1975 GEOPHYSICAL REPORT ON THE RED GROUP

DATE: JUNE, 1975.

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

5552

1975 GEOPHYSICAL REPORT ON THE RED GROUP

located in

NORTHERN BRITISH COLUMBIA

in the

OMENICA MINING DIVISION

94D/3E

approximately

100 MILES NORTH-NORTHEAST OF SMITHERS

at coordinates

56°15' N. LAT.; 127°12' W. LONG.

work for

CANADIAN SUPERIOR EXPLORATION LIMITED

work by

MORRISON & DEPAOLI
GEOPHYSICAL CONTRACTORS & CONSULTANTS

work period

MAY 21 TO JUNE 4, 1975.

TABLE OF CONTENTS

ILLUSTRATIONS

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 period May 22 to June 3, 1975 a total of 12 line miles of induced polarization / resistivity surveying were completed over the property. The following report describes the instrumentation, field procedure and results obtained from the survey.

The work was executed by MORRISON & DEPAOLI, Geophysical Contractors and Consultants upon the request of Canadian Superior Exploration Limited and under the supervision of J. Baker.

Location and Access

The property is located in Northern B.C. approximately 100 miles north-northeast of Smithers or 10 miles east of Bear Lake Airstrip. It lies within the Omenica Mining Division at coordinates 56°15' N. Latitude, 127°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.

Grid Control

The contol grid consists of 15 miles of cut, chained and flagged lines. Two baselines have been cut 5,200 feet long and 2000 feet apart. The baselines trend east-west and are labelled 60+00 S and 80+00 S. Thirteen perpendicular cross

Department of
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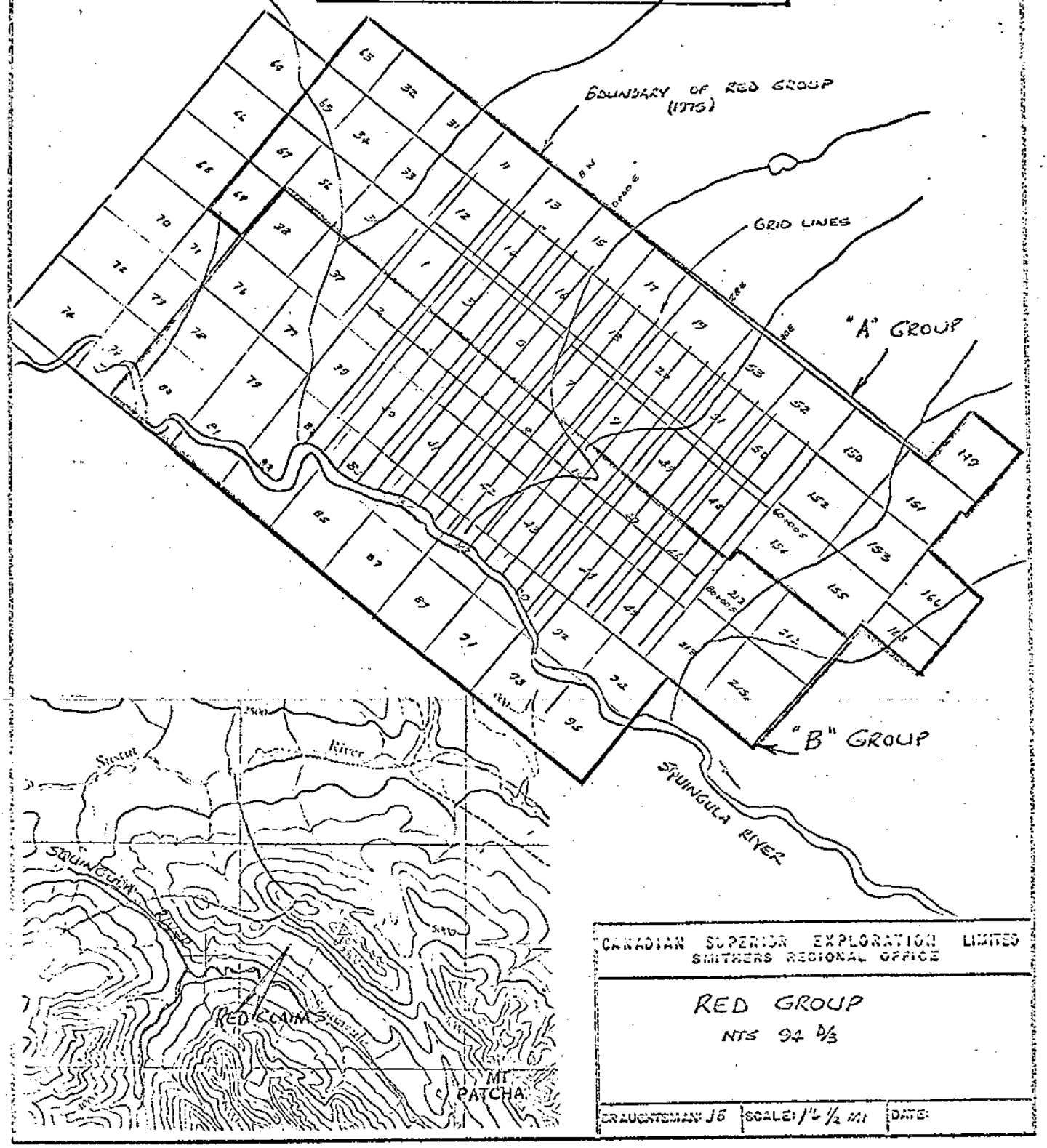
NO. 5552 MAP 1



CANADIAN SUPERIOR EXPLORATION LIMITED
SMITHERS REGIONAL OFFICE

RED GROUP
NTS 94 D/3

DRAUGHTSMAN: JS | SCALE: 1" = ½ mi | DATE:

lines were cut at 400 foot intervals. 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.

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 expected, however a sharp high resistivity contrast was anticipated from the limestone host rock.

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 deficiences 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 electrochemical 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 hertz to current applied at 5.0 hertz.

INSTRUMENT AND PROCEDURE

A multiple frequency McPhar Induced Polarization System Model P-660, 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.

On this survey the low and high frequencies employed were 0.3 and 5.0 hertz. Power was obtained from a 2½ KW - 400 hertz motor generator. The maximum output current for the transmitting system is 5.0 amp. while the maximum output voltage is 690 volts.

The receiver employed was the A.C. P-660 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 symetrical 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 data is plotted in 13 pseudosections, Figures 3a-m after page 12 . The pseudosections are vertical profile plots displaying apparent resistivities in $\rho_a/2\pi$ ohm-feet, calculated metal factors and percent frequency effect values. Contoured plan maps of the second separation (N=2) apparent resistivity and percent frequency effect data have also been prepared in Figures 4 and 5 respectively. An interpretation of the data is presented in Figure 6.

RESULTS AND INTERPRETATION

A high apparent resistivity anomaly greater than 750 ohm-feet dominates the grid area. As shown in Figure 4 the resistivity high strikes true north and has a general width of 800 feet. It extends for 3800 feet and is still open on the northwest corner of the grid. A second and possibly related resistivity high occurs in the southeast corner of the grid area. This anomaly is also open to the south. Several more minor and possibly connected resistivity highs are indicated throughout the remainder of the survey area.

The two major resistivity highs have coincident and subtle 3% PFE anomalies. (See Figure 5) As a general statement the higher PFE values favour the south western side of the resistivity highs.

On the basis of diamond drilling results, surface geological mapping and personnal communication with John Baker an arbritrary decision was made to interpret apparent resistivity values greater than 1000 ohm-feet as indicative of limestone. Employing this assumption a detailed pseudosection analysis was carried out in an effort to determine conservative limestone boundaries and relative dip on each line. The surface projection of deduced limestone boundaries and interpreted interline continuity is displayed in Figure 6. As a result of this study 3 major zones of limestone emerge. Several narrow indications of "limestone" which were obtained at depth are also plotted in Figure 6.

Contoured apparent resistivity and PFE values reveal coincident northwest and northeast trends. Several of these have been attributed to faulting as shown in Figure 6.

CONCLUSIONS

Known economic mineralization is characterized by apparent resistivities greater than 1000 ohm-feet with a coincident PFE response of 3% or greater. It is felt that all of the deduced limestone zones have potential, however unmineralized limestone is also known to occur on the property. In an effort to screen unmineralized limestone, areas of deduced limestone having a coincident PFE response of greater than 3% have been shaded in Figure 6. Three drill holes have recommended to test these areas.

Interpreted faulting patterns allow for the possibility that the three deduced limestone zones were once one continuous unit.

RECOMMENDATIONS

1. The following diamond drill holes are recommended to test similar induced polarization responses to those obtained over known mineralization.
   a) 4+00 W, 66+00 S -- 600 feet at -90°.
   b) 4+00 E, 81+60 S -- 400 feet at -90°.
   c) 32+00 E, 90+50 S -- 400 feet at -90°.

2. The narrow, deep indications of limestone should only be considered for further exploration if encouragement is obtained from the above drilling.

3. A ground proton precession magnetometer survey over the entire grid at 100 foot station intervals may detect a magnetic susceptibility contrast between the limestone and volcanic units and confirm the interpreted faulting directions.

RESPECTFULLY SUBMITTED

Gerry DePaoli

G.M. DEPAOLI,
GEOPHYSICIST, B.Sc.

JUNE 28, 1975
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, British Columbia 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 6 years in Northern Ontario, Quebec, Manitoba, Western U.S.A., 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 PROSPECT nor do I expect to receive any.

5. That the information contained herein was compiled under my direction and supervision during the period May 21 to June 4, 1975.

G.M. DEPAOLI,
GEOPHYSICIST, B.Sc.

June 28, 1975
Smithers, B.C.

CERTIFICATION

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

1. That I attended the University of Waterloo for two years enrolled in the Faculty of Science.

2. That I was employed as an electronic technician with Bell Canada in Ontario during the period 1964 - 1967.

3. That I was employed as a Geophysical Induced Polarization Operator with McPhar Geophysics during the period 1967 - 1970.

4. That I have operated as an independent Induced Polarization Contractor continuously since 1970 to the present.

5. That I have induced polarization surveying experience in Newfoundland, Nova Scotia, New Brounswick, Quebec, Ontario, Manitoba, British Columbia, Yukon and Northwest Territories, and the Pepublic of Panama.

6. That I have no interest directly or indirectly in the RED GROUP PROSPECT nor do I expect to receive any.

D.F. MORRISON

June 28, 1975
Smithers, B.C.

ASSESSMENT DETAILS

WORK SUMMARY

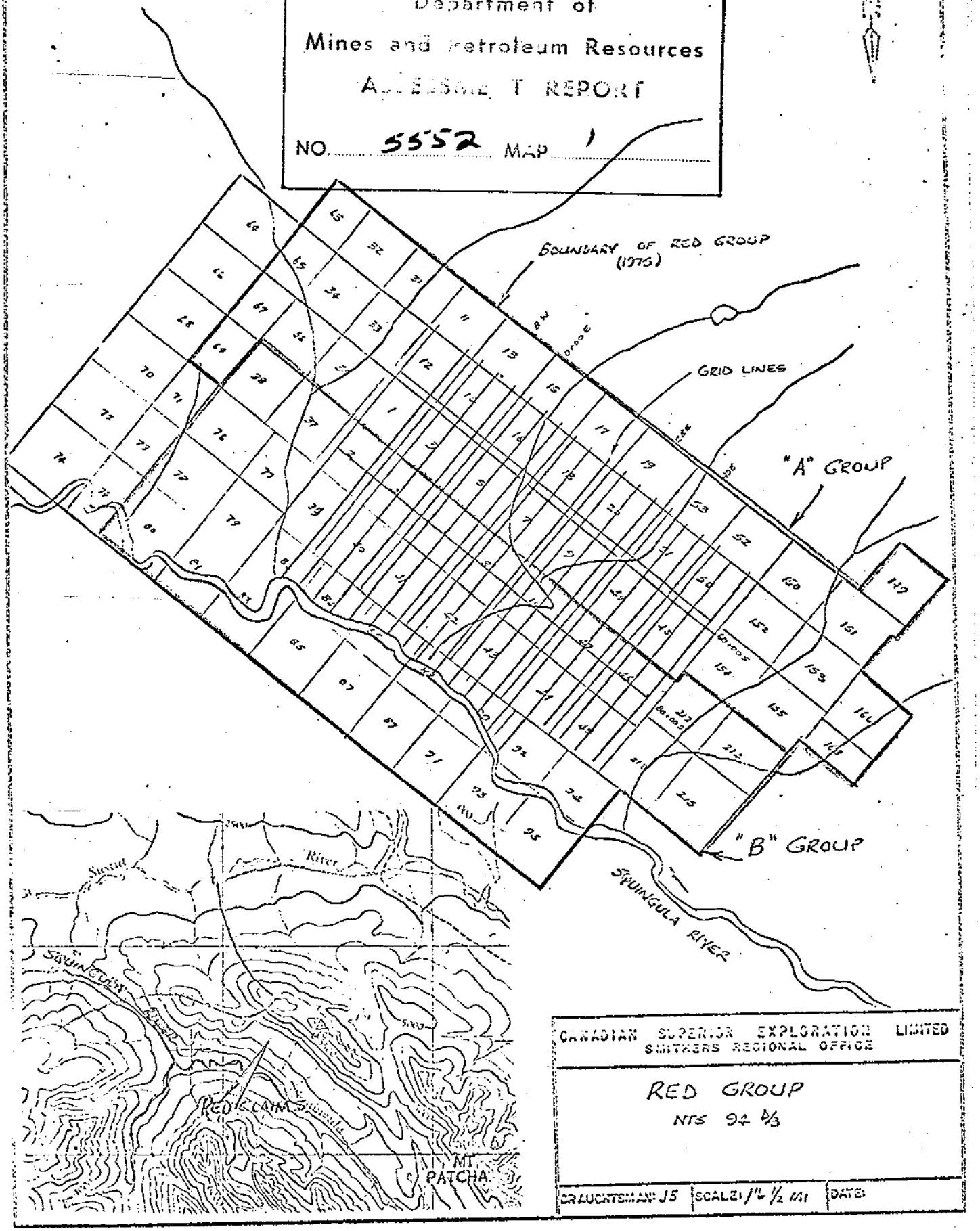
1. 15 miles of grid line cut, flagged and chained.
   Dates worked:

2. 12 miles of induced polarization / resistivity surveying.
   Dates worked May 22 - June 3, 1975.

PERSONNEL

Gerard Auger Box 1055, Smithers, B.C.	Line Cutter
Dennis F. Morrison Box 418, Gravenhurst, Ontario.	IP Contractor and Operator
Garry M. DePaoli 5305 E. Georgia, Burnaby 2, B.C.	Geophysicist
Blair Taylor 122 West 45 Ave., Vancouver, B.C.	Geophysicist
Chris Crowley 312 Carnarvan St., New Westminister, B.C.	Geophysical Assistant
Mitchell McLellan 11274 Kendale View, North Delta, B.C.	Geophysical Assistant
John Baker Box 100, Smithers, B.C.	Geologist

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 5552 MAP 1



CANADIAN SUPERIOR EXPLORATION LIMITED
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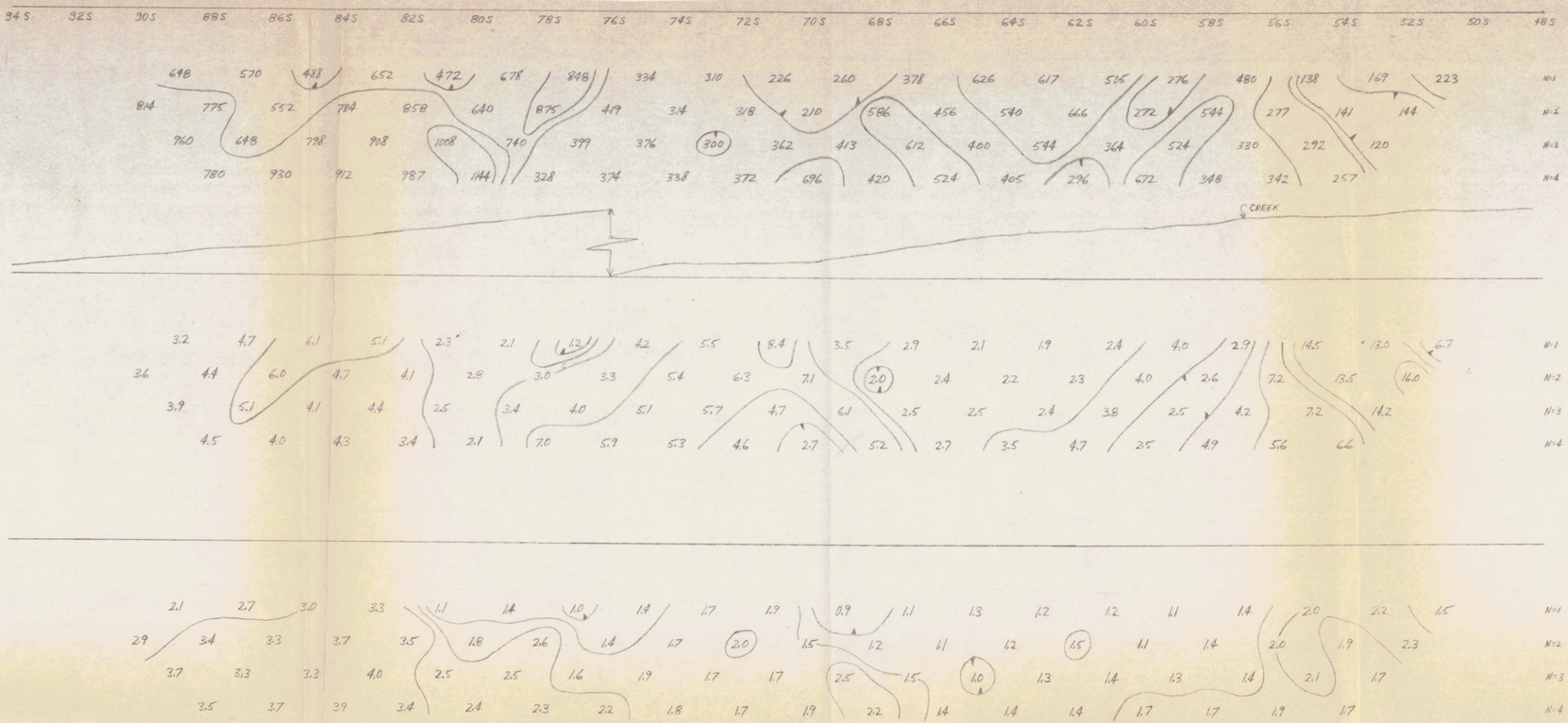
RED GROUP
NTS 94 D/3

DRAUGHTSMAN: JS | SCALE: 1" = 1/2 mi | DATE:

LINE 40 E



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

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

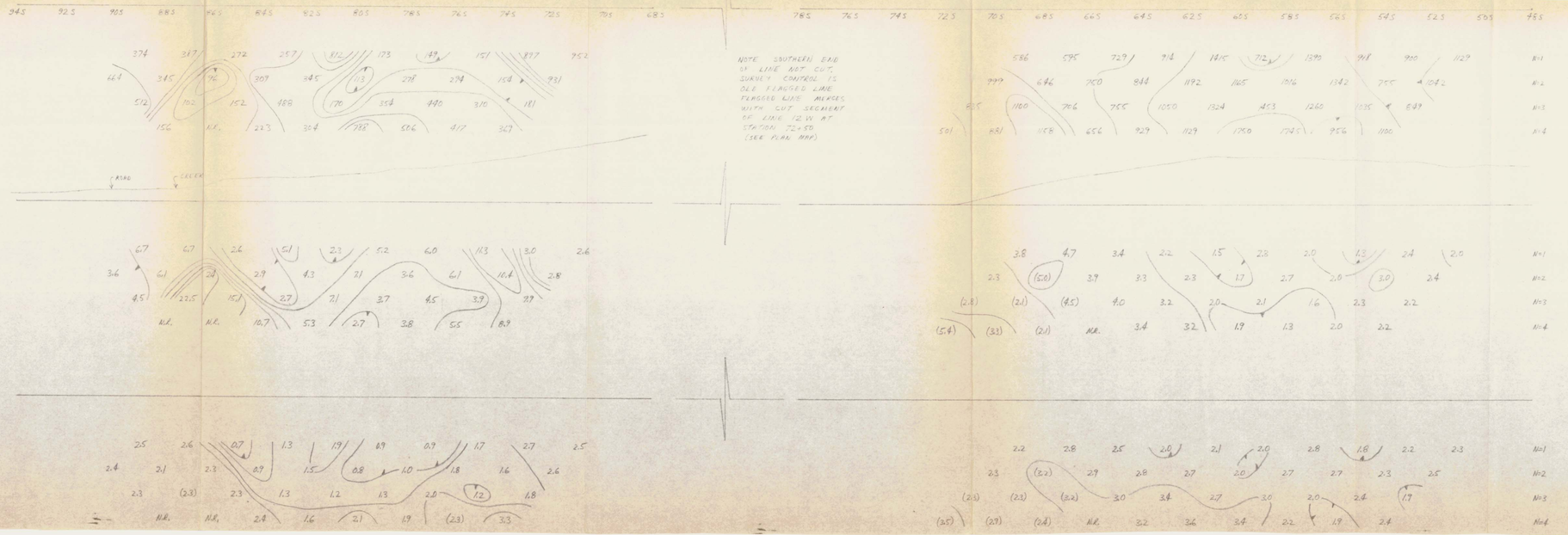
P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS : MORRISON & DEPAOLI

SCALE : 1" = 200'
DATE : MAY 26, 27 1975

LINE 40 +00 E

5552
FIG. M

LINE 8W



CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

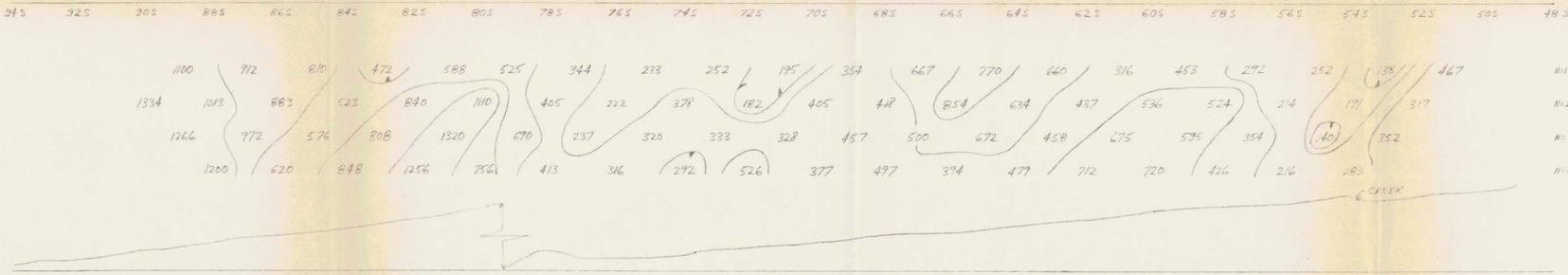
P-650 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 30 HERTZ
OPERATORS: MCKINSON & DEPAOLI

SCALE: 1" = 200'
DATE: JUNE 12, 1975

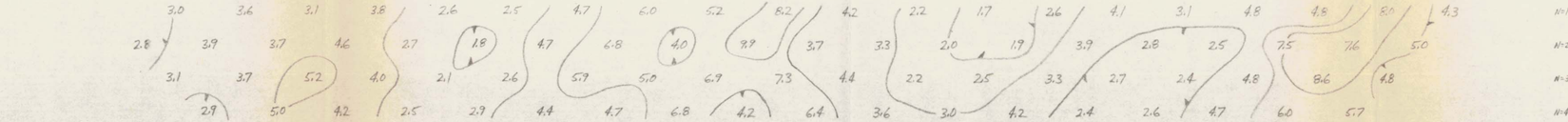
LINE 8+00W

5552
FIG. A

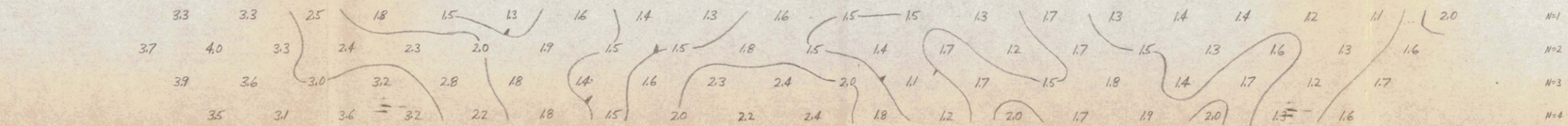
LINE 36 E



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



M.F.



F.E.

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

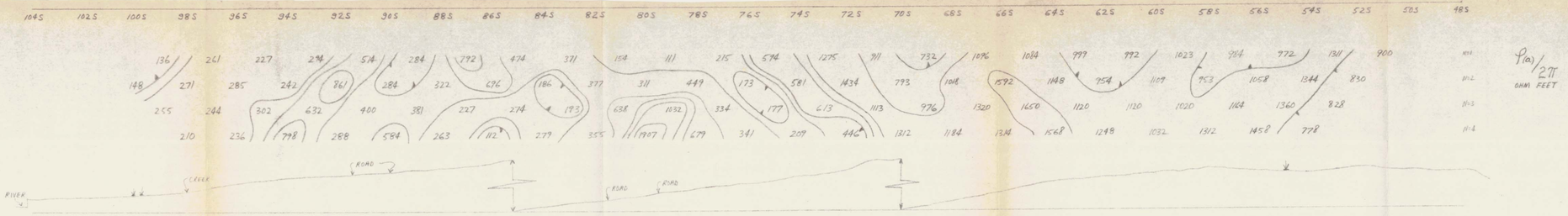
P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 26, 27 1975

LINE 36+00 E

5552
FIG. L

LINE 4W



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

M.F.

F.E.

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

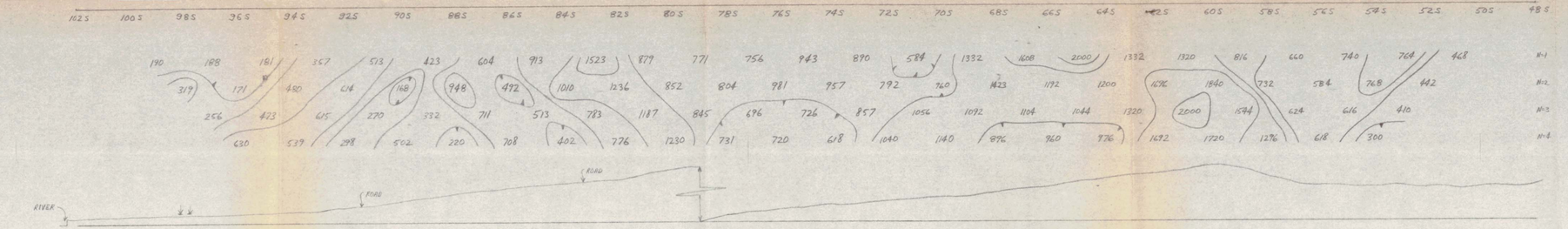
P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 23, JUNE 1,2 1975

LINE 4+00 W

5552
F16. B

LINE 0 E



P101/2π
OHM FEET

M.F.

F.E.

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

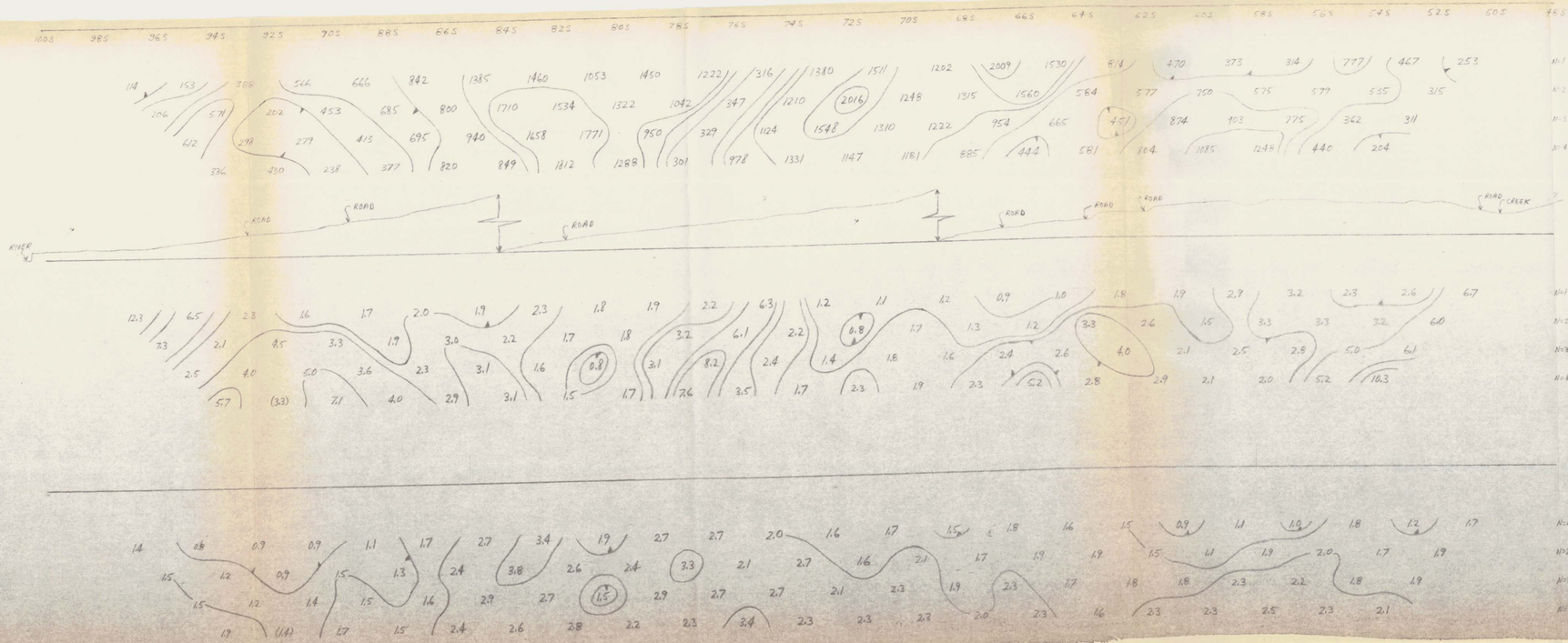
P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 22, 23, 31 JUNE 3, 1975

LINE 0+00 E

5552
FIG. C

LINE 4E



CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

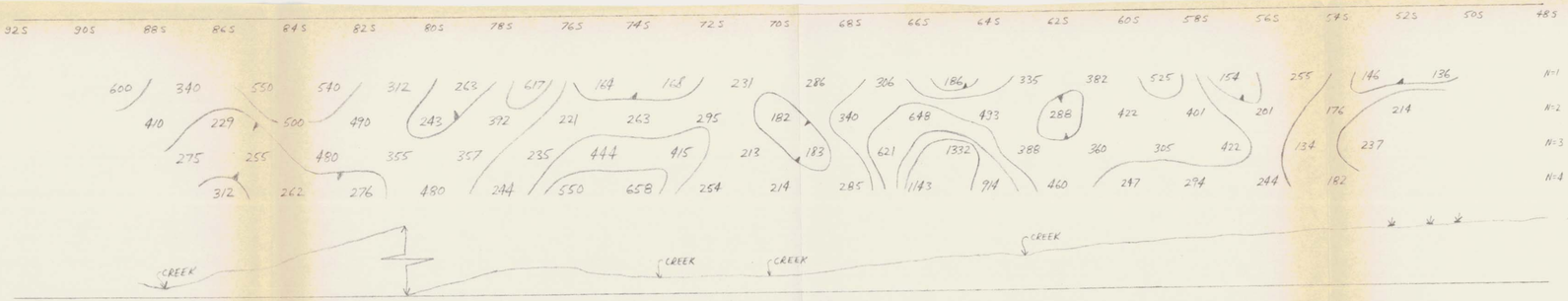
P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

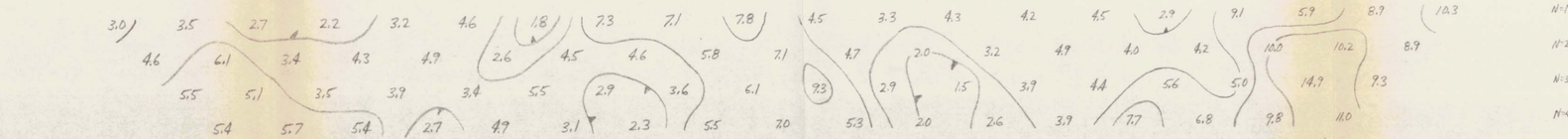
SCALE: 1" = 200'
DATE: MAY 22,31 JUNE 3, 1975

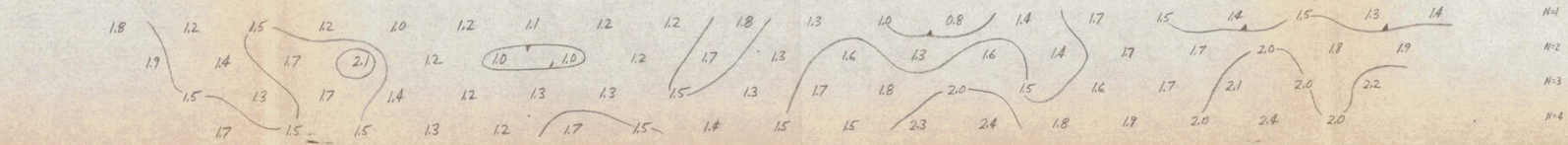
LINE 4+00E

5552
FIG. D

LINE 20 E







CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

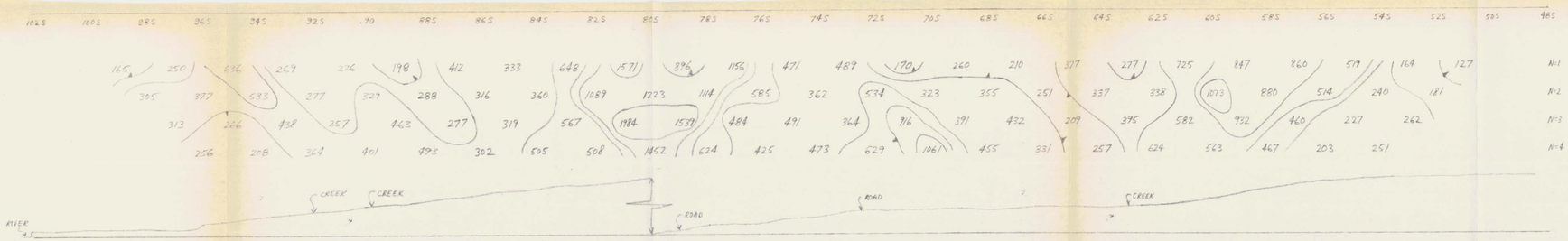
P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 24, 1975

LINE 20+00 E

5552
FIG. H

LINE 12 E



$\rho_a/2\pi$

M.F.

F.E.

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

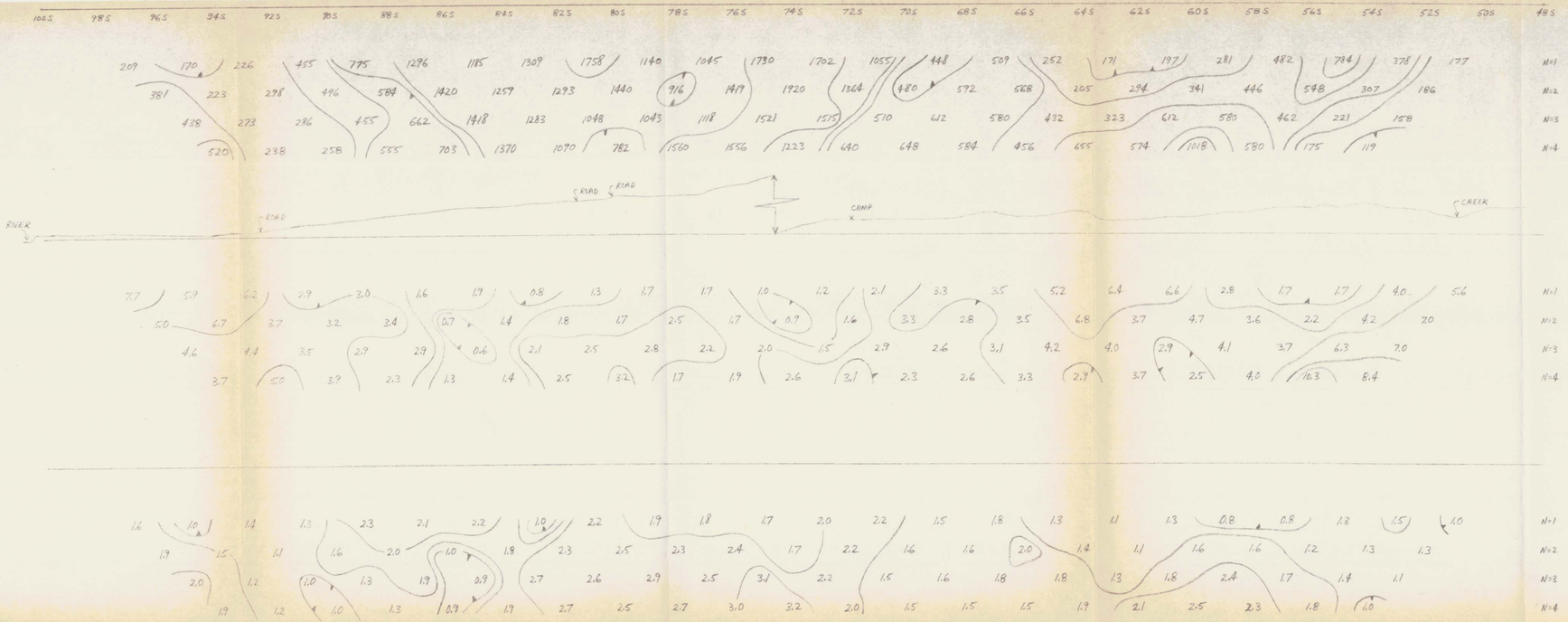
P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 23, 24 JUNE 3, 1975

LINE 12+00 E

5352
FIG. F

LINE 8 E



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

M.F.

F.E.

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

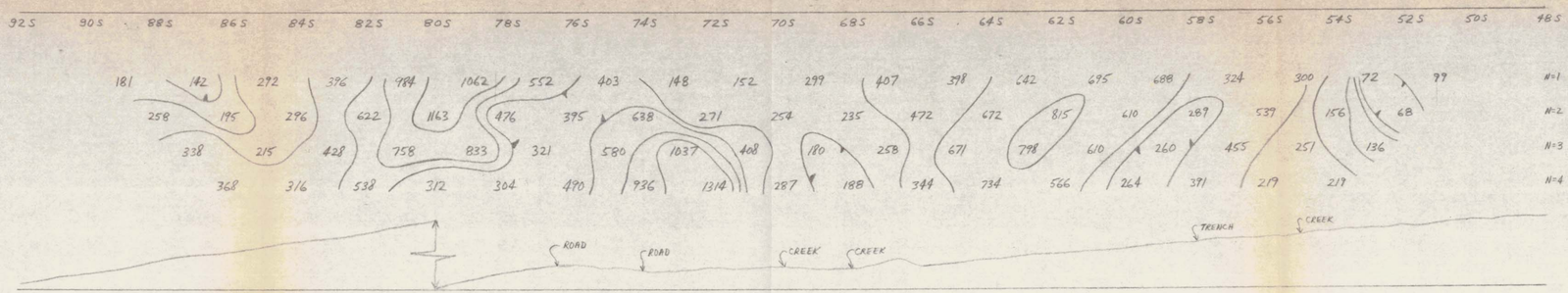
P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 22, 30 JUNE 3, 1975

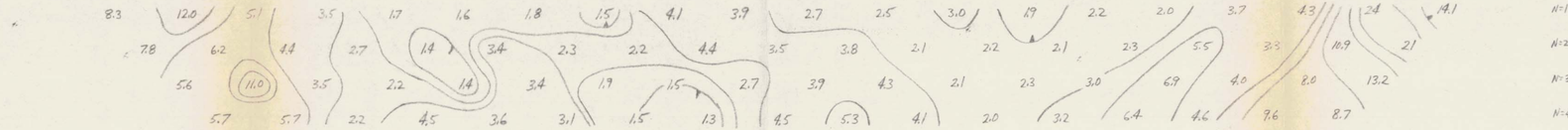
LINE 8+00 E

5552
FIG. E

LINE 16 E



$\rho_{(\omega)}/2\pi$



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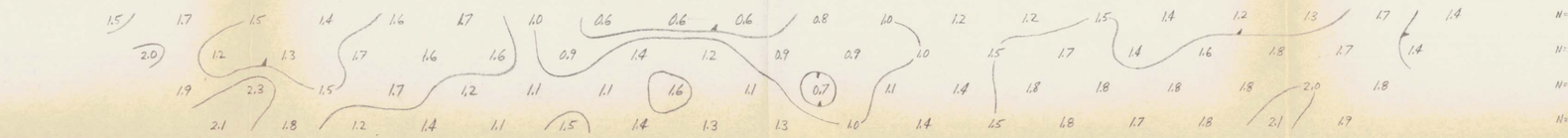


F.E.

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

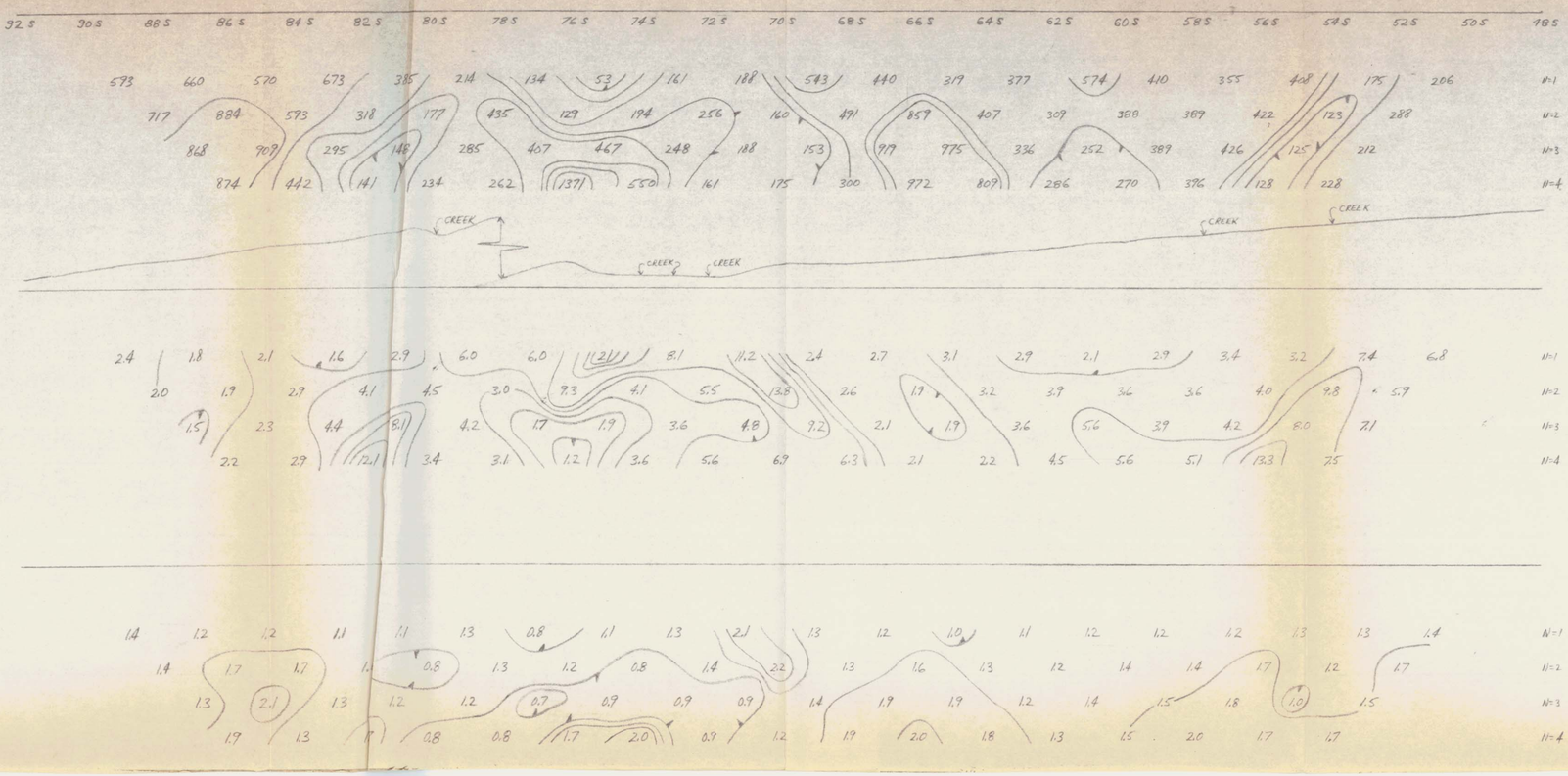
P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 24, 1975

LINE: 16+00 E

5552
FIG. 6.

LINE 24 E



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

M.F.

F.E.

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

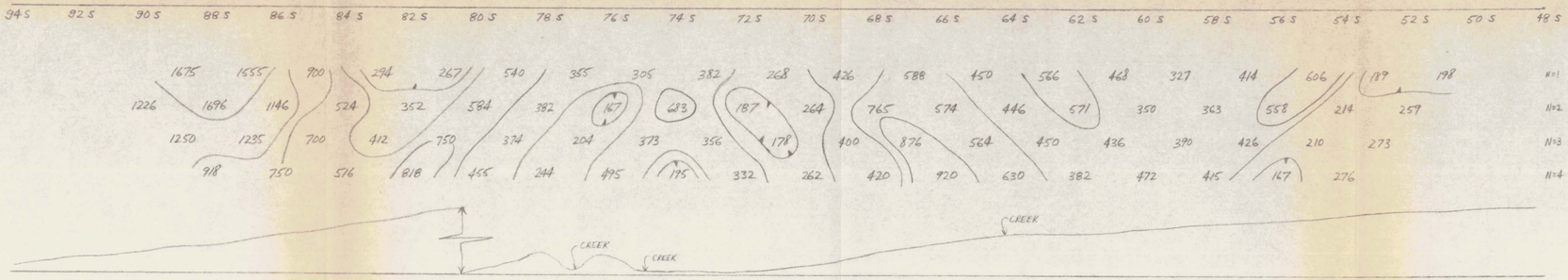
P-660 FREQUENCY DOMAIN I.P
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 25, 28, 29 1975

LINE 24+00 E

5552
FIG. I

LINE 28 E



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

M.F.

F.E.

CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

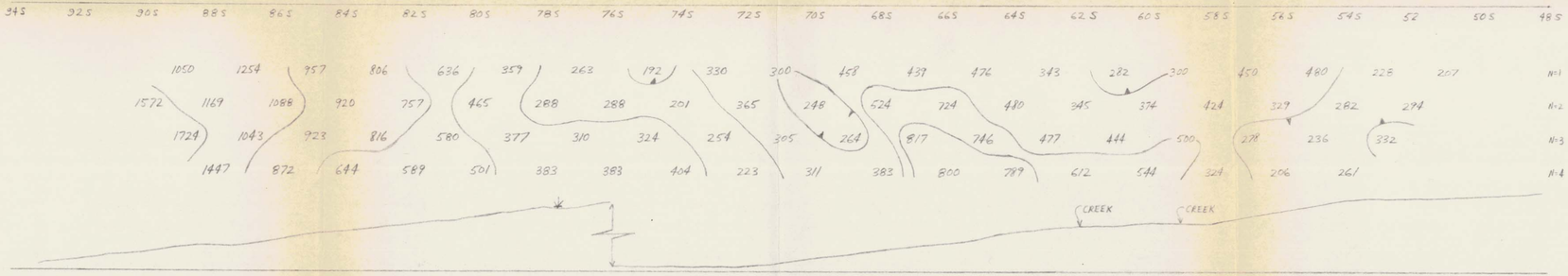
P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200'
DATE: MAY 25, 28 1975

LINE 28 + 00E

5552
FIG. J

LINE 32 E



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

M.F.

F.E.

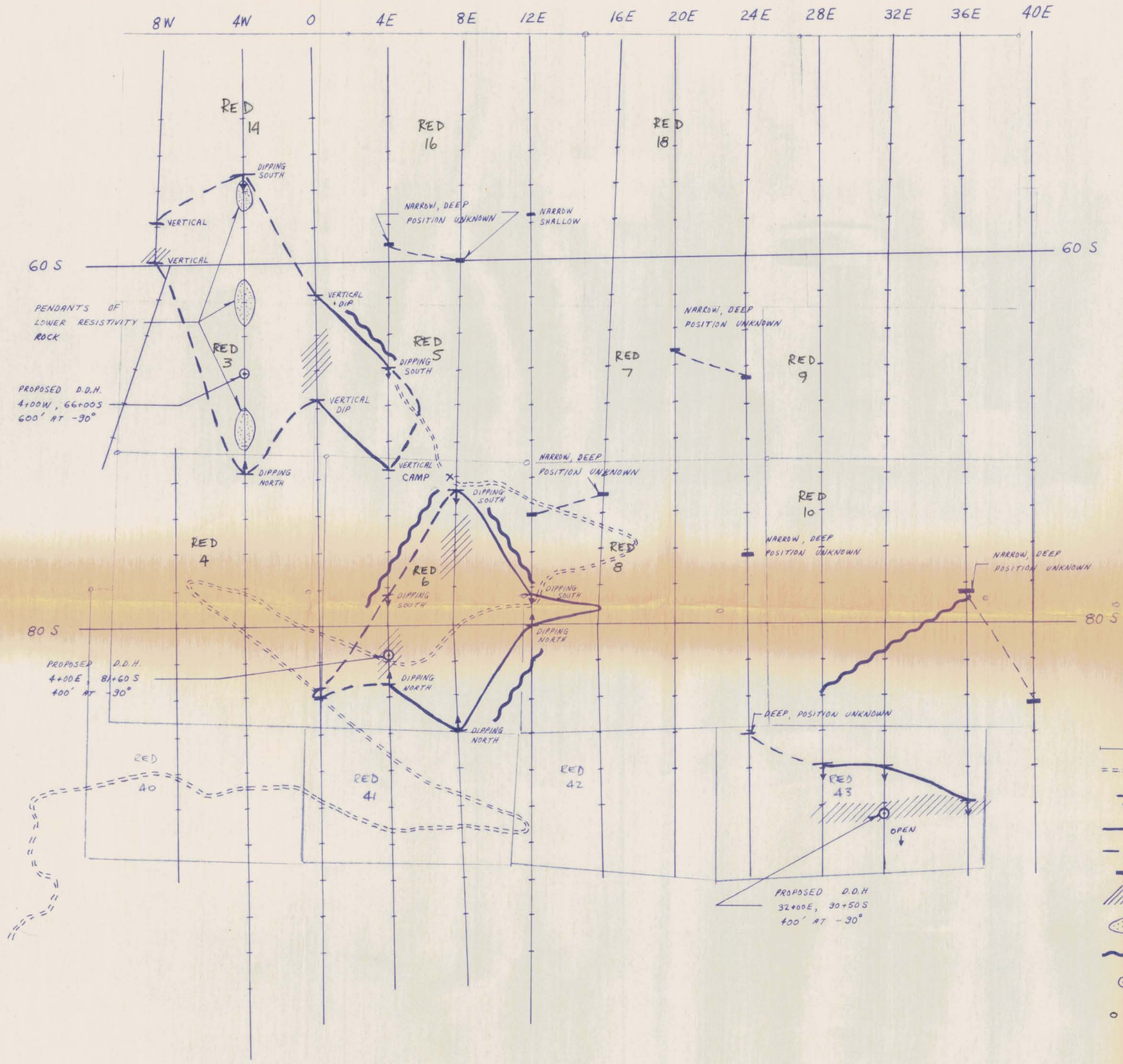
CANADIAN SUPERIOR EXPLORATION
RED GROUP
SMITHERS REGIONAL OFFICE

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

SCALE: 1" = 200'
DATE: MAY 25, 26, 28 1975

LINE: 32 + 00 E

5552
FIG. K



N

LEGEND

- CUT LINE
- ROAD
- DEDUCED LIMESTONE CONTACT AND DIP FROM PSEUDOSECTION ANALYSIS PROJECTED TO SURFACE
- INTERPRETED INTERLINE LIMESTONE CONTACT
- POSSIBLE INTERLINE LIMESTONE CONTACT
- APPARENT RESISTIVITIES INDICATIVE OF LIMESTONE
- COINCIDENT PFE VALUES > 3% PROJECTED TO SURFACE
- INTERPRETED PENDANTS OF LOWER RESISTIVITY ROCK
- POSSIBLE FAULTS
- RECOMMENDED DRILL HOLES
- CLAIM POST

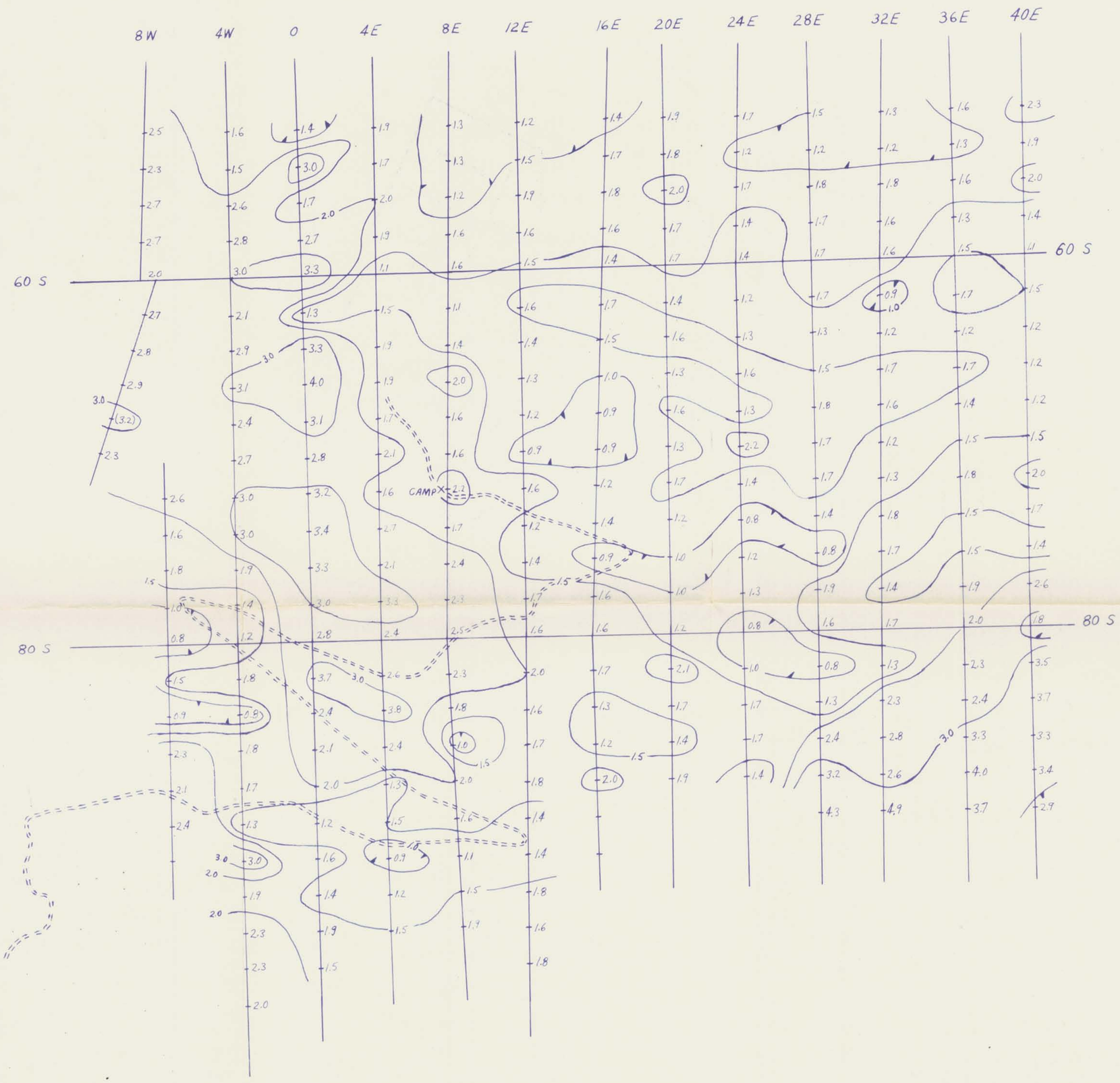
To Accompany Geophysical report on the Red Group of Claims, Squingula River Area, Omineca M.D. by G. Depatie, June 1975.

CANADIAN SUPERIOR EXPLORATION LIMITED
SMITHERS REGIONAL OFFICE

RED GROUP
GEOPHYSICAL INTERPRETATION

DRAWN BY: G.M.D.	DATE: JUNE 1975	SCALE: 1" = 400'
FIGURE: 6	TO ACCOMPANY 1975 GEOPHYSICAL REPORT	

#5552



LEGEND

CUT LINE

ROAD

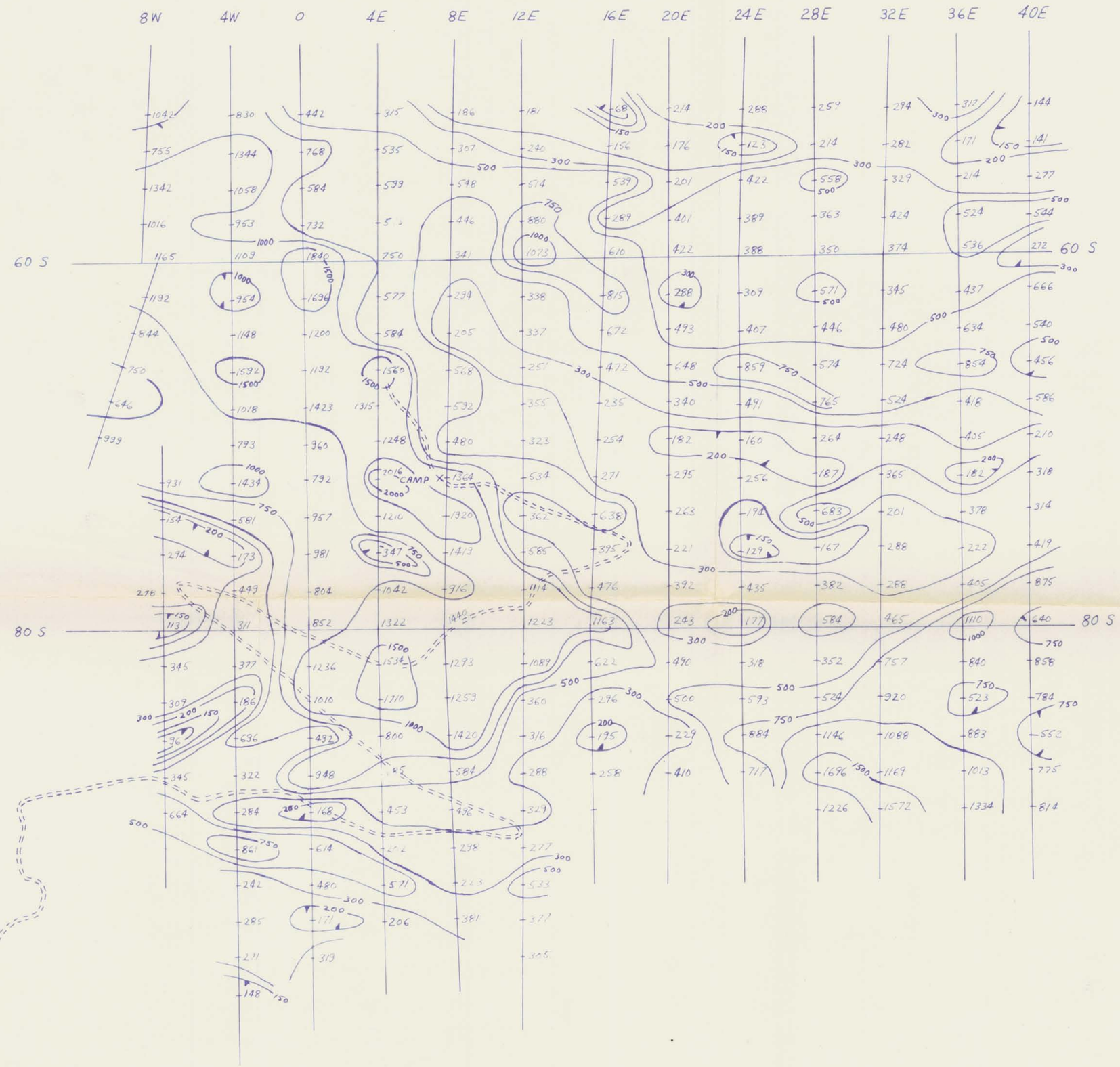
PERCENT FREQUENCY EFFECT CONTOUR INTERVAL 0.3, 0.5, 0.75, 1.0, 2.0, 3.0

P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY a = 200', N = 2
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON AND DEPAOLI

CANADIAN SUPERIOR EXPLORATION LIMITED
SMITHERS REGIONAL OFFICE

RED GROUP
CONTOURED PLAN PFE, N = 2

DRAWN BY: G.M.D.	DATE: JUNE 1975	SCALE: 1" = 400'
FIGURE: 5	TO ACCOMPANY 1975 GEOPHYSICAL REPORT	



LEGEND

CUT LINE

ROAD

APPARENT RESISTIVITY $\rho a/2\pi$ OHM FEET

CONTOUR INTERVAL 150, 200, 300, 500, 750, 1000, 1500

P-660 FREQUENCY DOMAIN I.P.
DIPOLE - DIPOLE ARRAY a = 200', N = 2
0.3 AND 5.0 HERTZ
OPERATORS: MORRISON AND DEPAOLI

CANADIAN SUPERIOR EXPLORATION LIMITED
SMITHERS REGIONAL OFFICE

RED GROUP
PLAN RESISTIVITY, N=2

DRAWN BY: G.M.D.	DATE: JUNE 1975	SCALE: 1" = 400'
FIGURE: 4	TO ACCOMPANY 1975 GEOPHYSICAL REPORT	

8W 4W 0 4E 8E 12E 16E 20E 24E 28E 32E 36E 40E

N

60 S

80 S

VERTICAL

VERTICAL

DIPPING SOUTH

NARROW, DEEP POSITION UNKNOWN

NARROW SHALLOW

PENDANTS OF LOWER RESISTIVITY ROCK

PROPOSED D.D.H. 4+00W, 66+00S 600' AT -90°

VERTICAL DIP

DIPPING SOUTH

VERTICAL DIP

DIPPING NORTH

VERTICAL

CAMP

NARROW, DEEP POSITION UNKNOWN

DIPPING SOUTH

DIPPING SOUTH

DIPPING NORTH

DIPPING SOUTH

DIPPING NORTH

DIPPING NORTH

PROPOSED D.D.H. 4+00E, 81+60S 400' AT -30°

NARROW, DEEP POSITION UNKNOWN

NARROW, DEEP POSITION UNKNOWN

NARROW, DEEP POSITION UNKNOWN

DEEP, POSITION UNKNOWN

OPEN

PROPOSED D.D.H. 32+00E, 30+50S 400' AT -30°

LEGEND

- CUT LINE
- ROAD
- DEDUCED LIMESTONE CONTACT AND DIP FROM PSEUDOSECTION ANALYSIS PROJECTED TO SURFACE
- INTERPRETED INTERLINE LIMESTONE CONTACT
- POSSIBLE INTERLINE LIMESTONE CONTACT
- APPARENT RESISTIVITIES INDICATIVE OF LIMESTONE
- COINCIDENT PFE VALUES > 3% PROJECTED TO SURFACE
- INTERPRETED PENDANTS OF LOWER RESISTIVITY ROCK
- POSSIBLE FAULTS
- RECOMMENDED DRILL HOLES

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 5552 MAP 4

5552
MAP 4

CANADIAN SUPERIOR EXPLORATION LIMITED
SMITHERS REGIONAL OFFICE

RED GROUP
GEOPHYSICAL INTERPRETATION

DRAWN BY: J.M.D.	DATE: JUNE 1975	SCALE: 1"=400'
FIGURE: 6	TO ACCOMPANY 1975 GEOPHYSICAL REPORT	