

5946

1976 GEOPHYSICAL REPORT ON

THE RED GROUP

940/3E,6E

GARRY M. DEPAOLI
GEOPHYSICIST, B.Sc.

June 2, 1976

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 5946 X MAP PART 1 of 2

1976 GEOPHYSICAL REPORT ON
THE RED GROUP

BY: GARRY M. DEPAOLI
GEOPHYSICIST, B.Sc.

DATE: JUNE 2, 1976.

1976 GEOPHYSICAL REPORT ON
THE RED GROUP

located in

NORTHERN BRITISH COLUMBIA

in the

OMENICA MINING DIVISION

approximately

100 MILES NORTH-NORTHEAST OF SMITHERS
AT COORDINATES $56^{\circ}15'$ N. LAT.; $127^{\circ}12'$ W. LONG.

owned by

CANADIAN SUPERIOR EXPLORATION LIMITED

work by

MORRISON & DEPAOLI
GEOPHYSICAL SURVEYING & CONSULTING

work period

MAY 21 to MAY 31, 1976

ILLUSTRATIONS

LOCATION MAP	}	→	FIGURE 1	AFTER PAGE 1
CLAIM MAP			FIGURE 2	IN POCKET
IP PSEUDOSECTION PROFILES			FIGURES 3a- 3 3e	AFTER PAGE 10
PLAN RESISTIVITY N=2			FIGURE 4 #1	IN POCKET
PLAN PFE N=2			FIGURE 5 #2	IN POCKET
GEOPHYSICAL INTERPRETATION			FIGURE 6 #3	IN POCKET

TABLE OF CONTENTS

	PAGE
INTRODUCTION	1
LOCATION AND ACCESS	1
GRID CONTROL	2
GENERAL GEOLOGY	2
INDUCED POLARIZATION SURVEY	2
INTRODUCTION AND THEORY	2
INSTRUMENT AND PROCEDURE	3
PRESENTATION OF DATA	4
RESULTS AND INTERPRETATION	5
CONCLUSIONS AND RECOMMENDATIONS	6
CERTIFICATION	8
GARRY M. DEPAOLI	8
DENNIS F. MORRISON	9
ASSESSMENT DETAILS	10
WORK SUMMARY	10
PERSONNEL	10
COST STATEMENT	
LIST OF CLAIMS	

INTRODUCTION

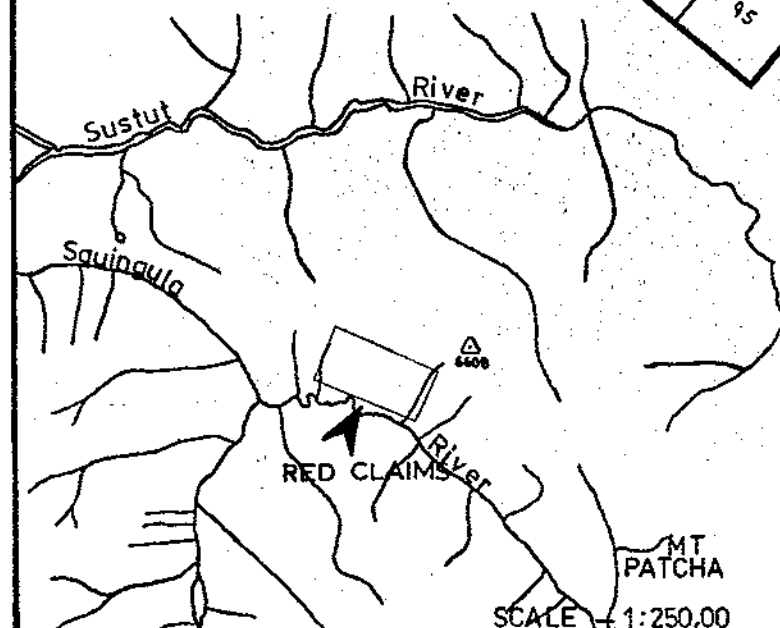
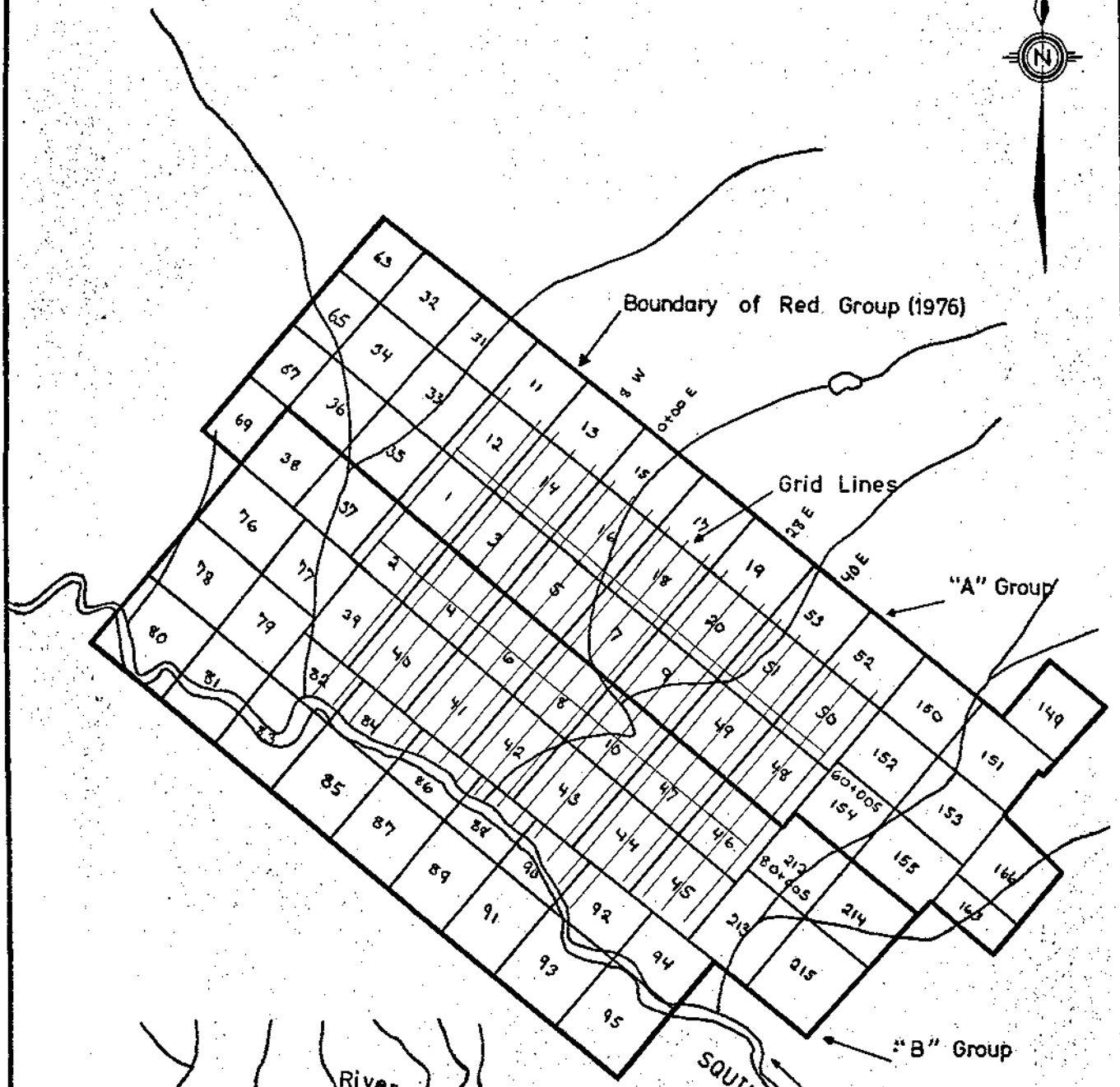
The Red Group Mineral Prospect is located in Northern British Columbia and consists of 89 mineral claims owned by Canadian Superior Exploration Limited. The economic viability of copper sulphide mineralization occurring in a limestone host rock is currently under investigation.

During the spring of 1975 a total of 12 line miles of induced polarization / resistivity surveying were completed over the Red Group. The work was executed by Morrison & DePaoli Geophysical Surveying & Consulting and the results of that survey are documented in a "1975 Geophysical Report On The Red Group", dated June 1975 by G.M. DePaoli.

During the period May 23 to May 30, 1976 a total of 6.6 line miles of IP coverage was added to the existing 1975 data. The work was again executed by Morrison & DePaoli using the same induced polarization equipment and electrode configuration. The following report describes the instrumentation, field procedure and the results obtained from the new data in context with the 1975 work.

LOCATION AND ACCESS

The property is located in Northern B.C. approximately 100 miles north-northeast of Smithers or 10 miles east of the Bear Lake Airstrip. It lies within the Omenica Mining Division at coordinates $56^{\circ}15'$ N. Latitude, $127^{\circ}12'$ W. Longitude. (See Location Map Figure 1). Access to the property is by air or B.C. Railway to Bear Lake and then by helicopter to the grid area.



* 5946

CANADIAN SUPERIOR EXPLORATION LIMITED
SMITHERS REGIONAL OFFICE

RED GROUP

NTS. 94 D/3

DRAUGHTSMAN: JB SCALE: 1" = 1/2 mi. DATE: MAY 1976

SCALE - 1:250.00

GRID CONTROL

The control grid consists of 6.5 line miles of cut, chained, and flagged lines which were added to the existing grid. Southern extensions were made on Lines 20E to 40E and new Lines 44E, 48E, 52E, 56E and 60E were added. Lines were emplaced by compass.

GENERAL GEOLOGY

The property lies within a sequence of Lower Jurassic Volcanics. Interest is focussed on a limestone basin within a volcanoclastic sequence. Chalcopyrite, chalcocite, minor bornite and minor pyrite mineralization occurs as disseminations within the limestone unit. It is thought that the mineralization is associated with Jurassic volcanism.

The prospect was discovered by a reconnaissance program undertaken by Canadian Superior Exploration Limited in the early 1970's. During 1972 Canadian Superior Exploration Limited completed a first stage diamond drill program on immediate target areas. A second phase of drilling by the same company is planned during 1976.

INDUCED POLARIZATION SURVEY

INTRODUCTION AND THEORY

Limited and poor outcrop exposure and possible masking of the limestone unit by thin sequences of volcanics or pyroclastics prompted the undertaking of an induced polarization / resistivity survey. Because of the nature of the mineralization only a very subtle, if any, induced polarization response was anticipated from the limestone host rock. However, a sharp high resistivity contrast was expected.

The term induced polarization means the electrical separation (ie. separation of charges) induced by an applied electric field. The cause of this polarization is changes in the mobilities of ions within a rock. At the interfaces between zones of different mobilities, excesses or deficiencies of ions occur; the concentration gradients developed oppose the current flow and cause a polarizing effect. When mineral grains block the pore passages of rocks and a current is applied, a concentration of ions builds up at the electrolyte (water) - metal interface while awaiting an electro-chemical reaction which must occur before the electric charge can be transferred from an ion in the electrolyte to a free electron in the metal. The forces which oppose the current flow are said to polarize the interface and the added voltage necessary to drive the current across the barrier is known as overvoltage.

It takes a finite time to build up overvoltage and one finds that the impedances of the zones (Warburg Impedance) decreases with increasing frequency. In the frequency domain system that was employed the decrease in the Warburg Impedance was measured between current applied at 0.3 and 5.0 hertz.

INSTRUMENT AND PROCEDURE

A multiple frequency McPhar induced polarization system, Model p660, was employed in measuring the polarization and resistivity parameters. The transmitter is a manually variable voltage source. The output current can be selected from both polarities and varies from direct current to automatically alternating output frequencies of 0.05, 0.1, 0.3, 1.25 and 5.0 hertz. Power was obtained from a $2\frac{1}{2}$ KW - 400 hertz motor generator. The maximum output current for the transmitter is 5.0 amp., while the maximum output voltage is 690 volts.

The receiver employed was the A.C P660 Model. This is a potentiometer type where the amplified and filtered signal is compared with a reference voltage. It is powered by six 9 volt alkaline transistor batteries and draws 7.5 ma. Total weight including carrying case and batteries is 2.2 kilograms.

A symmetrical in line dipole-dipole array was employed in the survey. The dipole length was 200 feet and measurements were taken to 4 separations (N=1,2,3,4). Survey procedure required the preparation of a "set-up" station near the center of each line. The transmitter and its motor generator power supply remained stationary at the set-up position and wires in increasing 200 foot intervals were strung out in both directions. Care was taken to ensure that the wires were well separated to prevent inductive coupling effects. The ends of the wires were connected to 4 foot stainless steel rods which had been hammered into the ground. Where possible the receiving dipole also utilized the stainless steel rods for electrode connections. Once the receiver dipole moved past the last steel rod ground connections were made via porous pots. Radio contact between the receiver and transmitter operators coordinated power on and off periods.

PRESENTATION OF DATA

The grid was extended on the east side from Line 40 E to Line 60 E and southerly on Lines 20 E to 40 E from 90 S to the Squingula River. In addition one cross line (Cross line 67 S, Figure 3 a) was surveyed perpendicular to the interpreted strike of known mineralization.

The data is plotted in 12 pseudosections, Figures 3a-1 after Page 10. The pseudosections are vertical profile plots displaying apparent resistivities in $\frac{\rho_a}{2\pi}$ ohm feet and percent frequency effect values. Contoured plan maps of the second separation (N=2)

apparent resistivity and percent frequency effect data incorporating the previous 1975 data have also been prepared in Figures 4 and 5 respectively. An interpretation of the data is presented in Figure 6.

RESULTS AND INTERPRETATION

Cross Line 67 S (Figure 3a) traversed near known economic mineralization encountered in a diamond drill hole. It was aligned perpendicular to the strike of the limestone host rock as interpreted from geologic and apparent resistivity data. First and second separation apparent resistivity values ranging from 1500 to 4600 $\rho_{a}/2\pi$ ohm feet near station 68 S are indicative of limestone. These values are interpreted to reflect the main mass of mineralized limestone of having a conservative width of 200 feet, a depth of 300 feet and to a first approximation of being dish - shaped in cross-section. In addition apparent resistivity values greater than 1000 $\rho_{a}/2\pi$ ohm feet extending to the 4th separation on the southern half of the line may reflect more limestone having a southerly dip. Partially coincident PFE values greater than 3% favour the southwestern side of the interpreted limestone. The relative position of the higher PFE values to the "limestone" resistivities is interpreted to reflect higher metallic concentrations on the southwestern side of the limestone.

A high apparent resistivity anomaly in the southeastern edge of the 1975 grid has now been more completely defined by the 1976 IP data. Apparent resistivity values ranging from 1000 to 1600 $\rho_{a}/2\pi$ ohm feet centered at 32 E ; 90+50 S are interpreted to reflect a limestone mass having a conservative width of 400 feet, a length of 800 feet, a depth of 400 feet and to a first approximation being dish shaped in cross-section. This resistivity anomaly has coincident PFE values greater than 3% indicating a weakly polarizable metallic source.

In addition to the above resistivity anomaly the southern limit of Lines 20 E, 24 E, 28 E and 44 E may indicate another limestone unit at depth. The southern end of Lines 20 E and 24 E in particular attract attention because the rapid increase in apparent resistivity values is accompanied by an increase in PFE response on their southwestern side. This is similar to the IP expression obtained near known economic mineralization.

Several other apparent resistivity highs were obtained at depth on Lines 44 E, 48 E, 52 E, and 56 E. Their exact position projected to surface is difficult to interpret. Their approximate position is displayed in Figure 6, however, they are considered to be low priority targets at this stage of exploration.

A PFE anomaly greater than 3% extending northeasterly along the eastern portion of the grid may be explained by very fine grained pyrite within volcanic rocks. Since, for the most part, this anomaly is associated with apparent resistivity values lower than 1000 /2 ohm feet it is not attributed to be reflecting limestone.

CONCLUSIONS AND RECOMMENDATIONS

1. Detailed prospecting should be carried out along the north bank of the Squingula River between Lines 40 E and 48 E to check for possible outcroppings of an interpreted limestone unit.
2. Recommended drill targets listed in the 1975 Geophysical Report are still considered valid.
3. Should economic mineralization be encountered in drilling, further exploration targets can be generated from existing data.

RESPECTFULLY SUBMITTED,

Garry De Paoli

GARRY M. DEPAOLI,
GEOPHYSICIST, B.Sc.

June 2, 1976
Smithers, B.C.

CERTIFICATION

I Garry M. DePaoli of the city of Burnaby, in the Province of British Columbia, HEREBY CERTIFY AS FOLLOWS:

1. That I am a graduate of the University of British Columbia, Vancouver, B.C. with a Bachelor of Science Degree in Combined Honours Geophysics and Geology. (1969)
2. That I have practiced my profession as a Geophysicist continuously for the past 7 years in Northern Ontario, ~~Quebec~~ Quebec, New Brunswick, Manitoba, Western USA, Alaska, Yukon Territories and British Columbia.
3. That I am a member in good standing of the Society of Exploration Geophysicists, The Geological Association of Canada, The Canadian Institute of Mining and Metallurgy, and the B.C. Society of Exploration Geophysicists.
4. That I have no interest directly or indirectly in the Red Group nor do I expect to receive any.
5. That the information contained herein was compiled under my direction and supervision during the period May 23 to May 30, 1976.

June 2, 1976
Smithers, B.C.

GARRY M. DEPAOLI,
GEOPHYSICIST, B.Sc.

CERTIFICATION

I Dennis F. Morrison, of the Village of Washago, in the Province of Ontario, HERBY CERTIFY AS FOLLOWS:

1. That I have attended the University of Waterloo for 2 years enrolled in the Faculty of Science.
2. That I was employed with Bell Canada as an electronic technician during the period 1964 - 1967.
3. That I was employed with McPhar Geophysics as an Induced Polarization Operator during the period 1967-1970.
4. That I have operated as an independent Induced Polarization Contractor from 1970 to the present.
5. That I have induced polarization operating experience in Newfoundland, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, British Columbia, Yukon and Northwest Territories, Alaska and the Republic of Panama.
6. That I have no interest directly or indirectly in the Red Group nor do I expect to receive any.

DENNIS F. MORRISON

June 2, 1976
Smithers, B.C.

ASSESSMENT DETAILS

WORK SUMMARY

6.6 line miles of induced polarization / resistivity surveying
May 23 to May 30, 1976.

6.5 line miles of line cutting
May to May 22, 1976

PERSONNEL

Dennis F. Morrison

IP Contractor,
Morrison & DePaoli
Geophysical Surveying & Consulting
P.O. Box 418, Gravenhurst,
Ontario POC 1G0

Garry M. DePaoli

Geophysicist
Morrison & DePaoli,
Geophysical Surveying & Consulting
5305 East Georgia,
Burnaby 2, B.C. V5B 1V3

Blair T. Taylor

Geophysicist
122 West 45 Ave.,
Vancouver, B.C.

Roy A. Throssell

Geophysical Assisstant,
P.O. Box 494, Lumby, B.C.

JUNE 1, 1976.

CANADIAN SUPERIOR EXPLORATION LIMITED,
P.O. BOX 100,
SMITHERS, BRITISH COLUMBIA.

ATTENTION: JOHN BAKER,
EXPLORATION MGR., NORTHERN REGION.

RE: Induced Polarization Survey Over
The Red Property, Northeast of Smithers, B.C.

As per our agreement dated April 6, 1976 an induced polarization survey has been completed over the Red Property.

6½ Operating Days @ \$450.00 per day	\$2,925.00
Travel, Standby and Bad Weather Days 5 Days @ \$250.00 per day	\$1,250.00
Expenses:		
As per attached receipts	\$174.17	
Plus 10%	<u>\$17.42</u>	
	\$191.59
		\$191.59
Total now due and payable	<u>\$4,366.59</u>

Please make payment to:

Morrison & DePaoli,
P.O. Box 418,
Gravenhurst, Ontario
POC 1G0

It has been a pleasure working with Canadian Superior Personnel on this project and we hope we may be of service in the future.

Yours truly,

MORRISON & DEPAOLI

COST STATEMENT

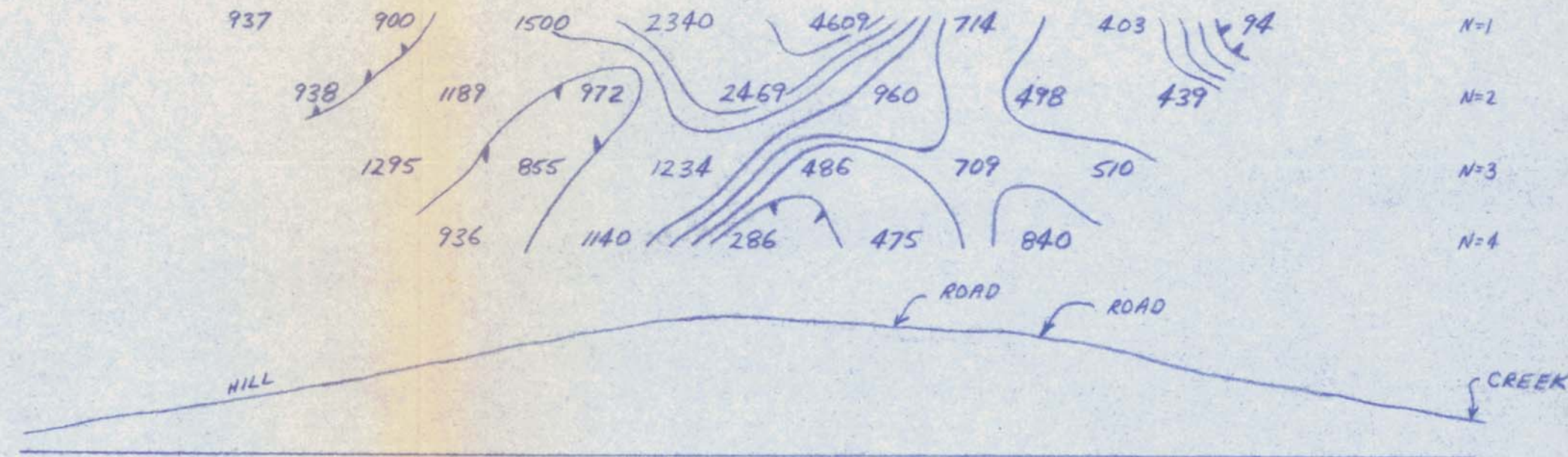
In support of an Affidavit on Application to Record Work on the Red A & B groups of Mineral Claims.

Costs incurred in Induced Polarisation Survey from May 21 - May 31, 76.

1. Contractors' charges as per attached: Morrison & Depaoli, Geophysical Contractors &	4,366.59
2. Camp supplies including groceries:	325.00
3. Supervision: J. Baker, Exploration Manager Northern B.C. 3 days @ \$60.00/day	180.00
	<hr/>
Total Cost \$	4,871.59

CROSS-LINE 67S

785 765 745 725 705 685 665 645 625 605 585



$S(a)/2\pi$

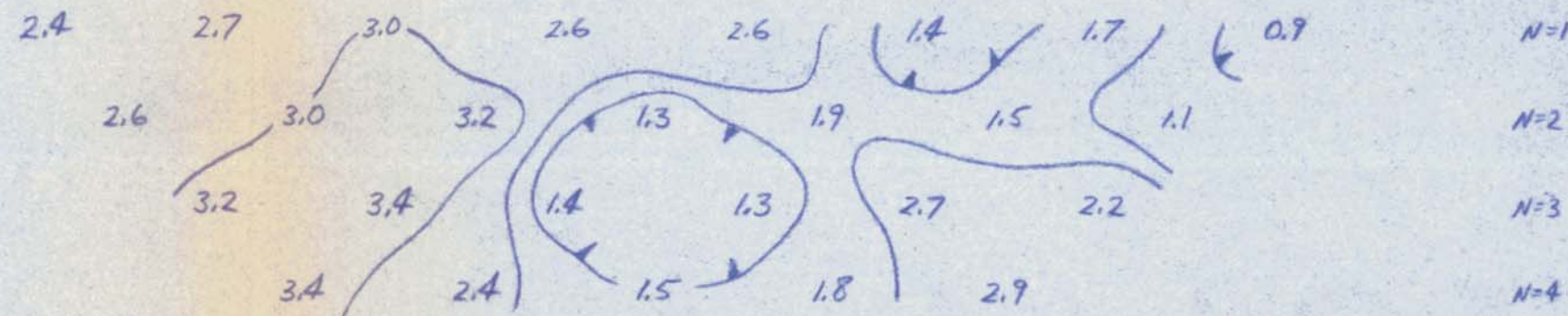
OHM - FEET

SCHEMATIC TOPOGRAPHY

CANADIAN SUPERIOR EXPLORATION
 RED GROUP
 SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P.
 DIPOLE - DIPOLE ARRAY
 0.3 AND 5.0 HERTZ
 OPERATORS: MORRISON + DEPAOLI

SCALE: 1" = 200'
 DATE: MAY 23, 1976



P.F.E.

CROSS-LINE 67S

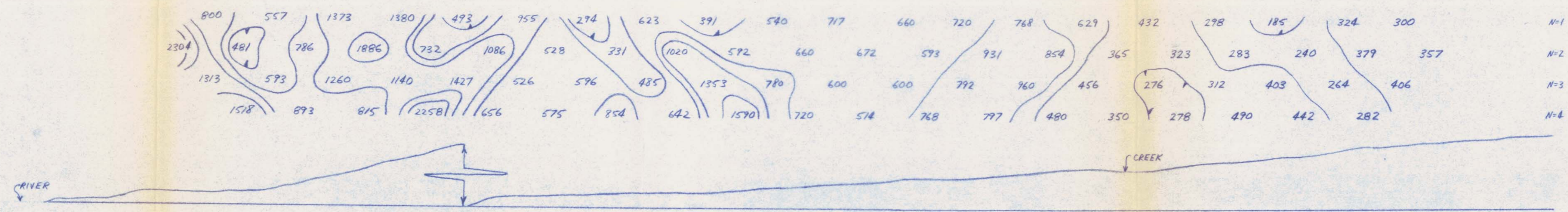
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FIGURE 3(a)

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LINE 44E

1085 1065 1045 1025 1005 985 965 945 925 905 885 865 845 825 805 785 765 745 725 705 685 665 645 625 605



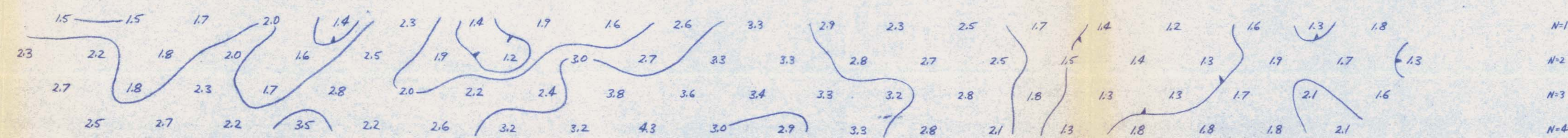
$\rho_a / 2\pi$
OHM - FEET

SCHEMATIC TOPOGRAPHY

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 24, 29 1976



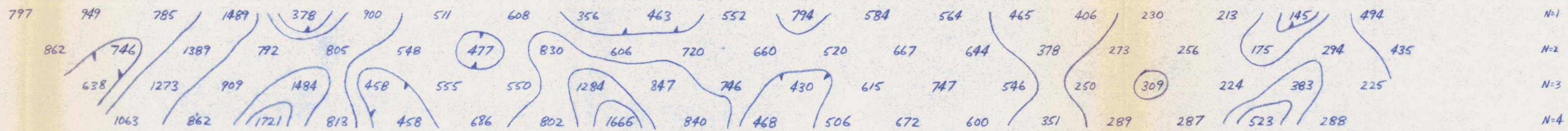
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LINE 44E

FIGURE 3(b)

LINE 48 E

1065 1045 1025 1005 985 965 945 925 905 885 865 845 825 805 785 765 745 725 705 685 665 645 625 605



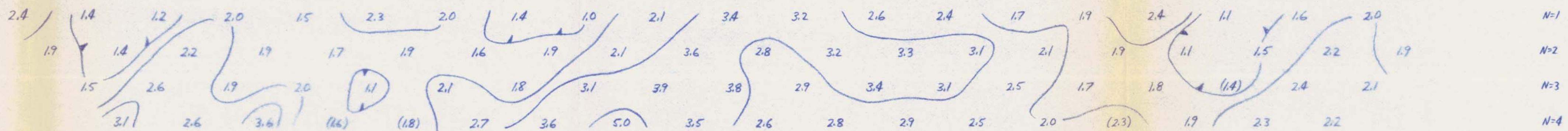
$\rho_{(a)}/2\pi$
OHM - FEET

SCHEMATIC TOPOGRAPHY

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 24, 28 1976



P.F.E.

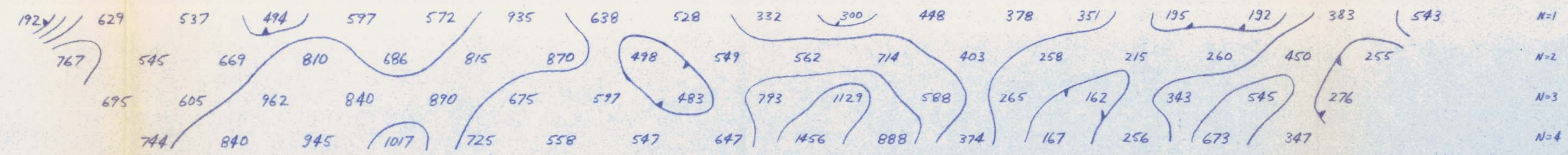
LINE 48 E

FIGURE 3(c)

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LINE 52 E

1005 985 965 945 925 905 885 865 845 825 805 785 765 745 725 705 685 665 645 625 605



CREEK

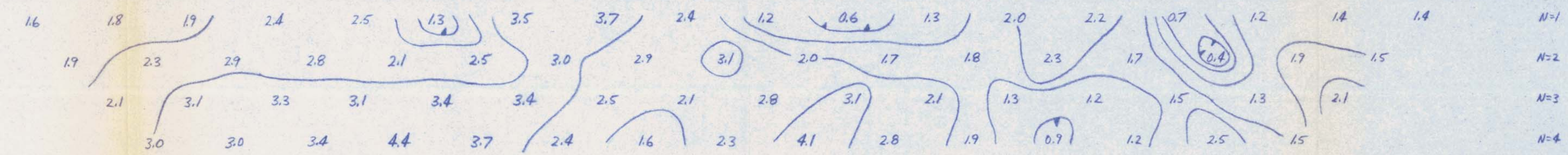
$\frac{1 \text{ cm}}{2 \pi}$
OHM- FEET

SCHEMATIC
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CANADIAN SUPERIOR EXPLORATION
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P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON + DEPAOLI

SCALE: 1" = 200'
DATE: MAY 25, 28 1976



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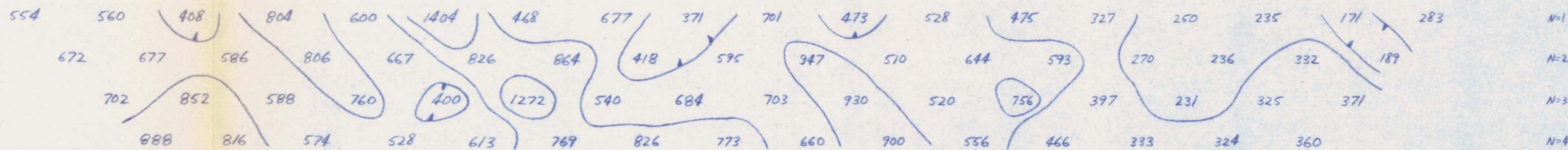
LINE 52 E

FIGURE 3(d)

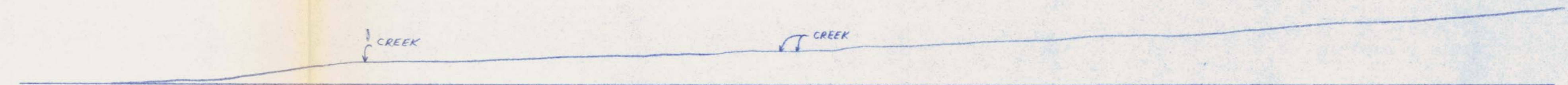
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LINE 56 E

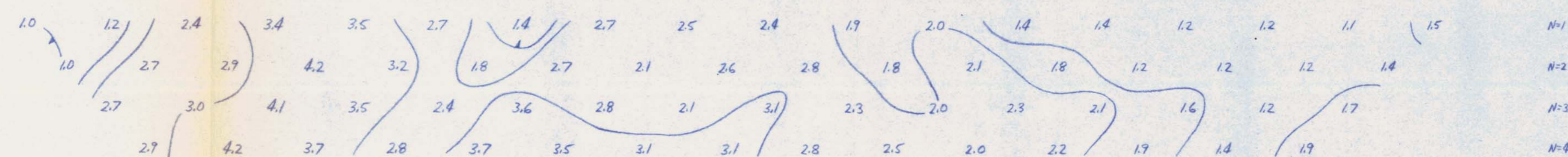
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$\frac{P_{\text{avg}}}{2\pi}$
OHM- FEET



SCHEMATIC
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CANADIAN SUPERIOR EXPLORATION
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P-660 FREQUENCY DOMAIN I.P.
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0.3 AND 5.0 HERTZ
OPERATORS: MORRISON + DEPAOLI

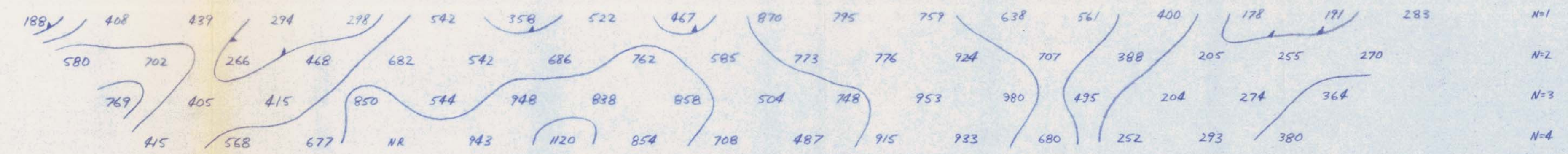
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LINE 56 E

FIGURE 3(e)

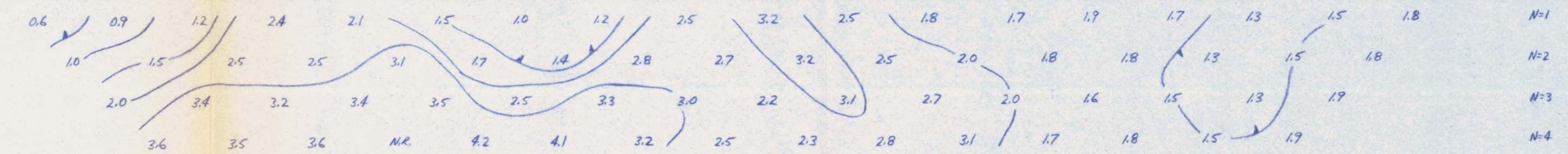
LINE 60E

1005 985 965 945 925 905 885 865 845 825 805 785 765 745 725 705 685 665 645 625 605



$\frac{\rho_{(a)}}{2\pi}$
OHM FEET

SCHEMATIC TOPOGRAPHY



R.F.E.

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P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
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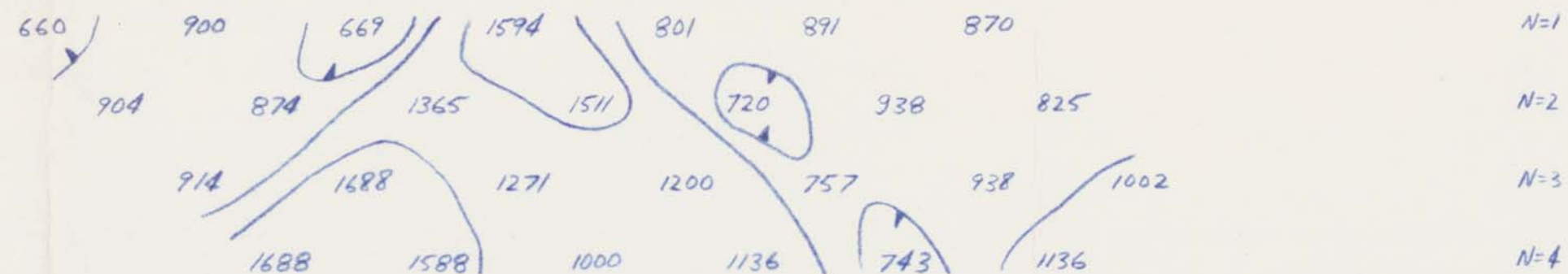
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DATE: MAY 26, 1976

LINE: 60E

FIGURE 3(F)

LINE 40E

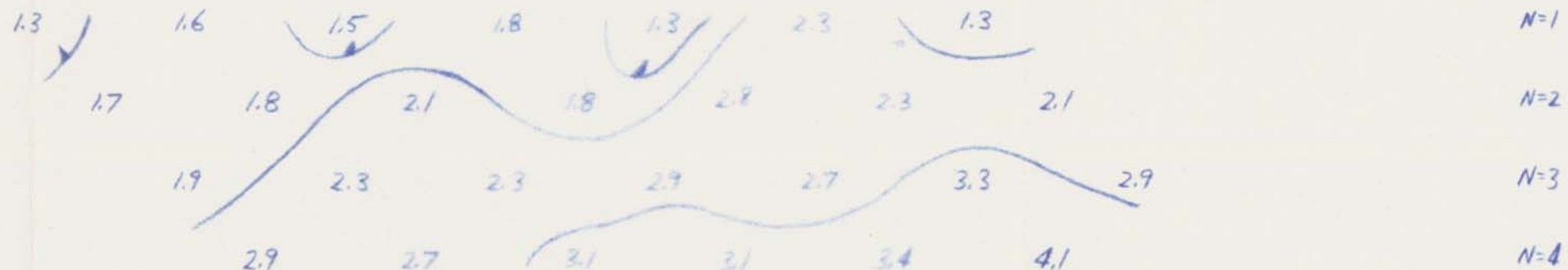
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N=1
N=2
N=3
N=4

$\rho_{(a)}$
 2π
OHM-FEET

SCHEMATIC
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N=1
N=2
N=3
N=4

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CANADIAN SUPERIOR EXPLORATION
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P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 29, 1976

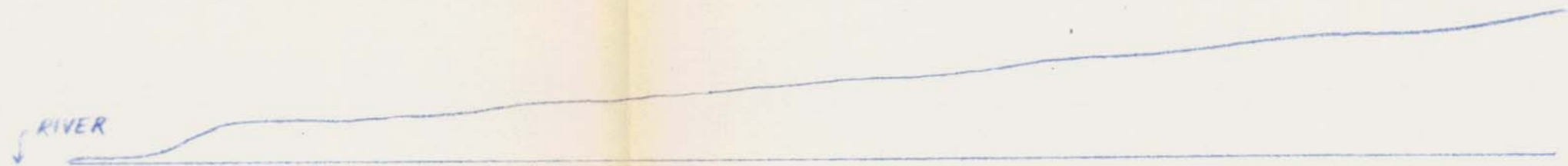
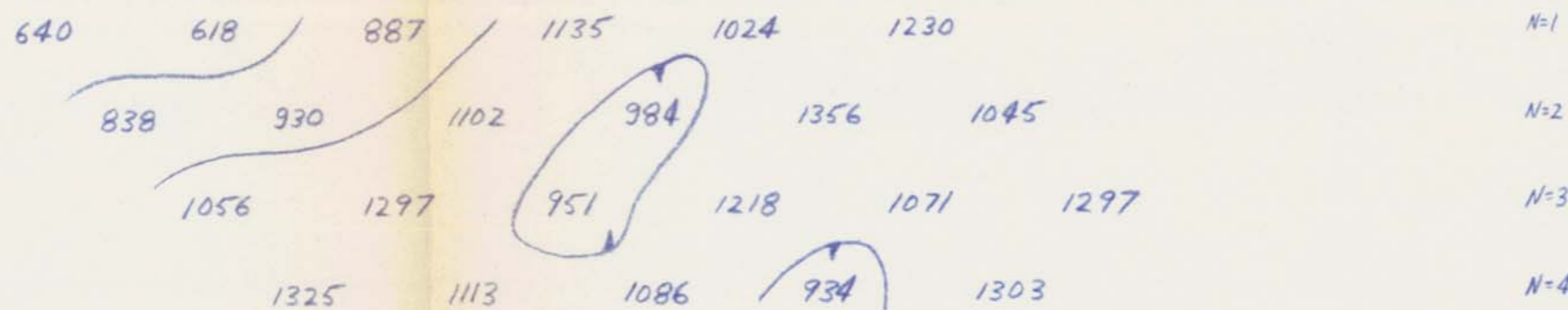
LINE 40E

FIGURE 3 (g)

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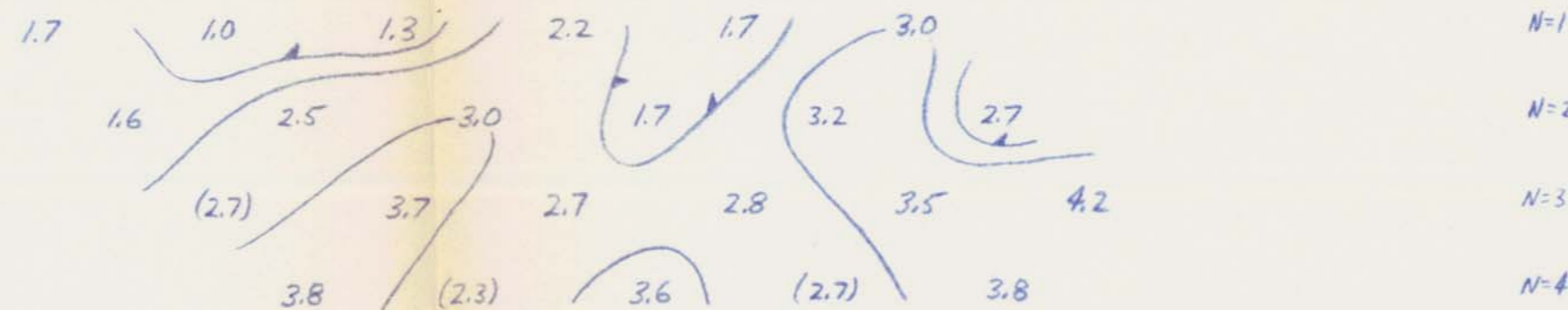
LINE 36 E

1045 1025 1005 985 965 945 925 905 885 865 845



$\rho(a) / 2\pi$
OHM- FEET

SCHEMATIC
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CANADIAN SUPERIOR EXPLORATION
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P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON + DEPAOLI

SCALE: 1" = 200'
DATE: MAY 29, 1976

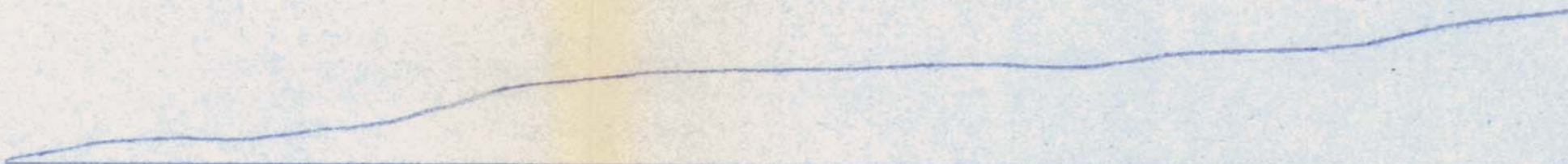
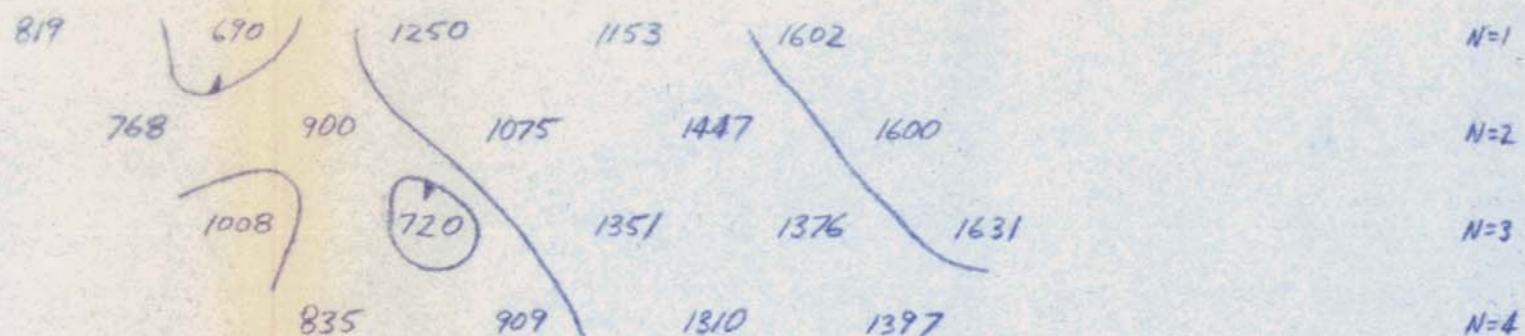
LINE 36 E

FIGURE 3(A)

#5946

LINE 32 E

1045 1025 1005 985 965 945 925 905 885 865 845



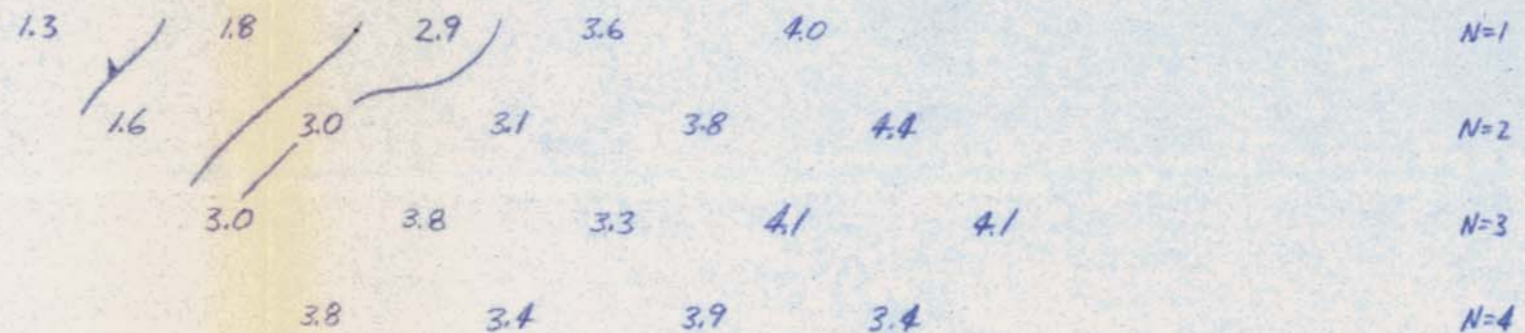
$P(a)/2\pi$
OHM - FEET

SCHEMATIC
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CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON + DEPAOLI

SCALE: 1" = 200'
DATE: MAY 30, 1976



P.F.E.

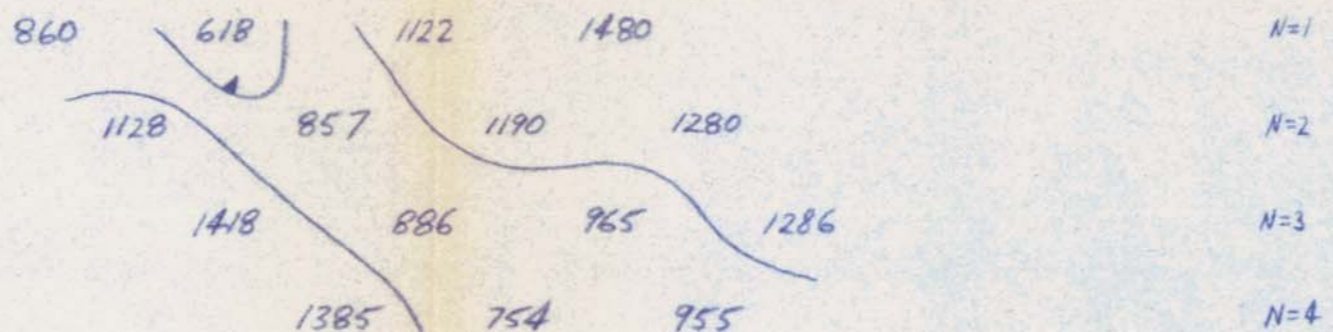
LINE 32 E

FIGURE 3(i)

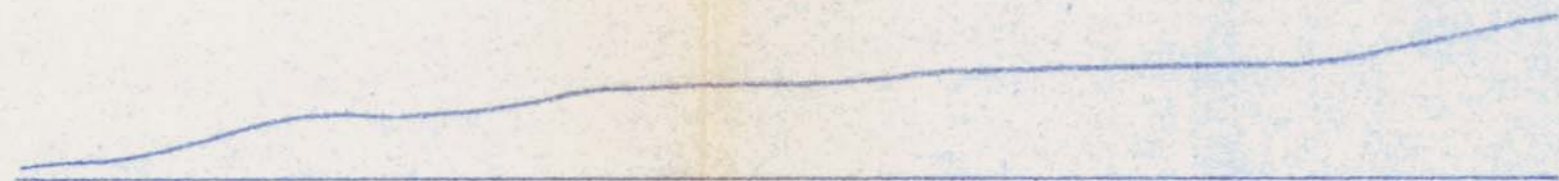
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LINE 28 E

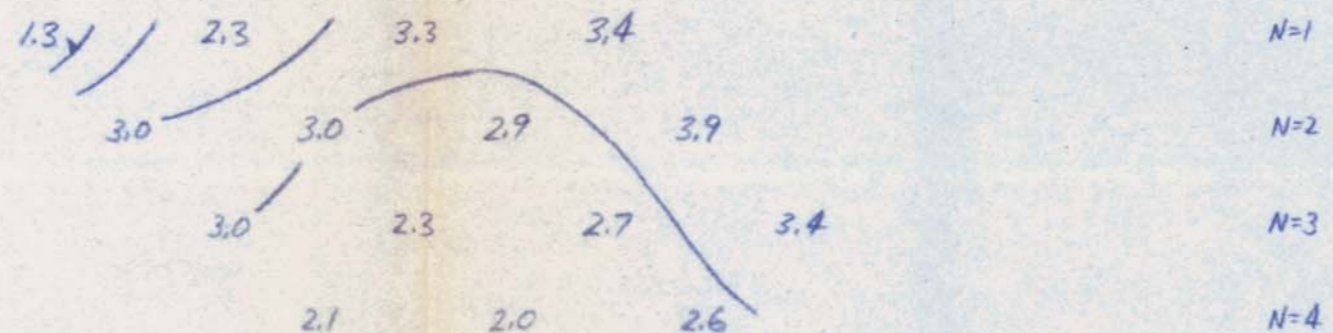
1005 985 965 945 925 905 885 865 845



$\rho(a) / 2\pi$
OHM FEET



SCHEMATIC TOPOGRAPHY



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CANADIAN SUPERIOR EXPLORATION
RED GROUP
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P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 30, 1976

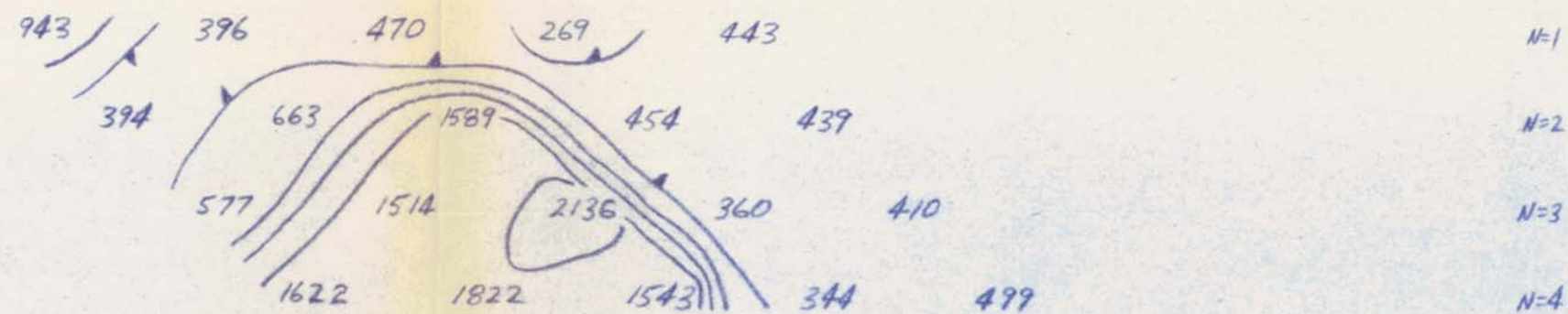
LINE: 28 E

FIGURE 3(f)

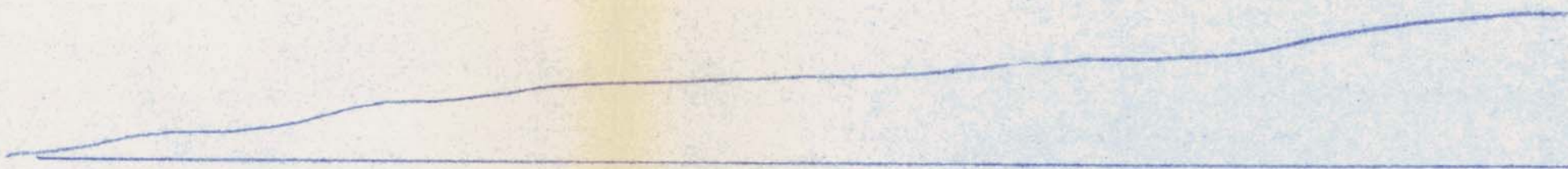
#5946

LINE 24 E

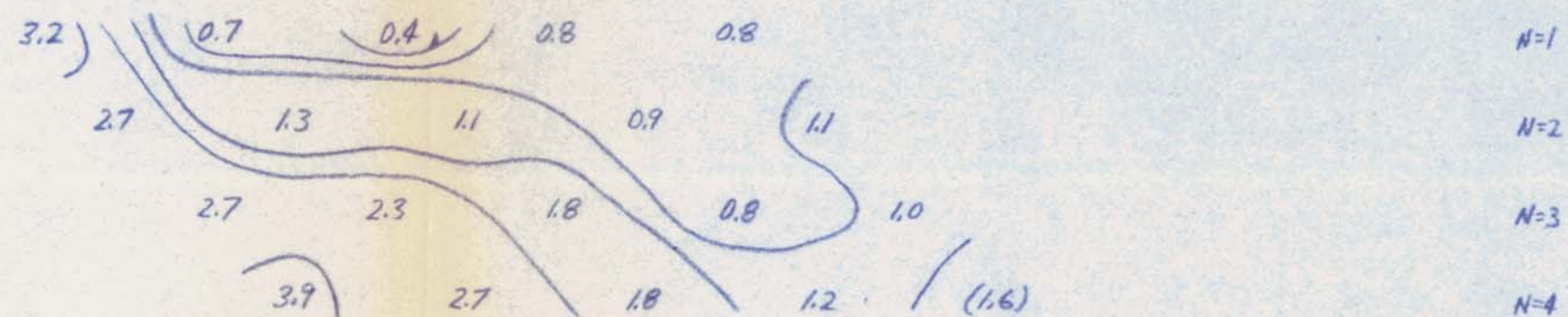
1025 1005 985 965 945 925 905 885 865 845 825



$P_{(a)}$
 2π
OHM FEET



SCHEMATIC
TOPOGRAPHY



P.F.E.

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON + DEPAOLI

SCALE: 1" = 200'
DATE: MAY 30, 1976

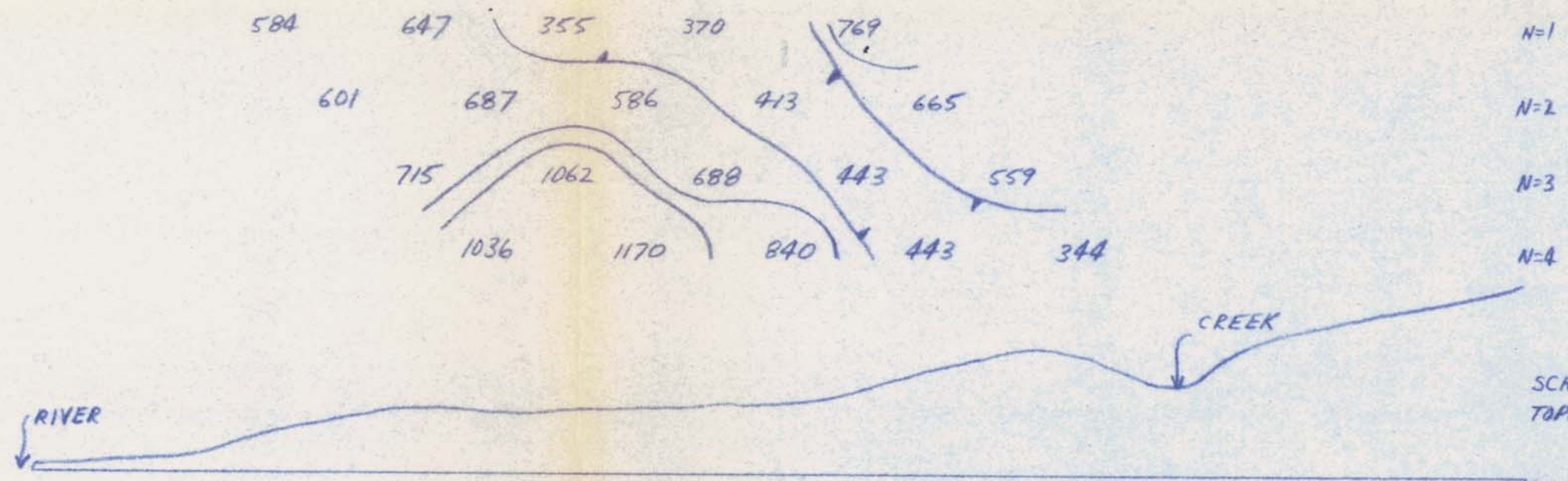
LINE 24 E

FIGURE 3(k)

#5946

LINE 20 E

1025 1005 985 965 945 925 905 885 865 845 825



$P(a)$
 2π
OHM- FEET

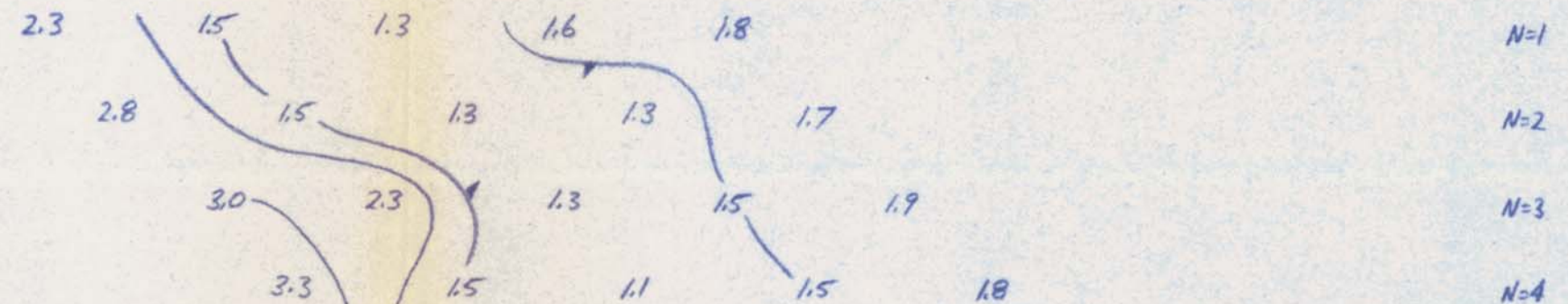
N=1
N=2
N=3
N=4

SCHEMATIC
TOPOGRAPHY

CANADIAN SUPERIOR EXPLORATION
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P-660 FREQUENCY DOMAIN I.P.
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OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 30, 1976



P.F.E.

N=1
N=2
N=3
N=4

LINE 20 E

FIGURE 3(1)

*5946