'80-#31-#7831

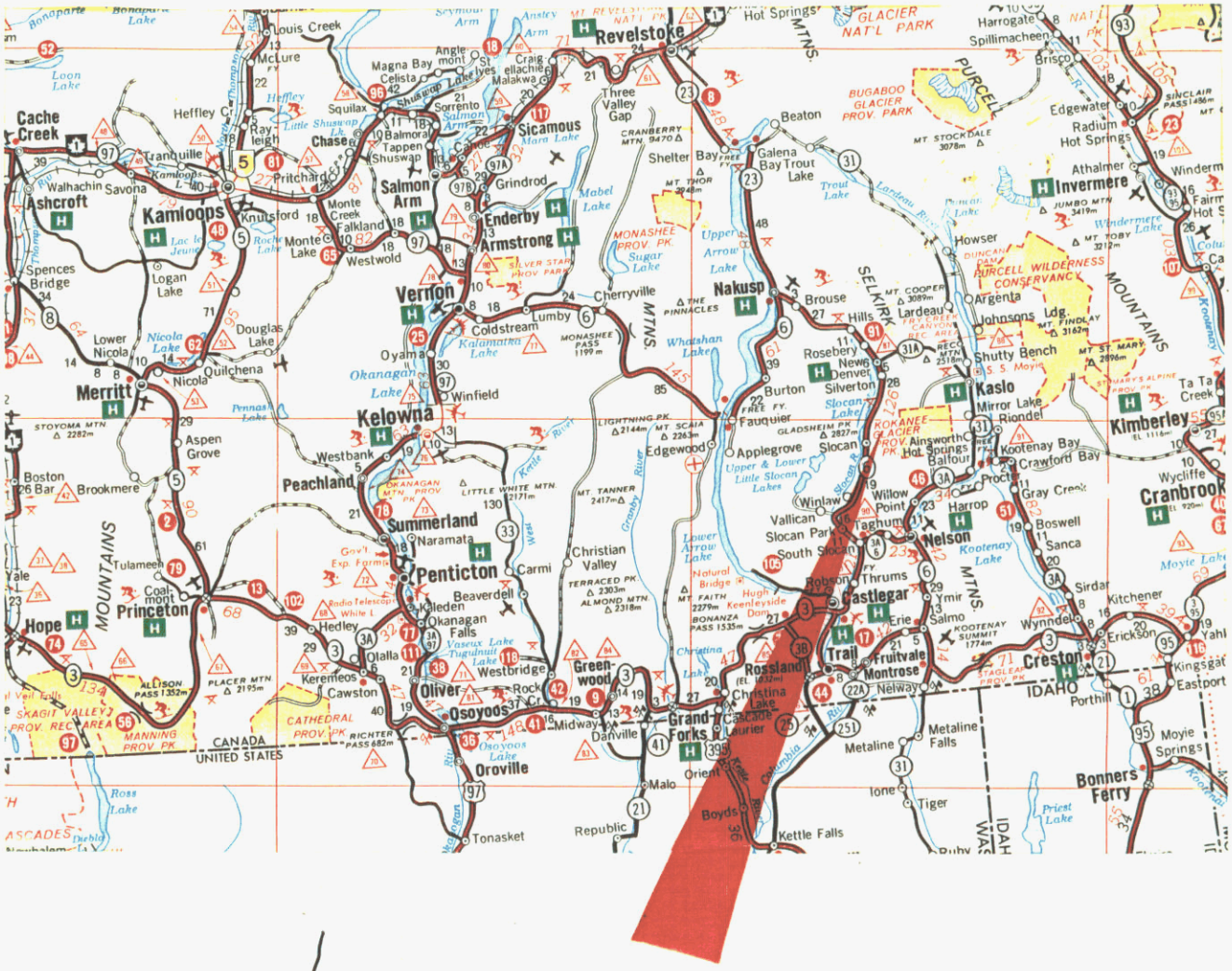
GEOPHYSICAL REPORT
On A
INDUCED POLARIZATION SURVEY
On The
Republic Property
For
TANSEM RESOURCES LTD.

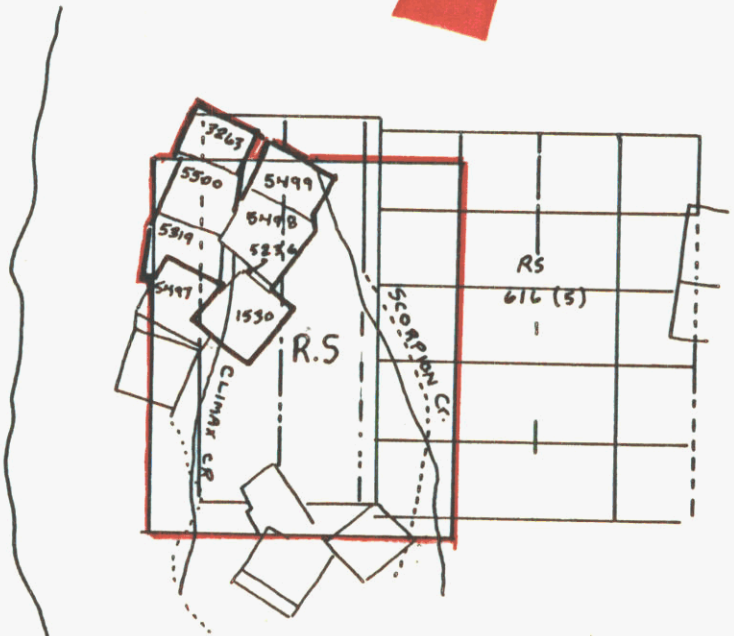
Lat. 49° 48' N Long. 117° 27' W

AUTHORS: E. Trent Pezzot, B.Sc., Geophysicist
Glen E. White, B.Sc., P. Eng.,
Consulting Geophysicist

DATE OF WORK: August 24, 1979 - August 31, 1979

DATE OF REPORT: September 21, 1979





TANDEM RESOURSES LTD.
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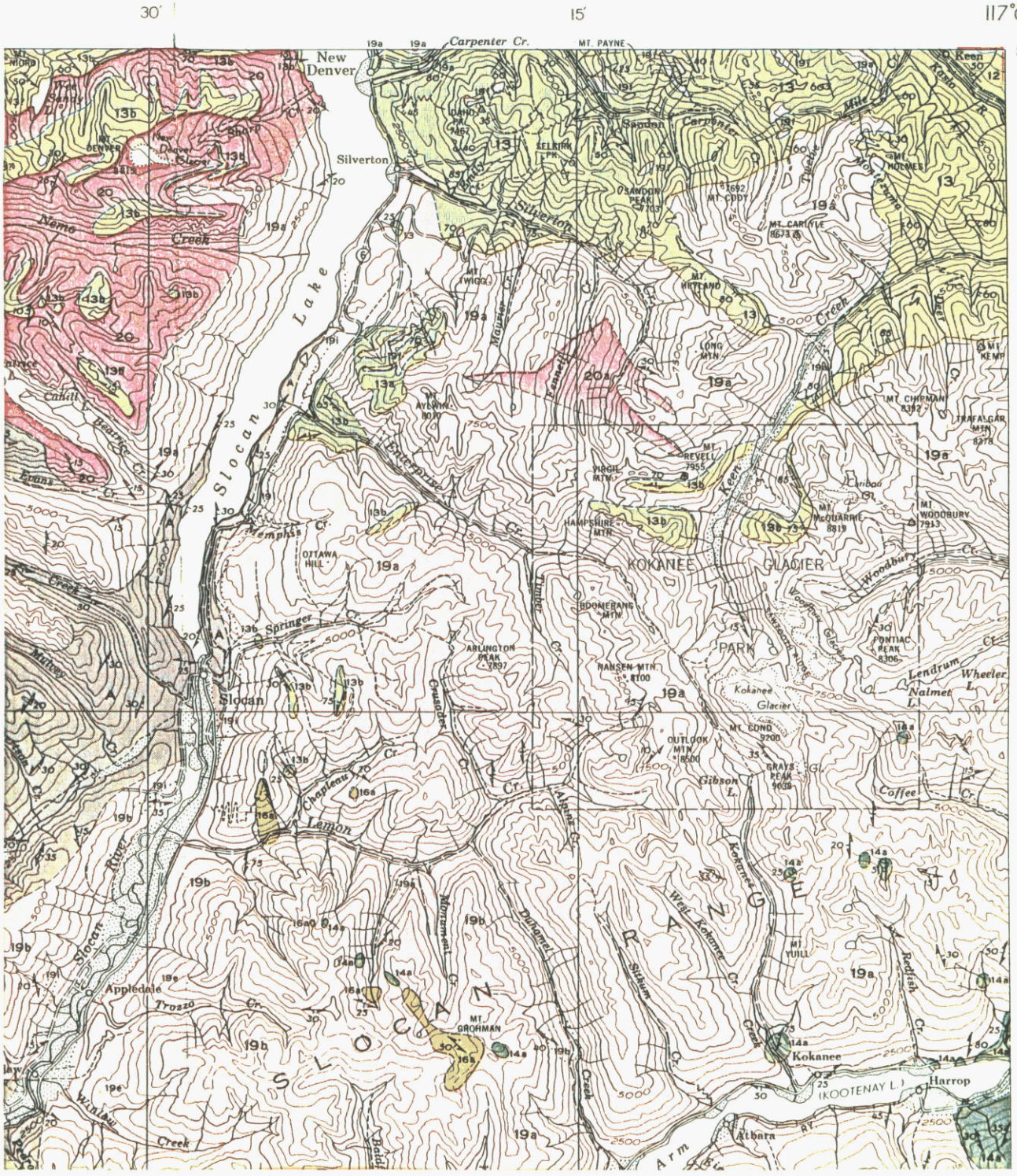
LOCATION AND CLAIMS MAP

Geo. E. Wist
geophysical consulting
3 months ltd.

FIG. 1.



GEOLOGY

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geophysical consulting
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Plate 1.

CONTENTS

INTRODUCTION

From August 24 to August 31, 1979, Glen E. White Geophysical Consulting & Services Ltd. conducted an induced polarization survey over 5,900 line meters of pre-cut grid on the Republic Property of Tandem Resources Ltd. The purpose of the survey was to evaluate areas geologically favourable as sites of disseminated porphyry zones or lenticular mineralized structures.

PROPERTY

The property of Tandem Resources Ltd. known as the Republic Property, consists of six crown grants and one 20 unit claim in the Slocan Mining Division of British Columbia. The property description is as follows:

Claim Name	No. of Units
RS	20
Crown Grant	
L 1530	Erin
L 5236	Erin Fraction
L 5319	Sunlight Fraction
L 5498	Republic No. 2
L 5499	American Eagle
L 5500	Bell No. 2

LOCATION AND ACCESS

The property is located at the headwaters of Scorpion Creek, approximately 3 km northeast of the town of Slocan, B. C. Latitude 49°48'N, Longitude 117°27'W.

Access to the property from Slocan, B. C. is via dirt roads easterly up Springer Creek then north by either Climax Creek or Scorpion Creek.

GENERAL GEOLOGY

The Republic Property is underlain by rocks of the Nelson Batholith of Lower Cretaceous age. The property itself was mapped and reported on by J. R. Tough and Associates in 1972 and by D. W. Tully, P. Eng. in 1973 and 1976. The report by D. W. Tully indicates eight litholigic units are exposed on the surface and mapped from yougest to oldest as: quartz veins, lamprophyre dykes, syenite porphyry, quartz porphyry, quartz-feldspar porphyry, granite, quartz diorite and pyroxene-amphibole biotite phase. The rock units, with the exception of some quartz veins, trend northerly. A north-northwesterly striking shear zone called the Republic Fault, traverses across the property and a second zone of fracturing through the valley of Scorpion Creek is inferred.

MINERALIZATION

Mineralization in the area includes copper, lead, zinc, gold and silver disseminated through the quartz veins, mainly related to the local shear zones. Past production records state 13,299 ounces silver, 107 ounces gold, 268 pounds lead and 171 pounds of zinc were mined from the property from 1902 to 1952 inclusive.

SURVEY SPECIFICATIONS

Survey Grid

The survey grid was established previous to the induced polarization survey by another contractor. The lines are orientated in a north-south direction and numbered at 50 m intervals and are tied together by three east-west crosslines.

Induced Polarization Survey

The equipment used on this survey was the Huntec pulse-type unit and Mark 111 receiver. Power was obtained from a Briggs and Stratton motor coupled to a 2.5 KW 400 cycle, three phase generator, providing a maximum of 2.5 KW D.C. to the ground. The cycling rate is 1.5 seconds "current on" and 0.5 seconds "current off", the pulse reversing continuously in polarity. Power was transmitted to the ground through two potential electrodes, P_1 and P_2.

The data recorded in the field consists of careful measurements of the current (I) in amperes flowing through electrodes C_1 and C_2, the primary voltage (V_p) appearing between electrodes P_1 and P_2 during the "current on" part of the cycle, and the secondary voltage (V_s) appearing between electrodes P_1 and P_2 during the "current off" part of the cycle. A cycle time of 4 seconds was used with a duty ratio of 2.2 to 1, T_p 20 ms and T_d 60 ms.

The apparent chargeability (M') in milliseconds, is calculated by $T_p (M_1 + 2M_2 + 4M_3 + 8M_4) = M'$, where T_p is the basic integrating time in tenths of seconds. M_1, M_2, M_3 and M_4 are the chargeability effects at various times on the voltage, decay curve following switch off of the transmitter, measured as a percentage of the primary voltage, V_p, recorded during the "current on" time. By the use of these factors, one can gain an estimate of the decay curve in terms of chargeability for the given time T_p. This gives a quantitative value to the data measured.

The apparent resistivity, in ohm-meters, is proportional to the ratio of the primary voltage to the measured current, the proportionality factor depending on the geometry of the electrode array used. The chargeability and resistivity obtained are called "apparent" as they are values which that portion of the earth sampled by the array would have if it

were homogeneous. As the earth sample is usually inhomogeneous, the calculated apparent chargeability and apparent resistivity are functions of the actual chargeabilities and resistivities of the rocks sampled and of the geometry of the rocks.

DISCUSSION OF RESULTS

In August, 1979, 5900 meters of grid were surveyed with the induced polarization method, pole-dipole array. A spacings of 50 and 100 meters and n values of 1 and 2 were required for the survey.

The resulting resistivity and chargeability profiles of the eight lines surveyed are displayed in Figures 2 through to 10 inclusive. When analyzed on an individual line basis, resistivity lows are evident at the following grid co-ordinates: 250S and 350W, 010S and 350W, 360W and 375S, 75W and 550S, 00W and 00N, 150E and 275N, 150E and 25N, 150E and 150S. Chargeability highs are present at: 75W and 75S, 150W and 50N, 150E and 225N, 75W and 550S, 360W and 500S.

To evaluate these responses, four plan maps were drawn to relate the observed anomalies into trends. Figures 11 and 12 display resistivity and chargeability values at approximately 50 meters depth. Two overall trends are observed on each map; a northeasterly high chargeability and low resistivity trend extending from 150E and 250N to 75W and 400S and a north-northwesterly lineament near 360W. Co-incident resistivity lows and chargeability highs occur at 150E and 225N, 00W and 25N, 360W and 450S.

Figures 13 and 14 display the I.P. responses at approximately 100 meters depth. The north-northwesterly trend near line 360W is still evident on these displays.

Co-incident resistivity lows and chargeability highs occur at 75W and 550S, 00W and 25N. The authors were unable to acquire an accurate map relating the grid surveyed to the claim boundaries or any distinct land marks. Therefore the accuracy in relating the induced polarization responses to the known geology from previous surveys and mining activity cannot be exact. The north-northwesterly trend near line 360W is most likely a reflection of the Republic Fault shear zone. As this zone is known to be related to some of the observed mineralization, the favourable resistivity and chargeability values at the south end of line 360W potentially reflect a mineralized area. The north-northeasterly trend observed is possibly a reflection of the shear zone which seems to encompass the major portion of the old workings and mineralization. As such it infers both a northern and southern extension to the observed mineralization. In addition, similar induced polarization responses, quite likely connected or related, occur northwest of this area at line 00W, station 25N with the high chargeability zone extending further west from this point to line 75W station 50N. One other area of encouraging induced polarization responses occurs on line 75W at station 550S, No geologic or mining information is available to qualify this geophysical anomaly. However, it could be an extension of the northeasterly striking shear zone.

SUMMARY AND CONCLUSIONS

From August 24 to 31, 1979, an induced polarization survey was conducted over Tandem Resources Ltd. Republic Property in the Slocan Mining Division of British Columbia.

The survey delineated the north-northwesterly striking Republic Fault shear zone and a northeasterly striking shear zone possibly related to the old mining activity. Four areas with sufficient geological and/or geophysical potential to warrant further work were defined. The four areas are at the surveyed grid co-ordinates: 360W and 425S, 00W and 25N, 150W and 50N, 75 W and 550S.

Respectfully submitted,
GLEN E. WHITE GEOPHYSICAL
CONSULTING & SERVICES LTD.

E. Trent Pezzot, B.Sc.
Geophysicist

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
GLEN E. WHITE

Glen E. White, B.Sc., P. Eng.
Consulting Geophysicist

A P P E N D I X

Instrument Specifications

A. Induced Polarization Receiver

(1) Type - Huntec MK III time domain

(2) Sensitivity - $V_p = 10^{-7}$ to 10^{-6} volts 1% resolution

$V_p = 10^{-6}$ to 10 volts 0.1% resolution

(3) Range - 30×10^{-6} to 10 volts

(4) Self Potential - $\pm$ 1 volt

(5) M Factor - 0.1%

(6) Power - 0.7 ampere at 12 volts
Rechargeable batteries

(7) Size - 16" x 9" x 5 3/4"

B. Induced Polarization Transmitter

(1) Type - Huntec LOPO M-3

(2) Maximum Current - 1.5 D.C.

(3) Maximum Voltage - 1,800 V D.C.

(4) Load Power - $\pm$ 160 watts @ 75% efficiency

(5) Load Current - Continuously adjustable

(6) Cycle time - 2, 4, 8 or 16 seconds

COST BREAKDOWN

Personnel	Dates	Wages	Total
T. Selbirk	Aug. 24-31/79	$120/day	$960.00
S. Amendolagine	"	"	95/day	760.00
G. Cuscito	"	"	90/day	720.00
M. Amendolagine	"	"	85/day	680.00
G. Gurat	"	"	85/day	680.00
Meals and accomodations @ $35/day/man				1400.00
Vehicle including insurance and gas @ $55/day				440.00
Instrument lease @ $90/day				720.00
Drafting and interpretation and reports				850.00
Total				$7210.00

STATEMENT OF QUALIFICATIONS

Name:	PEZZOT, E. Trent
Profession:	Geophysicist - Geologist
Education:	University of British Columbia - B.Sc. - Honors Geophysics and Geology
Professional Associations:	Society of Exploration Geophysicists
Experience:	Three years undergraduate work in geology - Geological Survey of Canada, consultants.
	Three years Petroleum Geophysicist, Senior Grade, Amoco Canada Petroleum Co. Ltd.
	Two years consulting geophysicist, Consulting geologist - B. C., Alberta, Saskatchewan, N.W.T., Yukon, western U. S. A.

STATEMENT OF QUALIFICATIONS

NAME: WHITE, Glen E., P. Eng.

PROFESSION: Geophysicist

EDUCATION: B.Sc. Geophysics - Geology
University of British Columbia

PROFESSIONAL ASSOCIATIONS: Registered Professional Engineer,
Province of British Columbia

Associate member of Society of Exploration Geophysicists.

Past President of B. C. Society of Mining Geophysicists.

EXPERIENCE: Pre-Graduate experience in Geology - Geochemistry - Geophysics with Anaconda American Brass.

Two years Mining Geophysicist with Sulmac Exploration Ltd. and Airborne Geophysics with Spartan Air Services Ltd.

One year Mining Geophysicist and Technical Sales Manager in the Pacific north-west for W. P. McGill and Associates.

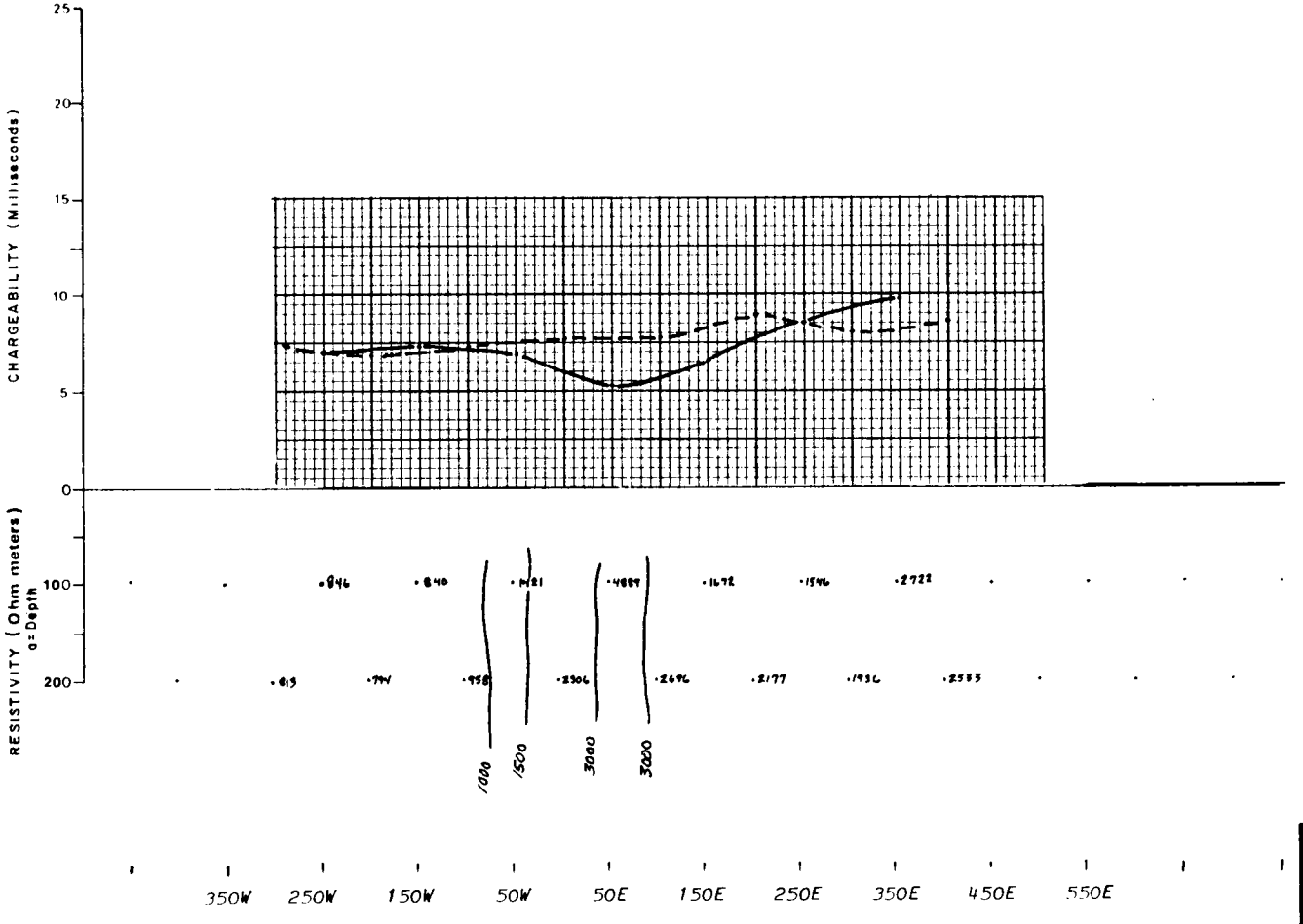
Two years Mining Geophysicist and supervisor Airborne and Ground Geophysical Divisions with Geo-X Surveys Ltd.

Two years Chief Geophysicist Tri-Con Exploration Surveys Ltd.

Eight years Consulting Geophysicist.

Active experience in all Geologic provinces of Canada.

LINE 500 S



INSTRUMENT HUNTEC 2.5 KW TIME DOMAIN

● = 100m

C2 ← I V

C1 Pole P2 Dipole P1

Metres

To Accompany Geophysical Report on

Date

By GLEN E WHITE B Sc. GEOPHYSICIST

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INDUCED POLARIZATION PROFILES

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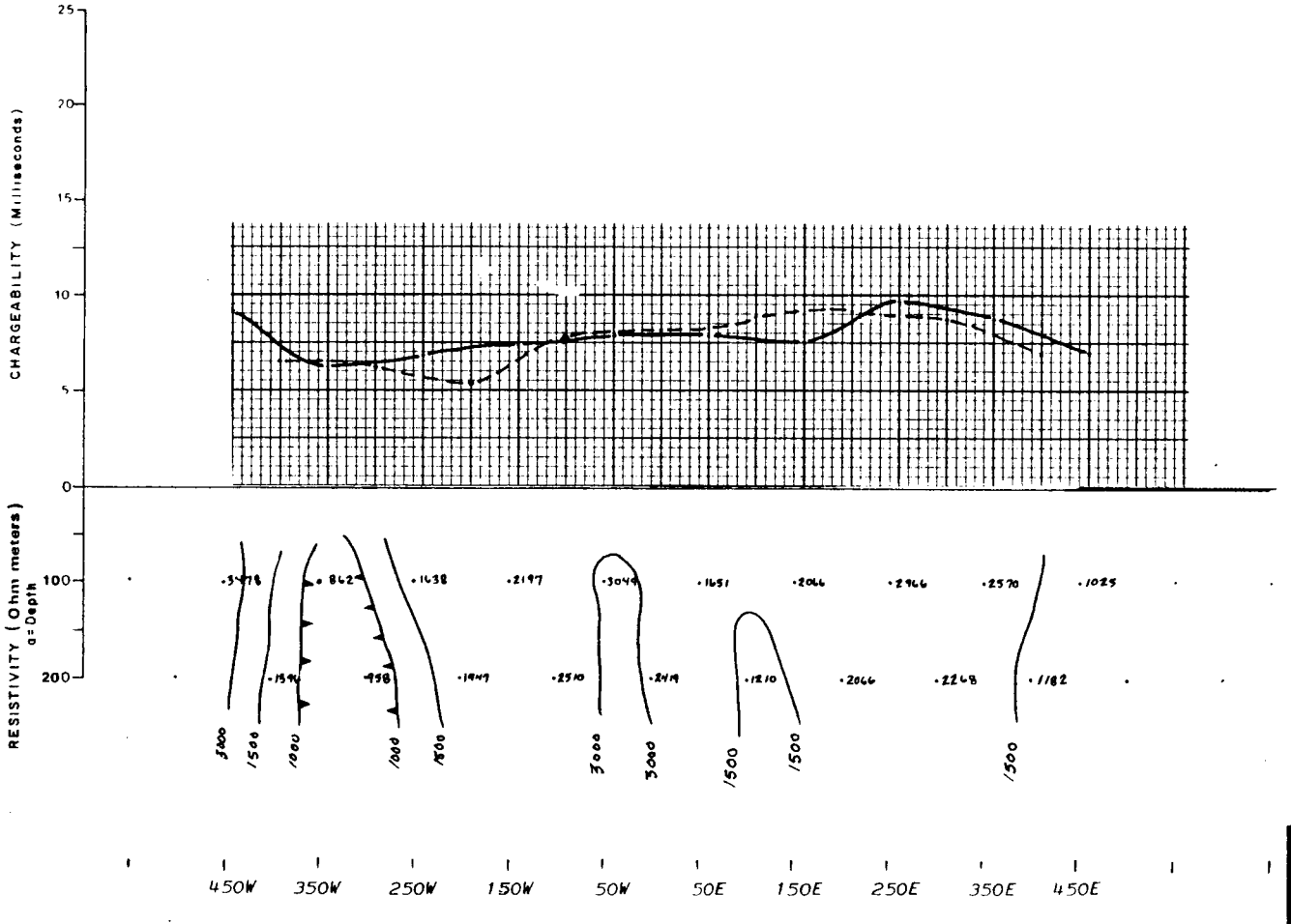
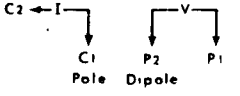
DATE :	
FIG No :	2

LINE 250 S



INSTRUMENT HUNTEC 2.5 KW TIME DOMAIN

a = 100m



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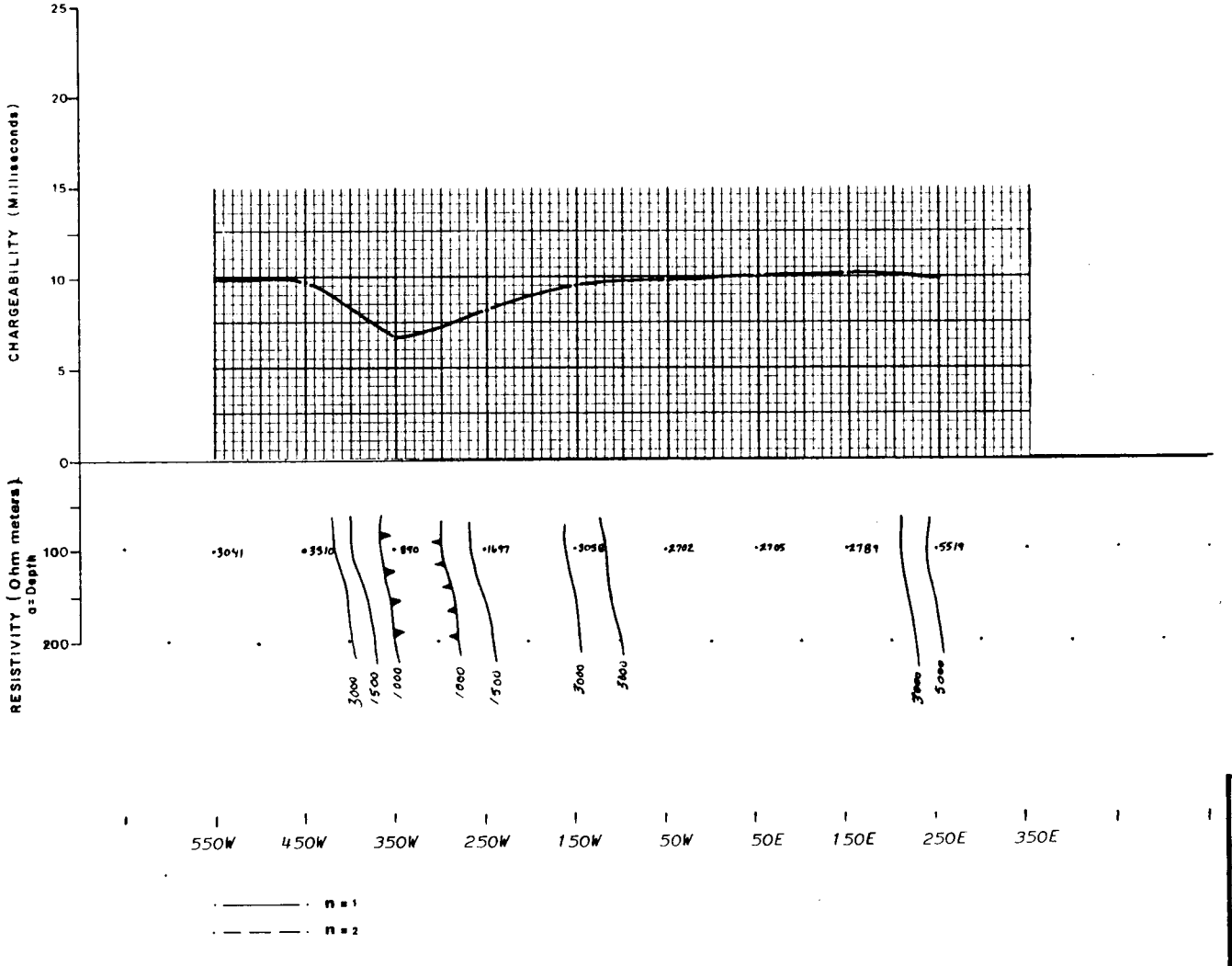
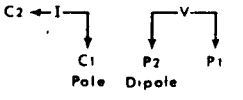
LINE 010 S



INSTRUMENT HUNTEC 2.5 KW TIME DOMAIN

a = 100m



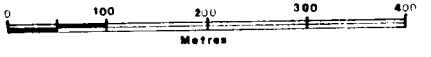


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FIG No:	4

LINE 360 W

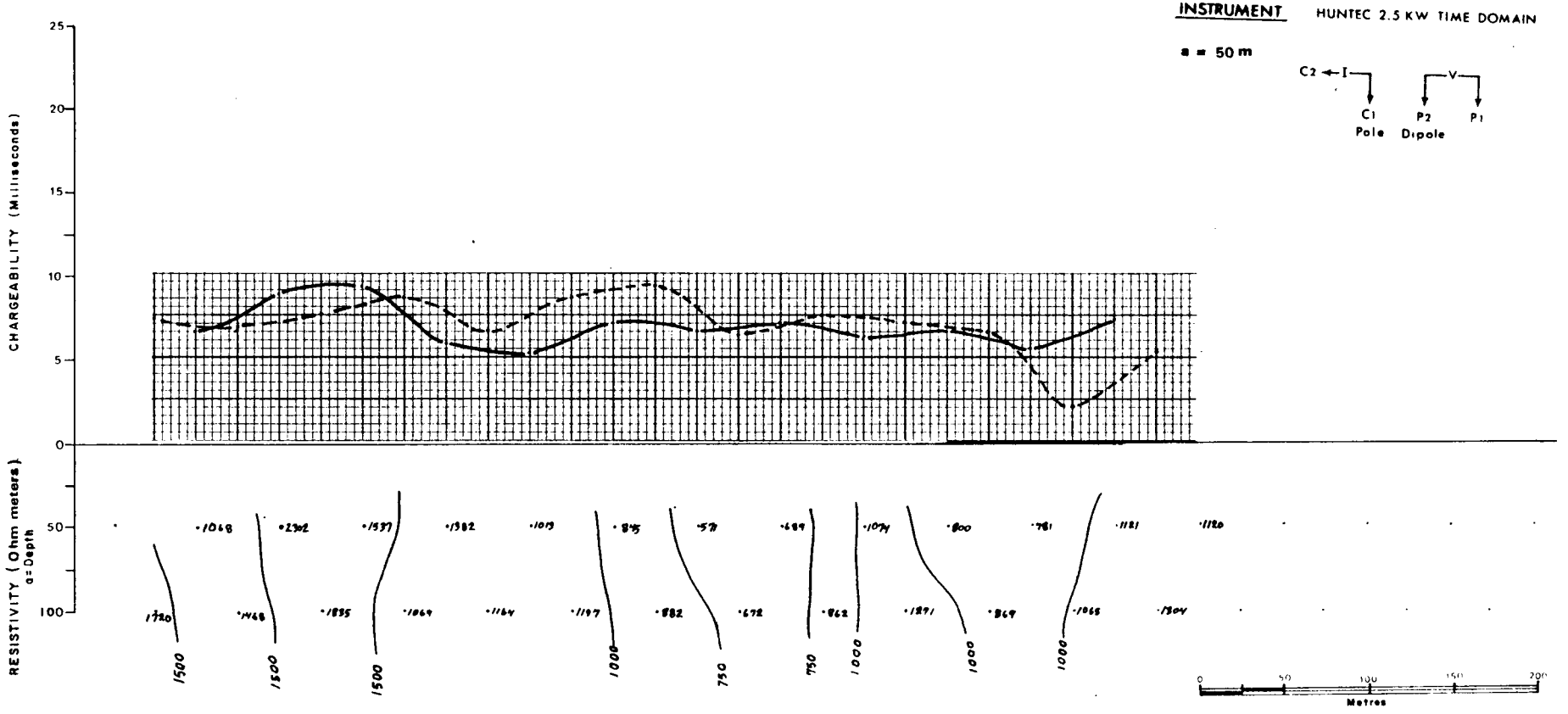

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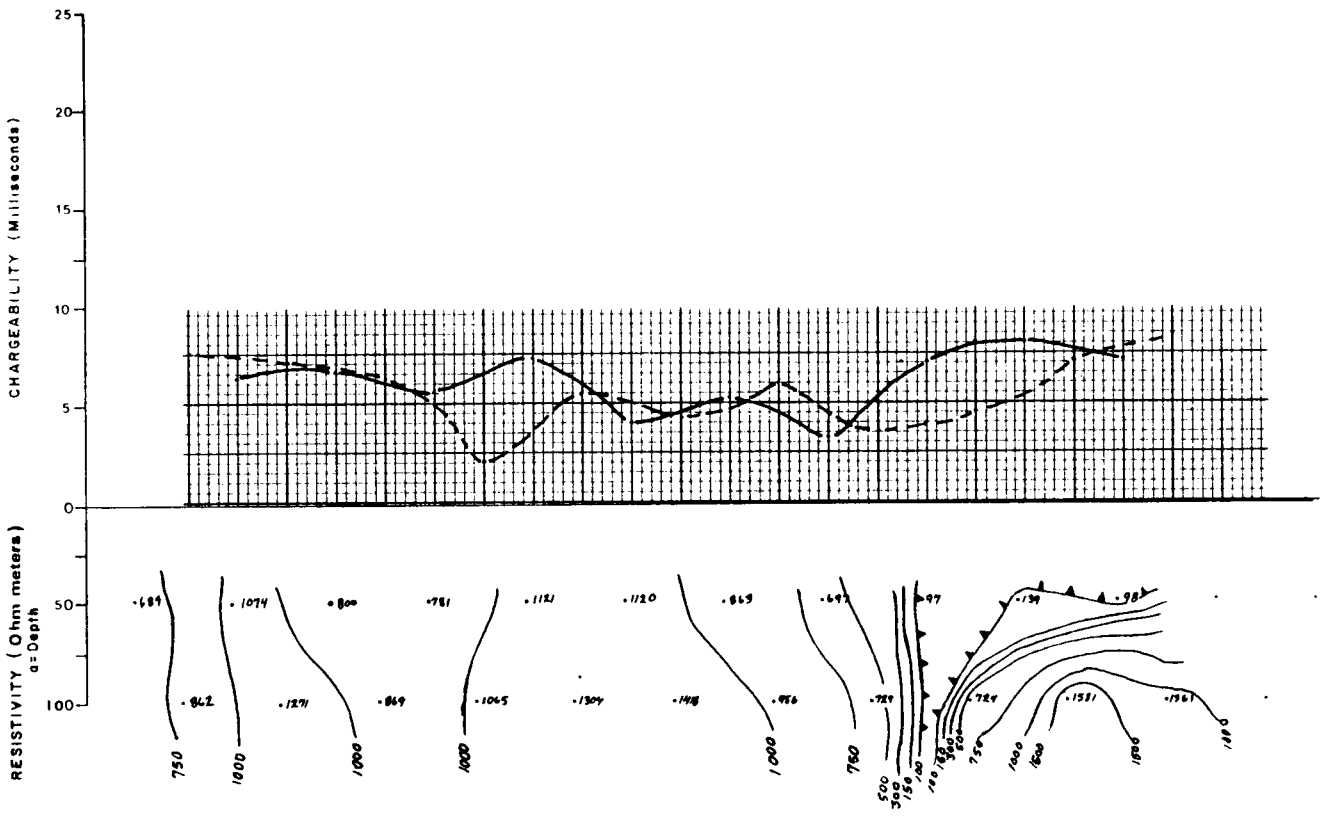
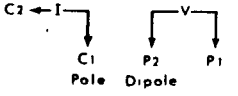
FIG No :	5

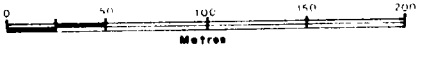
LINE 360 W



INSTRUMENT HUNTEC 2.5 KW TIME DOMAIN

a = 50 m





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DATE:	
FIG No:	6

LINE 150 W

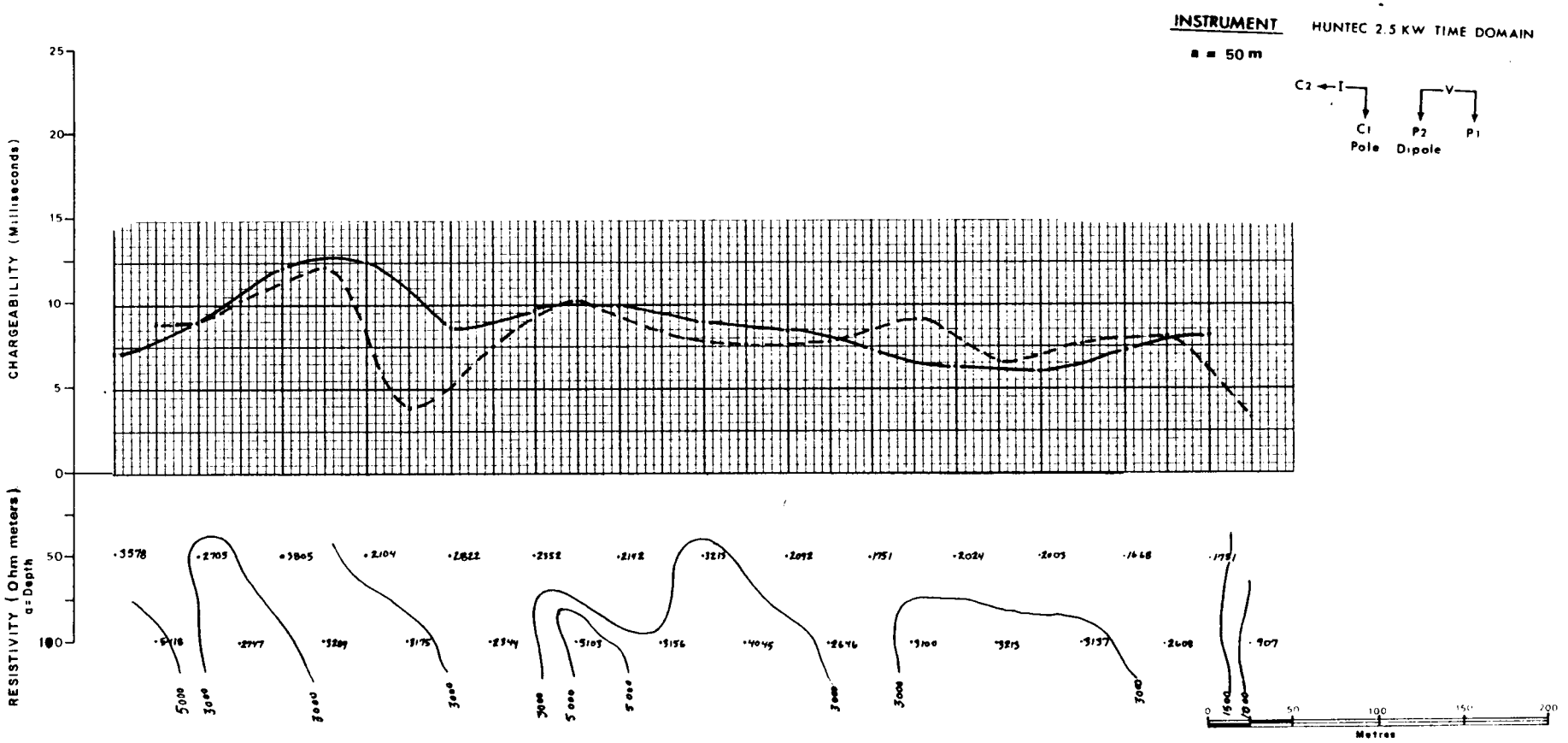

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FIG No:	7

LINE 75W

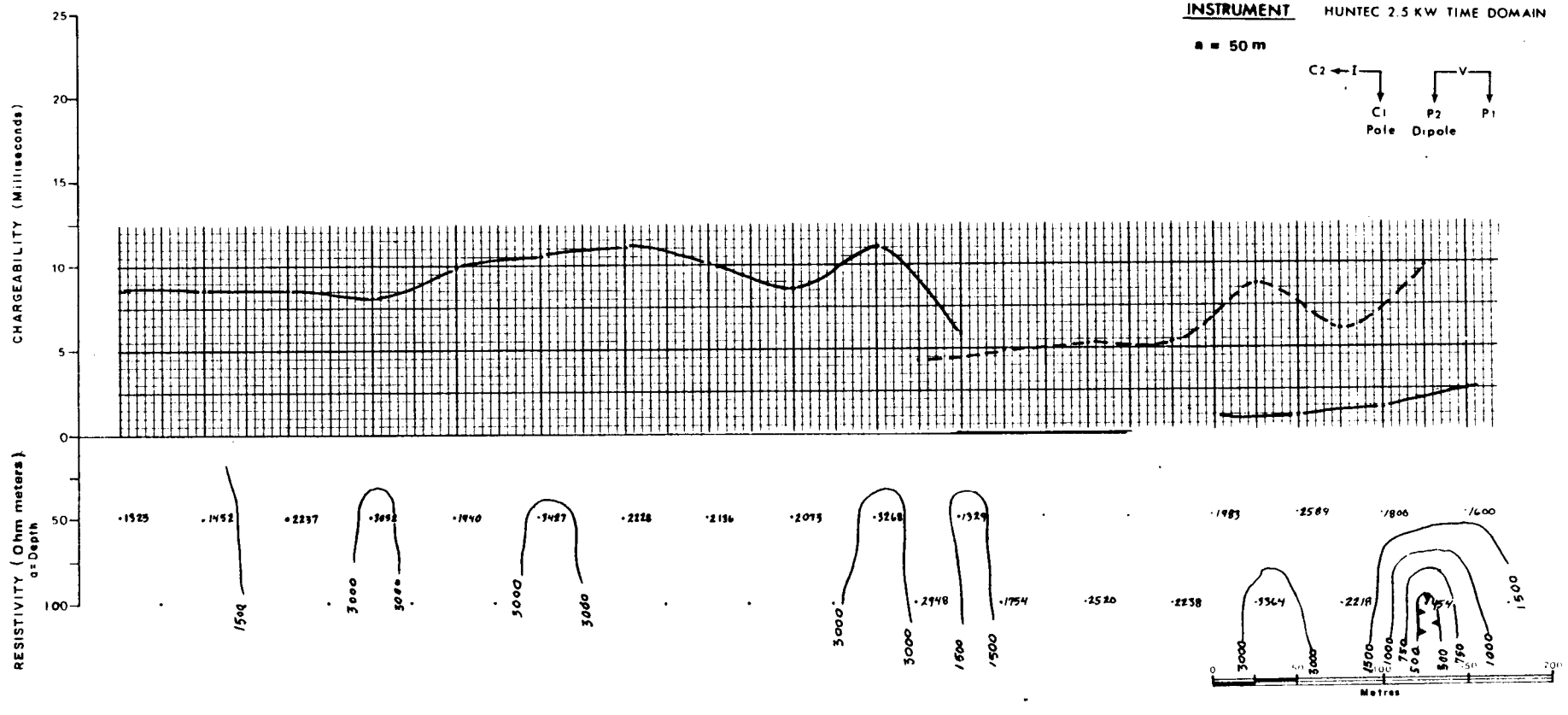

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FIG No.:	8

LINE 00

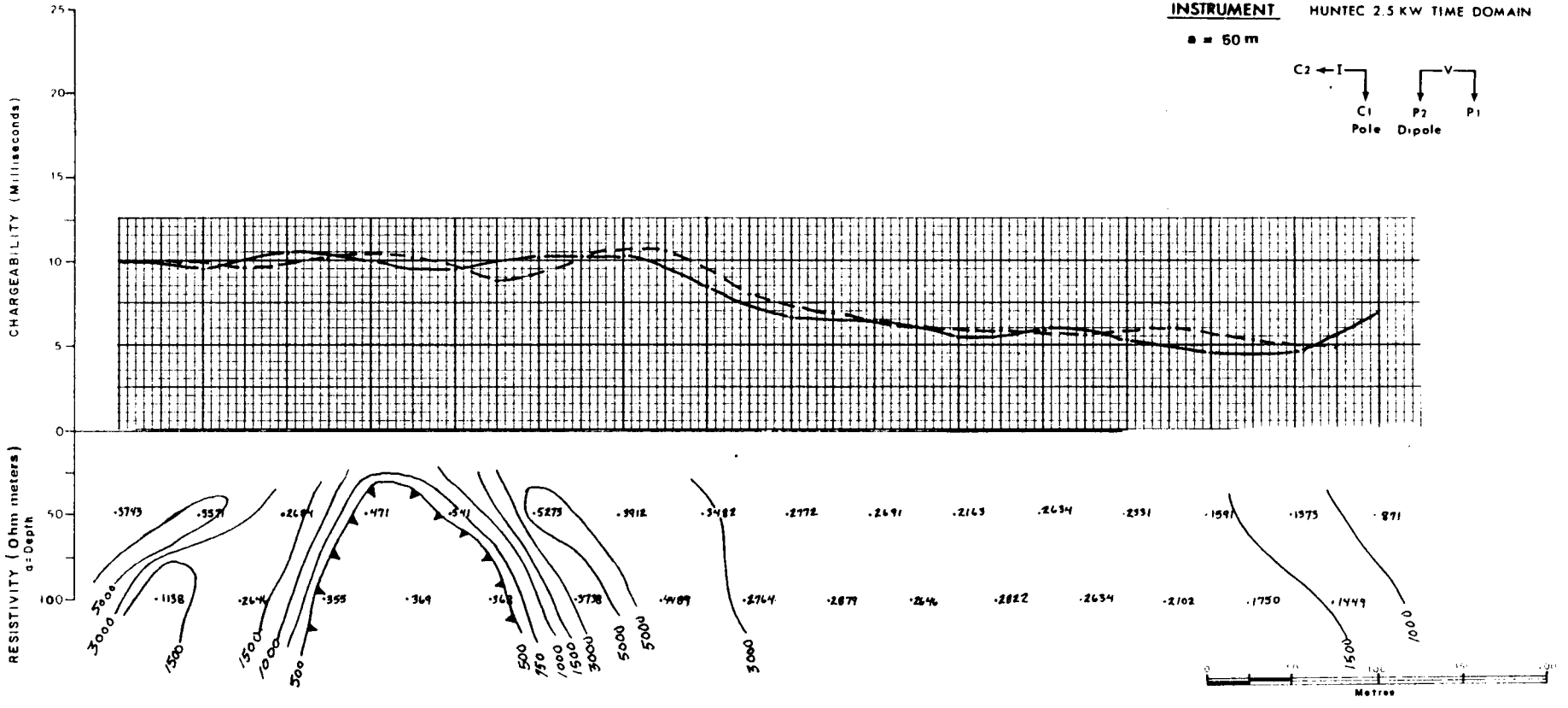

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FIG No: 9

LINE 150 E

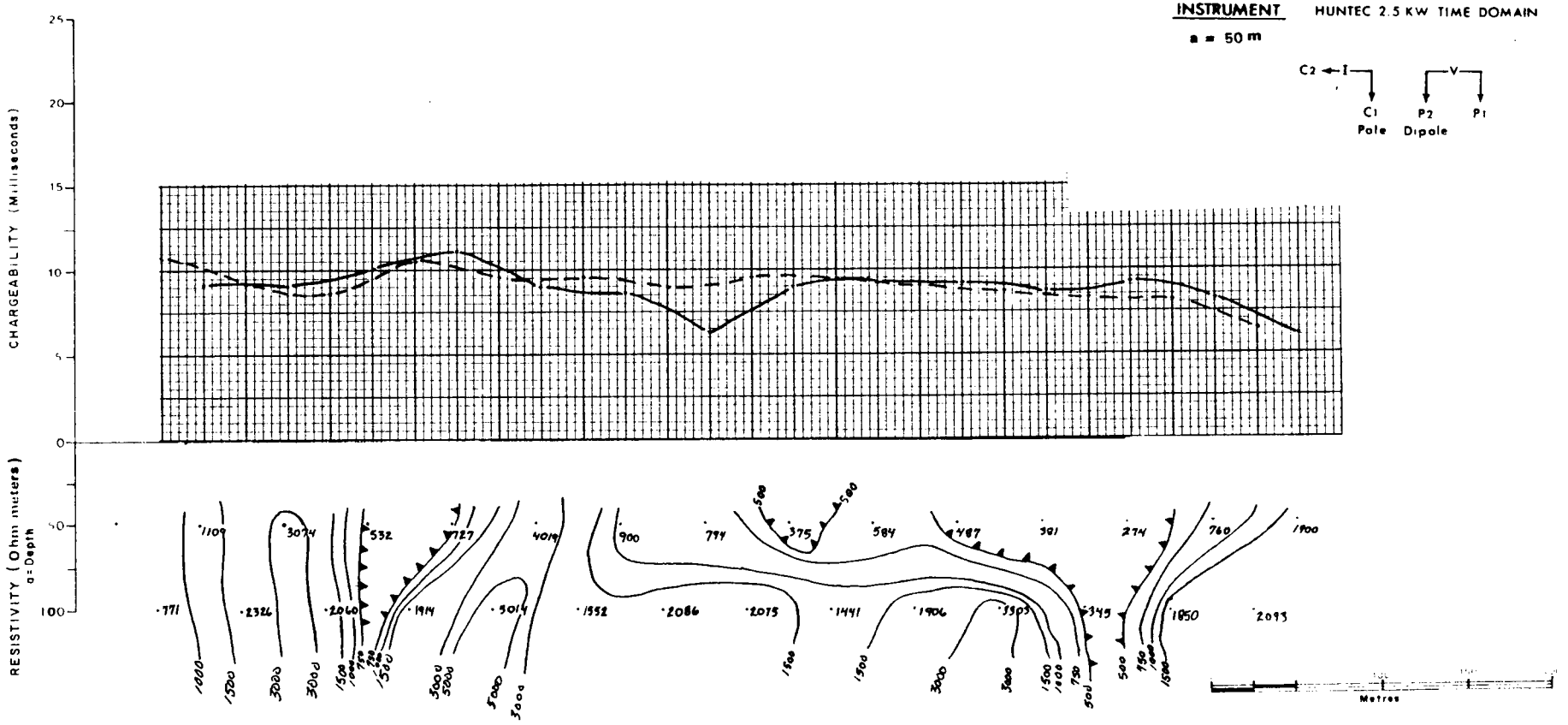

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FIG No: 10

117°27'

49°48'

6+00 W
5+00 W
4+00 W
3+00 W
2+00 W
1+00 W
0+00 BASE LINE
1+00 E
2+00 E
3+00 E
4+00 E
5+00 E

4+00N
3+00N
2+00N
1+00N
0+00
1+00S
2+00S
3+00S
4+00S
5+00S

BELL 2 L5500
AMERICAN EAGLE L5499
REPUBLIC L5498
SUNLIGHT FR. L5319
V.E. FR. L5501
ERIN FR. L5236
ERIN L1530
ROSS 7 FR.
Road
Fault

22°00'
MAGNETIC NORTH

LEGEND

CONTOUR INTERVAL : 100,150,300,500,750,1000,1500,3000,5000 Ohm Meters

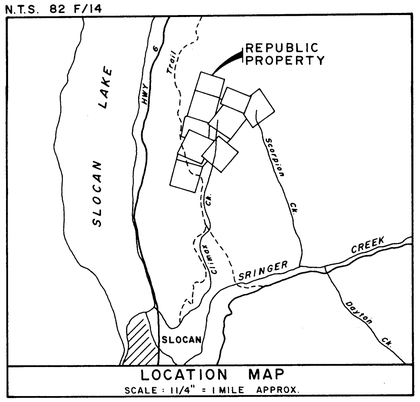
INSTRUMENT HUNTEC 2.5 KW TIME DOMAIN
(a = 50m n = 1)

C2 ← I V
C1 Pole P2 Dipole P1

RESISTIVITY KEY

5000 Ohm Meters
3000 " "
1500 " "
750 " "
500 " "

N.T.S. 82 F/14



LOCATION MAP
SCALE : 11/4" = 1 MILE APPROX.

50 25 0 50 100 150
Meters

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— REPUBLIC PROPERTY —

SLOCAN MINING DIVISION — BRITISH COLUMBIA

GEOPHYSICAL MAP
INDUCED POLARIZATION
APPARENT RESISTIVITY (Ohm Meters)

Glen E. White geophysical consulting & services ltd.

INTERPRETED BY : G.E.W.	
DRAWN BY : T.M.	
CHECKED BY :	
DATE : SEPT. 1979	
FIG. No. :	11

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By GLEN E WHITE ____ GEOPHYSICIST

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— REPUBLIC PROPERTY —

SLOCAN MINING DIVISION — BRITISH COLUMBIA

GEOPHYSICAL MAP
INDUCED POLARIZATION
PERCENT CHARGEABILITY (Milliseconds)

Glen E. White geophysical consulting & services ltd.

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DATE :	SEPT. 1979
FIG. No. :	14

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By GLEN E WHITE .... GEOPHYSICIST

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Date 0ct 15/79
By GLEN E WHITE ...... GEOPHYSICIST

TANDEM RESOURCES LTD.

—REPUBLIC PROPERTY—

SLOCAN MINING DIVISION — BRITISH COLUMBIA

GEOPHYSICAL MAP
INDUCED POLARIZATION
PERCENT CHARGEABILITY (Milliseconds)

Glen E. White geophysical consulting & services ltd.

INTERPRETED BY :	G.E.W.
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CHECKED BY :	
DATE :	SEPT. 1979
FIG. No. :	12

117°27'

49°48'

6+00 W
5+00 W
4+00 W
3+00 W
2+00 W
1+00 W
0+00 BASE LINE
1+00 E
2+00 E
3+00 E
4+00 E
5+00 E

4+00N
3+00N
2+00N
1+00N
0+00
1+00S
2+00S
3+00S
4+00S
5+00S

BELL 2 L5500
AMERICAN EAGLE L5499
REPUBLIC 2
L5498
V.E. FR. L5501
SUNLIGHT FR. L5319
ERIN FR. L5236
ERIN L1530
ROSS 7 FR.
Road
Fault

22°00'
MAGNETIC NORTH

LEGEND

CONTOUR INTERVAL : 500, 750, 1000, 1500, 3000, 5000 Ohm Meters

MINERAL RESOURCES BRANCH
Assessment Report
7831
NO.

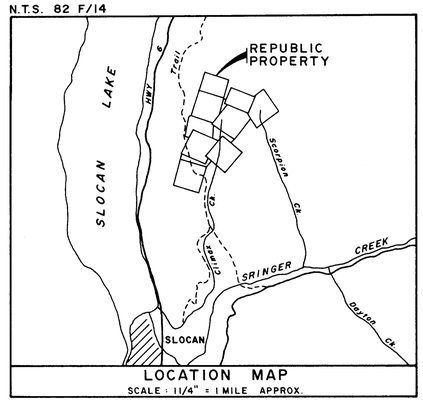
INSTRUMENT HUNTEC 2.5 KW TIME DOMAIN
(a = 100m n = 1 E-W Lines)
(a = 50m n = 2 N-S Lines)

C2 ← I → C1 Pole — V → P2 Dipole — P1

RESISTIVITY KEY

5000	Ohm Meters
3000	" "
1500	" "
750	" "
500	" "

N.T.S. 82 F/14



LOCATION MAP
SCALE : 1 1/4" = 1 MILE APPROX.

50 25 0 50 100 150
Meters

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SLOCAN MINING DIVISION — BRITISH COLUMBIA

GEOPHYSICAL MAP
INDUCED POLARIZATION
APPARENT RESISTIVITY (Ohm Meters)

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