

1022

REPORT ON THE
ELECTROMAGNETIC
AND
INDUCED POLARIZATION
AND RESISTIVITY
SURVEYS
ON THE
BISSON LAKE PROPERTY OF
NORANDA EXPLORATION COMPANY, LIMITED
VERNON MINING DIVISION, BRITISH COLUMBIA

BY

DAVID K. FOUNTAIN, P.Eng.

BISSON LAKE PROPERTY

VERNON MINING DIVISION

BRITISH COLUMBIA

50°N/118°W - S.W.

DATE STARTED:

MAY 13, 1967

DATE COMPLETED

JUNE 3, 1967

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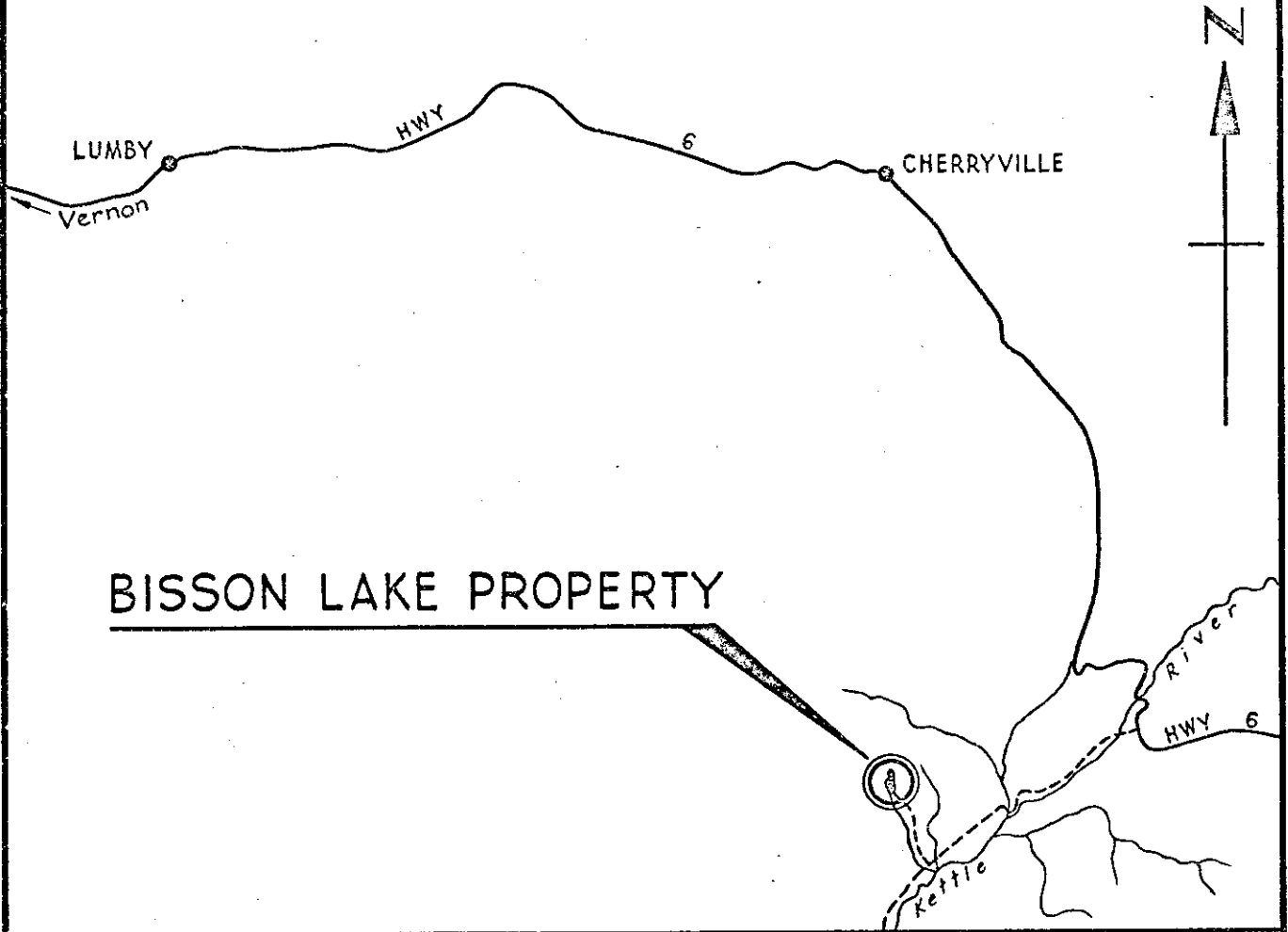
INTRODUCTION

The Bisson Lake Property referred to in this report lies approximately thirty-three air-miles south 60° east from the City of Vernon, British Columbia. Access to the property is via PROVINCIAL HIGHWAY NUMBER 6 east from Vernon, south on the Kettle River Valley access road, and then by jeep road to the property.

The property comprises twenty-eight contiguous mineral claims in the Vernon Mining Division optioned to Noranda Exploration Company, Limited (N.P.L.) by the owners John Lesowski, Albert Lesowski, Joseph Lesowski, William Miller and William McGie. In addition to the optioned claims and contiguous with them, two claims owned by Noranda Exploration Company, Limited (N.P.L.) are considered as forming part of the property.

In particular, the claims are as follows: -

FIG. 1



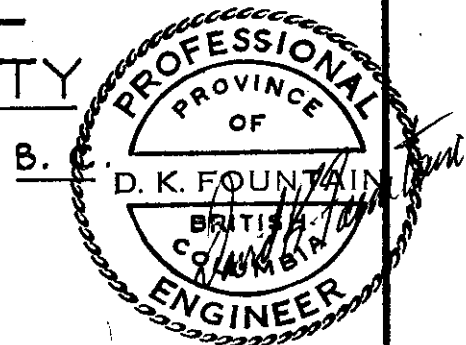
NORANDA EXPLORATION CO. LTD.

LOCATION MAP

BISSON LAKE PROPERTY

VERNON M.D.

SCALE: 1" = 4 MILES





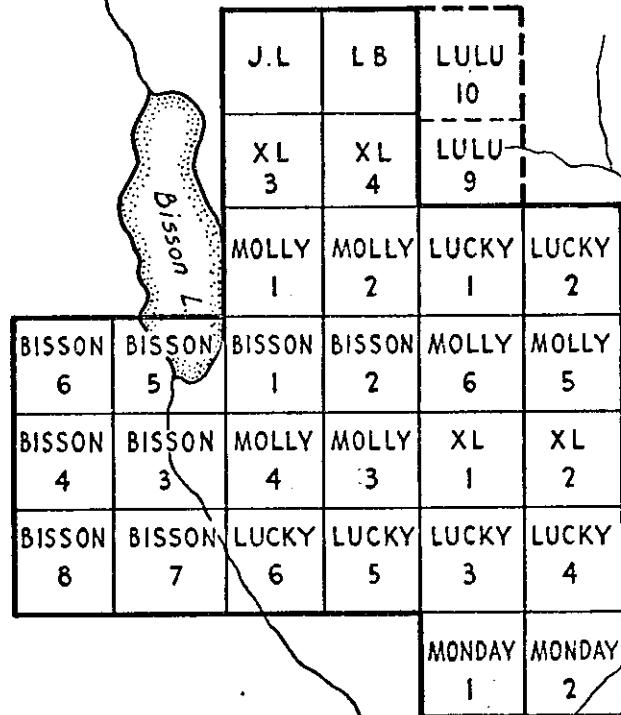
Expiry Date April 29, 1968

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FIG. 2

NO. 1022 MAP 2

 OPTIONED CLAIMS
 NORANDA CLAIMS



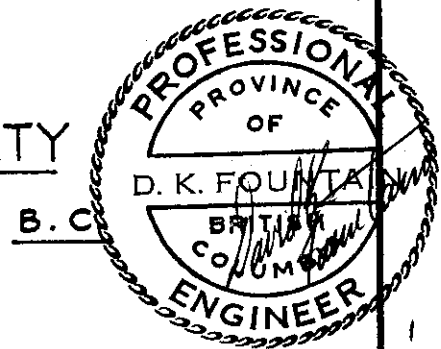
NORANDA EXPLORATION CO. LTD.

CLAIM MAP

BISSON LAKE PROPERTY

VERNON M.D.

SCALE : 1" = 1/2 MILE



Expiry Date: April 25, 1968

June 1967

Optioned from John Lesowski, et al

<u>Claim</u>	<u>Record Number</u>
Bisson Lake No. 1	8935
Bisson Lake No. 2	8936
Bisson No. 3	9113
Bisson No. 4	9114
Bisson No. 5	9115
Bisson No. 6	9116
Bisson No. 7	9117
Bisson No. 8	9118
J.L.	9126
L.B.	9125
Lucky No. 1	9119
Lucky No. 2	9120
Lucky No. 3	9121
Lucky No. 4	9122
Lucky No. 5	9123
Lucky No. 6	9124
Molly No. 1	8927
Molly No. 2	8928
Molly No. 3	9012
Molly No. 4	9013
Molly No. 5	9127
Molly No. 6	9128
Monday No. 1	9040
Monday No. 2	9041
XL No. 1	8957
XL No. 2	8958
XL No. 3	8966
XL No. 4	8965

Owned by Noranda Exploration Company, Limited (N.P.L.)

<u>Claim</u>	<u>Record Number</u>
Lulu No. 9	10125
Lulu No. 10	10126

The mineral claims comprising the property were staked on the basis of possible economic mineralization uncovered during the preparation of a logging road. The geophysical surveys described in this report were carried out in an attempt to determine the amount and extent of this mineralized area as well as attempting to locate similar mineralized zones on other parts

of the property. If the results of these surveys were favourable, then further investigation in the form of diamond drilling and/or trenching could be carried out to determine the economic significance of the mineralization.

BASE MAP AND GRID LINE PREPARATION

In order to carry out a geophysical survey, appropriate control must be established on the ground to properly locate the observations recorded.

Initially, a topographic base map of the area was prepared at a scale of 1 inch equals 400 feet by McElhanney Surveying and Engineering of Vancouver. This base map, prepared from photo coverage of the area, outlines roads, streams and topographic contours at twenty-five foot intervals.

For the purpose of the Electromagnetic survey, three cut base lines were established, namely 46N, ON, and 37S for a total of 12,000 feet of cut line. Utilizing these base lines, grid control consisted of blazed and flagged chain and compass lines, with stations established at 100 foot intervals along the line. A total of 67,800 feet of line was established in this way. One man, in addition to the Electromagnetic instrument operator, was required for this work.

For the purpose of the Induced Polarization and Resistivity Survey, cut and cleared picket lines were established at right angles to Base Line ON. Stations were established at 200 foot intervals

along these lines. A total of 16,000 feet of cut line was established in this way. A three man crew of linecutters utilizing axe and power saw were required to prepare and chain the base lines and the traverse lines for the Induced Polarization survey.

ELECTROMAGNETIC SURVEY

Method

The electromagnetic survey on the property was carried out utilizing an E.M.-16 survey unit manufactured by Geonics Limited, Toronto. The serial number of the particular unit employed was No. 47.

The theory and operation of this unit is described fully in the literature, but a brief outline will be given here. The E.M.-16 is simply a sensitive receiver covering the frequency band of the new VLF transmitting stations located throughout the world, and capable of measuring the vertical field components. The VLF transmitting stations have a vertical antenna creating a concentric horizontal magnetic field around them. When these magnetic fields meet conductive bodies in the ground, secondary fields are set up which cause variations in the resultant field. By measuring the variations in the resultant field, it is possible to map the conductive zones. It will be seen from the above that the method is similar to the standard Vertical Transmitting Loop system except that the transmitter is in effect located at infinity.

Two measurements are normally made, the tilt-angle in percentages from the horizontal of the resultant field and a

compensation $\pi/2$ signal from a second coil which is a measure of the out-phase component of the resultant field.

To take a reading, the instrument is first aligned in the field by means of nulling. The tilt angle of the resultant field from the horizontal is measured by obtaining a null about the horizontal axis. At the same time, by nulling the quadrature dial, a measure of the out of phase component is obtained.

For this particular survey, two stations were employed. For the east-west lines the station at Seattle, Washington (NPG, frequency 18.6 kHz) was utilized. The station at Cutler, Maine (NAA, frequency 17.8 kHz) was used for the north-south lines. A total of 67,800 feet of line was covered with readings being taken at 100 foot intervals.

Presentation of Results

The results of the survey are presented in Figure No. 6 of this report, a plan map at a scale of one inch equals 500 feet. The tilt-angle in percentage of the resultant field and the tilt angle in percentage of the out of phase component are plotted in the form of profiles along the line at a scale of one inch equals 40 percent. The conductor axes are indicated by appropriate symbols and arbitrarily graded as to definite, possible, and probable. The claim outlines are also indicated on the map.

Discussion of Results

The results of the E.M.-16 survey indicated several weak, one-line conductors, as well as one longer zone. This zone extends

from approximately 0N on Line 4E to 13N on Line 20E for an overall conductor axis strike length of at least 2400 feet. The weak conductive zone does not appear to be significant in itself.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

Method

The Induced Polarization and Resistivity Survey was carried out utilizing a McPhar Variable Frequency I.P. unit. The unit and operator were on contract from McPhar Geophysics Limited of Toronto.

The theory and method of operation of the Variable Frequency Induced Polarization Method is fully described in the literature and will not be further described here.

In this particular survey, a dipole-dipole electrode configuration was employed with 200 foot dipoles and reading three dipole separations. The frequencies employed were 0.3125 and 5 cps.

The survey crew comprised four men: the operator, the transmitter operator, and two assistants.

Presentation of Results

The induced polarization and resistivity results are shown on the enclosed data plots. In plotting these results, the values of the apparent resistivity, apparent metal factor, and apparent percent frequency effect measured for each set of electrode positions are plotted at the intersection of grid lines, one from the center point of the current electrodes and

the other from the center point of the potential electrodes. This is clear from the accompanying diagram.

It should be mentioned here that the sectional plot does not represent an electrical cross-section of the ground. The patterns developed from the observed readings can be interpreted by comparison with expected patterns obtained from computer programmes, model studies and previous experience. Both on the data plots and the plan map, the vertical projection of the I.P. anomalies are indicated by solid, dashed, or hatched lines depending upon their distinctiveness. The data plots for Line 4W, Line 4E, and Line 12E are presented in Figures 3, 4 and 5 respectively. Figure 7 is a plan map of the property at a scale of one inch equals 400 feet on which the vertical projection of the I.P. anomalies have been indicated.


Discussion of Results

Weak I.P. responses were obtained from 14S to 16S on Line 4W, from 1N to 2S on Line 12E, and from 1N to 2S on Line 4W. The latter would appear to correlate with the original mineralized showing. In addition, two parallel northeast trending weak responses are indicated at 12N to 16N and 18N to 22N on Line 4+00W, and 20N to 24N and 27N to 29N on Line 4+00E. These zones do not appear to extend to Line 12+00E, and the direction of the I.P. trend agrees with the direction of possible structural trends in the area.

RECOMMENDATIONS AND CONCLUSIONS

Weak anomalous responses have been obtained in both the Electromagnetic and Induced Polarization Surveys. However, due to the weakness of these responses, further work would not be warranted unless there was strong supporting geological or geochemical information.

Respectfully submitted

David K. Fountain
David K. Fountain P. Eng.
A circular professional seal for David K. Fountain, a Professional Engineer in British Columbia. The seal features the text "PROFESSIONAL ENGINEER" around the perimeter, "PROVINCE OF BRITISH COLUMBIA" in the center, and the name "D. K. FOUNTAIN" in the middle. The seal is stamped over the signature and name.

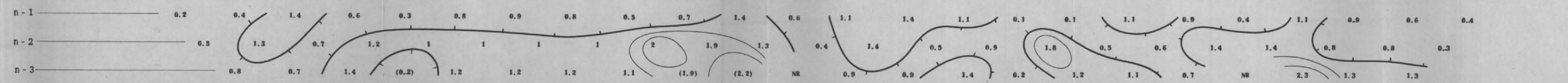
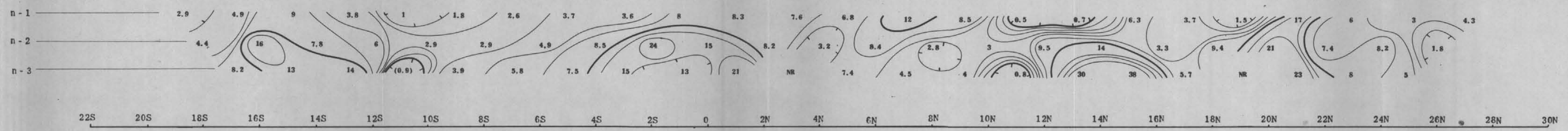
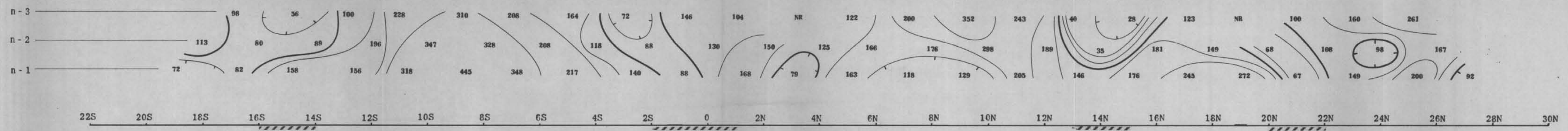
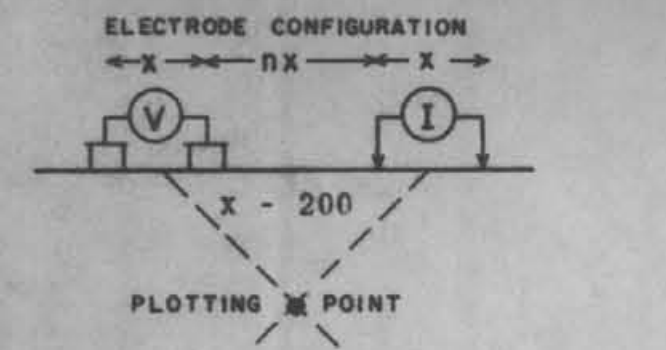
Expiry Date: April 25, 1968

Toronto, Ontario

June 29, 1967

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100

McPHAR GEOPHYSICS LIMITED INDUCED POLARIZATION AND RESISTIVITY SURVEY



NORANDA EXPLORATION COMPANY, LIMITED

BISSON LAKE PROPERTY-VERNON M.D., B.C.

Scale - One inch = 200 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

- DEFINITE
- PROBABLE
- POSSIBLE

$\rho_a / 2\pi$
(OHM FEET)

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(M.F.)_a

F. E. in %



FREQUENCY 0.31 & 5 CPS

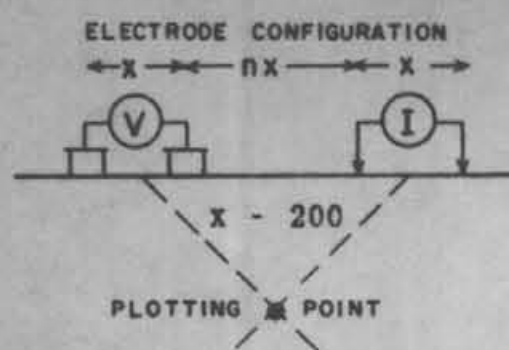
DATE SURVEYED JUNE 1967

APPROVED

Expiry Date: April 25, 1968

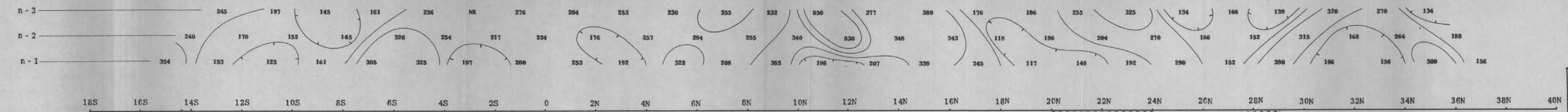
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LINE NO. - 4 W

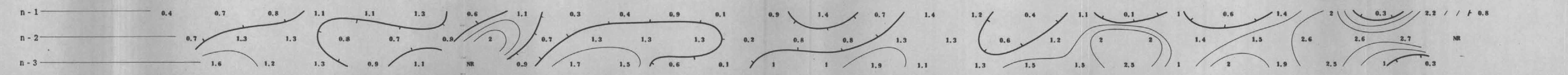
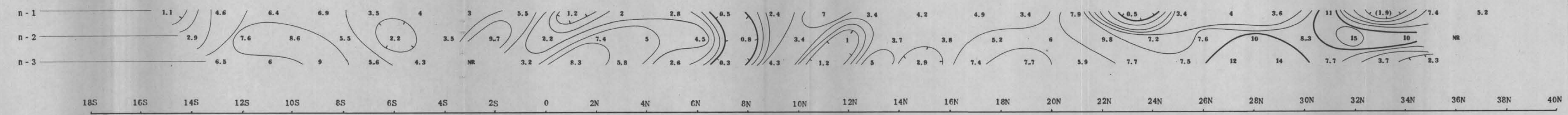


McPHAR GEOPHYSICS LIMITED
 INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



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 Mines and Petroleum Resources
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 NO. 1022 MAP



NORANDA EXPLORATION COMPANY, LIMITED

BISSON LAKE PROPERTY - VERNON M.D., B.C.

Scale - One inch = 200 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES
 DEFINITE —————
 PROBABLE
 POSSIBLE - - - - -

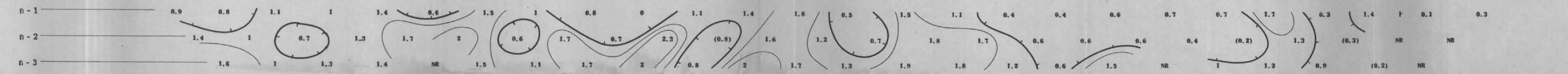
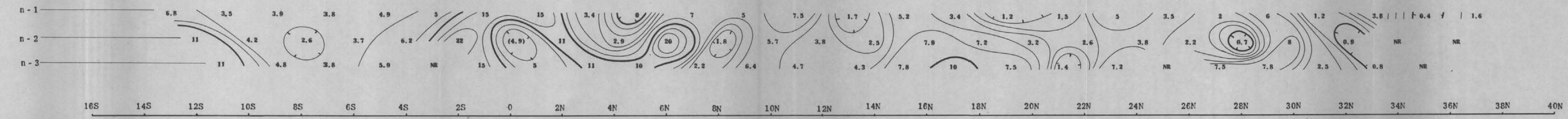
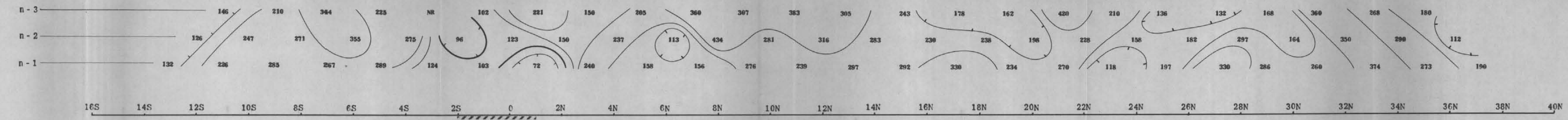
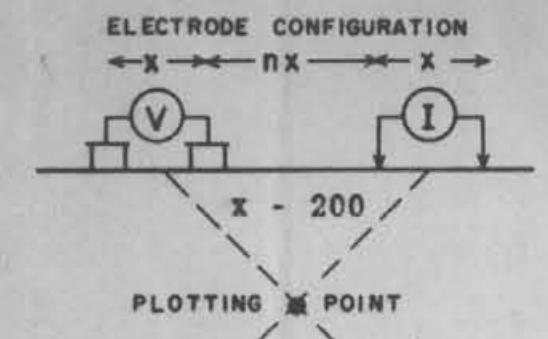
PROFESSIONAL ENGINEER
 PROVINCE OF BRITISH COLUMBIA
 D. K. FOUNTAIN
 FREQUENCY 0.3185 CPS
 DATE SURVEYED JUNE 1967
 APPROVED
 Expiry Date: April 25, 1968

1022

LINE NO. - 4E

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100

McPHAR GEOPHYSICS LIMITED INDUCED POLARIZATION AND RESISTIVITY SURVEY



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(M.F.)_a

F. E. in %

NORANDA EXPLORATION COMPANY, LIMITED

BISSON LAKE PROPERTY - VERNON M.D., B.C.

Scale - One inch = 200 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

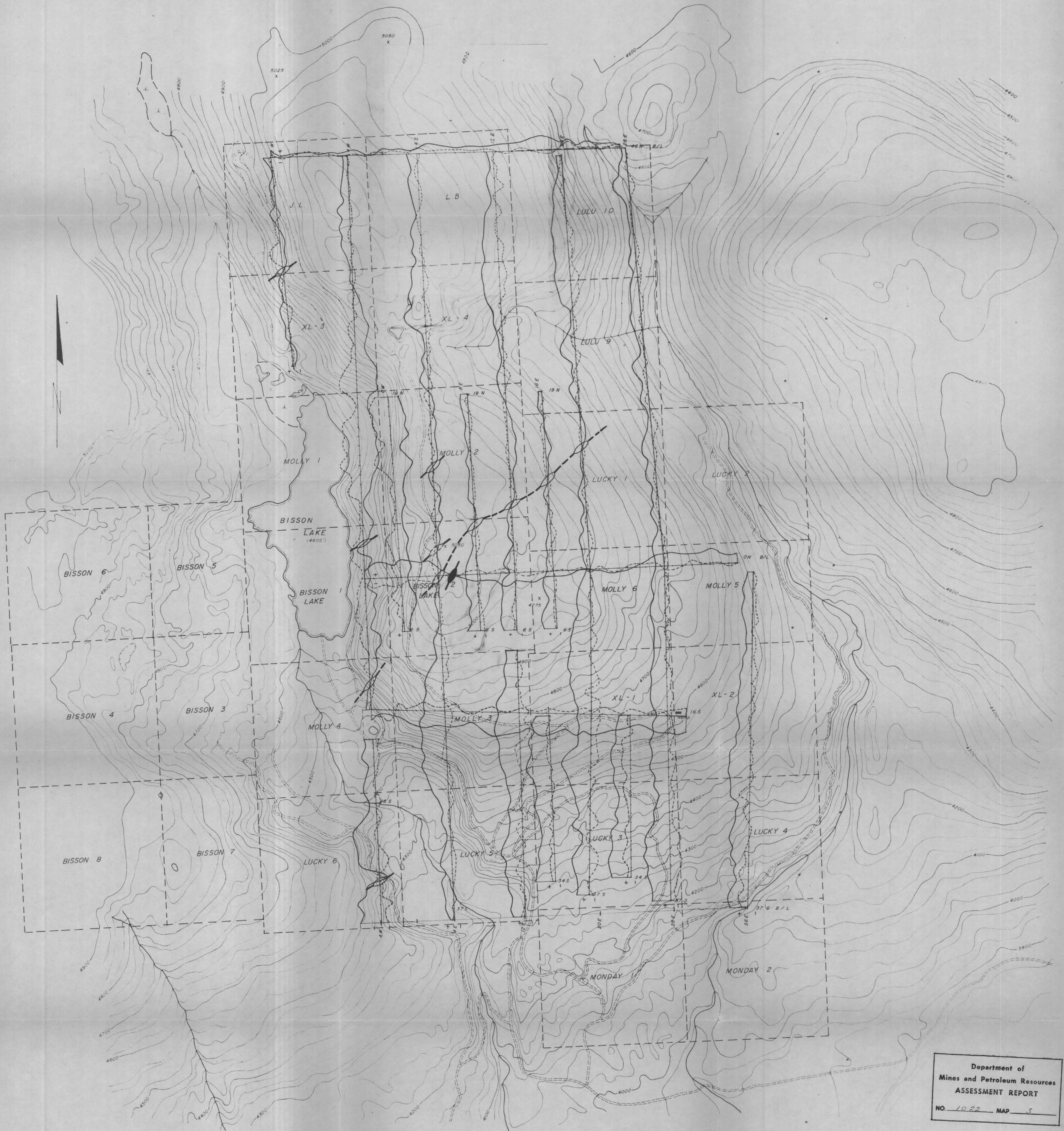
SURFACE PROJECTION OF ANOMALOUS ZONES

- DEFINITE
- PROBABLE
- POSSIBLE

PROFESSIONAL ENGINEER
 PROVINCE OF BRITISH COLUMBIA
 D. K. FOUNTAIN
 FREQUENCY 0.3185 CPS
 DATE SURVEYED JUNE 1967
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LINE NO. - 12 E



LEGEND

- TILT-ANGLE IN % OF RESULTANT FIELD 1" = 40%
- TILT-ANGLE IN % OF OUT OF PHASE COMPONENT 1" = 40%
- CLAIM OUTLINES

- DEFINITE CONDUCTOR AXIS
- POSSIBLE CONDUCTOR AXIS
- PROBABLE CONDUCTOR AXIS

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NO. 1022 MAP 3

NOVANDA EXPLORATION COMPANY LIMITED
BISSON LAKE PROPERTY
VERNON, B.C.

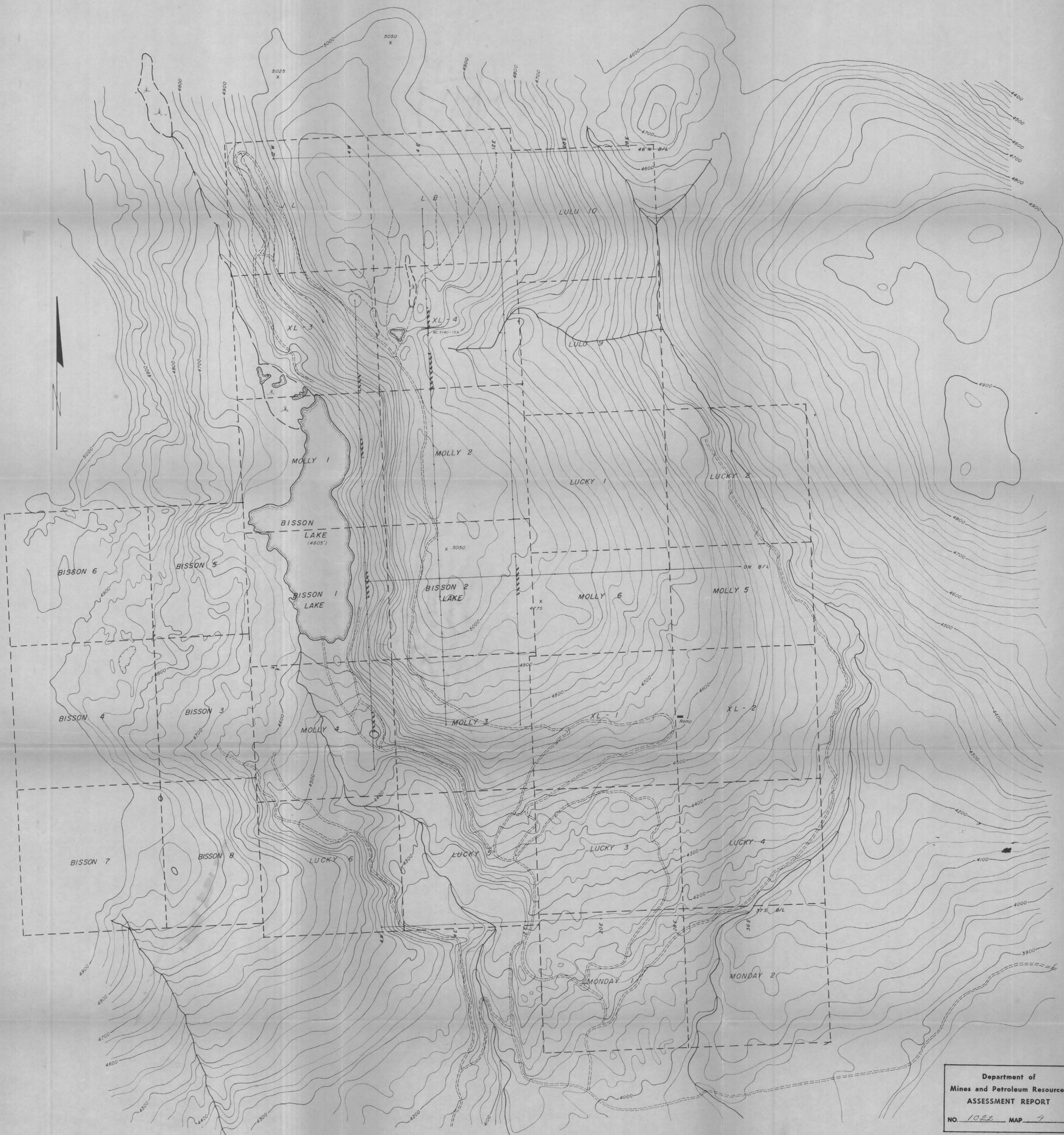
E M - 16 SURVEY

Scale 1" = 400'



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F S C



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NORANDA EXPLORATION COMPANY, LIMITED

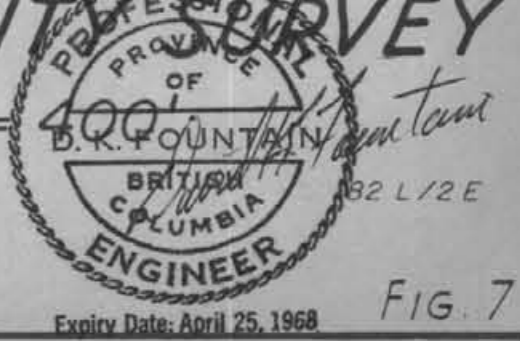
BISSON LAKE PROPERTY
VERNON M.D. B.C.

**INDUCED POLARIZATION
AND RESISTIVITY SURVEY**

Scale: 1" = 100 feet

JUNE, 1967

1022



Expiry Date: April 25, 1968

FIG. 7

LEGEND

- SURFACE PROJECTION OF ANOMALOUS ZONES
 - DEFINITE
 - PROBABLE
 - POSSIBLE
- CUT GRID LINES ————
- CLAIM OUTLINE - - - - -

BC 5140-160