COMINCO LTD.

EXPLORATION

NTS: 92I/7

WESTERN DISTRICT

GEOPHYSICAL REPORT

ON AN

INDUCED POLARIZATION SURVEY

ON THE

G U M P P R O P E R T Y

MAMIT LAKE AREA, NICOLA AND KAMLOOPS MINING DIVISIONS, B.C.

LATITUDE: 50°25'N
LONGITUDE: 120°44'W

Field Work Performed: October 25 - November 2, 1981

On Claims: Lake 1, Antler 2 and 4, Score 1,
MJC 3, ELF 5 and 8

23 DECEMBER 1981

J. KLEIN

TABLE OF CONTENTS

ATTACHMENTS

COMINCO LTD.

EXPLORATION WESTERN DISTRICT

NTS: 92I/7

GEOPHYSICAL REPORT

ON AN

INDUCED POLARIZATION SURVEY

G U M P P R O P E R T Y

MAMIT LAKE AREA, NICOLA AND KAMLOOPS MINING DIVISIONS, B.C.

INTRODUCTION

During the period October 25 - November 2, 1981, Eagle Geophysics Ltd. crews under contract to Cominco Ltd. completed some 16 kilometers of multiseparation induced polarization over portions of the GUMP property.

The present I.P. survey served to extend the I.P. coverage in the area. Previous surveys were done under contract for Cominco Ltd. by Lloyd Geophysics Ltd. (September, 1980) and Peter Walcott and Associates (March 1981), and by a COMINCO crew (May/June 1981), and the results of those surveys were submitted for assessment purposes in February, April and October of 1981 respectively.

The GUMP property is located in the Highland Valley area of B.C., immediately west of Mamit Lake. Plate 1b shows the general location of the property, and Plate 2b the location of the survey lines with respect to the claims.

This report describes the procedures used on the survey, presents the data and discusses the results.

GEOPHYSICAL SURVEY

Induced Polarization Survey

A Huntec 7.5 kw M-4 I.P. transmitter in combination with two Huntec M-3 and M-4 receivers were used on the GUMP survey.

Readings were taken in the time domain using a 2 second current ON/2 second current OFF alternating square wave signal. A delay time of 120 msec. and a total integration time from 120 msec. to 1020 msec. was used to measure the I.P. effect with the M-4 receivers. The M-3 receivers measured also from 120 msec. to 1020 msec. This was, however, done in 4 steps and the data of each channel added. This resulted in higher M-3 than M-4 readings. The M-3 readings are approx. 1.3-1.4 x as high as equivalent M-4 readings. Lines 800S, 1200S, 2400S and 4800S were measured with the M-3 receivers; and lines 800N, 1200N, 1600N, 2800N, 3200N and 3600N with the M-4 receivers.

Line 1200S is along the common boundary with the NOVA option and the results are also included in the report describing the I.P. survey results on that property.

The survey was of a regional reconnaissance nature with survey lines 400 meters apart. A pole-dipole electrode array was used with an "a" spacing of 100 meters and "n" separations of 1, 2, 3 and 4. For logistical reasons, the direction of the current electrode with respect to the potential dipole was not kept constant for the survey. In some areas it was to the west and in others to the east. The direction is noted on the pseudosections.

The apparent resistivity values are given in units of ohm meters and were calculated from the relation:

$$\text{apparent resistivity} = (V/I).K,$$

where V is the voltage across the measuring dipole during the current on period (I), and K is a geometrical factor dependent on the "a" spacing and "n" separation.

DISCUSSION OF RESULTS

The induced polarization survey results are plotted in pseudosection format on accompanying Plates 207-81-13 to 19. The chargeability response has been categorized on the sections in the following manner:-

		M-4	M-3
▬▬▬	strong I.P. high :	10 msecs.	> 15 msecs. (for n=1,2)
▬ ▬ ▬	moderate I.P. high :	8-10 msecs.	11-15 msecs. (for n=1,2)
//////	weak I.P. high :	5-8 msecs.	7-11 msecs. (for n=1,2)
— — —		> 5 msecs.	> 7 msecs. at further separations

The n=1 chargeability results are also presented in contour plan form together with previous data on Plates: 190-80-6a (Lines 800S, 1200S, 2400S and 4800S) and 207-81-3b (Lines 800N, 1200N, 1600N, 2800N, 3200N and 3600N). Values of greater than 5 msecs. and 7 msecs. (M-4 or M-3 data) are indicated by a stippled pattern.

The n=1 resistivity results are also presented in contour plan form together with the previous data on Plate 207-81-4b (the resistivity results for Lines 800S, 1200S, 2000S and 4800S are not shown in contour plan).

A weak anomaly was detected at the eastern ends of Lines 800N and 1200N. This could be the extension of the weak N-S trend along Lines 400S-1200S (Station 3500E) as shown on Plate 207-80-3a (see report by I. Jackisch dated October 1981).

The high readings near the west end of Line 2800N are suspiciously close to a powerline and most likely related to it. The same cannot be said of the weak high near 500E along Line 3200N. This line shows also a weak high near 2600E which continues on Line 3600N near 2500E. This latter weak trend could be the continuation of the trend seen along Lines 800N and 1200N.

Lines 800S, 1200S and 2400S show a high background level. This is a continuation of the zone detected earlier (see Plate 190-80-6, report by A.R. Scott, February 1981).

It is most likely that this zone is due to a change of rock type and of no particular economic significance.

CONCLUSIONS

Portions of the GUMP property were surveyed with multiseparation time domain I.P. in the early Fall of 1981. Two types of I.P. receivers were used: Huntec M-4 type for the eastern parts of the lines and Huntec M-3 type in the western part of the property.

On the first separation chargeability contour plans, which include data from the previous surveys, zones of weak chargeability increase are indicated. These zones appear to reflect a change in rock type (west zone) and possibly a structural zone (N-S) in the eastern part of the property.

This data has to be correlated with geological information prior to undertaking any further work in the areas surveyed.

Report by:

J. Klein
Chief Geophysicist

Approved for Release:

G. Harden, Manager
Exploration
Western District

JK/jel

DISTRIBUTION:

Mining Recorder	(2)
Western District	(1)
Vernon Office	(1)
Administration	(1)
Geophysics	(1)

REFERENCES

Jackisch, I, 1981: Geophysical Report on an I.P. Survey, Gump Property, Mamit Lake Area, dated 19 October 1981

Jackisch, I, and Scott, A.R., 1981: Geophysical Report on an I.P. Survey, Gump Property, Mamit Lake Area, dated 24 April 1981

Scott, A.R., 1981: Geophysical Report on I.P. and Magnetics Surveys, Gump Property, Highland Valley Area, dated 10 February 1981

APPENDIX I

IN THE MATTER OF THE B.C. MINERAL ACT

AND IN THE MATTER OF A GEOPHYSICAL PROGRAM

CARRIED OUT ON PORTIONS OF THE LAKE, ANTLER, SCORE, MJC AND ELF MINERAL CLAIMS

ON THE GUMP PROPERTY

LOCATED IN THE MAMIT LAKE AREA, KAMLOOPS AND NICOLA MINING DIVISIONS, B.C.

OF THE PROVINCE OF BRITISH COLUMBIA, MORE PARTICULARLY

N.T.S.: 92I/7

S T A T E M E N T

I, JAN KLEIN, OF THE CORPORATION OF RICHMOND, IN THE PROVINCE OF BRITISH COLUMBIA, MAKE OATH AND SAY:-

1) THAT I am employed as a geophysicist by Cominco Ltd. and, as such have a personal knowledge of the facts to which I hereinafter depose;

2) THAT the annexed hereto and marked as "Appendix II" to this statement is a true copy of expenditures incurred on geophysical survey on the Gump property;

3) THAT the said expenditures were incurred for the purpose of mineral exploration of the above-noted claims between the 25th day of October and the 2nd day of November, 1981.

Signed: Jan Klein

J. Klein
Chief Geophysicist

23 December 1981

APPENDIX II

STATEMENT OF EXPENDITURES

GUMP PROPERTY

(Induced Polarization Survey, October 25 - November 2, 1981)

1)	Contract Services by Eagle Geophysics	$ 15,428.85
2)	Drafting 16 km @ $ 59.17/km	946.72
3)	Reporting and Interpretation by J. Klein 1 day @ $ 190.00	190.00
		$ 16,565.57

APPENDIX III

C E R T I F I C A T I O N

I, JAN KLEIN, of 4371 Coventry Drive, in the Corporation of Richmond, in the Province of British Columbia, do hereby certify:-

1) THAT I graduated from the Technological University of Delft Netherlands in 1965 with a M.Sc. in Geophysics;

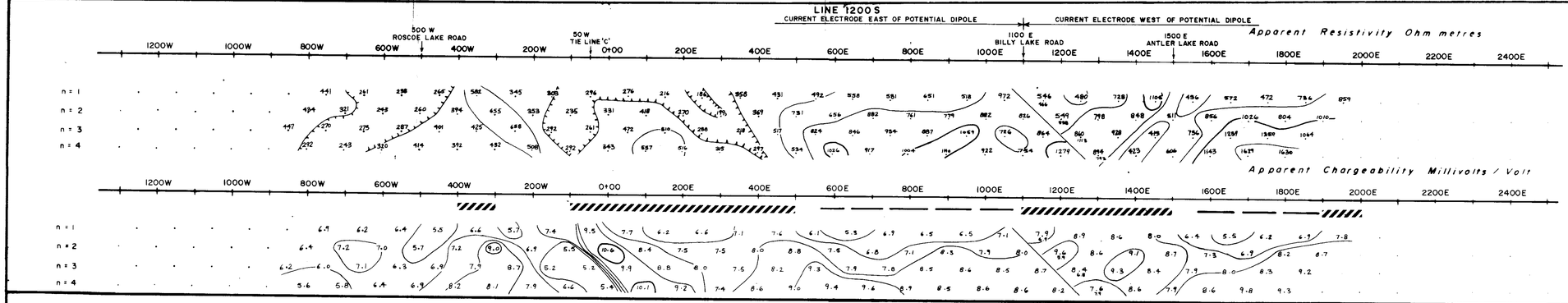
2) THAT I am a member of the Association of Professional Engineers of the Province of British Columbia, the Society of Exploration Geophysicists of America, and the British Columbia Geophysical Society;

3) THAT I have been practising my profession for the past sixteen years.

Signed: Jan Klein

J. Klein
Chief Geophysicist

23 December 1981



N.T.S. 92-I-7 DWG NO 216-81-12

COMINCO LTD.
GUMP GROUP
NOVA OPTION
KAMLOOPS M.D., B.C.

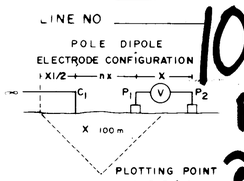
LINE NO 1200S

LINE NO

10,139

PART 2 of 2

POLE DIPOLE ELECTRODE CONFIGURATION



CHARGEABILITY (IP) INTERPRETATION
STRONG CHARGEABILITY HIGH
MODERATE CHARGEABILITY HIGH
WEAK CHARGEABILITY HIGH
IP HIGH AT FURTHER SEPERATIONS
APPARENT RESISTIVITY INTERPRETATION
APPARENT RESISTIVITY LOW

SCALE 1:6000 DATE SURVEYED OCTOBER 1981

CONTOUR INTERVALS

APP RES — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres APPROVED

APP CHARG 1 M SEC

DATE

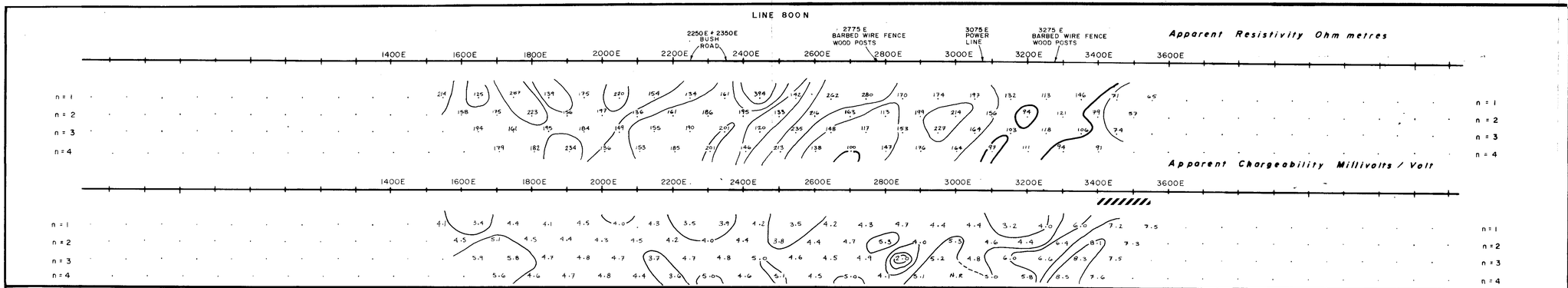
TRANSMITTER HUNTEC 7.5 Kw UNIT

RECEIVER HUNTEC M-3

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY EAGLE GEOPHYSICS LTD.

LINE 1200S



N.T.S. 92-I-7

DWG. NO. 207-81-13

COMINCO LTD.

GUMP PROPERTY

KAMLOOPS M.D., B.C.

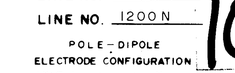
LINE NO. 800N

LINE NO. 1200N

10,139

PART 202

POLE-DIPOLE ELECTRODE CONFIGURATION



PLOTTING POINT
n = 1, 2, 3, 4

CURRENT ELECTRODE WEST OF POTENTIAL DIPOLE

CHARGEABILITY (IP) INTERPRETATION

- STRONG CHARGEABILITY HIGH
- MODERATE CHARGEABILITY HIGH
- WEAK CHARGEABILITY HIGH IP HIGH AT FURTHER SEPERATIONS

APPARENT RESISTIVITY INTERPRETATION

- APPARENT RESISTIVITY LOW

Line 800N OCTOBER 30,31/81

SCALE 1:6000

DATE SURVEYED Line 1200N OCTOBER 31/81

CONTOUR INTERVALS:

APP RES — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres

APP CHARG — 1 MSEC

APPROVED _____

DATE _____

TRANSMITTER — HUNTEC 7.5 Kw UNIT

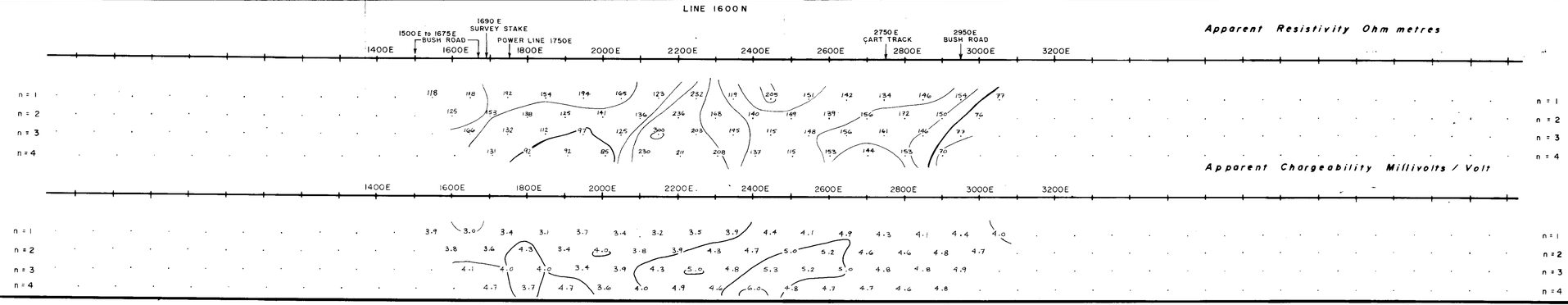
RECEIVER — n = 1,2 Mk.4 1004
n = 3,4 Mk.4 1036

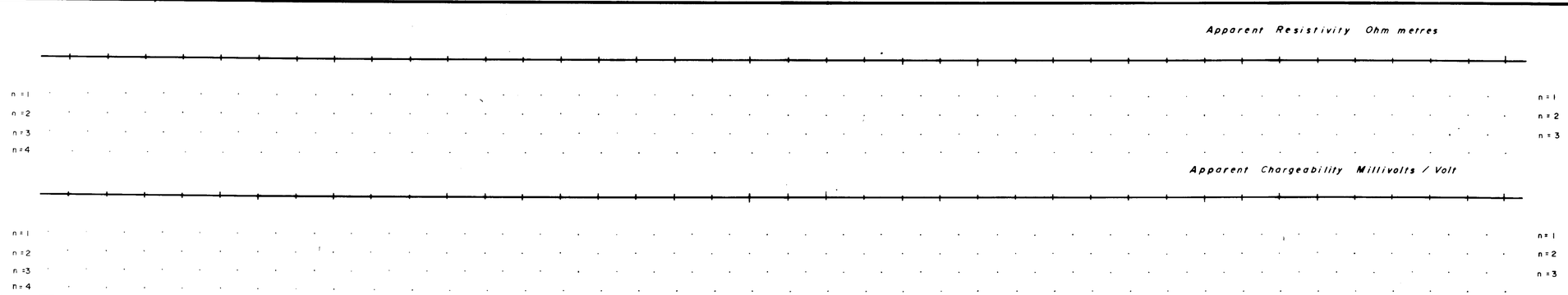
INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY EAGLE GEOPHYSICS LTD.

LINE 800N

LINE 1200N





N.T.S. 92-I-7

DWG. NO. 207-81-14

COMINCO LTD.

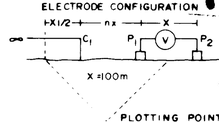
GUMP PROPERTY

KAMLOOPS M.D., B.C.

LINE NO. 1600 N

LINE NO. 10,139 PART 2 of 2

POLE-DIPOLE ELECTRODE CONFIGURATION



CURRENT ELECTRODE WEST OF POTENTIAL DIPOLE

CHARGEABILITY (IP) INTERPRETATION

- STRONG CHARGEABILITY HIGH
- MODERATE CHARGEABILITY HIGH
- WEAK CHARGEABILITY HIGH
- IP HIGH AT FURTHER SEPERATIONS

APPARENT RESISTIVITY INTERPRETATION

- APPARENT RESISTIVITY LOW

SCALE 1:6000

DATE SURVEYED NOVEMBER 1 1981

CONTOUR INTERVALS:

APP RES — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres

APP CHARG — 1 MSEC

APPROVED _____

DATE _____

TRANSMITTER — HUNTEC 7.5 Kw UNIT

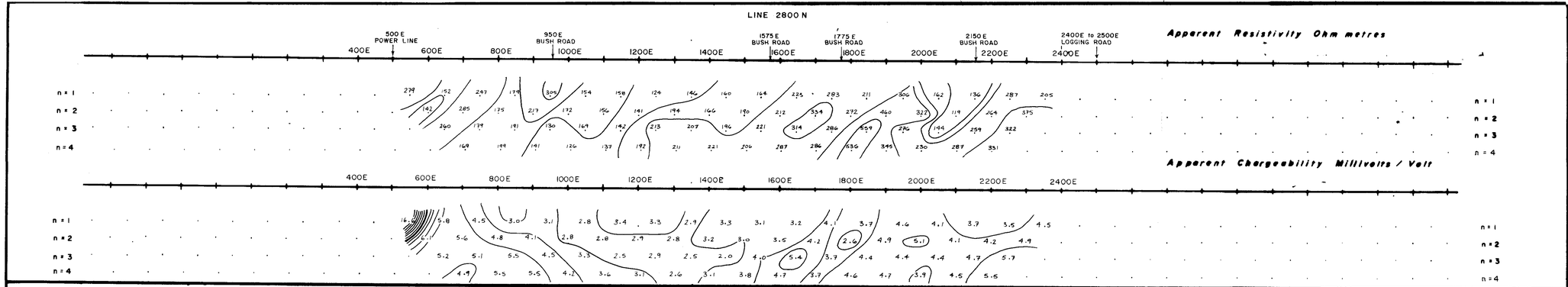
RECEIVER — n = 1,2 Mk. 4 1004

n = 3,4 Mk. 4 1036

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY EAGLE GEOPHYSICS LTD.

LINE 1600 N



N.T.S. 92-I-7 DWG. NO. 207-81-15

COMINCO LTD.

GUMP PROPERTY

KAMLOOPS M.D., B.C.

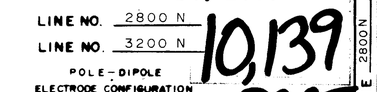
LINE NO. 2800 N

LINE NO. 3200 N

10,139

PART 2 of 2

POLE-DIPOLE ELECTRODE CONFIGURATION



CURRENT ELECTRODE WEST OF POTENTIAL DIPOLE

CHARGEABILITY (IP) INTERPRETATION

STRONG CHARGEABILITY HIGH

MODERATE CHARGEABILITY HIGH

WEAK CHARGEABILITY HIGH

IP HIGH AT FURTHER SEPERATIONS

APPARENT RESISTIVITY INTERPRETATION

APPARENT RESISTIVITY LOW

Line 2800N : OCTOBER 26/81

SCALE 1:6000

DATE SURVEYED Line 3200N : OCTOBER 27,28/81

CONTOUR INTERVALS :

APP RES — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres

APP CHARG — 1 MSEC

APPROVED _____

DATE _____

TRANSMITTER — HUNTEC 7.5 Kw UNIT

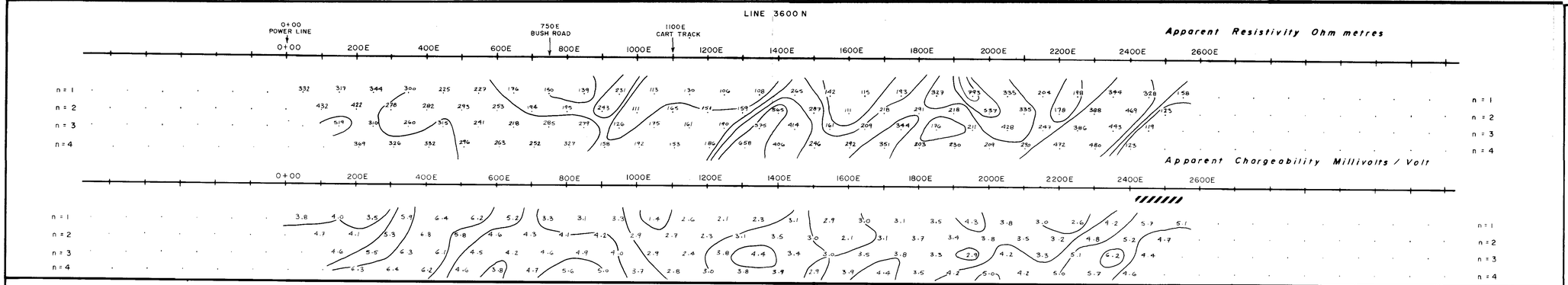
RECEIVER — n = 1,2 Mk.4 1004
n = 3,4 Mk.4 1036

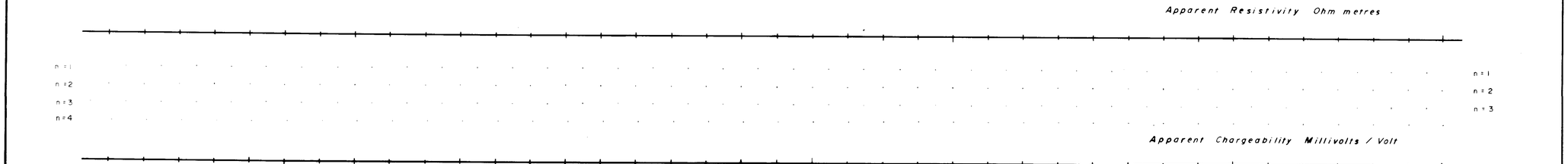
INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY EAGLE GEOPHYSICS LTD.

LINE 2800N

LINE 3200N





N.T.S. 92-I-7

DWG. NO. 207-81-16

COMINCO LTD.

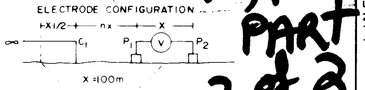
GUMP PROPERTY

KAMLOOPS M.D., B.C.

LINE NO. 3600N

LINE NO. 10,139 PART 2 of 2

POLE - DIPOLE ELECTRODE CONFIGURATION



PLOTTING POINT
n = 1, 2, 3, 4

CURRENT ELECTRODE WEST OF POTENTIAL DIPOLE

CHARGEABILITY (IP) INTERPRETATION
- STRONG CHARGEABILITY HIGH
- MODERATE CHARGEABILITY HIGH
- WEAK CHARGEABILITY HIGH
- IP HIGH AT FURTHER SEPERATIONS

APPARENT RESISTIVITY INTERPRETATION
- APPARENT RESISTIVITY LOW

SCALE 1:6000

DATE SURVEYED OCTOBER 28,29/81

CONTOUR INTERVALS:

APP RES — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres

APP CHARG — 1 MSEC

APPROVED _____

DATE _____

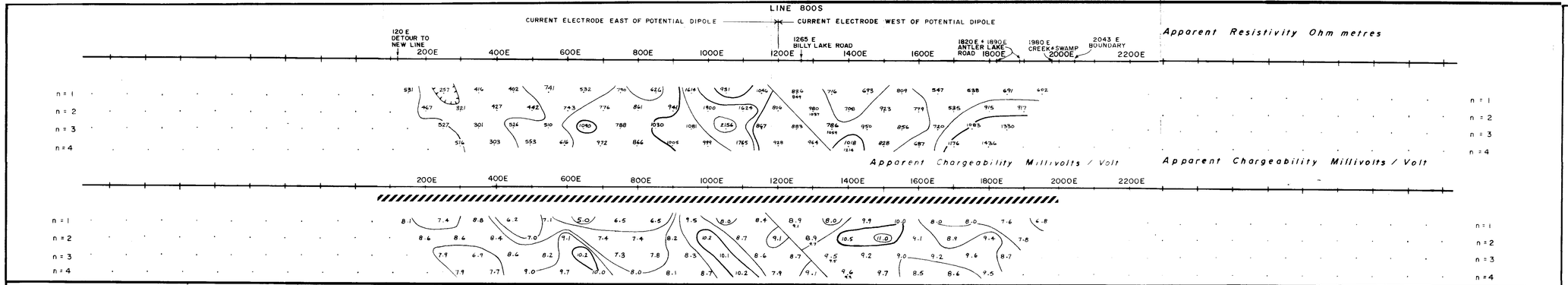
TRANSMITTER — HUNTEC 7.5 Kw UNIT

RECEIVER — n = 1, 2 Mk.4 1004
n = 3, 4 Mk.4 1036

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY EAGLE GEOPHYSICS LTD.

LINE 3600N



N.T.S. 92-I-7

DWG. NO. 207-81-17

COMINCO LTD.

GUMP PROPERTY

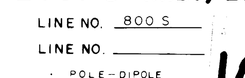
KAMLOOPS M.D., B.C.

LINE NO. 800 S

LINE NO. _____

10,139 PART 222

POLE-DIPOLE ELECTRODE CONFIGURATION



PLOTTING POINT
n = 1, 2, 3, 4

CURRENT ELECTRODE _____ OF POTENTIAL DIPOLE

CHARGEABILITY (IP) INTERPRETATION

- STRONG CHARGEABILITY HIGH
- MODERATE CHARGEABILITY HIGH
- WEAK CHARGEABILITY HIGH
- IP HIGH AT FURTHER SEPERATIONS

APPARENT RESISTIVITY INTERPRETATION

- APPARENT RESISTIVITY LOW

SCALE 1:6000

DATE SURVEYED OCTOBER 11 1981

CONTOUR INTERVALS:

APP RES — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres

APP CHARG — 1 MSEC

APPROVED _____

DATE _____

TRANSMITTER — HUNTEC 7.5 Kw UNIT

RECEIVER — HUNTEC Mk.3 3026
3070

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY EAGLE GEOPHYSICS LTD.

LINE 800S

LINE 2400S

Apparent Resistivity Ohm metres

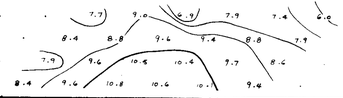
1800E 2000E 2200E 2400E 2600E

n = 1
n = 2
n = 3
n = 4

Apparent Chargeability Millivolts / Volt

1800E 2000E 2200E 2400E 2600E

n = 1
n = 2
n = 3
n = 4



Apparent Resistivity Ohm metres

n = 1
n = 2
n = 3
n = 4

Apparent Chargeability Millivolts / Volt

n = 1
n = 2
n = 3
n = 4

N.T.S. 92-I-7 DWG. NO. 207-81-18

COMINCO LTD.

GUMP PROPERTY

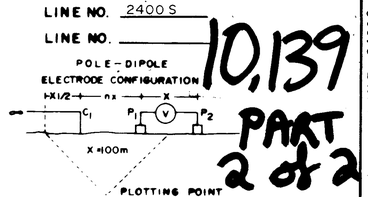
KAMLOOPS M.D., B.C.

LINE NO. 2400S

LINE NO. 10,139

POLE-DIPOLE ELECTRODE CONFIGURATION

PART 2 of 2



CURRENT ELECTRODE WEST OF POTENTIAL DIPOLE

CHARGEABILITY (IP) INTERPRETATION

STRONG CHARGEABILITY HIGH

MODERATE CHARGEABILITY HIGH

WEAK CHARGEABILITY HIGH

IP KNOWN AT FURTHER SEPERATIONS

APPARENT RESISTIVITY INTERPRETATION

APPARENT RESISTIVITY LOW

SCALE 1:6000

DATE SURVEYED OCTOBER 6,7 1981

CONTOUR INTERVALS:

APP RES — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres

APP CHARG — 1 MSEC

APPROVED

DATE

TRANSMITTER — HUNTEC 7.5 Kw UNIT

RECEIVER — HUNTEC Mk.3 3026
3070

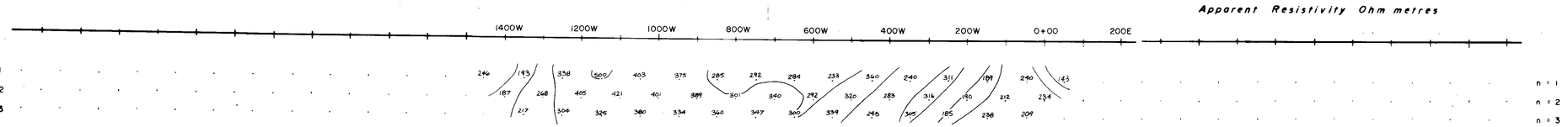
INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY EAGLE GEOPHYSICS LTD.

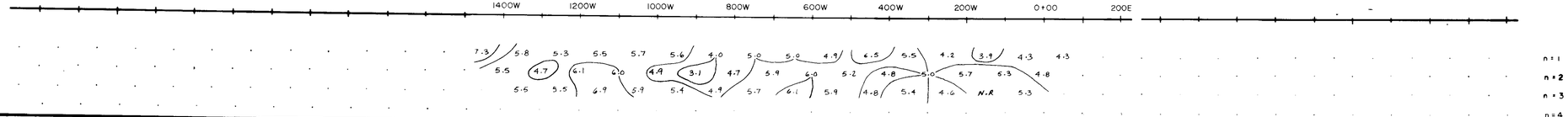
LINE 2400S

LINE 4800 S

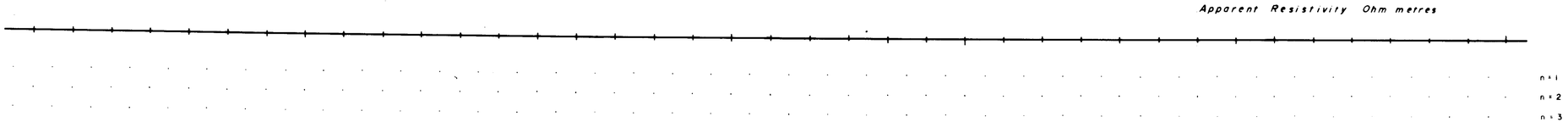
Apparent Resistivity Ohm metres



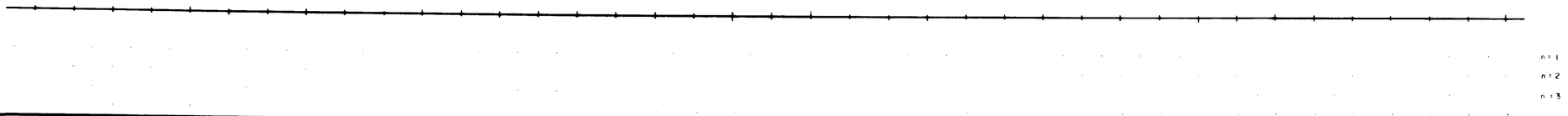
Apparent Chargeability Millivolts / Volt



Apparent Resistivity Ohm metres



Apparent Chargeability Millivolts / Volt



N.T.S. 92-I-7

DWG. NO. 207-81-19

COMINCO LTD.

GUMP PROPERTY

KAMLOOPS M.D., B.C.

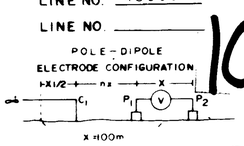
LINE NO. 4800S

LINE NO. _____

10,139

PART 2 of 2

POLE-DIPOLE ELECTRODE CONFIGURATION



PLOTTING POINT
n = 1, 2, 3, 4

CURRENT ELECTRODE WEST OF POTENTIAL DIPOLE

CHARGEABILITY (IP) INTERPRETATION
STRONG CHARGEABILITY HIGH
MODERATE CHARGEABILITY HIGH
WEAK CHARGEABILITY HIGH
IP HIGH AT FURTHER SEPERATIONS

APPARENT RESISTIVITY INTERPRETATION
APPARENT RESISTIVITY LOW

SCALE 1:6000

DATE SURVEYED OCTOBER 20, 1981

CONTOUR INTERVALS:
APP RES 5,2,3,5,7,5, Ohm metres
APP CHARG 1 MSEC

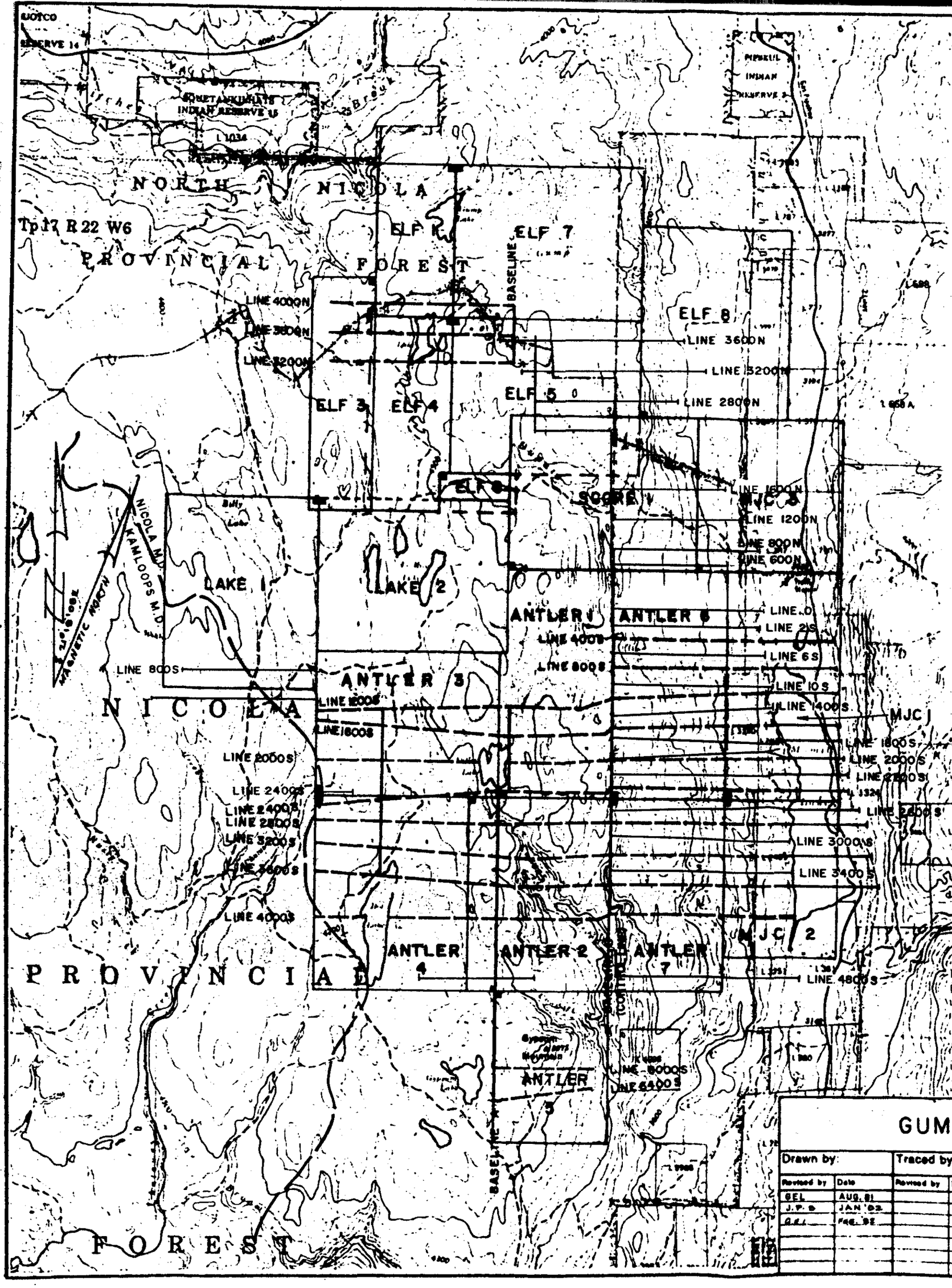
APPROVED _____

DATE _____

TRANSMITTER — HUNTEC 7.5 Kw UNIT
RECEIVER — HUNTEC Mk.3 3026
3070

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY EAGLE GEOPHYSICS LTD.

LINE 4800S



10,139 Part 2 of 2

GUMP PROPERTY

Gammex 92I/7

Drawn by:		Traced by: SJN	
Revised by	Date	Revised by	Date
GEL	AUG. 81		
J.P.B	JAN '82		
G.E.L	FEB. 82		

CLAIM MAP

1980-1981 GEOPHYSICS GROUND GRID

NICOLA M.D., B.C.

Scale: 1 : 50,000 | Date: MAY 15 — 1980 | Plate: 207-81-2b

Survey Control 5+00E

Survey Control 15+00

36N
32N
28N
24N
20N
16N
12N
8N
4N
00
4S
8S
12S
16S
20S
24S
28S
32S
36S

Creek

Leroy Lake

Antler Lake

Dot Lake

Guichon creek

Mamit Lake

10,139 PART 2 of 2

1981 GEOPHYSICS GROUND GRID
LAKE
CREEK
ROAD
GRAVEL ROAD

INSTRUMENT
TRANSMITTER HUNTEC 7.5 Kw UNIT
RECEIVER HUNTEC MK.4 n=1,2 1004
CONTOUR INTERVAL 2 MSEC n=3,4 1036

> 7.0 MSEC

METRES
200 100 0 200 400 600

GUMP GROUP

CHARGEABILITY
n=1
NICOLA M.D., B.C.

1:10000

Billy Lake

Leroy Lake

Roscoe Lake

Roscoe Creek

Chataway River

Chataway Lake

Dot Lake

Dot Lake

Antler Lake

Cougar Lake

Gypsum Lake

Creek

Survey Control 15+00W

800N
400N
0+00
400S
800S
1200S
1600S
2000S
2400S
2800S
3200S
3600S
4000S
4400S
4800S
5200S
5600S
6000S
6400S

8N
4N
00
4S
8S
12S
16S
20S
24S
28S
32S
36S
40S
44S
48S
52S
56S

GYPSUM MTN. △

10,139
PART
2 of 2

98: GEOPHYSICS GROUND GRID
LAKE
CREEK
ROAD
GRAVEL ROAD

INSTRUMENT:
TRANSMITTER HUNTEC 7.5Kw UNIT
RECEIVER HUNTEC Mk3 3026,3070
CONTOUR INTERVAL 2.0 MSEC
> 7.0 MSEC

METRES
0 200 400 600 800 1000

GUMP GROUP

NTS 92-I-7

Drawn by: GEL
Traced by: FEB. 82.
Revised by: Date
Revised by: Date

CHARGEABILITY
n = 1
NICOLA M.D., B.C.

Scale 1:10,000
Date JAN. 1981
Plate 190-80-6a

Survey Control 5+00E

Survey Control 15+00

36N
32N
28N
24N
20N
16N
12N
8N
4N
00
4S
8S
12S
16S
20S
24S
28S
32S
36S

Creek

Leroy Lake

Antler Lake

Dot Lake

Guichon Creek

Mamit Lake

10,139
PART
2 of 2

1981 GEOPHYSICS GROUND GRID
LAKE
CREEK
ROAD
GRAVEL ROAD

INSTRUMENT
TRANSMITTER HUNTEC 7.5 Kw UNIT
RECEIVER HUNTEC Mk 4
n=1,2 1004
n=3,4 1036

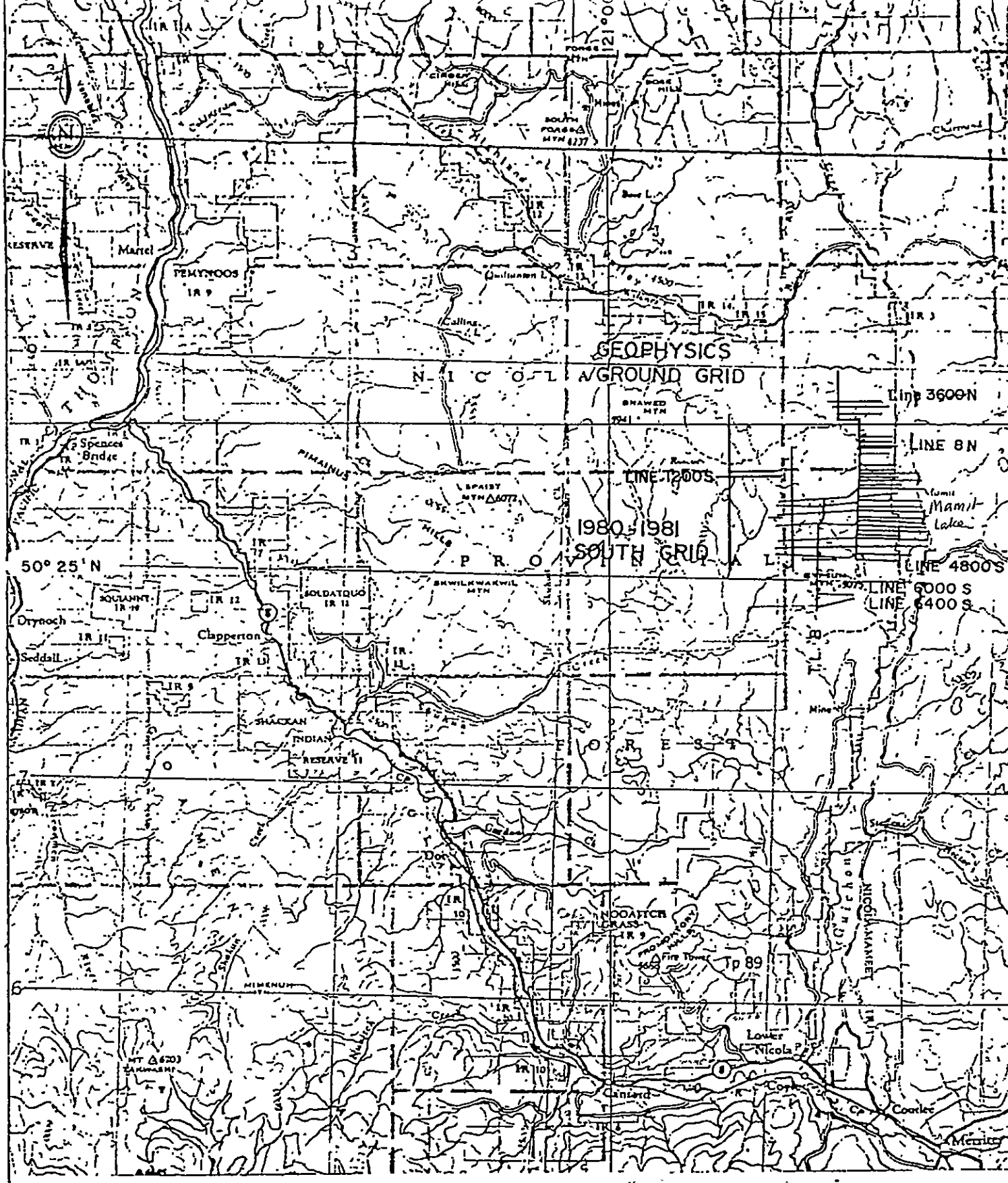
METRES
200 100 0 200 400 600

GUMP GROUP

RESISTIVITY
n = 1

NICOLA M.D., B.C.

1:10000 JANUARY 1982



GUMP GROUP

NTS 92-1-7

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date
J. P. S.	AUG; 81		
G.E.L.	FEB '82		

LOCATION MAP

NICOLA M.D., B.C.

Scale: 1:250,000 | Date: JAN 1981 | Plate 207-81-1a