REPORT ON

INDUCED POLARIZATION SURVEY

FOR

AMOCO CANADA PETROLEUM COMPANY LIMITED

ON

THE "DOYLE" CLAIM GROUP
139° 14'W, 62° 38'N

WHITEHORSE MINING DISTRICT
YUKON TERRITORIES

BY

GEOTERREX LIMITED

Project 85-386

This report has been August 12 August 20, 1975
Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of
$ 9710.00

Resident Geologist or
~~Resident Mining Engineer~~

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

D.R. BAXTER
Supervising Mining Recorder

for Commissioner of Yukon Territory

OTTAWA, ONTARIO
SEPTEMBER, 1975

L. WILSON, B.A.
Geophysicist

P. NORGAARD, P. Eng.
Senior Geophysicist

geoterrex LTD

090040

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ACCOMPANYING THIS REPORT

"DOYLE" CLAIM GROUP

Claim Map

List of Claims

Expense Affidavit

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I. INTRODUCTION

In the period from July 2 to August 20, 1975, Geoterrex Limited of 2060 Walkley Road, Ottawa, Ontario, completed induced polarization surveys on three groups of claims located in the Coffee Creek Area of the Yukon Territory on behalf of Amoco Canada Petroleum Company Limited, Mining Division, Suite 2110, 65 Queen Street West, Toronto, Ontario.

The purpose of the induced polarization surveys was to map the subsurface distribution of polarizable material in areas of interest, within the three groups of claims, the locating of which were defined by geological and geochemical surveys.

The geophysical field programme was carried out by a five man crew under the supervision of David McManus, a Geoterrex staff geophysicist, and was further supervised by P. Norgaard, P. Eng., senior geophysicist and Geoterrex Vice-President.

Mr. Merv Tews, field geologist representing Amoco Canada Petroleum Company Limited, visited and assisted the crew during the course of the surveys.

A total of approximately 240,400 line feet of induced polarization survey including detailing, was completed in the above period. Of this total, 104,400 feet of survey was carried out on the "PATT" claim group, 64,800 feet on the "CC" claim group and 61,200 feet on the "DOYLE" claim group.

II. DESCRIPTION OF THE SURVEY AREAS AND CLAIMS COVERED

The claim groups are located in the Coffee Creek Area situated roughly 100 air miles north west of Carmacks, Yukon Territory. All three claim groups are located within the Whitehorse Mining District.

This report deals with the "DOYLE" claims which are located at latitude 62° 38'N and longitude 139° 14'W at the headwaters of Doyle Creek. Induced polarization work was completed on claims 1-40 inclusive. The grid layout on the claim groups was cut and marked by Amoco Canada Petroleum Company Limited.

III. PERSONNEL AND TIME DISTRIBUTION

The following is a list of the Geoterrex personnel necessary to the completion of the induced polarization survey including field work, compilation, interpretation of data and reporting; the list also indicates the number of eight (8) - hour man days, both Production and Standby, spent by each person on the project.

Name and Address	Production Days	Standby Days	Office
David C. McManus, Geophysicist 2060 Walkley Road Ottawa, Ontario	6	3	
David Garrard, Transmitter Operator 2060 Walkley Road Ottawa, Ontario	6	3	
Lloyd M. Wilson, Geophysicist 905 - 2470 Southvale Cres. Ottawa, Ontario	-	-	1

Three geophysical field assistants and all camping facilitites, subsistance, and transportation between Whitehorse and the Amoco field camp were provided by Amoco Canada Petroleum Company Limited at no expense to Geoterrex Limited.

The total Geoterrex charge to Amoco for the survey on the Patt claim group is as follows:

i)	Mob Demob		280.00
ii)	Survey Charge:	6 Production days @ 365	2190.00
		3 Standby days @ 275	825.00
iii)	Interpretation Report		400.00
			3695.00

IV. SURVEY INSTRUMENTS

Direct current, pulse-type induced polarization equipment was employed for the survey.

The following Geoterrex equipment was used:

SCINTREX IPR-2, 6 or 8	Induced Polarization Receivers
ELLIOT 1.5 KW or HUNTEC 2.5 KW	I.P. Transmitter

3 Johnson 5 watt CB Radio Transceivers, 3 DC sound powered hand telephones, reels, wire, stainless steel and porous pot electrodes and auxiliary equipment were also provided by Geoterrex Limited.

Detailed specifications for the Geophysical instruments employed are enclosed in the Appendix to this report.

V. SURVEY PROCEDURE

V.1 Survey Procedure

The induced polarization survey was completed using the pole-dipole electrode configuration which is illustrated in the Appendix to this report. The pole-dipole array is known as the equispaced three array when the three moving electrodes are spaced equidistant along the survey line for a particular reading.

For the reconnaissance coverage of the survey areas a 400 ft. dipole size employed with pole to dipole separations of 800 ft. and 1200 ft. The reading interval along the lines for the reconnaissance work was always 400 ft. for both of the pole-dipole separations.

For purposes of better definition and to aid in the interpretation, detailed work was completed on selected sections of lines using the equispaced three array and electrode spacings of 100 feet, 200 feet and 400 feet as required. For this detailed work the reading interval along the lines was equal to half the electrode spacing.

V.2 Data Observed

The field measurements taken are as follows:

i) The applied current, Ia, flowing through the two current electrodes.

ii) The primary voltage, Vp, which exists between the potential electrodes while the current is flowing.

iii) The apparent chargeability, Ma, which is the I.P. effect noted for one complete cycle; i.e. for two current pulses applied in opposite directions.

V.3 Data Reduction

From the observations of primary voltage, Vp, and the applied current, Ia, the apparent resistivity is calculated at each station as follows:

$$\rho_a = \frac{Vp}{Ia} \cdot K$$

Where ρ_a is the apparent resistivity in ohm-metres
Vp is the primary voltage in volts
Ia is the applied current in amps
K is a constant dependent on the array geometry

For the pole-dipole electrode array

$$K = 29\ (n)\ (n+1)$$

where a is the dipole length and n=1, 2, 3...etc.; na is the distance between the potential dipole and the moving current electrode.

The apparent chargeability, Ma, in milliseconds for the IPR-2 and IPR-6 and in millivolts per volt for the IPR-8, is read directly on the I.P. receiver. As mentioned earlier in this report, the chargeability is measured for a complete cycle rather than per single pulse. The chargeability readings obtained with the IPR-8 mode employed for this survey are 0.7 times the readings obtained with the IPR-2 and IPR-6.

All the readings on the "PATT" claim group were obtained using the IPR-8 receiver reading the middle slice of mode 2.

VI. DATA PRESENTATION

The apparent chargeability and apparent resistivity data are presented in profile form on plates accompanying this report at a scale of 1 inch 800 feet. The apparent chargeability results are plotted at a vertical scale of 1 inch = 10.0 millivolts/volt or milliseconds and the apparent resistivities in ohm-meters at a logarithmic scale of 1 inch per cycle.

For the sake of clarity of presentation of the results, the lines are not spaced to scale on the profile plots.

The reconnaissance chargeability values are also presented in contoured form at a scale of 1 inch = 400 feet and with a contour interval of 2.0 milliseconds. The reconnaissance resistivity values are presented in contoured form at a scale of 1 inch = 400 feet and with a logarithmic contour interval as shown on the plates.

The apparent chargeability and apparent resistivity data for the detailed I.P. surveying over selected lines are also presented in profile form at varying horizontal and vertical scales as shown on the plates.

VII. DISCUSSION OF RESULTS

Background apparent chargeabilities and resistivities show very little variation throughout the entire grid. Slight increases in the apparent chargeability level of the order of one to two milliseconds generally relate to increases in the apparent resistivity level a phenomenon generally related to the thickening and thinning of the relatively conductive overburden material.

On the basis of the geophysical results alone no obvious exploration target was outlined and no detailed work was carried out on this grid.

Respectfully submitted,

Lloyd M. Wilson

Lloyd Wilson, B.A.
Geophysicist.

Peer Norgaard, P. Eng.
Senior Geophysicist.

REGISTERED PROFESSIONAL ENGINEER
P. NORGAARD
PROVINCE OF ONTARIO

geoterrex ltd

THE INDUCED POLARIZATION METHOD

The Induced Polarization method is based on the electro-chemical phenomenon of "over-voltage", that is, on the establishment and detection of double layers of electrical charge at the interface between ionic and electronic conducting material when an electrical current is caused to pass across the interface.

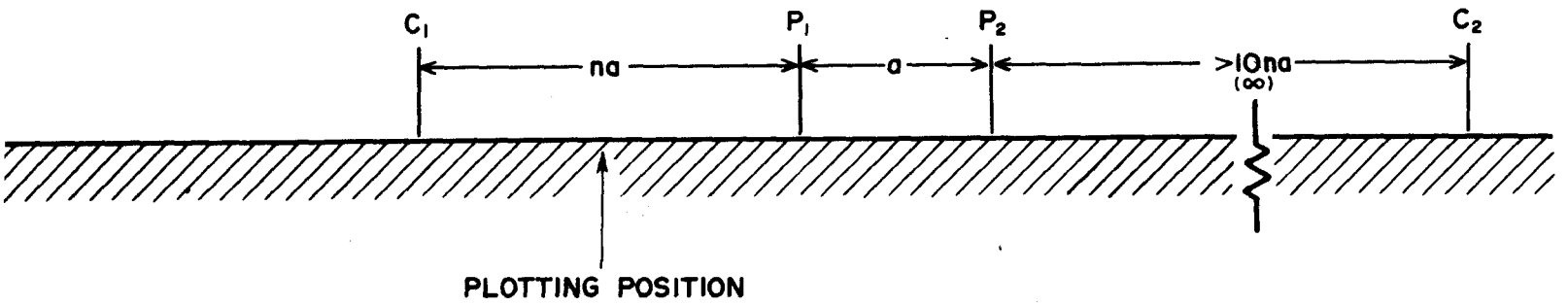
All naturally occurring sulphides of metallic lustre, some oxides and graphite, give marked induced polarization responses when present in sufficient volume even when such materials occur in low concentrations and in the form of discrete unconnected particles. Thus induced polarization is the only method available which has general application to the direct detection of disseminated sulphide deposits.

Each rock and soil type exhibits appreciable induced polarization response, usually confined to a relatively low amplitude range, which is characteristic of the mineral or soil. However certain clays and "laminar" minerals including serpentine, sericite and chlorite may give rise to anomalous response. These effects are attributed largely to "membrane" polarization.

In order to measure I.P. effects in a volume of rock a current is caused to flow through it via two current electrode contact points and resulting potential differences are measured across two potential electrode contact points.

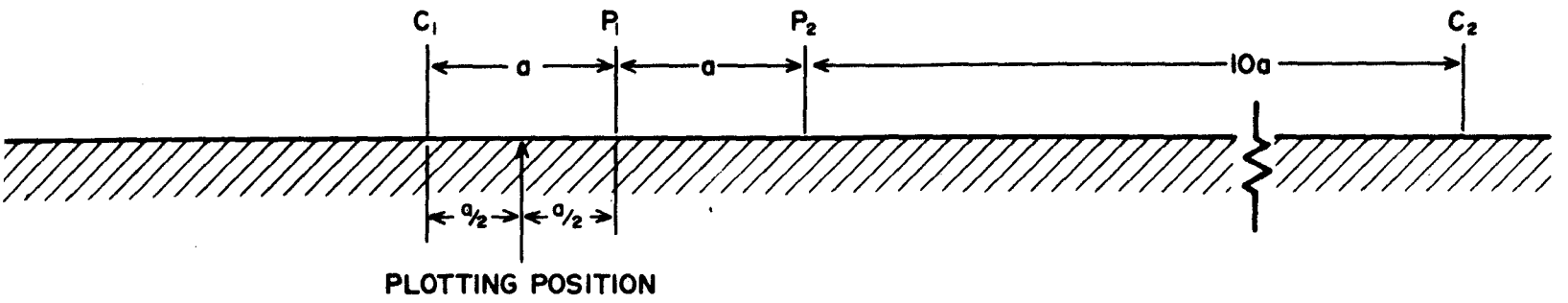
In practice two different techniques are used, namely "Time Domain" and "Frequency Domain". In the Time Domain technique which was employed for this survey a direct current is allowed to flow for several seconds and then cut off. The decay of the polarization voltages built up, during the passage of the current is then studied after the current is switched off. In the Frequency Domain technique a Sine wave current form of two low but well separated frequencies is used. Since polarization effects take an appreciable time to build up the response at the lower frequency will be greater so that apparent resistivities or transfer impedances between the current and measuring circuits will be larger at that lower frequency.

POLE-DIPOLE ELECTRODE ARRAY

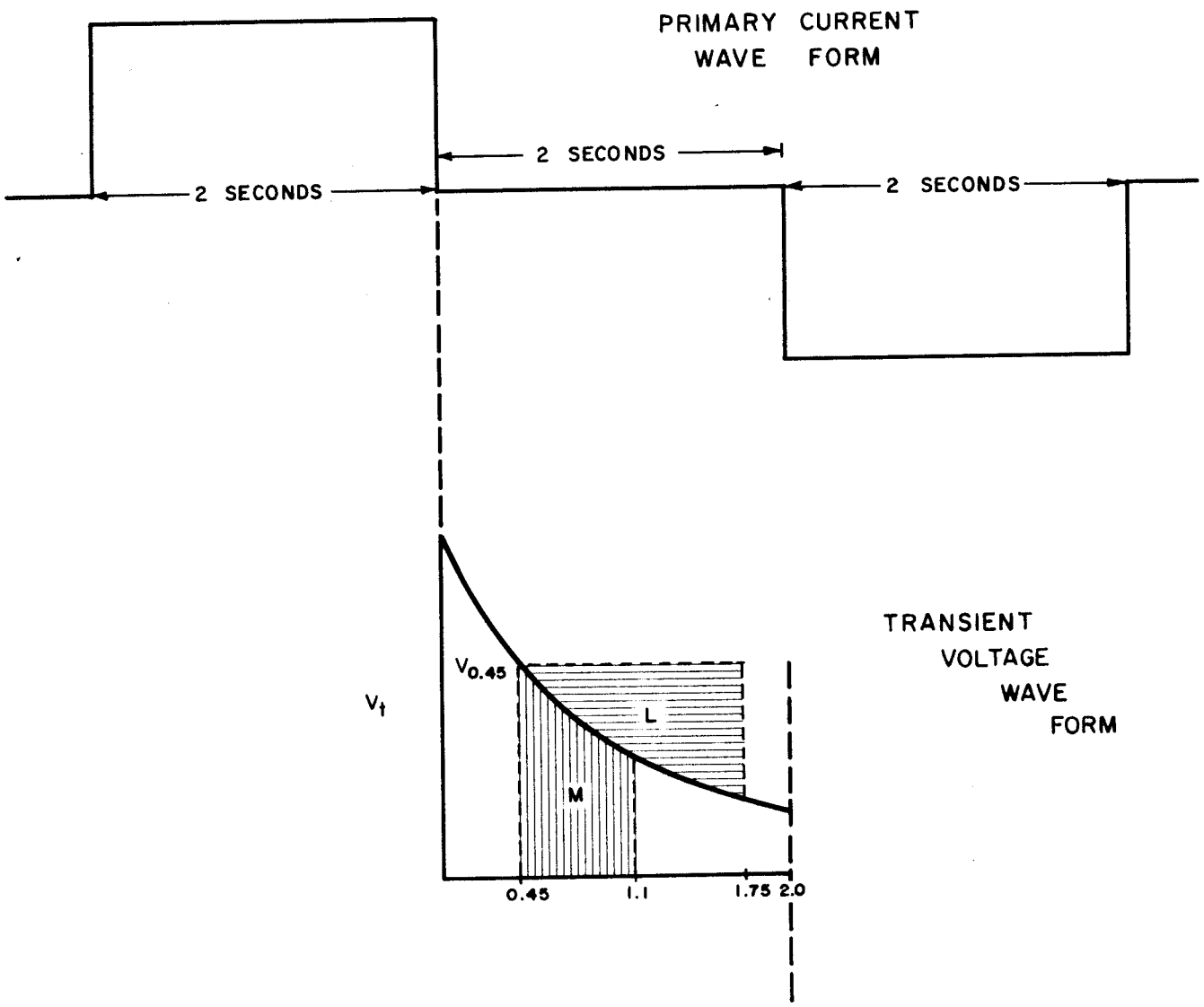


P_1 P_2 POTENTIAL ELECTRODES
C_1 C_2 CURRENT ELECTRODES
a DIPOLE LENGTH
n = 1, 2, 3, 4, ...

EQUISPACED THREE ELECTRODE ARRAY



POLE-DIPOLE ELECTRODE CONFIGURATIONS.

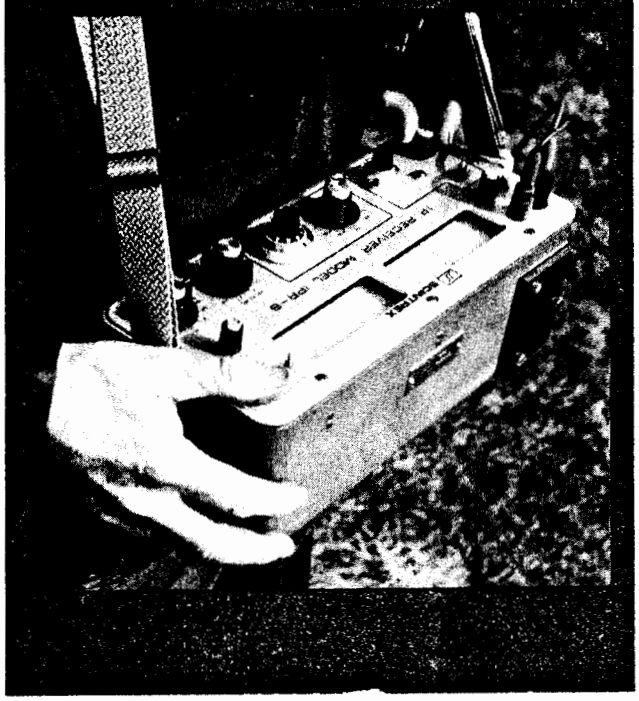


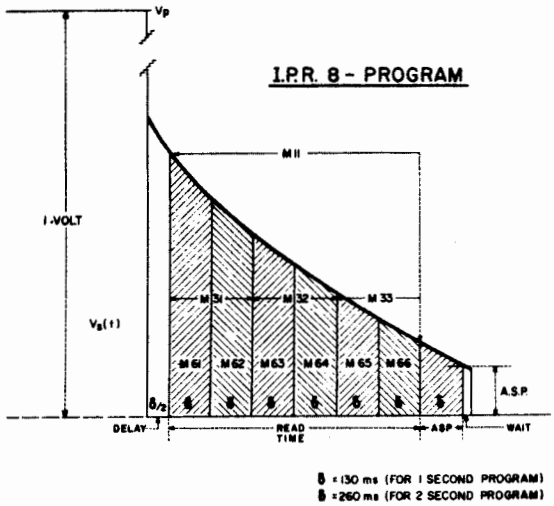
NEWMONT - TYPE TIME DOMAIN WAVE FORMS
AND QUANTITIES MEASURED

TECHNICAL DESCRIPTION OF IPR-8 RECEIVER

SCINTREX

Input Impedance	3.3 megohms
50 or 60 Hz Powerline Rejection	-50 db (300x)
Primary Voltage Range	300 microvolts to 40 volts in 10 ranges
Accuracy of Vp Measurement	±3% of full scale
Vs/Vp Range	2% and 10% (20 and 100 per mil) full scale
Vs/Vp Accuracy	3% of full scale
Primary SP Buckout Range	± 1 volt
Automatic SP Tracking Range	6 x Vp, maximum ± 1 volt
Continuity Meter Reading	0 - 500 k ohms
Required Stability of Transmitter Timing	Need only exceed measuring program selected (1 second or 2 seconds)
Operating Temperature Range	-30°C to + 60°C
Dimensions	31 cm x 15 cm x 17 cm
Weight, Complete With Lid and Batteries	3.6 kg
Power Supply	4 D cells; estimated battery life 2 months intermittent duty at 25°C





δ = 130 ms (FOR 1 SECOND PROGRAM)
δ = 260 ms (FOR 2 SECOND PROGRAM)

IPR-2&6 NEWMONT TYPE RECEIVER SPECIFICATIONS

Electrical:

Primary Voltage Range	300 microvolts to 30V Accuracy ± 3%
Input Impedance	300 K ohms
Chargeability (M) Reading Range	0-100 and 0-3-- milliseconds Accuracy ± 5%
Curve Factor (L) Reading Range	0-100 and 0-300 milliseconds Accuracy ± 5%
Delay Time Before Integration	0.45 seconds
SP and VLF Noise Compensation	Manual: ± 1.5 millivolts Automatic: 1mV range ± 10mV total 30 mV range ± 1V total
Power Supply	Internal rechargeable nickel cadmium batteries. Rated life 45 hours/charge.
Temperature Range	-20° to 30°F (-29°C to +55°C)
Humidity Range	to 100% non-condensing

Mechanical:

Weight	13½ lb. (6.1 kg) including batteries
Dimensions	14"x11"x6½" (35.5 cm x 28 cm x 16.5 cm)

ELLIOTT GEOPHYSICAL COMPANY

1.5 KW I.P. TRANSMITTER

SPECIFICATIONS:

INPUT POWER	120 volt 400 Hz single phase at 1800 VA, relatively insensitive to input voltage/frequency regulation
OUTPUT POWER	1500 watts
OUTPUT VOLTAGE	200 to 3000 volts in 12 switch selected steps
OUTPUT CURRENT	5 amp. maximum
OUTPUT IMPEDANCE DRIVE	40 ohms to over 10,000 ohms
TIME CYCLE	On/off periods (symmetrical) adjustable at factory from 0.5 to 10 seconds
TEMPERATURE RANGE (AMBIENT)	$-15^{\circ}C$ to $+60^{\circ}C$ ($+5^{\circ}F$ to $140^{\circ}F$)
WEIGHT, COMPLETE WITH CASE	45 pounds
DIMENSIONS, INCASE	10.5 inches high by 16 inches wide by 11.5 inches deep

Power Supply for 1.5 KW IP Transmitter
Specifications

manufactured by McPhar Geophysics Limited

Output	voltage	125 volts
	frequency	400 Hz
	power	2.5 KVA
Engine		Briggs & Stratton 7 HP

INDUCED POLARIZATION TRANSMITTER

2.5 KW SYSTEM

Output	300-5000 volts DC in 8 steps 3 amps maximum
Input	3 phase 400 cps 115 volt 2.75 KVA
Output	2 ranges
Current Meter	0-1.5 amps and 0-3 amps ± 2%
Dummy Load	2 level - 1750 watts and 500 watts
Size	21" x 17" x 11½" (53.1 cm x 43.2 cm x 29.3 cm)
Weight	Console 50 lbs. (22.7 kg) Shipping weight 75 lbs. (34.0 kg).

MOTOR GENERATOR SET

Output	2.75 KW, 120 volts 400 cycle 3 phase 13.8 amps / phase
Engine	Briggs and Stratton 6 HP at 3600 RPM
Fuel	Capacity: 0.92 Imperial Gals. (4.1 litres). Consumption: Approximately 1.2 lbs / KWH (.5 kg / KWH)
Alternator	6000 RPM Belt Driven. Sealed bearing, rotating field, 70 lbs. approximately.

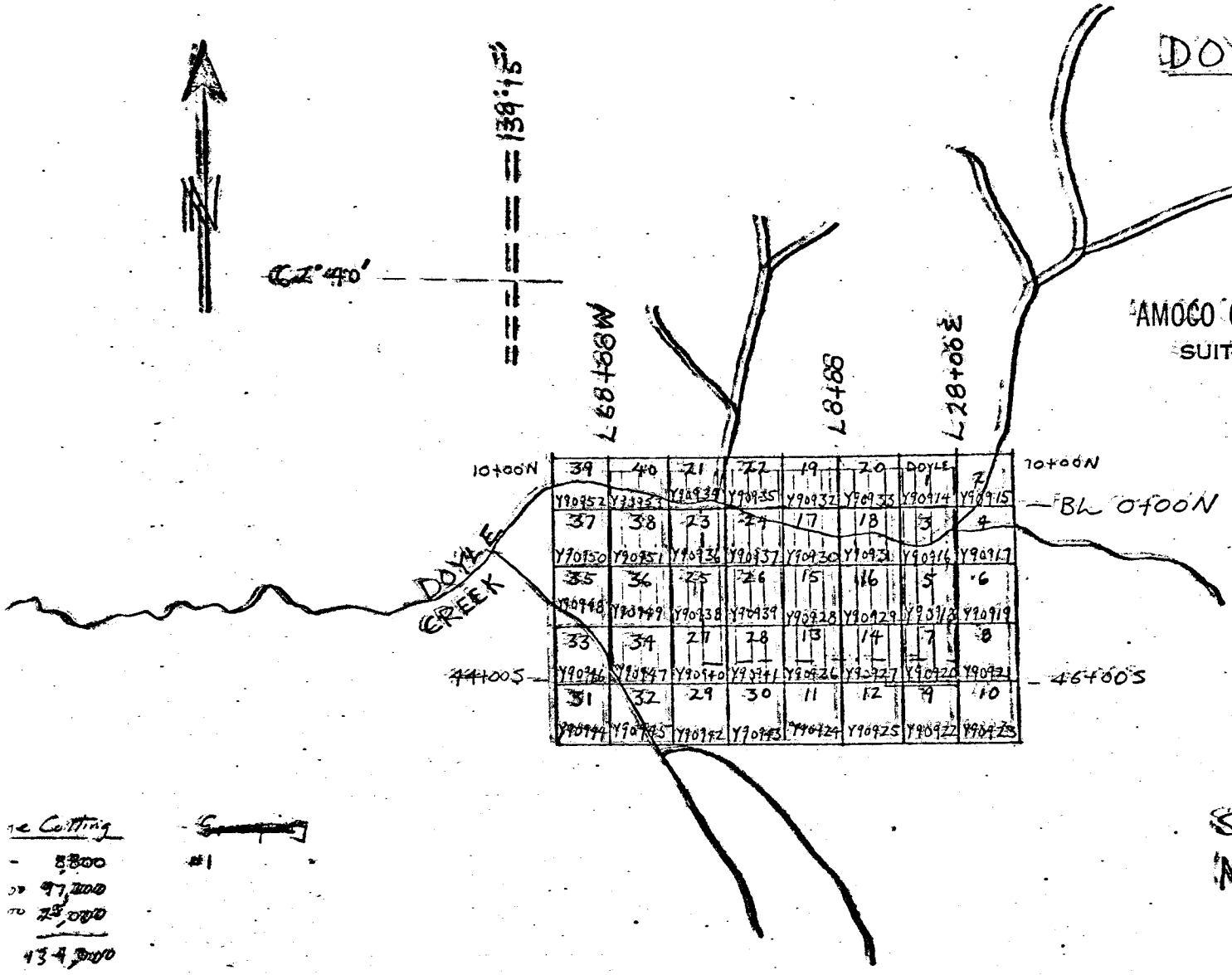
DOYLE CLAIM GROUP

40 claims 1-40

Y 909 14 to

Y 909 53 inclu.

AMOCO CANADA PETROLEUM COMPANY LTD.
SUITE 2010 - 65 QUEEN ST. WEST
TORONTO 1, ONTARIO



Scale: 1: 50,000

NTS: 115 F 11

e Cutting

- 8800
- 97,200
- 25,000

134,000

25.38 miles

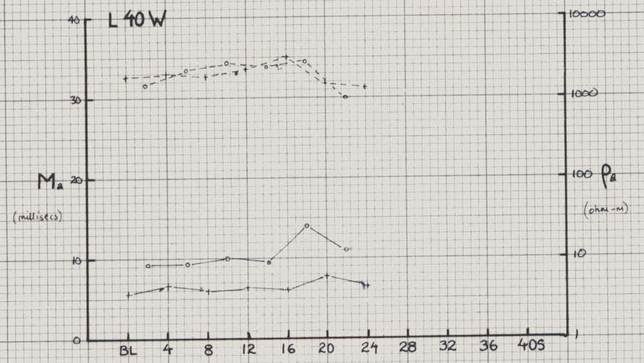
26M.

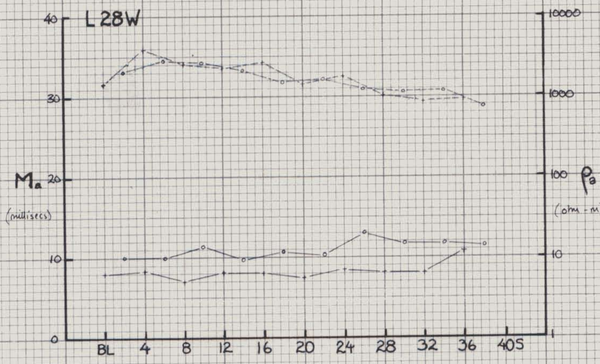
AMOCO CANADA PETROLEUM COMPANY LTD.
SUITE 2010 - 65 QUEEN ST. WEST
TORONTO 1, ONTARIO

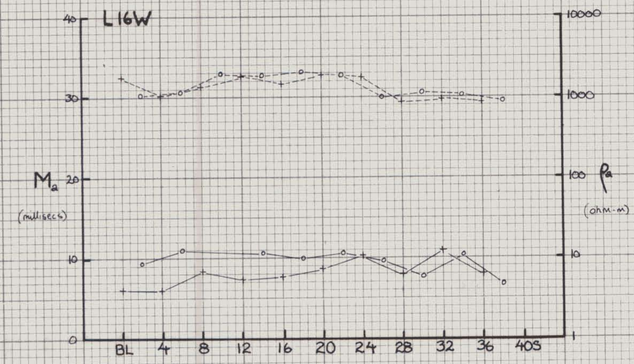
DOYLE GROUP 115 J 11

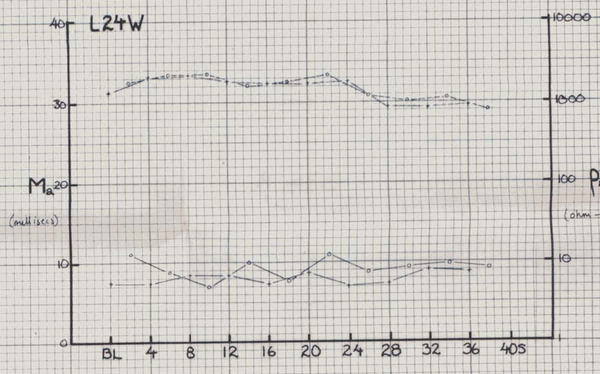
-LIST 2-

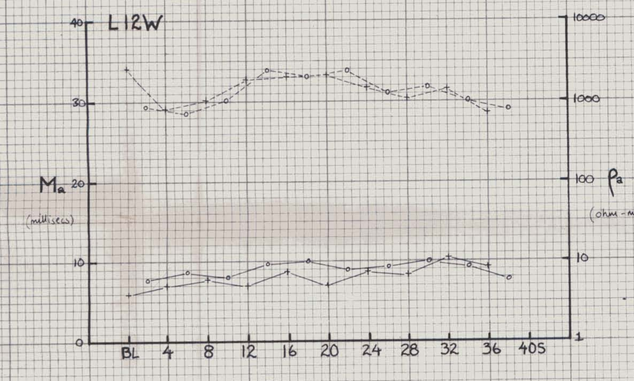
Y 90914	DOYLE 1	Y90934	DOYLE 21
15	2	35	22
16	3	36	23
17	4	37	24
18	5	38	25
19	6	39	26
20	7	40	27
21	8	41	28
22	9	42	29
23	10	43	30
24	11	44	31
25	12	45	32
26	13	46	33
27	14	47	34
28	15	48	35
29	16	49	36
30	17	50	37
31	18	51	38
32	19	52	39
Y909 33	DOYLE 20	Y909 53	DOYLE 40

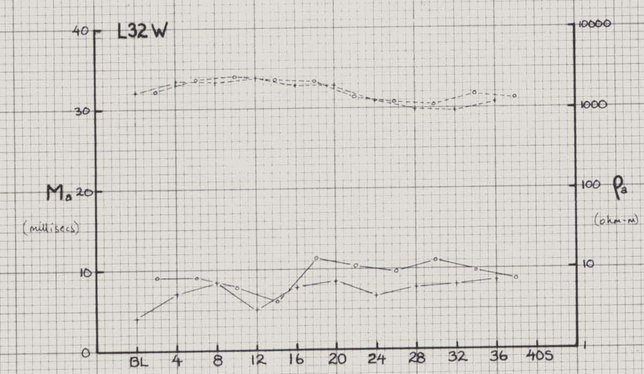


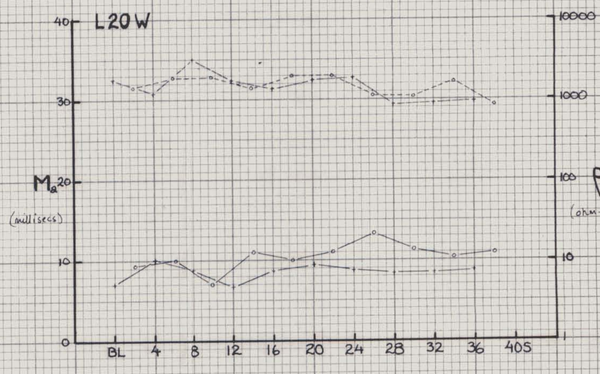












LEGEND

a = 400'

M_a n=2 ——+——+——

n=3 o——o——o

ρ_a n=2 +.....+.....+

n=3 o.....o.....o

SURVEYED & COMPILED BY geoterrex ltd

FOR AMOCO CANADA PETROLEUM CO. LTD.

POLE DIPOLE RECONNAISSANCE

LINES 40W to 8W

Scales: 1": 800'
1": 10 milliseconds
1": resistivity logarithmic cycle

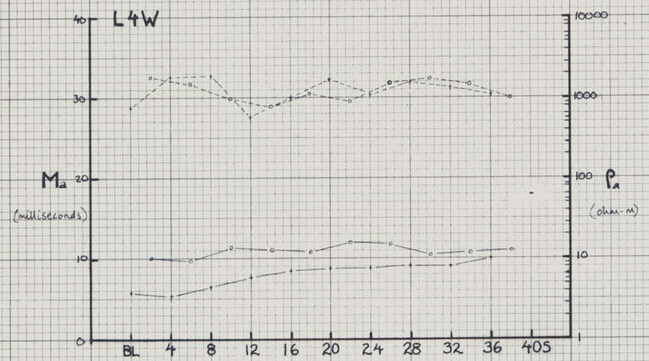
"DOYLE" CLAIM GROUP

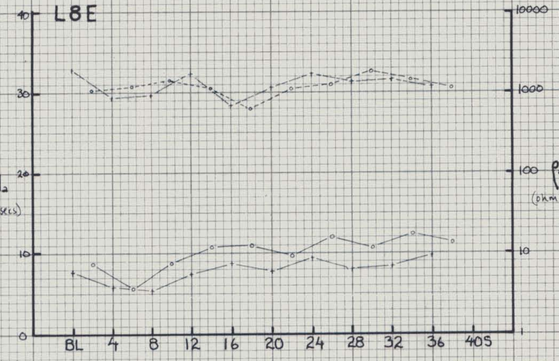
PLATE I

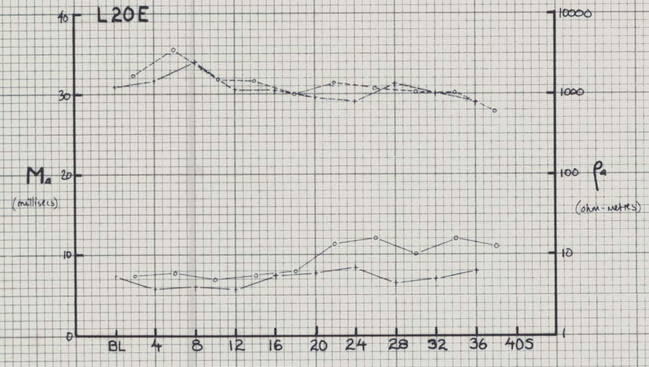
Instruments:

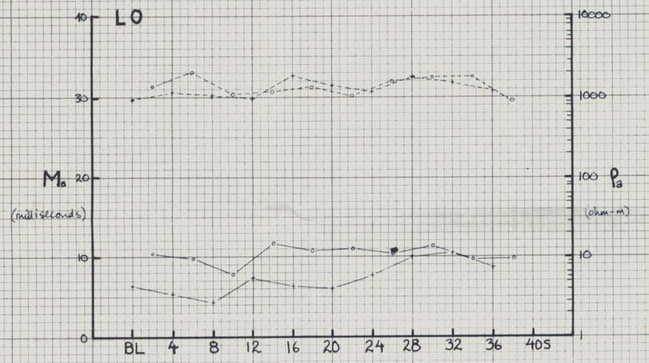
SURVEY BY D.M. & D.G. | PLOTTED BY: D. M.

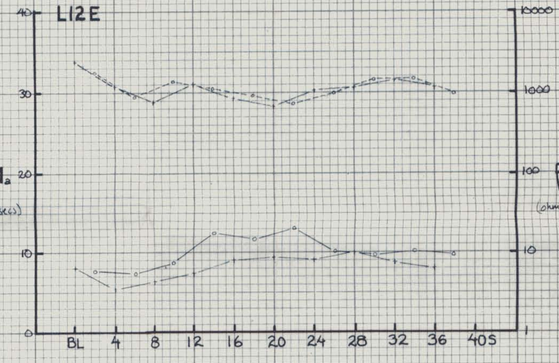
DATE AUG. 1975 | GEOTERREX PROJECT No. 85-386











LEGEND

a = 400'

Ma		Ca
+ ——— +	n=2	+ - - - - +
o ——— o	n=3	o - - - - - o

SURVEYED & COMPILED BY geoterrex ltd

FOR AMOCO CANADA PETROLEUM CO. LTD

POLE DIPOLE RECONNAISSANCE LINES 4W to 28E

Scales: 1": 800'
1": 10 milliseconds
1": resistivity logarithmic cycle

"DOYLE" CLAIM GROUP

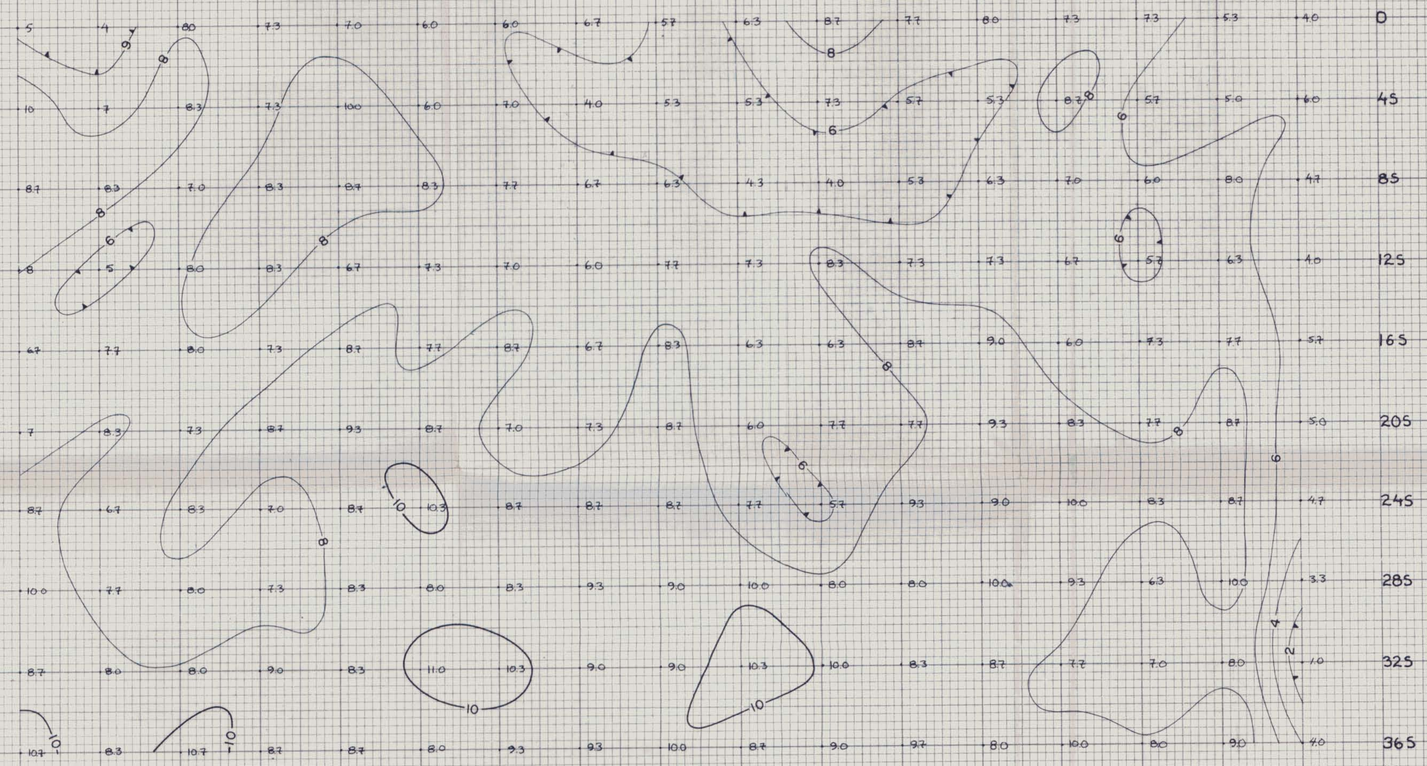
PLATE II

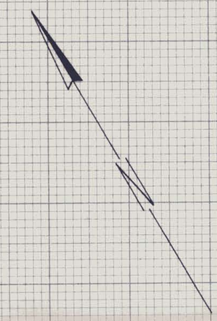
Instruments:

SURVEY BY D.M. & D.G. PLOTTED BY D.M.

DATE AUG. 1975 GEOTERREX PROJECT No. 80-386

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





SURVEYED & COMPILED BY: geoterrex ltd

ANOCO CANADA FOR PET. CO. LTD.
MINING DIVISION

CHARGEABILITY CONTOUR PLAN a = 400' n = 2

Scales: 1" = 400 FEET

CONTOUR INTERVAL: 2 MILLISECONDS

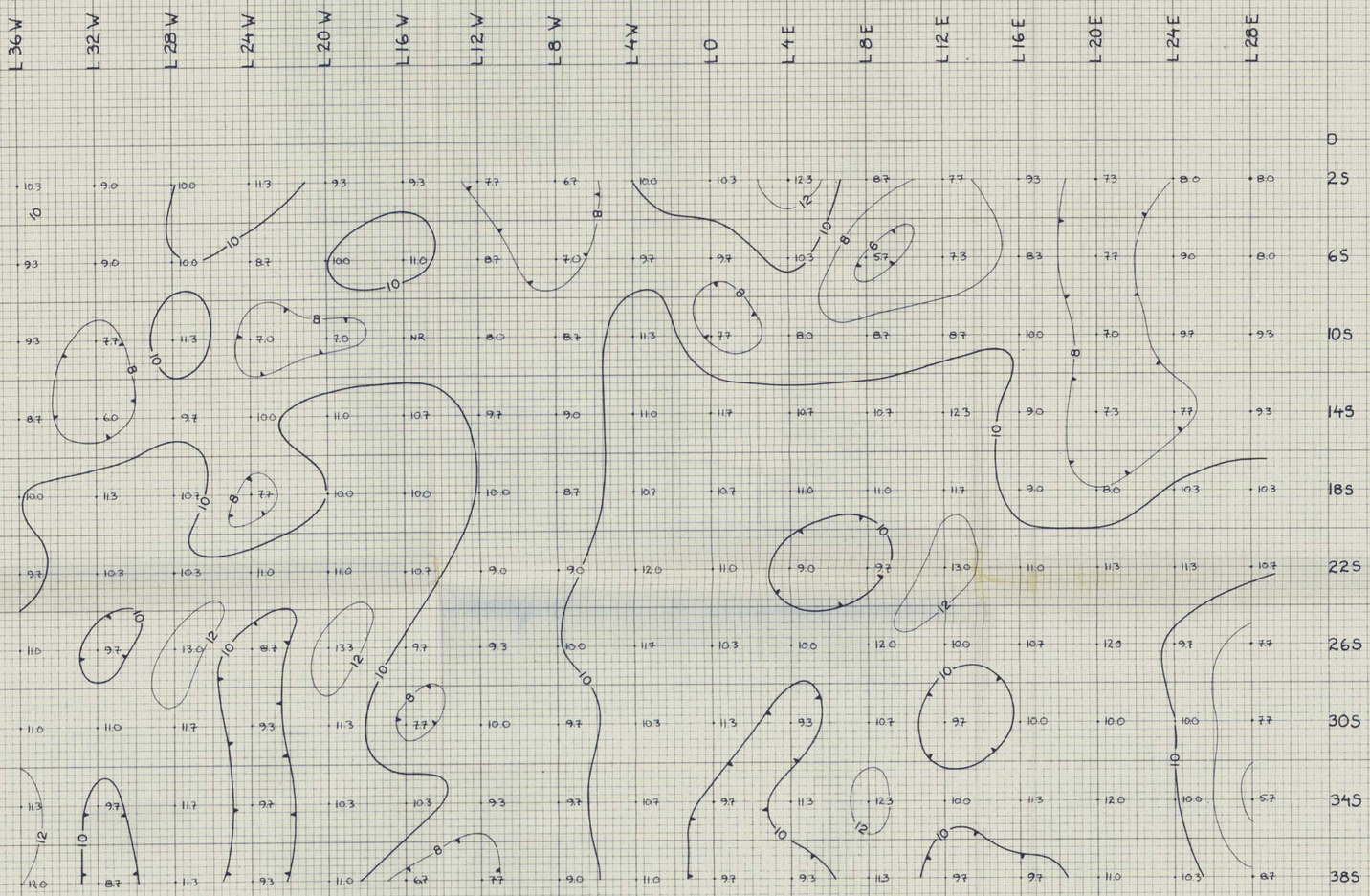
Instruments:

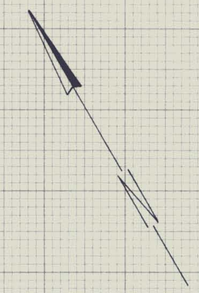
"DOYLE" CLAIM GROUP

PLATE III

SURVEY BY: D.M. & D.G. PLOTTED BY: D.M.

DATE: AUG., 1975 GEOTERREX PROJECT No. 85-380





SURVEYED & COMPILED BY
geoterrex ltd

FOR
AMOCO CANADA PET. CO. LTD
MINING DIVISION

CHARGEABILITY CONTOUR PLAN a = 400' n = 3

Scales: 1" = 400 FEET

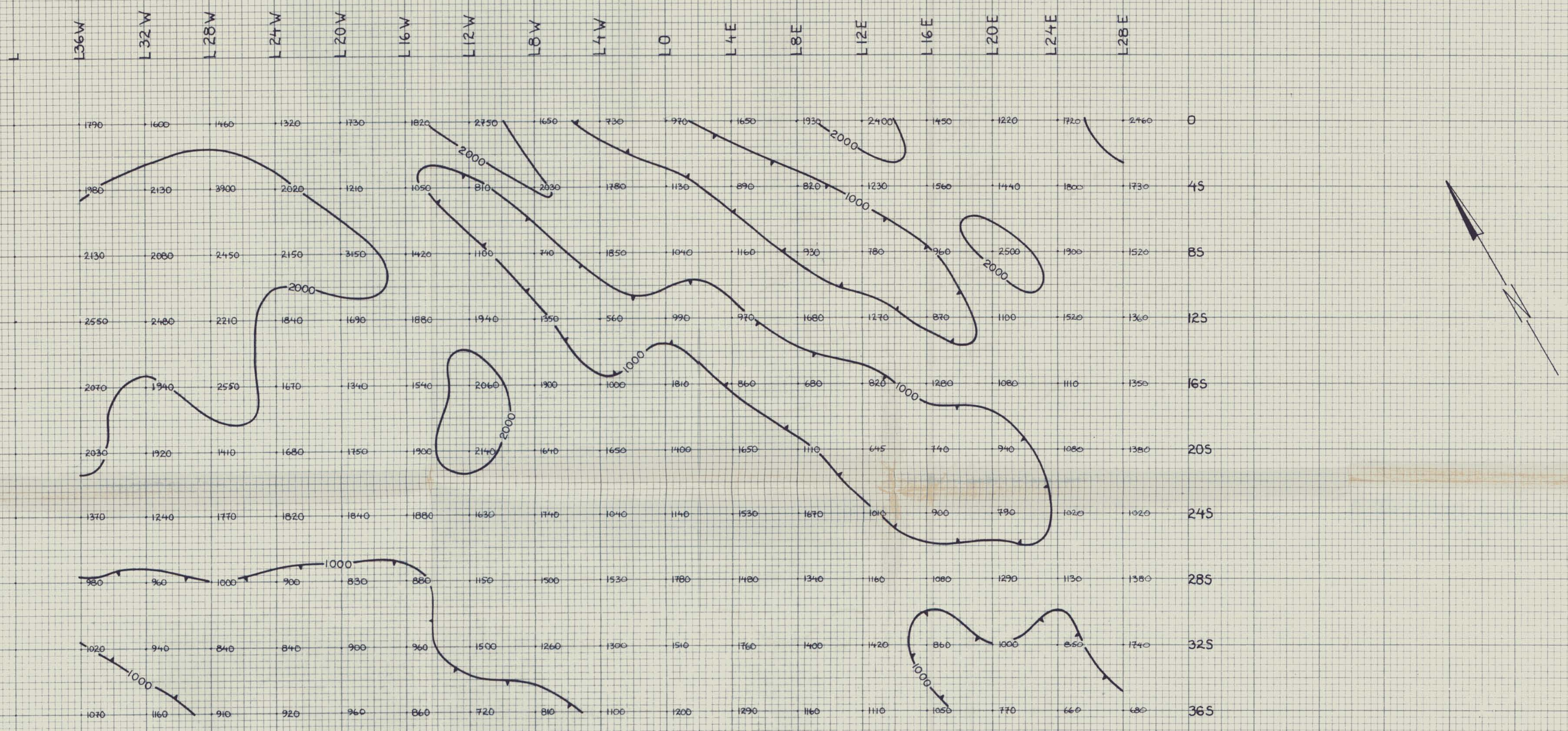
"DOYLE" CLAIM GROUP

CONTOUR INTERVAL: 2 MILLISECONDS

PLATE IV

Instruments:

SURVEY BY D.M. & D.G. | PLOTTED BY D.M.
DATE AUG. 1975 | GEOTERREX PROJECT No. 80-38



SURVEYED & COMPILED BY **geoterrex** ltd

AMOCO CANADA FOR PET. CO. LTD.
MINING DIVISION

RESISTIVITY CONTOUR PLAN a = 400' n = 2

Scales: 1" = 400 FEET

"DOYLE" CLAIM GROUP

PLATE V

CONTOUR INTERVAL: LOGARITHMIC (1, 2, 5, 10, ...)

Instruments:

SURVEY BY D.M. & D.G.	PLOTTED BY D.M.
DATE AUG. 1975	GEOTERREX PROJECT No 85-386

39 Y90952 | 40 Y90953 | 21 Y90934 | 22 Y90935 | 19 Y90932 | 20 Y90933 | DOYLE 1 Y90914 | 2 Y90915

L36W L32W L28W L24W L20W L16W L12W L8W L4W L0 L4E L8E L12E L16E L20E L24E L28E

0
25
65
105
145
185
225
265
305
345
385

37 Y90950 | 38 Y90951 | 23 Y90936 | 24 Y90937 | 17 Y90930 | 18 Y90931 | 3 Y90916 | 4 Y90917

35 Y90948 | 36 Y90949 | 25 Y90938 | 26 Y90939 | 15 Y90928 | 16 Y90929 | 5 Y90918 | 6 Y90919

33 Y90946 | 34 Y90947 | 27 Y90940 | 28 Y90941 | 13 Y90926 | 14 Y90927 | 7 Y90920 | 8 Y90921

31 Y90944 | 32 Y90945 | 29 Y90942 | 30 Y90943 | 11 Y90924 | 12 Y90925 | 9 Y90922 | 10 Y90923

SURVEYED & COMPILED BY geoterrex ltd

FOR AMOCO CANADA PET. CO. LTD MINING DIVISION

RESISTIVITY CONTOUR PLAN a = 400' n = 3

Scales: 1" = 400 FEET

CONTOUR INTERVAL: LOGARITHMIC (1, 2, 5, 10, ...)

Instruments:

"DOYLE" CLAIM GROUP

PLATE VI

SURVEY BY D.M. E.D.G. PLOTTED BY D.M.

DATE AUG. 1975 GEOTERREX PROJECT No. 85-38