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OEL 20 & 21

COOPER BASIN

1966 MOOMBA STRUCTURE SEISMIC SURVEY FINAL REPORT

Submitted by

Delhi Australian Petroleum Ltd.
1967

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PRIMARY INDUSTRIES AND RESOURCES SA

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NUMBER 710

OEL 20 AND OEL 21

EROMANGA, COOPER AND WARBURTON BASINS

1966 MOOMBA PROSPECT SEISMIC AND GRAVITY SURVEY

FINAL REPORT

Submitted by

Delhi Australian Petroleum Ltd

1967

MINES AND ENERGY
SOUTH AUSTRALIA

Enquiries: Information Services Branch
Mines and Energy South Australia
191 Greenhill Road, Parkside 5063
Telephone: (08) 274 7687
Facsimile: (08) 272 7597

ENVELOPE 710

TENEMENT: OEL 20 and OEL 21; Eromanga, Cooper and Warburton Basins

TENEMENT HOLDER: Delhi Australian Petroleum Ltd (operator) and Santos Ltd

CONTENTS

END OF CONTENTS

710

000003

Seismic Survey

for

DELHI AUSTRALIAN PETROLEUM LTD.

by

UNITED GEOPHYSICAL CORPORATION

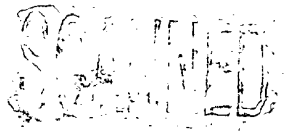
Party 133

MOOMBA STRUCTURE PROSPECT

South Australia

Australia

June-July 1966



CONTENTS

ILLUSTRATIONS

UNITED GEOPHYSICAL

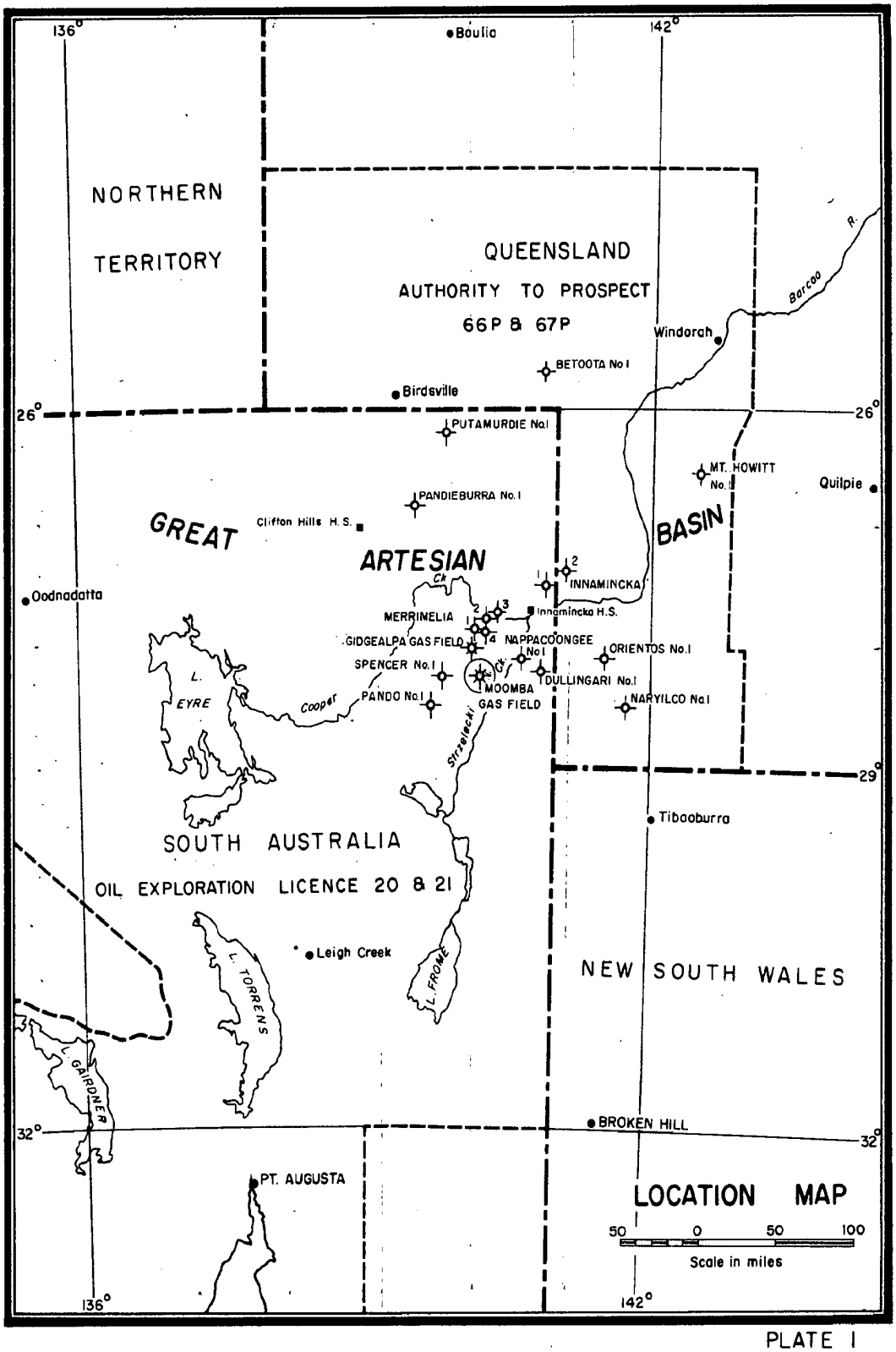

136°
142°
Boulia
NORTHERN
TERRITORY
QUEENSLAND
AUTHORITY TO PROSPECT
66P & 67P
Barcoo R.
Windorah
BETOOTA No 1
Birdsville
26°
PUTAMURDIE No.1
MT. HOWITT No.1
Quilpie
PANDIEBURRA No.1
Clifton Hills H.S.
GREAT
ARTESIAN
BASIN
Ck
INNAMINCKA
Innamincka H.S.
Oodnadatta
MERRIMELIA
GIDGEALPA GAS FIELD
NAPPACOONGEE No.1
ORIENTOS No.1
SPENCER No.1
MOOMBA GAS FIELD
DULLINGARI No.1
NARYILCO No.1
PANDO No.1
L. EYRE
Cooper
Strzelecki
29°
Tibooburra
SOUTH AUSTRALIA
OIL EXPLORATION LICENCE 20 & 21
Leigh Creek
L. TORRENS
L. FROME
NEW SOUTH WALES
L. GAIRDNER
32°
BROKEN HILL
PT. AUGUSTA
LOCATION MAP
50 0 50 100
Scale in miles

PLATE 1

ABSTRACT

A seismic survey was conducted on the Moomba Structure Prospect for Delhi Australian Petroleum Ltd., (Operator) and Santos Ltd., by United Geophysical Corporation Party 133 during the period June 19 to July 23, 1966. The survey was performed within South Australian Oil Exploration Licences 20 and 21, and its purpose was to provide greater density of control on which to base calculation of gas reserves in the structure and on which to base selection of future drill sites.

INTRODUCTION

The seismic survey was conducted on behalf of Delhi Australian Petroleum Ltd., Adelaide, S.A., within Oil Exploration Licence numbers 20 and 21 in South Australia. Refer to location map (Plate 1) included in this report. This survey was not included in the Eromanga - Frome Seismic Survey nor covered by the Petroleum Search Subsidy Act 1959-1961.

The geophysical contractor was United Geophysical Corporation with main offices in Pasadena, California, U.S.A. and Australian offices in Brisbane and Toowoomba, Queensland; Perth, Western Australia and in Adelaide, South Australia. Seismic Party 133 conducted the survey. Details of equipment and personnel are given in Appendix 1 and 2.

Topography of the prospect was flat to high rolling sand dunes. A bull dozer was necessary to clear the shotpoint lines.

The detail program was worked from one camp. Access provided by previously dozed lines facilitated operations. The climate was generally dry but occasional rain occurred. The winds were normally light to moderate, but occasional high winds curtailed operations.

Statistics are presented in Appendix 3.

PURPOSE OF THE SURVEY

Previous seismic and gravity work in the area outlined a large, gently folded anticline. The drill site for Moomba No. 1. was based on this information. Drill -stem tests in this well revealed an accumulation of gas in the upper Permian. The Moomba No. 2 was drilled some three miles away and it also tested gas in commercial quantities.

The objective of Moomba Structure Seismic and Gravity Survey was to provide greater density of control on which to base calculations of gas reserves and on which to base selection of future drill sites.

REGIONAL GEOLOGY *

The Moomba anticline is located slightly to the south-east of the main axis of the Cooper's Creek basin. This basin is the most westerly sub-basin of the Great Artesian Basin which covers much of central and eastern Australia. The field is approximately 20 miles to the south-east of Gidgealpa.

Moomba is a large, undulate, gently folded anticline with a substantial Permian section, the upper member of which is productive of gas. Structure in Permian and younger beds is relatively simple but the pre-Permian rocks are complicated and their stratigraphic and structural relationships with each other are unknown. The Moomba No. 1 well bottomed in granite which has been dated by radiometric methods as being Carboniferous in age. Moomba No. 2, three and one half miles to the southwest, drilled into rocks dipping 62° to 75° which are believed to be Ordovician in age.

The Moomba anticline differs from other, more typical Cooper's Creek basin anticlines in being located much nearer the centre of the basin and consequently having more complete Permian section with little or no truncation within this interval. Folding is much less severe in the Permian and younger beds than it is, for example, at Merrimelia and Gidgealpa.

*(Provided by Mr. Langdon Smith - Delhi Australian Petroleum Ltd.)

FIELD PROCEDURES

Split spreads of 2640 ft. with 9EVS geophones/trace spaced at 18 ft. intervals were used on all lines except lines MX and MV. These two lines were shot with 1800 ft. split spreads with 18 geophones/trace spaced at 12 ft. intervals. The geophones were placed on terrain with a common elevation in areas where there were abrupt changes in topography.

Recordings were made on magnetic tape with a wide filter band. Playbacks were made without mix using a 5-7 filter setting (down 6db at 20 and 66 cycles per second).

Record quality was fair.

Single shot holes averaging 120 ft. in depth, bottomed in clay, were used on all lines except MV where three hole patterns were used. All shot holes were drilled with water.

An average charge of 30 lbs. was used. Comparison shots were taken daily in order to maintain opitmum charge size.

A Bulldozer was used to clear the shotpoint line and to make access roads where necessary.

All shot points were established by chained distance. Horizontal and vertical ties were made by a transit to previous work done by United Geophysical Corporation.

The detail program consisted of lines designated MR through ND.

INTERPRETATION AND COMPUTATION PROCEDURES

Four uphole velocity surveys were taken at various sites in the project. The sub-weathering velocities varied from 5800 to 6500 ft./sec. (See Plates No. 2 - 5)

Reflection times were corrected to sea level datum using a correction velocity of 6500 ft./sec. by the use of the Uphole Method of computation. (See Plate No. 6)

The magnetic tapes with static trace corrections were submitted to the Petty Geophysical Engineering Corporation playback centre for processing of fully corrected clipped variable area with wiggly line recording sections.

The interpretation was based on data taken from the record sections. Record sections of previous work in the area were reviewed and the results of the detailed program incorporated.

A correction of .017 seconds was added to all lines proceeding the EA series to tie to the Port Augusta Mean Sea Level Datum (-53.4 feet correction). This correction was first used in August 1965.

Corrected reflection times were converted to depth by use of average velocities.

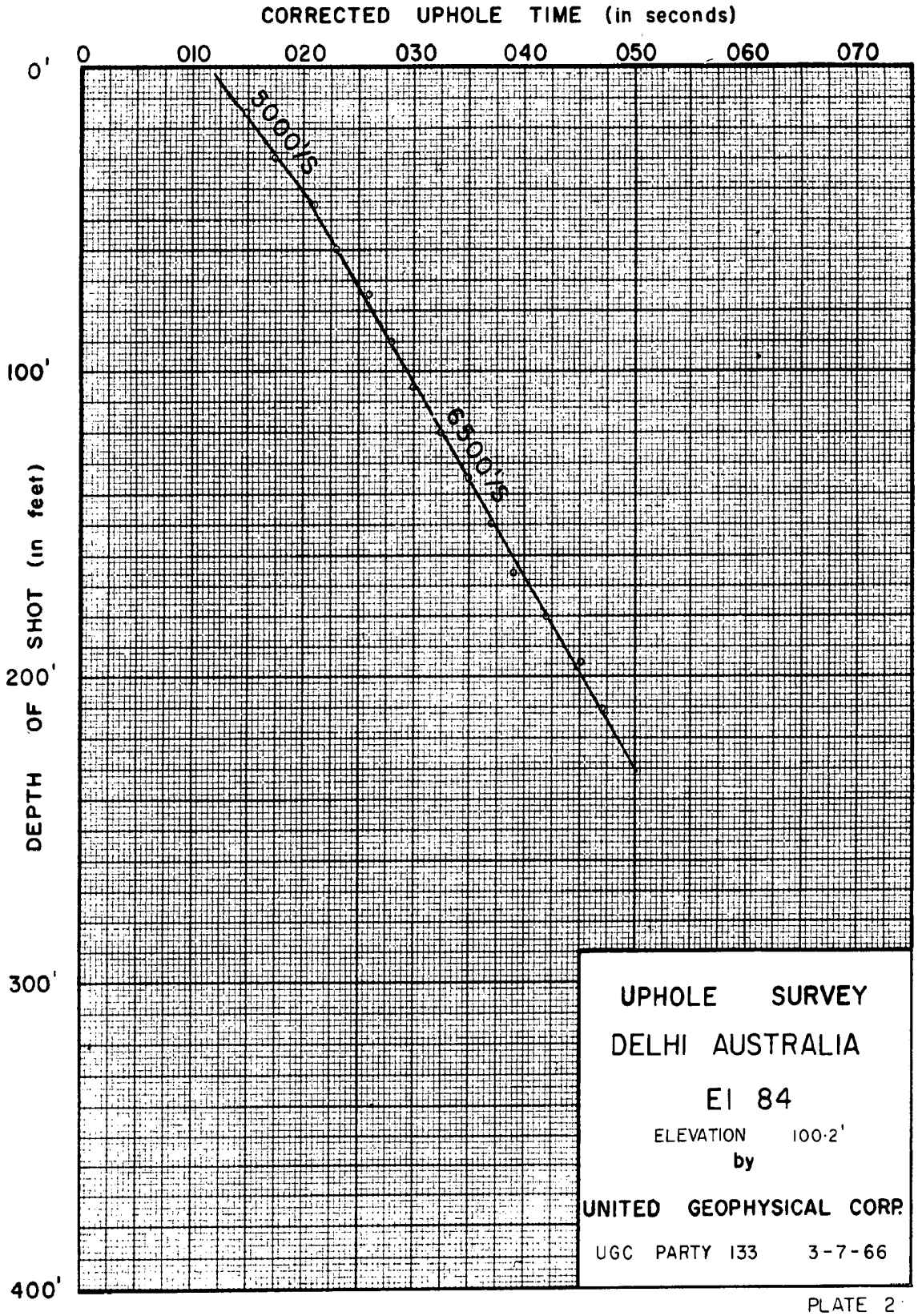

CORRECTED UPHOLE TIME (in seconds)
0
010
020
030
040
050
060
070
0'
100'
200'
300'
400'
DEPTH OF SHOT (in feet)
5000 f/s
6500 f/s
UPHOLE SURVEY
DELHI AUSTRALIA
EI 84
ELEVATION 100·2'
by
UNITED GEOPHYSICAL CORP.
UGC PARTY 133 3-7-66

PLATE 2

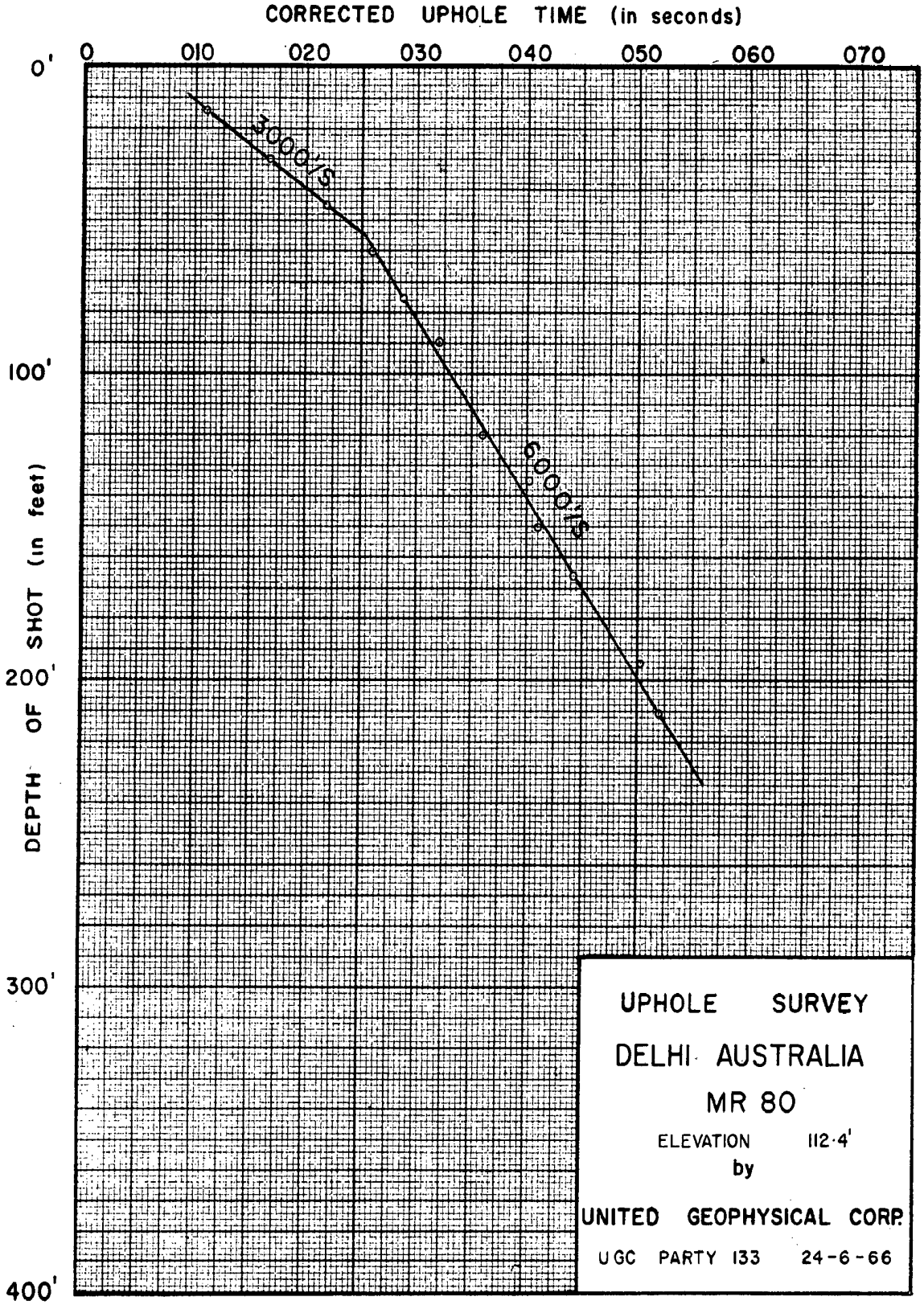

CORRECTED UPHOLE TIME (in seconds)
0
010
020
030
040
050
060
070
0'
100'
200'
300'
400'
DEPTH OF SHOT (in feet)
3000 f/s
5000 f/s
UPHOLE SURVEY
DELHI AUSTRALIA
MR 80
ELEVATION 112·4'
by
UNITED GEOPHYSICAL CORP.
UGC PARTY 133 24-6-66

PLATE 3

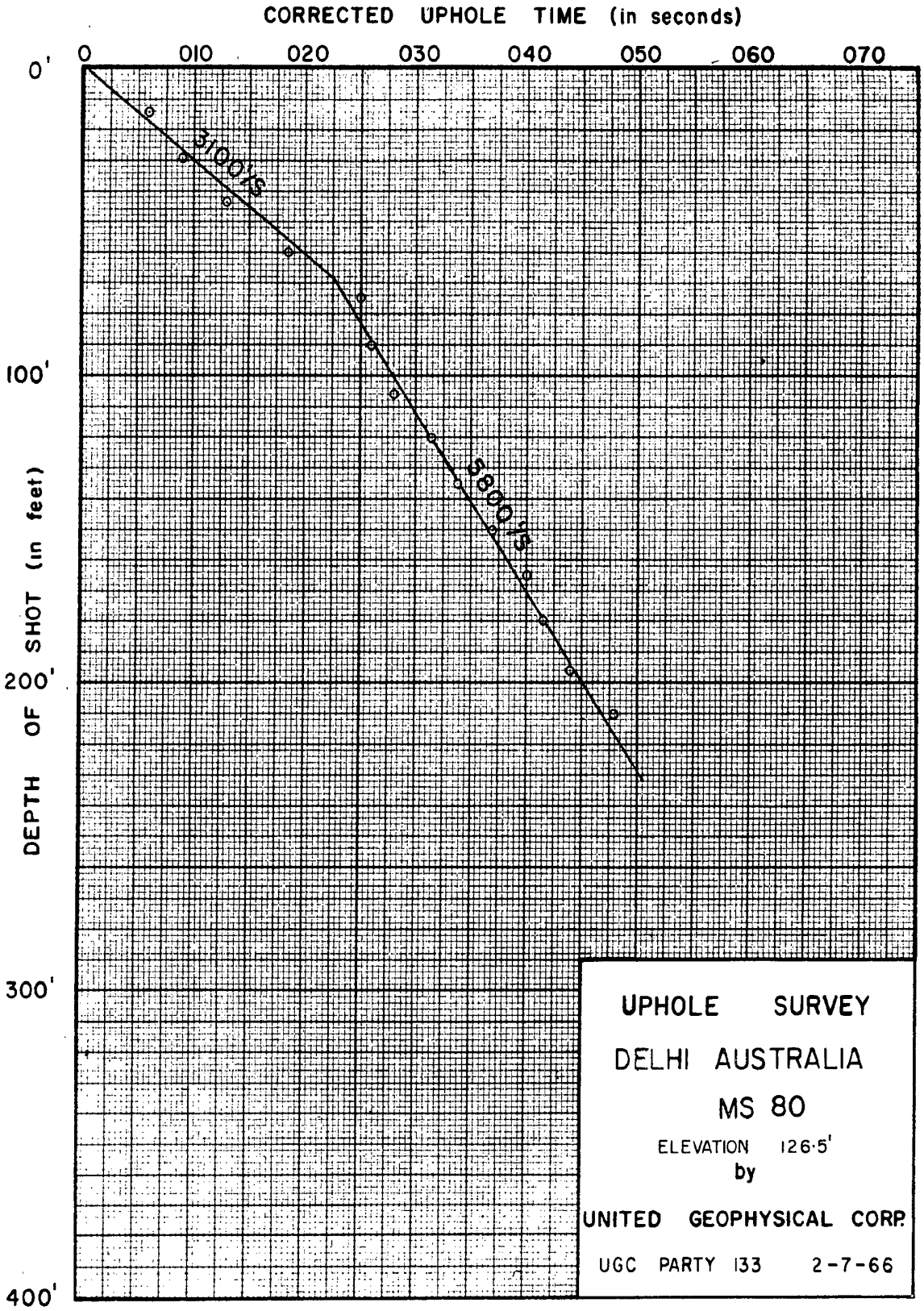

CORRECTED UPHOLE TIME (in seconds)
0
010
020
030
040
050
060
070
0'
100'
200'
300'
400'
DEPTH OF SHOT (in feet)
310015
580015
UPHOLE SURVEY
DELHI AUSTRALIA
MS 80
ELEVATION 126·5'
by
UNITED GEOPHYSICAL CORP.
UGC PARTY 133 2-7-66

PLATE 4

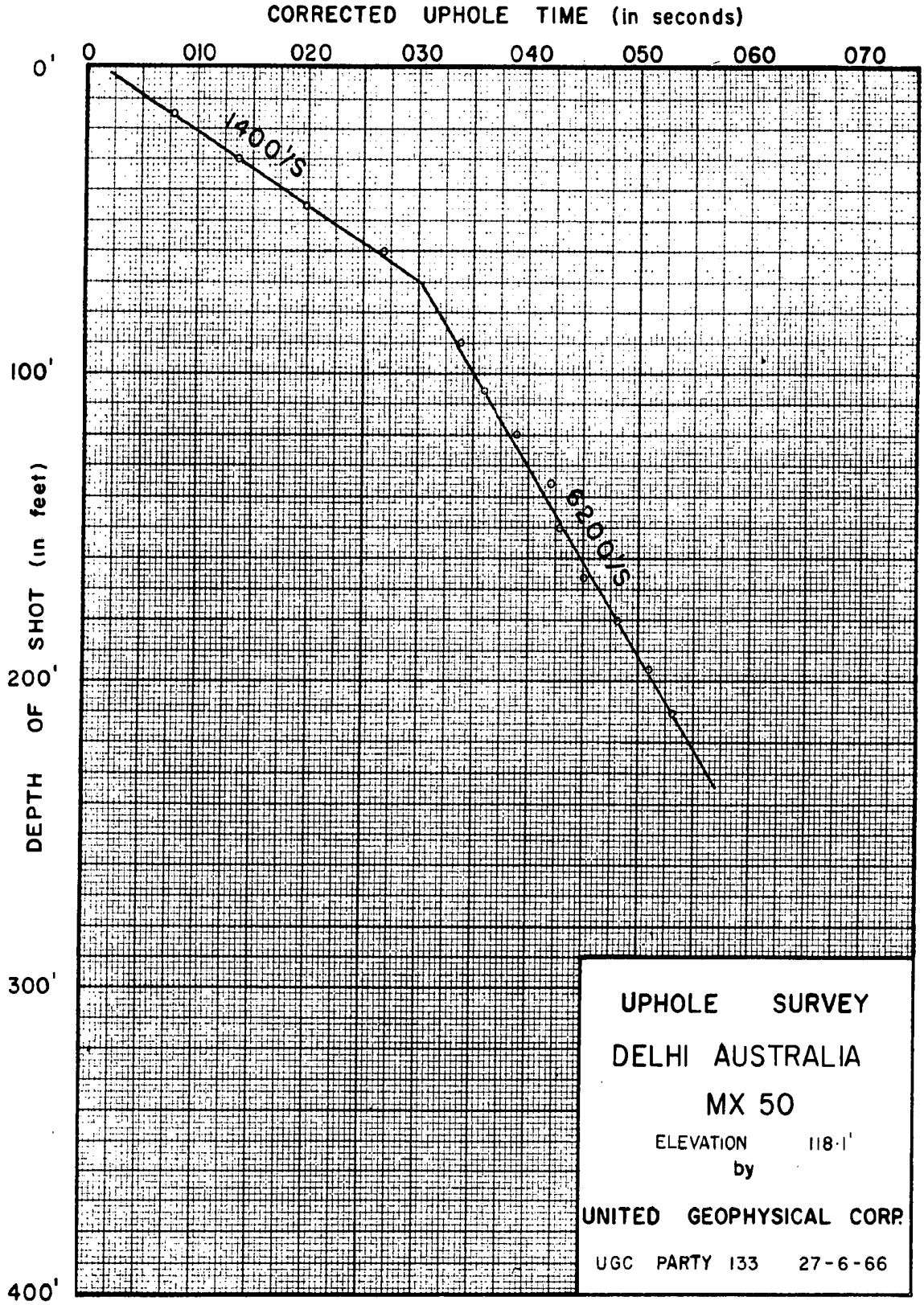
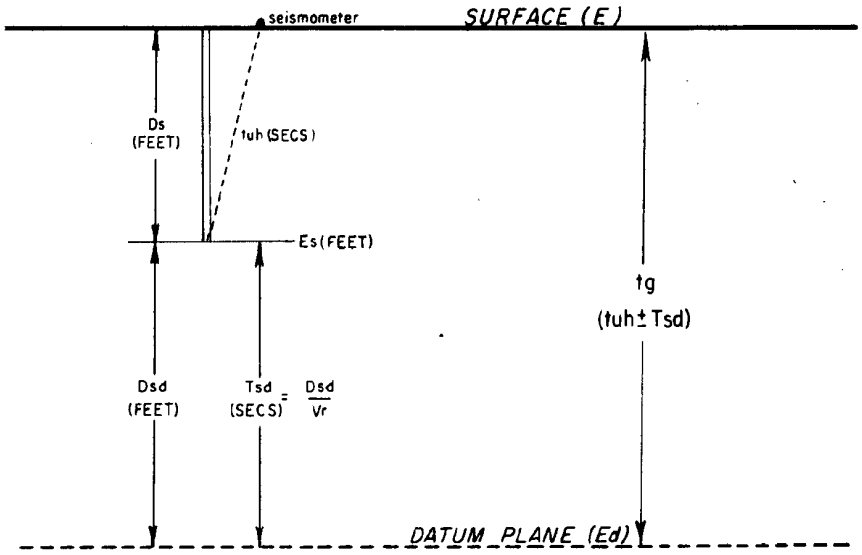

CORRECTED UPHOLE TIME (in seconds)
0
010
020
030
040
050
060
070
0'
100'
200'
300'
400'
DEPTH OF SHOT (in feet)
1400'/S
6200'/S
UPHOLE SURVEY
DELHI AUSTRALIA
MX 50
ELEVATION 118·1'
by
UNITED GEOPHYSICAL CORP.
UGC PARTY 133 27-6-66

PLATE 5

DATUM CORRECTION METHOD



E = elevation at shot point

Ds = depth of charge

Es = elevation of charge = E − Ds

Dsd = distance from charge to datum plane

Ed = elevation of datum plane

tuh = observed up-hole time recorded by shot point seismometer

Tsd = time from charge to datum = $\frac{Dsd}{Vr}$

Vr = velocity in sub-weathering zone

Tg = time correction from surface to datum

= algebraic sum of tuh & Tsd

TOTAL CORRECTION = Tsd ± tg

PLATE 6

DISCUSSION OF RESULTS

Three contoured structural and two Isopach maps are submitted.

The "C" and Base of Mesozoic Horizons as mapped are deeper than the actual well tops in the range of 100 ft. at Moomba No. 1. At Moomba No. 2 the "C" Horizon is about 100 ft. deeper than the actual well tops.

The seismic mistie with logged tops in the Moomba No. 1 and No. 2 wells is apparently due to the following:

(1) Maps not corrected for instrument lag.

(2) Maps not corrected for lateral velocity change.

(3) The picked seismic events may not correlate directly with geological tops.

(4) All values were timed on record sections to nearest .005 seconds.

(5) The mapped depths were obtained by use of a velocity of 7500 ft./sec. for the "C" Horizon and 8700 ft./sec. for the Base of Mesozoic and Base of Permian Horizons.

The Moomba structure is mapped as a relatively low relief anticline, of irregular outline but circular in general, covering a large area. The Moomba structure is separated from the Gidgealpa Field by a prominent N/S trending syncline. A NE-SW trending fault, downthrown to the north is mapped in the south-

DISCUSSION OF RESULTS (cont.)

east portion of the project on the two deep maps. Closure against the fault is contoured on the upthrown side on the Base of Mesozoic and Base of Permian Horizons. An auxiliary fault cutting BY and CB lines is noted on the Base of Permian map.

Reduced record sections of MV and MS are enclosed. Line MV ties Moomba No. 1 and No. 2 wells. MS is an east-west line and crosses Moomba No. 1 well. MS is considered representative of the sections of the detail work.

There is apparently very little or no pre-Permian data on the record sections of the detail program. Pre-Permian data seem to appear only on lines surrounding the low relief anticline.

Respectfully submitted,

UNITED GEOPHYSICAL CORPORATION
Party 133.

EQUIPMENT APPENDIX 1

Recording

1 Ford Model F-600 four wheel drive recording truck, complete with cable reels and recording cab.

1 United Model 24-9E Recording system including 24 Model 1-38 amplifiers, Techno Tape recording system and 24 trace camera.

675 EVS-2 Geophones in strings of 9 each with series parallel hook-up.

1 Ford F-600 four wheel drive reel truck.

Cables for 1800 ft. and 2640 ft. reflection spreads.

1 Toyota 4 wheel drive utility for personnel carrier.

2 - 25 watt Eilco radio transceivers with two shooting units and one recorders unit for radio time breaks and upholes for offset shooting.

Shooting

1 Ford F-600 four wheel drive water truck complete with powder and detonator magazines. 1 complete set of shooting equipment including blasters for reflection shooting.

Surveying

1 short wheel base Land Rover.

1 complete set of surveying equipment.

Drilling

3 heavy duty Mayhew 1000 combination air-water drills mounted on Ford F-850 four wheel drive trucks. One drill equipped with Gardner Denver Mole Drill percussion tool and two stage compressor.

3 Ford F-800 four wheel drive water trucks equipped with 1000 gallon flat tank.

1 Toyota four wheel drive for Personnel carrier.

1 2500 gallon and 3 - 350 gallon canvas water bags.

Supply

1 Ford F-800 four wheel drive truck equipped with 1000 gallon flat tank and stake body.

EQUIPMENT (cont.)

Utility

1 Allis Chalmers Crawler Tractor and one trailer mounted 2000 gallon water tank.

1 Caterpillar D-7 Bulldozer.

1 Land Rover for bulldozer service.

Shop

1 shop caravan equipped with air compressor, drill, vices, hand tools, spare parts and other equipment for repairs to equipment.

1 Welder outfit complete with arc and acetylene welding equipment and supplies.

1 spare parts trailer.

Camp

1 Kitchen caravan, air conditioned complete with all utensils, equipment and supplies.

1 dining caravan, air conditioned with fixtures and tableware.

1 shower caravan complete with pressure water system.

Two trailer mounted Sentinel 36KVA Light Plants for camp power.

4 air conditioned sleeping caravans.

1 complete complement of linen, beds etc., for accommodation of personnel.

1 Line-Camp kitchen trailer.

Office

1 air conditioned office caravan equipped with office machines, drafting equipment and 3 radio transceivers.

1 short wheel base Land Rover.

Gravity

1 Worden gravity meter No. 479.

1 Land Rover

PERSONNEL — APPENDIX 2

Chief Seismologist	D.A. Cowan
Field Seismologist	E.H. Harris
Observer	V. Viljas
Surveyor	L.F. Sanders
Gravity Meter Man	G.L. Devlin
Party Manager	E.P. Lane
Drillers	E. Hoeppner M. Gregory J. Smythe
Dozer Operator	E. Purcell
Crawler Operator	L. Viles

Twenty one additional men completed the crew of 32 men.

Supervision was furnished by Mr.B.H. Flusche.

STATISTICS — APPENDIX 3

Starting Date First Shot	June 19th, 1966
Completion Last Shot	July 23rd, 1966
Total Profiles Shot	219
Total Number Shots	219
Total Miles Subsurface Coverage	109.50
Total Hours Recording Field Time	139.25
Total Hours Recording Driving Time	24.00
Total Hours Actual Recording Time	* 163.25
Total Hours Holidays	Nil
Total Hours Charged to Client	163.25
Total Dynamite Used	6450 lbs
Average Charge per Shot	29.4 lbs
Total Detonators Used	377
Total Boosters Used	137
Total Number Holes Drilled	295
Total Number Feet Drilled	32670
Total Hours Drilling Field Time	406.50
Total Hours Drilling Driving Time	109.75
Total Hours Drilling Time	516.25
Total Number Finger Bits Used	8
Total Number Rock Bits Used	1
Mud Used	Nil
Line Numbers	MR through ND

* Eleven hours of camp move Lake Frome to Moomba included.

UNITED GEOPHYSICAL

GRAVITY REPORT — APPENDIX 4.

UNITED GEOPHYSICAL

INTRODUCTION

A gravity survey was carried out over the Moomba structure by United Geophysical Corporation in connection with the seismic program. All shot points were metered.

The work was conducted by G.L. Devlin, who served as meter operator, computer and interpreter.

Previous geophysical control consisted of seismic and gravity surveys by United Geophysical Corporation.

Present mapping has included all available gravity control in the area.

FIELD OPERATIONS

Survey control for the gravity operation was obtained from the seismic operation. Elevations were not adjusted as both horizontal and vertical closures were within the established requirements for gravity computations.

Worden Gravity Meter No. 479 was used for the survey. This meter was calibrated on the Adelaide Gravity Range which has an established 62.59 milligals difference. The calibration factor used was 0.08665 mg. per dial division.

Observed gravity values were controlled by existing United bases in the area. These bases were originally established by the "advancing base" method with two or more values determined to establish a new base. When possible the bases were also tied into loops for further control.

The observed gravity datum is as used in the 1962 BMR Helicopter survey.

Two hundred and twelve new gravity stations were metered. Of these, about 5% were rechecked. The range of misclosure was between 00 - 0.21 mg. Note: Two shot points on BY and AL lines were picked as tie stations in a normal loop. It was found that a misclosure of 0.21 mg. on BY-99 and 0.16 mg.

FIELD OPERATIONS (cont.)

on AL-200 (BY-100) had occurred. These shot points were rerun and the same misclosure resulted. Since these shot points were metered previously it is possible that the original location was not the same as the tie location or that the original adjustments of these points were in error to the control used for the additional work.

COMPUTATIONS

The elevation correction applied was a combination of Bouguer correction and free-air correction. This factor was originally determined by G.S.I. profile and has been carried on all subsequent work in the area. The correction factor used was 0.06982 mg./ft. and corresponds to a density of 1.9 grams/cubic centimeter. Additional profiles and triplet determinations have confirmed that this correction factor is useful in the area of the survey.

Latitude corrections were calculated from the tables of Theoretical Gravity on the International Ellipsold.

INTERPRETATION

Interpretation of the data was made from the Bouguer gravity map. No residual or derivative interpretation was attempted by United.

The Bouguer Anomaly Map is comprehensive in that all known gravity data have been utilized in its preparation. All present and past ground gravity control was first used in preparing this map. Mr. H.A. Shetrone of Delhi Australian has added the Helicopter Gravity Control.

All of the new gravity work over the Moomba structure was added to provide a greater density of control. This survey was not included in the Eromanga-Frome Seismic Survey nor covered by the Petroleum Subsidy Act 1959-1961.

Regional Features

The Moomba structure is dominated by two major northeast-southwest trending features. To the southeast of the structure is a strong gravity maximum called the Nappacoongie feature and to the northwest is the Spencer, Gidgealpa, Merrimelia, Packsaddle, Innaminka and Karmona trend.

A low trend between and parallel to these two features contains the Moomba structure.

INTERPRETATION (cont.)

Local Features

Original gravity work over the Moomba structure produced a maximum nosing in the vicinity of Moomba No. 2 well, and a small pullout near Moomba No. 1 well. Subsequent field work in conjunction with the seismic has not significantly altered the original gravity interpretation of this structure.

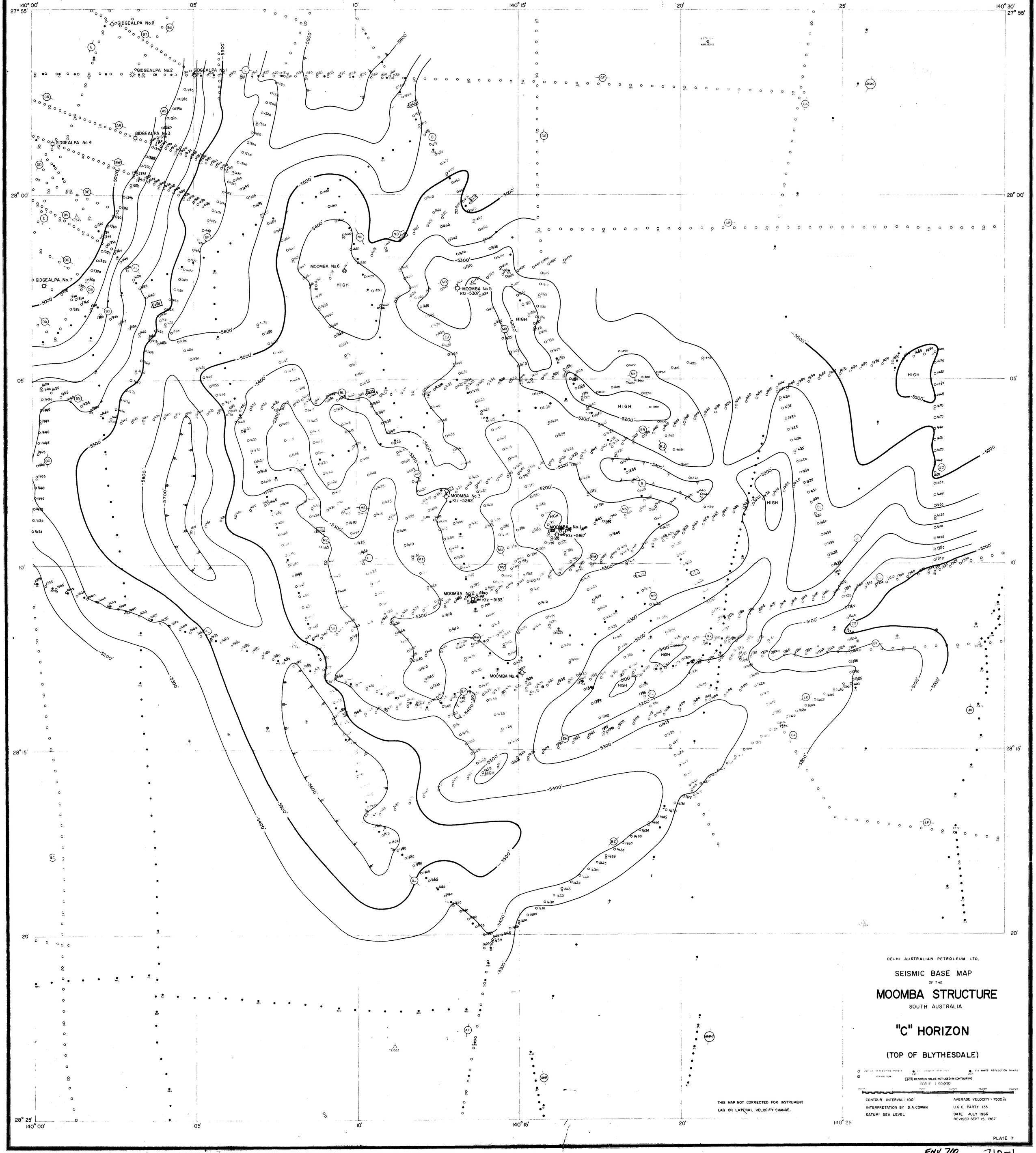
Conclusion

The additional gravity control over the Moomba structure has substantiated the existing Interpretation. A residual and/or derivative interpretation would add to the clarification of the structure.

Respectfully submitted,

UNITED GEOPHYSICAL CORPORATION
Party 133.

D A Cowan



DELHI AUSTRALIAN PETROLEUM LTD.

SEISMIC BASE MAP

OF THE

MOOMBA STRUCTURE

SOUTH AUSTRALIA

"C" HORIZON

(TOP OF BLYTHESDALE)

DENOTES VALUE NOT USED IN CONTOURING

SCALE 1:60,000

CONTOUR INTERVAL: 100'

INTERPRETATION BY D.A.COWAN

DATUM: SEA LEVEL

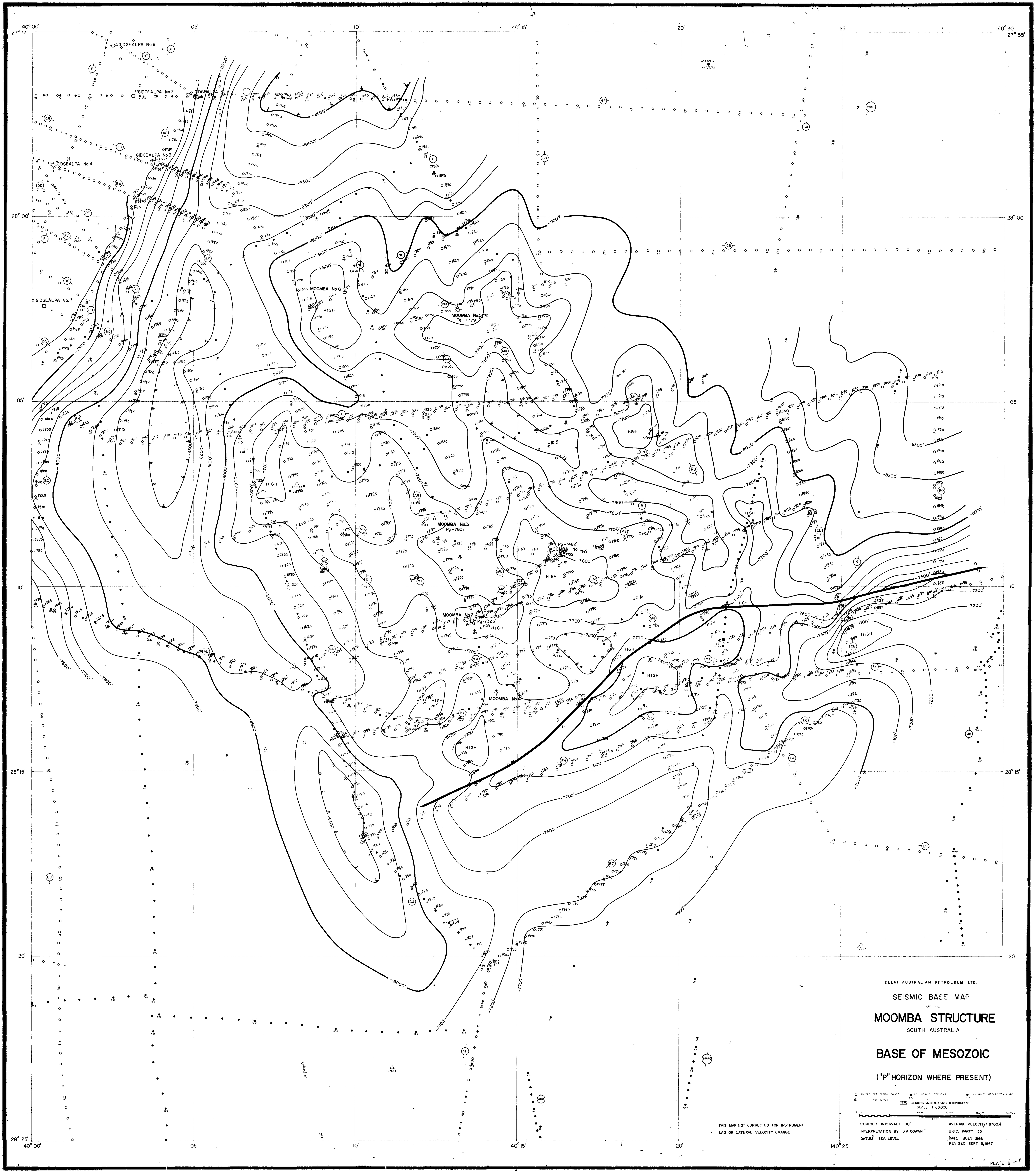
AVERAGE VELOCITY: 7500'/s

U.G.C. PARTY 133

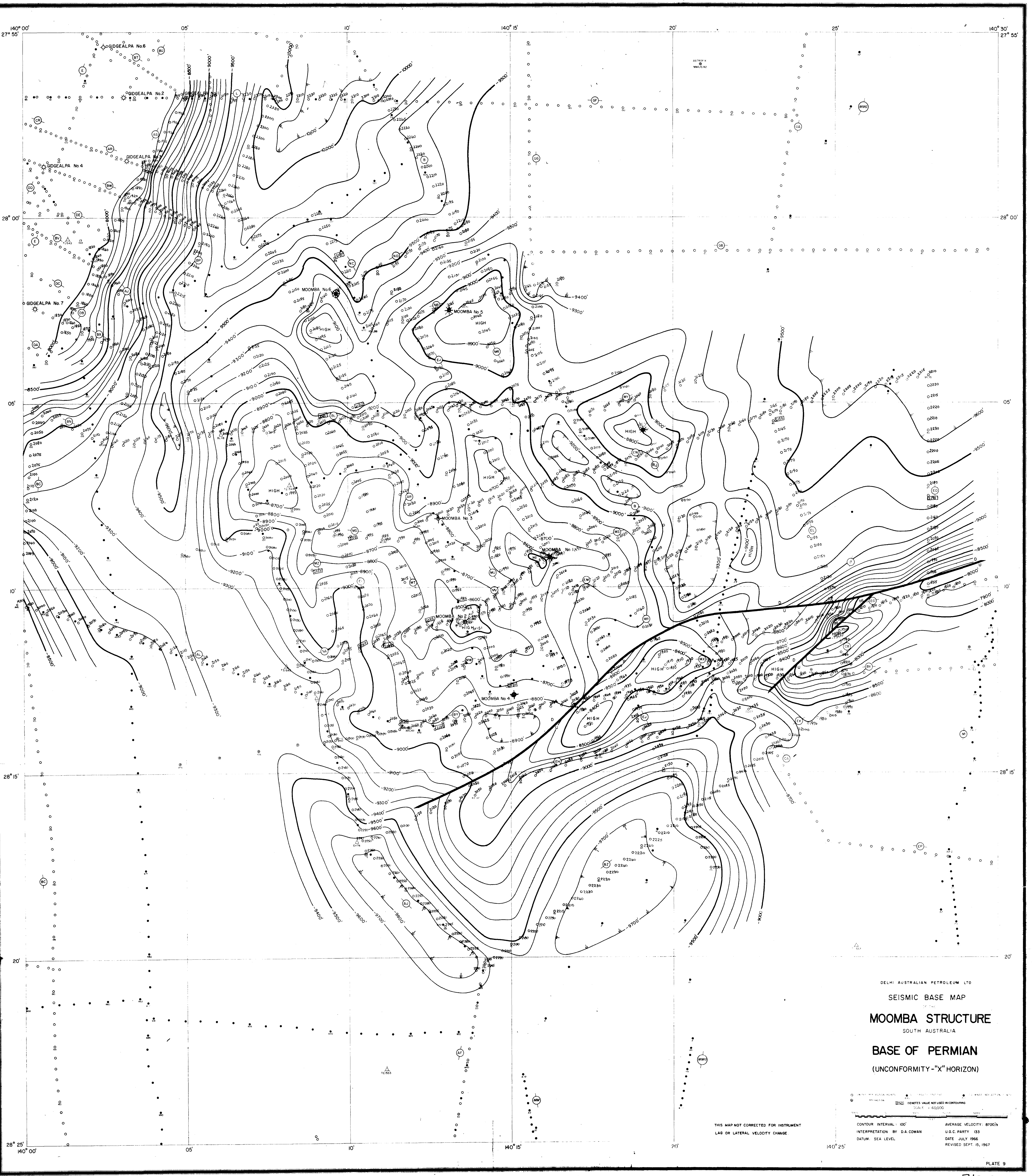
DATE JULY 1966
REVISED SEPT 15, 1967

THIS MAP NOT CORRECTED FOR INSTRUMENT LAG OR LATERAL VELOCITY CHANGE.

PLATE 7



DELHI AUSTRALIAN PETROLEUM LTD.
SEISMIC BASE MAP
OF THE
MOOMBA STRUCTURE
SOUTH AUSTRALIA
BASE OF MESOZOIC
("P" HORIZON WHERE PRESENT)
UNITED REFLECTION POINTS
G.S. GRAVITY STATIONS
S.A. MINES REFLECTION POINTS
REFRACTION
DENOTES VALUE NOT USED IN CONTOURING
SCALE 1:60,000
FEET
CONTOUR INTERVAL: 100'
INTERPRETATION BY D.A. COWAN
DATUM: SEA LEVEL
AVERAGE VELOCITY: 8700'/s
U.G.C. PARTY 133
DATE JULY 1966
REVISED SEPT. 15, 1967
THIS MAP NOT CORRECTED FOR INSTRUMENT
LAG OR LATERAL VELOCITY CHANGE.
PLATE 8
ENV 710-2
GIDGEALPA No.1
GIDGEALPA No.2
GIDGEALPA No.3
GIDGEALPA No.4
GIDGEALPA No.6
GIDGEALPA No.7
MOOMBA No.1
Pg -7482'
MOOMBA No.2
Pg -7323
MOOMBA No.3
Pg -7601
MOOMBA No.4
MOOMBA No.5
Pg -7779
MOOMBA No.6
HIGH
ASTROFIX
NMA/E/42
140° 00'
05'
10'
140° 15'
20'
25'
140° 30'
140° 25'
27° 55'
28° 00'
28° 15'
28° 25'



DELHI AUSTRALIAN PETROLEUM LTD

SEISMIC BASE MAP

MOOMBA STRUCTURE

SOUTH AUSTRALIA

BASE OF PERMIAN

(UNCONFORMITY-"X" HORIZON)

2010 DENOTES VALUE NOT USED IN CONTOURING

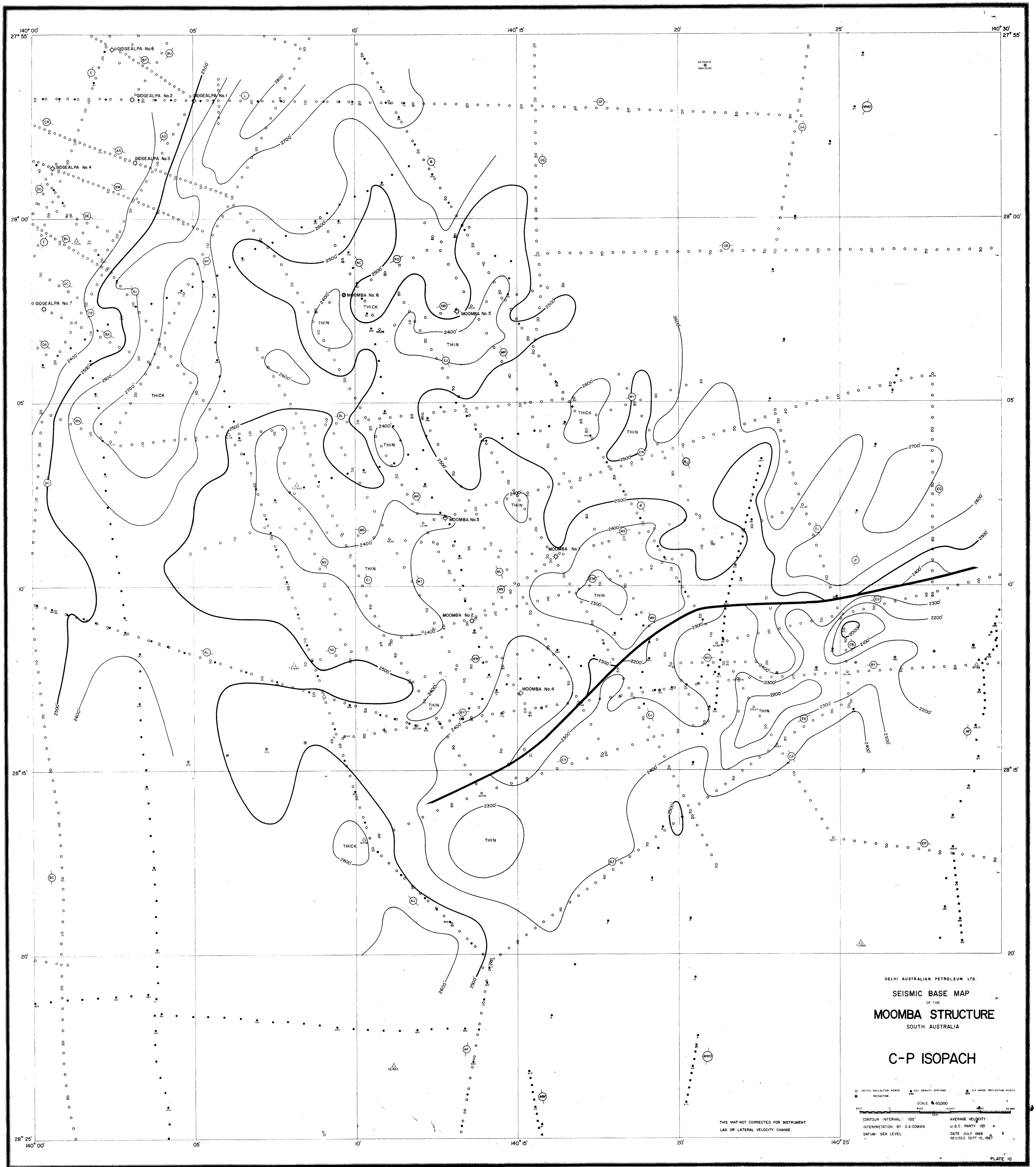
SCALE 1:60,000

CONTOUR INTERVAL: 100'
INTERPRETATION BY D.A.COWAN
DATUM: SEA LEVEL

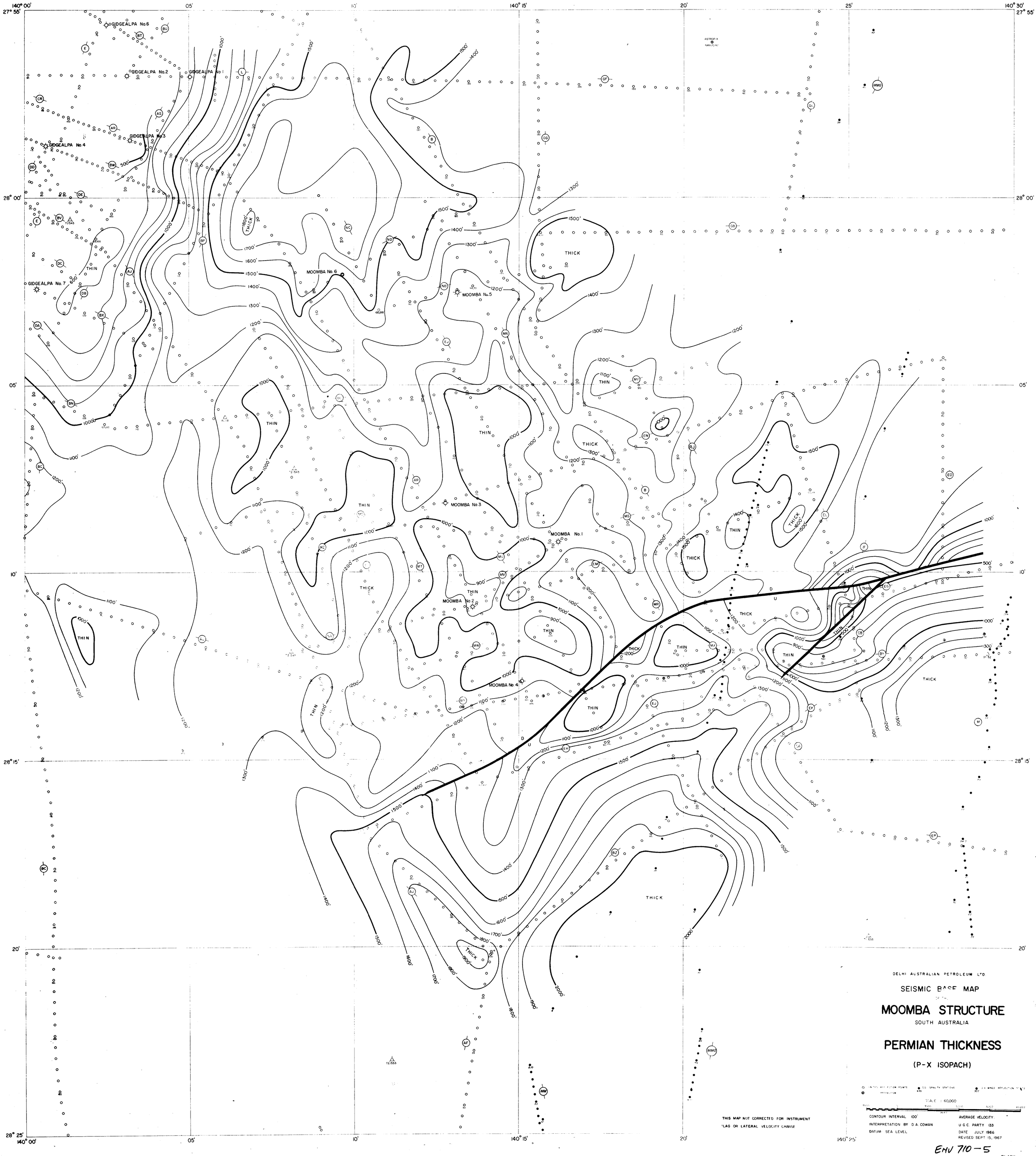
AVERAGE VELOCITY: 8700'/s
U.G.C. PARTY 133
DATE JULY 1966
REVISED SEPT. 15, 1967

PLATE 9

710-3


GIDGEALPA No.6
GIDGEALPA No.2
GIDGEALPA No.1
GIDGEALPA No.3
GIDGEALPA No 4
GIDGEALPA No.7
MOOMBA No.6
MOOMBA No.5
MOOMBA No.3
MOOMBA No.1
MOOMBA No.2
MOOMBA No.4
ASTROFIX
NMA/E/42
THICK
THIN
2100'
2200'
2300'
2400'
2500'
2600'
2700'
2800'
140° 00'
05'
10'
140° 15'
20'
140° 25'
140° 30'
27° 55'
28° 00'
28° 15'
28° 25'
THIS MAP NOT CORRECTED FOR INSTRUMENT LAG OR LATERAL VELOCITY CHANGE.
DELHI AUSTRALIAN PETROLEUM LTD.
SEISMIC BASE MAP
OF THE
MOOMBA STRUCTURE
SOUTH AUSTRALIA
C-P ISOPACH
UNITED REFLECTION POINTS
REFRACTION
GSI GRAVITY STATIONS
S A MINES REFLECTION POINTS
SCALE 1:60,000
FEET
CONTOUR INTERVAL: 100'
INTERPRETATION BY D.A.COWAN
DATUM: SEA LEVEL
AVERAGE VELOCITY:
U.G.C. PARTY 133
DATE JULY 1966
REVISED SEPT. 15, 1967
PLATE 10

ENV 710 — 4



DELHI AUSTRALIAN PETROLEUM LTD.

SEISMIC BASE MAP

MOOMBA STRUCTURE

SOUTH AUSTRALIA

PERMIAN THICKNESS

(P-X ISOPACH)

SCALE : 1:50,000

CONTOUR INTERVAL 100'

INTERPRETATION BY D.A. COWAN

DATUM SEA LEVEL

AVERAGE VELOCITY

U.G.C. PARTY 133

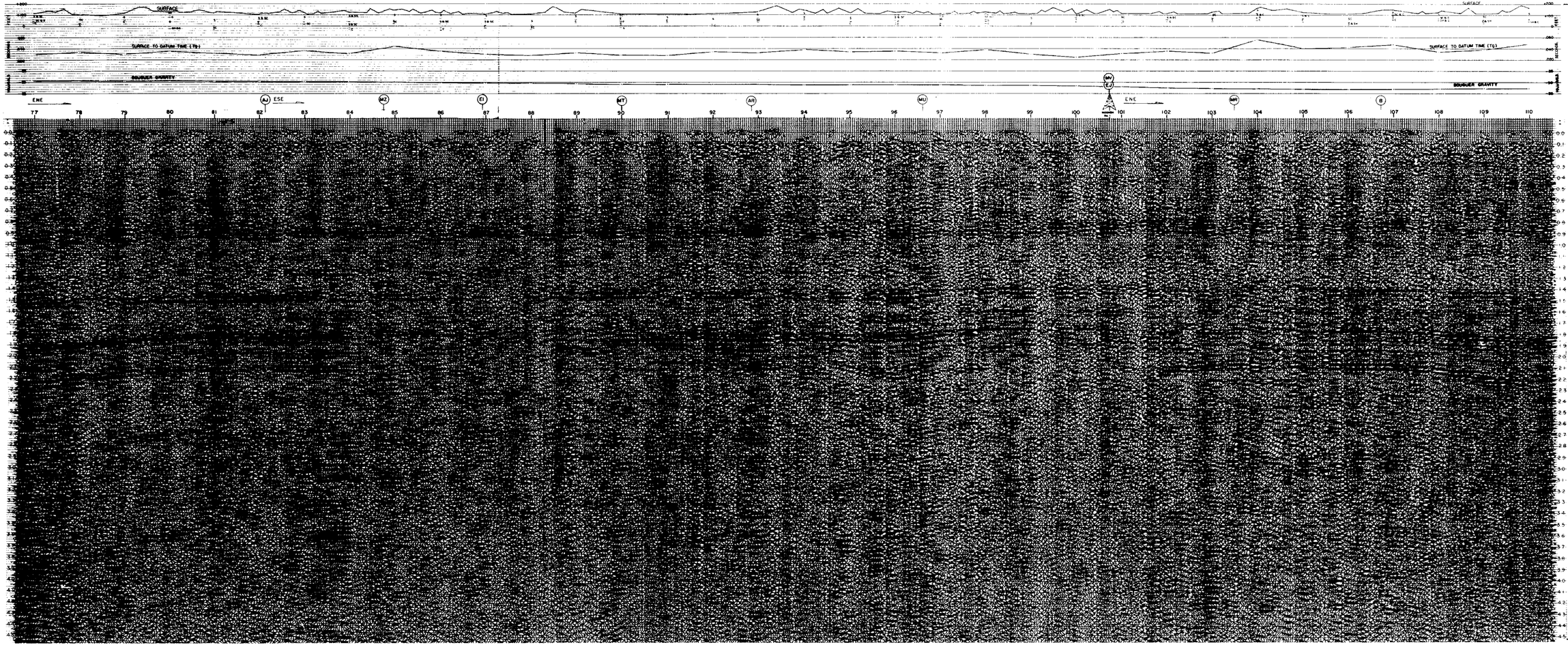
DATE JULY 1966

REVISED SEPT 15, 1967

THIS MAP NOT CORRECTED FOR INSTRUMENT FLAG OR LATERAL VELOCITY CHANGE

EHV 710-5

PLATE II



MOOMBA AREA

LINE MS

SP 77 — 110

SHOT-HOLE LOGGING

C = Clay
G = Gravel
S = Sand
SC = Sandy Clay
SS = Sand Stone
SH = Shale
LS = Lime Stone
RK = Rock

PRESENTED BY

Petty Geophysical Engineering Company

"Progress Through Excellence Since 1933"

PRESENTED FOR

DELHI AUSTRALIAN PETROLEUM LTD.

DETECTORS/GROUP 9 GROUP INTERVAL 220'

S.P. INTERVAL 2640' DATUM S.L.

FILTER 20 - 60 MIX 20% TAPER

HORIZONTAL SCALE 1" = 1760' V_s 6500'/sec

SINGLE COVERAGE

SHOT BY
UNITED GEOPHYSICAL CORPORATION
PARTY 133
FOR
DELHI AUSTRALIAN PETROLEUM LTD.

MOOMBA AREA

PERMIT STATE SOUTH AUSTRALIA

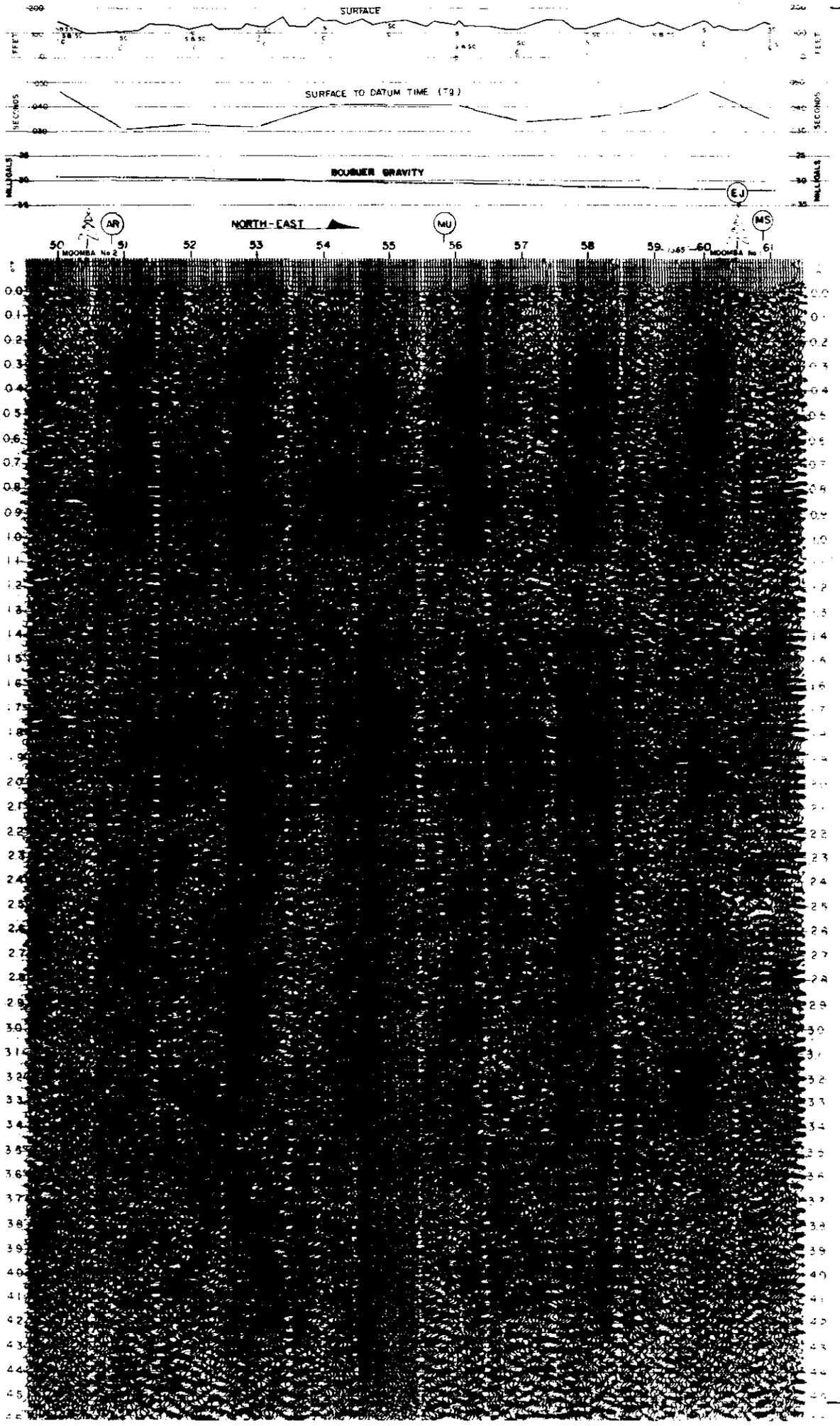
LINE -MS-

S.P. 77 — 110

PLATE 12

710-6

DATE JULY '64



MOOMBA AREA

LINE MV

SP 50 – 61.

SHOT HOLE LEGEND

C	=	Clay
G	=	Gravel
S	=	Sand
SC	=	SandyClay
SS	=	Sand Stone
SH	=	Shale
LS	=	Limestone
RK	=	Rock

PRESENTED BY

Petty GEOPHYSICAL ENGINEERING COMPANY

"Progress Through Excellence since 1930"

PRESENTED FOR

DELHI AUSTRALIAN PETROLEUM LTD.

DETECTORS/GROUP 18 GROUP INTERVAL 150'

SP INTERVAL 1800' DATUM S.L.

FILTER 20 - 60 MIX 20 % TAPER

HORIZONTAL SCALE 1" = 1800' V_s 6500'/sec

SINGLE COVERAGE

SHOT BY
UNITED GEOPHYSICAL CORPORATION
PARTY 133
FOR

DELHI AUSTRALIAN PETROLEUM LTD

MOOMBA AREA

PERMIT STATE SOUTH AUSTRALIA

LINE -MV-

S.P. 50 – 61.

DATE JULY '66

710-7 PLATE 13

DELHI AUSTRALIAN PETROLEUM LTD.

GRAVITY BASE MAP

OF THE

MOOMBA STRUCTURE

SOUTH AUSTRALIA

BOUGUER GRAVITY MAP

○ UNITED REFLECTION POINTS ● GSI GRAVITY STATIONS ● S.A. MINES REFLECTION POINTS
REFRACTION

SCALE 1 60,000

FEET

INTERPRETATION BY G.L.DEVLIN E.C.F. 0.698 mgl/ft.

CONTOUR INTERVAL: 1.0mgl. DATE JULY, 1966.

PLATE 14

ENV 710 710-8