COMINCO LTD.

EXPLORATION WESTERN DISTRICT

N.T.S. 92H/15E

GEOPHYSICAL REPORT

INDUCED POLARIZATION AND MAGNETOMETER GEOPHYSICAL SURVEYS

GROVE PROPERTY

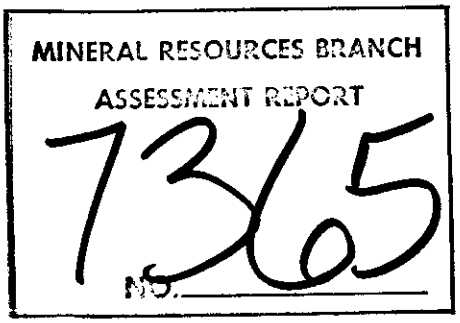
SNOWFLAKE CLAIMS

Aspen Grove Area, Nicola Mining Division, B.C.

Latitude: 49°58'N; Longitude: 120°34'W

Work Performed: May 6-25, 1979

On Claims: Snowflake 2, 4, 5, 7, 8, 9, and 10



July 1979

Alan Scott

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ATTACHMENTS

Plate	150-79-1	Location Map
"	150-79-2	Claims and Grid Map
"	150-79-3 to 14	Induced polarization and apparent resistivity pseudosections, magnetic field profiles.

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INTRODUCTION

The GROVE property (SNOWFLAKE mineral claims) is located immediately east of Highway 5, some 22 kilometers south of Merritt, B.C. Plate 150-79-1 shows the general location of the property, and plate 2 shows the location of the survey grid relative to the claims.

During the period May 6-25, 1979, a Cominco geophysical crew completed some 26 line kilometers of multiseparation induced polarization and total field magnetics surveys over portions of the claims.

This report describes these geophysical surveys, presents the data, and discusses the results.

LOCATION AND ACCESS

The GROVE property lies immediately east of Highway 5, some 22 kilometers south of Merritt, B.C.

Vehicle access can be gained via a dirt road east from Highway 5, as indicated on the accompanying claims and grid map, plate 2.

GEOLOGY

The exploration targets on the GROVE property are alkaline porphyry copper deposits. Previous work on the property (trenching, percussion drilling, geological mapping) has located mineralization (chalcocite, chalcopyrite, bornite and native copper) in propylitized diorites near the contact with alkaline Nicola basalts.

INDUCED POLARIZATION SURVEY

G.J. Niemeyer, geophyscial technician, was the party chief/receiver operator on the Grove survey.

A Huntec 7.5 Kw time domain induced polarization motor generator/transmitter was used in the survey. A 2 second current on/2 second current off alternating square wave was used for the transmitted signal. The survey was started with a Scintrex IPR-8 receiver, but due to a malfunction, it was necessary to use a

Huntec Mk III

.....2/

Huntec MK III receiver for a portion of the survey.

The chargeability values plotted for the IPR-8 are the M_{232} values, and the units are in millivolts per volt. The MK III values were obtained using a time delay (t_d) of 240 msec and a measuring period (t_p) of 60 msec.

Line 21+00N was surveyed with both instruments and the ratio of 0.813 was established as the conversion factor for MK III to IPR-8 values. Values plotted are those for the IPR-8 M_{232} window or MK III values converted to IPR-8 equivalent.

The pole dipole electrode array was used on the survey. The "a" spacing was 75 meters and readings were taken at "n" separations of 1, 2, 3 and 4. The current electrode was kept to the east of the potential dipole.

The apparent resistivity values are given in units of ohn meters. They were calculated from the relation:

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

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

MAGNETOMETER SURVEY

Scintrex MP-2 proton precession magnetometer was used for the magnetics survey. The instrument measures the earth's total magnetic field to the nearest gamma. A check was made on diurnal variation by repeating readings at base line stations within 2 hour periods. No diurnal variations of greater than 20 gammas were observed, and the data has not been corrected for those changes.

Readings were taken at 25 meter intervals along the IP survey line, and are plotted in profile form on the IP pseudosections.

DESCRIPTION OF RESULTS

.....3/

DESCRIPTION OF RESULTS

The four separations of apparent resistivity and chargeability (IP) data are plotted in standard pseudosection format on accompanying plates 150-79-3 to 14, inclusive. The magnetic field data is shown in profile form. Note that the pseudosection format is a schematic representation of the data, and no depth to target or target geometry is implied by this representation. IP anomalies have been coded on the section as follows:

definite (high amplitude and well defined)

probable (moderate amplitude)

weak (above background values but poorly defined)

The strongest IP response of the survey was the anomaly centered at 150 W on line 900N. The peak n=1 separation value is 33.7 millivolts per volt. A strong response to this anomaly was also obtained on line 1200N, where it is centered near the baseline, and the peak n=1 value is 27.6 millivolts per volt.

Strong chargeability responses also plot on line O at midway between stations 1575 and 1650 W, and between stations 1425 and 1500 W. Similar, but lower amplitude, anomalies were also obtained along strike on line 400 N. The overall response of these two anomalies is complex, with the easternmost anomaly being associated with a very strong magnetic high (some 9,000 gammas above background on line O). The powerline is coincident with the western anomaly on line O and the eastern anomaly on line 400 N. The possibility of a cultural source (grounding networks for the tower?) cannot be overlooked, but seems unlikely in view of the lack of such response elsewhere along the powerline, and the very large width of the overall anomalous zone.

Moderate amplitude IP anomalies have been noted centered at 1275 E and at 600 W on line O; at 375 E on line 1800 N; and at 675 E on line 2100 N. In addition, there are several weak anomalies noted on the section. Such weak anomalies could well be significant if they are caused by copper mineralization rather than iron sulphides.

CONCLUSIONS

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CONCLUSIONS

Portions of the SNOWFLAKE mineral claims were surveyed with multiseparation time domain IP and total field magnetics in May, 1979. The survey was fairly regional in its coverage, in that survey lines were normally 300 or 400 meters apart.

Several chargeability (IP) anomalies were detected on the survey. These have been defined on the pseudosections as definite, probable, or weak. The main features are discussed briefly in the text.

A detailed correlation of these anomalies to geological and geochemical data to assess their significance is required. Fill in IP survey lines should then be run over higher priority anomalies, prior to any drilling program.

Respectfully submitted by:

Alan Scott
Geophysicist

Endorsed for release by:

G. HARDEN
Manager, Exploration
Western District

ARS/tlp
9 July 1979

Distribution:

Mining Recorder (2)
Western District (1)
Geophysics File (1)

APPENDIX I

IN THE MATTER OF THE B.C. MINERAL ACT

AND IN THE MATTER OF A GEOPHYSICAL PROGRAMME

CARRIED OUT ON PORTIONS OF THE SNOWFLAKE MINERAL CLAIMS

ON THE GROVE PROPERTY

LOCATED 22 KM SOUTH OF MERRITT IN THE NICOLA MINING DIVISION

OF THE PROVINCE OF BRITISH COLUMBIA, MORE PARTICULARLY

N.T.S.: 92H/15E

S T A T E M E N T

I, ALAN SCOTT, OF THE CITY OF VANCOUVER, 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 SNOWFLAKE MINERAL CLAIMS;

3. THAT THE SAID EXPENDITURES WERE INCURRED FOR THE PURPOSE OF MINERAL EXPLORATION OF THE ABOVE NOTED CLAIMS BETWEEN THE 6th OF MAY AND 25th OF MAY, 1979.

Alan Scott
Geophysicist

ARS/tlp
9 July 1979

APPENDIX II

GROVE PROPERTY

STATEMENT OF EXPENDITURES

(IP and Magnetics Surveys)

Salaries (Geophysics field survey, May 6-25):

A. Scott	May 6-8	3days	@	$150....$	450
G. Niemeyer	May 6-11, 13-18, 20-25	18 "	@	105....	1,890
I. Cummings	May 6-11, 13-18, 20-25	18 "	@	81....	1,458
J. Bell	May 6-11, 13-18, 20-25	18 "	@	81....	1,458
R. Prefontaine	" 6-11, 13-18, 20-25	18 "	@	81....	1,458
S. Kirstiuk	May 8-11, 13-18, 20-25	16 "	@	81....	1,295
D. Saunders	May 22-25	4 "	@	81....	324

Rentals:

7-5 Kw IP survey system	18days	@	251/day.	4,518
Magnetometer rental	4 "	@	10/day.	40

Charges per operating day:

(Towards report, drafting, supervision)

17 days at $175/day. 2,975

Miscellaneous:

Food, lodging, gas, consumables. 3,798

Linecutting:

19.07 miles (30.5 Km) @ $300/mile. 5,721

Project Geologist:
(Supervision of line cutting & locating claim posts)

R.U. Bruaset	April 30, May 1-2, 30-31	5 days	@	$150..	750
	Domicile	5 "	@	35..	175
	Transportation	5 "	@	40..	200

TOTAL EXPENDITURES. $26,511

ARS/tlp
9 July 1979

Alan Scott
Geophysicist

APPENDIX III

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

I, ALAN SCOTT, of 4013 West 14th Avenue, in the City of Vancouver, in the Province of British Columbia, do hereby certify that:

1. I graduated from the University of British Columbia in 1970 with a B. Sc. in Geophysics.

2. That I am a member of the Association of Professional Engineers of the Province of Saskatchewan, the Society of Exploration Geophysicists of America, and the British Columbia Geophysical Society.

3. I have been practising my profession for the past nine years.

Alan Scott
Geophysicist

ARS/tlp
9 July 1979

SCALE 1:50,000 ÉCHELLE

Miles 1 0 1 2 3 Miles

Metres 1000 500 0 1000 2000 3000 4000 Mètres

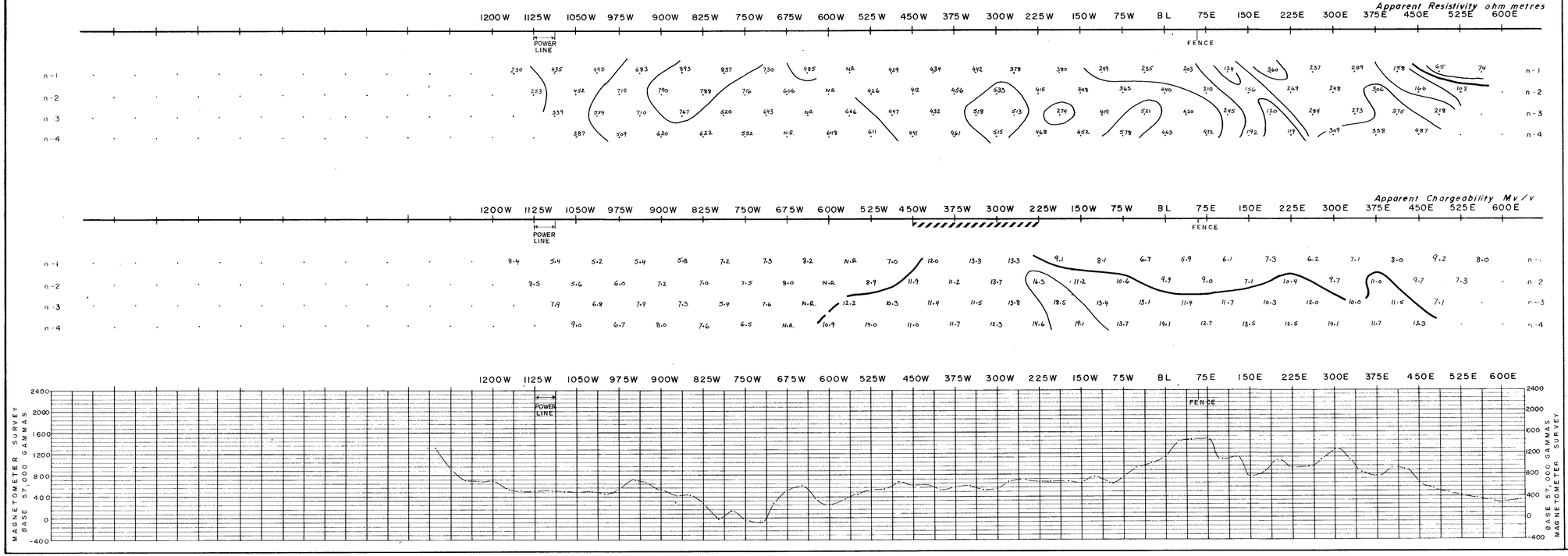
Yards 1000 500 0 1000 2000 3000 4000 Verges

NTS
92H 15 E

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

GROVE PROPERTY
SNOWFLAKE CLAIMS
LOCATION MAP
NICOLA M. D., B. C.

Scale: 1: 50,000 | Date: JULY, 1979 | Plate: 150-79-1



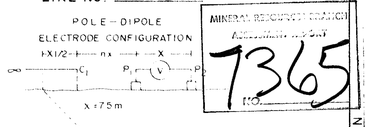
N.T.S. 92 H 15 E

DWG. NO. 150-79-8

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M.D., B.C.

LINE NO. 1500N

POLE-DIPOLE ELECTRODE CONFIGURATION



PLOTTING POINT n=1, 2, 3, 4

CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

CONTOUR INTERVALS

APP RES. — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres
APP CHARG — 5.0 Mv/V

DATE SURVEYED

APPROVED

DATE

TRANSMITTER — HUNTEC 7.5 Kw

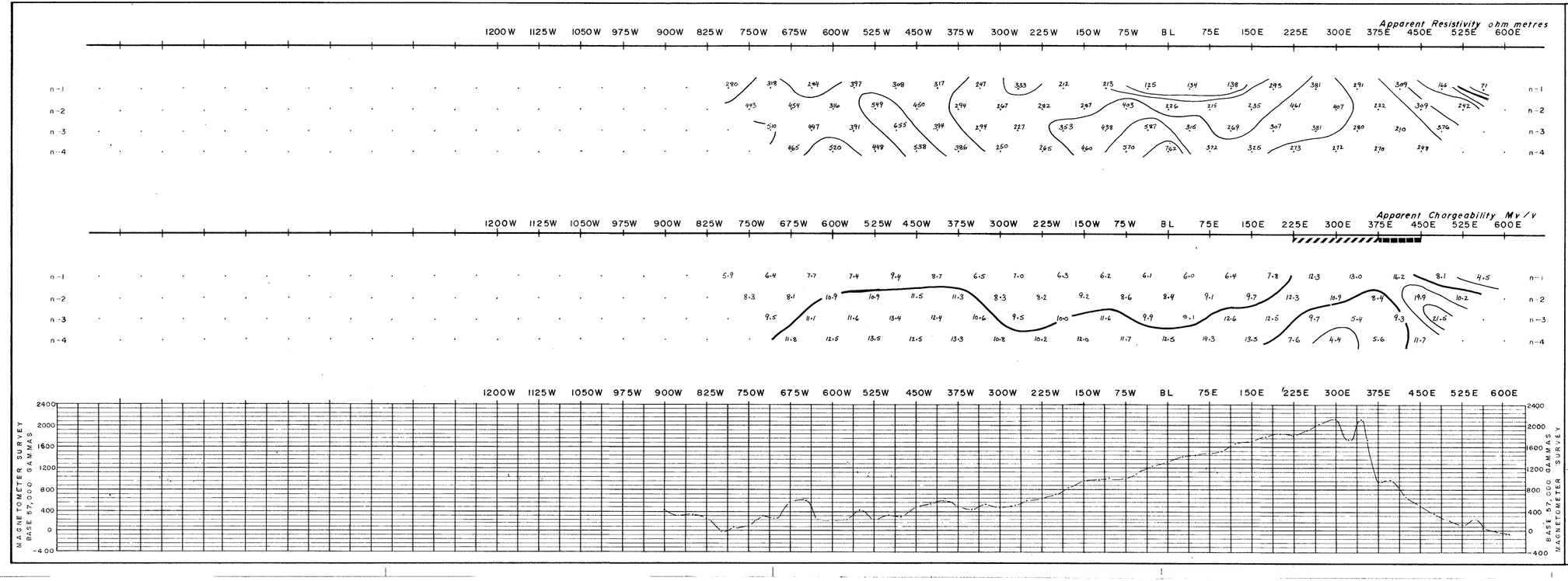
RECEIVER — MK III (Converted to IPR8)

SCINTREX MP II PROTON PRECESSION MAGNETOMETER

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

1500N



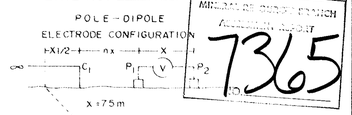
N.T.S. 92 H 15 E

DWG NO 150-79-9

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M.D., B.C.

LINE NO. 1800 N

POLE-DIPOLE ELECTRODE CONFIGURATION



PLOTTING POINT
n = 1, 2, 3, 4

CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

DATE SURVEYED

CONTOUR INTERVALS:

APP RES — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres
APP CHARG — 5.0 Mv/V

APPROVED

DATE

TRANSMITTER — HUNTEC 7.5 Kw

RECEIVER — MK III (Converted to IPR 8)

SCINTREX MP II PROTON PRECESSION MAGNETOMETER

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

LINE 1800 N

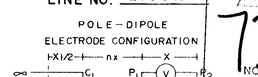
N.T.S. 92 H 15 E

DWG. NO. 150-79-10

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M.D., B.C.

LINE NO. 2100N

POLE-DIPOLE ELECTRODE CONFIGURATION



PLOTTING POINT
n = 1, 2, 3, 4

CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

DATE SURVEYED

CONTOUR INTERVALS:

APP RES. - 1,1.5,2,3,5,7.5,10 ohm metres
APP CHARG - 5.0 Mv/V

APPROVED

DATE

TRANSMITTER - HUNTEC 7.5 Kw

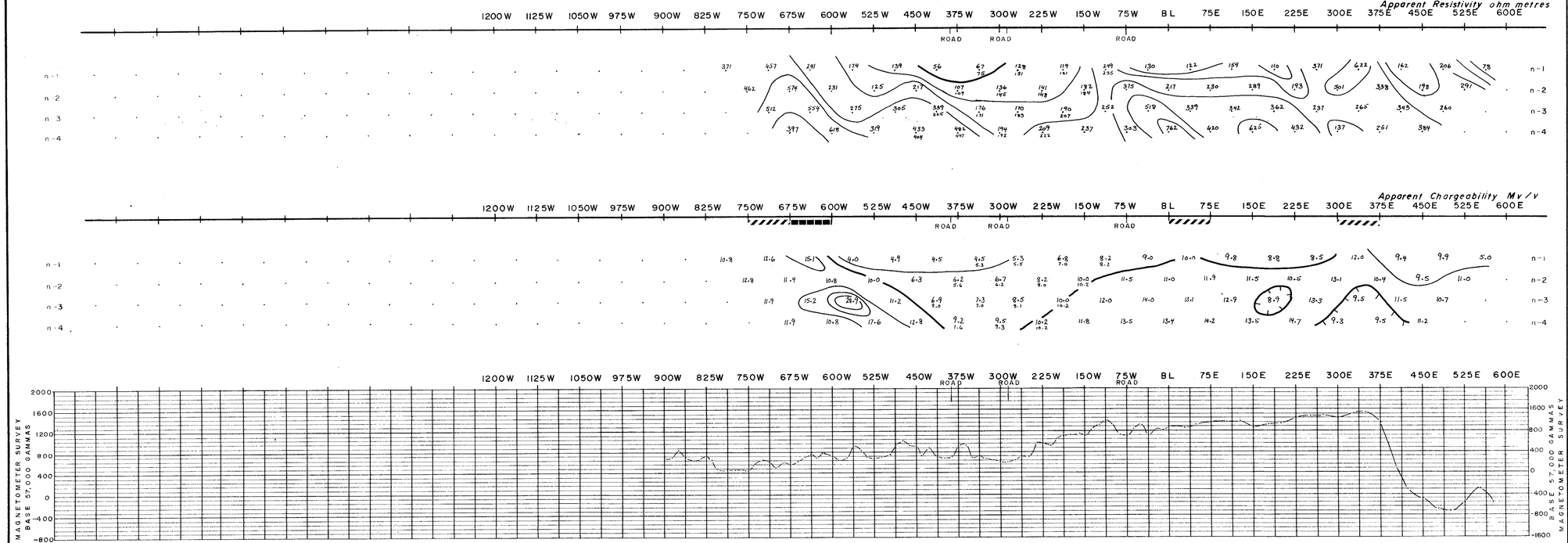
RECEIVER - MK III (Converted to IPR 8) sta 600E to BL
AND IPR 8 Mv/V sta 75W to sta 750W

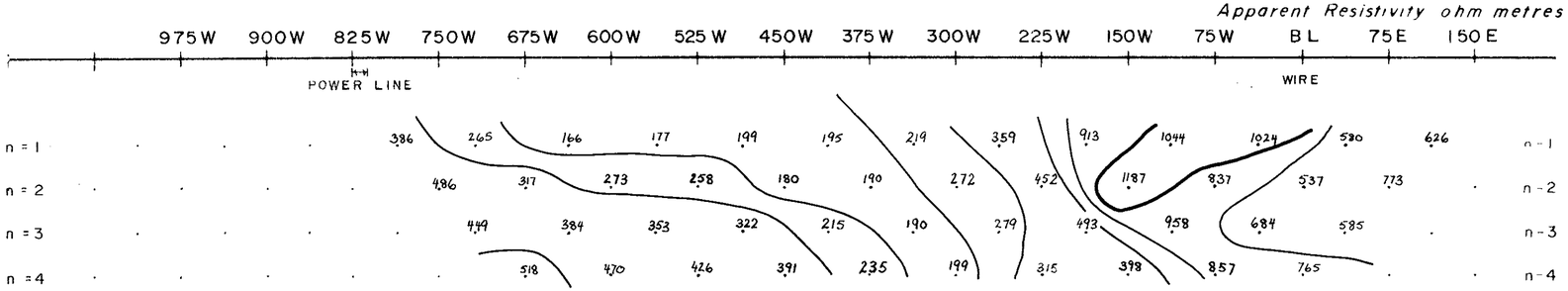
SCINTREX MP II PROTON PRECESSION MAGNETOMETER

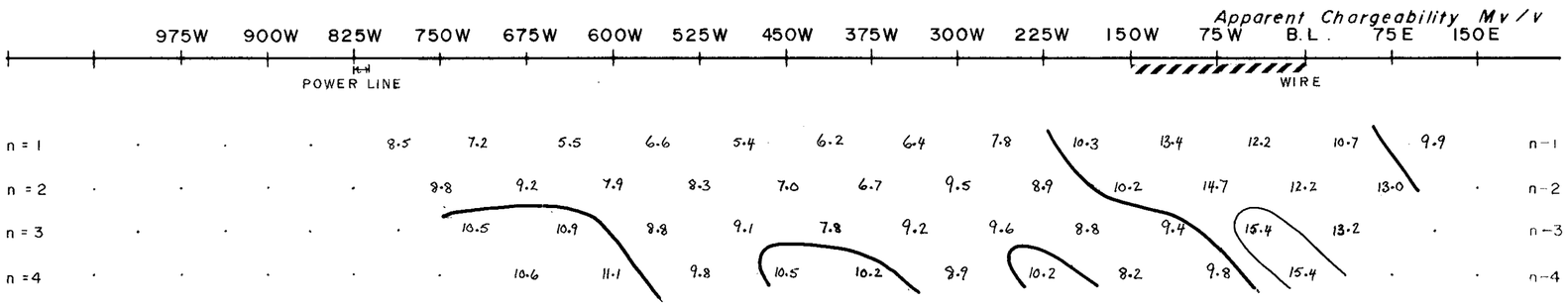
INDUCED POLARIZATION AND RESISTIVITY SURVEY

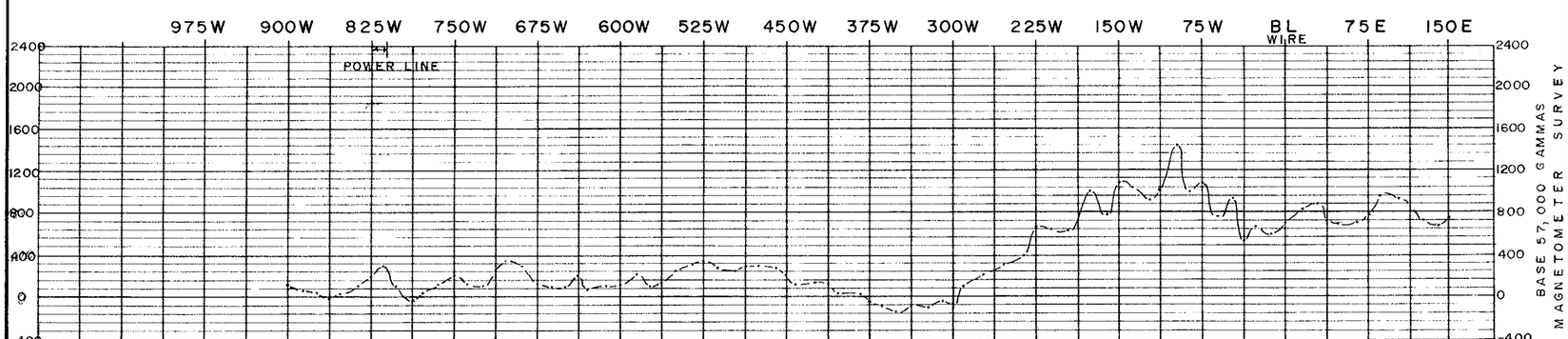
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

LINE 2100N





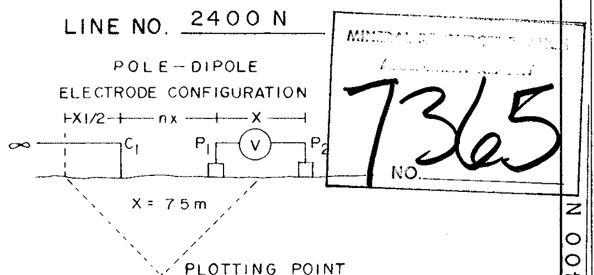




N.T.S. 92 H 15 E DWG. NO. 150-79-11

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M.D., B.C.

LINE NO. 2400 N



MINERAL [illegible]
7365
NO.

CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

DATE SURVEYED

CONTOUR INTERVALS:
APP. RES. — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres
APP CHARG. — 5.0 Mv/V

APPROVED

DATE

TRANSMITTER — HUNTEC 7.5 Kw.
RECEIVER — MK III (Converted to IPR8)

SCINTREX MP II PROTON PRECESSION MAGNETOMETER

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

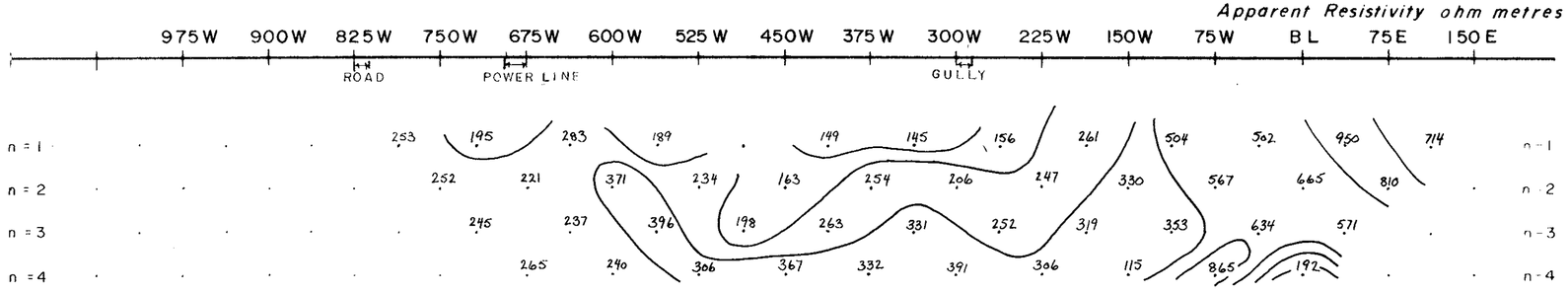
N 2400 N

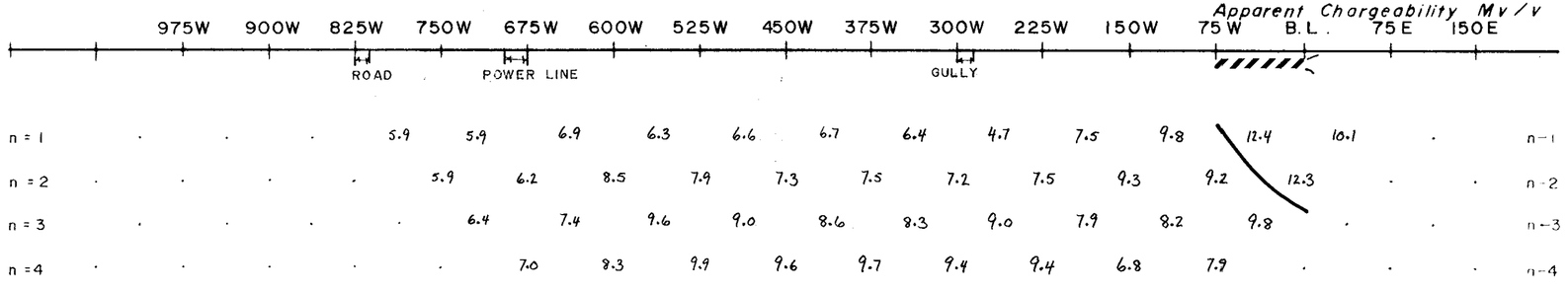
N.T.S. 92 H 15 E

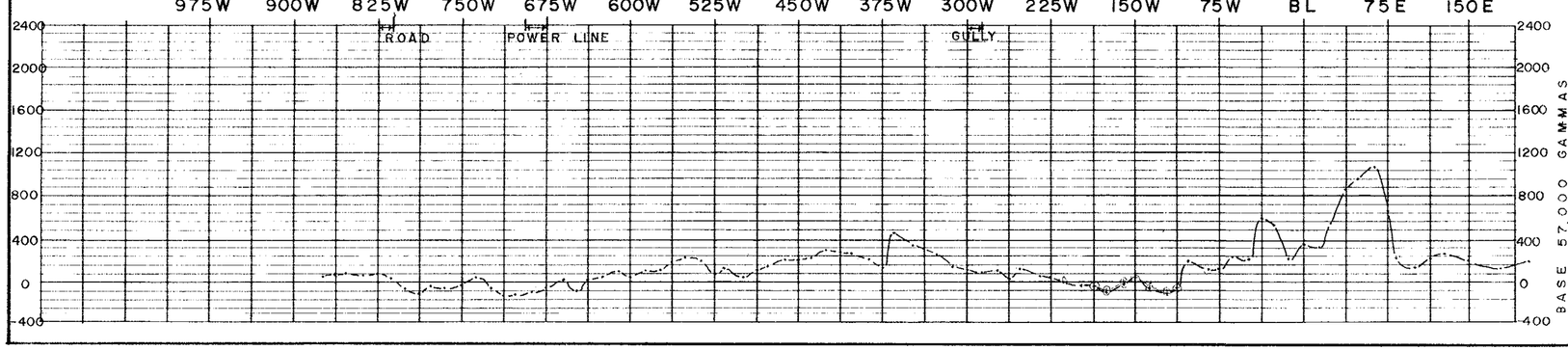
DWG. NO. 150-79-12

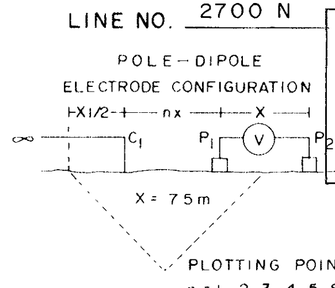
COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M. D., B. C.

LINE NO. 2700 N









CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

DATE SURVEYED

CONTOUR INTERVALS :

APP RES. — 1, 1.5, 2, 3, 5, 7.5, 10 ohm metres
APP CHARG. — 5.0 Mv/V

APPROVED

DATE

TRANSMITTER -- HUNTEC 7,5 Kw.

RECEIVER — MK III (Converted to IPR8)

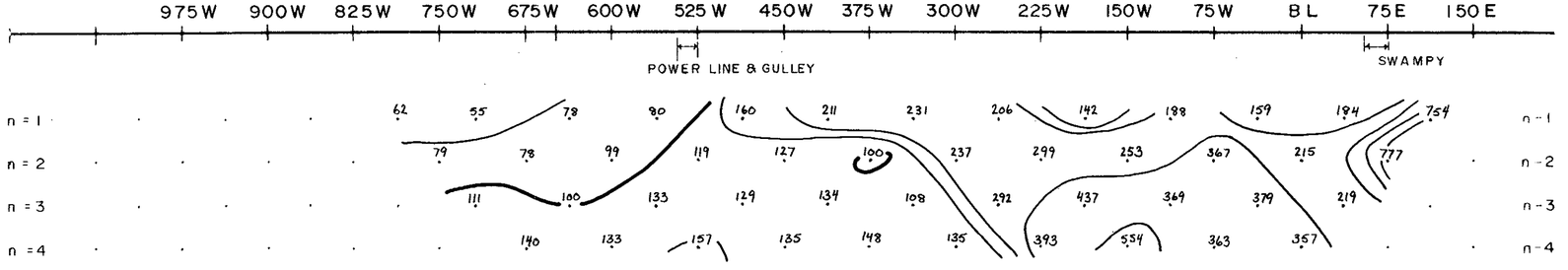
SCINTREX MP II PROTON PRECESSION MAGNETOMETER

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

NE 2700 N

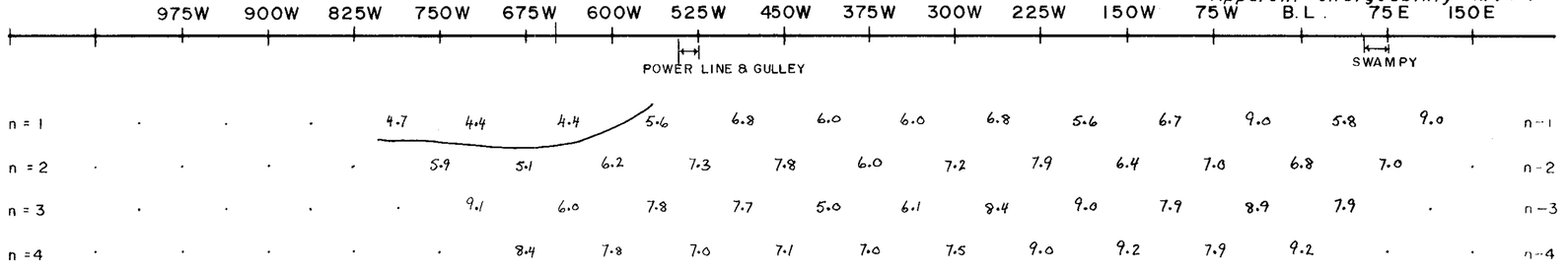
THE LINE MOVES 25 m NORTH
AT STA. 650W

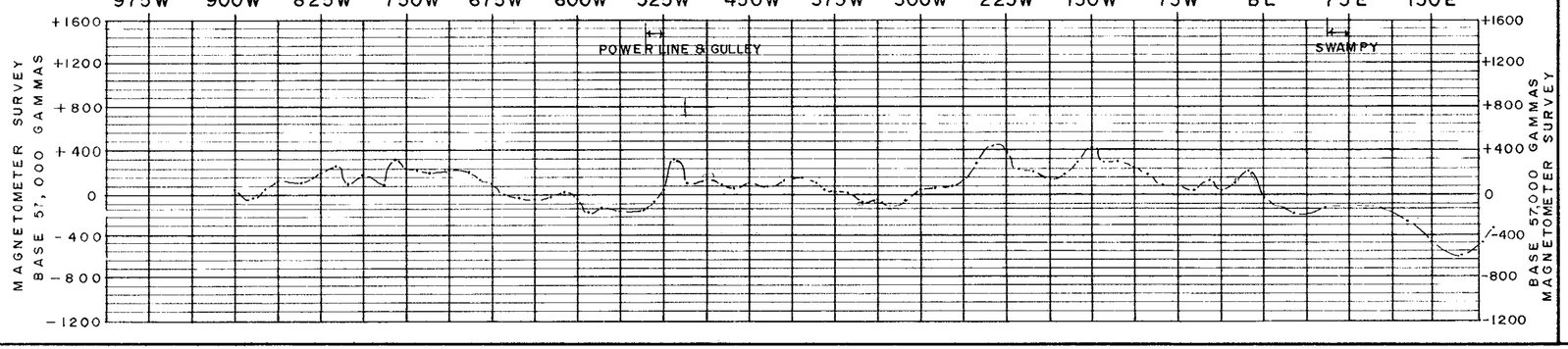
Apparent Resistivity ohm metres



THE LINE MOVES 25m NORTH
AT STA. 650 W

Apparent Chargeability Mv / v





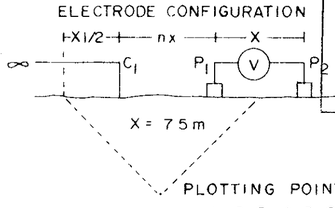
N.T.S. 92 H 15 E

DWG. NO. 150-79-13

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M. D., B. C.

LINE NO. 3000 N

POLE – DIPOLE
ELECTRODE CONFIGURATION



CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

DATE SURVEYED MAY 8, 1979

CONTOUR INTERVALS :

APP. RES. – 1, 1.5, 2, 3, 5, 7.5, 10
APP CHARG. – 5.0 Mv/V

APPROVED

DATE

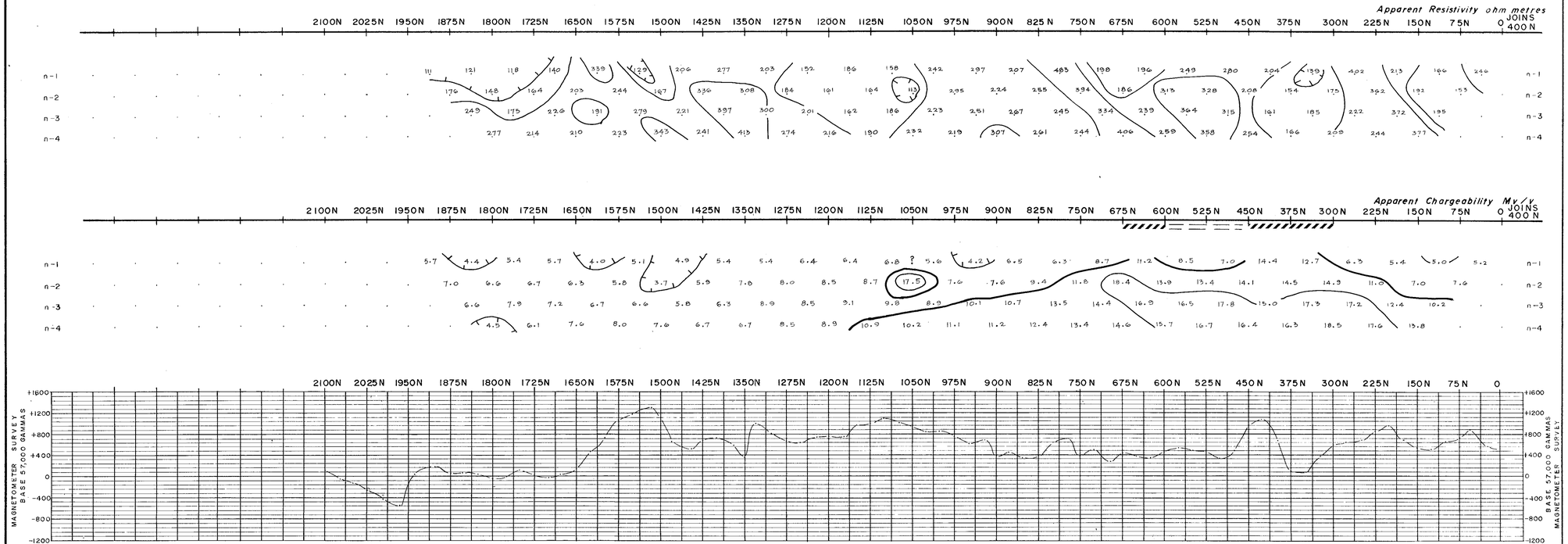
TRANSMITTER – HUNTEC 7.5 Kw.

RECEIVER – IPR 8 Mv/V

SCINTREX MP II PROTON PRECESSION MAGNETOMETER

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

LINE 3000 N



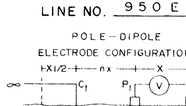
N.T.S. 92 H 15

DWG. NO. 150-79-14

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M.D., B.C.

LINE NO. 950 E

POLE-DIPOLE ELECTRODE CONFIGURATION



PLOTTING POINT
n = 1, 2, 3, 4, 5 & 6

CURRENT ELECTRODE SOUTH OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

SCALE 1:

CONTOUR INTERVALS:

APP. RES. — 1, 1.5, 2, 3, 5, 7.5, 10

APP. CHARG. — 5.0 Mv/V

DATE SURVEYED MAY 16, 1979

APPROVED

DATE

TRANSMITTER — HUNTEC 7.5 Kw

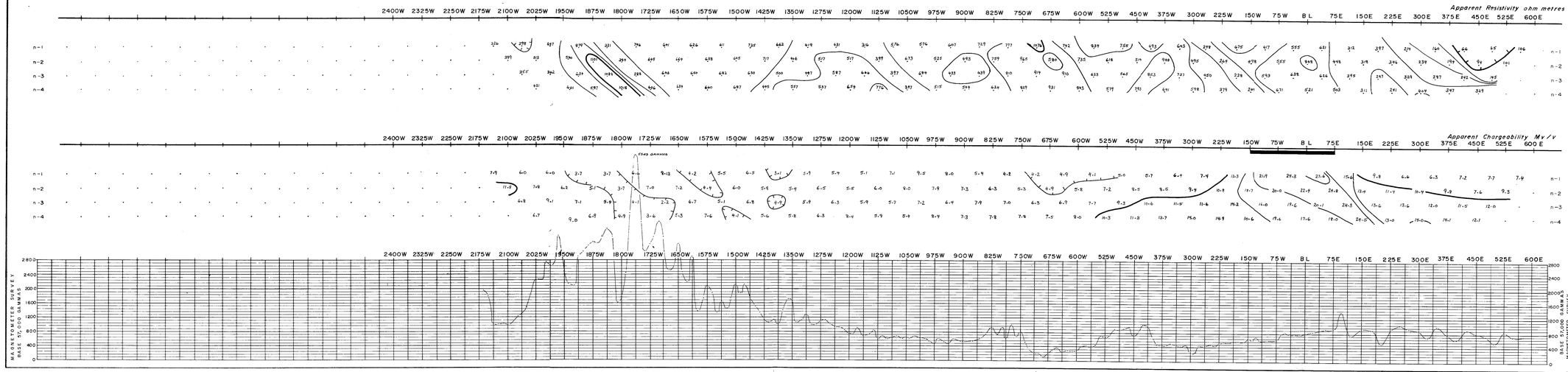
RECEIVER — MK III (Converted to IPR8)

SCINTREX MP II PROTON PRECESSION MAGNETOMETER

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

LINE 950 E



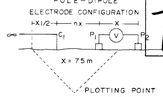
N.T.S. 92 H 15 E

DWG. NO. 150-79- 7

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M.D., B.C.

LINE NO. 1200 N

POLE - DIPOLE
ELECTRODE CONFIGURATION



PLOTTING POINT
n = 1, 2, 3, 4

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 7365

CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

CONTOUR INTERVALS :
APP. RES. — 1, 1.5, 2, 3, 5, 7.5, 10
APP CHARG. — 5.0 M v/v

DATE SURVEYED MAY 13, 1979

APPROVED

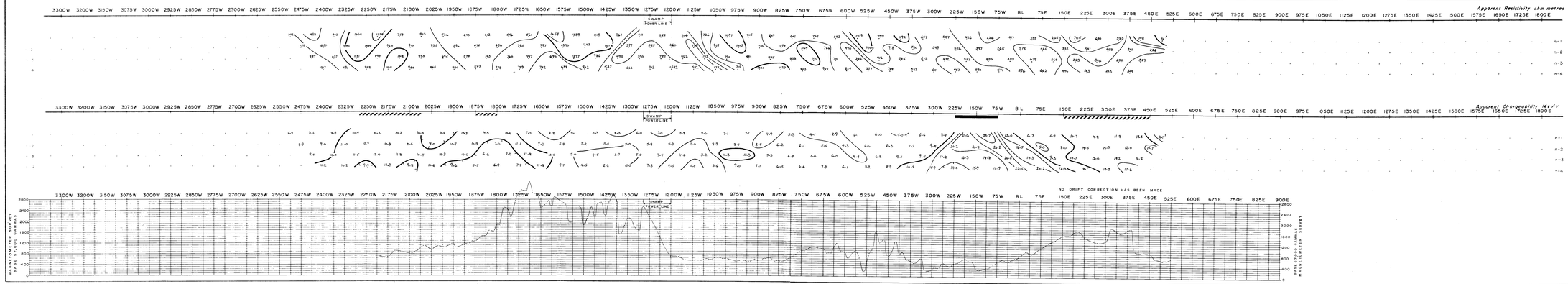
DATE

TRANSMITTER — HUNTEC 7.5 Kw
RECEIVER — MK III (Converted to IPRB Mv/V)

SCINTREX MPII PROTON PRECESSION MAGNETOMETER

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

LINE 1200 N



N.T.S. 92 H 15 E

DWG NO. 150-79-6

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M.D., B.C.

LINE NO. 900 N

POLE-DIPOLE ELECTRODE CONFIGURATION

CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
POSSIBLE
WEAK

DATE SURVEYED

CONTOUR INTERVALS:

APP. RES. — 1.0, 2.5, 5.7, 5, 10 ohm metres

APP. CHARG. — 5.0 Ms/s

APPROVED

DATE

TRANSMITTER — HUNTEC 7.5 Kw

RECEIVER — MK III (Converted to IPRE Ms/V) sta 525E to sta 1200W AND IPRE Ms/V) sta 1275W to sta 2475W

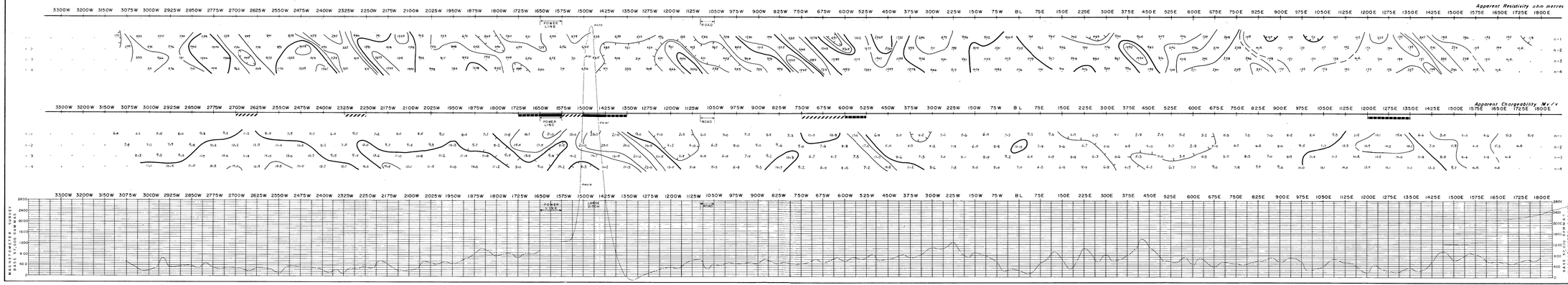
SCINTREX MP-2 PROTON PRECESSION MAGNETOMETER

INDUCED POLARIZATION AND RESISTIVITY SURVEY

SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

LINE 900 N

7365



N.T.S. 92 H 15 E

DWG. NO. 150-19- 4

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M.D., B.C.

LINE NO. O

POLE - DIPOLE
ELECTRODE CONFIGURATION
na x a = 7365
X = 7.5a

PLOTTING POINT
n = 1, 2, 3, 4

CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

DATE SURVEYED

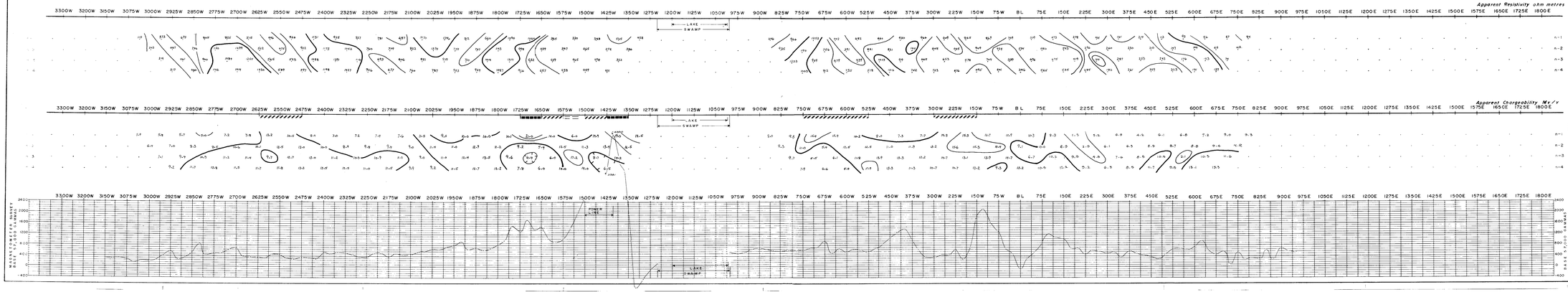
CONTOUR INTERVALS:
APP. RES. — 0.5, 2.5, 5, 7.5, 10 ohm metres
APP. CHARG. — 5.0 Mv/V

APPROVED

DATE

TRANSMITTER — HUNTEC 7.5 Kw
RECEIVER — MK III (Converted to IPR8 Mv/V) Sta. 1800E to Sta. 825W
AND IPR8 Mv/V) Sta. 825W to Sta. 3075W
SCINTREX MP2 PROTON PRECESSION MAGNETOMETER

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION



N.T.S. 92 H 15 E

DWG. NO. 150-79-5

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M.D., B.C.

LINE NO. 400 N

MINERAL RESOURCES DIVISION
GEOPHYSICAL BRANCH
1365
FILE

POLE-DIPOLE
ELECTRODE CONFIGURATION

CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

DATE SURVEYED

CONTOUR INTERVALS:
APP. RES. — 1, 2, 3, 5, 7, 10 ohm metres
APP. CHARG. — 5.0 MV/V

APPROVED

DATE

TRANSMITTER — HUNTEC 7.5 Kw
RECEIVER — MK III (Converted to IP/RES MV/V) sts 825W to sts 850W
AND IPRS MV/V) sts 1275 to sts 3000W
SCINTREX MP II PROTON PRECESSION MAGNETOMETER

INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

N.T.S. 92 H 15 E

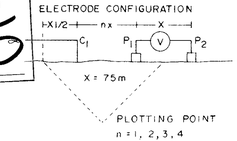
DWG NO. 150-79-3

COMINCO LTD.
GROVE PROPERTY
SNOWFLAKE CLAIMS
NICOLA M.D., B.C.

LINE NO. 500 S

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
7365
NO.

POLE-DIPOLE
ELECTRODE CONFIGURATION



CURRENT ELECTRODE EAST OF POTENTIAL DIPOLE

DEFINITE
PROBABLE
WEAK

DATE SURVEYED MAY 16, 1979

CONTOUR INTERVALS:
APP RES. — 1, 1.5, 2, 3, 5, 7.5, 10 ohm m
APP CHARG. — 5.0 Mv/M

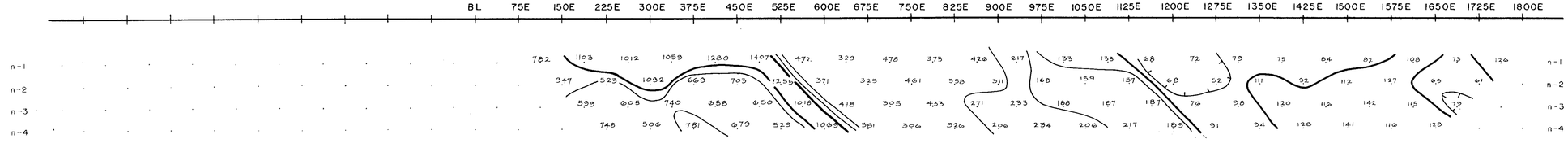
APPROVED

DATE

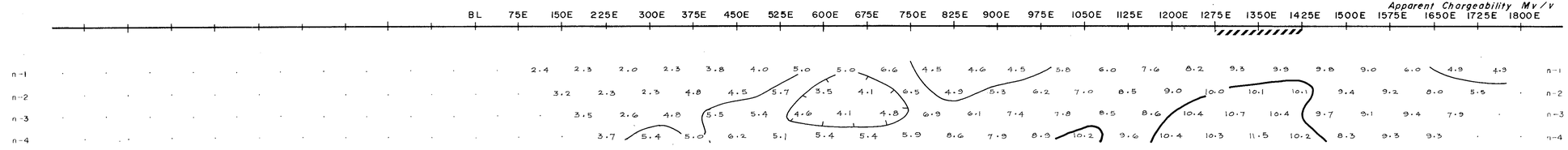
TRANSMITTER — HUNTEC 7.5Kw
RECEIVER — IPR 8
SCINTREX MPII PROTON PRESSION MAGNETOMETER

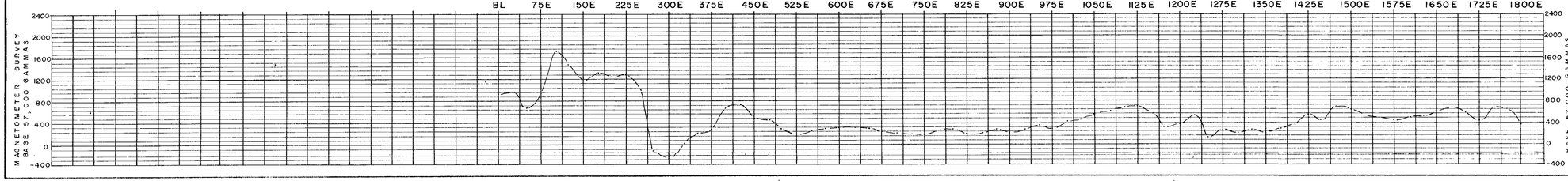
INDUCED POLARIZATION AND RESISTIVITY SURVEY
SURVEYED BY COMINCO LTD., EXPLORATION DIVISION

Apparent Resistivity ohm metres

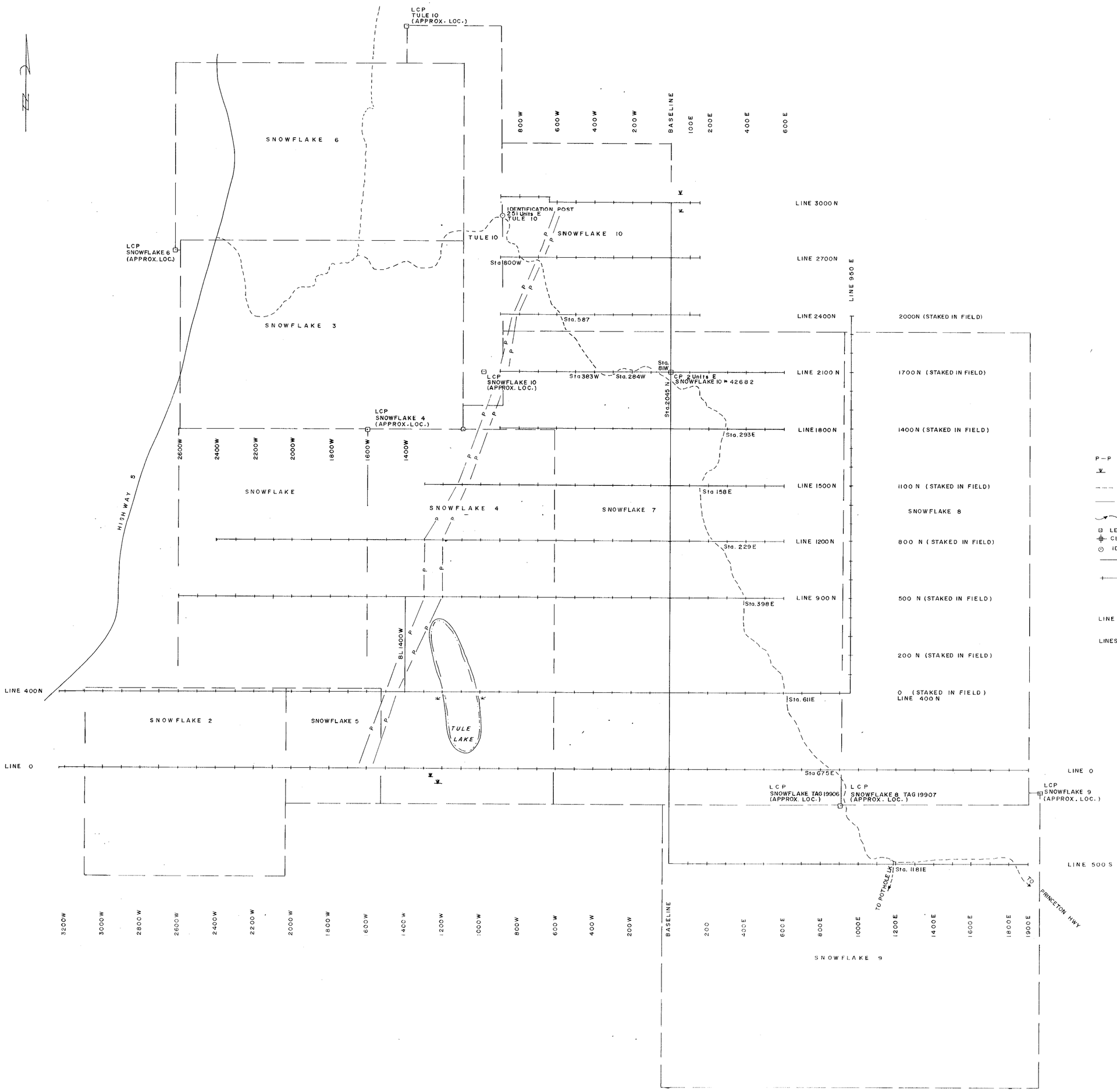


Apparent Chargeability Mv/v





NE 500 S



GROVE PROPERTY

92 H 15 E

Drawn by:	Traced by:

SNOWFLAKE CLAIMS
CLAIM MAP AND GRID MAP
NICOLA M.D., B. C.

Scale: 1 : 1000 | Date: JUNE 1979 | Plate 150-79 2

FORM 370 0666