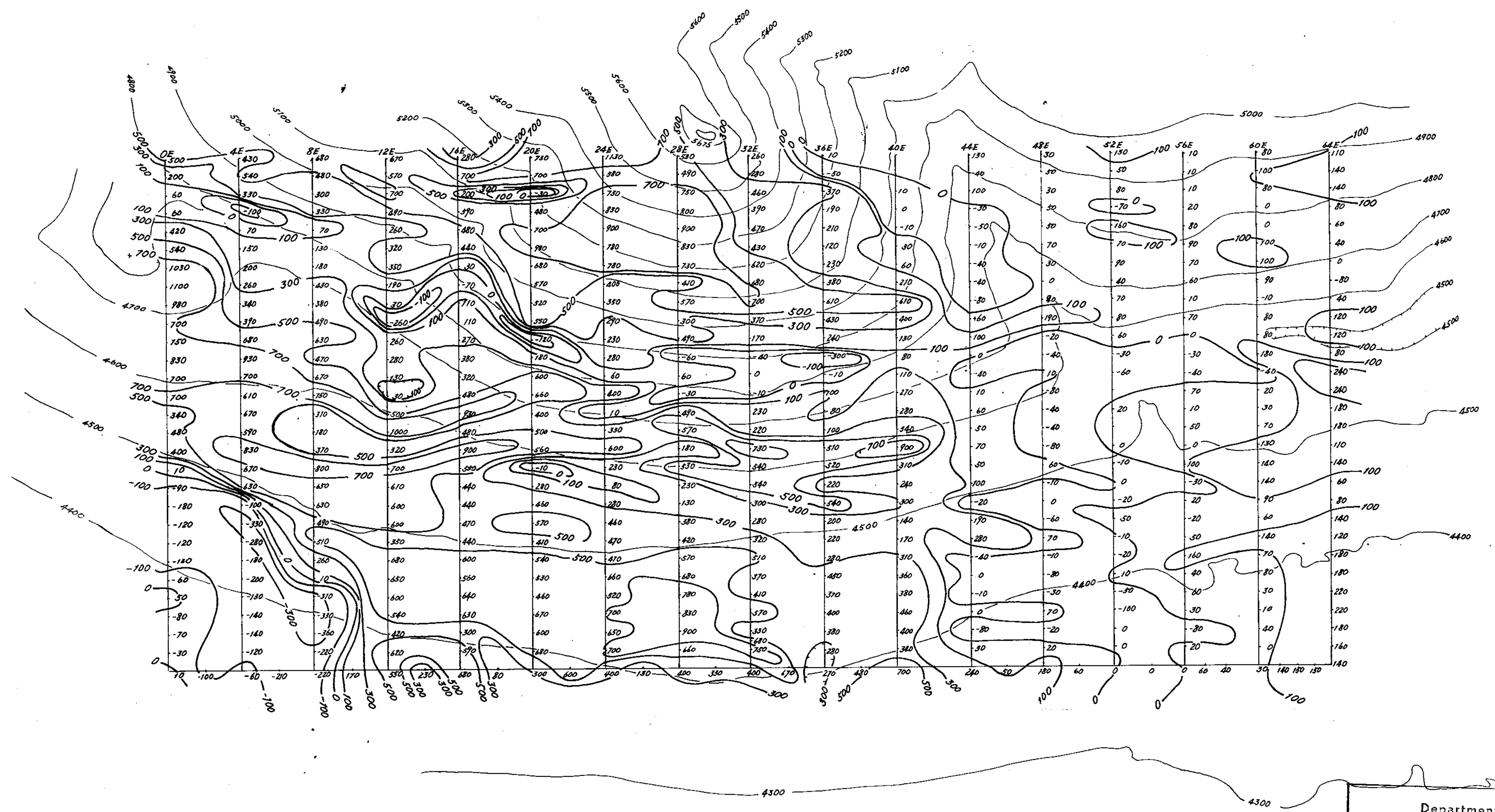
Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4062 MAP #3

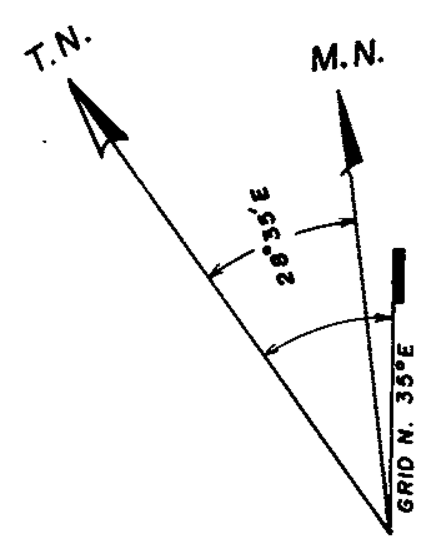


To Accompany Geophysical Report
by T. Yokoyama and J. Morita
on the Moosehorn Property
Eleven Miles Southwest of
Chukachida Lake, B.C.
Omineca Mining Division
Dated: 18 Aug., 1972

T. Yokoyama
J. Morita

SULLIVAN RODGERS	
—SUMAC—	
MOOSEHORN PROPERTY	
METAL FACTOR (M.F.)	
Map No. 211-GP-3	
Date: August, 1972	Scale: 1" = 400'





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J. Morita

SULLIVAN RODGERS

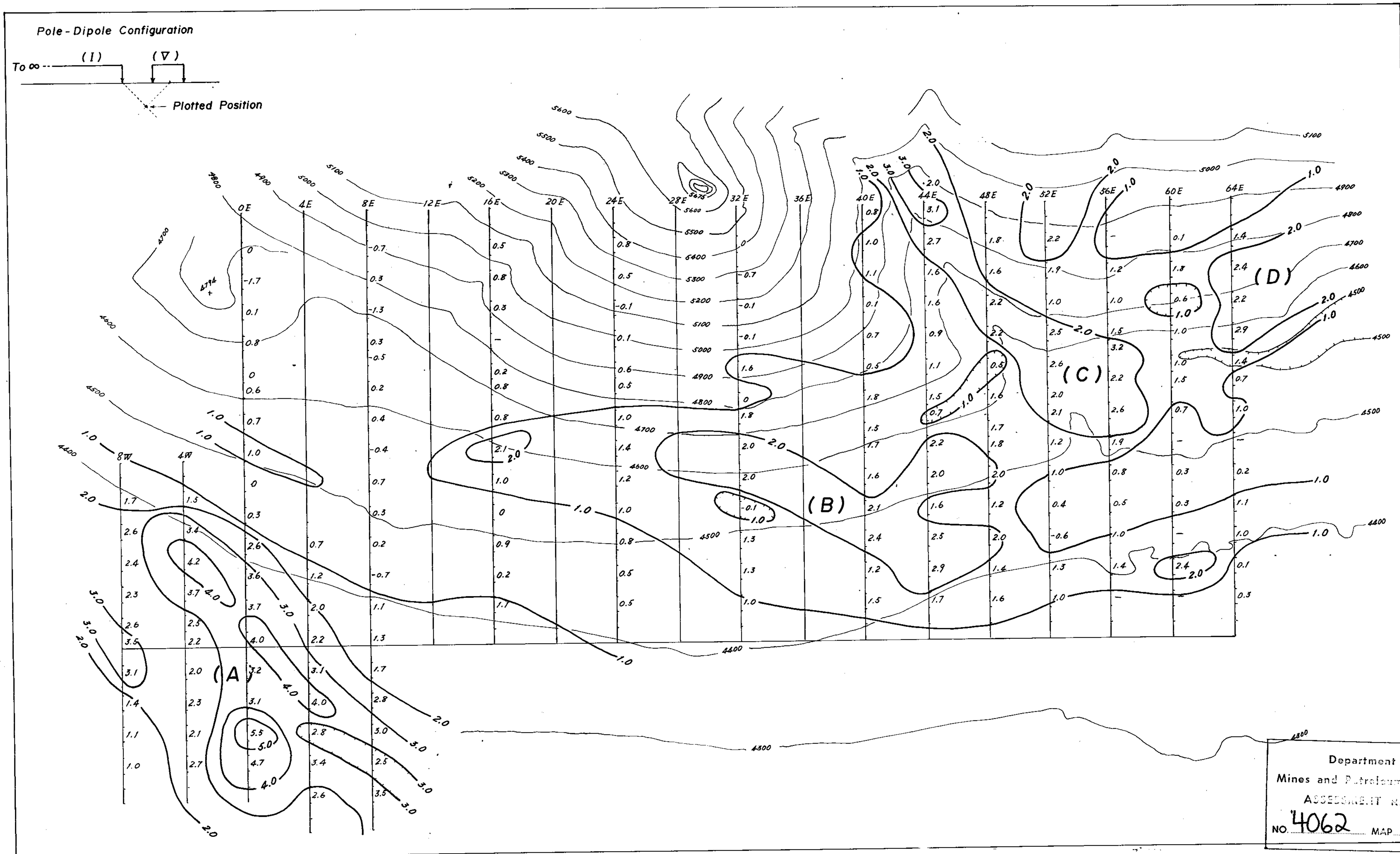
— SUMAC —

MOOSEHORN PROPERTY

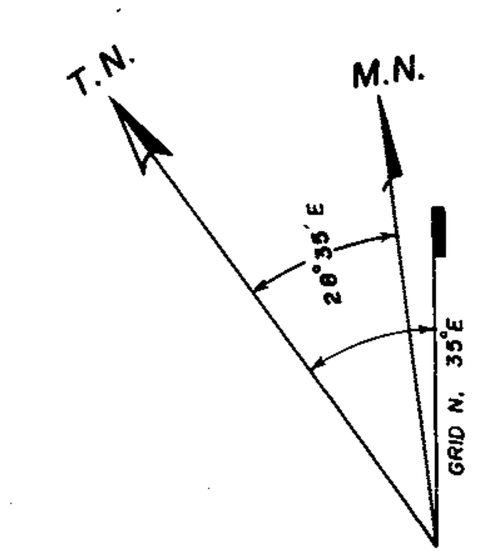
VERTICAL MAGNETIC COMPONENT
IN GAMMAS (γ)

MAP NO. 211-GP-4

Date: August, 1972 | Scale: 1" = 400'



Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4062 MAP #2



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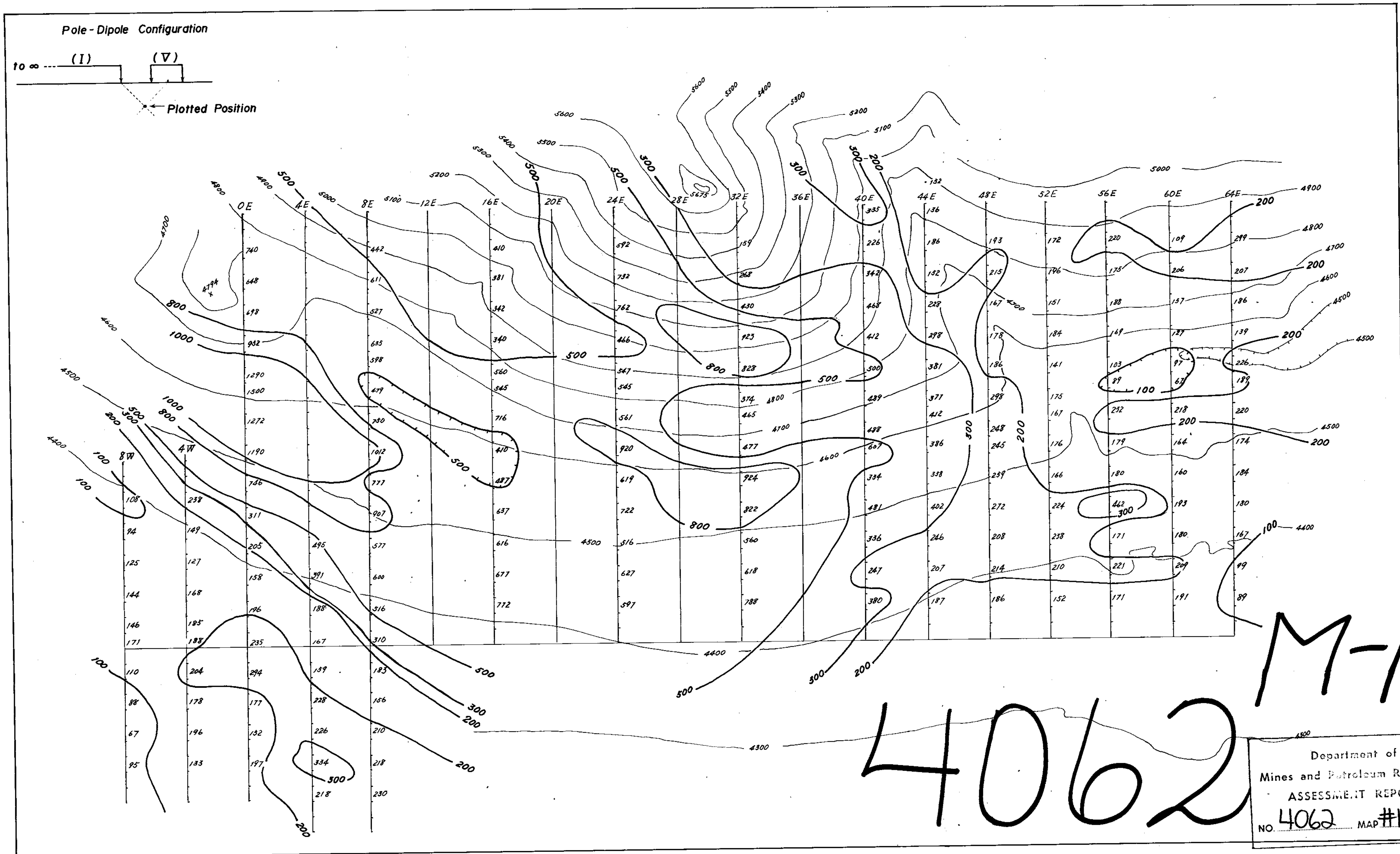
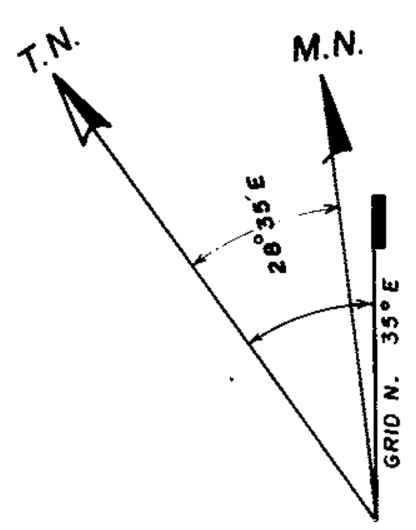
J. Morita

SULLIVAN RODGERS	
—SUMAC—	
MOOSEHORN PROPERTY	
FREQUENCY EFFECT (F.E.) Unit: PERCENT (%)	
Map No. 211-GP-2	
Date: August, 1972	Scale: 1" = 400'



4062 M-1

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4062 MAP #1



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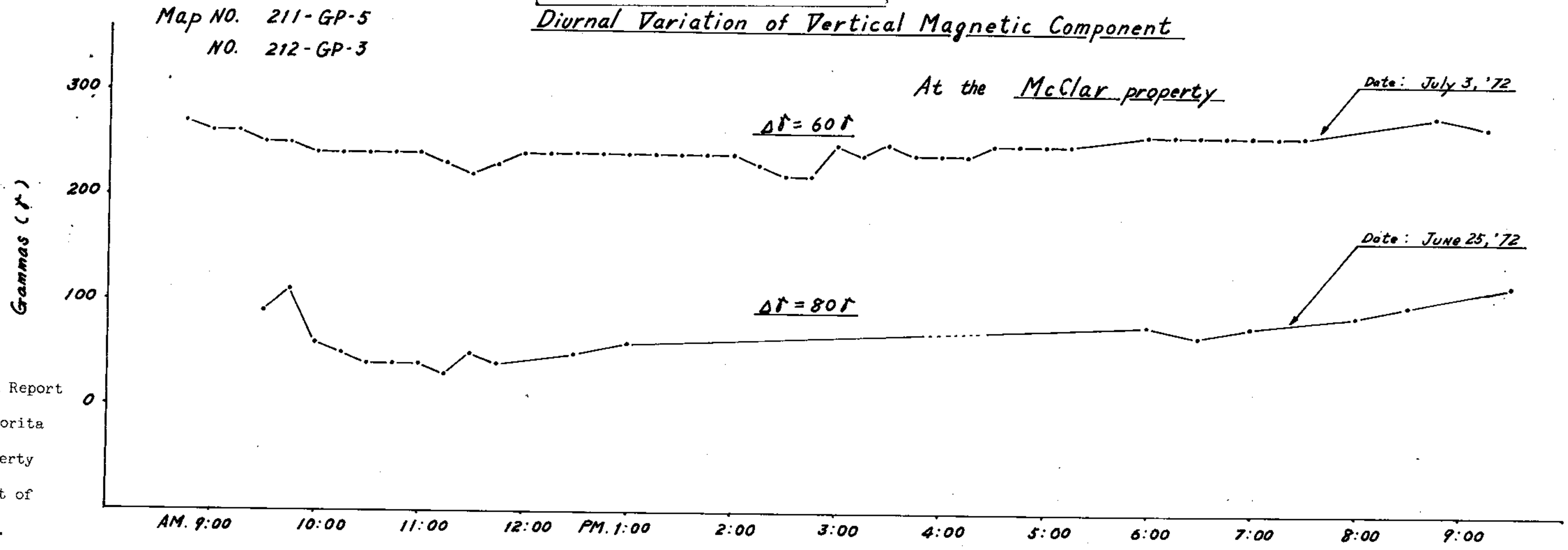
J. Morita

SULLIVAN RODGERS
— SUMAC —
MOOSEHORN PROPERTY
APPARENT RESISTIVITY Unit : Ohm(Ω) — Ft / 2π
Map No. 211-GP-1
Date : August, 1972 — Scale : 1" = 400'

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4062 MAP #5



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