Transparencies In
Cylinder 2306/1
B.P. Surveys.

CONTENTS ENVELOPE 2328

TENEMENT: E.L. 77 - Parabana Hill.

TENEMENT HOLDER: Petromin N.L. - Transoil N.L. - Oilmin N.L.

REPORT:	Results Of Coring Programme. Report No. SA-71F. June 1973.	Pgs. 3-18
	Field Logging Sheet Hole No. PB42.	Pgs. 19-22
	Log Hole No. PB21.	Pgs. 23-25
PLANS:	Locality Map Lake Frome Embayment.	Pg. 26
	Gamma/Electric Log Hole No. PB21.	2328(I)-1
	" " " " " PB21.	2328(I)-2
	" " " " " PB21.	2328(I)-2A
	" " " " " PB42.	2328(I)-3
	Digital Readout Data.	Pg. 27
	Log Hole PB21.	2328(I)-4
	" " PB42.	2328(I)-5
	Field Logging Sheet Hole No. PB21.	Pgs. 28-41
	Drill Hole Map.	Pg. 42
REPORT:	Quarterly Report Period Ending 5th Jan. 1974.	Pg. 43
	" " " " 5th April 1974.	Pg. 44
	" " " " 5th July 1974.	Pg. 45
	" " For July to Sept. 1974.	Pg. 46
	" " " " Sept. 1974.	Pgs. 47-48
APPENDICIES:	Appendix I. Resistivity Survey.	Pgs. 49-61
PLANS:	Lake Frome Resistivity Survey Location Plan - Reconnaissance Lines. Plate 1.	2328(I)-6
	Lake Frome Resistivity Profiles E.L. 77 & Lines 1, 2, 4 & 5 Beverley Deposit Lines A & B. Plate 2.	2328(I)-7
	Lake Frome Resistivity Survey E.L. 91 Lines 3 & 6. Plate 3.	2328(I)-8
	E.L. 77 Locality Plan. Plan I.	2328(I)-9
	Water Bore Survey. Plan II.	2328(I)-10
	Rotary Drill Hole Locations. Plan III.	2328(I)-11
	Lake Frome Resistivity Survey Interpretation E.L. 77 Reconstruction - Emphasis On Easterly Flowing Channels. Plate 4.	2328(I)-12

PLANS: Lake Frome Resistivity Survey Interpretation · E.L. 77 Reconstruction B - Emphasis On Fault Controlled Channels. Plate 4A. 2328(I)-13
Lake Frome Current Electrode Separation (Metres) Line 1 00S. Plate 6. Pg. 62
Lake Frome Current Electrode Separation (Metres) Line 1 3500N. Plate 7. Pg. 63
Lake Frome Current Electrode Separation (Metres) Line 1 14500N. Plate 8. Pg. 64
Lake Frome Current Electrode Separation (Metres) Line 1 24500N. Plate 9. Pg. 65
Lake Frome Current Electrode Separation (Metres) Line 1 4000S. Plate 10. Pg. 66
Lake Frome Current Electrode Separation (Metres) Line 1 7000S. Plate 11. Pg. 67
Lake Frome Current Electrode Separation (Metres) Line 1 12000S. Plate 12. Pg. 68
Lake Frome Current Electrode Separation (Metres) Line 1 23000S. Plate 13. Pg. 69
Lake Frome Current Electrode Separation (Metres) Line 1 32000S. Plate 14. Pg. 70
Lake Frome Current Electrode Separation (Metres) Line 2 00W. Plate 15. Pg. 71
Lake Frome Current Electrode Separation (Metres) Line 4 5000E. Plate 19. Pg. 72

REPORT: Gaussian Filtering Of Lake Frome Resistivity Survey Results. Pgs. 73-78

PLANS: Lake Frome Resistivity Survey Addenum To Report 83. Gaussian Filtered Results (Directionally Corrected). Contour Interpretation. 2328(I)-14
Gaussian Function Plotted In Space Domain. Fig. 1. Pg. 79
" " " " Frequency " " 2. Pg. 79
Lake Frome Resistivity Survey Gaussian Filtered Results. Ref. 2/H/5. Fig. 3. 2328(I)-15
Lake Frome Resistivity Survey Gaussian Filtered Results Contour Interpretation. Ref. 2/H/5. Fig. 4. 2328(I)-16
Lake Frome Resistivity Profiles E.L. 77 Lines 1, 2, 3 & 4. Ref. 2/H/5. Fig. 5. 2328(I)-17
Lake Frome Resistivity Profiles E.L. 91 Lines 3 & 6. Ref. 2/H/5. Fig. 6. 2328(I)-19

REPORT: Water Assays - Uranium In Water Determined By Delayed Neutron Activation Analyses. Pgs. 80-81
Drill Data - Poontana Drilling Sept. 1974. Pgs. 82-83

REPORT: Quarterly Report Period Ended Dec. 1974. Pgs. 84-99

PLANS: Location Of Phase 2 Resistivity Lines Plate 1. Pg. 100
Contour Plan Calculated True Resistivity Layer 3. Plate 4. Pg. 101
Resistivity Interpretation τ = 500m Pepogoona Channel. Plate 3. Pg. 102
Resistivity Profile Lines 7, 8, 9, 10. Plate 2. 2328(II)-1
Current Electrode Separation From Centre Of Configuration (Metres) Line 7 00W (Hole 12). Plate 5. Pg. 103
Current Electrode Separation From Centre Of Configuration (Metres) Line 8 1500W. (Hole 27). Plate 6. Pg. 104
Current Electrode Separation From Centre Of Configuration (Metres) Line 8 4500E. Plate 7. Pg. 105
Current Electrode Separation From Centre Of Configuration (Metres) Line 9 500E. Plate 8. Pg. 106
Current Electrode Separation From Centre Of Configuration (Metres) Line 9 3000E. Plate 9. Pg. 107

REPORT: Quarterly Expenditure Report To Dec. 1974. Pg. 108
" " " " June 1975. Pgs. 109-110
Resistivity Survey Lake Frome July 1975. Pgs. 111-126

PLANS: Location Of Phase 3 Resistivity Lines Plate 1. Pg. 127
Contour Plan - Apparent Resistivity τ = 300 metres Directionally Corrected. Plate 4. Pg. 128
Contour Plan Apparent Resistivity τ = 500 metres Data. Manually Smoothed & Directionally Corrected. Plate 3. 2328(II)-2
Alternative Interpreted Faults From Traverse Sections. Plate 2. Overlay to Plate 3. 2328(II)-3
Resistivity Profiles & Interpreted Sections Lines 14-19 τ = 300m & τ = 500m. Plate 2. 2328(II)-4
Current Electrode Separation From Centre Of Configuration. Line 1400E. Plate 5. Pg. 129
Current Electrode Separation From Centre Of Configuration (Metres). Line 14 5000E. Plate 6. Pg. 130
Current Electrode Separation From Centre Of Configuration (Metres). Line 14 8000E. Plate 7. Pg. 131
Current Electrode Separation From Centre Of Configuration (Metres) Line 14 12000E. Plate 8. Pg. 132
Current Electrode Separation From Centre Of Configuration (Metres) Line 14 13500E. Plate 9. Pg. 133
Current Electrode Separation From Centre Of Configuration (Metres) Line 15 1000E. Plate 10. Pg. 134

PLANS: Current Electrode Separation From Centre Of Configuration (Metres) Line 15 3000E. Plate 11. Pg. 135

Current Electrode Separation From Centre Of Configuration (Metres). Line 15 4000E. Plate 12. Pg. 136

Current Electrode Separation From Centre Of Configuration (Metres) Line 15 8000E. Plate 13. Pg. 137

Current Electrode Separation From Centre Of Configuration (Metres) Line 15 12000E. Plate 14. Pg. 138

Current Electrode Separation From Centre Of Configuration (Metres) Line 16 00S. Plate 15. Pg. 139

Current Electrode Separation From Centre Of Configuration (Metres) Line 16 4000S. Plate 16. Pg. 140

Current Electrode Separation From Centre Of Configuration (Metres) Line 16 8000S. Plate 17. Pg. 141

Current Electrode Separation From Centre Of Configuration (Metres) Line 17 500E. Plate 18. Pg. 142

Current Electrode Separation From Centre Of Configuration (Metres Line 3000E. Plate 19. Pg. 143

Current Electrode Separation From Centre Of Configuration (Metres) Line 18 3500S. Plate 20. Pg. 144

Current Electrode Separation From Centre Of Configuration (Metres) Line 19 4000E. Plate 21. Pg. 145

Current Electrode Separation From Centre Of Configuration (Metres) Line 19 8000E. Plate 22. Pg. 146

Current Electrode Separation From Centre Of Configuration (Metres) Line 19 12000E. Plate 23. Pg. 147

Current Electrode Separation From Centre Of Configuration (Metres) Line 19 15500E. Plate 24. Pg. 148

REPORT: Quarterly Report Period Ended March 1975. Pg. 149

" Expenditure Report To March 1975. Pgs. 150-151

1974 Drilling Programme - Lake Frome Embayment. March 1975. Pgs. 152-169

PLANS: Exploration Leases On North West Side Of Lake Frome Embayment. Plate I. Pg. 158

Schematic Stratigraphic Column. Plate III. Pg. 161

Poontana Project 1974 Drill Hole Locations & Sections. Plate II. 2328(II)-5

Poontana Project 1974 - Structural Interpretation Showing Possible Faults & Channels. Plate IV. 2328(II)-6

Poontana Project Programme 1. Area I North Mulga Section AA'. Plate V. 2328(II)-7

Poontana Project Programme 1 Area I North Mulga Section BB'. Plate VI. 2328(II)-8

Poontana Project Programme 1. Area II. Pipeline Section CC'. Plate VII. 2328(II)-9

PLANS:	Poontana Project Programme 1. Area III. Parabarana Creek Section DD'. Plate VIII.	2328(II)-10
	Poontana Project Programme 1. Area IV. Poontana Creek Section C'E. Plate IX.	2328(II)-11
	Poontana Project Programme 1. Area IV. Poontana Creek Section FF'. Plate X.	2328(II)-12
	Drill Logs Hole Nos. 77-4 to 8, 10 to 13, 15 to 20, 23 to 25 & 27.	Pgs. 170-188
	Drill Logs Hole Nos. 77-1 to 3, 9, 14, 21 to 22, 26 & 28.	2328(II)-13 To 2328(II)-21
REPORT:	Quarterly Report Period Ended June 1975.	Pgs. 189-191
	1975 Drilling Programme No. 1 - Lake Frome Embayment. Sept. 1975.	Pgs. 192-211
PLANS:	Exploration Leases On North West Side Of Lake Frome Embayment. Fig. I.	Pg. 198
	Schematic Stratigraphic Column. Fig. III.	Pg. 201
	Poontana Project 1975 Drill Hole Location Map.	2328(III)-1
	Drill Logs Hole Nos. 77-29 To 38, 40 & 42.	Pgs. 212-223
	" " " " 77-39, 41, 43 to ~~44, 46 to~~ 47.	2328(III)-2 To 2328(III)-8
	Poontana Project - 1975 Drill Hole Locations & Sections. Fig. II.	2328(III)-9
	Poontana Project - 1975 Structural Interpretation Showing Possible Faults & Channels.	2328(III)-10
	Poontana Project - 1975 Programme 1 Area IV Poontana Creek Section I. Fig. V.	2328(III)-11
	Poontana Project - 1975 Programme 1. Area IV. Poontana Creek Section II. Fig. VI.	2328(III)-12
	Poontant Project - 1975 Programme 1. Area IV. Poontana Creek Section III. Fig. VII.	2328(III)-13
	Poontana Project - 1975 Programme 1. Area IV. Poontana Creek Section IV. Fig. VIII.	2328(III)-14
	Poontana Project - 1975 Programme 1. Area II & Area IV. Pipleine & Poontana Creek Section V. Fig. IX.	2328(III)-15
	Poontana Project - 1975 Programme 1. Area IV. Poontana Creek Section VIA. Fig. X.	2328(III)-16
	Poontana Project - 1975 Programme 1. Area IV. Poontana Creek Section VIB. Fig. XI.	2328(III)-17
	Poontana Project - 1975 Programme 1. Area IV. Poontana Creek Section VII. Fig. XII.	2328(III)-18
	Poontana Project - 1975 Programme 1. Area IV. Poontana Creek Section VIIIA. Fig. XIII.	2328(III)-19
	Poontana Project - 1975 Programme 1. Area IV. Poontana Creek. Section VIIIB. Fig. XIV.	2328(III)-20

TECHMIN PTY. LTD.

7th FLOOR, 27-35 TURBOT ST., BRISBANE, Q. 4000
POSTAL ADDRESS: P.O. BOX 232, NORTH QUAY, Q. 4000
PHONE: 21 8288, 21 8448, 21 1524, 21 1604

Telegraphic Address:
"Techmin", Brisbane
Telex: AA41040

Management Company for—
OILMIN N.L. (Formerly EXOIL N.L.)
TRANSOIL N.L.
PETROMIN N.L.

043

T315/74

DHH:ja

6th February, 1974

The Director of Mines,
Department of Mines,
Box 38,
Rundle Street Post Office,
ADELAIDE. S.A. 5000

Dear Sir,

Quarterly Report - Exploration Licence No. 77
Period ending 5th January 1974

Exploratory work on the above licence area, which is under farm-out to Minad Teton, was suspended during the quarter whilst negotiations continued between Minad-Teton and Afmeco Pty. Limited with regard to Afmeco entering into the farm-in agreement between Minad Teton and our Group of Companies as a partner to Minad Teton, with right to earn a 30% interest in the area.

Towards the close of the quarter, Afmeco were notified that Federal Government approval would not be granted to any proposal directed towards their becoming a party to the joint-venture. The Minad-Afmeco negotiations have therefore been indefinitely suspended.

Minad-Teton report no exploration expenditure for the quarter and advise that the future exploration programme is under review.

Yours faithfully,
TECHMIN PTY. LIMITED

D. H. HERON
General Manager

RECEIVED
11 FEB 1974
DEPT. OF MINES
SECURITY
2528

ENV. 2328

944

TECHMIN PTY. LTD.

7th FLOOR, 27-35 TURBOT ST., BRISBANE, Q. 4000
POSTAL ADDRESS: P.O. BOX 232, NORTH QUAY, Q. 4000
PHONE: 21 8288, 21 8448, 21 1524, 21 1604

Telegraphic Address:
"Techmin", Brisbane
Telex: AA41040

Management Company for—
OILMIN N.L.
TRANSOIL N.L.
PETROMIN N.L.

T462/74

DHH:ja

15th May, 1974

The Director of Mines,
Department of Mines,
Box 38,
Rundle Street Post Office,
ADELAIDE. S.A. 5000

Dear Sir,

Quarterly Report - Exploration License No. 77
Period ending 5th April, 1974

There has been no exploratory activity on the area held under Exploration License No. 77 during the quarter under report.

Subsequent to the rejection of Afmeco's plans to enter into an assignment with Minad-Teton to earn an interest in the area, an attempt was made to interest Afmeco in joining with Minad-Teton and Oilmin, Transoil and Petromin in a joint approach to British Petroleum Minerals Australia such that British Petroleum could earn an interest in various of the titles at Lake Frome, including Exploration License No. 77.

Afmeco declined to enter into this joint approach, and Oilmin, Transoil and Petromin, together with Minad-Teton are at present finalizing negotiations with British Petroleum on a joint venture relating to Exploration Licenses No's. 77 and 91. It is hoped that a signed agreement covering the proposed joint venture will be available for your perusal and for subsequent approval by the Minister of Mines within the next few weeks.

Yours sincerely,
TECHMIN PTY. LTD.

D. H. HERON
General Manager

c.c. Mr. R Bryan
(Mimd-Teton)

TECHMIN PTY. LTD.

7th FLOOR, 27-35 TURBOT ST., BRISBANE, Q. 4000
POSTAL ADDRESS: P.O. BOX 232, NORTH QUAY, Q. 4000
PHONE: 21 8288, 21 8448

Telegraphic Address:
"Techmin", Brisbane
Telex: AA41040

Management Company for—
OILMIN N.L.
TRANSOIL N.L.
PETROMIN N.L.

045

T545/74

DHH:ja

7th August, 1974

The Director of Mines,
Department of Mines,
Box 38,
Rundle Street Post Office,
ADELAIDE. S.A. 5000

Dear Sir,

Quarterly Report - Exploration Licence
No. 77. Period ending 5th July, 1974

During the quarter under report, a joint venture agreement was finalized between the Oilmin group, Minad-Teton and British Petroleum Minerals Australia Pty. Ltd. covering operations on Exploration Licences No's. 68, 77 and 91.

This agreement between the parties received Ministerial approval on July 4th, 1974.

Under the terms of the agreement, interest in Exploration Licence No. 77 is now held by the Oilmin group ($66^2/3\%$) and by Minad Teton ($33^1/3\%$) and B.P. may earn a 25% interest in the title by expenditure on exploration during the next three years.

The necessary formalities to implement the changes in title interest are in hand.

At the close of the quarter B.P. was on the point of commencing a resistivity survey over the licence area and the adjacent areas held under Exploration Licences No's. 68 and 91.

Only minor expenditures were incurred by the titleholders during the quarter, and a full statement of expenditure for the 6 monthly period 6th April to 5th October 1974 will be submitted with the next quarterly report.

Yours sincerely,
TECHMIN PTY. LTD.

D. H. HERON
General Manager

c.c. B.P. Minerals, Melbourne
M.T.A., Brisbane

CILMIN N.L.

TRANSOIL N.L.

PETROMIN N.L.

MINES ADMINISTRATION PTY LTD

TETON EXPLORATION DRILLING COMPANY PTY LTD

BP MINERALS AUSTRALIA PROPRIETARY LIMITED

046

PRIMARY AGREEMENT

EXPLORATION LICENCES 68, 77 AND 91 SOUTH AUSTRALIA

QUARTERLY EXPENDITURE REPORT

In accordance with Clause 8 of the above agreement, BP hereby reports on the expenditure for the quarter :- July to September, 1974.

	Total	EL 68	EL 77 ✓	EL 91
-Overheads: Plant and Tools	906	302	302	302
-Exploration				
Geological Services	190	63	64	63
Geochem. Services	377	94	189	94
Drilling Services	23,278	-	23,278	-
Drill-hole logging	5,904	-	5,904	-
Resistivity Survey	5,884	-	4,119	1,765
Access Roads	66	-	66	-
Consumable Stores	1,646	240	1,166	240
Consultants	310	103	104	103
-Operations				
Vehicle Operating	327	-	309	18
Charter Aircraft	1,007	148	609	250
Freight & Cartage	29	-	29	-
Travelling Expenses	247	-	235	12
Personnel Services and Trade	2,319		2,148	171
-Salaries & Wages	7,005	66	6,582	357
-Lease Fees	1,370	1	404	965
TOTAL	50,865	1,017	45,508	4,340

Certified Correct

J.H. Hills

Senior Geologist (Uranium)

BP Minerals Australia Proprietary Limited
Incorporated in Victoria

1 Albert Road, Melbourne
Postal Address: G.P.O. Box 5222BB, Melbourne, 3001
Telephone: 26-6911 Telex: 30166 Telegraphic Address: Austbeepee, Melbourne

RECEIVED
31 OCT 1974
DEPT. OF MINES
SECURITY
2328

The Director of Mines
Department of Mines
Box 38, Rundle Street, Post Office
ADELAIDE S.A. 5000

Our Reference	Your Reference	Telephone Ext'n	Date
AG/27/16/14/1			22nd. October, 1974.

Dear Sir,

QUARTERLY REPORT FOR PERIOD ENDING SEPTEMBER 1974 - EL 77

The Honourable Minister for Development and Mines approved the farm-in agreement between the Oilmin Group, Minad-Teton and BP Minerals Australia Pty. Ltd. for Exploration Licence 77 (and adjacent Licence areas). Under the terms of the agreement BP Minerals Australia Pty. Ltd., as operator, will in future submit the quarterly report.

Exploration

During the quarter of July - August - September, water sampling, resistivity surveying, and rotary drilling was done on EL 77.

Water Sampling:

A total of 14 water bores were sampled and assayed for uranium in this lease area.

Resistivity:

A surface resistance survey was carried out over most of the lease area by Murdoch Geology & Geophysics Pty. Ltd. A total of 108 kilometres of line was surveyed.

Drilling and Logging:

A total of 28 rotary holes were drilled in five target areas in the lease area. Drilling depths were in the range of 500 to 700 feet. A total of

./2

17,000 feet was drilled and logged. Drilling was done by Thompson Drilling Co. Pty. Ltd. using a Mayhew 1000 and the logging was carried out by Geoscience Associates (Australia) Pty. Ltd.. A report on the drilling will be submitted with the fourth quarter report.

Personnel:

BP Personnel:

M.S. Bell - Project Geologist
D. Hurburgh - Assistant Geologist (6 weeks period)
R. Milner - Field Assistant
D. Brown - Field Assistant

Thompson Personnel:

C. Stratford - Tool Pusher
1 driller
2 assistants

Geoscience Pty. Ltd:

B. McGurk - Logger

Murdoch geology & Geophysics Pty. Ltd.:

R. Murdoch - Geophysicist
B. Copps - Assistant Geophysicist
2 Field Assistants

Future Exploration:

No exploration work is planned forthe fourth quarter of this year.

Enclosures:

Appendix	I	Report on Resistivity Survey
Appendix	II	Water assays
Appendix	III	Drill Data
Plan	I	EL Location Map
Plan	II	Water Sample Map
Plan	III	Drill Hole Location Map

Yours faithfully,

Dr. J. H. Hills
Senior Geologist (Uranium)

APPENDIX I

REPORT ON RESISTIVITY SURVEY

1. R. Murdoch - July 1974 - A Resistivity Survey over EL 77 Lake Frome, South Australia for BP Minerals Australia Pty. Ltd.

2. Dianne Harbison - August 1974 Gaussian Filtering of the Lake Frome Resistivity Survey Results.

APPENDIX I

050

A RESISTIVITY SURVEY OVER EL 77 LAKE FROME, SOUTH AUSTRALIA

FOR BP MINERALS AUSTRALIA PTY. LTD.

EL 77

Relevant data on EL 77 taken from Resistivity Survey Report

R. Murdoch, B.A. (Earth Sciences)
Murdoch Geology & Geophysics P/L,
310 Grey Street,
GLEN INNES N.S.W. 2370

July 1974

CONCLUSIONS

A reconnaissance resistivity survey has been carried out over parts of two exploration licences located immediately west and north-west of Lake Frome in North Eastern South Australia. The areas occur near the Beverley sedimentary uranium deposit and are considered prospective for sedimentary uranium. The Beverley Deposit occurs within Lower Tertiary fluvial sands deposited within a channel incised into Cretaceous sediments and thought to have drained eastwards from the Flinders Ranges. The aim of the survey conducted was to locate basement channelling and faulting on several reconnaissance traverse lines conducted within the two EL's.

Several likely channel segments and possible faults were located within the EL's, with the main area of interest being the central part of EL 77 north of North Mulga Outstation. Two reconstructions of basement geology are possible and these are summarised on Plate 4 and 4A accompanying this report.

Although insufficient work has been done to confidently reconstruct the basement geology of the EL, a drilling programme involving at least 9 preliminary holes has been recommended on EL77. Successful holes should be followed by step-out drilling designed to adequately define the channel segment located.

Additional resistivity work is recommended either coinciding with or immediately following the preliminary drilling programme.

INTRODUCTION

A resistivity survey has been carried out by Murdoch Geology & Geophysics Pty Ltd over EL 77 near Lake Frome, South Australia.

The field work associated with the survey was carried out over a period of 16 days from the 7th to 22nd July, 1974. The survey was carried out by a three man crew lead by Mr B. Copps (geophysicist). The crew was supervised and assisted on 10 of the 16 days by the author (senior geophysicist). A camp was established at Western Nuclear's base camp, situated 10 kilometres west of North Mulga Oustation for the period of the survey.

North Mulga Oustation is situated on the Copley - Moolawatana road, 40 kilometres NE of Wooltana Station and 160 kilometers ENE of the Village of Copley in north eastern South Australia. (See Plate 1. - location plan). The area is immediately east of the Flinders Ranges and immediately west of Lake Frome.

The area surveyed comprised parts of two explorations licences: namely: EL 77 & EL 91.

The location of both EL's and all the resistivity lines conducted during the survey are shown on Plate 1, a 1:250,000 location plan of the area west and north-west of Lake Frome.

The survey comprised 158.5 kilometres of Schlumberger Array profiling and 15 detailed Schlumberger Array soundings.

GEOLOGY

The area surveyed comprises part of the Lake Frome Embayment of the Great Artesian Basin. Sands deposited within Tertiary channels incised into Cretacous basement rocks are considered prospective for sedimentary uranium deposits. The channels are thought to have meandered generally eastwards from the foothills of the Flinders Ranges, where Proterozoic and Lower Palaeozoic rocks of the Adelaidean Series crop out. These rocks have relatively high background concentrations of uranium, and are thought to be the source area for the Beverley Deposit.

The Beverley Deposit was located by Western Nuclear and its position is shown on Plate 1. The ore-body occurs within Lower Tertiary fluvial sands at depths between 160-200 metres.

Evidence from deep drillholes and water bores suggest that Cretaceous shales form the basement rocks throughout the area surveyed. The Lower Tertiary channels have been incised into the basement rock and have been overlain by blanket deposits of Upper Tertiary and Quaternary alluvium in excess of 150 metres thick.

Channelling in the vicinity of the Beverley Deposit is thought to have been controlled by faulting associated with the up-lifting of the Flinders Ranges. Movement is thought to have been progressive from the Cretacous continuing possibly as late as the Upper Tertiary.

The aim of the survey described in this report was to determine whether the electrical resistivity method could be used successfully to delineate channelling and faulting within the Cretacous bedrock. If successful, then the aim was to use the method to attempt to reconstruct as much basement geology of the EL's as time permitted.

THE RESISTIVITY METHOD

Details of the principles of the electrical resistivity method are not included in this report. The reader is either referred to a simple geophysical text on resistivity or additional information could be supplied by the author upon request.

EQUIPMENT

The equipment used for this survey comprises a DC Voltage Source with a maximum output of 540 volts. The current electrodes comprised 3 foot brass rods connected to the E.M.F. by insulated cables. The current flowing through this circuit was measured on a Yew Milliameter capable of reading accuracies of 0.3 milliamps. Facilities were available to reverse the direction of current output to check anisotropy. No aids to conduction such as salt and water etc. were necessary during this survey.

The potential drop across a part of the electrical field established above was recorded on high impedance Comark Microvoltmeter connected to conventional porous pots. A simple bucking circuit was connected to the microvoltmeter to enable cancellation of SP currents.

FIELD PROCEDURES

The resistivity survey was conducted along 6 traverse lines with a constant reading interval of 0.5 kilometres. Each reading station was marked with a 25 mm x 25 mm survey peg projected at least 0.5 metres above the ground. The respective line and position number were recorded on each peg. The distance between each reading station was measured by a wire 500 metres long. Surface landmarks (fences, tanks etc.) intersected on each line are marked at their respective positions on the profile graphs (Plate 2 and 3). The position of all lines conducted on EL 77 is shown on Plate 4.

The traverses comprised resistivity profiling with a current electrode separation of 1 kilometre and potential electrode separation of 200 metres. Profiling was parallel to the traverse direction. A short profile using a current electrode separation of 2 kilometres with the 200 metre potential electrode separation was tried from Line 1 5000S - 9000S to determine whether any extra information could be obtained by using a wider electrode separation. This method of profiling has been recommended for future use on Line 3 (EL91) and the northern end of Line 1 (EL 77).

Detailed Schlumberger Array soundings were conducted in several places to assist the interpretation. However, generally the conducting of soundings was ignored because of the very homogeneous electrical properties of the Cretaceous basement. The position of each detailed sounding conducted is given in Table 1 within the Interpretation Section below. All soundings were expanded parallel to the traverse line on a predetermined logarithmic formulae. Generally they were expanded to a maximum current electrode seperation from the centre of configuration of 500 metres, but some were expanded as far as 1 kilometre from the centre of configuration. On most soundings 14-15 individual readings were taken.

RESULTS

All the detailed soundings have been plotted as standard log-log graphs of apparent resistivity (vertical axis) against current electrode separation from the centre of the configuration (horizontal axis). The plotting of the data in this manner allows the sounding graphs to be compared with standards 2 & 3 layer computer-derived interpretation curves.

The sounding curves are presented as Plates 6 to 15, and 19 accompanying this report.

The profiles conducted during the survey are plotted on Plates 2 and 3. They are plotted as graphs of apparent resistivity (vertical axis) against line position (horizontal axis). The vertical scale used is 1 cm = 1 ohm metres. The horizontal scale used is 1 cm - 500 metres. The result of the short 2 km traverse (Line 1 5000S - 9000S) has been plotted at its respective position on Plate 2.

Apparent resistivity data from EL 77 has been plotted on Plate 4, a 1 cm = 600 metre plan of part of the EL, to show possible interpretation between lines.

INTERPRETATION

(a) Detailed Soundings

The detailed soundings have been interpreted by partial curves matching techniques using essentially 2 layer and auxiliary curves. This method of interpretation intergrates the sounding curve into a number of layers of different resistivity and thickness. An expected lithology is assigned to each layer depending upon the known geology of the area, its resistivity value, position and thickness.

The detailed soundings have been interpreted as follows:

TABLE 1

DETAILED SOUNDING INTERPRETATION

	Layer	Resistivity (ohm metres)	Depth Interval (metres)	Expected Lithology
Line 1 00S	1	15	0-44	Surface layer
Plate 6	2	3	44-260	Tertiary sediments
	3	12	260+	Cretaceous sediments
Line 1 3500N	1	5	0 - 70	Surface layer-Quaternary
Plate 7	2	3.3	70 -420	Tertiary sediments
	3	8.approx	420+	Cretaceous sediments
Line 1 14500N	1	9	0 - 10	Surface layer
Plate 8	2	7.2	10 -150	Quaternary-Tertiary
	3	3	150-270	Tertiary sediments
	4	4.2	270-approx 500	Tertiary sediments
	5	?	approx.500	Cretaceous
Line 1 24500N	1	350	0 - 9	Surface layer
Plate 9	2	17.5	9 -63	Quaternary-Tertiary
	3	5 -	63 - ?	Tertiary, thence Cretaceous
Line 1 4000S	1	12	0 -54	Surface layer-Quaternary
Plate 10	2	3.6	54 -380	Tertiary sediments
	3	20 approx.	380+	Cretaceous sediments
Line 1 7000S	1	12	0 -50	Surface layer-Quaternary
Plate 11	2	4.8	50 -550	Tertiary sediments
	3	10	550+	Cretaceous sediments
Line 1 12000S	1	12	0 -42	Surface layer
Plate 12	2	4	42 -360	Tertiary sediments
	3	8	360+	Cretaceous sediments
Line 1 23000S	1	25	0 -30	Surface layer
Plate 13	2	8.2	30 -155	Quaternary-Tertiary
	3	6.2	155+	Cretaceous or Tertiary

	Layer	Resistivity (ohm metres)	Depth Interval (metres)	Expected Lithology
Line 1 32000S	1	14	0- 40	Surface layer
Plate 14	2	7	40-120	Tertiary sediments
	3	13	120+	Adelaidean or Cretacous (?)
Line 2 00W	1	8	0 -75	Quaternary surface layer
Plate 15	2	4	75-175	Tertiary sediments
	3	5	175-505	Tertiary sediments
	4	?	505+	Cretaceous
Line 4 5000E	1	15	0 -16	Surface layer
Plate 19	2	6	16-64	Quaternary
	3	3.5	64-approx 500	Tertiary sediments
	4	?	approx. 500+	Cretaceous

In the above interpretation the following resistivity ranges have been interpreted as representing the following formations:

3 - 5	Tertiary sediments
6 -12	Cretaceous sediments
13 -20	Cretaceous or Adelaidean

Some minor exceptions occur, namely:

(1) Line 1 4000S, 20 ohm metre 3rd layer is probably Cretaceous.

(2) Line 1 24500N, Line 1 23000S, Line 3 10000, Line 3 21000S.

On these soundings the Tertiary layer has a resistivity between 5 and 6 and no separate Cretaceous layer has been penetrated to a depth of 500 metres. There may be virtually no electrical contrast between a relatively resistive Tertiary section (5-6 ohm metres) and a relatively conductive Cretaceous section. (6 ohm metres).

In interpretating the sounding data, the surface layer can be ignored as the resistivity and thickness of this layer is largely dependent upon near-surface moisture conditions at the time of the survey and

the current electrode separation of the first reading taken. This layer has been loosely termed Quaternary, but it is likely that the Quaternary section in most cases will continue downwards into the second layer, particularly where an additional layer can be interpreted between the surface layer and the Tertiary layer. The additional layer, where it occurs, has been loosely termed Quaternary-Tertiary.

Most soundings were not expanded beyond 500 metres, as it was considered that profiling was of more value than sounding in attempting to reconstruct the geology of the area, considering the time available. Additional soundings, expanded to maximum current electrode separations from the centre of configuration of 1 km, are required during any subsequent survey, particular in the central part of EL 77, to provide more accurate information of the depth to the Cretaceous layer.

Experimental profiling with a current electrode separation of 2 kms is required over the northern part of Line 1 and along parts of line 3 to confirm that optimum profiling interval has been used in all areas.

The 2 km traverse on Line 1 5000S - 9000S confirmed that no additional basement data could be obtained using a wider profiling interval in areas where the depth to basement was less than 500 metres.

It is considered likely that the proposed experiments with wider separations will reveal that 2 km separations need only be used in isolated very deep areas, which have to be initially located using 1 km separations.

(b) Profiles

During the survey the main emphasis was placed on obtaining as much profile data as possible, at a uniform separation, to allow a preliminary reconstruction of the geology of the area. Over the area surveyed apparent resistivity values at the 1 km separation generally vary from 4 to 7 ohm metres indicating very little variation in the electrical properties of the layers present. In some areas values drop below 4 (deep basement and channelling) and at the extreme southern end of Line 1 rise above 7. Sudden variations in apparent resistivity value of about 1 ohm metre along the profiles have been interpreted as faults. Channels have been interpreted where lower values occur over an interval comprising several readings.

Channelling and faulting have been interpreted to occur as follows:

TABLE 2

PROFILE INTERPRETATION

(a) Channelling			
EL 77	Line 1	1750N - 4250N	
	Line 1	7750N - 10250N	
	Line 1	14750N - 17250N	
	Line 1	6750S - 7750S	(Possible)
	Line 1	19250S -22250S	
	Line 1	10750W - 12250W	
	Line 4	4250E - 5750E	
	Line 4	7250W - 10000W	
	Line 5	2250N - 4250N	
(b) Faulting			
EL 77	Line 1	1750N - Downthrow north	
	Line 1	28250N - Downthrow south	
	Line 1	19250S - Downthrow south-west	
	Line 1	22250S - Downthrow north-east	
	Line 1	24250S - Downthrow north-east	
	Line 1	31250S - Cretaceous-Adelaidean Contact?	
	Line 2	9250W - Downthrow north-west	
	Line 5	4250N - Downthrow to south	

Interpreted Geological Sections

Interpreted geological sections have been constructed for each line beneath their respective profile. They have been constructed using both the qualitative interpretation of profiles and the quantitative interpretation of the soundings. They have been plotted on the same horizontal scale as the profiles, but on a vertical scale of 1 cm = 100 metres.

The interpreted geological sections are schematic rather than absolute due to the lack of sufficient fully expanded detailed soundings. They show the likely positioning of channelling, faulting and the approximate depth to basement as indicated by those soundings conducted.

(a) EL 77

Most of the geological features of interest located during this survey occur on EL 77. A 1 cm - 600 metre plan of the area surveyed within this EL is presented as Plate 4 accompanying this report. The apparent

resistivity profile data has been plotted at its appropriate position on this plan. An attempt has been made to reconstruct the basement geology of the area. Two alternative reconstructions are possible. Alternative A, where the emphasis is on easterly flowing channels, as shown on Plate 4, and Alternative B, where the emphasis is on channelling controlled by faulting, is shown on Plate 4A at the same scale.

Some of the interpretation is common to both reconstructions. Several faults are indicated at the southern end of Line 1. One at Line 1. 22250S, downthrow to the east, appears to form a graben with the Poontana Fault. A channel within the graben is likely (Line 1 19250S - 22250S)

Step faulting (downthrown north-east) occurs further south on Line 1. The basement contact between Cretaceous and Adelaidean rocks may occur at 31250S on Line 1. Faulting also occurs at the far northern end of Line 1.

The method of reconstruction varies in the area of Lines 4, 5, 2 and the central part of Line 1. It is doubtful whether either reconstruction is right and the actual situation is probably a combination of both reconstructions. Further profiling has been recommended to help unravel the basement geology.

RECONSTRUCTION A: Plate 4

This reconstruction assumes that all the channels segments located flow generally eastwards. Four channels would have to occur, namely: Pepegoona Channel A and Channel B, the Poontana Channel and the possible North Mulga Channel as shown on Plate 4. The main fault in this interpretation is that it does not allow for channel deviation due to structural trends, which generally strike NE-SW.

RECONSTRUCTION B: Plate 4A

This reconstruction assumes that Lower Tertiary drainage was controlled by structural trends. It is possible that faulting at the western end of Lines 2 and 4 may be connected and that an analogous situation to Beverley may occur with channelling just west of the fault zone.

Channelling anomalies Line 1 6750S - 7750S, Line 1 14750N - 17250N and Line 5 2250N - 4250N coincide with the presumed axis of the Poontana Sub-basin as defined by previous scout drilling. These anomalies, particularly the second one, may only be marking the deepest point of the sub-basin. However, on Line 5 at least it would appear that channelling has occurred along a weak zone associated with the axis.

The proposed North Mulga Channel may also be controlled by NE-SW faulting.

RECOMMENDATIONS

(a) Preliminary Drilling Programme

EL - 77

Although insufficient work has been done to confidently reconstruct the geology of EL 77 from the work completed, preliminary drillholes are recommended at the following positions to initially evaluate channel segments indicated.

Line 1	16500N, 8500N, 3000N, 7250S, 21000S
Line 2	11000W
Line 4	7750W, 5000E
Line 5	4500N

Step-out holes should be drilled at intervals of $\frac{1}{2}$ km either side of the preliminary holes until channel intervals located have been adequately defined and some preliminary information on radio-activity present in the channel segments has been obtained.

(b) Additional Resistivity Programme

Additional resistivity work either coinciding with, or immediately following, the preliminary drilling programme, should be aimed at.

(a) Providing more accurate information on depth to Cretaceous sediments in the deeper parts of EL 77. Short 2 km current electrode separation traverses should be conducted in deeper parts of the area to determine whether the optimum profiling separation has been selected for use in all parts of the Lake Frome Prospects.

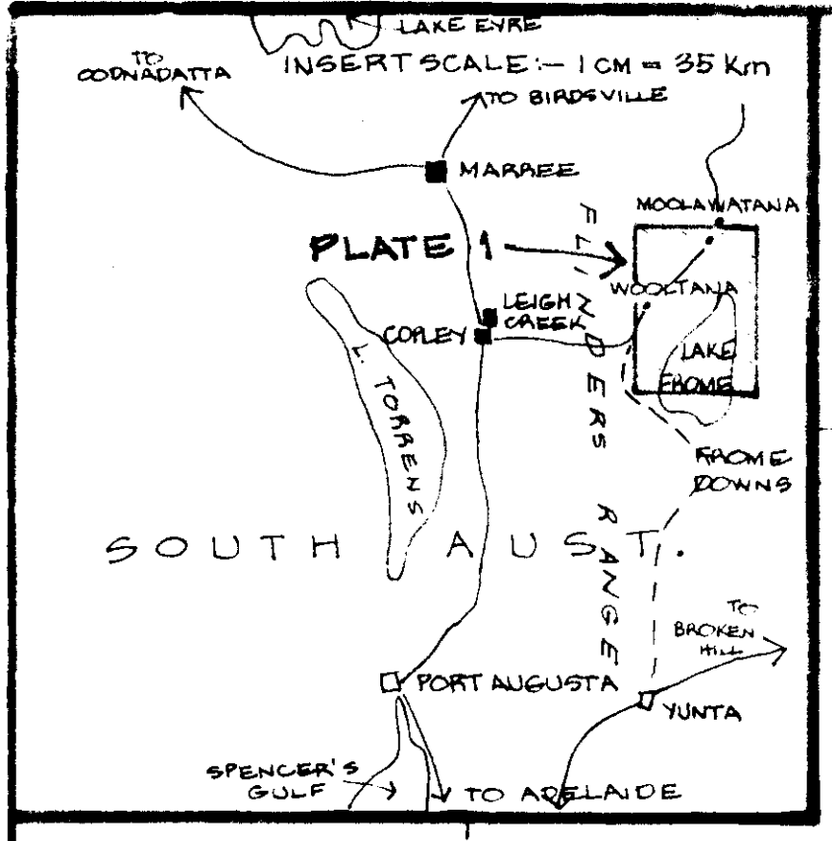
(b) Additional reconnaissance work in the following areas

EL 77 (1) Complete Line 5 continuing northwards towards Box Bore.
(2) East-west line near Box Bore.
(3) Complete Line 1 northwards to Skeleton Bore.
(4) Complete Line 4 to join Line 2.
(5) East-west line near Paralana Homestead.

(c) More detailed work in areas found to be of interest from the preliminary drilling to determine channel paths on parallel lines 2 kilometres spart orientated perpendicular to the expected channel

path. On these lines the reading separation should be reduced to 0.25 kilometres to provide slightly more data over channel segments.

(d) Resistivity has been used in other sedimentary uranium areas to locate suitable environments for uranium deposition along channel segments. Such work indicates the position of ponding, channel bends etc., and has been successful in locating pyrite zones often associated with sedimentary uranium deposits.



MT. HOPELESS

45'

MOOLAWATANA STATION

140° 00'

20000 N

32° 00'

HAMILTON CREEK

13500 W

EL 77

LINE 2

12000 N

LINES 6500 N

A 00 W

10000 E

6500 N

LINE 5 00 N

LINE A

POONTANA CREEK

BEVERLEY DEPOSIT

LINE A 00 E

705

NORTH MULGA OUTSTATION

"WESTERN NUCLEAR's" CAMP

LINE A 7000 E

15'

MOOLAWATANA ROAD

LINE 1

32000 S

COPLEY

WOOLTANA STATION

LAKE FROME

UP

DOWN

005 00 E

LINE G F F

18000 E

LINE 3

CHANNEL ?

COPLEY 110 km

30'

EL 91

UP

DOWN

Fault

BIG JOHN CREEK

29000 S

45'

LAKE FROME

130° 30'

31° 00'

45'

140° 00'

45'

B.P. AUSTRALIA – MINERALS DEPT.

LAKE FROME RESISTIVITY SURVEY

EL 77 & EL 91

LOCATION PLAN – RECONNAISSANCE LINES

SCALE :- 1 : 250000

— — EL BOUNDARY

COPLEY – MOOLAWATANA ROAD

00E LINE A — RESISTIVITY LINES, POSITION AT END OF LINE

PREPARED BY :-

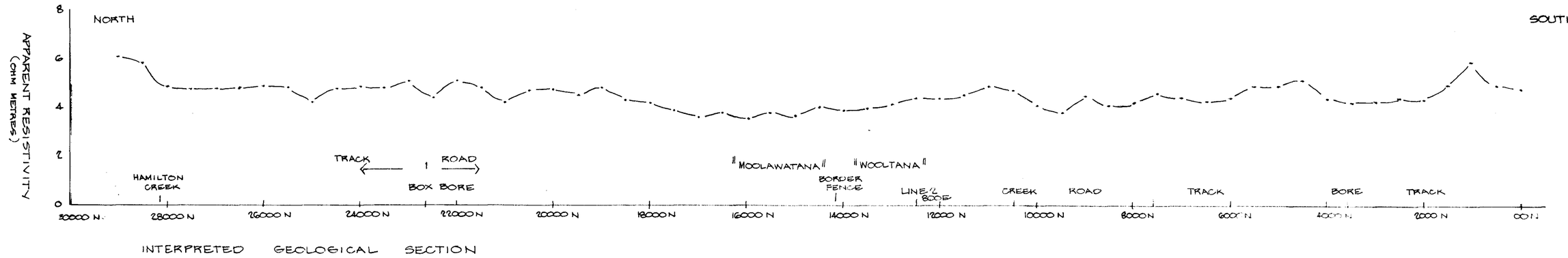
MURDOCH GEOLOGY & GEOPHYSICS PTY. LTD.

GLEN INNES , N. S. W.

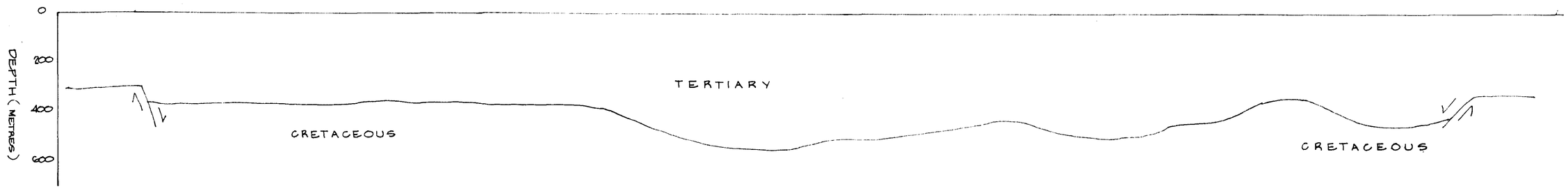
PLATE 1 REPORT 63

2328(7)-6

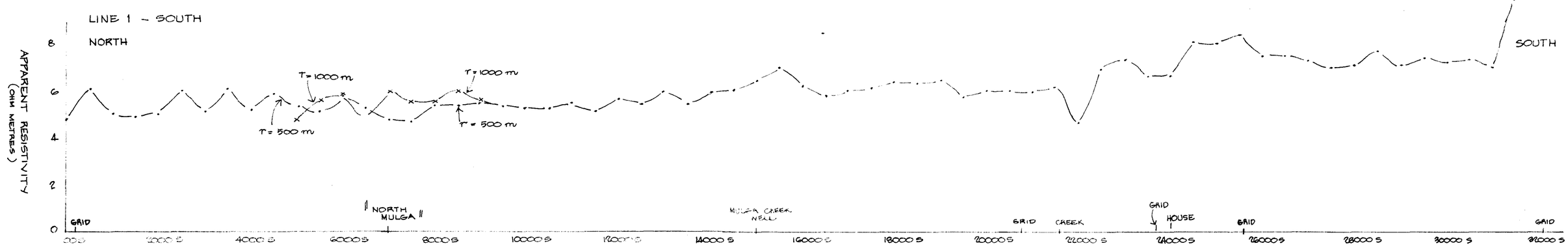
LINE 1 – NORTH



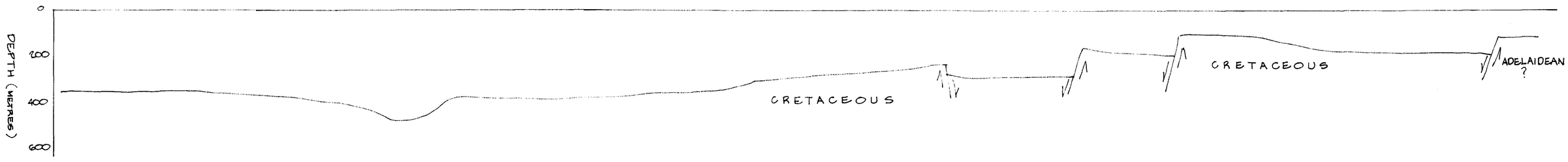
INTERPRETED GEOLOGICAL SECTION



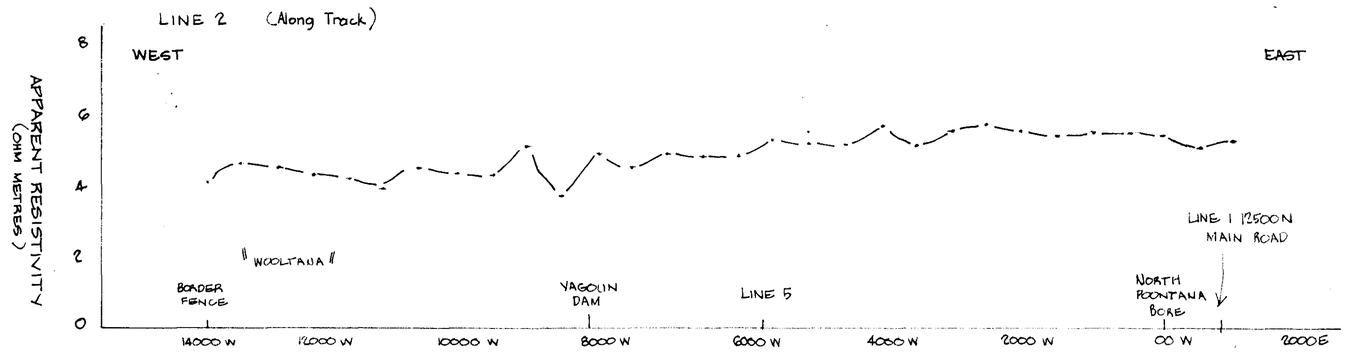
LINE 1 – SOUTH



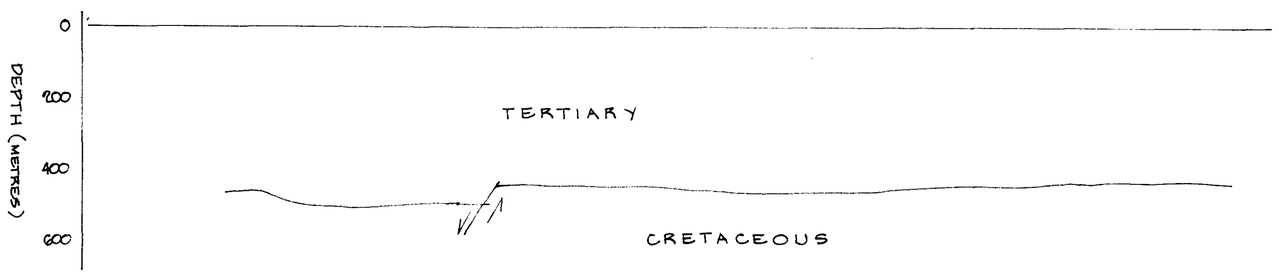
INTERPRETED GEOLOGICAL SECTION



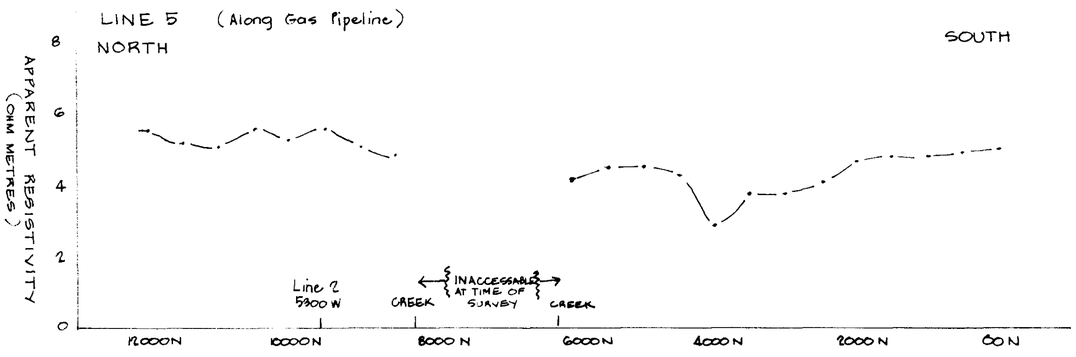
LINE 2 (Along Track)

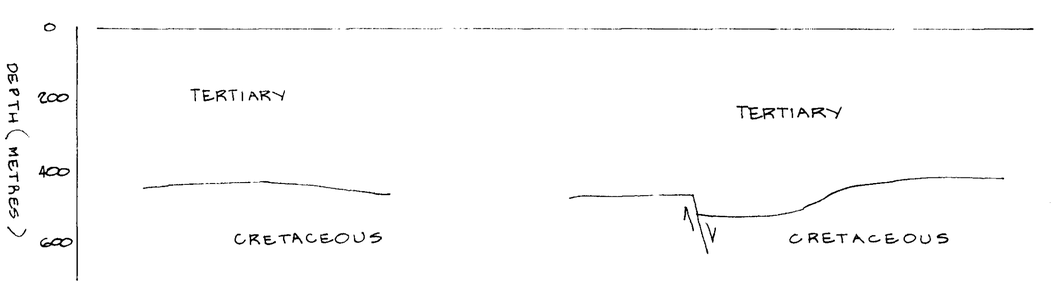


INTERPRETED GEOLOGICAL SECTION



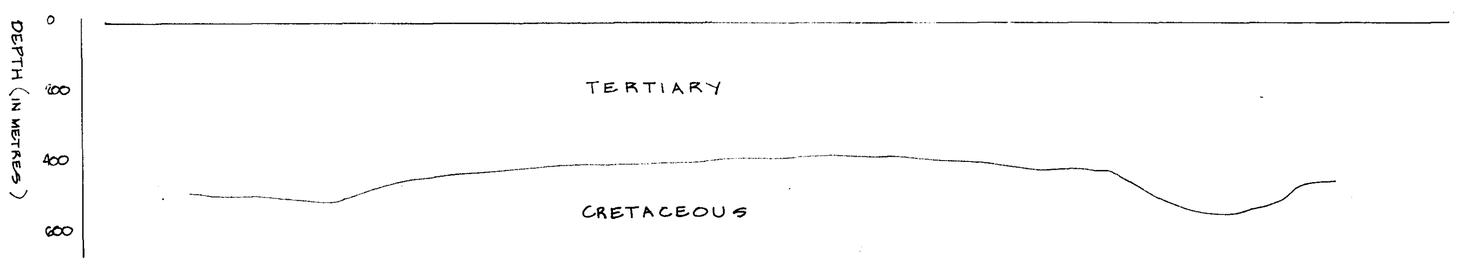
LINE 5 (Along Gas Pipeline)





LINE 4

INTREPRETED GEOLOGICAL SECTION



2328-D-7

B.P. AUSTRALIA – MINERALS DEPT.
LAKE FROME RESISTIVITY PROFILES

EL 77 & LINES 1, 2, 4 and 5
BEVERLEY DEPOSIT LINES A & B

SCALES :–
Vertical : Profiles 1 cm. = 1 ohm metre
interpreted Section 1cm = 100 metres

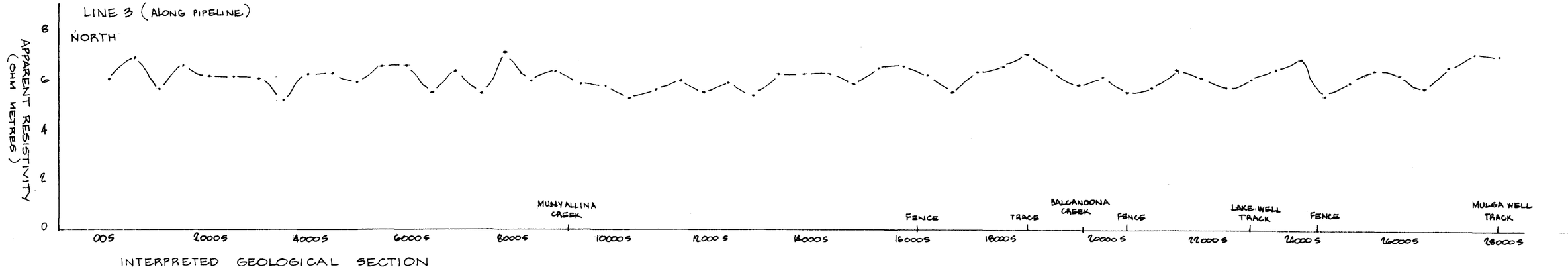
Horizontal : 1 cm. = 500 metres

PREPARED BY :–
MURDOCH GEOLOGY & GEOPHYSICS PTY. LTD.
GLEN INNES, N.S.W.

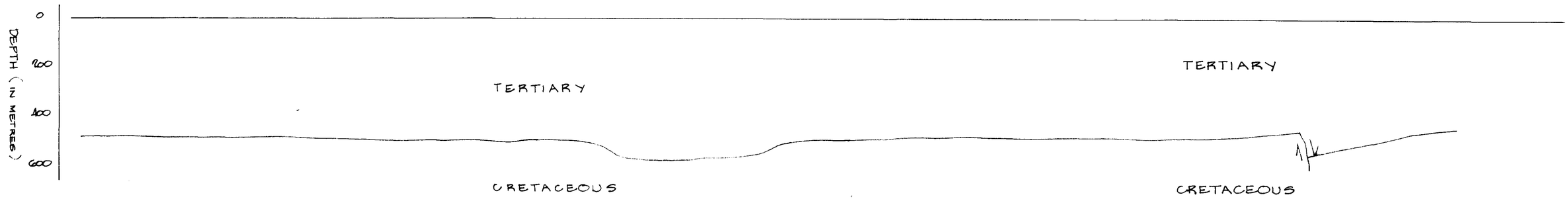
PLATE 2 REPORT 83

LINE 3 (ALONG PIPELINE)

NORTH

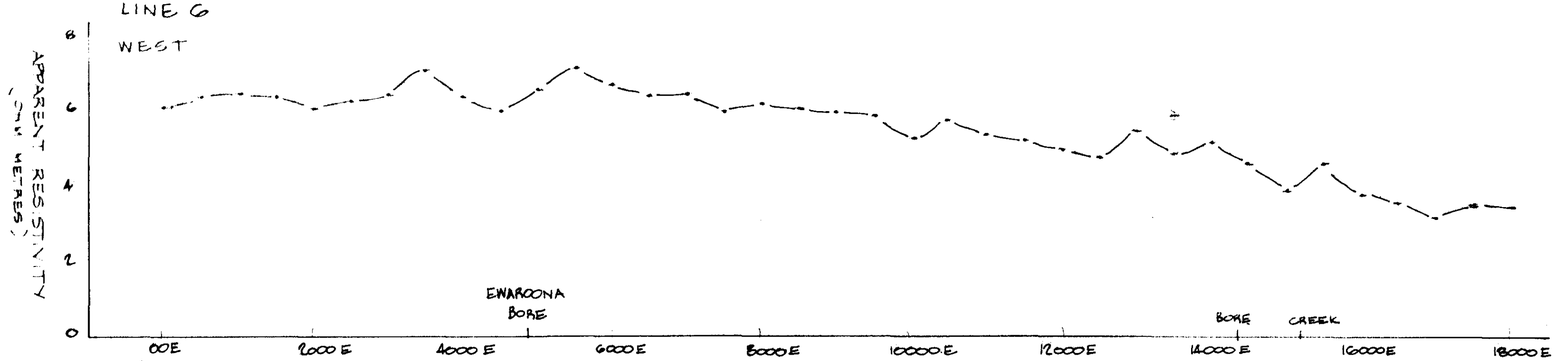


INTERPRETED GEOLOGICAL SECTION

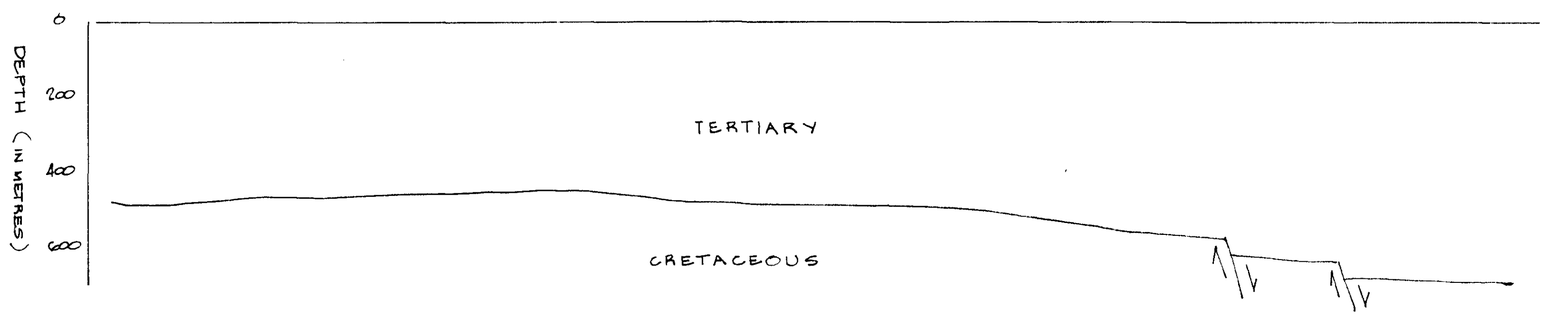


LINE 6

WEST



INTERPRETED GEOLOGICAL SECTION



B. P. AUSTRALIA - MINERALS DEPT.

LAKE FROME RESISTIVITY SURVEY

E.L. 91 LINES 3 & 6

SCALES :-

VERTICAL - PROFILES 1 CM = 1 OHM METRE

INTERPRETED SECTIONS 1 CM = 100 METRES

HORIZONTAL - 1 CM. = 500 METRES

PREPARED BY :-

MURDOCH GEOLOGY & GEOPHYSICS PTY. LTD.

GLEN INNES, N. S. W.

PLATE 3 REPORT 83

2328(I)-8

T 1125

EL 77

EL 68

EL 91

Lake

Frome

"Moolawatana"

"Old Moolawatana" (ruins)

"Mt Freeling"

"Mt Fitton"

"Yerelina"

"Paratana"

"North Mulga"

"Umberatana"

"Old Illinawortina"

"Arkaroola"

"Yadaninna"

"Wooltana"

"Balcanoona"

"Wertaloona"

"Wearing" (ruins)

"Arrowie"

"Mulga View"

"Lake Cootabarlow"

RANGES

FLINDERS

NORTH

LAKE CALLABONNA

Trinity Well

Village Well

Billy Spring Bore

The MacDonnell Ck

Pelican Well

Tardlapinna Well

Mundawertina Well

Lonesome Bore

Mt Livingston Well and Spring

Tindelpina Creek

Great Gladstone Bore

Tindelpina Well

Canyon Bore

Daly Bore

Yudnamutana Bore

Overland Bore

Bend Well

Mt Thomas Well Bore

North Well

Mallee Well

Illinawortina Well

Boulder Bore

Bolla Bollana Creek

O'Donohue Castle Well

Merinjina Well

Nudlamutana Well

Woodnamoka Well

John Brown Well

Gunpowder Bore

Twelve Springs

Terrapinna Bore

Terrapinna Springs

Marks Bore

Valley Bore

Hamiltons Creek

Speculation Well

Pepegoona Bore (I.D.)

Four Mile Creek

Well (P.D.)

Paratana Hot Springs

Four Mile Bore

North Mulga Bore

No.35 Bore

Buxton Bore

Mulga Creek Well (P.D.)

Hotsprings Creek

No.6 Bore (I.D.)

Arkaroola Creek

Caldina Creek

No.12 Bore

Roberts Well

No.1 Bore

Ewaroona Well

Woodlawoodlana Well

Muckalooana Well

Mulga Bore

Mulga Bore (P.D.)

Home Rule Bore

Johnsons Dam

Netting Well Creek

Balcanoona Creek

Mallee Well

John Well

One Gun Dam

Willawortina Dam

Moro Spring

Nantawarrinna Bore

Dead Bullock Bore

Old Dam

Mora Creek

Ironstone Bore

One Tree Bore

Yates Well

Black Oak Well

Collins Dam

Double Dam

Horse Dam

Willowie Bore No.3

Pauls Dam

Pauls Well

O'Connell Bore

Moorowie Well

Moorowie Bore

Little Bobmonie Well

Rockhole Bore

Wearing Well

No.1 and No.2 Wells

Bell Bore

Bore (I.D.)

Bendeuta Creek

Mosquito Creek Bore

Mulligan Dam

Woolatchi Creek

Woolatchi Bore

Bore

Skeleton Bore

Anderson Bore

Little Bank Bore

Parabarana Bore

No.1 Bore

Box Bore

Middlebank Bore

New Bore

Yagalin Dam

North Poontana Bore

Ned's Bore

Bar Bore

Poontana Creek

Moolawatana Bore

Eagle Well

Christmas Bore

Ram Bore

Tea Tree Bore

Tea Tree Creek

Eagle Dam

Christmas Well

Mungaranie Bore

Sandridge Bore

Lake Ball Well

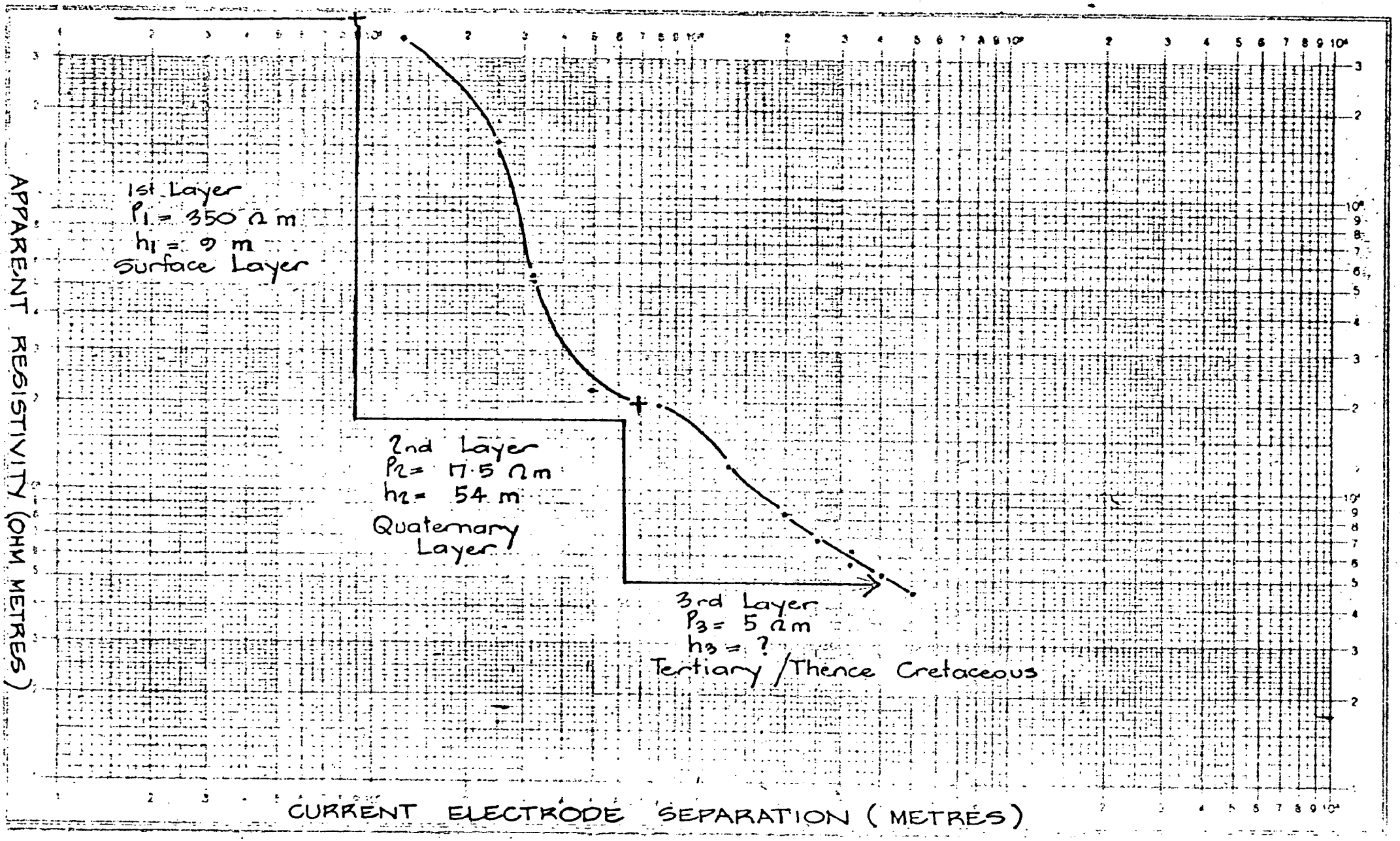
Bore

Cootabarlow No.1 Bore

Bore

Bore

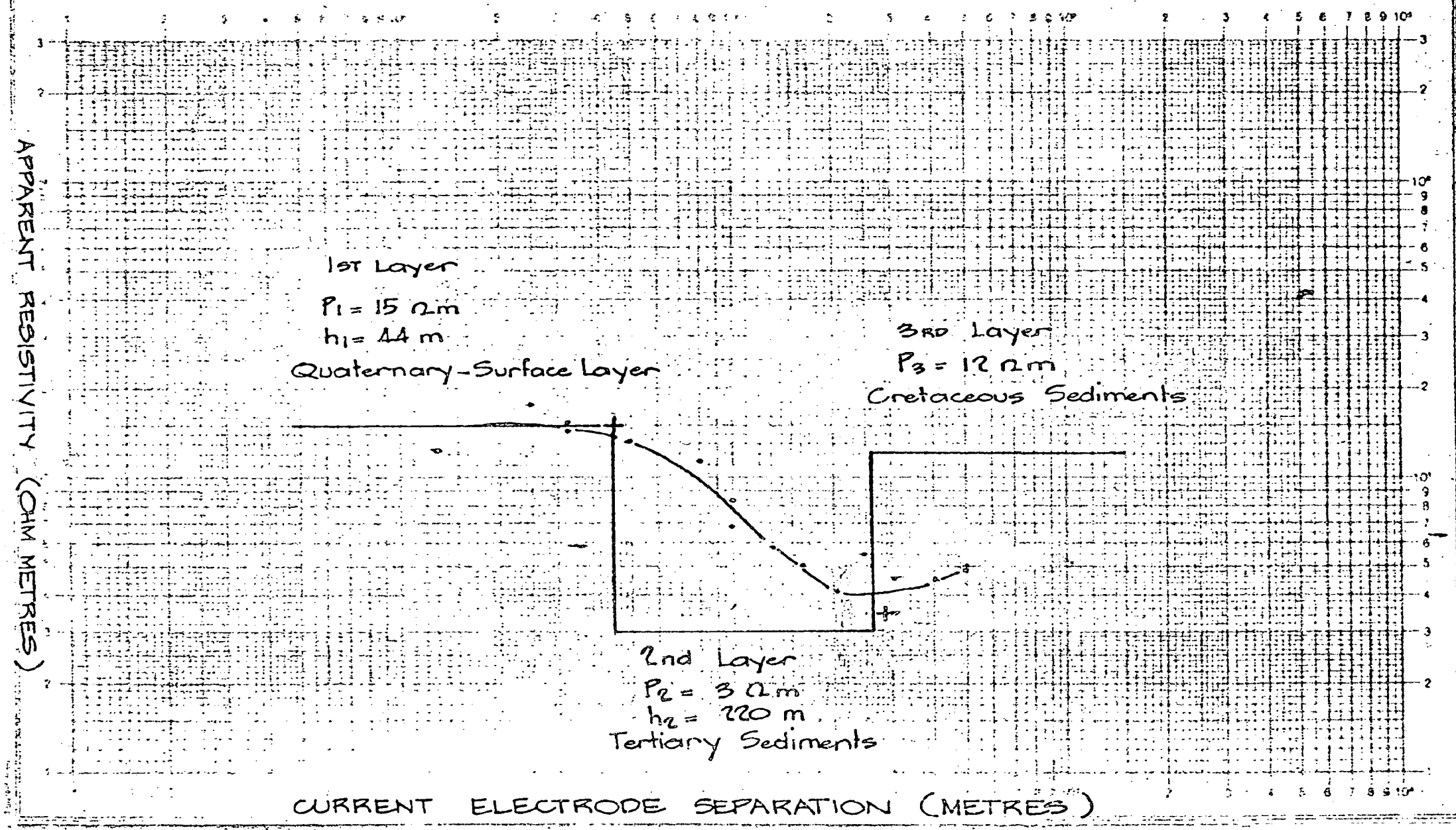
LAKE FROME
LINE 1 24500 N



LAKE FROME
LINE 1 00S

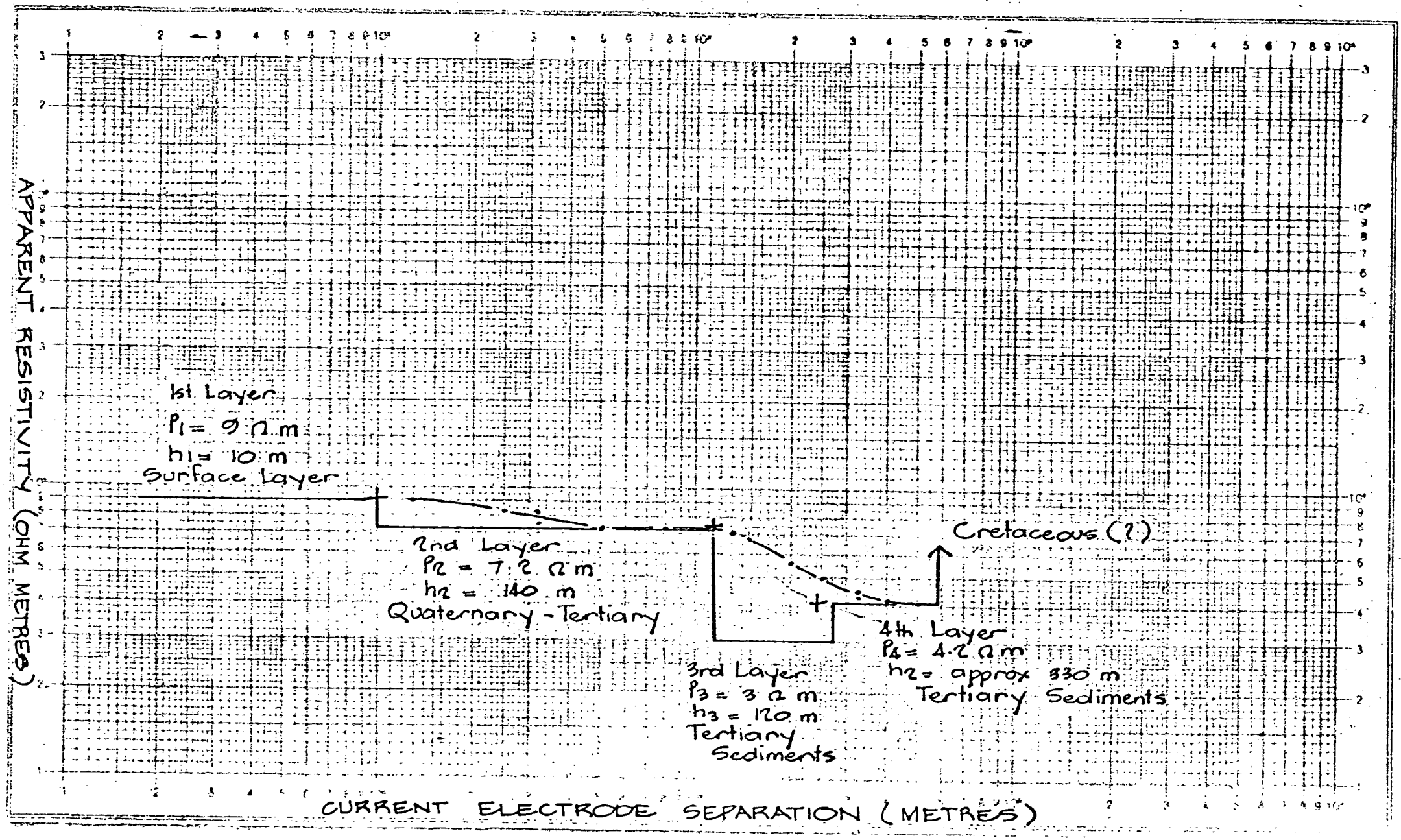
062

PLATE 6 REPORT 83



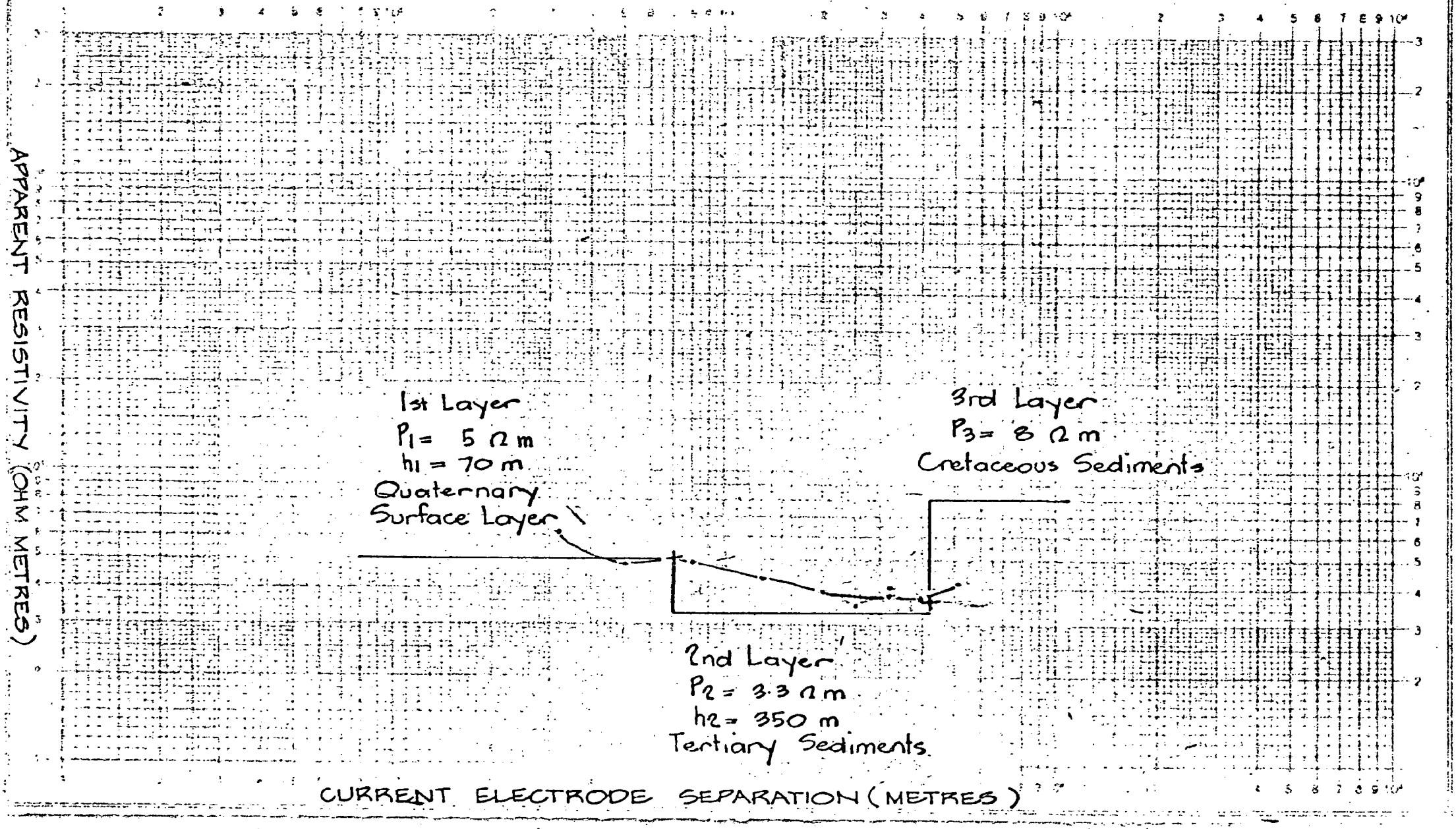
LAKE FROME
LINE 1 14500 N

064 PLATE 8 REPORT 83



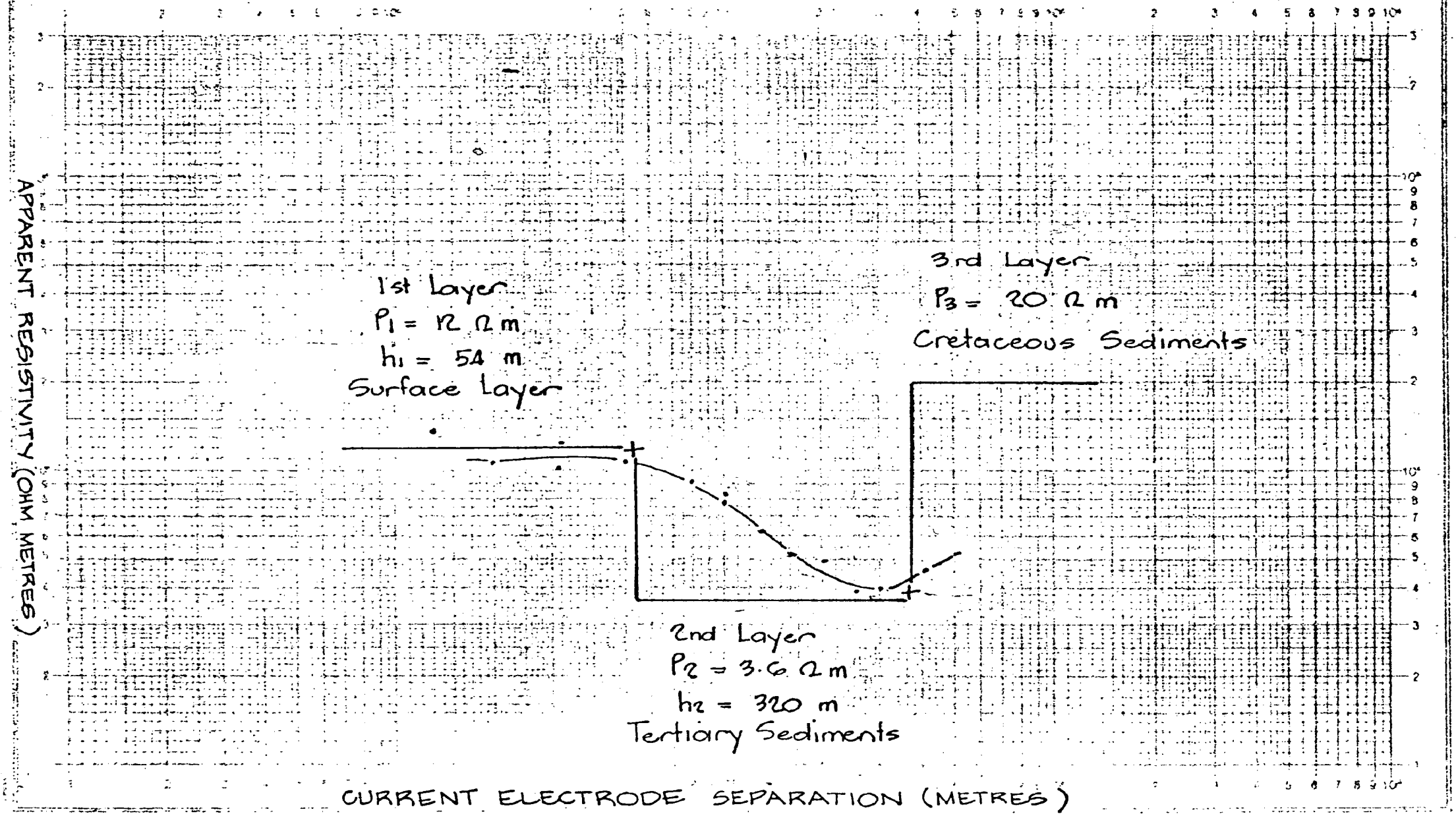
LAKE FROME
LINE 1 3500 N

PLATE 7 REPORT 83



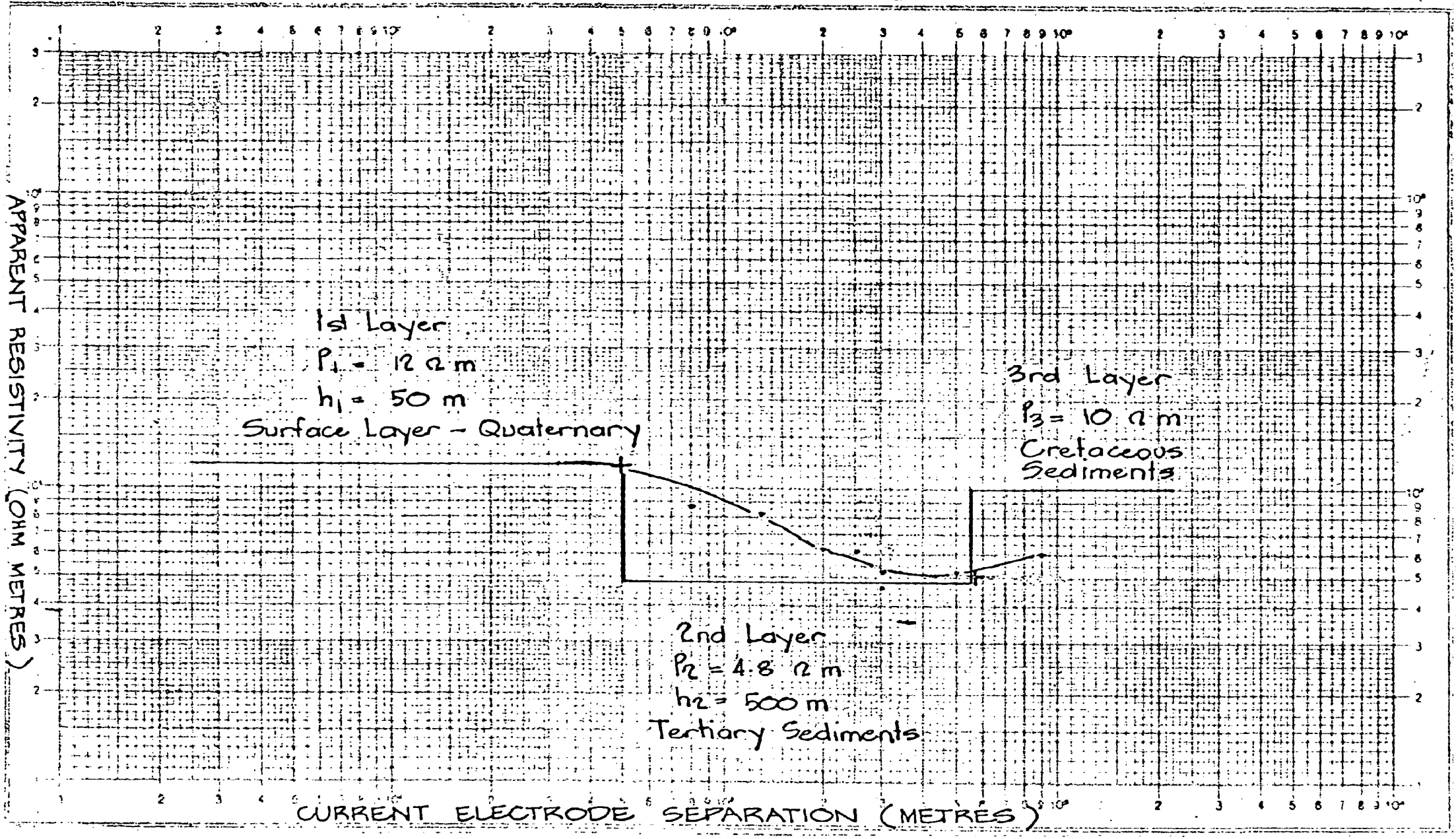
LAKE FROME
LINE 1 4000S

066 PLATE 10 REPORT 83



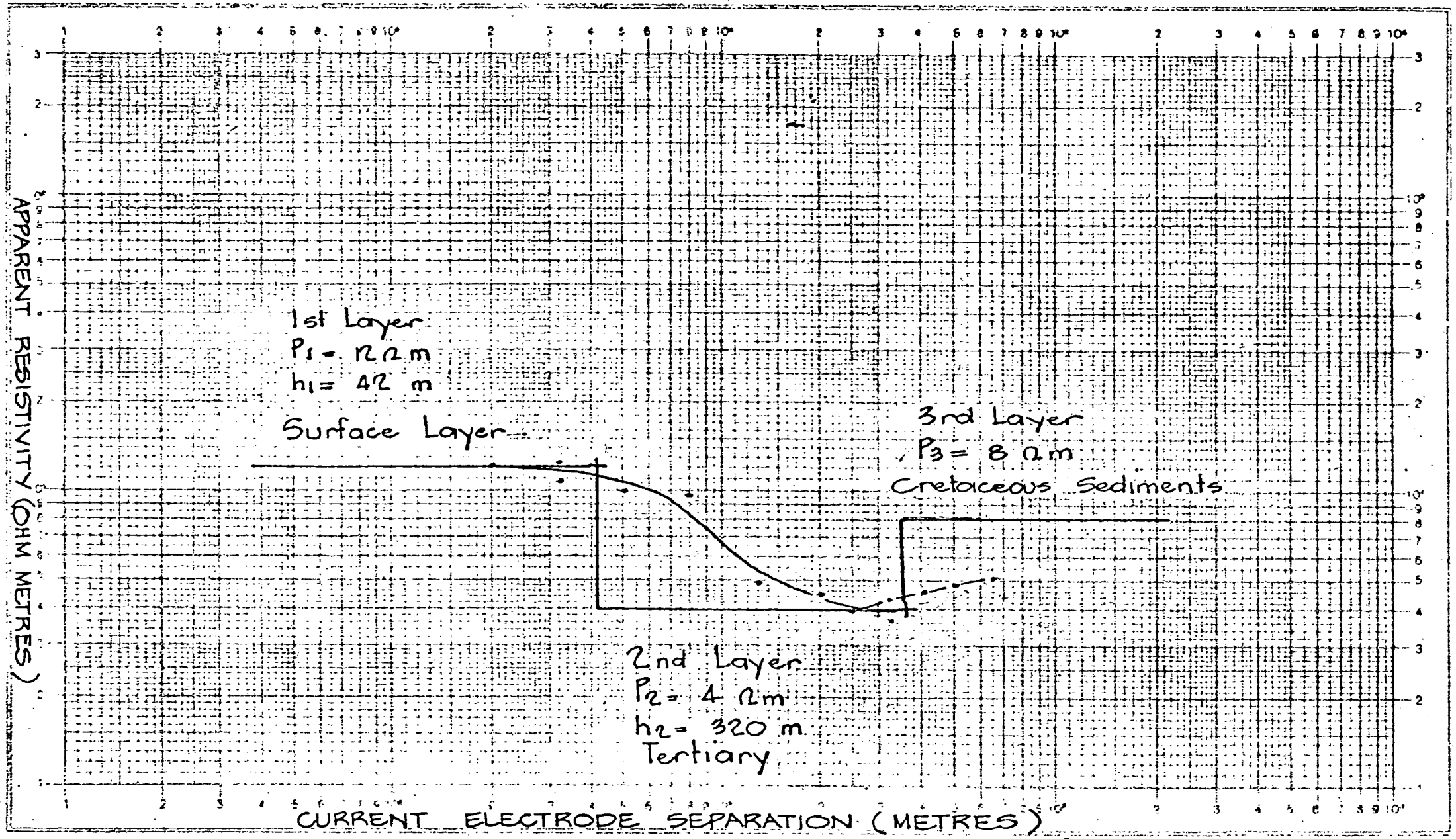
LAKE FROME
LINE 1 7000 S

PLATE II REPORT 83



LAKE FROME
LINE 1 12000S

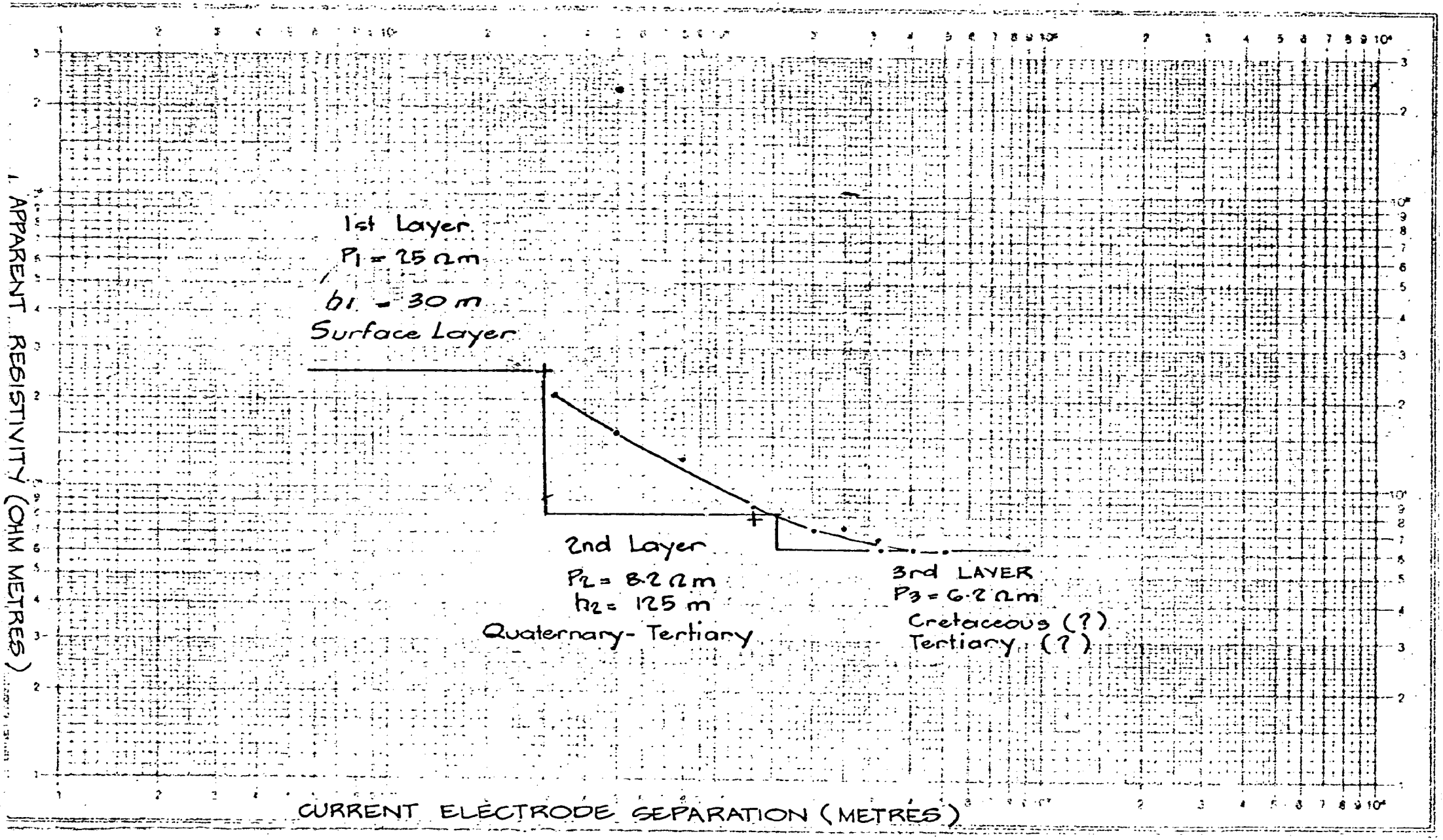
OGC PLATE 12 REPORT 83



LAKE FROME
LINE 1 23000 S

089

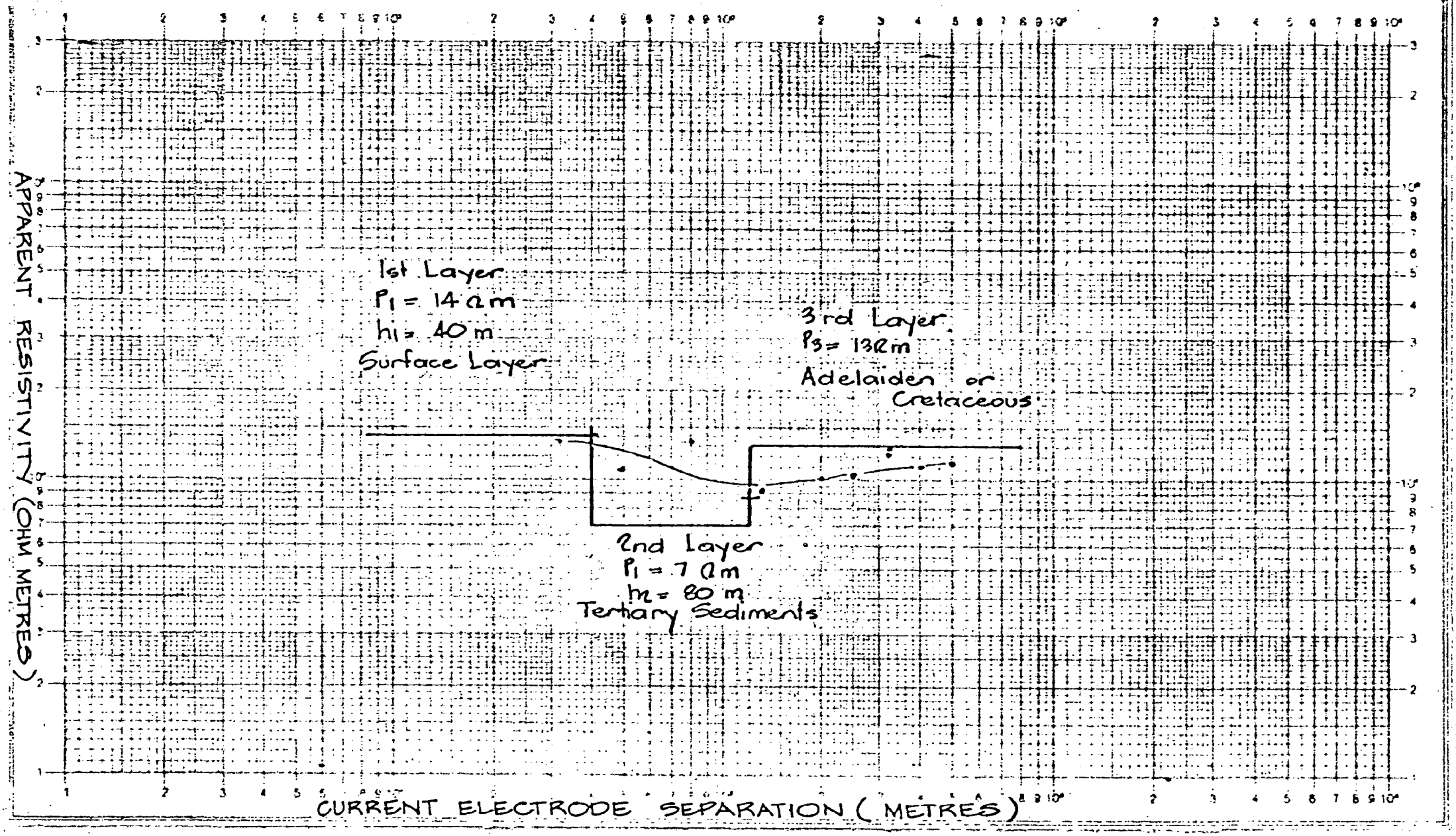
PLATE 13 REPORT 83



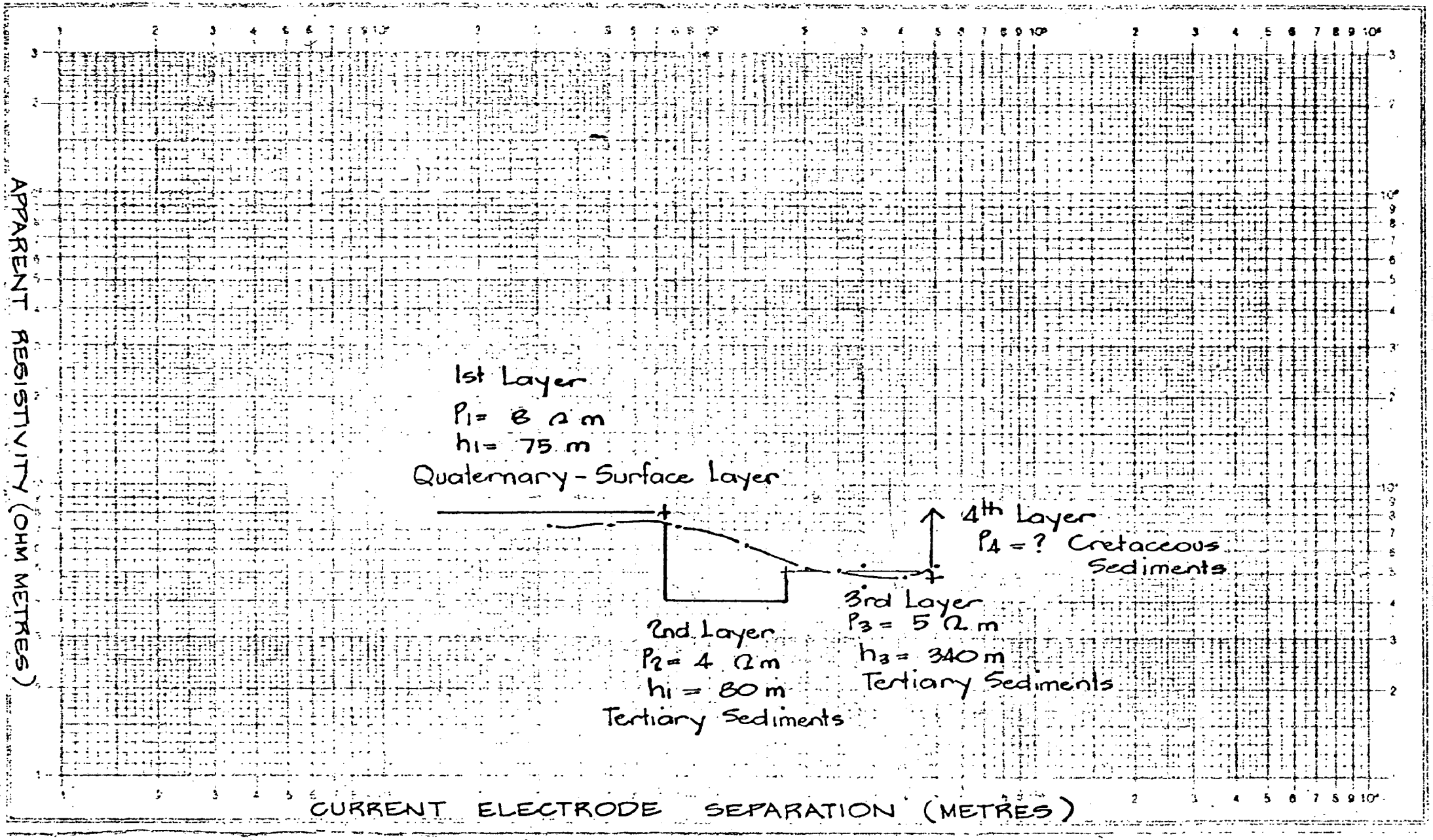
LAKE FROME

LINE 1 32000 S

070 PLATE 14 REPORT 83

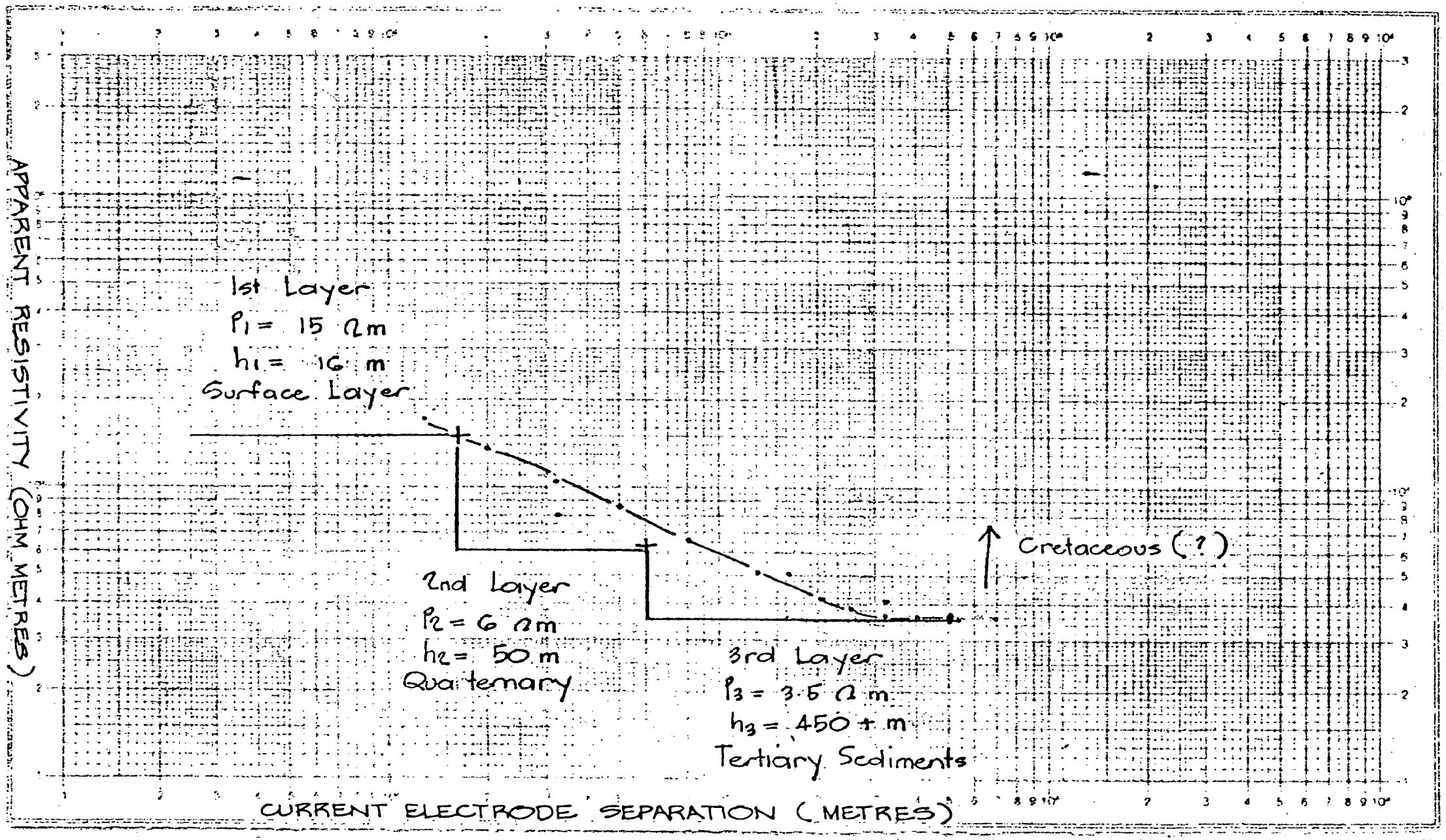


LAKE FROME
LINE 2 00W



LAKE FROME
LINE 4 5000 E

PLATE 19 REPORT 83



BP MINERALS AUSTRALIA PROPRIETARY LIMITED

GAUSSIAN FILTERING

OF

THE LAKE FROME RESISTIVITY SURVEY RESULTS

Dianne Harbison

Melbourne, Victoria
August, 1974.

S U M M A R Y

A Gaussian Filter was applied to attenuate noise in resistivity results from a survey carried out in the Lake Frome area. This technique has an overall smoothing effect on the resistivity profiles and tends to minimise spurious anomalies. The corrected values and filtered profiles are shown in the accompanying figures.

CONTENTS

1. Introduction.

2. Technique.

3. Treatment and Discussion of Results.

4. Conclusions.

5. Acknowledgements.

LIST OF FIGURES

Fig. 1 The Gaussian Function Plotted in the Space Domain.

Fig. 2 The Gaussian Function Plotted in the Frequency Domain.

Fig. 3 Filtered Resistivity Values EL 77.

Fig. 4 A Contoured Interpretation of Filtered Resistivity Values For EL 77.

Fig. 5 Filtered, Resistivity Profiles for EL 77.

Fig. 6 Filtered Resistivity Profiles for EL 91.

1. INTRODUCTION

Noise is present in all resistivity profiles, and when it is superimposed upon the anomalies it tends to produce distortion. This effect is due to fluctuating, near-surface or contact resistivity, and should be reduced in order to obtain a more accurate resistivity profile. Surface features may also produce noise, but where the landsurface is relatively flat and monotonous, the effect of terrain would not be significant.

The Gaussian Filter was applied to the direct current resistivity survey carried out over EL's 77 and 91 in the Lake Frome area for BP Minerals Australia Pty. Ltd., by Murdoch Geology and Geophysics Pty.Ltd. in July 1974.

2. TECHNIQUE

To attenuate the noise, a filtering process was used. The Gaussian Filter function was chosen and in the space domain is of the form :

$$F(x) = \exp(-\pi x^2)$$

Its transform in the frequency domain has the same form, namely

$$G(s) = \exp(-\pi s^2)$$

This filtering technique was applied as a weighted running mean, and has an overall smoothing effect on the resistivity profile.

To determine the filtered value of a particular point, X_n, a weighted average of five points (X_n and the four points directly preceding and following X_n) was calculated. The five points are each multiplied by a constant, ranging between 0 and 1, which varies according to the distance of the point from the central value ie. X_n. This constant is calculated according to a Gaussian function, which is symmetrical about the central value. (see Fig. 1)

To obtain the weighted constants the Gaussian function must be transformed into the frequency domain. Filter parameters were chosen such that anomalies having a spatial frequency greater than 0.25 cycles per station.

spacing were attenuated by more than 80%. From these parameters the new range, in terms of Gaussian intervals, may be determined as follows:

$$\exp\left(-\pi s^2\right) = 0.2 \quad \text{(i.e. on 80\% attenuation)}$$

$$s = \sqrt{-\frac{\ln 0.2}{\pi}}$$

$$= 0.73 \text{ cycles / Gaussian interval}$$

$\Rightarrow$ 0.25 cycles/sampling interval is equivalent to 0.73 cycles / Gaussian interval. Therefore 1 Gaussian interval = 3 station spacings. (approximately). Figure 2 shows the Gaussian frequencies corresponding to the station intervals, and from the function we can calculate the amplitude factor by which the resistivity values at stations adjoinging the computation point are multiplied.

Thus the filtered value for X_n, X_n' may be written:

$$X_n' = (0.24\, X_{n-2} + 0.9\, X_{n-1} + 1.X_n + 0.9\, X_{n+1} + 0.24\, X_{n+2})/\, 3.28$$

where $3.28 = \Sigma$ weighting factors

$$\underline{\text{i.e.}}\ (2 \times 0.24 + 2\text{x}0.9 + 1)$$

Using this method a program for the Monroe 1880 Computer was written, and a series of new, filtered resistivity values were calculated.

A favourable feature of this filtering method is that the degree by which an apparent resistivity profile may be smoothed, is controlled by the selection of the filter parameters.

3. TREATMENT AND DISCUSSION OF RESULTS

The filtered resistivity values for EL 77 are shown in Figure 3. Results on lines which intersect the main survey line (i.e. line 1) were directionally corrected so that it was possible to contour the new values. The directionally corrected values are shown in brackets.

A contoured interpretation is shown in Figure 4.

As there were only two survey lines along which resistivity readings were measured on El.91, it was not possible to obtain a meaningful interpretation from contouring the filtered results.

The upper surface of the Cretaceous basement appears to consist of a series of domes and spurs, which are separated by narrow elongate depressions. These long, low regions run approximately east-west; they may be bifurcated and may also be open or closed at either end. These regions of negative relief are thought to be the site of Lower Tertiary channels which have been incised into the Cretaceous basement and then overlain by Upper Tertiary and Quaternary alluvium.

The filtered results for both EL.77 and El.91 were also plotted as profiles and superimposed upon the original apparent resistivity profiles, as prepared by Murdoch Geophysics Pty. Ltd. These revised profiles were much smoother; and tend to alleviate sigmoidal fluctuations. Sharp anomalies along inferred fault positions are subdued. Faults are best interpreted by examining the filtered data in conjunction with the original data. (Fig.5 and Fig.6)

4. CONCLUSIONS

4.1 The positions of Lower Tertiary channels, as inferred from the filtered resistivity contour plots, appear to agree quite closely with Plate 4 of Report by Murdoch Geophysics, which is a reconstruction with emphasis on easterly flowing channels. However, there appears to be very little evidence to support the second reconstruction, viz. Plate 4A, which shows a reconstruction with emphasis on fault controlled channels.

4.2 Comparing the filtered profiles with the original, apparent resistivity profiles, it seems that Gaussian filtering is effective in attenuating noise to give a clearer indication of anomalous resistivity, without losing too much detail.

ACKNOWLEDGEMENTS

The Gaussian filter and a Monroe Computer Program to calculate filtered values for the Lake Frome Survey, were prepared by Dr. Paul St. John and it is gratefully acknowledged.

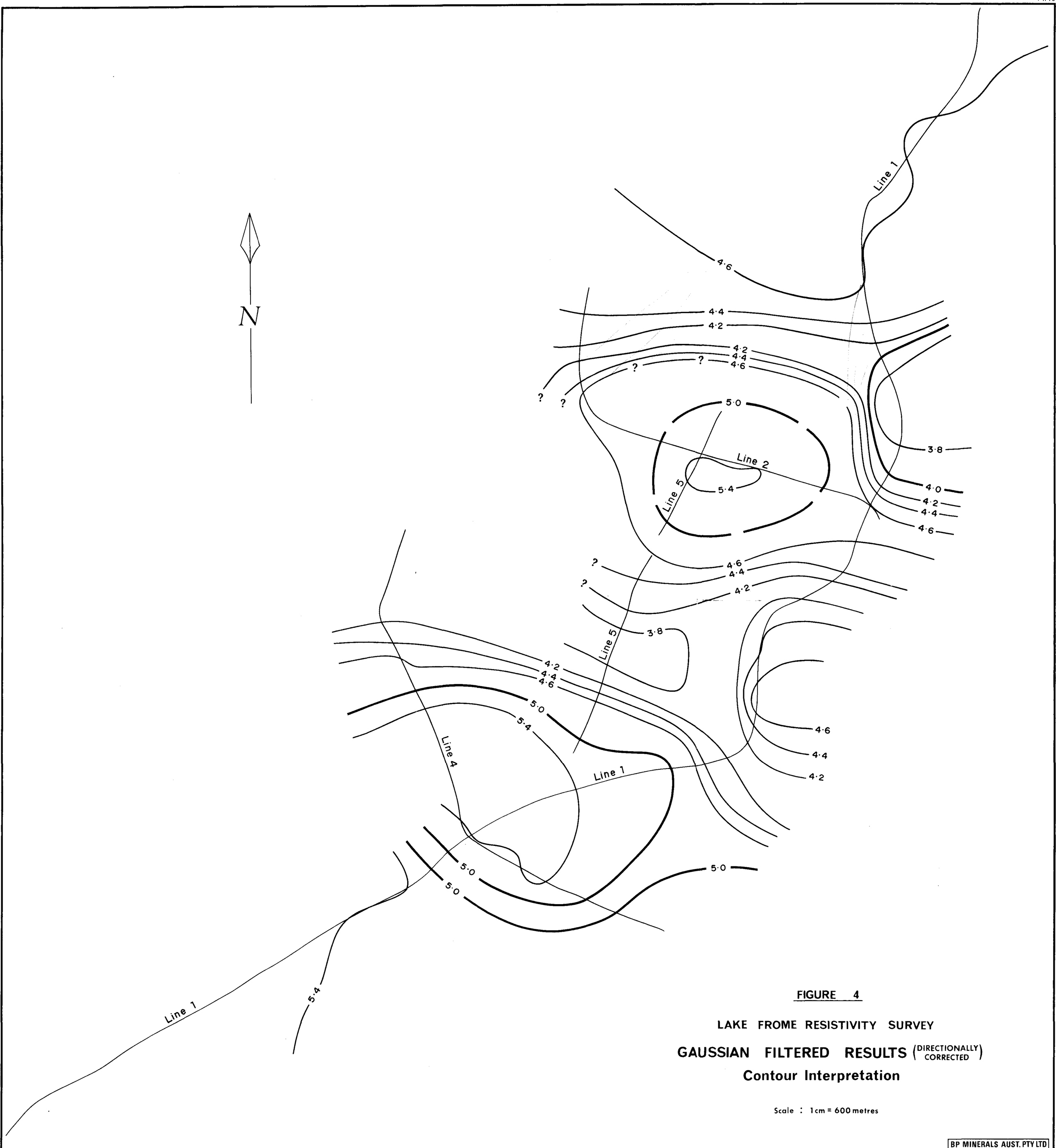


FIGURE 4

LAKE FROME RESISTIVITY SURVEY

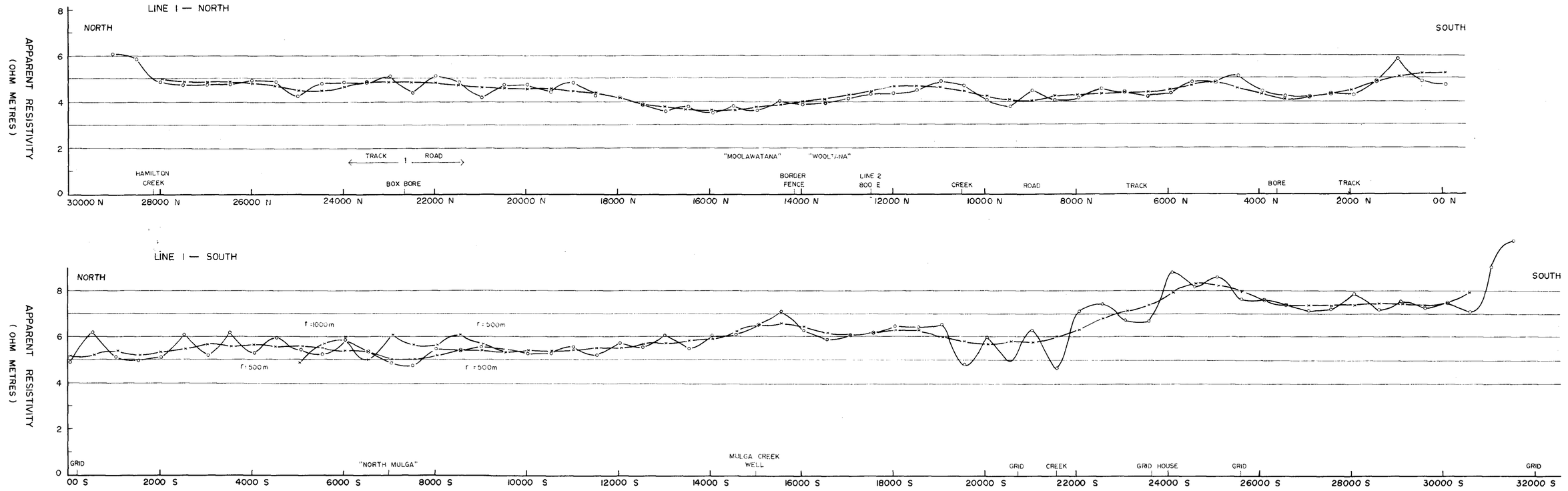
GAUSSIAN FILTERED RESULTS (DIRECTIONALLY CORRECTED)

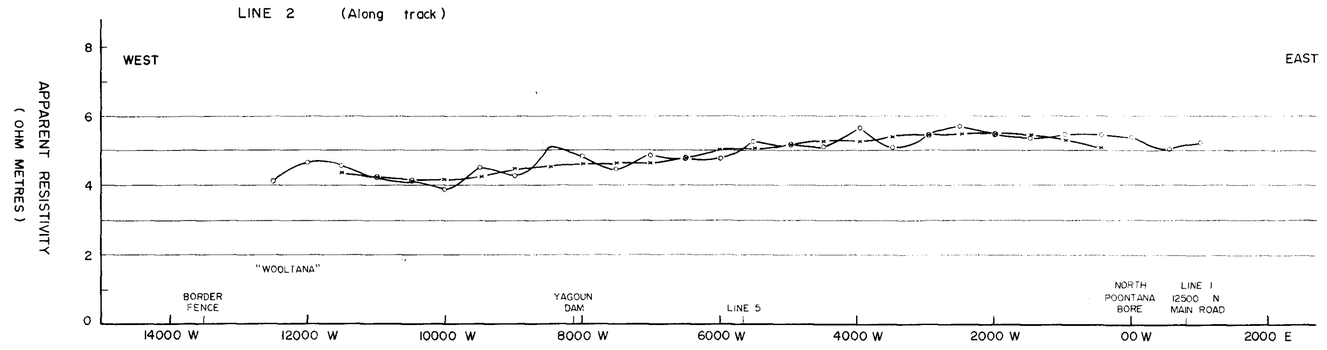
Contour Interpretation

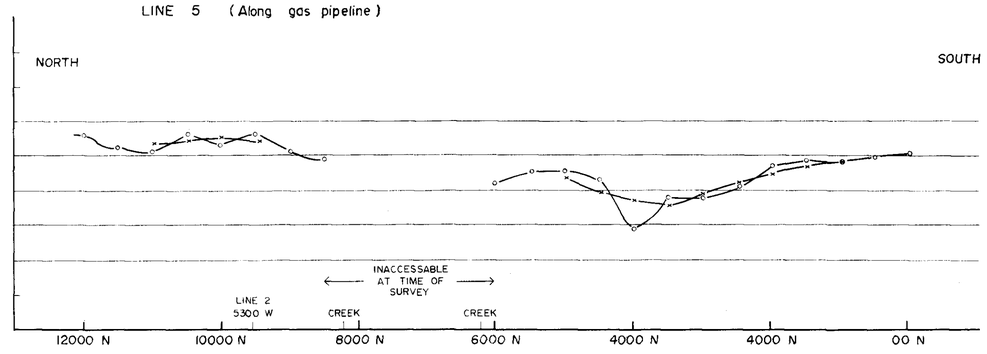
Scale : 1cm = 600 metres

BP MINERALS AUST. PTY LTD	
Area: LAKE FROME	
SOUTH AUSTRALIA	
REF:	2/H/5
SEPT. 1974	MIN DEPT

2328(I)-16







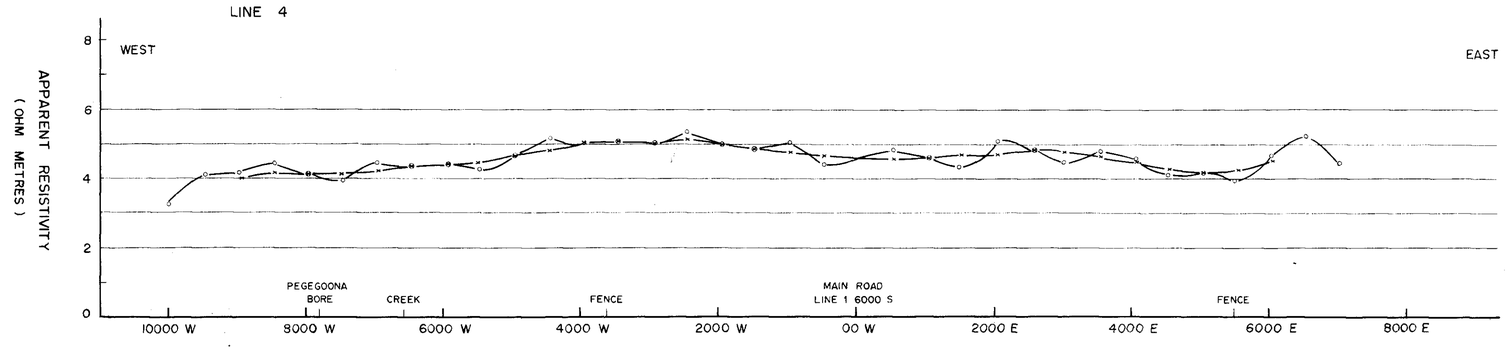


FIGURE 5

E.L. 77 LINES 1, 2, 3 and 4

LAKE FROME RESISTIVITY PROFILES

SCALE :—

Vertical : Profiles 1 cm = 1 ohm metres
Horizontal : 1 cm = 500 metres

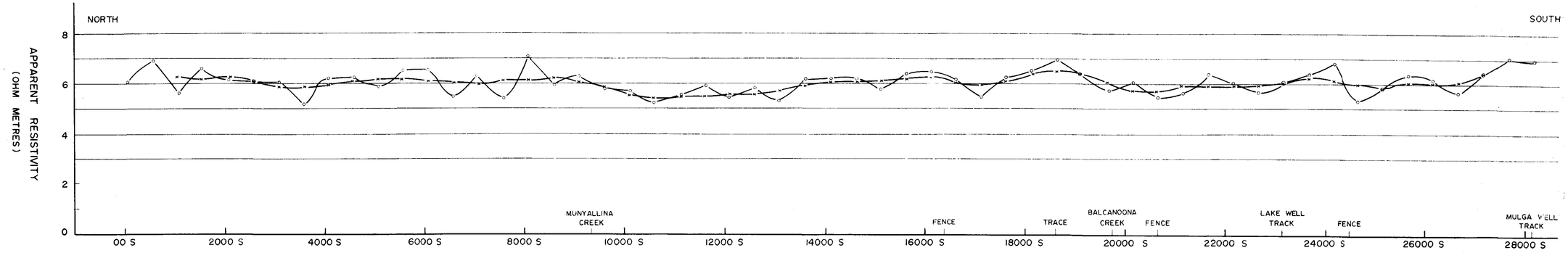
o Raw Data
× Gaussian Filtered Results

BP MINERALS AUST PTY LTD	
Area:	LAKE FROME
	SOUTH AUSTRALIA
REF:	2/H/5
OCT. 1974	MIN. DEPT.

2328(I)-17

T 1151A

LINE 3 (Along pipeline)



LINE 6

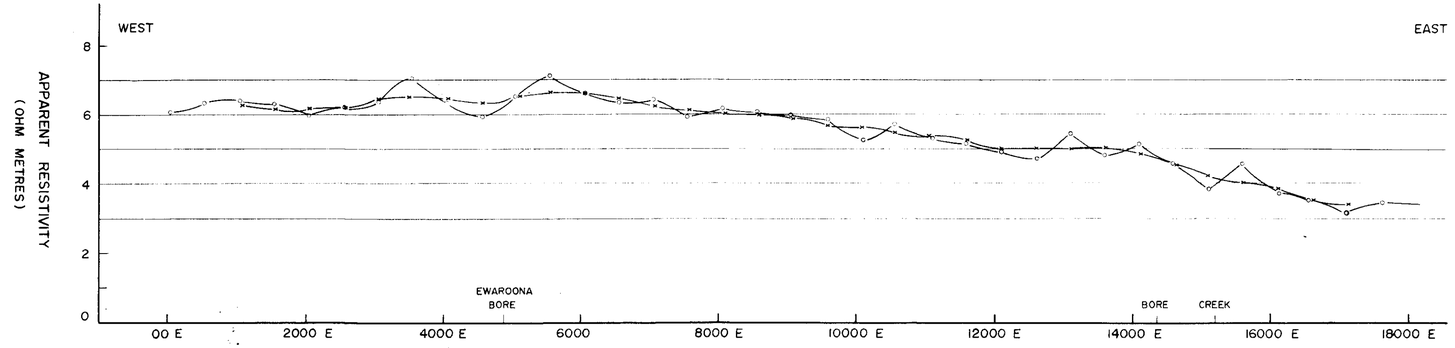


FIGURE 6

EL. 91 LINES 3 and 6

LAKE FROME RESISTIVITY PROFILES

SCALE :—

Vertical : Profiles 1cm = 1 ohm metres
Horizontal : 1 cm = 500 metres

o Raw Data
× Gaussian Filtered Results

BP MINERALS AUST. PTY LTD	
Area:	LAKE FROME
	SOUTH AUSTRALIA
REF:	2/H/5
OCT 1974	MIN. DEPT.

2328(I)-18

079

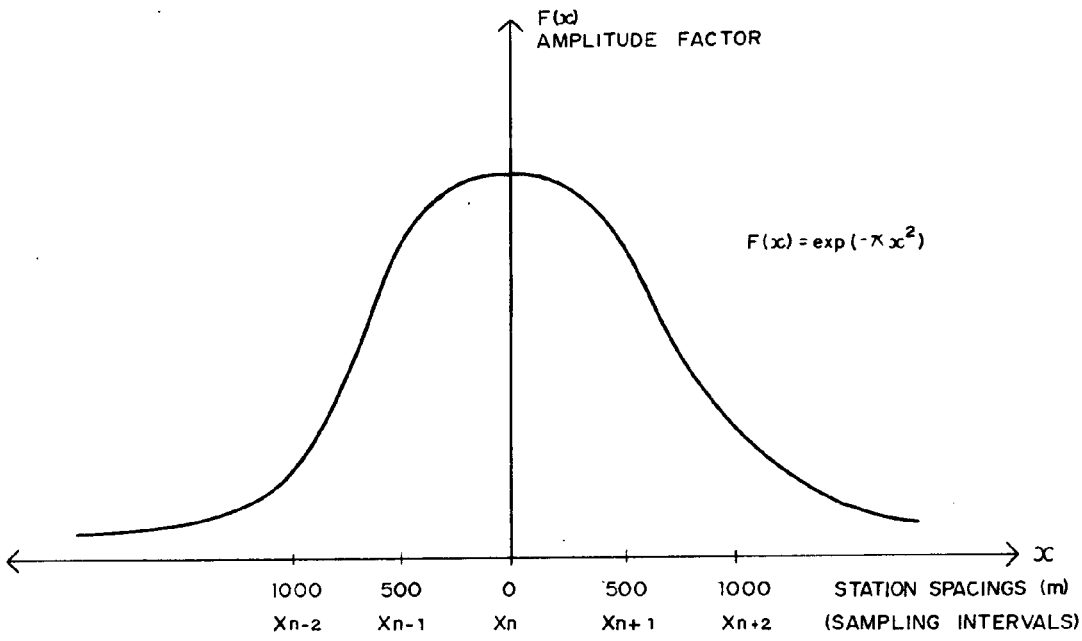


Figure 1 THE GAUSSIAN FUNCTION PLOTTED IN THE SPACE DOMAIN.

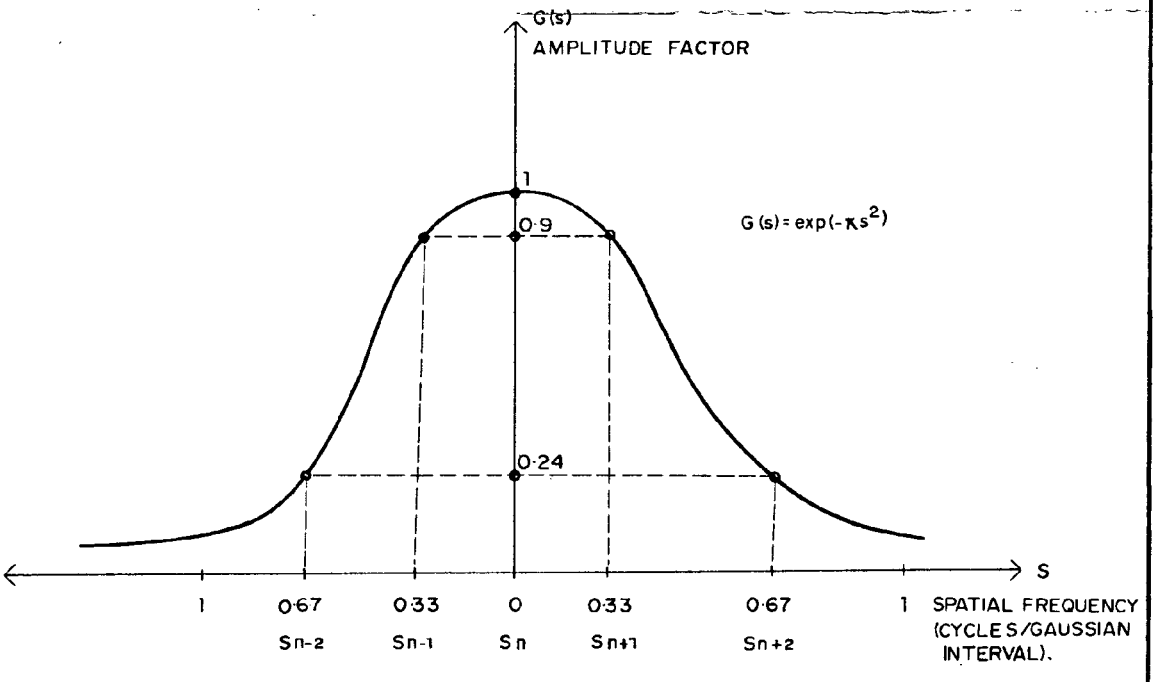


Figure 2 THE GAUSSIAN FUNCTION PLOTTED IN THE FREQUENCY DOMAIN.

BP MINERALS AUST. PTY LTD.	
Area: LAKE FROME	
SOUTH AUSTRALIA	
REF: 2/H/5	
AUGUST, 1974.	D. HARBISON

APPENDIX II - WATER ASSAYS

URANIUM IN WATER DETERMINED BY DELAYED NEUTRON ACTIVATION ANALYSES

URANIUM ANALYSIS FOR BORE AND STREAM WATERS FROM POONTANA SUB-BASIN - LAKE FROME

Results are quoted in micro-gram of natural uranium per litre. All samples containing greater than 2 micro-gram per litre of uranium have been re-analysed before being reported here.

SAMPLE NUMBER	URANIUM (ppb)	REMARKS
PU - 1	1	Bore
- 2	66	"
- 3	38	"
- 4	228	"
- 5	21	Creek
- 6	70	Bore
- 7	8	"
- 8	19	"
- 9	2	"
-10	124	Creek
-11	5	Bore
-12	5	"
-13	1	"
-14	1	"
-15	6	"
-16	6	Creek
-17	6	Bore
-18	11	"
-19	35	"
-20	30	"
-21	34	"
-22	46	"
-23	5	"
-24	701	"
-25	521	"
-26	900	"
-27	156	"
-28	226	"
-29	151	"
-30	23	"
-31	18	"
-32	32	"
-35	3	"
-36	688	"
-37	4	"
-38	40	"
-43	28	"
-44	4	"
-45	4	"
-46	113	"
-47	72	Creek

Analysts : A.W.R.E.
Aldermaston

APPENDIX III - DRILL DATA

POONTANA DRILLING SEPTEMBER 1974.

APPENDIX III - DRILL DATA

POONTANA DRILLING SEPTEMBER 1974.

085

EL 77

Hole No.	Drilled Depth	Probe Depth	Date Started	Date Completed	Gamma-activity (Back-ground 8-15 cps.)
77- 1	725	716	1.9	2.9	55 cps @ 685' 373 cps @ 663'
77- 2	695	686	2.9	3.9	NIL
77- 3	725	715	3.9	4.9	NIL
77- 4	560	552	4.9	4.9	NIL
77- 5	560	552	5.9	5.9	NIL
77- 6	530	521	5.9	6.9	NIL
77- 7	605	596	7.9	7.9	NIL
77- 8	530	530	7.9	8.9	NIL
77- 9	710	700	8.9	8.9	NIL
77-10	530	530	9.9	9.9	50 cps @ 357'
77-11	530	530	9.9	9.9	NIL
77-12	530	530	10.9	10.9	NIL
77-13	605	605	10.9	10.9	NIL
77-14	710	710	11.9	11.9	34 cps @ 681'
77-15	530	530	11.9	12.9	NIL
77-16	530	530	12.9	12.9	NIL
77-17	530	530	12.9	15.9	30 cps @ 520'
77-18	530	530	15.9	16.9	58 cps @ 501.5'
77-19	530	530	16.9	16.9	58 cps @ 445'
77-20	530	530	16.9	17.9	NIL
77-21	710	710	17.9	17.9	NIL
77-22	620	620	19.9	19.9	NIL
77-23	600	596	19.9	20.9	NIL
77-24	620	610	20.9	20.9	NIL
77-25	620	610	20.9	21.9	NIL
77-26	710	710	21.9	22.9	NIL
77-27	620	620	22.9	22.9	90 cps @ 382.5'
77-28	710	710	22.9	23.9	60 cps @ 555' Sand interval from 300 - 400'
	16935/ft				

BREAK DOWNS :

Logging Unit : Evening 12th to 14th September inclusive.

17th (Down after logging one hole) to 18th September inclusive.

JHH/yt
2/10/1974

BP Minerals Australia Proprietary Limited
Incorporated in Victoria

084

1 Albert Road, Melbourne
Postal Address: G.P.O. Box 5222BB, Melbourne, 3001
Telephone: 26-6911 Telex: 30166 Telegraphic Address: "Austbeepee", Melbourne

The Director of Mines
Department of Mines
Box 38, Rundle Street Post Office,
Adelaide S.A. 5000

Our Reference	Your Reference	Telephone Ext'n	Date
AG/27/16/14/1			4th February, 1975.

Dear Sir,

EL 77 - Quarterly Report for Period ended December 1974.

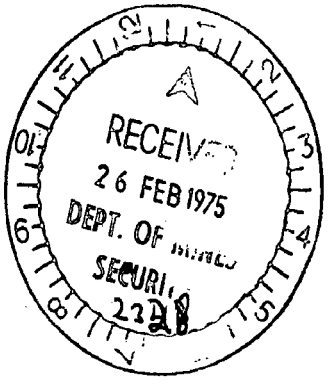
General

Some delay has been experienced in the drafting of the drill-hole logs for the report on the September drilling programme and the work is still not ready for distribution. A copy of the report will be forwarded as soon as it is available.

Resistivity Surveys

The D.C. resistivity survey data were re-interpreted in the light of the drilling results, and the revised interpretation by Murdoch (October 1974) is enclosed.

A detailed resistivity survey with 4 lines 1 to 1.15km apart was carried out in an attempt to outline the sand body intersected in drill-hole 77-27. The survey was run by Murdoch Geology and Geophysics Pty Ltd. and their report is attached.



../2

085

Personnel

BP Personnel

M.S. Bell - Project Geologist

Murdoch Geology and Geophysics Pty Ltd.

R. Murdoch - Geophysicist
B. Copps - Assistant Geophysicist
R. Vinycomb - Assistant Geophysicist
- 2 Field Assistants.

Future Exploration

No field exploration work is planned for the first quarter of 1975.

Enclosures

Murdoch Geology and Geophysics Pty Ltd.
- Addendum to Report 83 by R. Murdoch.

- A Second resistivity survey on EL 77 - Lake Frome, South Australia for BP Minerals Australia Pty Ltd., by R. Murdoch.

Yours faithfully,

Dr. J. H. Hills
Senior Geologist (Uranium)

MURDOCH GEOLOGY & GEOPHYSICS PTY. LTD.

310 GREY STREET — GLEN INNES, N.S.W., 2370
(HOURS: 2 p.m.-5 p.m.) — PHONE 1461

P.O. BOX 153
GLEN INNES,
N.S.W., 2370

28th October, 1974.

086

Dr. J. Hills,
B.P. Minerals Australia,
B.P. House,
1 Albert Road,
MELBOURNE. VIC. 3000

Dear Dr. Hills,

Addendum to Report 83.

As a result of inspection of recent drilling results with yourself and Mr. M. Bell in Melbourne last Friday, I have reinterpreted the EL 77 resistivity data as shown on the accompanying plan. The enclosed resistivity contour map has been drawn up using the Gaussian filtered and directional corrected data supplied by B.P. Minerals.

To this plan I would offer the following interpretation; The Tertiary channel incised into Cretaceous shale described on Plate 4 Report 83 as the Pepegoona Channel flows easterly from the northern end of Line 4, through Line 5 and Line 1. Instead of splitting into Channel A and B as proposed in the report, it is suggested that the channel intersects an interpreted fault near Line 1. This fault may mark the edge of an ancient equivalent to the present day Lake Frome. Deposition of deltaic sands may have occurred at the edge of this ancient Lake. This situation is analogous to the present day Lake Frome environment, where drainage systems are depositing deltaic sands at the edge of the Lake. The edge of the present day Lake Frome appears to coincide with a fault.

Drilling within the interpreted channel on Line 5 encountered thick dark clays (a reducing environment) coinciding with low resistivity values. Drilling on Line 1 encountered thick sandy sections, (oxidizing environment) coinciding with higher resistivity values contained between two lows. The lows should mark the edge of deltaic deposition. It should be possible to locate the re-ox front with fairly accurately using resistivity as the contact between the dark clays (3.8 ohm metres) and the sand

(4.6 ohm metres) should provide a good contrast. Such a front would probably coincide with the position of the interpreted fault. Insufficient work has been carried out to make any similar predictions elsewhere on the EL, although two other smaller channels are indicated from the work.

It is thought likely that several sets of faults striking approximately NNE will occur between the Flinders Ranges and the present position of Lake Frome (ie. Beverley, the one drilled and possibly one other). An ancient equivalent of Lake Frome could have occurred eastwards of each fault, with associated deltaic deposition and re-ox fronts.

Resistivity could be used as follows:

(1) Reconnaissance at ½ km reading separation to locate faults, channels and deltaic sands. The best electrode separation for this work should be determined in the vicinity of the area drilled.

(2) Detail at from 50 metres to 500 metres reading separation to locate possible re-ox fronts within interpreted channels. This work could be designed to zero-in on the front to an estimated 50 metre lateral accuracy.

I hope that you will find this re-interpretation interesting and we look forward to working with you in this area again and being able to confirm the interpretation.

Yours faithfully,
Murdoch Geology & Geophysics Pty. Ltd.

R. Murdoch

R. Murdoch,
Manager.

2M17-2
LIBRARY

086

A SECOND RESISTIVITY SURVEY ON EL 77 - LAKE FROME, SOUTH AUSTRALIA FOR B.P. MINERALS (AUSTRALIA)

By: R. Murdoch, B.A. (Earth Sciences),
Murdoch Geology & Geophysics P/L,
310 Grey Street,
GLEN INNES. N.S.W. 2370

November, 1974.

Report No. 91.

CONCLUSIONS

The principal aim of the second resistivity survey conducted on EL 77 was to provide additional information of the geology around South Poontana Bore. In particular, to locate faults, the approximate extent of deltaic sands encountered in drillhole 77 - 27 and possible redox fronts.

A detailed sounding conducted at hole 77 - 27 indicated that the method could reasonably locate the coarse sands encountered in this hole although a large number of detailed soundings may be required to accurately outline their lateral extent.

Profiling in the vicinity of South Poontana Bore has indicated three parallel faults, the western two downthrown to the east and the eastern one downthrown west to form a graben-type resistivity anomaly similar to that located over the Beverley ore-body. The deltaic sands encountered in hole 77 - 27 appear to commence east of fault 1, which possibly coincides with an ancient shore-line of Lake Frome.

Continued movement on the faults into the Tertiary may have caused the plastic flexure of the deltaic sands over fault 2. Such flexure would cause an ideal environment for a roll-front to occur with possible precipitation of uranium salts in a stratigraphic wedge-out of deltaic sands near fault 3.

A short drilling programme is recommended to prove or alter the theories advanced in this report. Subsequent exploration in the area of South Poontana Bore would depend upon the results obtained.

090

INTRODUCTION

Under instruction from Dr. J. Hills and Mr. M. Bell of B.P. Minerals Australia, Murdoch Geology & Geophysics Pty. Ltd. have carried out a resistivity survey over part of EL 77 north-west of Lake Frome in South Australia.

The field work was carried out over 3 days from 4th - 6th November, 1974. The survey was conducted by a 4 man crew lead by Mr. B. Coppa (geologist).

The location of EL 77 and the resistivity lines conducted during this survey are shown on Plate 1, a 1 : 250,000 location plan of the area north-west of Lake Frome.

This survey is the second resistivity survey conducted on EL 77. The previous survey is described in Murdoch Geology & Geophysics Pty. Ltd. Report No. 83 (July, 1974). Details of access, the resistivity method and equipment used are not included in this report as they have been previously described in Report No. 83.

GEOLOGY

The area surveyed comprises part of the Lake Frome Embayment, where thick Cainozoic deposits overlie Cretaceous mudstones.

Fluvial sands deposited within Tertiary channels are considered prospective for secondary uranium deposits. The channels appear to have flowed eastwards from the Flinders Ranges and have intersected a number of faults striking NNE - SSW. These faults are thought to coincide with ancient shore-lines of the present Lake Frome.

From the previous resistivity survey (see Addendum Report 83) it was thought that ancient channel (Pegogoona Channel) has flowed east and intersected one such fault in the vicinity of the survey area. Deposition of deltaic sands is thought to have occurred

where the channel intersected the lake. Thick white sands were located in hole 77 - 27 below 90 metres. 091

Movement on the faults is thought to have continued into the Tertiary causing the Tertiary deltaic sands to slump over the fault and cause an ideal environment for a uranium roll-front. Secondary uranium concentrations may occur where the deltaic sands wedge-out on the lake-side of the fault.

The aim of the survey described in this report was to determine whether the electrical resistivity method could outline the thick sands located in hole 77-27 and to provide more information on the structure of the area and the position of wedge-out of the deltaic sands.

FIELD PROCEDURES

The position of the four lines conducted during this survey are shown on Plate 1. Along each line readings were taken at intervals of 0.5 kilometre. Each reading station was marked with a 25 mm x 25 mm survey peg projecting at least 0.5 metres above the ground. The respective line and position number were recorded on each peg. The distance between each reading station was measured by a wire 500 metres long.

The resistivity traverses comprised Schlumberger Array profiling with current and potential electrode separations from the centre of the configuration as follows:

TABLE 1. - Profiles Conducted and Separations Used

	Current electrode separation from centre of configuration (r metres)	Potential electrode separation from Centre of configuration (m metres)
Line 7	80	20
	130	20
	200	20
	500	100

092

	Current electrode separation from centre of configuration (r metres)	Potential electrode separation from centre of configuration (m metres)
Line 8	80	20
	130	20
	200	20
Line 9	80	5
	130	40
	200	40
	500	100
Line 10	80	5
	130	40
	200	40

The profiling was conducted parallel to the traverse direction. The r = 80, 130 and 200 profiles were conducted as the one traverse using the 3 position rapid Schlumberger sounding technique. The r = 500 profiles were conducted as completely separate traverses. Electrical soundings were conducted at the five positions shown in Table 3. (Interpretation Section).
Soundings were expanded along the traverse lines using the following logarithmic formula:

TABLE 2. - Detailed Sounding Readings

r (Current electrode separation from centre of configuration) (metres)	m (Potential electrode separation from centre of configuration) (metres)
13	2
20	2
32	2
32	5
50	5
80	5
100	5
100	40
130	40

r (Current electrode separation from centre of configuration) (metres)	m (Potential electrode separation from centre of configuration) (metres)
160	40
200	40
250	40
320	40
320	100
400	100
500	100

093

RESULTS

The various profiles conducted during this survey have been plotted on Plate 2. They are plotted as graphs of apparent resistivity (vertical axis) against line position (horizontal axis). The vertical scale used was 1 cm = 0.5 ohm metres and the horizontal scale used was 1 cm = 250 metres. The approximate true resistivity for the third layer has been calculated for each reading position and profile graphs of true resistivity third layer have been plotted on the same scale as other profiles on Plate 2.

The r = 500 m apparent resistivity values have also been plotted on Plate 3, a 1 : 60,000 plan of the area. Directional corrected Gaussian filtered data, from the first survey, has been included on this plan. The contour interval used was 0.2 ohm metres. The R_3 (true resistivity - 3rd layer) calculated results have been plotted on Plate 4 and contoured using the same interval as above.

The detailed soundings have been plotted as standard log-log graphs of apparent resistivity (vertical axis) against current electrode separation from the centre of configuration in metres (horizontal axis). The plotting of the data in this manner allows comparison of the sounding curves with standard interpretation curves. The soundings are presented as Plates 5 to 9 accompanying this report.

INTERPRETATION

(a) Detailed soundings.

The detailed soundings have been interpreted by partial curve matching techniques using essentially 2-layer and auxiliary interpretation curves. This method of interpretation integrates the sounding curve into a number of layers of different resistivity and thickness. An expected lithology can then be assigned to each layer depending upon the known geology of the area, its resistivity value, position and thickness.

The detailed soundings have been interpreted as follows:

TABLE 3. - Detailed Sounding Interpretation

	Layer	Resistivity (ohm metres)	Depth Interval (metres)	Expected Geology
Line 7	1	38	0 - 13	Surface layer
00E	2	5.7	13 - 97	Upper Cainozoic
(Hole 77-12)	3	3.3	97 -187	Tertiary clay
Plate 5.	4	5.5	187 +	Cretaceous mudstone
Line 8	1	21	0 - 10.5	Surface layer
1500E	2	3.2	10.5- 90	Upper Cainozoic clastics
(Hole 77-27)				
Plate 6	3	16.5	90 -120	Tertiary deltaic sand
	4	4.0	120 -190	Tertiary sandy clay
	5	5.0	250 +	Cretaceous mudstone(?) or Tertiary sandy clay
Line 8	1	70	0 - 5	Surface layer
4500E	2	7	5 - 47	Upper Cainozoic clastics
Plate 7	3	3.55	47 +	Tertiary clay
Line 9	1	36	0 - 8	Surface layer
500E	2	5.4	8 - 44	Upper Cainozoic clastics
Plate 8	3	3.6	44 +	Tertiary clay

095

	Layer	Resistivity	Depth Interval	Expected Geology
Line 9	1	46	0 - 5.5	Surface layer
3000E	2	4.6	5.5- 26	Upper Cainozoic clastics
Plate 9	3	2.9	26 -211	Tertiary clay
	4	15	211 +	Cretaceous sandstone

In the above interpretation the following resistivity ranges have been interpreted as representing the following formations:

Upper Cainozoic clastics	3.2 to 7 ohm metres
Tertiary clay	2.9 to 3.6 ohm metres
Tertiary sand, some clay	5.1 ohm metres
Cretaceous mudstone	5.6 ohm metres
Cretaceous sandstone	15 ohm metres

In interpreting the sounding data the surface layer can be ignored as the resistivity and thickness of this layer is largely dependent upon near-surface moisture conditions at the time of the survey and the current electrode separation of the first reading taken.

The second layer on each sounding has been labelled Upper Cainozoic clastics. The clastics vary somewhat in composition from clay to sand (3.2 to 7 ohm metres). They are a blanket deposit covering the prospective lower Tertiary sediments.

In each of the soundings it is the third layer that is considered important. The third layer extends from 40 or 80 metres down to at least 180 metres and generally deeper. Tertiary fluvial deposits prospective for uranium are likely to occur at these depths, wheras deeper deposits may be too deep to be considered economical, within the fore-seeable future. Higher resistivity values for the third layer (over 4.5 ohm metres) should indicate sandy sequences.

and lower values (under 4.0 ohm metres) clay sequences.

(b) Profiles

Over the area surveyed apparent resistivity values on all profiles vary from 2 to 8 ohm metres. The three shallower profiles are generally parallel, with the r = 80 profile having highest apparent resistivity values and the r = 200 profile the lowest. This is a result of the third layer (Lower Tertiary) being more conductive than second layer (Upper Cainozoic clastics).

The r = 500m profiles show a similar form to the shallower three, but vary in some cases. The similarity in profile form suggest some uniformity in the lithology of the section vertically, regardless of lateral changes in lithology. It also indicates that basement structures are reflected through the Tertiary section. The r = 80m and 130m profiles may be partially effected by variations in composition of the clastics. The r = 200 metres and 500 metres are probably the most reliable profiles.

The calculated true resistivity profiles for the third layer (R_3) may be useful, but their interpretation varies somewhat from that of the other profiles. Higher profile values should reflect a sandy Lower Tertiary section, but at the western end of Line 7 and 10 they may be reflecting shallower basement.

INTERPRETED GEOLOGICAL SECTION

Interpreted Geological Sections have been constructed for each line beneath their respective profile on Plate 2. They have been constructed using both the quantative sounding interpretation and qualative appraisal of all the profiles. They are plotted on the same horizontal scale as the profiles, but at a vertical scale of 1 cm = 100m. The interpreted sections are schematic rather than absolute due to lack of detailed soundings.

Perhaps the greatest aid to interpretation is Plate 3, the contour plan of r = 500m apparent resistivity results, which incorporates the directional corrected and Gaussian filtered results of the first survey. On this plan the path of the Lower Tertiary Pegogoona Channel, the approximate outline of the deltaic sands and the position of the various faults encountered have been marked.

Faulting is interpreted to occur as follows:

TABLE 4. - Fault Interpretation

Line 7	1250E	Downthrow east
Line 8	0250E	Downthrow east
Line 9	0250E	Downthrow east
Line 10	West of hole 77-25	
Fault 2.		
Line 7	3250E	Down-throw east
Line 8	2250E	Downthrow east
Line 9	1750E	Downthrow east
Line 10	1250E	Downthrow east
Fault 3.		
Line 7	East of line	Downthrow west
Line 8	3750E	Downthrow west
Line 9	4250E	Downthrow west
Line 10	3750E	Downthrow west

There appears to be 3 parallel faults striking NNE-SSW. The two western faults are downthrown to the east and the eastern fault downthrown to the west. A graben, similar to the one located by r = 500m profiling over the Beverley ore- body, is suggested between faults 2 and 3.

The deltaic sands appear to have been deposited east of fault 1. The R_3 profiles indicate that the sands wedge-out near fault 2, whilst the r = 500m and r = 200m profiles suggest they extend

096

further east. It is likely that the sands have slumped over fault 2 and wedge-out close to fault 3.

Basement highs appear to occur at the western end of Line 7 and Line 10.

Areas Prospective for Sedimentary Uranium

Continued movement on fault 1 and possibly fault 2 may have caused the plastic flexure of Lower Tertiary deltaic sands over fault 2. Such flexure would cause an ideal environment for roll-fronts to occur with possible precipitation of uranium salts in the stratigraphic wedge-out of deltaic sands near fault 3.

On Line 8 the sands located in hole 77-27 appear to wedge-out at about 3000E. Contouring on Plates 3 and 4 suggest that the sands continue northward to Line 9 and southwards to Line 7. If the sands do occur on these lines the wedge-out should occur at about 3250E on Line 7 and 1750E on Line 9.

RECOMMENDATIONS

A drilling programme is recommended to substantiate, alter or disprove the predictions made in this report. In particular to test the Beverley-type resistivity anomalies on Lines 8 and 9, with possible wedging-out of the deltaic sand near the eastern ends of these lines.

Drillholes are recommended as follows:

1. Line 8 2500E
   Line 8 3000E and step-out at intervals of ½ km eastwards until the limit of the sands has been confirmed.
2. Line 9 1500E and step-out at intervals of ½ km eastwards until the limit of the sands has been confirmed.

3. Line 7 3000E and step-out at intervals of ½ km east-wards until the limits of the sands has been confirmed.

4. Line 10 2000E (step-out eastwards if sands occur)

Further exploration in the area of Lines 7 to 10 should depend upon the results of the drilling programme recommended above.

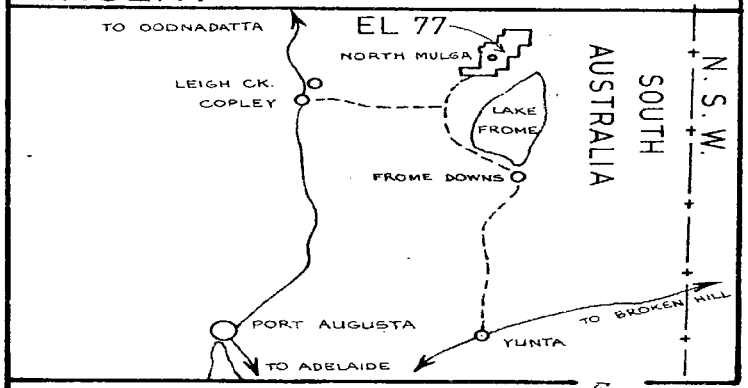
B.P. MINERALS AUST. LTD

EL 77 SOUTH AUSTRALIA
LOCATION OF PHASE 2
RESISTIVITY LINES
Scale - 1 250,000

Plate 1 Report 91

Prepared by: Murdoch Geology and Geophysics P/L. Glen Innes N.S.W. Nov. 1974

INSERT SCALE : 1cm = 30 km



200

Moolawatana

Hamilton's Creek

Box Bore

EL 77

North Poontona Bore

Mile Creek

Four

Poontona Creek

10
9
8
7

Bore

Beverley Orebody

North Mulga Outstation

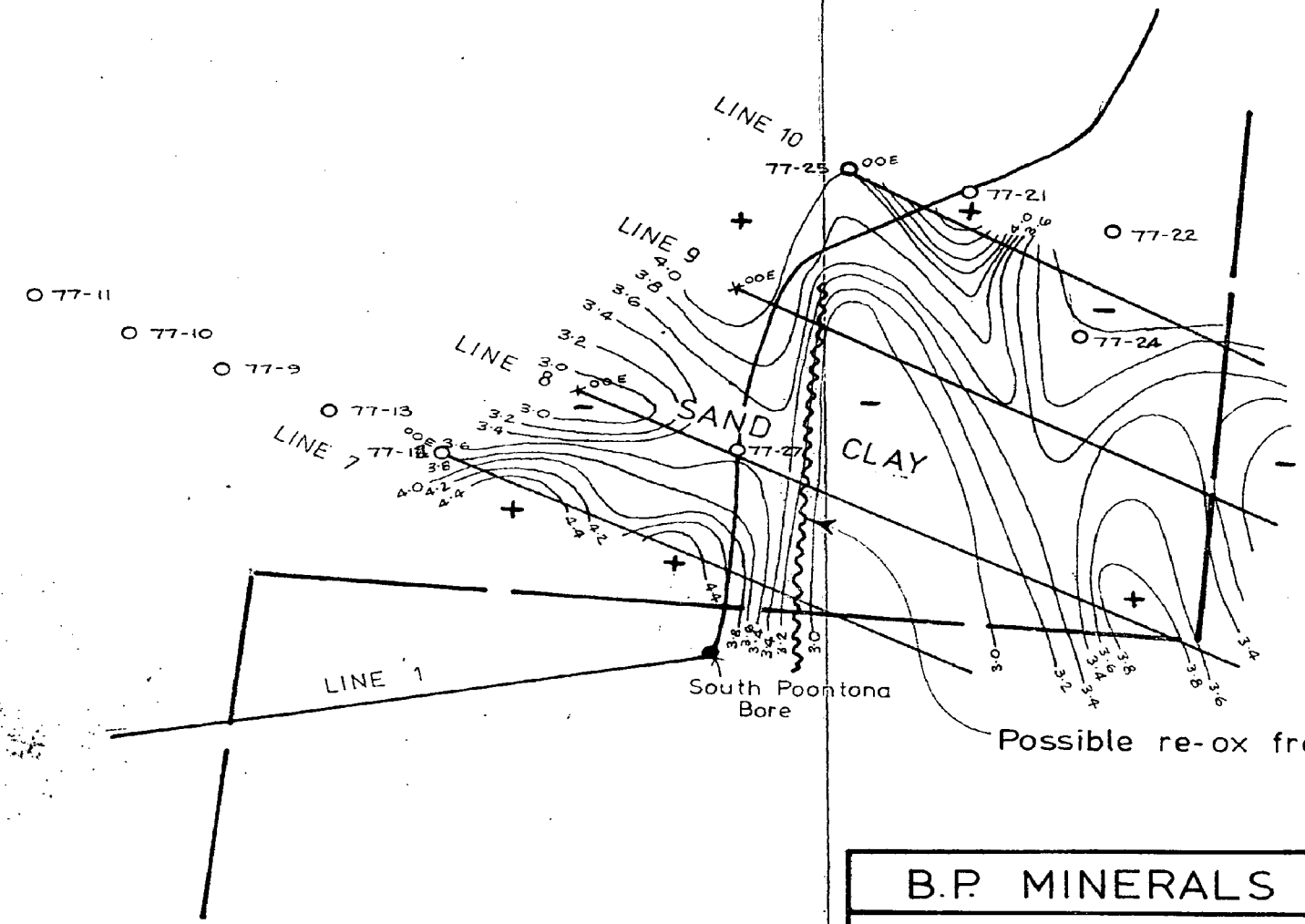
Paralana Creek

Caldina Creek

Copley 130 kms

LAKE FROME

333
RECEIVED
26 FEB 1975
DEPT. OF MINES
SECURITY



RECEIVED
24 FEB 1975
2328
2346

B.P. MINERALS AUSTRALIA LTD

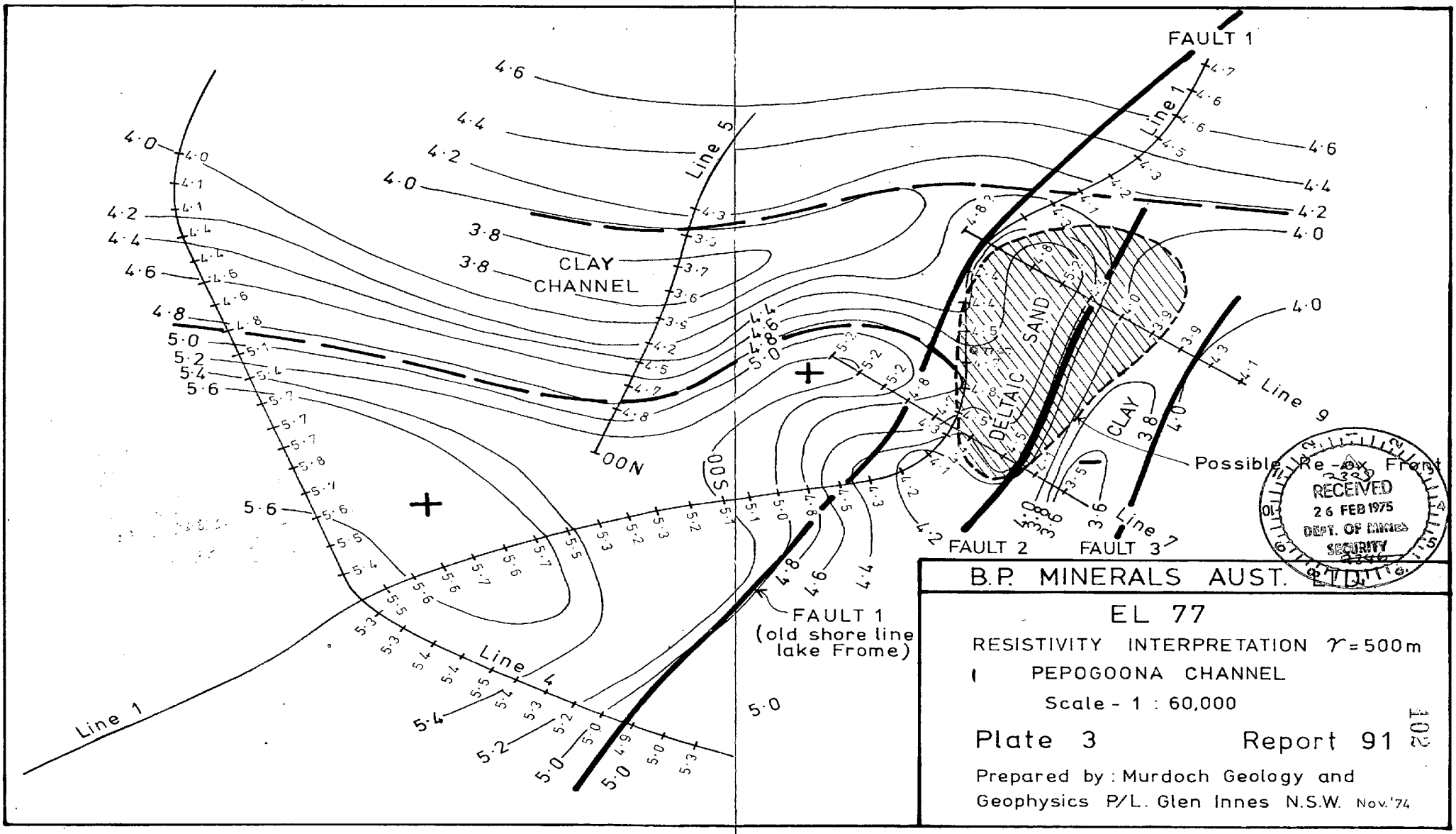
EL 77

CONTOUR PLAN CALCULATED TRUE RESISTIVITIES LAYER 3

Scale - 1:60,000

Plate 4 Report 91

Prepared by : MURDOCH GEOLOGY & GEOPHYSICS P/L
GLEN INNES N.S.W. Nov. '74



B.P. MINERALS AUST. LTD.

EL 77

RESISTIVITY INTERPRETATION ρ = 500m

PEPOGOONA CHANNEL

Scale - 1 : 60,000

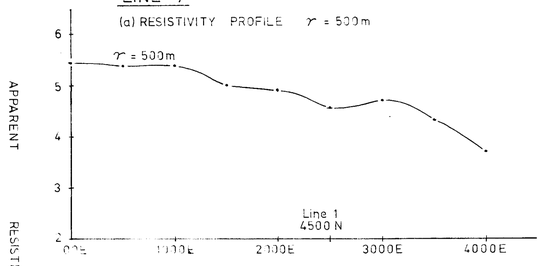
Plate 3 Report 91

Prepared by : Murdoch Geology and Geophysics P/L. Glen Innes N.S.W. Nov.'74

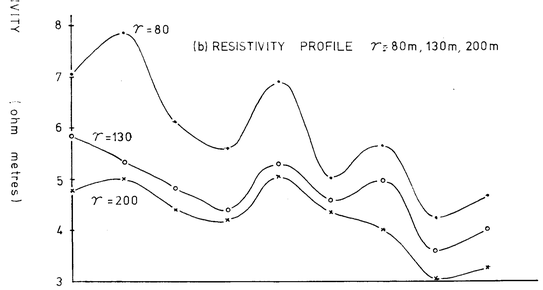
102

LINE 7

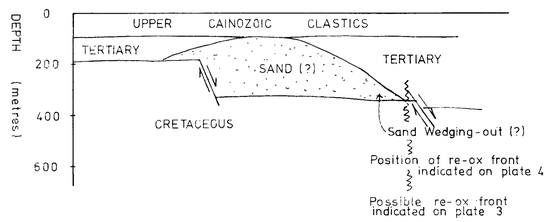
(a) RESISTIVITY PROFILE γ = 500m



(b) RESISTIVITY PROFILE γ = 80m, 130m, 200m

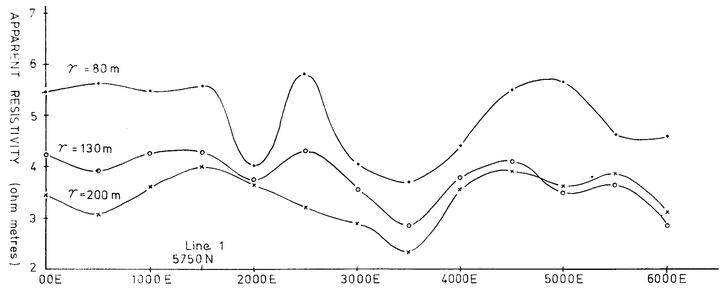


(c) INTERPRETED GEOLOGICAL SECTION

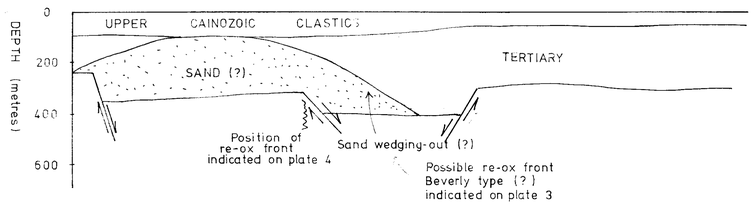


LINE 8

(b) RESISTIVITY PROFILES γ = 80m, 130m, 200m

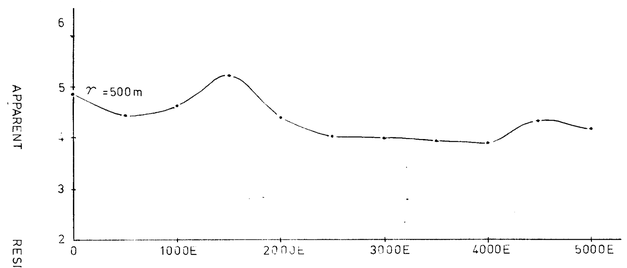


(c) INTERPRETED GEOLOGICAL SECTION

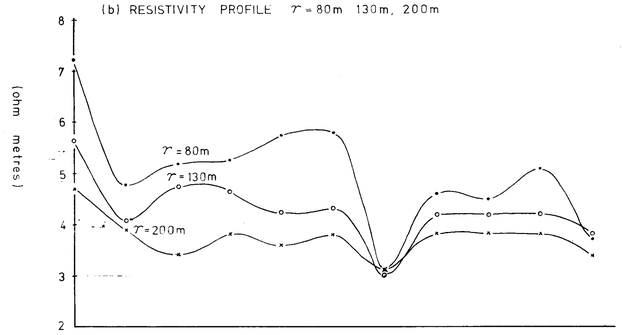


LINE 9

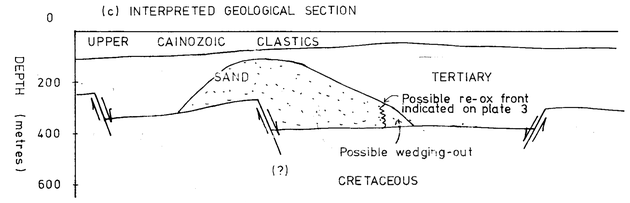
(a) RESISTIVITY PROFILE γ = 500m



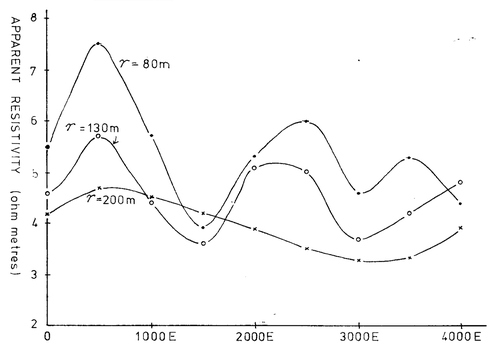
(b) RESISTIVITY PROFILE γ = 80m 130m, 200m



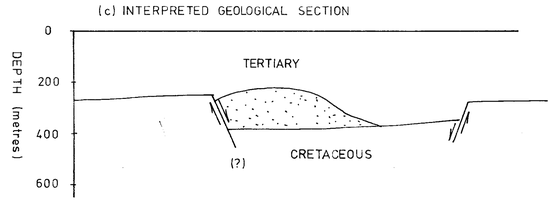
(c) INTERPRETED GEOLOGICAL SECTION



LINE 10

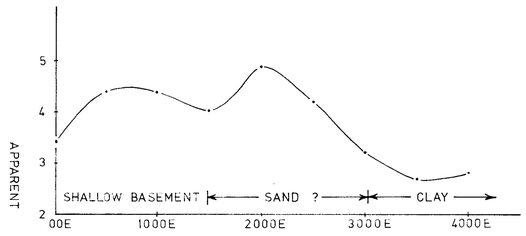


(c) INTERPRETED GEOLOGICAL SECTION

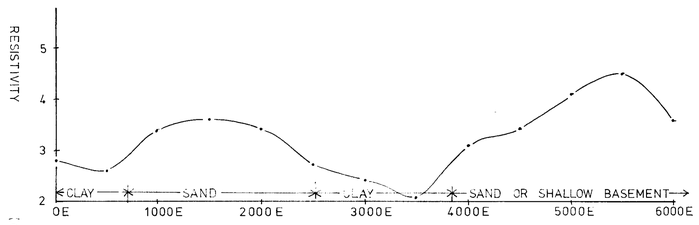


CALCULATED TRUE RESISTIVITY LAYER 3

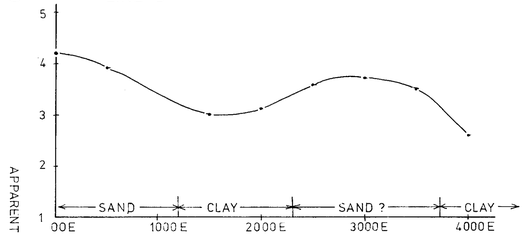
LINE 7



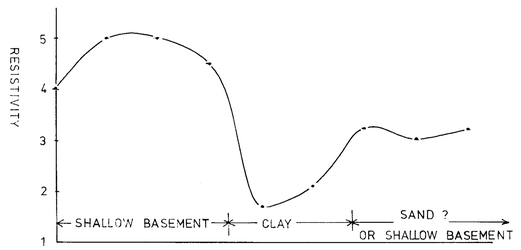
LINE 8



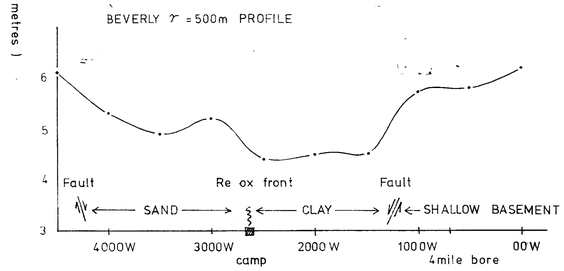
LINE 9



LINE 10



BEVERLY γ = 500m PROFILE



B.P. MINERALS AUSTRALIA LTD

EL 77

RESISTIVITY PROFILE LINES 7, 8, 9, 10

SCALES :- VERT. (PROFILES) 1cm = 0·5 metres

(SECTIONS) 1cm = 100 metres

HORZ. 1cm = 250 metres

Plate 2 Report 91

PREPARED BY :

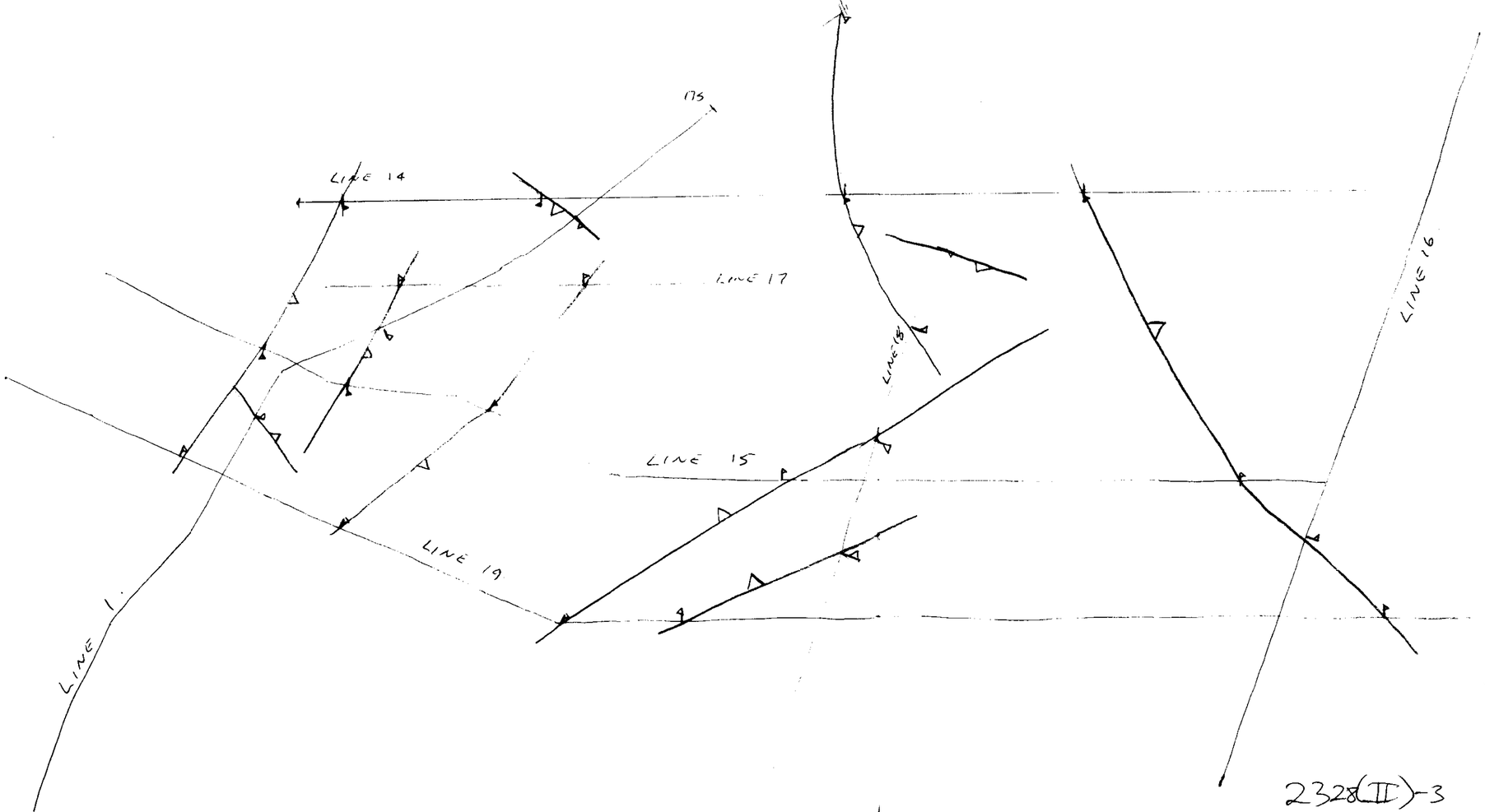
MURDOCH GEOLOGY AND GEOPHYSICS PTY LTD

GLEN INNES N.S.W.

NOV. 1974

2328
25 FEB 1975
DEPT. OF
SECURITY

2328(A)-1



Alternative Interpreted Faults from transverse Sections Plate 2

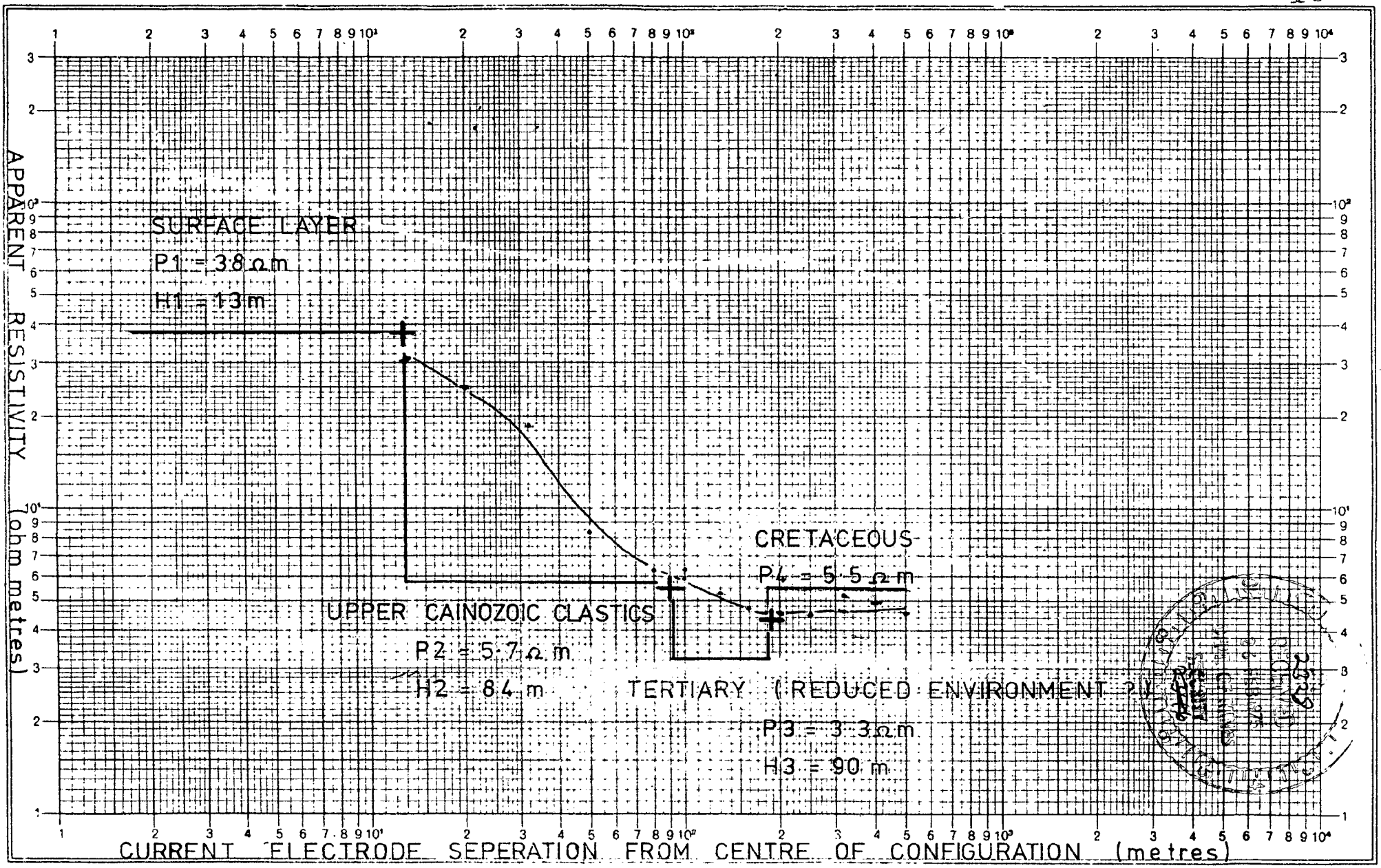
Overlay to Plate 3

i.e. NE & NW trending faults only

2328(II)-3

EL 77 SOUTH AUSTRALIA
Line 7 00 W (Hole 12)

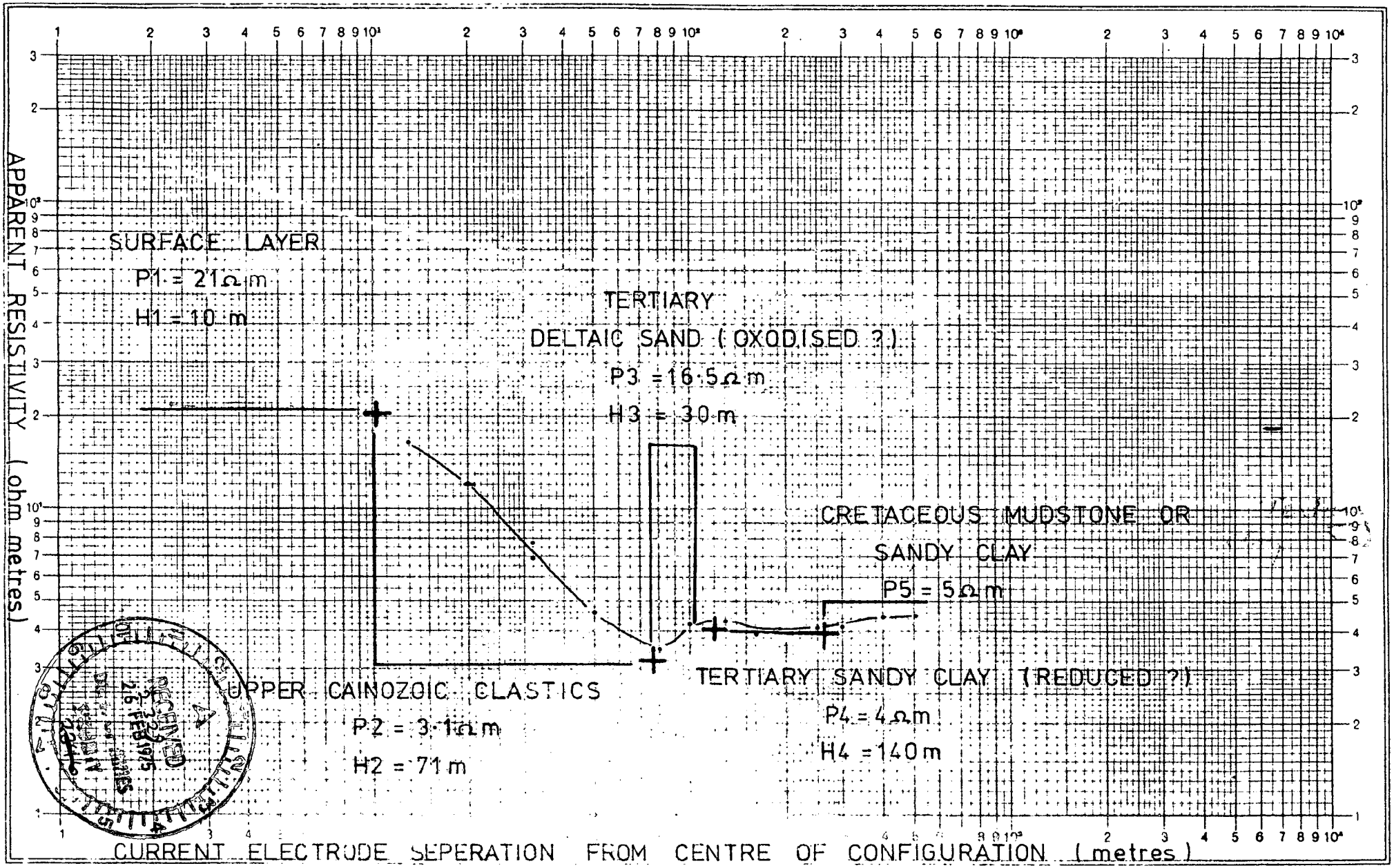
PLATE 5 REPORT 91



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

EL 77 - SOUTH AUSTRALIA
Line 8 1500 W (Hole 27)

PLATE 6 REPORT 91 104

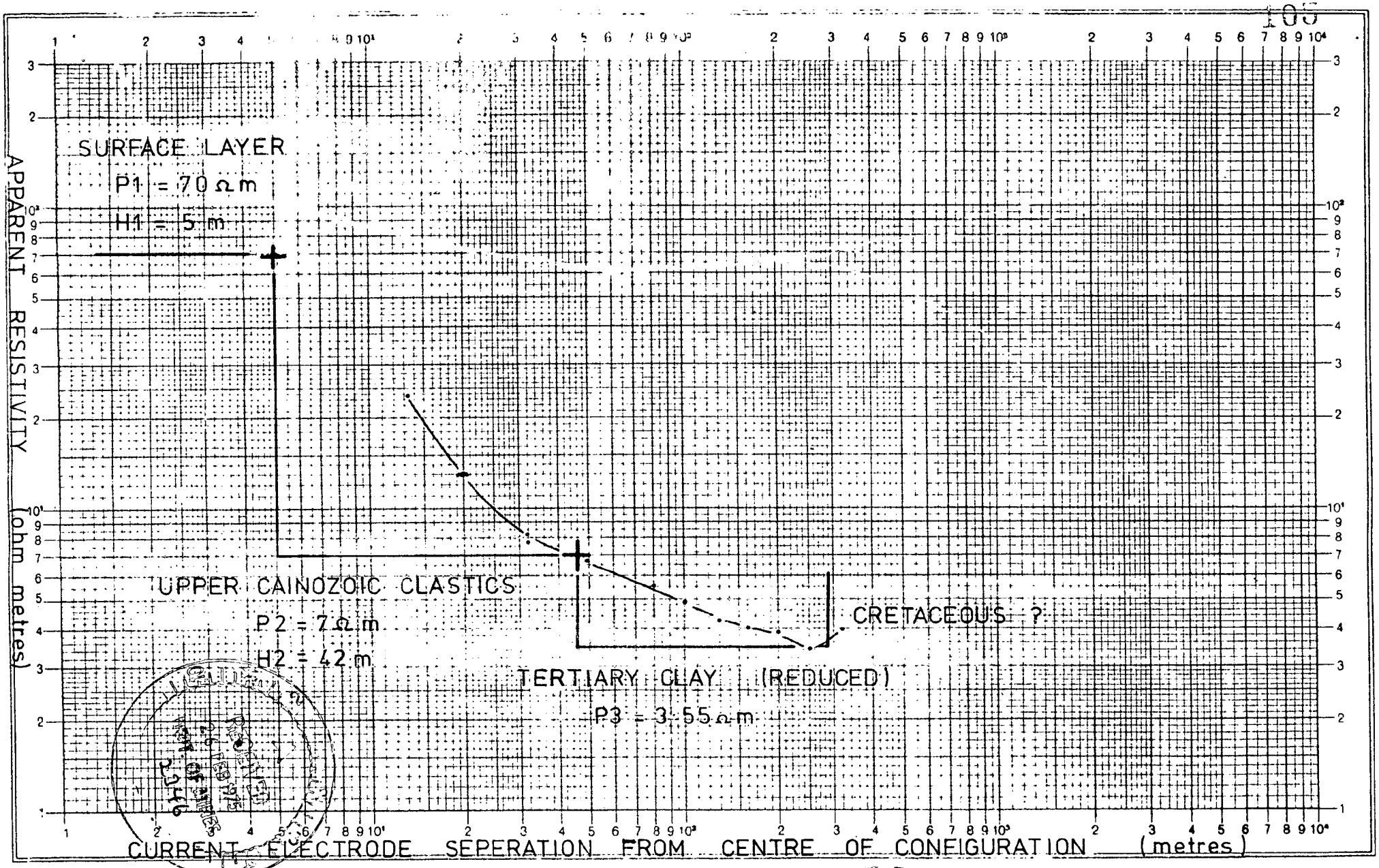


RECEIVED
215 FEB 1975
DEPT. OF MINES
ADELAIDE

MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES N.S.W.

EL 77 - SOUTH AUSTRALIA
Line 8 4500 E

PLATE 7 REPORT 91

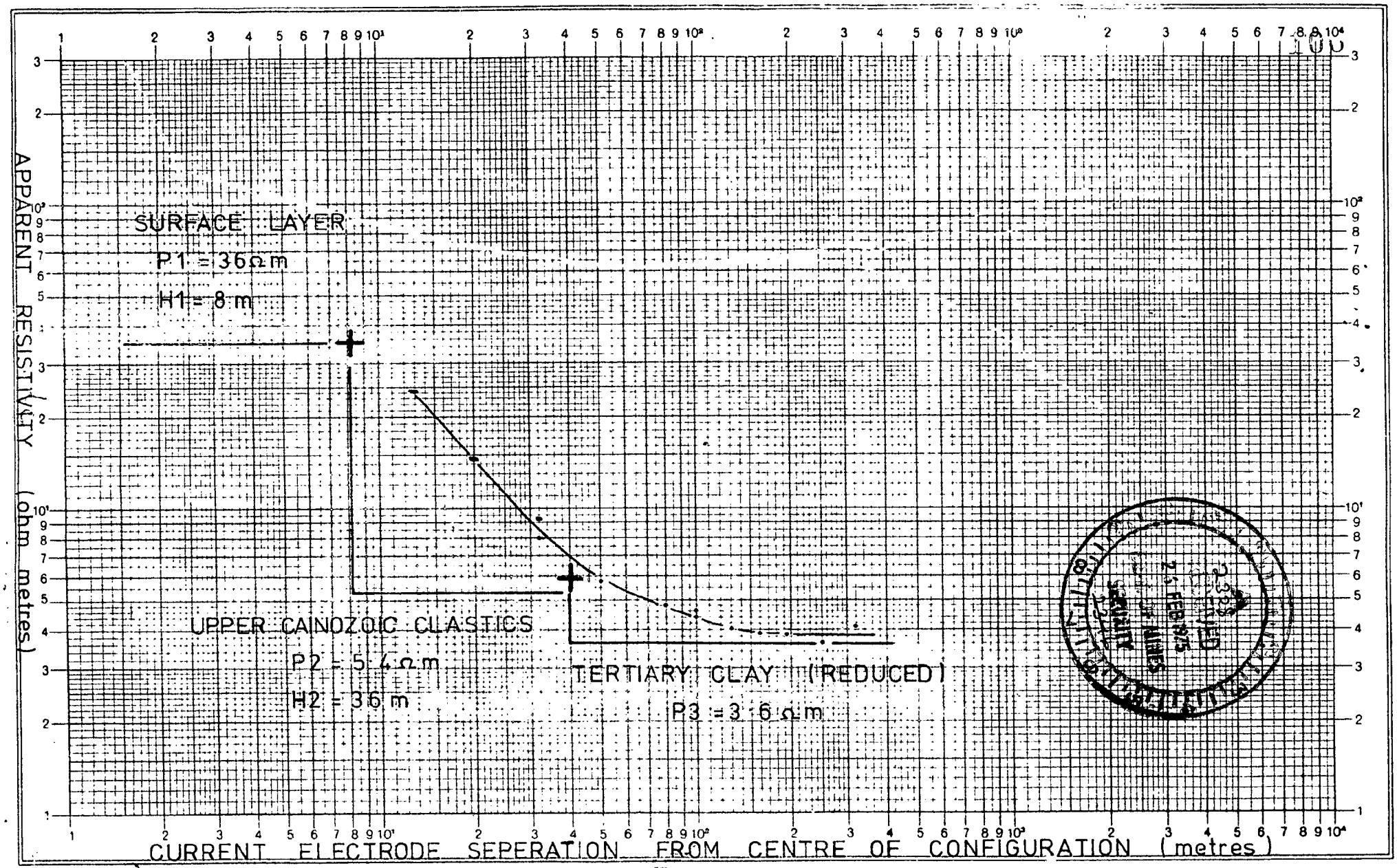


RECEIVED 26 FEB 1975 DEPT. OF MINES

MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES N.S.W.

EL 77 - SOUTH AUSTRALIA
Line 9 500 E

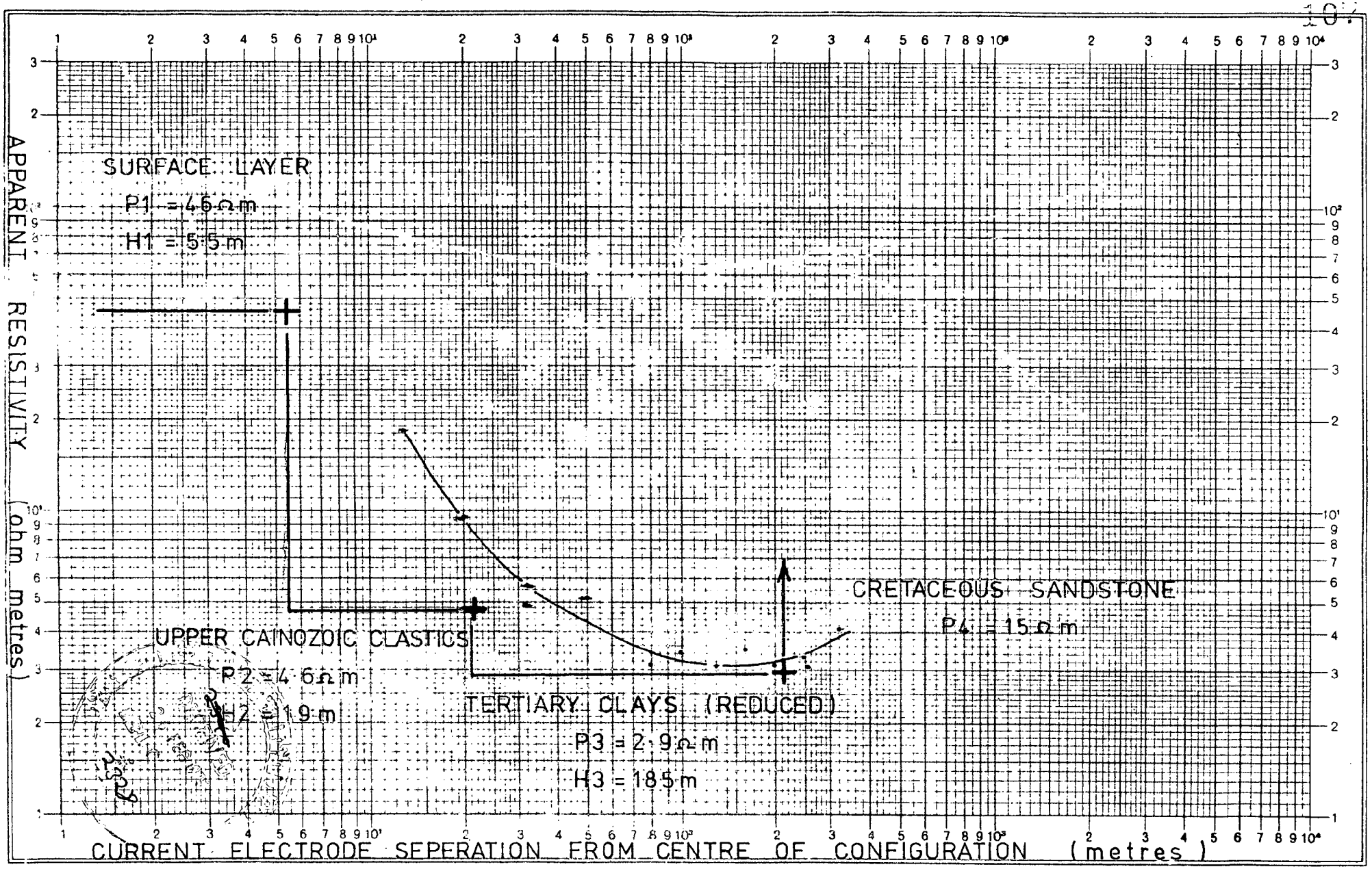
PLATE 8 REPORT 91



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

EL 77 - SOUTH AUSTRALIA
Line 9 3000 E

PLATE 9 REPORT 91



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

OILMIN N.L.

TRANSOIL N.L.

PETROMIN N.L.

MINES ADMINISTRATION PTY LTD

TETON EXPLORATION DRILLING COMPANY PTY LTD

BP MINERALS AUSTRALIA PROPRIETARY LIMITED

106

PRIMARY AGREEMENT

EXPLORATION LICENCES 68, 77 AND 91 SOUTH AUSTRALIA

QUARTERLY EXPENDITURE REPORT

In accordance with Clause 8 of the above agreement, BP hereby reports on the expenditure for the quarter ending..December, 1974.....
The expenditure for quarter October to December is shown in brackets.

	Total	EL 68		EL 77		EL 91	
			(2nd)		(2nd)		(2nd)
- Overheads	2,610	870	(568)	870	(568)	870	(568)
Plant and Tools:							
- Exploration							
Geological Services	1,764	720	(657)	79	(15)	965	(902)
Geochem. Services	631	175	(81)	280	(91)	176	(82)
Drilling Services	46,026	9,554	(9,554)	23,278	-	13,194	(13,194)
Drill-hole logging	12,804	2,898	(2,898)	5,904	-	4,002	(4,002)
Resistivity Survey	10,092	1,362	(1,362)	5,760	(1,641)	2,970	(1,205)
Access Roads	66	-		66	-	-	-
Consumable Stores	2,072	453	(213)	1,166	-	453	(213)
Exploration Tenement Fees	2,001	212	(211)	614	(210)	1,175	(210)
- Investigations							
Consultant Services	310	103	-	104	-	103	-
- Operations							
Vehicle Operating	1,427	462	(462)	309	-	656	(638)
Rental of Equipment	882	370	(370)	-	-	512	(262)
Aircraft Charter	* 786	* 115	-	* 476	-	195	(195)
Freight & Cartage	89	25	(25)	29	-	35	(35)
Travelling Expenses	1,030	329	(329)	235	-	466	(454)
Personnel Services	5,824	1,472	(1,472)	2,148	-	2,204	(2,033)
- Salaries & Wages	14,118	3,053	(2,987)	6,582	-	4,483	(4,126)
TOTAL	102,532	22,173	(21,189)	47,900	(2,525)	32,459	(28,119)

Certified Correct

.....

Senior Geologist (Uranium)

* Figures adjusted from 1st. Quarterly Report.

RECEIVED
10 SEP 1975
DEPT. OF MINES
SECURITY
3328-III

CILMIN N.L.

TRANSOIL N.L.

PETROMIN N.L.

109

MINES ADMINISTRATION PTY LTD

TETON EXPLORATION DRILLING COMPANY PTY LTD

BP MINERALS AUSTRALIA PROPRIETARY LIMITED

AG/27/16/14/1

28.7.1975.

PRIMARY AGREEMENT

EXPLORATION LICENCES 68, 77 AND 91 SOUTH AUSTRALIA

QUARTERLY EXPENDITURE REPORT

In accordance with Clause 8 of the above agreement, BP hereby reports on the expenditure for the quarter ending June and total expenditure for the first Project Year.

	Total QUARTER	EL 68 APRIL 1975 TO JUNE 1975.	EL 77	EL 91
- Overheads				
Plant and Tools:	283	94	95	94
- Exploration				
Geological Services	304	101	102	101
Geochem. Services	-	-	-	-
Drilling Services	21,924	-	21,924	-
Drill-hole logging	3,277	-	3,277	-
Resistivity Survey	-	-	-	-
Access Roads	20	-	20	-
Consumable Stores	1,308	98	1,112	98
Exploration Tenement Fees	158	108	25	25
- Investigations				
Consultant Services	-	-	-	-
- Operations				
Vehicle Operating	1,768	132	1,504	132
Rental of Equipment	102	-	102	-
Aircraft Charter	278	21	236	21
Freight & Cartage	131	-	131	-
Travelling Expenses	118	-	118	-
Personnel Services	2,750	137	2,476	137
- Salaries & Wages	5,311	650	4,011	650
TOTAL	37,732	1,341	35,133	1,258

Certified Correct

.....D.Hall.....

Senior Geologist (Uranium)

JHH/YT

AG/27/16/14/1

28.7.1975.

BP MINERALS AUSTRALIA PROPRIETARY LIMITED

EXPENDITURE JULY 1974 - JUNE 1975

	Total	EL 68	EL 77	EL 91
- Overheads				
Plant and Tools :	2,893	964	965	964
- Exploration				
Geological Services	2,090	832	181	1,077
Geochem. Services	702	175	351	176
Drilling Services	67,950	9,554	45,202	13,194
Drill-hole logging	16,081	2,898	9,181	4,002
Resistivity Survey	10,092	1,362	5,760	2,970
Access Roads	86	-	86	-
Consumable Stores	3.380	551	2,278	551
Exploration Tenement Fees	2,159	320	639	1,200
- Investigations				
Consultant Services	402	133	135	134
- Operations				
Vehicle Operating	3,354	673	1,813	868
Rental of Equipment	984	37o	102	512
Aircraft Charter	1,064	136	712	216
Freight & Cartage	220	25	160	35
Travelling Expenses	1,148	329	353	466
Personnel Services	8,574	1,609	4,624	2,341
- Salaries & Wages.	23,874	5,184	12,075	6,615
TOTAL	145,053	25,115	84,617	35,321

Certified Correct

.....

Senior Geologist (Uranium)

JHH/YT

A RESISTIVITY SURVEY ON EL77, LAKE FROME, SOUTH AUSTRALIA

FOR B.P. MINERALS AUSTRALIA

By: R. Murdoch, B.A. (Earth Sciences),
Murdoch Geophysics (Australia) P/L.,
310 Grey Street, Glen Innes, N.S.W.,
Australia.

RECEIVED
19 AUG 1975
DEPT. OF MINES
SECURITY

Report: 204.

July, 1975.

CONCLUSIONS

The aim of the third resistivity survey conducted on EL77 was to provide information of the nature of the Upper Tertiary section and structure of the southern part of the EL.

Profiling has indicated a fairly complex structural picture in the area surveyed. A large shallow basement (granite?) mass occurs in the south-west corner. Several major faults have been interpreted. They strike roughly north-south with downthrow to the east. Minor faulting with downthrow to the west and some transverse east-west faulting have also been interpreted.

A total of nine preliminary drillholes have been recommended to test two channels interpreted within the survey area. Channel A appears to have initially headed south occupying a graben (see Plate 3). It has been turned abruptly east where it has encountered shallow basement. The major bend would provide an ideal position for mechanical deposition of contained uranium salts (targets on Line 1). Sand deposited east of the bend may have slumped over an easterly dipping fault causing a possible roll-front environment to occur (targets on Line 17).

Channel B also appears to have occupied a graben and may join Channel A east of Line 18. A drillhole has been recommended to test possible sand deposition within Channel B on Line 19. Three holes have been recommended over the interpreted combined paths of Channels A and B further east on Lines 15, 19 and 16.

Four second priority drillholes have been recommended over other possible Upper Tertiary sand bodies interpreted away from the expected channel paths.

Step-out drillholes at intervals of 1 kilometre are recommended along each line where Upper Tertiary sand bodies are encountered by the preliminary drillholes.

INTRODUCTION

Under instruction from B.P. Minerals Australia, Murdoch Geophysics (Australia) Pty. Ltd. have undertaken a resistivity survey over the southern part of EL77, near Lake Frome, South Australia. The field work was carried out from the 25th June to 5th July, 1975 by a four man crew led by Mr. G. Phair. The location of EL77 and the resistivity lines conducted during this survey are shown on Plate 1, a 1 : 250,000 location plan of the area north-west of Lake Frome.

This survey is the third resistivity survey conducted by Murdoch Geophysics (Australia) Pty. Ltd. on EL77. The previous resistivity surveys are described in our Reports No's. 83 (July, 1974) and 91 (November, 1974). Details of access, the resistivity method and equipment used are not included in this report as they have been previously described in the reports mentioned above.

GEOLOGY

The area surveyed comprises part of the Lake Frome Embayment, where thick Cainozoic sediments overlie Cretaceous mudstones.

Fluvial sands deposited within Upper Tertiary channels overlying the Lower Tertiary Eyre Formation are considered prospective for secondary uranium deposits. The channels appear to have flowed eastwards from the Flinders Ranges and have intersected a number of NNE-SSW striking faults. These faults are thought to coincide with ancient shore-lines of the present Lake Frome. It is thought that Upper Tertiary channels draining the Flinders Ranges, deposited deltaic sands on the lake side of the shore-lines. Movement of the faults is thought to have continued into the Upper Tertiary causing the fluvial and deltaic sands to slump over the fault, causing an ideal environment for a uranium roll-front. Secondary uranium concentrations may occur where the deltaic sands wedge out on the Lake side of the fault.

The aim of the survey was to outline possible deltaic sand bodies and faulting and to generally access the Tertiary structure of the southern part of EL77.

FIELD PROCEDURES

Resistivity profiling and electrical soundings were conducted on the seven lines shown on Plate 1. Along each traverse line readings were taken at intervals of 0.5 kilometres. Each reading station was marked with a 25mm survey peg projecting at least 0.5 metres above the ground. The respective line and position number were recorded on each peg.

The resistivity traverses comprised Schlumberger Array profiling with current electrode separations from the centre of the configuration (r) of 500 metres. In addition Lines 14, 15, 17 and 1 were profiled with an r separation of 300 metres. Potential electrode separations from the centre of the configuration (m) used were 100 metres for r = 500 metres and 40 metres for r = 300 metres.

Detailed soundings were conducted where necessary to assist interpretation. The soundings were expanded perpendicular to the traverse direction to a logarithmic formula using the Schlumberger Array. At each detailed sounding individual readings were taken at each of the following electrode positions.

TABLE 1.- Detailed Sounding Readings

r(Current electrode separation from centre of configuration) (metres)	m(Potential electrode separation from centre of configuration) (metres)
13	2
20	2
32	2
32	5
50	5
80	5
100	5
100	40

r (Current electrode separation from centre of configuration) (metres)	m (Potential electrode separation from centre of configuration) (metres)
130	40
160	40
200	40
250	40
320	40
320	100
400	100
500	100

The soundings were conducted at the positions listed in Table 2 below.

RESULTS

The various profiles conducted during this survey have been plotted on Plate 2. They are plotted as graphs of apparent resistivity (vertical axis) against line position (horizontal axis). The vertical scale used was 1cm = 0.5 ohm metres and the horizontal scale used was 1cm = 250 metres. The r = 500m apparent resistivity values have been manually smoothed to enable them to be reasonably contoured (dashed line on Plate2).

The smoothed values for r = 500 metres have been plotted on Plate 3, a 1 : 60,000 plan of the survey area. On some lines the data has been directionally corrected to fit values obtained on intersecting lines. The smooth and corrected results have been contoured at a scale of 0.5 ohm metres.

Similarly, directionally corrected r = 300 metres data has been contoured on Plate 4. The contour interval used on this plan was 1 ohm metre.

The detailed soundings have been plotted as standard log-log graphs of apparent resistivity (vertical axis) against current

electrode separation from the centre of configuration in metres (horizontal axis). The plotting of the data in this manner allows comparison of the sounding curves with statdard interpretation curves. The soundings are presented as Plates 4 to 24 accompanying this report.

INTERPRETATION

(a) Detailed Soundings

The detailed soundings have been interpreted by partial curve matching techniques. This method of interpretation integrates the sounding curve into a number of layers of different resistivity and thickness. An expected lithology can then be assigned to eacl layer depending upon the known geology of the area, its resistivity value, position and thickness.

The detailed soundings have been interpreted as follows:

TABLE 2.- Detailed Sounding Interpretation

Line	Layer	Resistivity (ohm metres)	Interval (metres)	Expected Geology
14	1	16	0 - 9.5	Surface layer
00E	2	6.4	9.5- 95	Upper clastics
Plate 5	3	4.4	95 -236	Upper Tertiary
	4	12.5	236 +	Cretaceous basement
14	1	150	0 - 7.5	Surface layer
5000E	2	10.5	7.5-120	Upper clastics
Plate 6	3	5	120 -300 (?)	Upper Tertiary
	4	6	300 + (?)	Lower Tertiary (Eyre Formation)
14	1	250	0 - 8	Surface layer
8000E	2	15	8 -104	Upper clastics
Plate 7	3	3.9	104 -260 (?)	Upper Tertiary
	4	5.5	260 ?+	Lower Tertiary (Eyre Formation)

Line	Layer	Resistivity (ohm metres)	Interval (metres)	Expected Geology
14	1	42	0 - 9	Surface layer
12000E	2	12.6	9 -108	Upper clastics
Plate 8	3	3.9	108 -268	Upper Tertiary
	4	5.5	268 +	Lower Tertiary (Eyre Formation)
14	1	60	0 - 11	Surface layer
13500E	2	9	11 -110	Upper clastics
Plate 9	3	2.9	110 -260	Upper Tertiary
	4	4.8	260 +	Lower Tertiary (Eyre Formation)
15	1	270	0 - 5	Surface layer
10000E	2	9	5 - 60	Upper clastics
Plate 10	3	3.6	60 -128	Upper Tertiary
	4	200	128 +	Granite basement
15	1	10.5	0 - 12	Surface layer
3000E	2	3.15	12 - 14	Upper clastics
Plate 11	3	7	14 -134	Upper clastics
	4	4.55	134 -274	Tertiary
	5	9.6	274 +	Cretaceous (?)
15	1	13.5	0 - 15.5	Surface layer
4000E	2	6.75	15.5- 62	Upper clastics
Plate 12	3	10	62 -111	Upper clastics (sand or limestone)
	4	4.5	111 -247 (?)	Upper Tertiary
	5	4.8	247 + (?)	Lower Tertiary (Eyre Formation)
15	1	110	0 - 10.5	Surface layer
8000E	2	8.8	10.5-152	Upper clastics
Plate 13	3	4.5	152 -312 (?)	Upper Tertiary
	4	6.0	312 + (?)	Lower Tertiary (Eyre Formation)

Line	Layer	Resistivity (ohm metres)	Interval (metres)	Expected Geology
15	1	12	0 - 5.5	Surface layer
12000E	2	21	5.5- 37	Upper clastics
Plate 14	3	7.6	37 -249	Upper Tertiary
	4	4	249 +	Lower Tertiary (Eyre Formation)
16	1	5	0 - 7.5	Surface layer
00S	2	12.5	7.5- 37.5	Upper clastics
Plate 15	3	5	37.5-212	Upper Tertiary
	4	5.5	212 +	Lower Tertiary (Eyre Formation)
16	1	28	0 - 20	Surface layer
4000S	2	7	20 -120	Upper clastics
Plate 16	3	2.6	120 -240	Upper Tertiary
	4	14.5	240 +	Cretaceous? or Lower Tertiary (Eyre Formation) (sandy)
16	1	7.6	0 - 12.5	Surface layer
8000S	2	40	12.5- 42	Upper clastics
Plate 17	3	5	42 -230	Upper Tertiary
	4	7	230 +	Lower Tertiary (Eyre Formation)
17	1	14	0 - 9.5	Surface layer
500E	2	7	9.5-105	Upper clastics
Plate 18	3	3.5	105 -265	Upper Tertiary
	4	9.2	265 +	Cretaceous? or Lower Tertiary (Eyre Formation) (sandy)
17	1	300	0 - 7.5	Surface layer
3000E	2	11	7.5-105	Upper clastics
Plate 19	3	1.8	105 -115	Upper Tertiary
	4	8	115 -245	Upper Tertiary
	5	3.1	245 +	Lower Tertiary (Eyre Formation)

Line	Layer	Resistivity (ohm metres)	Interval (metres)	Expected Geology
18	1	68	0 - 16	Surface layer
3500S	2	10.2	16 - 99	Upper clastics
Plate 20	3	4.05	99 -199 (?)	Upper Tertiary
	4	6.0	199 + (?)	Lower Tertiary (Eyre Formation)
19	1	17.5	0 - 10.5	Surface layer
4000E	2	7.2	10.5-165	Upper clastics and Upper Tertiary
Plate 21	3	6	165 +	Lower Tertiary (Eyre Formation)
19	1	44	0 - 15	Surface layer
8000E	2	6.6	15 -139	Upper clastics
Plate 22	3	3.5	139 -246	Upper Tertiary
	4	7.2	246 +	Lower Tertiary (Eyre Formation)
19	1	55	0 - 25	Surface layer
12000E	2	8.25	25 -300	Upper clastics and Upper Tertiary
Plate 23	3	2.4	300 +	Lower Tertiary (Eyre Formation)
19	1	22	0 - 16	Surface layer
12000E	2	8.8	16 - 38	Upper clastics
Plate 24	3	12	38 - 85	Upper clastics
	4	4.8	85 -340	Upper Tertiary
	5	5.5	340 +	Lower Tertiary (Eyre Formation)

The geoelectric layers interpreted from the soundings have been correlated with four holes drilled as follows:

TABLE 3.- Drillhole Information

Hole 77-44	Upper clastics	0	-100 metres
Line 14 3750E	Upper Tertiary	100	-275 metres
	Lower Tertiary Eyre Formation	275	+ metres
Hole 77-45	Upper clastics	0	- 60 metres
Line 14 2200E	Upper Tertiary	60	-250 metres
	Basement(?) granite	250	+ metres
Hole 77-46	Upper clastics	0	- 95 metres
Line 16 2050S	Upper Tertiary	95	-285 metres
	Lower Tertiary Eyre Formation	285	+ metres
Hole 77-47	Upper clastics	0	- 95 metres
Line 16 3550S	Upper Tertiary	95	-200+metres

The position of each hole is shown on Plate 3.

The geoelectric layers interpreted have been grouped as follows:

TABLE 4.- Geoelectric Layer Grouping

Position of Layer	Geology	Range of Resistivity Values
Third last layer and above, excluding surface layer	Upper Tertiary clastics	6 - 40 ohm metres
Second layer	Upper Tertiary	2.9- 8.2 ohm metres
Final layer	Lower Tertiary Eyre Formation	2.4- 7.0 ohm metres
	Cretaceous sediments	9 - 25 ohm metres
	Precambrian schist	25 -100 ohm metres
	Granite	Over 100 ohm metres

Over each of the above ranges the more conductive readings are expected to represent finer grained and moister sediments, whilst

the more resistive values represent sands, gravels and limestones. In the Upper Tertiary layers, which is the unit of interest, values exceeding 5 ohm metres are expected to reflect significant sand deposition.

The resistivity of the first layer (surface Layer) is largely dependent upon near surface moisture conditions at the time of the survey (dry) and the current electrode separation of the first reading. As the resistivity of this layer can be very variable its range of values have not been considered in Table 4 above.

(b) Profiles

Apparent resistivity values on the r = 500m profile range from 4 to 25 ohm metres over the area surveyed. Very high values (over 10 ohm metres) probably reflect shallower basement, whilst low values (under 7 ohm metres) probably reflect thick sections of Upper Tertiary clays and silts. The bulk of readings fall into the intermediate range (7-10 ohm metres) and it is this group that is of interest in selecting optimum areas for future exploration.

Features of importance on the r = 500m profiles are as follows:

(a) W shaped anomalies, which are characteristic of channels -

These anomalies are generally 1 to 2 kilometres wide. The sides of the anomaly reflect the channel edge and the small central peak, sand deposition within the channel.

(b) Sudden rises or falls in resistivity value indicates a fault -

The downthrown side has lower apparent resistivities as the more conductive Upper Tertiary section would be thicker on that side.

(c) Small smooth anomalies either associated with the faulting anomaly or masking it -

These anomalies may indicate Upper Tertiary deltaic sand deposits slumped over faulting which was progressive into the Upper

Tertiary. These anomalies are of particular importance near channelling.

On the r = 300m profiles high values should generally indicate very thick clastics or Upper Tertiary sand deposition and low values little or no sand. Only in areas of very shallow basement (less than 200 metres) would these profiles be mapping basement features.

Features of importance interpreted from the profiles were as follows:

TABLE 5.- Profile Interpretation

	r Value of Anomaly	Position	Interpretation
Line 14	r = 500m	750E	Fault downthrown to east
	r = 500m	750-3250E	Possible channel (Hole 77-45?)
	r = 300m & r = 500m	3250E-5500E	Sandy Upper Tertiary (Hole 77-44, 77-45?)
	r = 300m	3250E	Fault downthrown to west
	r = 500m	6750E	Fault downthrown to east
	r = 500m	9750E	Fault downthrown to east
	r = 500m	10500E-11750E	Sandy Upper Tertiary
Line 15	r = 500m	500E-2250E	Shallow basement
	r = 500m	2250E	Fault downthrown to east
	r = 300m	4250E-5000E	Sandy Upper Tertiary
	r = 500m	5250E	Fault downthrown to east
	r = 500m	9000E	Fault downthrown to east
	r = 500m	10750E-12500E	Snady Upper Tertiary
	r = 500m	14500E	Fault downthrown to east
Line 16	r = 500m	00S- 750S	Snady Upper Tertiary?
	r = 500m	6750S	Fault downthrown to north
	r = 500m	6750S- 8000S	Sandy Upper Tertiary
	r = 500m	4750S- 5500S	Sandy Upper Tertiary
	r = 500m	9250S-10000S	Sandy Upper Tertiary

	r Value of Anomaly	Position	Interpretation
Line 1	r = 500m	19250S	Fault downthrown to south
	r = 500m	19250E-22550S	Graben or channel
	r = 300m & r = 500m	20000S-22000S	Sandy Upper Tertiary with channel
	r = 500m	22250S	Fault downthrown to north
	r = 500m	24250S	Fault downthrown to north
	r = 300m	1000E	Fault downthrown to east
Line 17	r = 300m	3250E	Fault downthrown to east
	r = 500m	2250E-3500E	Sandy Upper Tertiary
Line 18	r = 500m	1750S	Fault downthrown to south
	r = 500m	3250S	Possible fault downthrown north
	r = 500m	4250S	Possible fault downthrown south
	r = 500m	6250S	Possible fault downthrown north
Line 19	r = 500m	2250E	Possible fault downthrown east
	r = 500m	4750E	Possible fault downthrown east
	r = 500m	7750E	Possible fault downthrown east
	r = 500m	7250E-7750E	Sandy Upper Tertiary ?
	r = 500m	9250E	Possible fault downthrown west
	r = 500m	17750E	Possible fault downthrown east
	r = 500m	11250E-14000E	Sandy Upper Tertiary

(c) Interpreted Geological Sections

Interpreted geological sections have been constructed beneath each profile on Plate 2. They have been constructed using the quantative sounding interpretation (Table 4) guided by a quantative profile interpretation (Table 5). They are plotted at the same horizontal scale as the profiles, but at a vertical scale of 1cm =

100 metres. The sections are fairly schematic away from drillhole or sounding positions. 124

(d) Contour Plans

The r = 500m data plotted on Plate 3 has been manually filtered (see Plate 2) and directionally corrected as follows:

Line 1: + 1.2 ohm metres added to all values. This data was recorded during a previous survey when survey moisture conditions were wetter and hence apparent resistivities at depth slightly lower.

Line 17 and Line 15: 0.5 ohm metres to all values tapered to no correction at the end of Line 15.

Line 16: No correction at each end of the line increasing to - 0.5 ohm metres at the intersection with Line 15.

Lines 14, 18 and 19: No correction.

The corrected data has been contoured at an interval of 0.5 ohm metres with a bias towards features interpreted from the profiling.

The interpretation on Plate 3 appears fairly complicated. There appears to ba a series of about four major faults orientated approximately north-south and with downthrow to the east. Combined with this are several minor east-west, north-east - south-west and even north-south striking faults which can be interpreted on one and even two lines but are not continuous throughout the area.

Two channels may occur within the survey area, both initially occupying interpreted fault grabens.

Channel A may occupy a graben at the eastern end of Line 14, 17 and on nearby Line 1. The channel appears to have initially headed south along the graben, but its path has been halted by a larger resistive shallow basement area at the eastern end of Line 15 and 19. This resistive basement mass may have caused the channel to bend to

the east, crossing the graben fault and depositing a wide area of sand west of this fault. Upper Tertiary sand occurs in Hole 77-44 on Line 14. Sand can be interpreted as occurring on Line 17 and also on Line 1, within the south-east corner of the graben. The channel sands may extend as far south as Line 15. The thickest sand would occur near the centre of the interpreted channel on Line 17. On this line the sands may have slumped over a fault with easterly throw and wedged out as a delta within an ancient equivalent of Lake Frome east of the fault. This area would therefore be an ideal environment for uranium deposition.

The channel bend interpreted to occur near Line 1 21000S must also constitute an important area for possible uranium deposition, particularly on the outside of the channel bend.

Channel B may occupy a graben area near the middle of Line 19 and head north-easterly to cross Line 18 (see Plate 3). Broad areas of Upper Tertiary sand deposition have been interpreted on Lines 15 and 19 east of Line 18 and on Line 16 further east. These sands may occur along the combined paths of Channels A and B. Sand deposition on Line 16 is probably deltaic, occurring just east of another major fault.

Contouring on Plate 4 highlights the area of sand deposition at the centre of Line 17 and on Lines 1 and 14. Structural details on Plate 4, in some places, appear masked by lithology changes within the Upper Tertiary section.

Areas Prospective for Sedimentary Uranium

Upper Tertiary sand bodies, either deltaic or fluvial, are considered prospective for sedimentary uranium accumulation. These sands are of particular importance where they may have slumped over faults having progressive movement into the Upper Tertiary. The fluvial sands may also be of importance in major channel bends where the slowing down of stream energies causes deposition of coarser material on the outside of the bends. Such areas provide greater porosity for movement of the mineralizing fluids. In both the deltaic and fluvial sands ideal mineral traps occur where the sands pinchout downstream against finer grained minerals having reduced porosity.

A drillhole is recommended on each of the sand anomalies interpreted within the proposed paths of Channels A and B, with step-out drilling on each sand body encountered to define its limits. Such a programme would provide preliminary information on the uraniferous content of each major sand body encountered.

RECOMMENDATIONS

A drilling programme is recommended to substantiate, alter or disprove the predictions made in this report. Nine priority one holes and four priority two holes are recommended.

They are as follows:

Priority 1.

Line 17	3000E, 4000E
Line 1	21500S, 21000S, 22000S
Line 19	8000E, 12000E
Line 15	12000E
Line 16	5000S

Priority 2.

Line 14	5000E, 9500E, 11000E
Line 15	4500E

At each site, where thick sand is encountered, step-out holes should be drilled at intervals of 1 km, particularly towards the eastern end of the anomaly, to define the extent of the sand body and to provide some preliminary information on its uranium content.

Further exploration would depend upon the results of the above drilling programme. Where sand bodies of importance are confirmed, detailed resistivity can be used to define their limits, structure and shape.

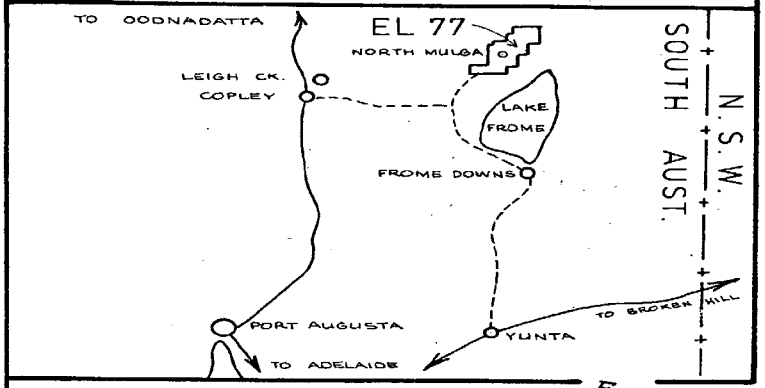
B.P. MINERALS AUST. LTD

EL 77 SOUTH AUSTRALIA
LOCATION OF PHASE 3
RESISTIVITY LINES
Scale - 1 : 250,000

Plate 1 **Report 204**

Prepared by : Murdoch Geophysics
(Australia) P/L Glen Innes N.S.W.

INSERT SCALE : 1cm = 30 km.



127

MOOLAWATANA

Hamilton's Creek

EL 77

BOX BORE

NORTH POONTANA BORE

Poontana Creek

Mile Creek

Four

BEVERLEY OREBODY

BORE

NORTH MULGA OUTSTATION

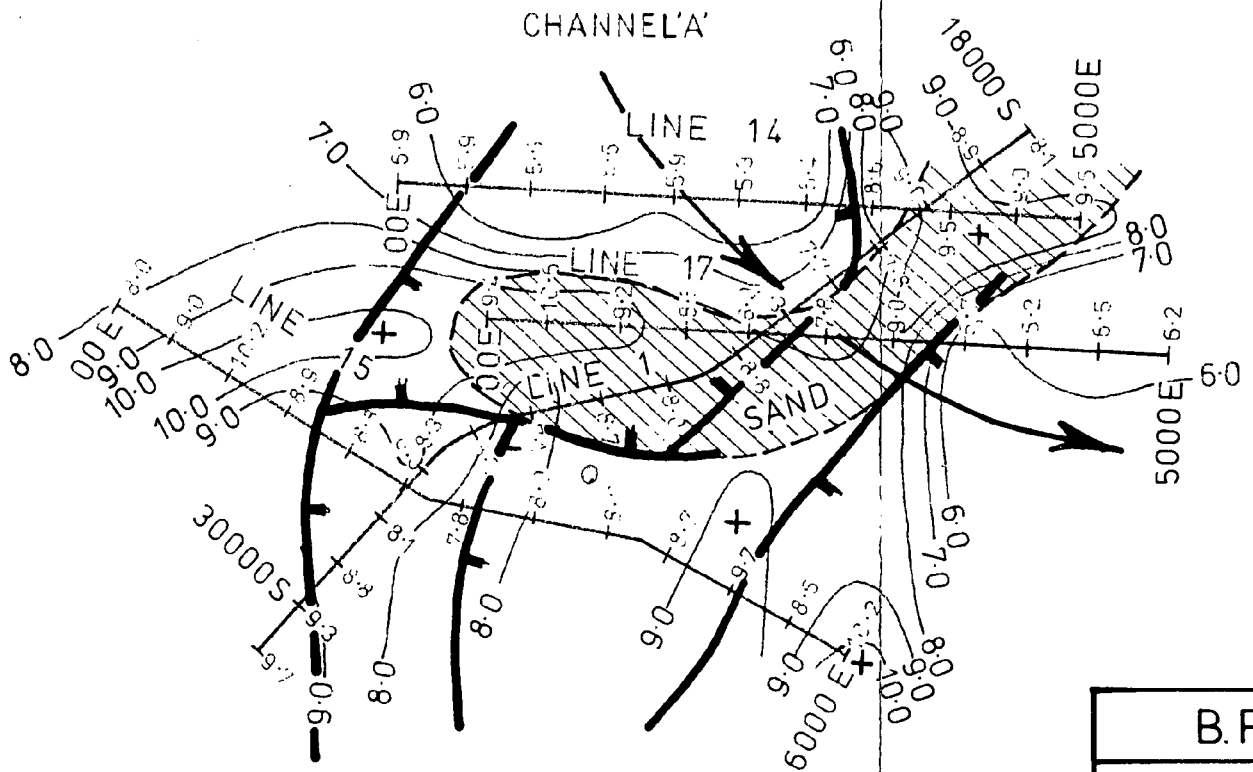
Parralana Creek

14 18 16 17 19 15 1

Caldina Creek

COPLEY 130 kms.

LAKE FROME



B.P. MINERALS AUSTRALIA

EL 77 SOUTH AUST.

CONTOUR PLAN - APPARENT RESISTIVITY

γ = 300 metres

Directionally Corrected

Scale 1cm = 500 m.

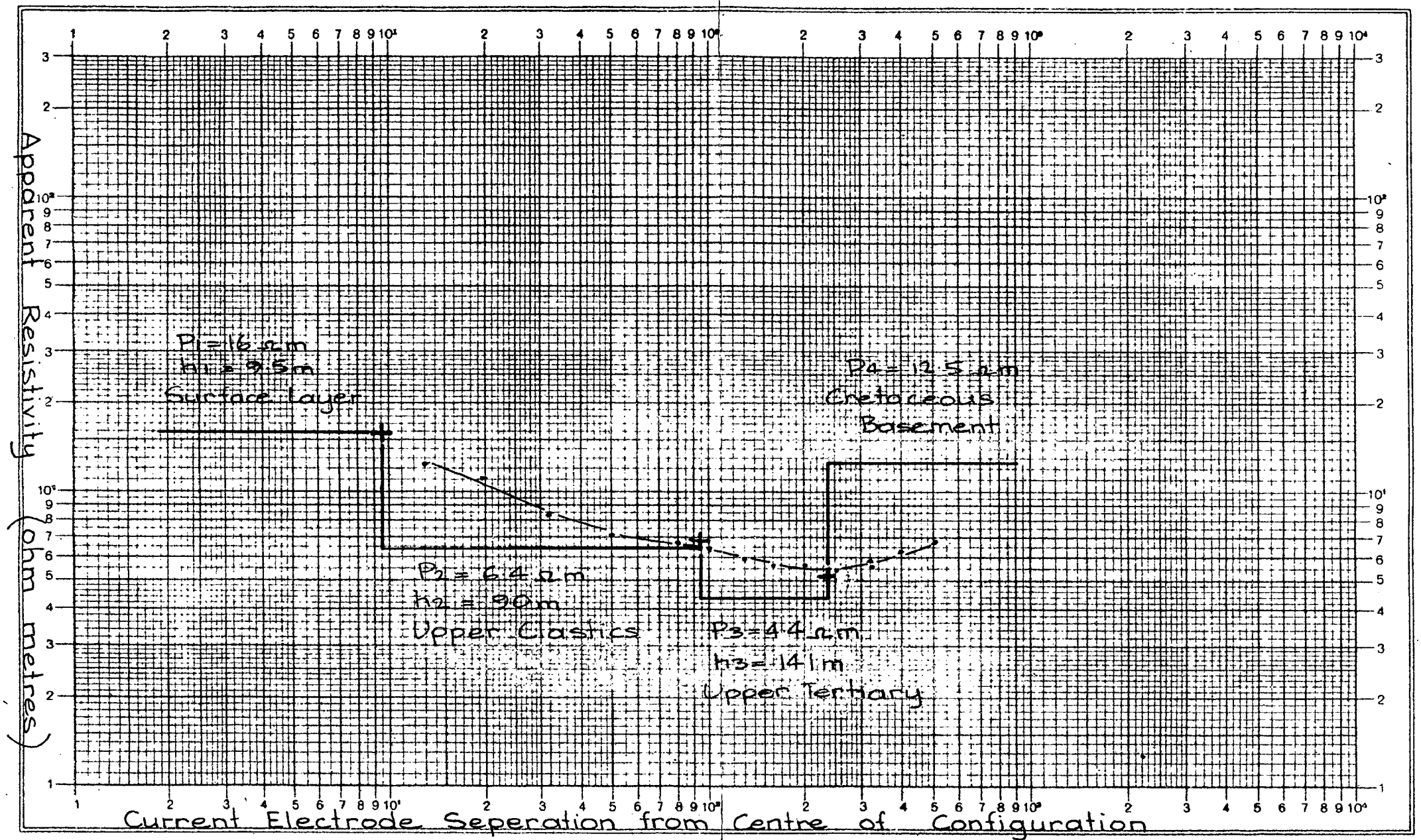
Prepared by :

Murdoch Geophyics (Aust.) P/L
Glen Innes N.S.W.

Plate : 4 Report : 204

LINE 14 OOE
EL77

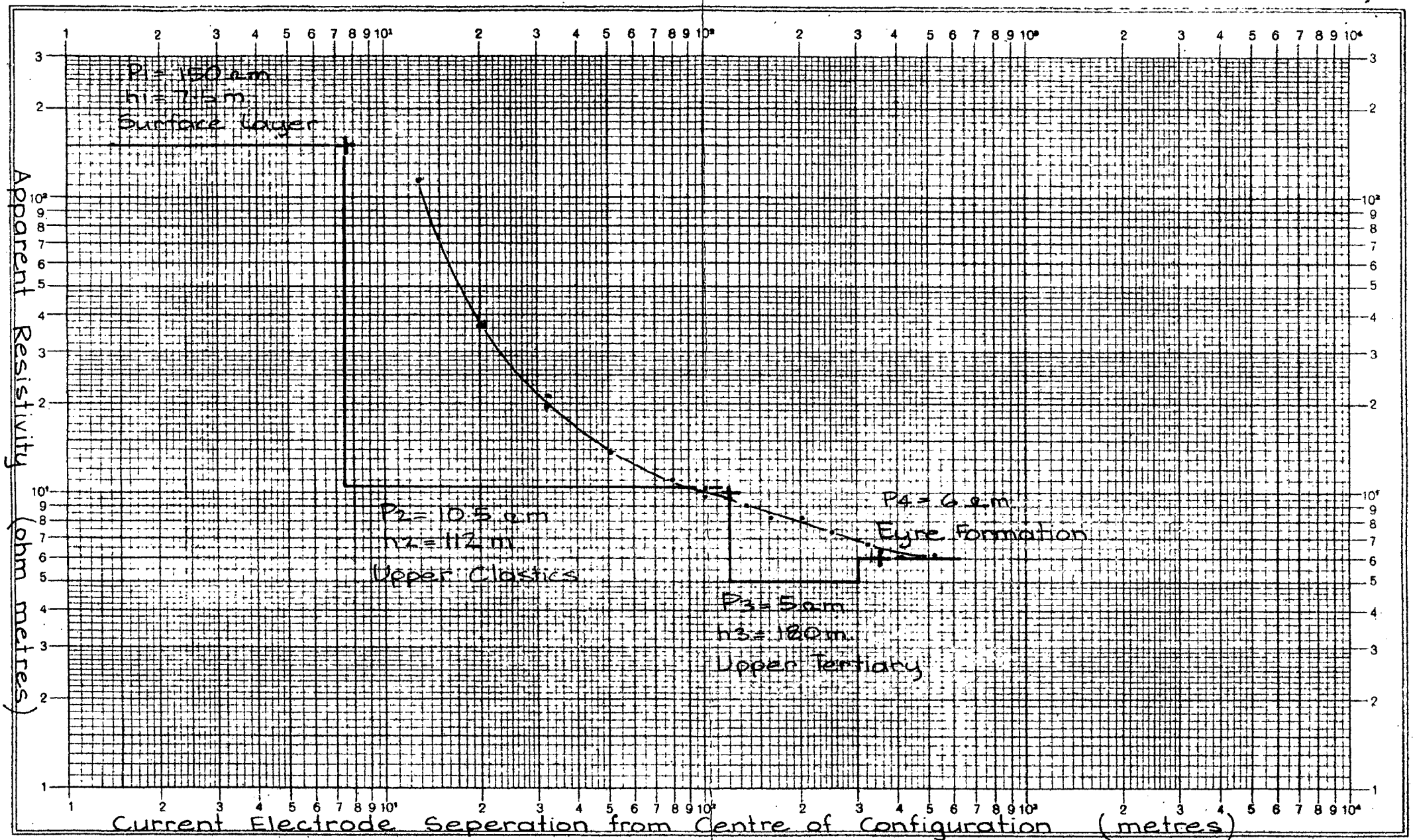
Plate: 5 129 Report: 204



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 14 5000 E
EL 77

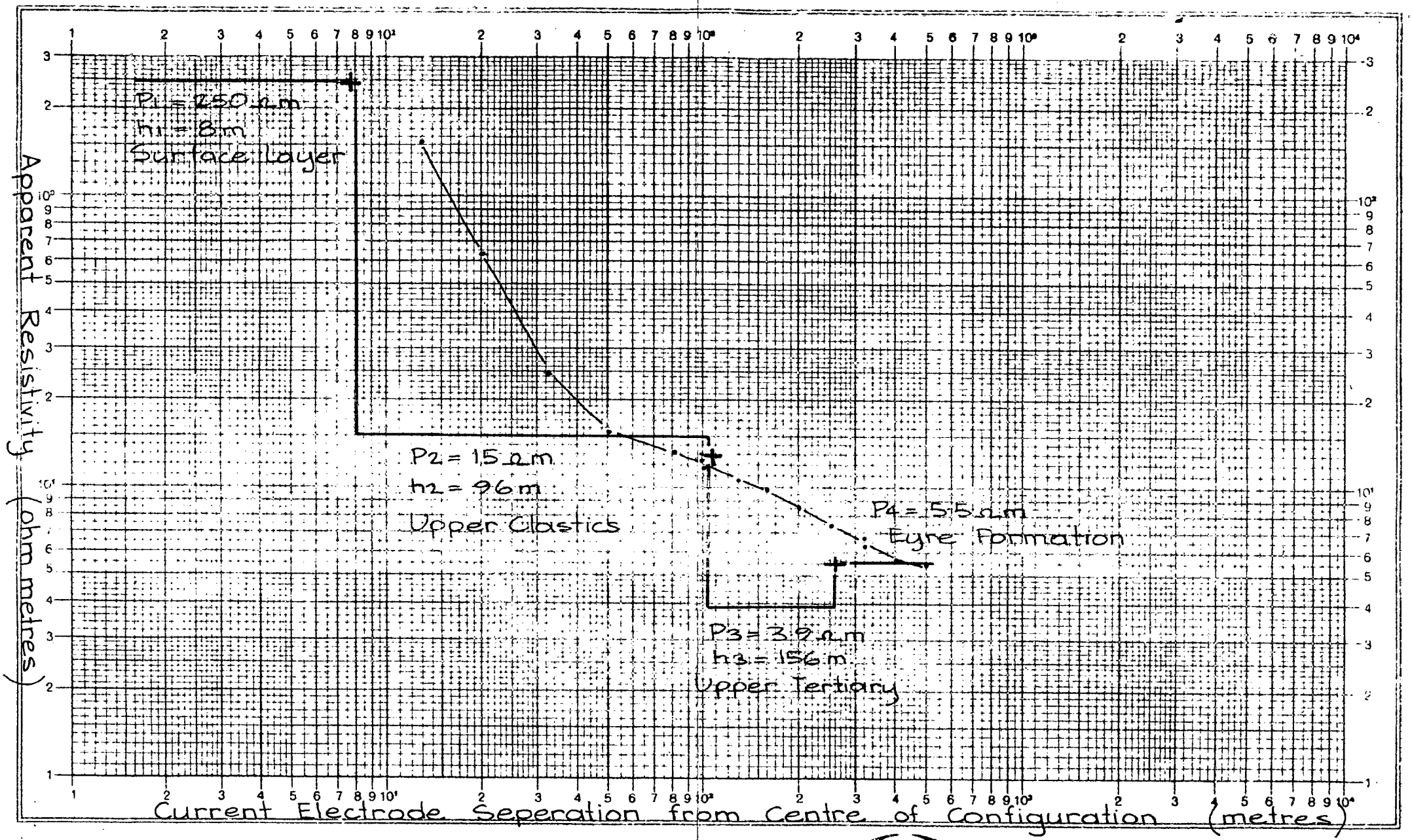
Plate: 6 13U Report: 204



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 14 8000 E
EL 77

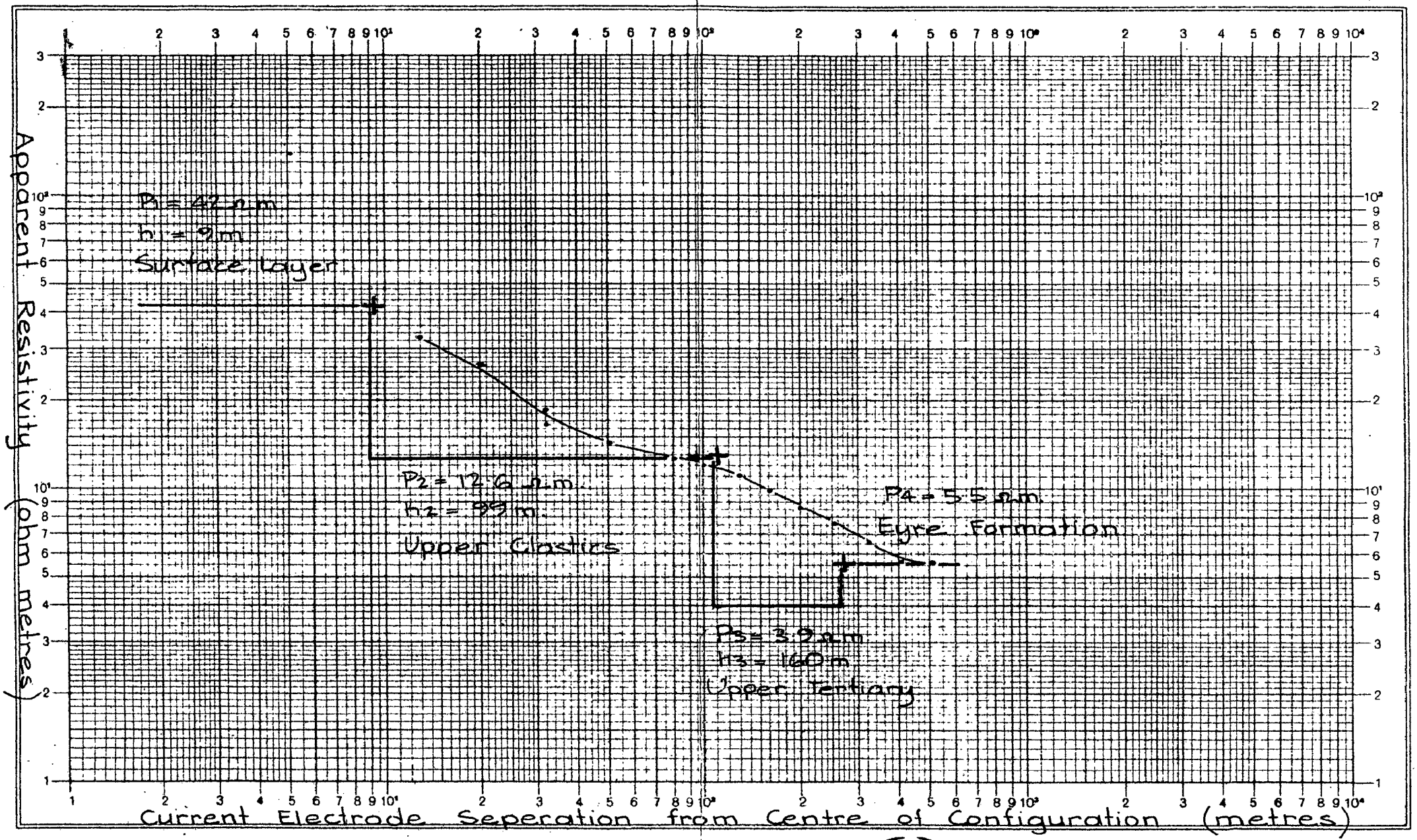
Plate: 7 13 Report: 204



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 14 12000 E
EL 77

Plate: 8 132 Report: 204

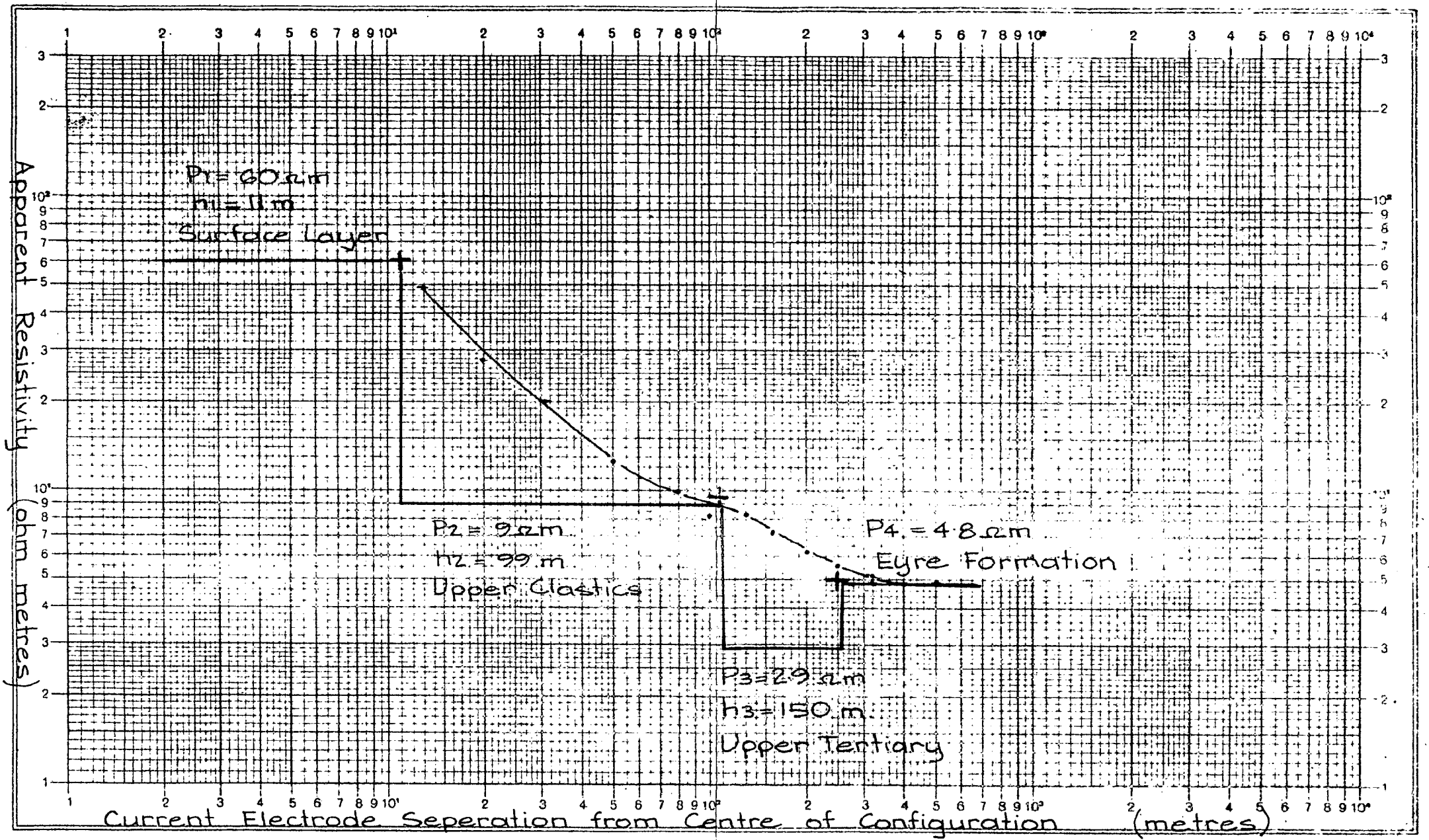


MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 14 13500 E
EL 77

Plate: 9

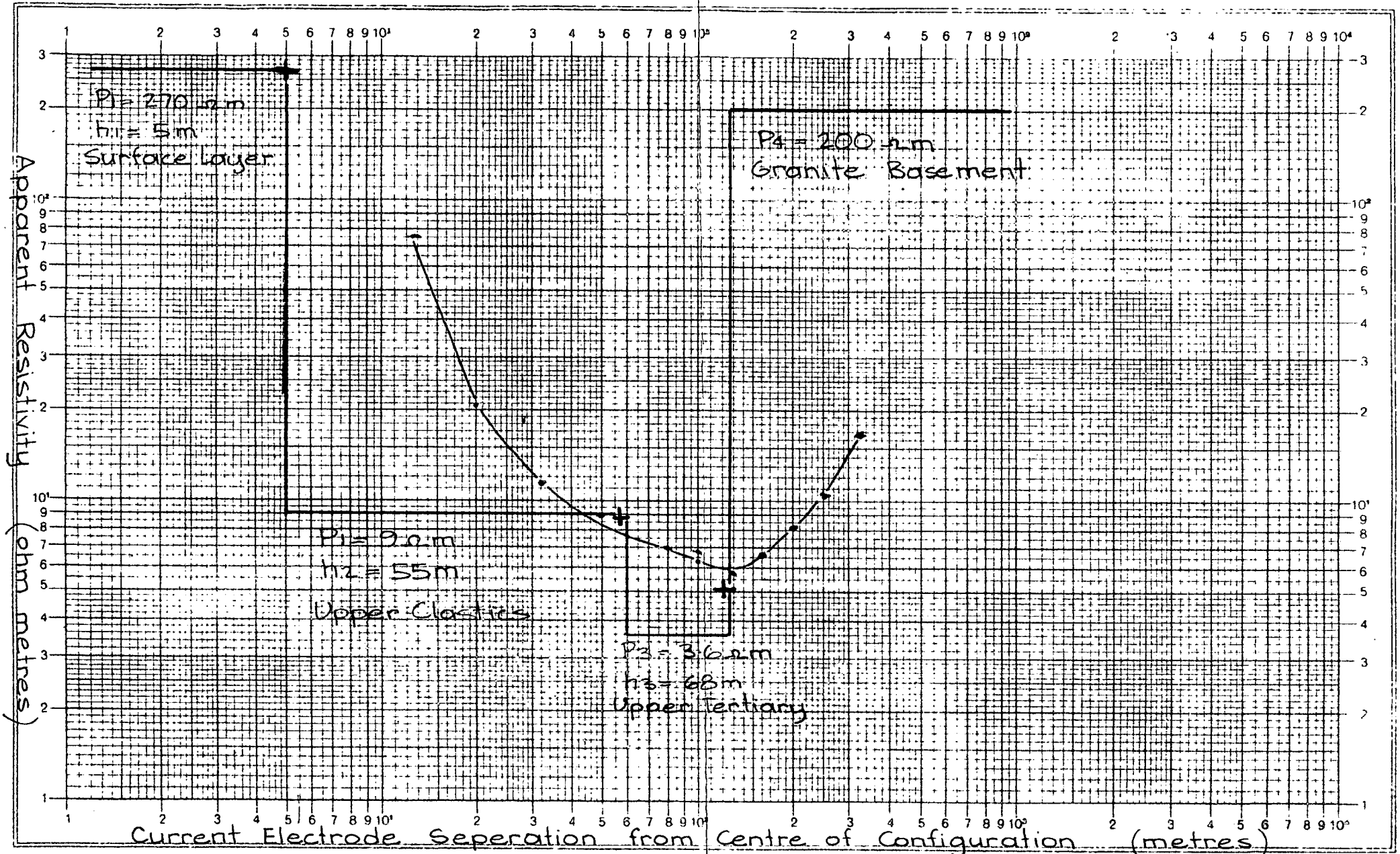
Report: 204



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 15 1000 E
EL77

Plate: 10 134 Report: 204

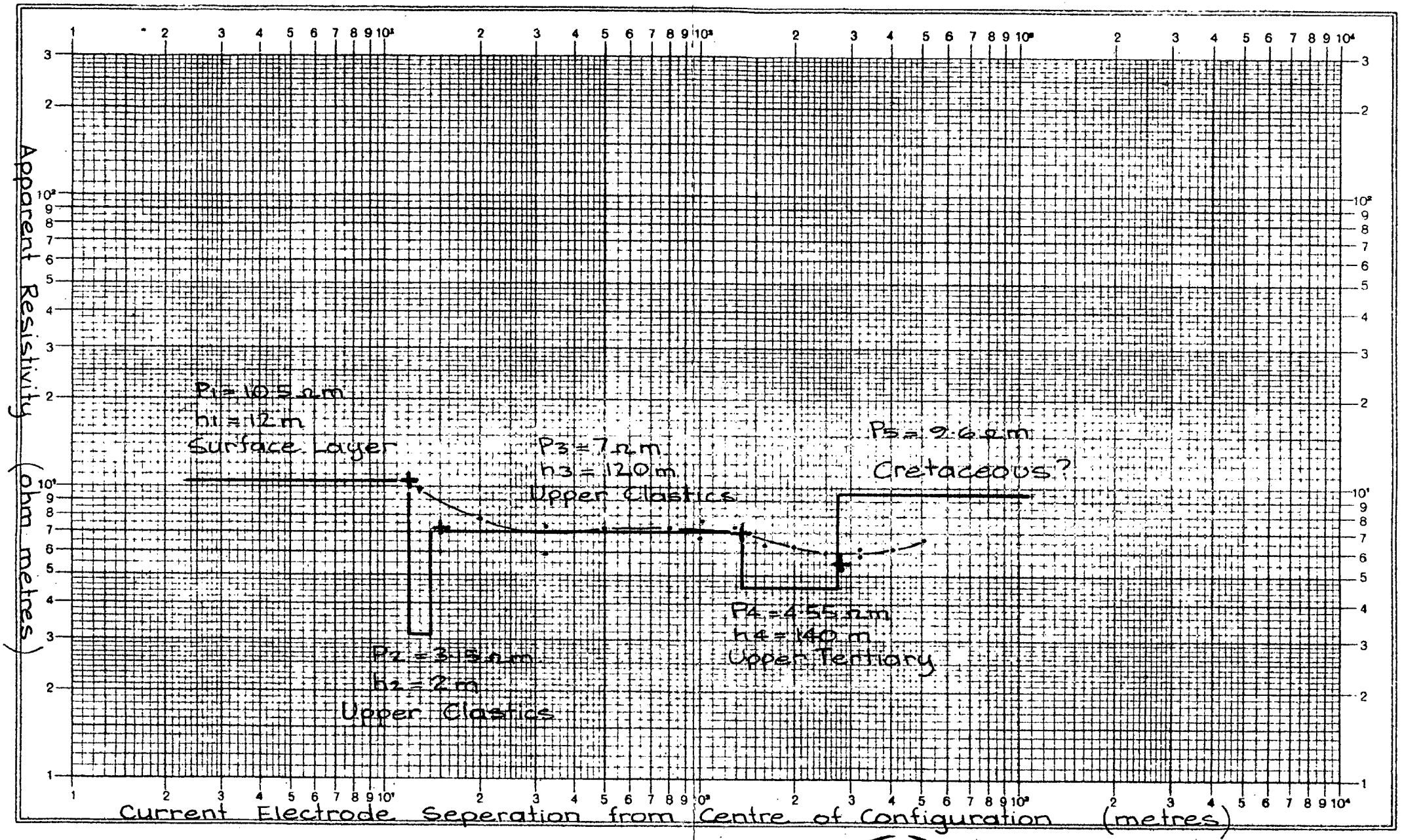


MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 15 3000 E
EL 77

Plate: 11

130 Report: 204

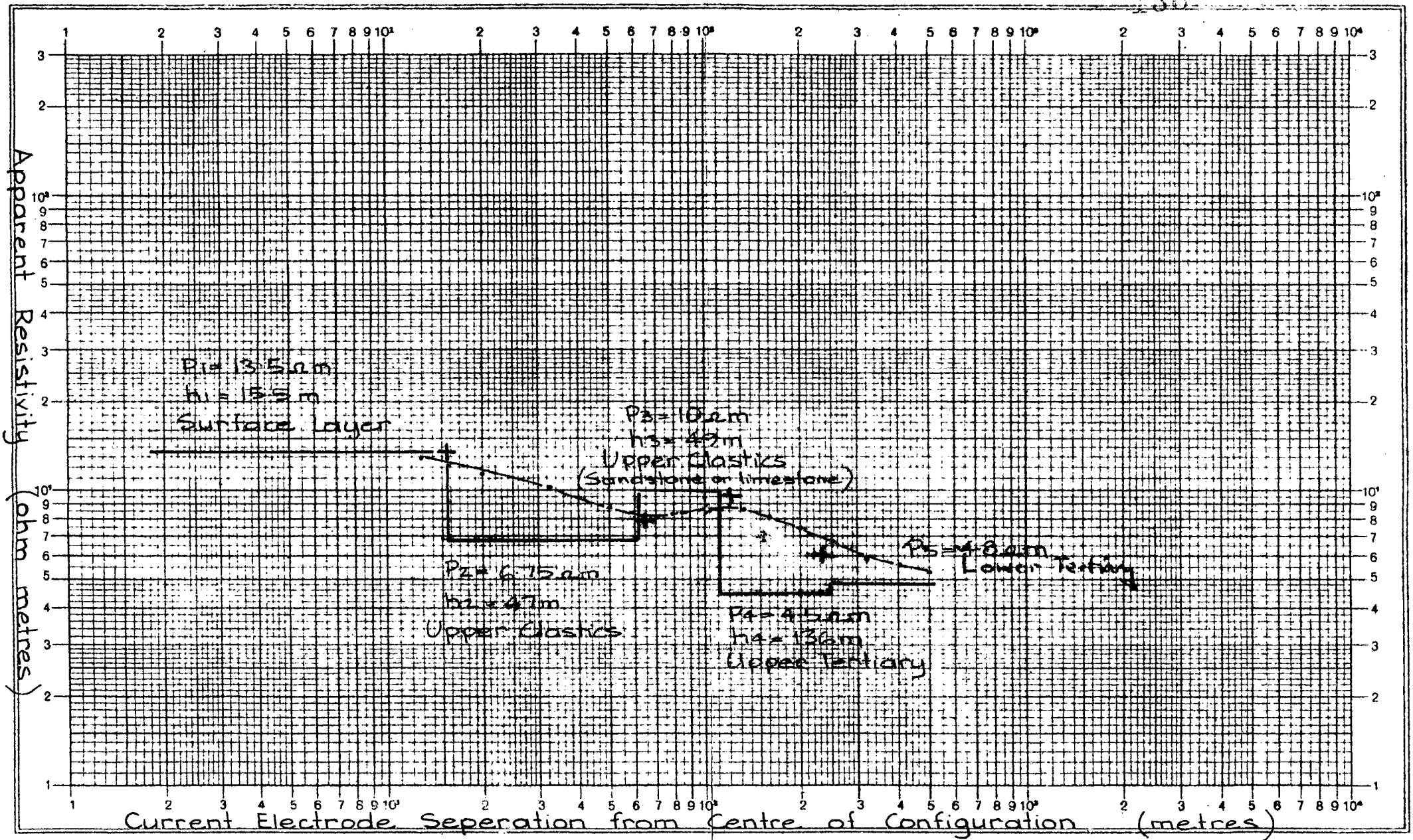


MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 15 4000 E
EL 77

Plate : 12

Report : 204

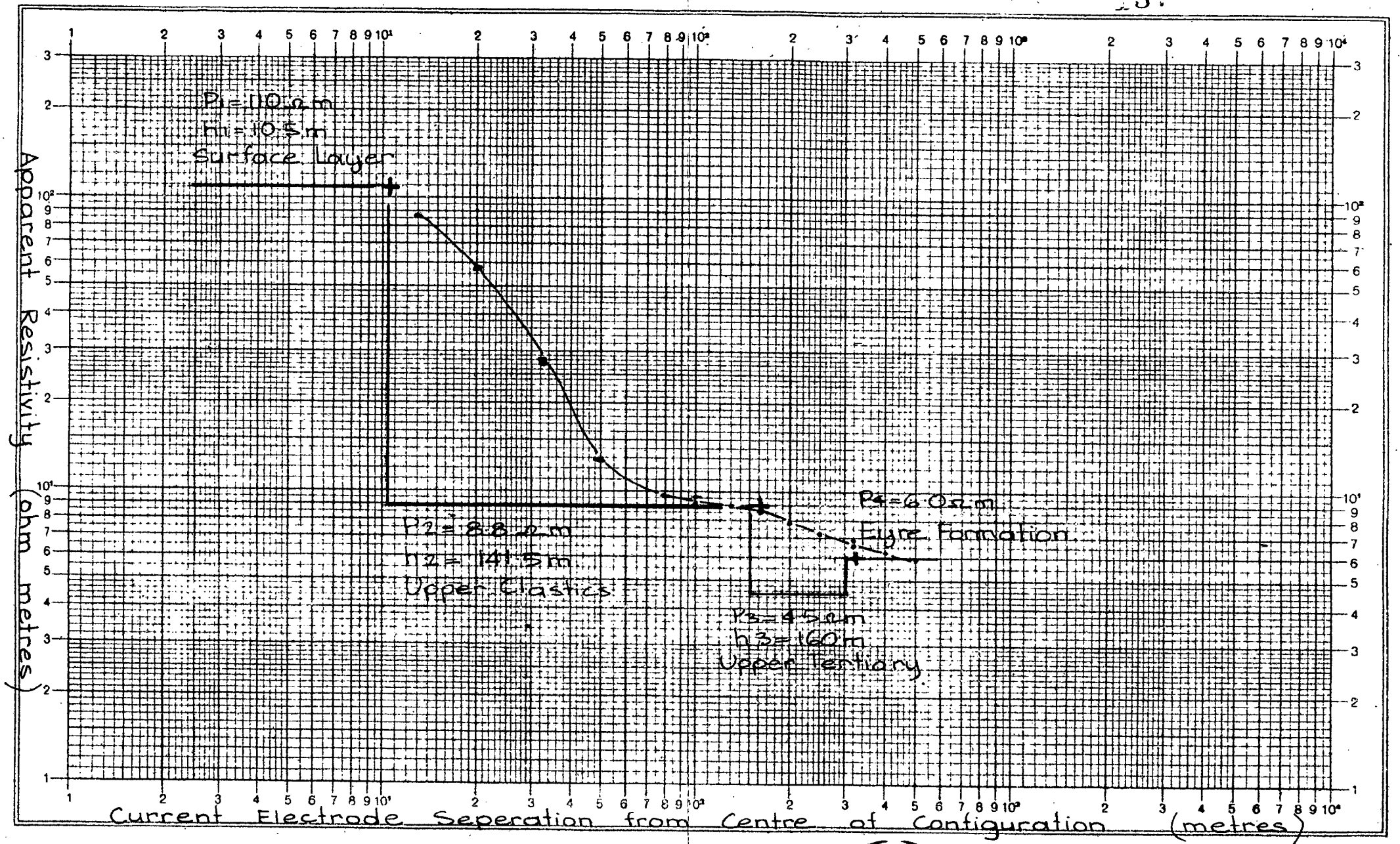


MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 15 8000 E
EL 77

Plate: 13

Report: 204



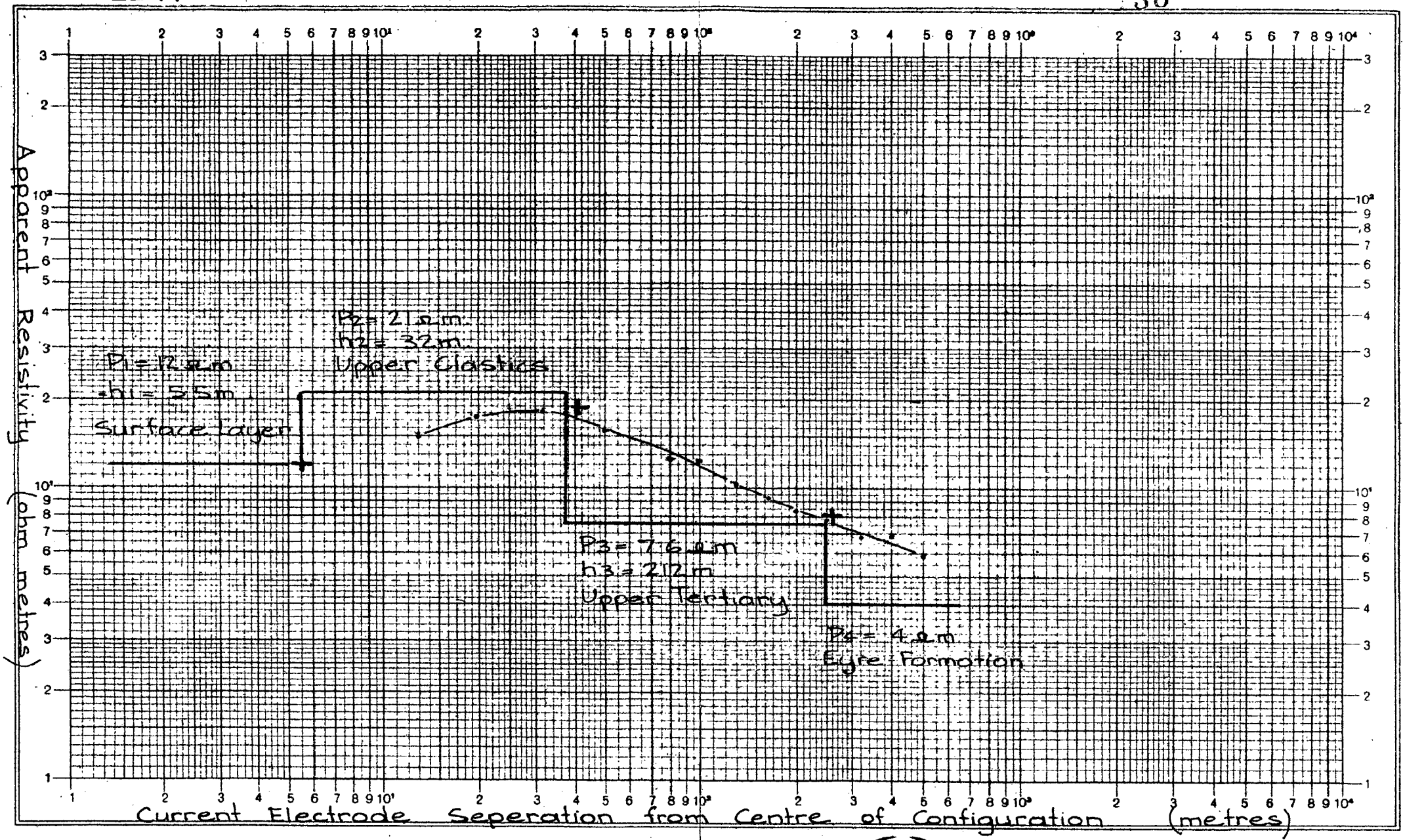
MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 15 12000 E
EL 77

Plate : 14

Report : 204

136



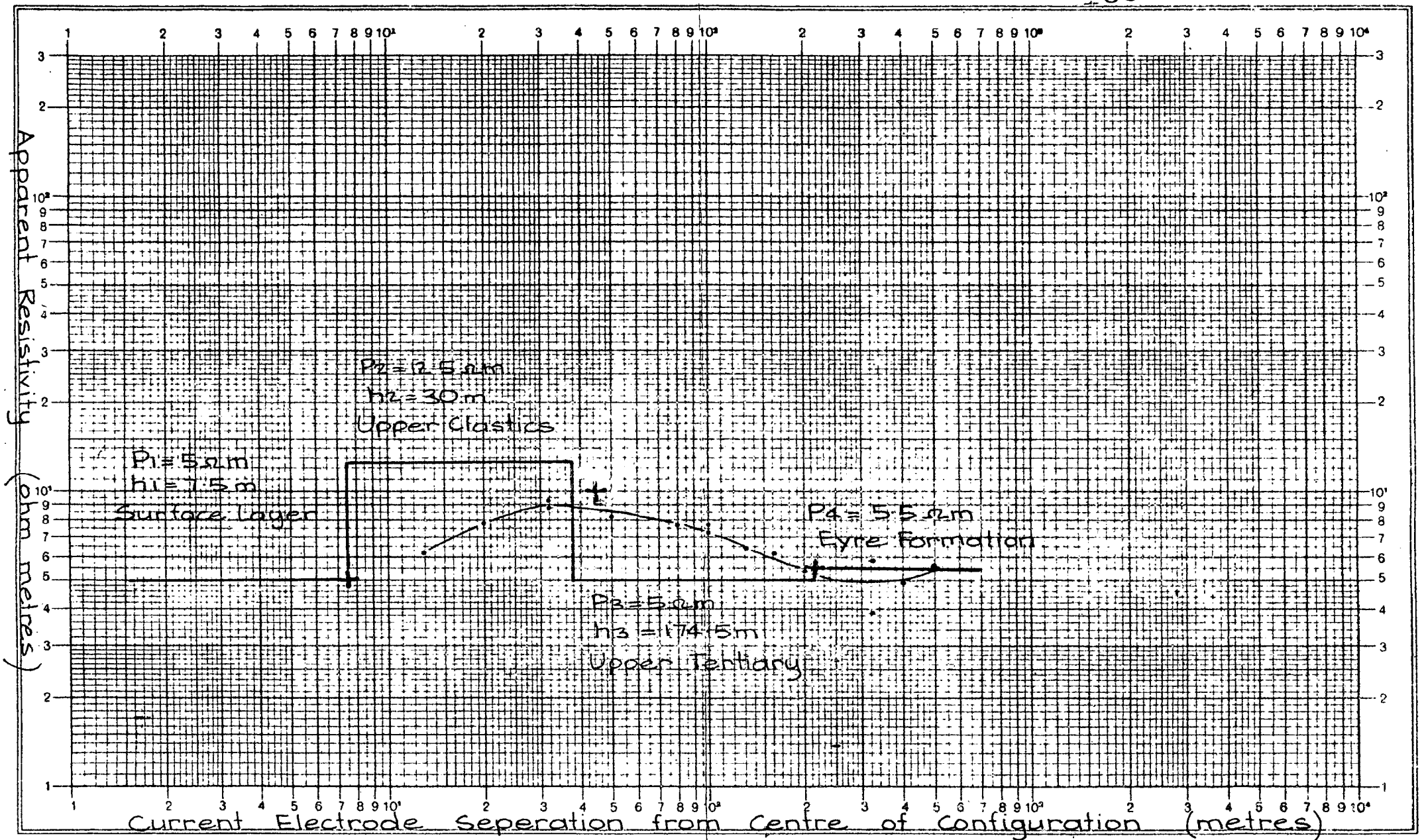
MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 16 005
EL 77

Plate: 15

239

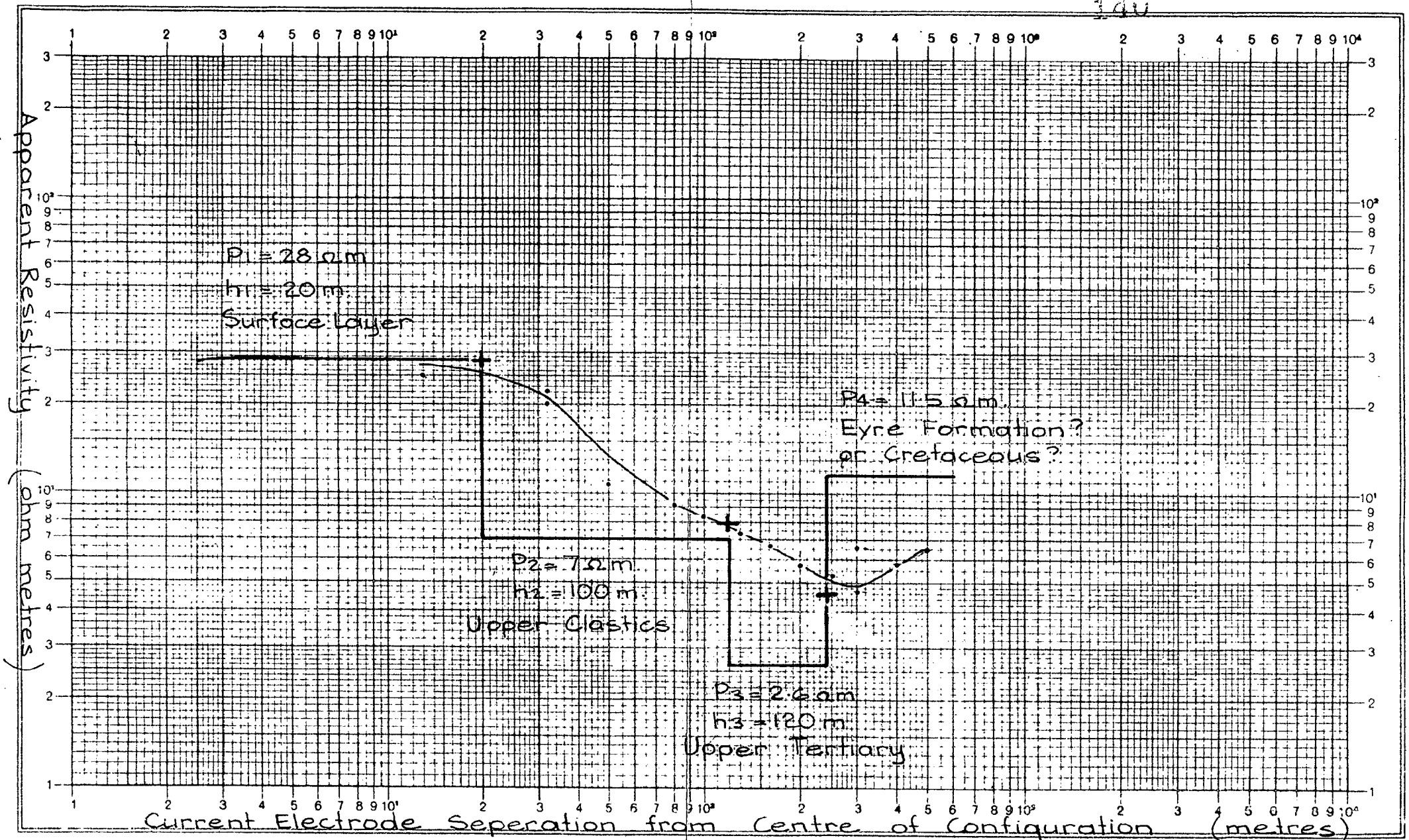
Report: 204



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 16 4000 S
EL 77

Plate: 16 Report: 204



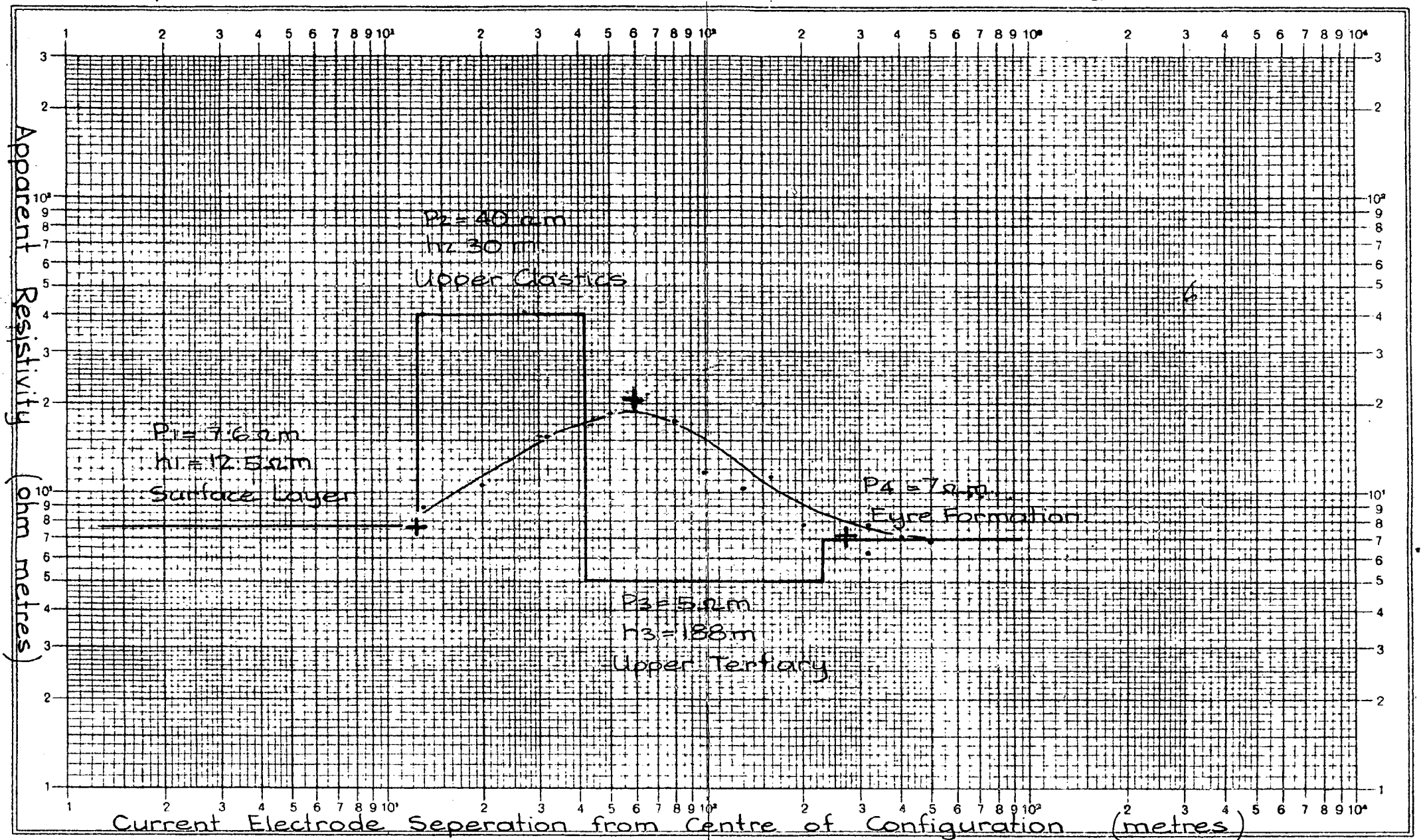
MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 16 8000 S
EL 77

Plate: 17

14

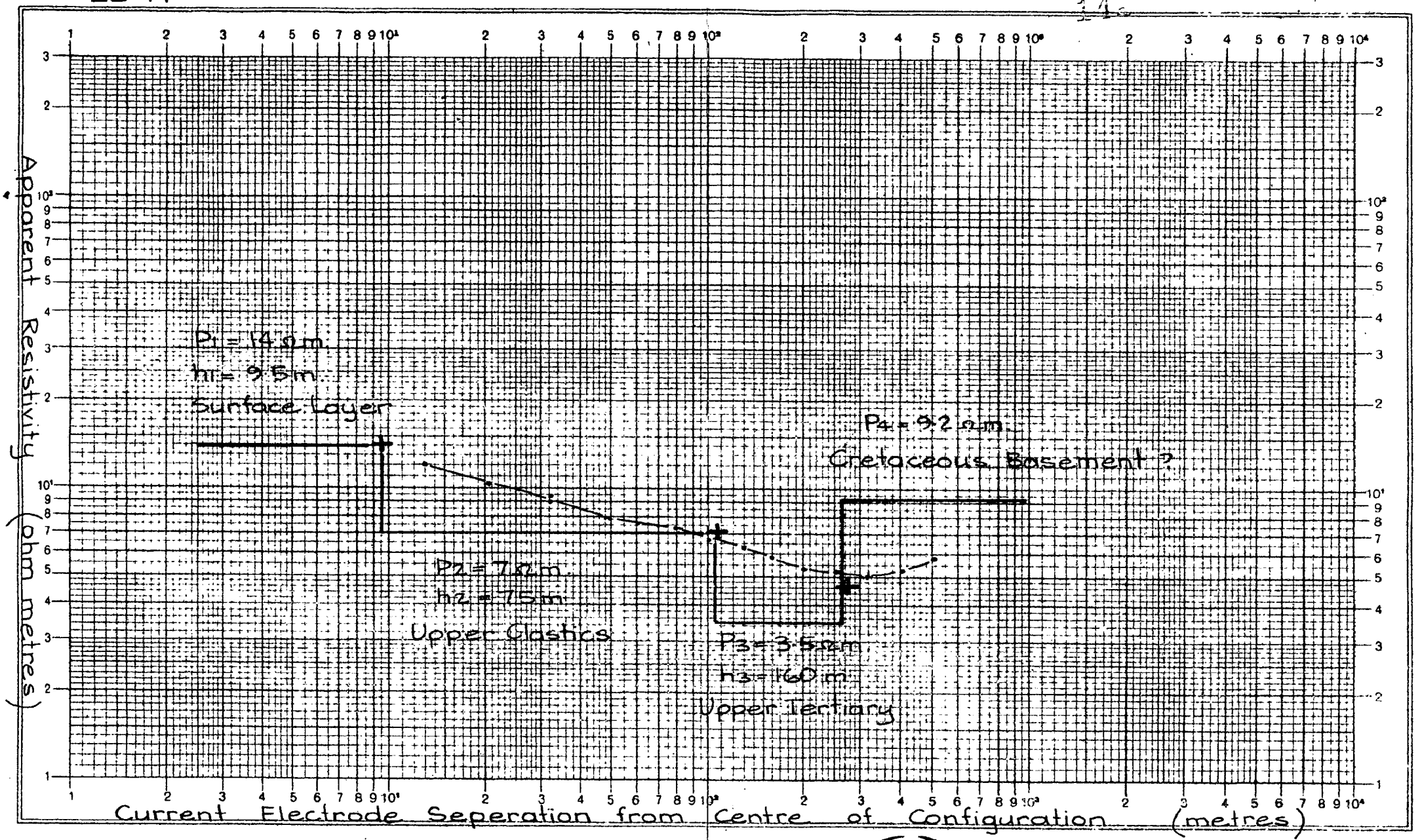
Report: 204



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 17 500 E
EL 77

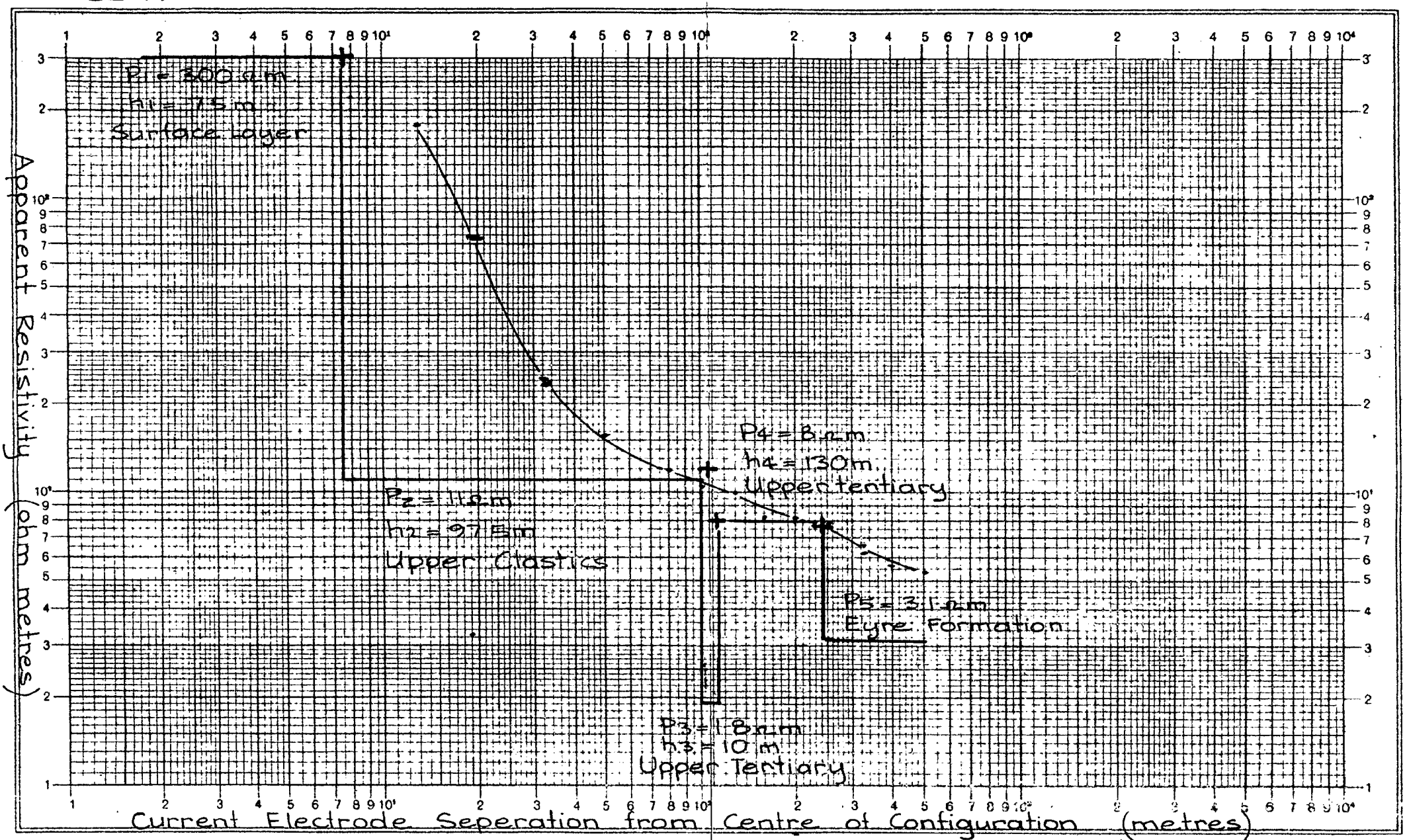
Plate: 18 Report: 204



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 17 3000 E
EL 77

Plate: 19 145 Report: 204

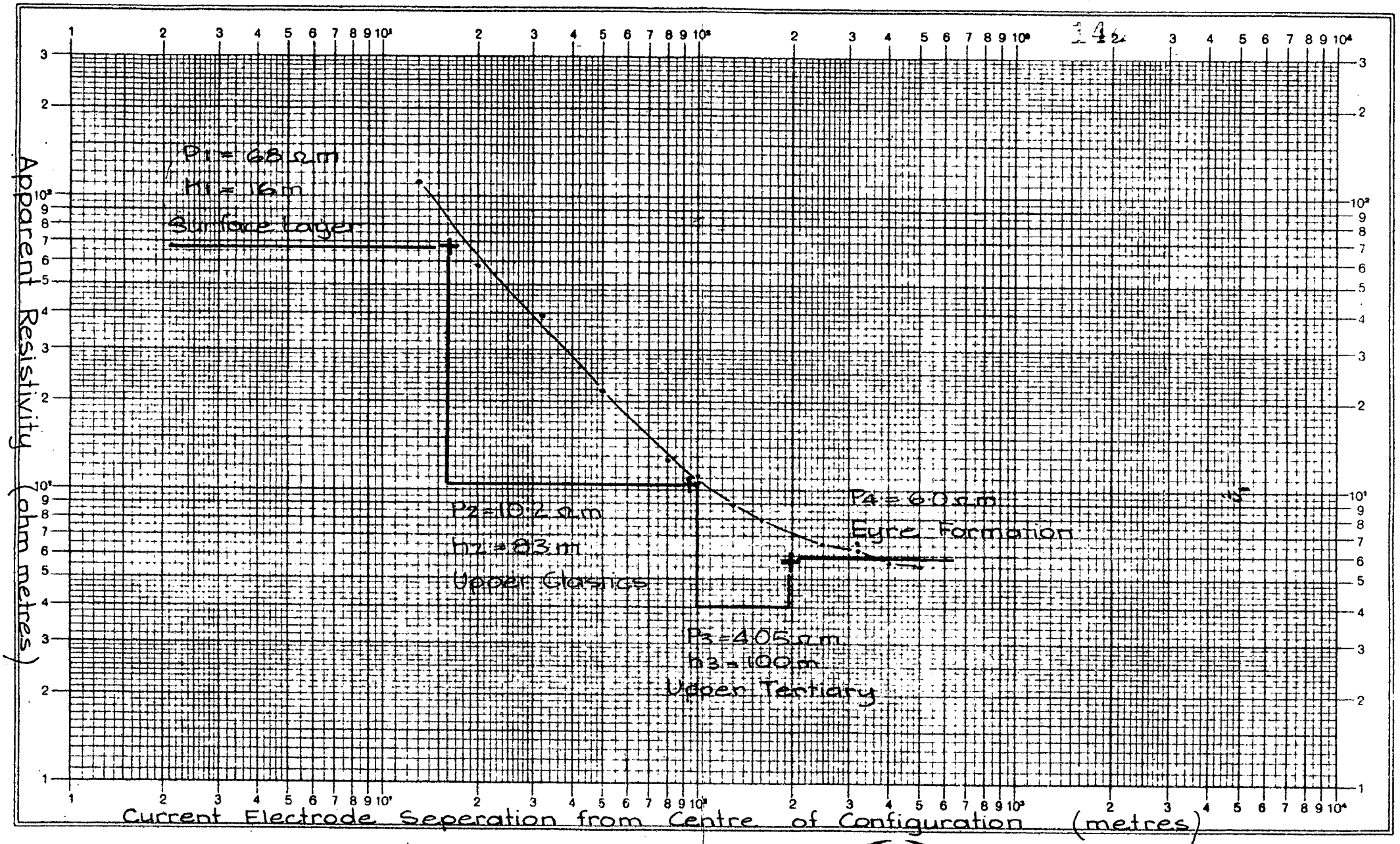


MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 18 3500S
EL 77

Plate : 20

Report : 204

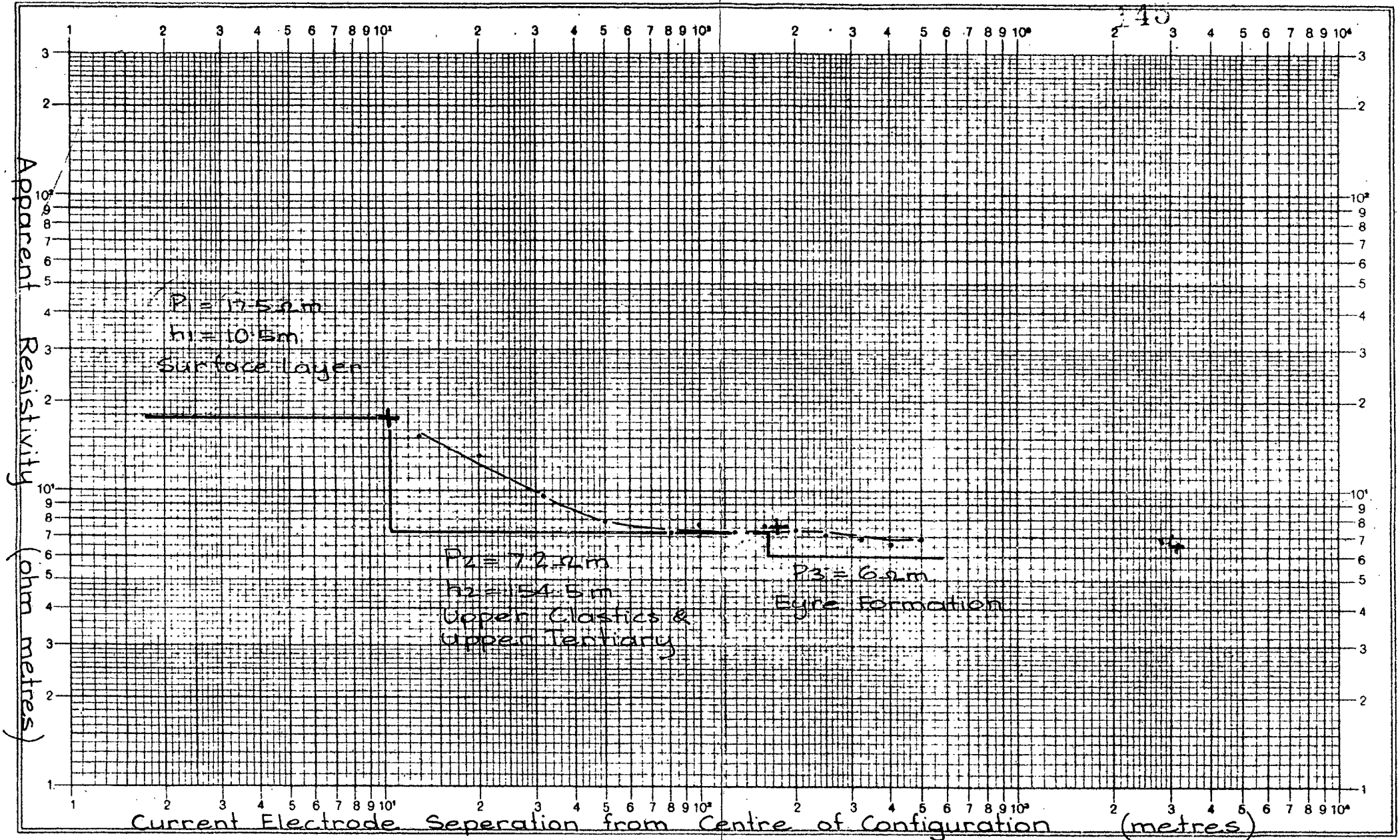


MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 19 4000E
EL 77

Plate : 21

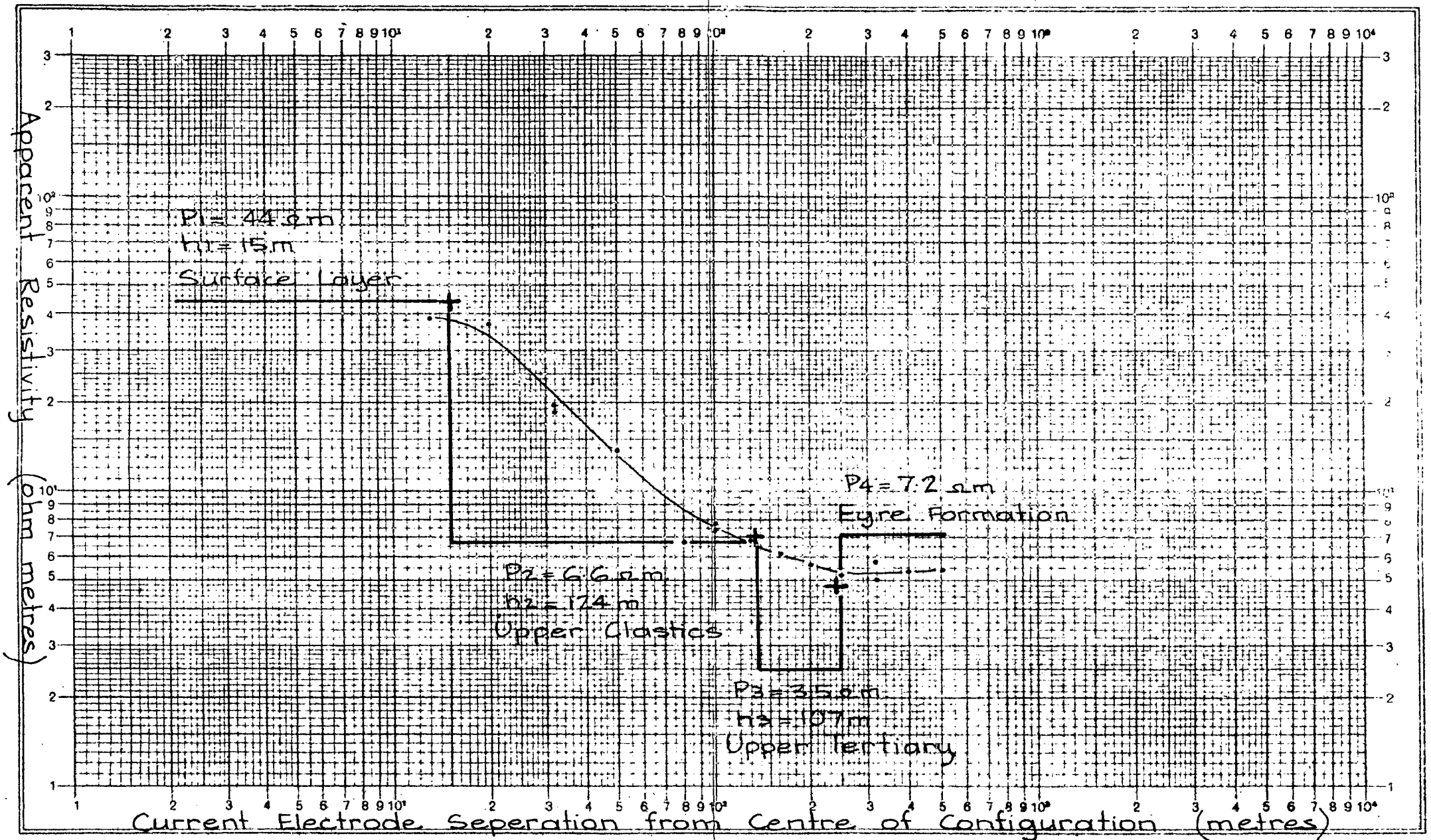
Report : 204



MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 19 8000 E
EL 77

Plate: 22 ~~10~~ Report: 204

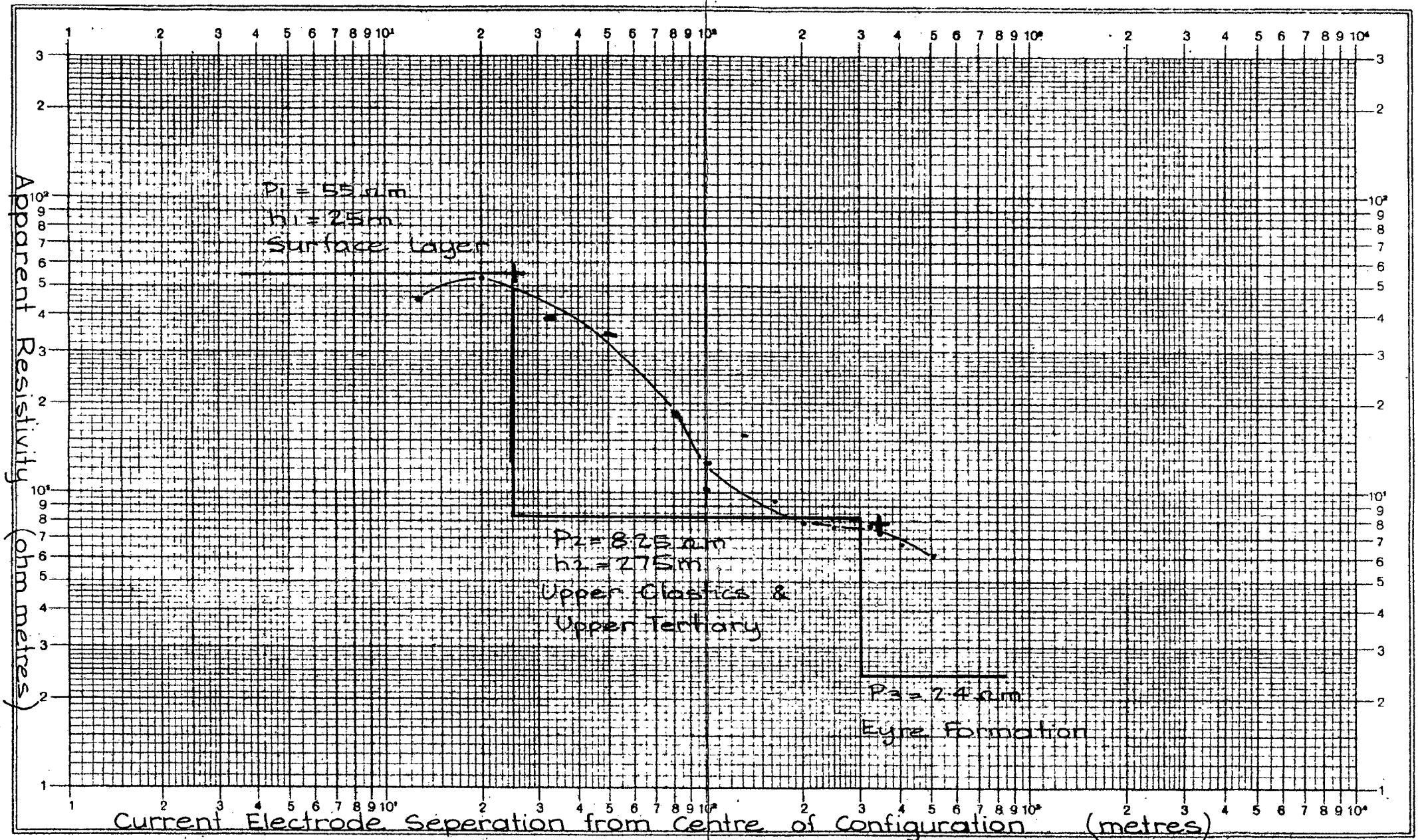


MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 19 12000 E
EL 77

Plate: 23

Report: 204



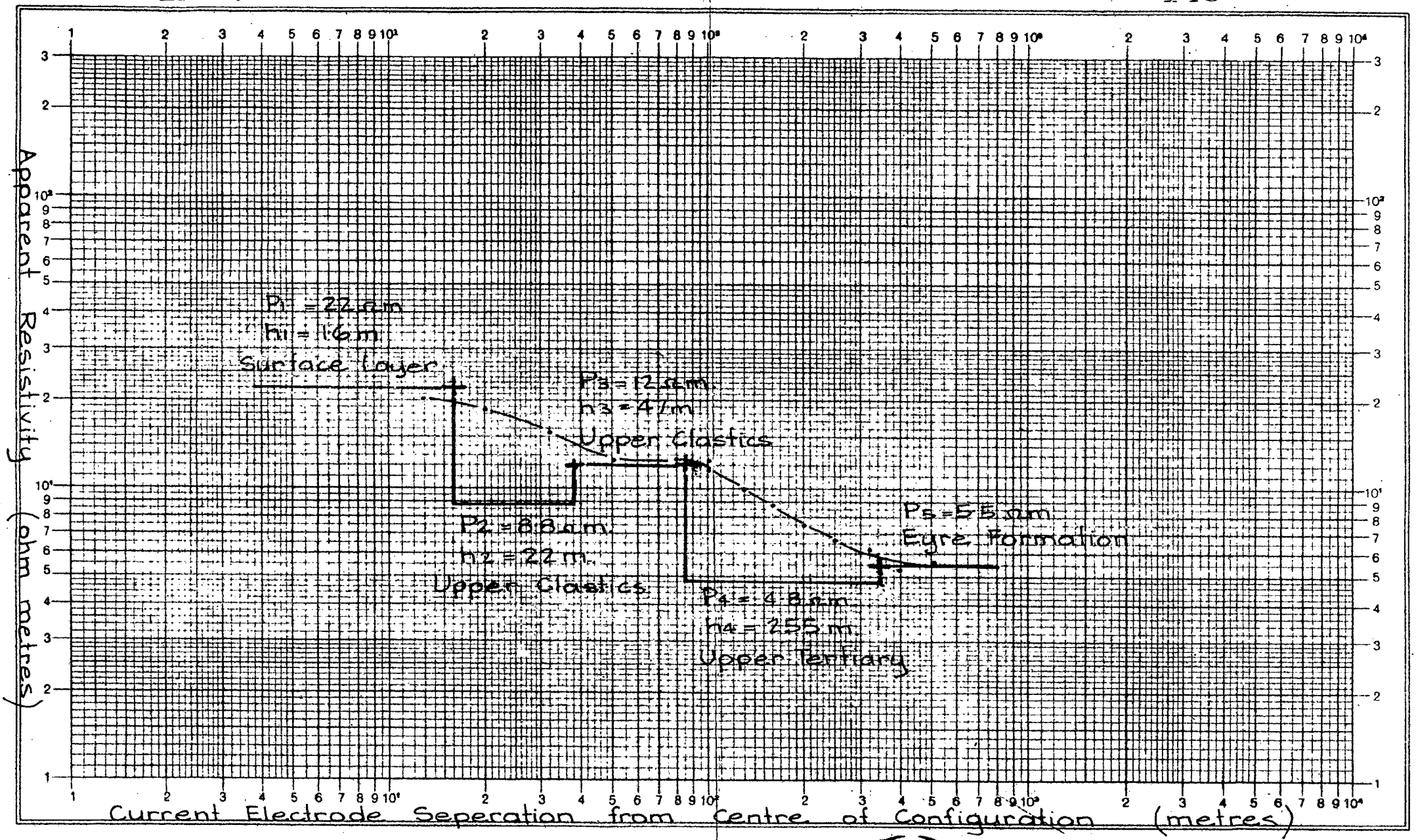
MURDOCH GEOLOGY & GEOPHYSICS P/L.
GLEN INNES. N.S.W.

LINE 19 15,500 E

EL 77

Plate: 24

Report: 204



MURDOCH GEOLOGY & GEOPHYSICS P/L.

GLEN INNES. N.S.W.

BP Minerals Australia Proprietary Limited
Incorporated in Victoria

149

1 Albert Road, Melbourne
Postal Address: G.P.O. Box 5222BB, Melbourne, 3001
Telephone: 26-6911 Telex: 30166 Telegraphic Address: "Austbeepee", Melbourne

The Director of Mines
Department of Mines
Box 38,
Rundle Street Post Office
Adelaide S.A. 5000

Our Reference	Your Reference	Telephone Ext'n	Date
AG/27/16/14/1			14th. May, 1975.

Dear Sir,

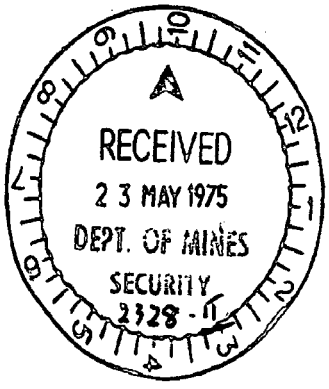
EXPLORATION LICENCE 77 - QUARTERLY REPORT FOR PERIOD ENDED MARCH 1975.

A report on the 1974 exploration drilling programme was completed and forwarded to the Department.

No further field work has been carried out during the third quarter but a drilling programme is planned for the final quarter.

Yours faithfully,

Dr. J. H. Hills
Senior Geologist (Uranium)



OILMIN N.L.

TRANSOIL N.L. 150

PETROMIN N.L.

MINES ADMINISTRATION PTY LTD

TETON EXPLORATION DRILLING COMPANY PTY LTD

BP MINERALS AUSTRALIA PROPRIETARY LIMITED

AG/27/16/14/1

14.5.1975

PRIMARY AGREEMENT

EXPLORATION LICENCES 68, 77 AND 91 SOUTH AUSTRALIA

QUARTERLY EXPENDITURE REPORT

In accordance with Clause 8 of the above agreement, BP hereby reports on the expenditure for the quarter ending March and total expenditure for the first three quarters of the Project Year.

	Total	EL 68	EL 77	EL 91
- Overheads				
Plant and Tools:				
- Exploration				
Geological Services	22	11		11
Geochem. Services	71		71	
Drilling Services				
Drill-hole logging				
Resistivity Survey				
Access Roads				
Consumable Stores				
Exploration Tenement Fees				
- Investigations				
Consultant Services	92	30	31	31
- Operations				
Vehicle Operating	159	79	-	80
Rental of Equipment				
Aircraft Charter				
Freight & Cartage				
Travelling Expenses				
Personnel Services				
- Salaries & Wages	4,445	1,481	1,482	1,482
TOTAL	4,789	1,601	1,584	1,604

Certified Correct

.....

Senior Geologist (Uranium)

JHH/YT

RECEIVED
2 2 MAY 1975
DEPT. OF MINES
SECURITY

BP MINERALS AUSTRALIA PROPRIETARY LIMITED

EXPENDITURE JULY 1974 - MARCH 1975

	Total	EL 68	EL 77	EL 91
- Overheads	2,610	870	870	870
Plant and Tools :				
- Exploration				
Geological Services	1,786	731	79	976
Geochem. Services	702	175	351	176
Drilling Services	46,026	9,554	23,278	13,194
Drill-hole logging	12,804	2,898	5,904	4,002
Resistivity Survey	10,092	1,362	5,760	2,970
Access Roads	66		66	
Consumable Stores	2,072	453	1,166	453
Exploration Tenement Fees	2,001	212	614	1,175
- Investigations				
Consultant Services	402	133	135	134
- Operations				
Vehicle Operating	1,586	541	309	736
Rental of Equipment	882	370	-	512
Aircraft Charter	786	115	476	195
Freight & Cartage	89	25	29	35
Travelling Expenses	1,030	329	235	466
Personnel Services	5,824	1,472	2,148	2,204
- Salaries & Wages.	18,563	4,534	8,064	5,965
TOTAL	107,321	23,774	49,484	34,063

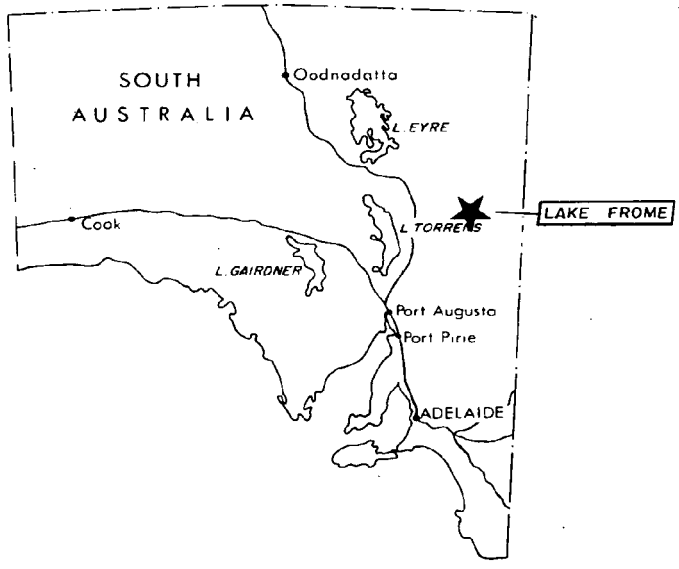
Certified Correct

.....

Senior Geologist (Uranium)

JHH/YT

152



LOCATION MAP

1974 DRILLING PROGRAMME

EL 77

LAKE FROME EMBAYMENT

SOUTH AUSTRALIA

RECEIVED
6 MAY 1975
DEPT. OF MINES
SECURITY
2328-II

BP MINERALS AUSTRALIA PTY. LTD.

1974 DRILLING PROGRAMME

EL 77

LAKE FROME EMBAYMENT, SOUTH AUSTRALIA

M.S. Bell
MELBOURNE, VICTORIA
March, 1975.

S U M M A R Y

Exploration Licence 77 is located in the Lake Frome Embayment of South Australia, and approximately 400 miles north of Adelaide. The Embayment is an extension of the Great Artesian Basin, and is bounded on the west, south, and east by hills and mountain of older Proterozoic rocks.

Uranium mineralization is found in the Proterozoic rocks, and in the Tertiary sediments within the embayment.

Work commenced in July with resistivity surveying and water sampling, which was followed in August by a rotary drilling programme of 28 holes. Some detailed resistivity work was done after the drilling in order to check the previous work and to help prepare the next drilling programme.

No outstanding radiometric anomalies were detected, but a favourable host sand with a small anomaly was intersected in a few of the holes.

C O N T E N T S

		Page No.
	Summary	
	List of Illustrations	
1.	Introduction	1
2.	Previous Exploration	1
3.	General Geology	2
3.1	Stratigraphy	3
3.2	Structural Interpretation	5
4.	1974 Exploration Programme	6
4.1	Drilling Results	6
4.2	Interpretation of Drilling and Logging Results	7
5.	Conclusions and Recommendations	9
6.	References	10
7.	Appendices	10

List of Illustrations

Tables

Table I Drill Data

Plates

Plate I E.L. Location Map (after page 1)

Plate II Drill hole Locationsand Sections (in back pocket)

Plate III Schematic Stratigraphic Column (after page 3)

Plate IV Structural Interpretation Showing Possible Faults and Channels (in back pocket).

Plate V Section AA' (Sections in back pocket)

Plate VI Section BB'

Plate VII Section CC'

Plate VIII Section DD'

Plate IX Section C'E

Plate X Section FF'

1. INTRODUCTION

Exploration Licence 77 (S.M.L. 586) was granted to Oilmin-Transoil-Petromin (O.T.P.) on 30th April, 1971. On 14th July, 1971 final agreement was reached on a farm-in between O.T.P. and Minad - Teton Australia Pty Ltd. (M.T.A.). The required work earned M.T.A. a 50% interest in the licence.

On 4th July, 1974 a joint-venture between the partners and BP Minerals Australia Pty Ltd. was ratified by the Minister of Mines of South Australia.

The exploration licence covering approximately 311 square miles is located on the flood plains of the Flinders Ranges, northwest of the north end of Lake Frome. It adjoins E.L. 92 (S.M.L. 564) to the west; another section of E.L. 92 (S.M.L. 587) to the south; and E.L. 19 (S.M.L. 634) to the southeast. The ground is open to the northwest (Flinders Ranges), north, and northeast (Plate I).

Uranium mineralization is found in the Mt. Painter Block of the North Flinders Ranges, and in the Miocene sediments underlying the plains to the west of the North Mulga area of E.L. 77.

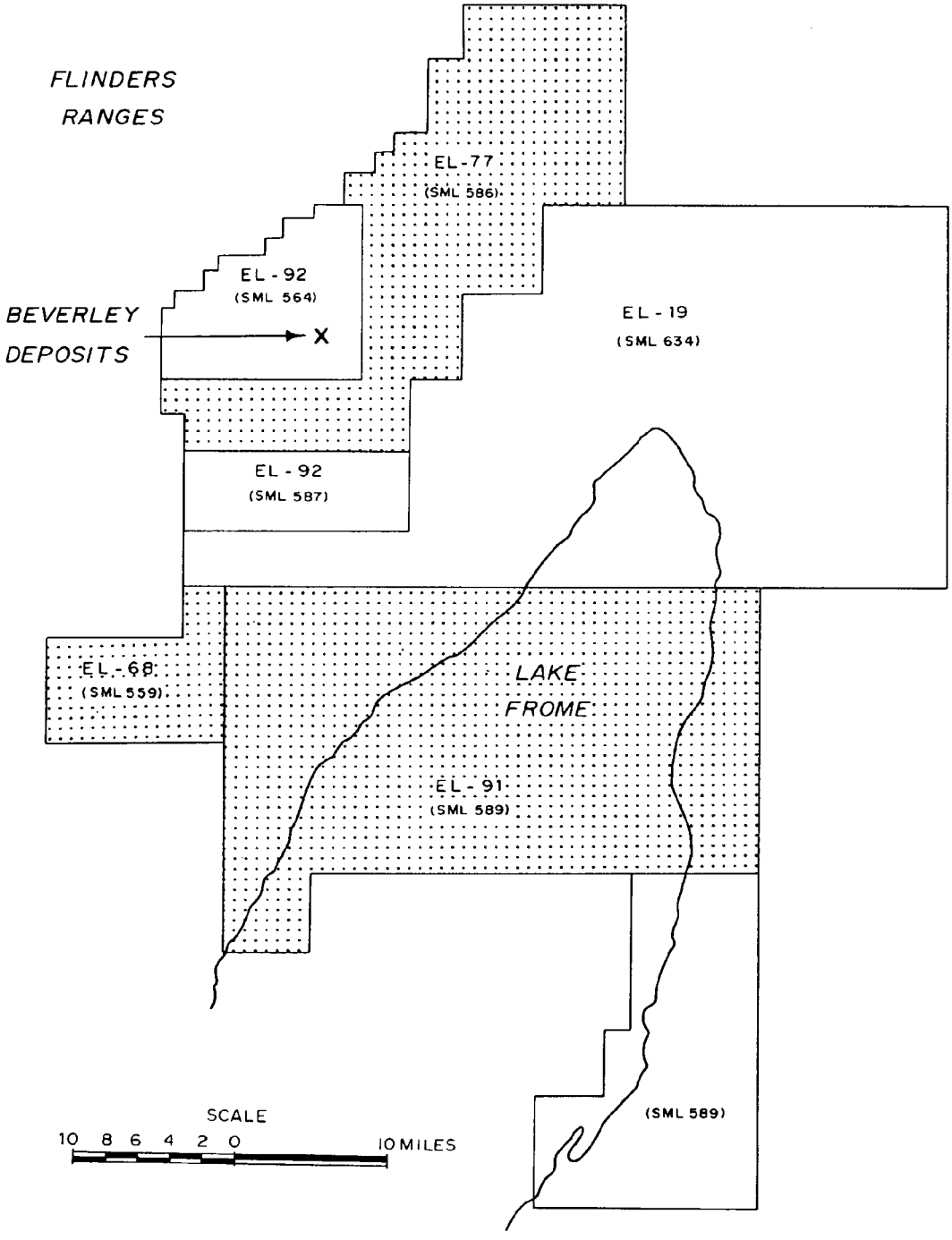
2. PREVIOUS EXPLORATION

The earliest work in the area was done by Kerr McGee in what was known as S.M.L. 218. This lease was granted on the 15th July, 1968 and in October of 1968 an aerial radiometric survey was carried out over the area by Geophysical Resources Development Company. No prominent anomalies were found. Weak anomalies were noted along several streams draining the Mt. Painter Precambrian area. At the present time this area is covered by Licence 77, and parts of Licence 92.

To test the Quaternary, Tertiary and Mesozoic sediments a 9 hole non-coring drill programme was carried out. The holes were logged by a South Australia Department of Mines unit with a gamma ray and resistivity probe. Hole depths ranged from 350 to 1010 feet.

The aim of the programme was to test the Quaternary and Mesozoic Blythesdale Formation, but since the drill depth was restricted to 1000 feet, only the Quaternary and Tertiary were tested. The drill programme did not find any geological features suggesting favourability for uranium mineralisation, and the lease was surrendered at the end of the first year of the two year term.

15c



EXPLORATION LEASES ON NORTH WEST SIDE OF LAKE FROME EMBAYMENT.

25% BP INTEREST.

PLATE I

BP MINERALS AUST. PTY LTD	
Area: LAKE FROME	
SOUTH AUSTRALIA	
Ref:	
FEB., 1975	M. S. BELL

Drilling by Petromin was done on the area in 1970, and previous to this airborne radiometric surveying and water sampling was done. In the Hamilton Creek Block 26 holes numbered 355-39 to 355-64 were drilled to a depth of 530 feet, in the North Mulga Block 24 holes numbered 355-9 to 355-13 and 355-20 to 355-38 were drilled to depths of 530 feet, whilst in the Paralana Block 60 holes numbered 221-1 to 221-33 and 245-1 to 245-27 were drilled.

In April of 1971 S.M.L. 586, which covers most of S.M.L. 218 was granted to Exoil-Transoil-Petromin. The exploration work here was done by Minad-Teton (Aust.) Pty Ltd (M.T.A.) on a farm-in agreement. Under the terms of the agreement the S.M.L. was divided into three separate blocks: Hamilton Creek in the north, North Mulga in the center and Poontana to the south.

In the Hamilton Creek Block HC-1 to HC-23 were drilled for a total logged footage of 15,311 feet. Several of the holes went to a depth of 710 feet.

On the North Mulga Block holes numbered NM-1 to NM-7 were drilled for a total logged footage of 3,950 feet. The maximum depth was 605 feet, but the majority of the holes went only to 560 feet.

On the Paralana Block, holes numbered PB-1 to PB-52 were drilled for a total logged footage of 29,890 feet.

The total footage (HC, NM and PB) was 49,151 in the 82 holes, and they ranged from 500 to 568 feet in depth.

All three blocks were surveyed by air with a total count scintillometer and the bores were water sampled. No anomalies were found from the aerial surveying, but higher values were found over or near creeks. Several water bores were highly anomalous.

In the drill holes anomalous readings were recorded in holes PB-21, PB-33, NM-3 and HC-8.

3. GEOLOGY

Prior to Mesozoic deposition, the Lake Frome area was occupied by gently folded Middle and possibly Lower Cambrian red-beds and limestones. These rested on a thin Proterozoic sequence over crystalline basement. To the west were Cambrian and Precambrian deposits of the Adelaide Geosyncline, and to the south and east Precambrian crystalline basement of the Olary and Barrier Ranges Blocks, with a cover of metamorphosed Adelaidean sediments.

During Lower Jurassic time, epeirogenic movements were initiated, resulting in the formation of the Great Artesian Basin and permitting a marine transgression during the Lower Cretaceous. The Frome Embayment is part of the Great Artesian Basin and owes its present aspect partly to Late Tertiary and Quaternary events (Callen, 1973).

3.1 Stratigraphy (Plate III)

The sediments penetrated by drilling range in age from Quaternary to Lower Cretaceous (Johnson 1971, Ryan 1971).

Upper Clastics (Quaternary-Upper Tertiary)

The clastics comprise silty sandy mudstones, sands, coarse sand and grit, gravel and boulder below and minor clay with gypsum. They are primarily reddish brown in colour. The sedimentary units in this section lens out over short distances making correlation between drill holes difficult. The sediments are primarily piedmont deposits and cover a wide area at the foot of the Flinders Ranges; thickness is approximately 370 feet near the centre of the Poontana Basin.

Upper Clays (Miocene)

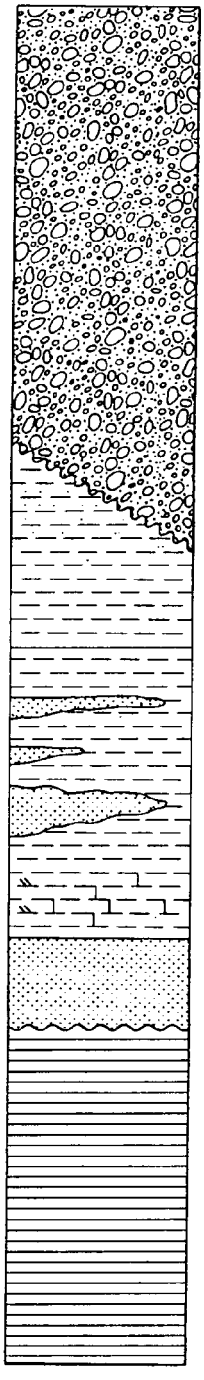
The upper clay unit is about 100 feet thick, unaffected by surface oxidation and is widespread in the Poontana Basin except west of the Poontana Structure. The clay, light greenish grey to pale olive grey in colour, contains a sand at or near its base which is usually about 50 feet thick. The sand is grey, fine to medium grained and quartzose. A number of gamma anomalies have been detected in this sand.

Lower Clays (Miocene)

The lower clay unit is unaffected by surface oxidation and is found throughout the Poontana Sub-basin. It consists of grey to dark grey clays (lignitic in some cases) with a number of interbedded sands. In some places the clays may in part be greenish grey to brownish-grey in colour. Crystalline gypsum and chalky limestones are found within the clays. The dark clays are commonly waxy to sub-waxy and traces of hematite-limonite mottling can be found. Towards the base a consistent horizon containing abundant calcareous nodules is recognised. This unit is approximately 100 feet thick in Poontana Bore located near the axis of the sub-basin.

181

SCHEMATIC STRATIGRAPHIC COLUMN



QUATERNARY
–?– –?– –?

60' — 370'+

Oxidised Clastics :–

Piedmont deposits and surface oxidised clays and sands.

TERTIARY

0' — 200'

Upper Clays :–

Greenish grey clays with brown and olive grey clay.

80' — 400'+

Lower Clays :–

Grey to dark grey clays, with interbedded fine sand and silt.

200' — 300'

Lower Tertiary Sands

CRETACEOUS

Cretaceous Claystone and Shales

PLATE III

BP MINERALS AUST. PTY LTD	
Area: LAKE FROME	
SOUTH AUSTRALIA	
Ref:	
FEB. 1975	M. S. BELL

The individual sands are discussed below in order of occurrence from top to bottom.

D-Sand

This unit ranges from 20 to 30 feet in thickness and is a generally fine to medium grained, grey, quartzose sand. It appears to be somewhat coarser on the crest of the Poontana structure. Varying amounts of limonitic staining were noted throughout. It is an excellent marker for correlation on both geophysical and lithological logs. A number of gamma anomalies are associated with the D-Sand.

On Exploration Lease 92 (S.M.L. 564) the D-Sand is the host for the Beverley deposit.

E-Sand

This unit is very difficult to isolate in drill cuttings. However, valid correlations between holes are possible from the geophysical logs. The E-Sand, which reaches a thickness of 15-20 feet, appears to be composed of grey, silty, very fine grained, quartzose sand. Anomalous radioactivity is associated with the E-Sand in various drill holes.

F-Sand

This unit is similar in all respects to the E-Sand, and appears clearly on the geophysical logs. The sands are of comparable thickness and are separated by about 30' of dark clay. The F-Sand contains the highest intensity of radioactivity found to date on E.L. 77

G-Sand

Again this unit is rarely seen in drill cuttings, but is probably similar in character and origin to the D-, E- and F-Sands. It differs in one respect from the other sands in that the horizon contains bands of calcareous material.

Lower Tertiary Sands (Eocene)

The Lower Tertiary sands consist of fine to medium, occasionally coarse quartzose sandstone with minor feldspar, chert, occasional pyrite, and carbonaceous matter.

These sands were described by MTA 'Lower N' and 'Upper N' sands on Lake Callabonna (S.M.L. 431) and Lake Blanche (S.M.L. 439), and have been correlated with the exposed Murnpeowie Formation in that area (Jarret and Brunt, 1971). They appear to be blanket type deposits and

POONTANA PROJECT - 1974
DRILL HOLE LOCATIONS & SECTIONS

EL 77

EL 68

EL 91

Lake Frome

"Moolawatana" "Mt Fitton" "Mt Freeling" "Pelican Well" "Trinity Well" "Village Well" "Tardlapinna Well" "Mundawerting Well" "Lonesome Bore" "Mt Livingston Well and Spring" "Billy Spring Bore" "Terrapinna Bore" "Terrapinna Springs" "Gunpowder Bore" "Twelve Springs" "Bore" "Mosquito Creek Bore" "Mulligan Dam" "Woolatchi Bore" "Skeleton Bore" "Anderson Bore" "Marks Bore" "Little Bank Bore" "Parabarana Bore" "N.1 Bore" "Box Bore" "Middebank Bore" "New Bore" "Hamiltons Creek" "Old Moolawatana" (ruins) (P.D.) "Moolawatana Bore" "Ned's Bore" "North Poontana Bore" "Bar Bore" "Poontana Creek" "Yagalin Dam" "Valley Bore" "Hamiltons Creek" "Tindelpina Creek" "Great Gladstone Bore" "Yerelina" "Yerelina Creek" "Tindelpina Well" "Canyon Bore" "Daly Bore" "Yudnamutana Bore" "Overland Bore" "Bend Well" "Mt Thomas Well Bore" "Umberatana" "North Well" "Mallee Well" "Illinawortina Well" "Old Illinawortina" "Yadaninna" "Arkaroola" "Boulder Bore" "Arkaroola Creek" "Bolla Bollana Creek" "Nudlamutana Well" "Woodnamoka Well" "Wooltana" "O'Donohue Castle Well" "Merinjina Well" "Speculation Well" "Pepegoona Bore (I.D.)" "Four Mile Creek" "Well (P.D.)" "Paralana Hot Springs" "Bore" "Four Mile Bore" "Paralana" "No.35 Bore" "Buxton Bore" "Mulga Creek Well (P.D.)" "Hotsprings or Paralana Creek" "North Mulga Bore" "North Mulga" "Christmas Bore" "Eagle Well" "Ram Bore" "Tea Tree Bore" "Tea Tree Creek" "Eagle Dam" "Christmas Well" "No.6 Bore (I.D.)" "Mungaroonie Bore" "Sandridge Bore" "Lake Bati Well" "John Brown Well" "Caldina Creek" "Mulga Park Well" "No.12 Bore" "Roberts Well" "N.E. Ewaroona Bore" "New Caldina Bore" "Ewaroona Well" "Lockatoo Bore" "Caldina Well" "White Dam Bore" "Woodlawoodiana Well" "Acacia Park Well" "Munyallina Creek" "Mulga Bore (P.D.)" "Balcanoona" "Bore" "Johnsons Dam" "Muckaloodna Well" "Mulga Bore" "Home Rule Bore" "Mallee Well" "John Well" "Wertaloona" "One Gun Dam" "Lake Well" "Tli-Tree Bore" "O'Reilly Dam" "Dead Bullock Bore" "Old Dam" "Mulga Well" "John Well" "Lake Dam" "Williawortina Dam" "Mara Spring" "Nantawarrinna Bore" "Mara Creek" "One Tree Bore" "Ironstone Bore" "Yates Well" "Black Oak Well" "Collins Dam" "Double Dam" "Willowie Bore No.3" "Pauls Dam" "Pauls Well" "O'Connell Bore" "Paul Creek" "Bell Ck" "Bell Bore" "Bendleula Creek" "Bore (I.D.)" "Moorowie Well" "Moorowie Bore" "Little Bobmonie Well" "Rockhole Bore" "Wearing Well" "Wearing" (ruins) "Arrowie" "Horse Dam" "Mulga View" "No1 and No2 Wells" "Netting Well" "Italowie Creek" "Willowie Creek" "Coombs Dam" "Lake Cootabarlow" "Cootabarlow No.1 Bore" "Eagle Dam"

A A' B B' C C' D D' E F F'

15 19 17 14 20 18 16 — 28 1 2 8 7 6 4 3 5 — 11 10 9 12 13 27 26 — 21 25 22 24 23

RANGES — FLINDERS — NORTH

30°00' 30°15' 30°30' 30°45' 139°15' 139°30' 139°45' 140°00'

LOCATION DIAGRAM

REFERENCE TO AUSTRALIA STANDARD MAP SERIES

SH54-5 MARREE	SH54-6 CALLABONNA	SH54-7 MILPARINKA
SH54-9 COPLEY	SH54-10 FROME	SH54-11 COBHAM LAKE
SH54-13 PARACHILNA	SH54-14 CURNAMONA	SH54-15 BROKEN HILL

RECEIVED
6 MAY 1975
DEPT. OF MINES
SECURITY
2328-11

SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 30 KILOMETRES

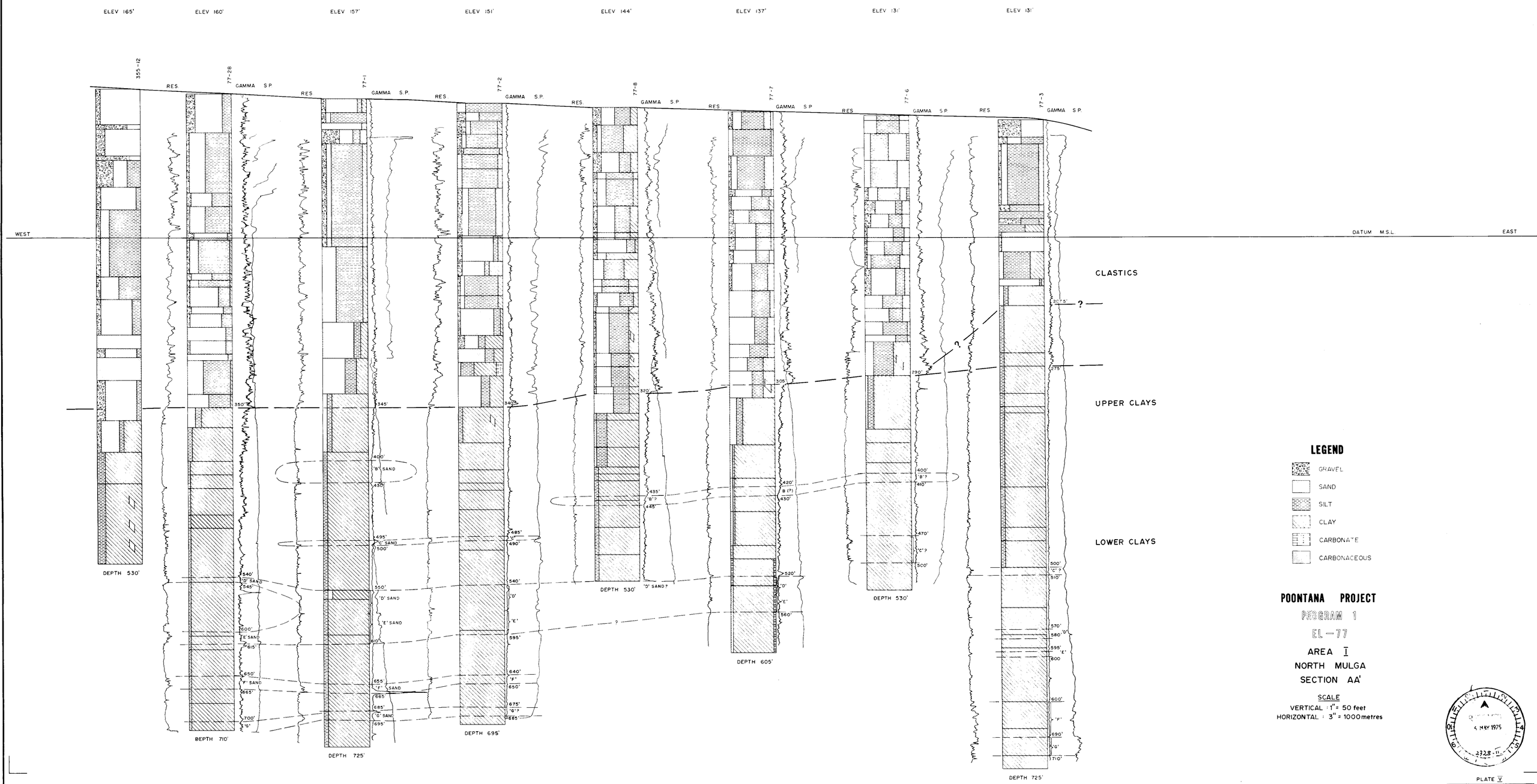
LEGEND

- Road, loose surface all weather second class
- Road, unimproved earth
- Lake, river or stream intermittent
- Participation area

PLATE II

BP MINERALS AUST. PTY LTD	
Area: LAKE FROME	
EL-77	
REF:	
MARCH, 1975	M.S.BELL

2328(11)5



LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

POONTANA PROJECT

PROGRAM 1

EL-77

AREA I

NORTH MULGA

SECTION AA'

SCALE

VERTICAL : 1" = 50 feet

HORIZONTAL : 3" = 1000 metres

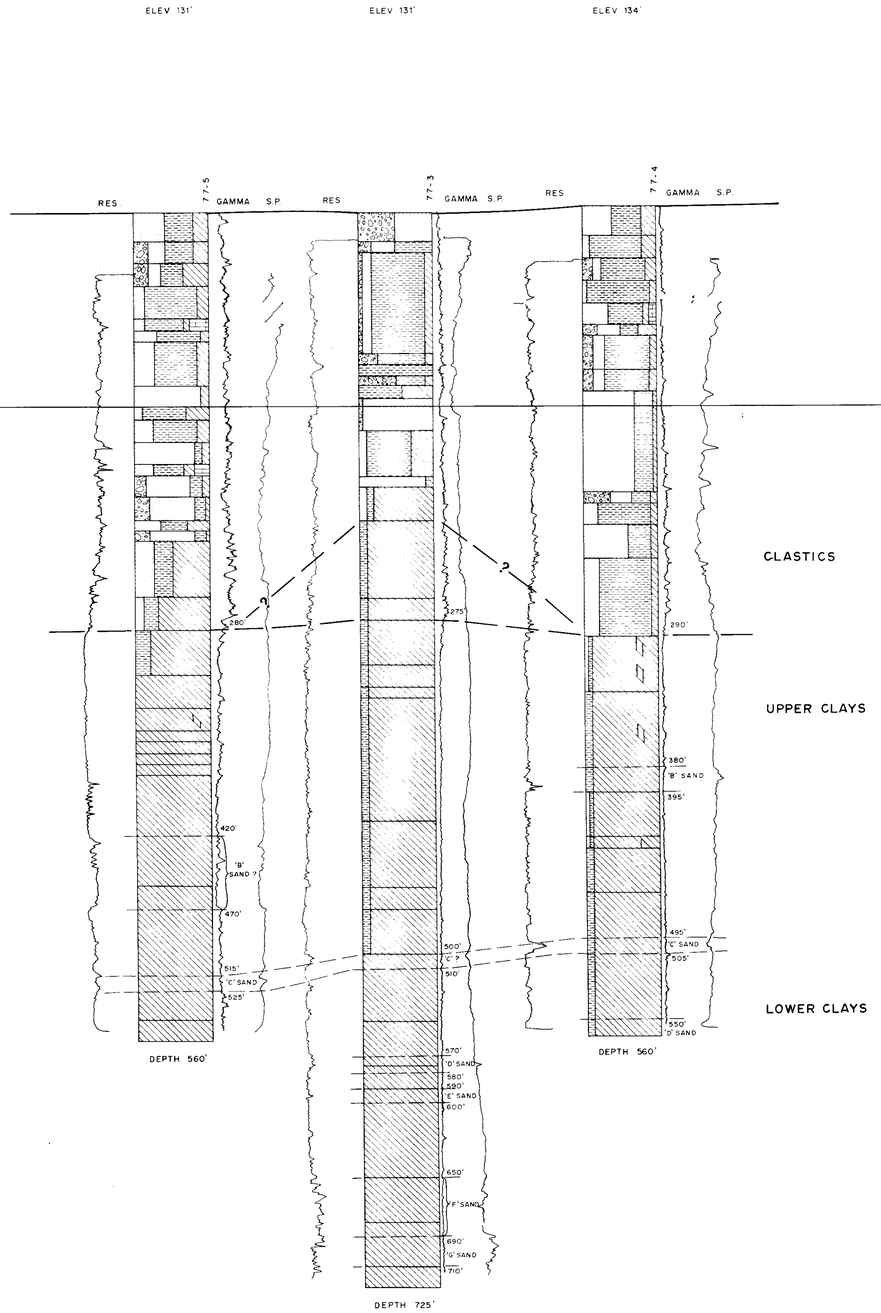
6 MAY 1975
2328-II

PLATE V

BP MINERALS AUST PTY LTD	
Area LAKE FROME	
SOUTH AUSTRALIA	
Ref.	
FEBRUARY 1975	M. BELL

2328(II)-87

T 1258 B



LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACOUS

POONTANA PROJECT

PROGRAM 1

EL—77

AREA I

NORTH MULGA

SECTION BB'

SCALE

VERTICAL : 1" = 50 feet

HORIZONTAL : 3" = 1000metres

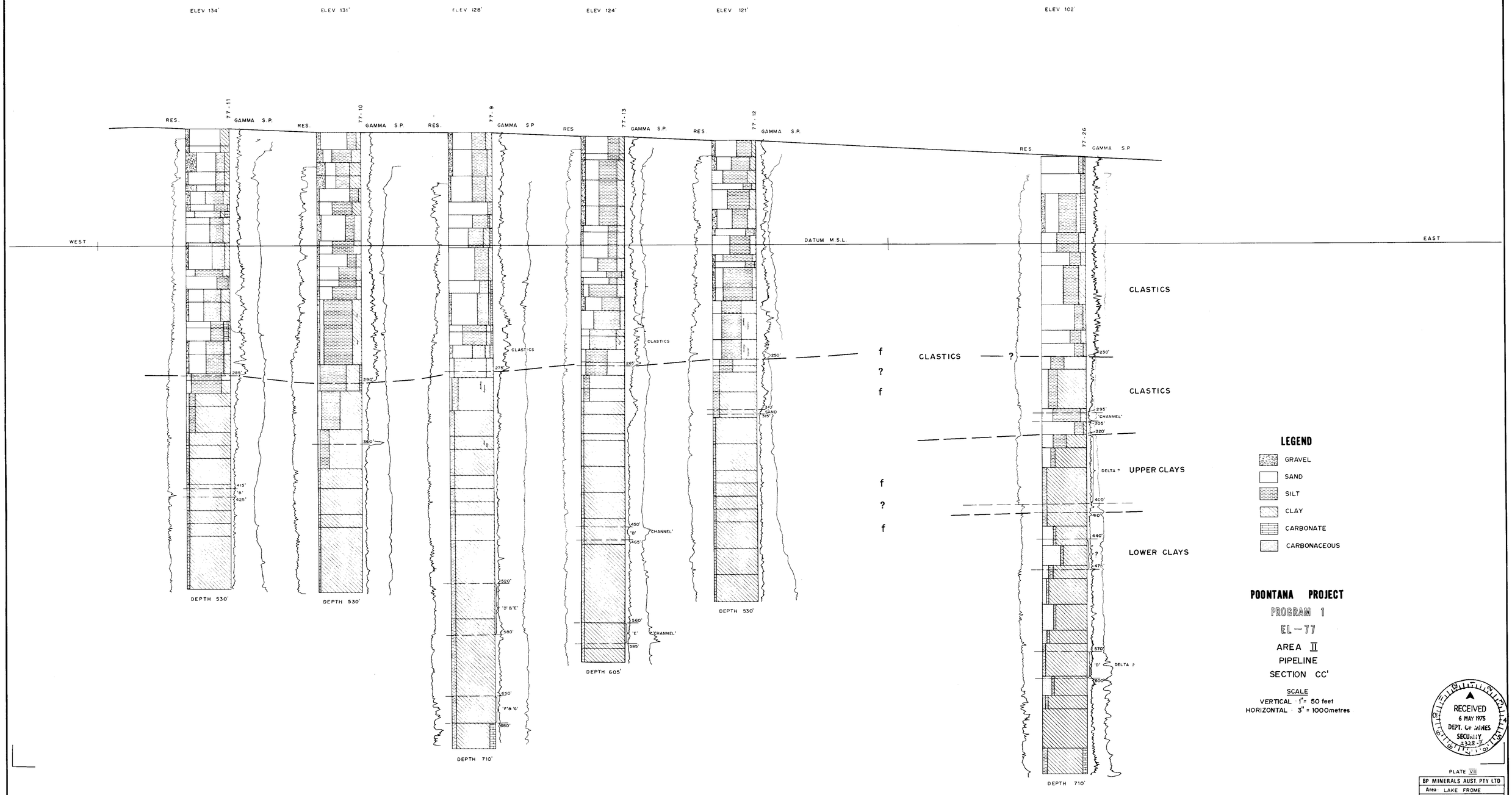
RECEIVED
6 MAY 1975
DEPT. OF MINES
SECURITY
2328-F

PLATE VI

BP MINERALS AUST. PTY LTD	
Area: LAKE FROME	
SOUTH AUSTRALIA	
Ref:	
FEBRUARY 1975	M. BELL

2328(II)-8

T 12580



POONTANA PROJECT

PROGRAM 1

EL – 77

AREA II

PIPELINE

SECTION CC'

SCALE

VERTICAL 1" = 50 feet

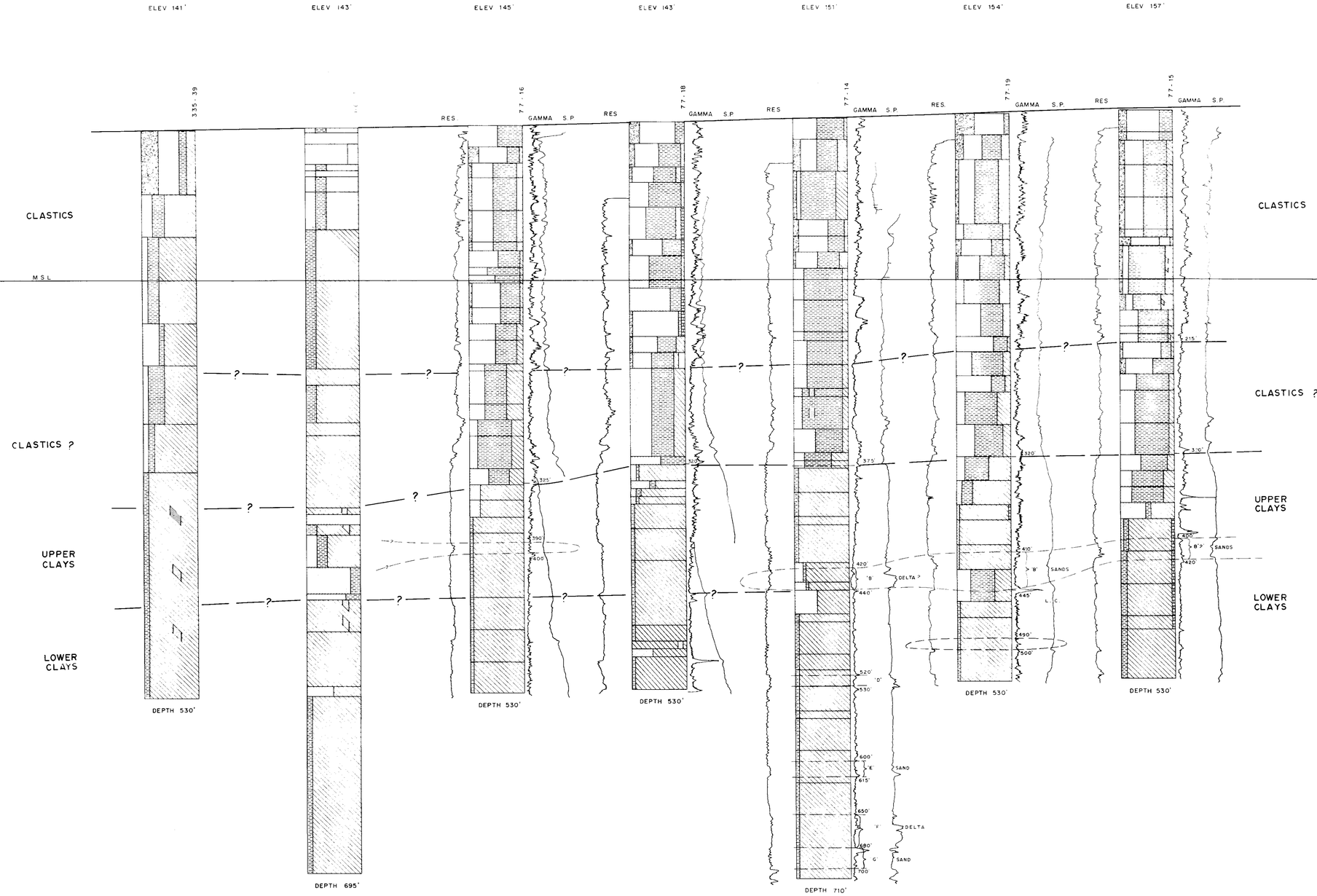
HORIZONTAL 3" = 1000metres

RECEIVED
6 MAY 1975
DEPT. OF MINES
SECURITY
2328-II

PLATE VII

BP MINERALS AUST. PTY LTD	
Area: LAKE FROME	
SOUTH AUSTRALIA	
Ref:	
FEBRUARY 1975	M. BELL

2328(II)-9



LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACOUS

POONTANA PROJECT

PROGRAM 1

EL — 77

AREA III

PARABARANA CREEK

SECTION DD'

SCALE

VERTICAL : 1" = 50 feet

HORIZONTAL : 3" = 500 metres

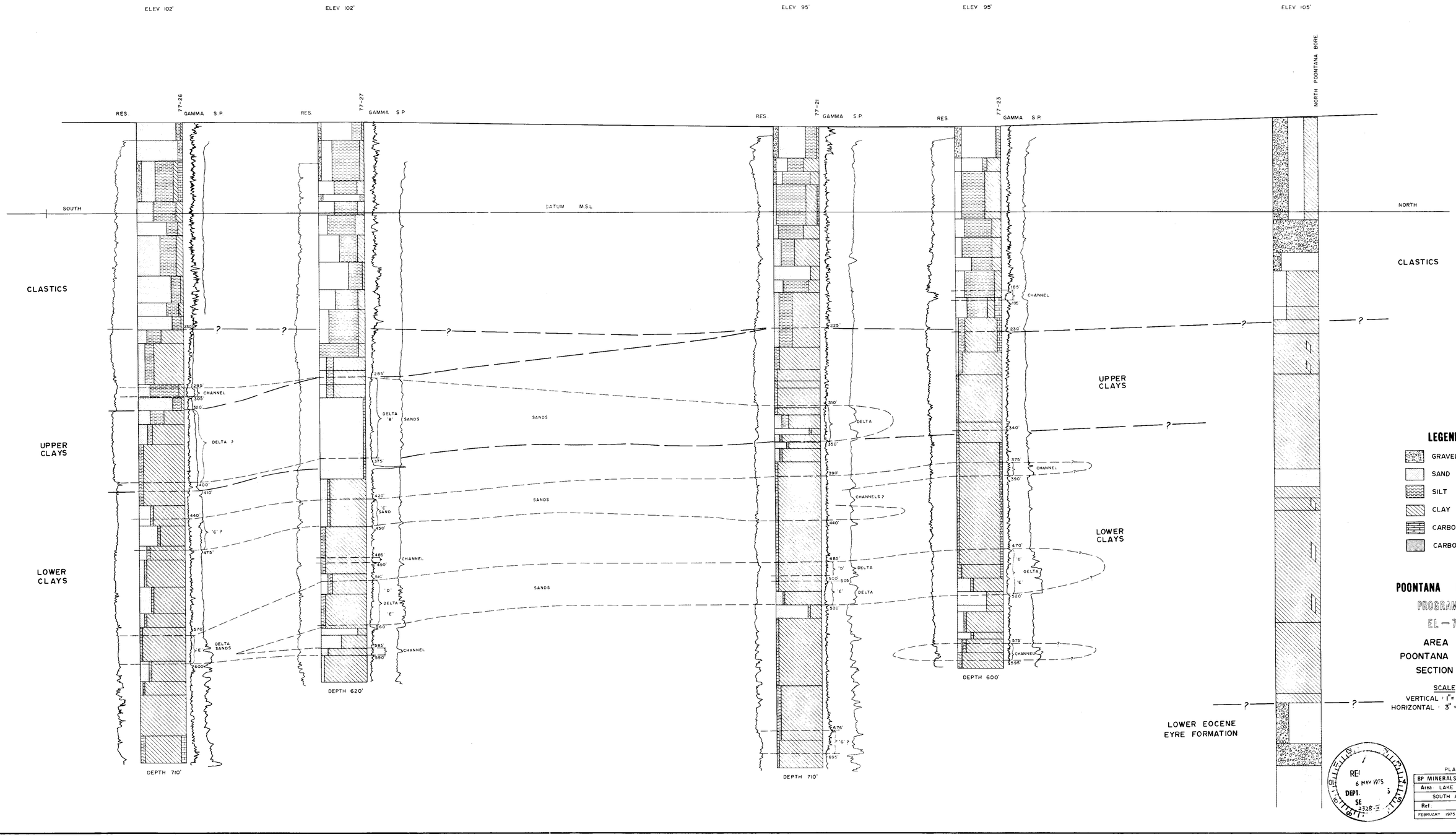
RECEIVED
6 MAY 1975
DEPT. OF MINES
SECURITY
2328-5

PLATE VIII

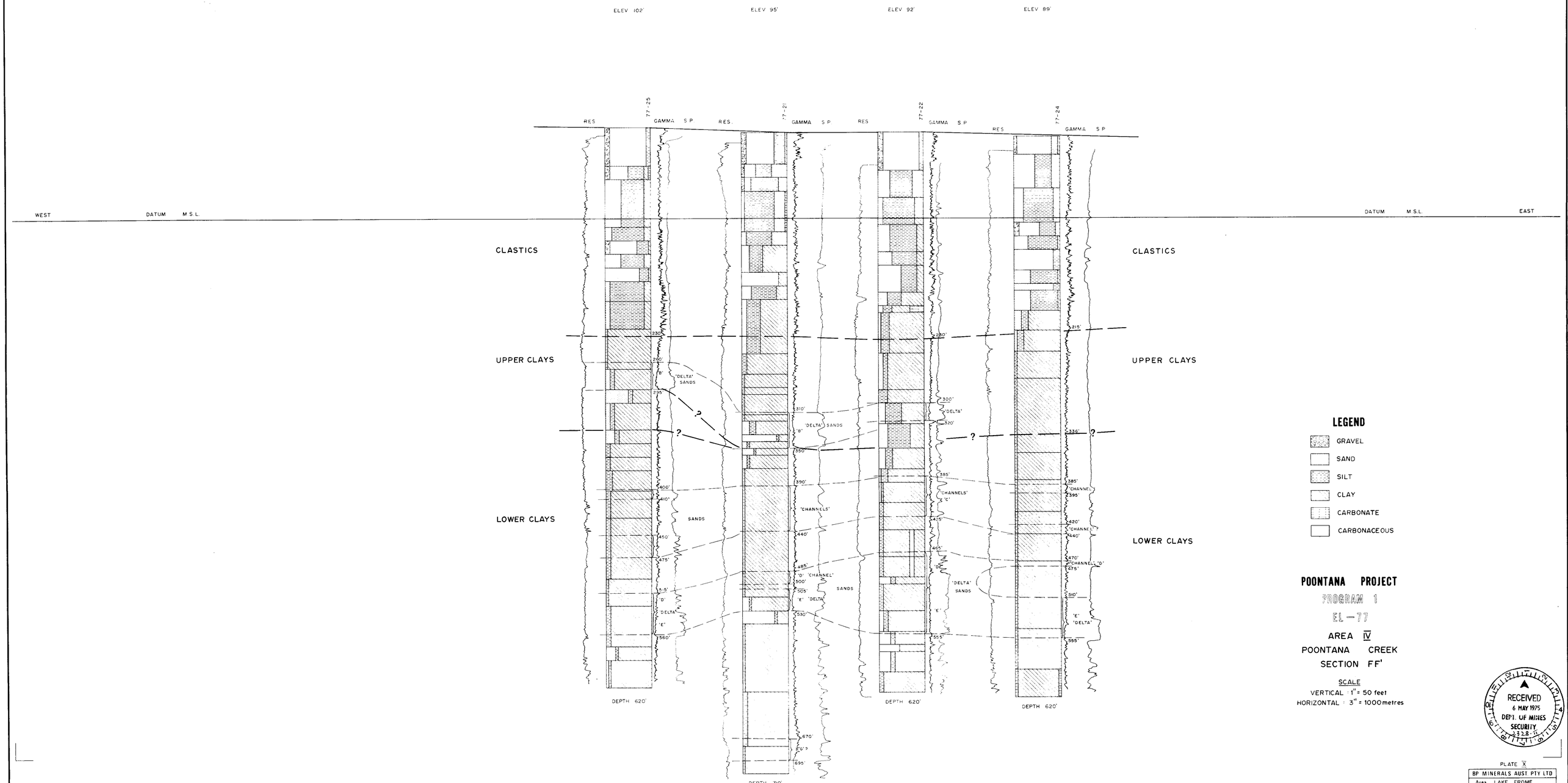
BP MINERALS AUST. PTY LTD	
Area LAKE FROME	
SOUTH AUSTRALIA	
Ref.	
FEBRUARY 1975	M. BELL

2328(#)-10

T 1258 F



2328(II)-11



LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

POONTANA PROJECT

PROGRAM 1

EL – 77

AREA IV

POONTANA CREEK

SECTION FF'

SCALE

VERTICAL : 1" = 50 feet

HORIZONTAL : 3" = 1000 metres

RECEIVED
6 MAY 1975
DEPT. OF MINES
SECURITY
2328-H

PLATE X

BP MINERALS AUST PTY LTD	
Area LAKE FROME	
SOUTH AUSTRALIA	
Ref	
FEBRUARY 1975	M. BELL

are easily correlated from the M.T.A. holes there, with the water bores further out in the Artesian Basin. A palynological determination from a carbonaceous clay, sample at a depth of 575 feet between the 'Upper N' and the 'Lower N' sands in LC-1A give a date of the "uppermost Knight Group" (Middle to Upper Eocene). The maximum known thickness is about 300 feet, near Lake Callabonna.

Cretaceous Shales

The Lower Tertiary sands are underlain by dark greenish, grey to bluish clays and shale. All drill holes on S.M.L. 431 and S.M.L. 439 bottomed in this formation. A section was dated by M.T.A. as Lower Cretaceous (Albian) by palynological determinations from cuttings taken at depths of 785', 850' and 1135' in drill hole LC - 1A.

3.2 Structural Interpretation

The major geological features in the licence area is the Poontana Sub-basin. This is a downwarp extending from the Lake Callabonna-Lake Frome lineament in the east to the Flinders Ranges in the west and southwest and the Mt. Painter Ridge in the north. This basin is believed to have existed from early Tertiary time to very recent times.

The major structure in the sub-basin is the Poontana fault-monocline towards the west side. This feature, with downthrow to the east, passes through drill hole PB-16 in the Paralana Block and extends in a N-S direction for at least 28 miles. About four miles north of PB-16 it passes to the west of the Beverley deposit and eventually is lost in the Flinders Ranges. The southern limit of the Poontana structure is not known though it has been recognized in drilling 12 miles scuth of PB-16. A geomorphic reflection of the structure can be seen in the linear alignment and sharp truncation of recent gravels extending out from the base of the Flinders Ranges from a line north of the Beverley deposit to the southern margin of the Paralana Block. In the sub-surface the position of the structure is identified by the abrupt drop of Tertiary marker beds to the east, and by the increase in thickness of the oxidized Upper Clastics. West of the Poontana structure the clastics average 180 feet thick, but to the east of the structure thickness increases to approximately 400 feet.

In addition to the major downwarping to the east along the Poontana structure sagging has also taken place to the west, tending to make the structure a barrier between the groundwater systems of the west and of the east (Bryan 1971).

The latest drilling and surface resistivity indicates the possibility of another fault (the Mulga Fault) in the sub-basin, striking NE-SW along the east side of the licence area (Plate II). Thick sands have been located to the east of the structure, in the vicinity of Poontana Creek.

Channel sands have been indicated by the resistivity work that was done in July (Murdoch, Report 83). Upon the completion of the drilling and the finding of the sands between the indicated channels, the interpretation was changed to fit the drilling results. However, due to the depths of penetration used in the survey, and the depth of the sub-basin, in comparison to the depth drilled, it is quite possible that these channels do exist at greater depth, possibly in the Lower Tertiary Eyre Formation.

Other structures indicated (Plate IV) have been copied or interpreted mainly from topographic and geological maps.

4. 1974 EXPLORATION PROGRAMME

The latest exploration done on the licence included the following: the open-hole rotary drilling of 28 holes; the water sampling of 21 water bores; and the resistivity surveying of 124 kilometers of line.

The drilling was done by Thompson Drilling Company Pty Ltd of Millicent, S.A.; the down-hole logging was done by Geoscience Associates (Aust) Pty Ltd of Adelaide S.A., and the resistivity surveying was done by Murdoch Geology and Geophysics Pty Ltd of Glen Innes, N.S.W.

4.1 Drilling Results

From 1st September, 1974 to 23rd. September, 1974, 28 rotary non-coring holes were drilled on EL 77. A total of 16,935 feet was drilled and holes varied from 530 ft to 725 ft (Table I). Four areas were drilled as follows: Area I (North Mulga) 9 holes; Area II (Pipeline) 5 holes; Area III (Paralana Creek) 7 holes; and in Area IV (Poontana Creek) 7 holes. In Area IV some thick sand bands were located.

All holes were logged for gamma, self-potential and resistivity response. Due to delay in receiving the samples from depth, the drill hole logs do not correlate exactly with the geophysical logs and can differ by up to 30 feet (Appendix I).

4.2 Interpretation of Drilling and Logging Results

The location of the drill holes is indicated on Plate II, and are shown in section on Plates V to X. The lithological logs are in Appendix I.

On section AA' (Plate V) are the holes 355-12, 77-28, and 77-1 to 77-8. The uppermost clastics unit is quite well defined in all the holes except 77-3. The lithology indicates the contact to be around 207.5 feet, while the gamma indicates it to be at 275 feet. The electric logs indicate a contact about half way between 207.5 and 275 feet. This discrepancy could show possible faulting in the sequence between hole 77-6 and hole 77-3.

Below the clastics are the upper and lower clays, with the contact between them at the bottom of the 'B' sand, but not very well indicated on this section.

The 'B' sand is in holes 77-1,6,7 and 8 at 400 to 500 feet. The best indication of the sand is in the electric logs in hole 77-1. (The interpretation of the sand bands are generally done from the electric logs as very rarely are they picked up in the drill cuttings). A possible 'C' sand is indicated in holes 77-1 and 77-2, and 'D' and 'E' sands in most of the holes; 'F' and 'G' sands are strongly indicated and in hole 77-1 there is a gamma anomaly in the 'F' sand. Most of these sands are likely stream deposits.

Section BB' (Plate VI) is in the same area as section AA' and at right angles to it. The drill holes are 77-3, 4, and 5. Once again the clastics are well defined except in hole 77-3, as mentioned above.

In the clay units the 'B' sand is indicated in 77-4 and 5, and the 'C' sand in all three holes. The 'F' sand is well defined on the electric logs in hole 77-3.

On section CC' (Plate VII) are the holes 77-9 to 77-13, and 77-26. This section runs east-west across the central part of the Poontana Sub-basin. The uppermost clastics unit is well defined in most of the holes, but the contact between the upper and lower clays is very difficult to determine, except in 77-26. Hole 77-26 seems to be separated from the other holes by a fault-monocline structure. Sands, which are almost non-existent to any extent in the other holes, are quite common in hole 77-26. Most of the upper clay unit comprises sands which are approximately 80 feet deep. The origin of these fine, well-sorted sands are still in question. More sands are indicated from 440-475 feet and from 570-600 feet. The electric logs indicate that the lowest sands (570-600 feet) are deltaic in origin.

Calcareous, sediments are found at the bottom of holes 77-9 and 77-26.

Section DD' (Plate VIII) has the holes 355-39, HC-1, 77-14, 77-15, 77-16, 77-18, and 77-19 on it.

The clastic-upper clay contact is questionable, but is probably at a depth of 320-325 feet, as indicated on the section. The contact between the upper and lower clays is indicated by the 'B' sands in holes 77-14, 15, and 19. The 'F' sand is well indicated in hole 77-14 and appears to be a delta formation.

Section C'E (Plate IX) is to the east of the axis of the Poontana Sub-basin, and runs approximately along the strike of the sub-basin.

The drill holes in this area contain a considerable amount of sands, which is indicated by the lithological and geophysical logs. 'B', 'C', 'D' and 'E' sands are well defined, with the 'D' and 'E' sands appearing to be deltaic in origin. A small gamma anomaly is indicated as the bottom of the 'B' sands in hole 77-27.

North Poontana Bore is included in this section, with sands being indicated at the 'B' level and the Lower Eocene sands at about 800 feet deep.

Section FF' (Plate X) runs east-west in the same area as section C'E and includes the holes 77-21, 22, 24 and 25. As in section C'E delta deposits are indicated at the 'B' level and the 'D' and 'E' level, with some channel sands in between them. Although not much carbonaceous matter has been found in the drill holes, as yet, the 'B' sands make a very good target for future drilling.

5. CONCLUSIONS AND RECOMMENDATIONS

Drilling and surface resistivity surveying indicate a possible fault structure at depth in the Poontana Creek area and striking NNE-SSW. This structure appears to have controlled the limits of Lake Frome at one time, as there appears to be some deltaic deposits associated with it. On section C'E (Fig. IX), deltas are indicated at two different levels caused by a regression of Lake Frome, due to increased sedimentation and then a period of transgression caused by a period of little erosion or subsidence and a spreading of the lake. In hole 77-27 an anomaly in the upper delta registered over eight times background.

It is recommended that these delta deposits be extensively drilled to ascertain if there is any uranium present, and also drilling should be done along the strike of the fault to locate any other delta systems, especially in the vicinity of Mulga Creek.

It is also recommended that the Lower Tertiary channels (Fig.IV) be drilled to check for any radioactive mineralization.

6. REFERENCES

Bryan, R., 1971 : Notes on the Uranium Prospects and Cainozoic Stratigraphy, Paralana Farm-in Block (S.M.L. 586). Unpublished Quarterly Report to Dept.of Mines, S.A.

Callan, R.A., 1973 : Lake Frome Area - Regional Geology and Tertiary Stratigraphy. Dept. of Mines, S.A. Rept. Bk. No.73,263

Jarre, G.A., and Brunt, D.A., 1971 : Summary of Exploration on S.M.L.586, Lake Frome Area, S.A. Unpublished Quarterly Report to Dept. of Mines, S.A.

Johnson, R.L., 1971 : Drilling Report - S.M.L. 586 (Paralana) and Geological Evaluation - N.W. Frome Embayment. Unpublished Quarterly Report to Dept. of Mines, S.A.

Murdoch, R., 1974 : A Resistivity Survey near Lake Frome, South Australia, for B.P. Minerals Australia Pty Ltd., Report No. 83 and Addendum.

Murdoch, R., 1974 : A Second Resistivity Survey on E.L. 77 - Lake Frome South Australia, for BP Minerals Australia Pty Ltd., Report No.91.

7. APPENDICES

Appendix I Drill Logs (Geophysics and Lithology). (In back pocket).

TABLE I (DRILL DATA)

HOLE NUMBER	DEPTH PROBED	HIGH COUNTS
77-1	716	373 c/s at 663 feet (19xBKG)
2	686	
3	715	
4	552	
5	552	
6	521	
7	596	
8	530	
9	700	
10	530	
11	530	
12	530	
13	605	
14	710	
15	530	
16	530	
17	530	
18	530	
19	530	
20	530	
21	710	
22	620	
23	596	
24	610	
25	610	
26	710	
27	620	104 c/s at 383 feet (7xBKG)
28	710	

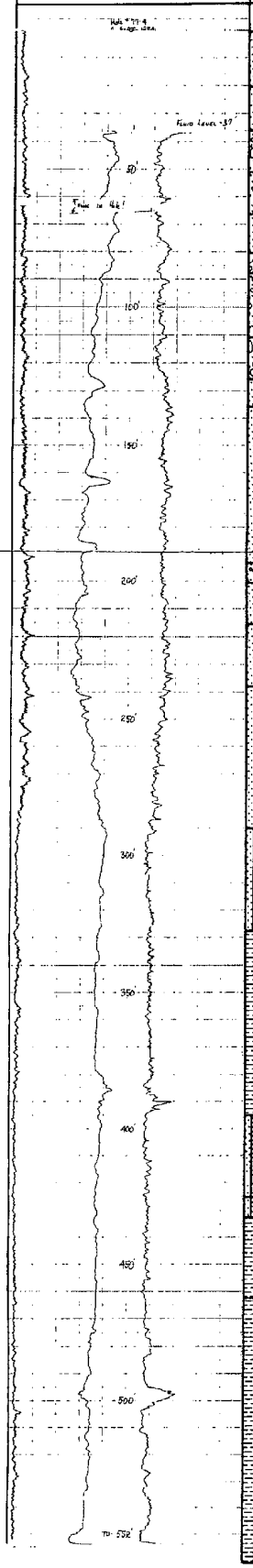
TS 13680

DRILL HOLE LOG

170

HOLE No.	77-4	DATE DRILLED	4/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	4/9/74	RANGE	500	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	4/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	110
LOCATION	L. Frome	DRILLED DEPTH	560'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	552'	LOGGING SPEED	20'/min	FLUID LEVEL	37.0'
GEOLOGIST	M. Bell	ELEVATION	131'	BACK GROUND	15 c/s		
DRILLER	G. Sadler	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	D. Stevens			K-FACTOR	6.40×10^{-5}		

LITHOLOGY: Gravel, Sand, Silt, Clay, Carbonate, Carbonaceous



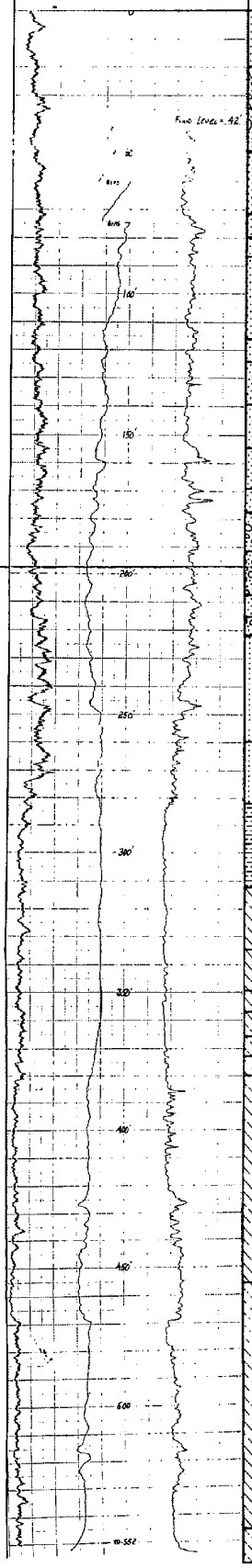
INTERVAL	DESCRIPTION
0'- 20'	SANDSTONE: reddish-brown.
20'- 35'	SILTSTONE: reddish-brown, coarse sub-rounded sand to 2mm.
35'- 50'	SILTSTONE: reddish-brown, some white.
50'- 65'	SILTSTONE: reddish-brown, sub-rounded quartz sand, occasional mica and limestone.
65'- 80'	SILTSTONE: with coarse sand up to 2mm.
80'- 87.5	SANDSTONE: with angular to sub-rounded pebbles. Reddish-brown.
87.5-110'	SILTSTONE: reddish-brown to white, angular to sub-rounded quartzite pebbles up to 3cm.
110'-125'	SILTSTONE: "as above"
125'-192.5	SANDSTONE: coarse sand up to 5mm.
192.5-200'	SANDSTONE: angular to sub-rounded pebbles 0.5-2cm. Reddish-brown.
200'-215'	SILTSTONE: reddish-brown.
215'-237.5	SANDSTONE: reddish-brown, coarse sand 1-5mm.
237.5-290'	SILTSTONE: reddish-brown to light grey, minor limestone fragments and Fe stain.
290'-327.5	CLAYSTONE: buff coloured, minor reddish-brown to purple Fe stain, pockets of carbonaceous matter.
327.5-395'	CLAYSTONE: dark grey, carbonaceous ? minor Fe stain.
390'-425'	CLAYSTONE: buff to light grey to olive grey.
425'-432.5	CLAYSTONE: as above, with carbonaceous matter.
432.5-462.5	CLAYSTONE: light to dark grey, minor red and yellow stain.
462.5-560'	CLAYSTONE: light to dark grey, minor varied coloured clays. (red, yellow, purple and buff).
	End of hole.

171

DRILL HOLE LOG

HOLE No.	77-5	DATE DRILLED	5/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	5/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	5/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	120
LOCATION	S.A.	DRILLED DEPTH	560'	PAPER SPEED	10'/in	BIAS	570
STATE	M. Bell	LOGGED DEPTH	552'	LOGGING SPEED	20'/min	FLUID LEVEL	42.0'
GEOLOGIST	G. Sadler	ELEVATION	131'	BACK GROUND	15 c/s		
DRILLER	R. McGurk	CO-ORDS		TIME BASE	1.0 sec		
LOGGER				K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



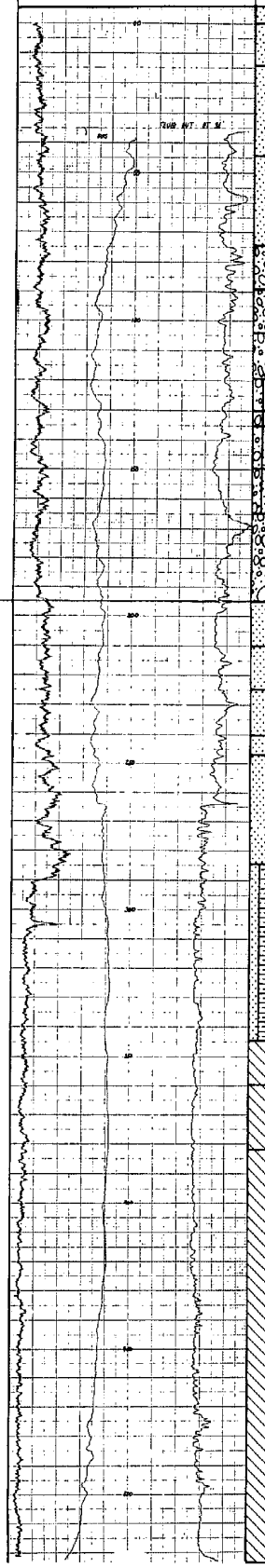
INTERVAL	DESCRIPTION
0' - 20'	CLASTICS: reddish-brown with creamy clay.
20' - 35'	CLASTICS: reddish-brown with creamy clay; angular quartzite pebbles to 2cm; minor carbonate.
35' - 50'	CLASTICS: reddish-brown with creamy clay; angular to sub-rounded quartzite pebbles to 3cm.
50' - 72.5	CLASTICS: reddish-brown with creamy clay; minor carbonate.
72.5- 80'	CLASTICS: reddish-brown with creamy clay.
80' - 87.5	SANDY-SILTSTONE: reddish-brown; coarse angular quartz sand to 3mm; minor biotite.
87.5-117.5	SANDY-SILTSTONE: reddish-brown; coarse sand.
117.5-125'	SANDSTONE: reddish-brown; fine to very coarse sand (2-5mm), angular and quartzitic.
125' -140'	SILTSTONE: reddish-brown to creamy clay; minor carbonate, carbonaceous matter, and mica.
140' -155'	SANDY-SILTSTONE: reddish-brown; coarse sand (1-3mm).
155' -170'	SANDSTONE: reddish-brown; some coarse sand.
170' -177.5	SANDSTONE: reddish-brown with creamy clay; limy.
177.5-192.5	CLASTICS: reddish-brown; clays reddish-brown to creamy; coarse sand 1-3mm; rounded quartzite pebbles to 2cm; fine sand 0.05-1mm.
192.5-207.5	CLASTICS: reddish-brown; creamy clay; coarse sand; orthoclase and rounded quartzite pebbles 1-4cm.
207.5-215'	SANDY-SILTSTONE: reddish-brown with creamy clay.
215' -222.5	CLASTICS: reddish-brown; creamy clay; coarse sand; orthoclase and rounded quartzite pebbles 1-4cm.
222.5-260'	SANDY-CLAYSTONE: reddish-brown; white to cream clays; iron staining.
260' -282.5	CLAYSTONE: reddish-brown.
282.5-312.5	CLAYSTONE: greenish-grey, with increasing iron stain.
312.5-335'	CLAYSTONE: purplish-grey; minor light grey and reddish-brown clay.
335' -350'	CLAYSTONE: light grey clays with minor dark grey, reddish-brown, and cream clay; minor carbonaceous matter.
350' -357.5	CLAYSTONE: creamy and dark grey with minor light grey.
357.5-365'	CLAYSTONE: mainly dark grey.
365' -372.5	CLAYSTONE: dark grey with creamy green and minor reddish-brown clay.
372.5-380'	CLAYSTONE: mainly dark grey with minor cream, olive and reddish-brown clays. Some carbonate.
380' -455'	CLAYSTONE: mainly dark to light grey with minor cream, olive and reddish-brown clays. Yellow-brown and reddish-pink iron stain. Occasional gypsum.
455' -470'	CLAYSTONE: mainly dark grey with light grey, cream and reddish-brown clays.
470' -545'	CLAYSTONE: light to dark grey with olive, reddish-brown and cream clay; occasional limonite staining and gypsum crystals.
545' -560'	CLAYSTONE: dark grey with minor light grey, olive, cream and reddish-brown clays.
End of hole	

DRILL HOLE LOG

172

HOLE No.	77-6	DATE DRILLED	5/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	6/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	6/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	120
LOCATION	L. Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	521'	LOGGING SPEED	20'/min	FLUID LEVEL	36.0'
GEOLOGIST	M. Bell	ELEVATION	131'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY: Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



INTERVAL	DESCRIPTION
0' - 20'	CLASTICS: reddish-brown silty sands.
20' - 50'	CLASTICS: reddish-brown with creamy clays; coarse sand and pebbles (0.2-2cm).
50' - 80'	CLASTICS: reddish-brown; coarse sand with minor muscovite, biotite and carbonate.
80' - 95'	CLASTICS: reddish-brown; coarse sand; and angular to sub-rounded pebbles 0.5-2cm.
95' -110'	SANDSTONE: reddish-brown sand from 2-5mm; quartz and quartzite pebbles 1-3cm; minor gypsum.
110' -125'	SANDSTONE: reddish-brown, angular to sub-rounded, quartz and quartzite pebbles 1-3cm, minor gypsum.
125' -140'	SANDSTONE: reddish-brown with angular to subrounded pebbles 1-3cm.
140' -155'	SILTSTONE: reddish-brown with pebbles 1-2cm.
155' -170'	SILTSTONE: reddish-brown with creamy clay, minor carbonaceous matter.
170' -200'	SANDSTONE: reddish-brown with pebbles 1-3cm.
200' -215'	SILTSTONE: reddish-brown to cream, sand 1-3mm, some pebbles and limestone.
215' -230'	SANDSTONE: reddish-brown with creamy clay.
230' -245'	SILTSTONE: reddish-brown with creamy clay.
245' -252.5	SANDSTONE: reddish-brown with creamy clay.
252.5-290'	SILTSTONE: reddish-brown to creamy iron stain, mica and minor carbonaceous matter.
290' -350'	CLAYSTONE: greenish-grey to white clay, occasional quartzite pebbles 2-6cm, iron stain - red to purple.
350' -365'	CLAYSTONE: dark grey, some carbonaceous stain.
365' -387.5	CLAYSTONE: light grey with minor dark grey, red, brown and creamy.
387.5-530'	CLAYSTONE: dark grey with hematite stain and reddish-brown to olive green clay.
	End of hole.

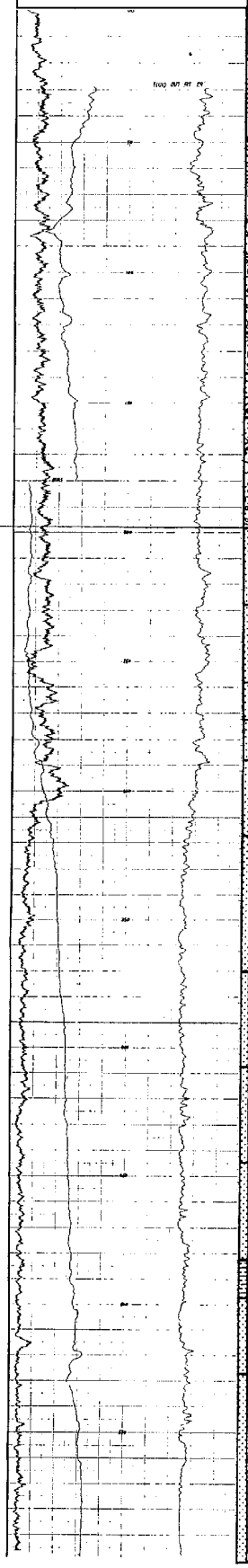
TS 1368 G

175

DRILL HOLE LOG

HOLE No.	77-7	DATE DRILLED	6/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	7/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	7/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	110
LOCATION	~~L. Frome~~	DRILLED DEPTH	605'	PAPER SPEED	~~10"/in~~	BIAS	~~570~~
STATE	S.A.	LOGGED DEPTH	596'	LOGGING SPEED	20'/min	FLUID LEVEL	29.0'
GEOLOGIST	M. Bell	ELEVATION	137'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



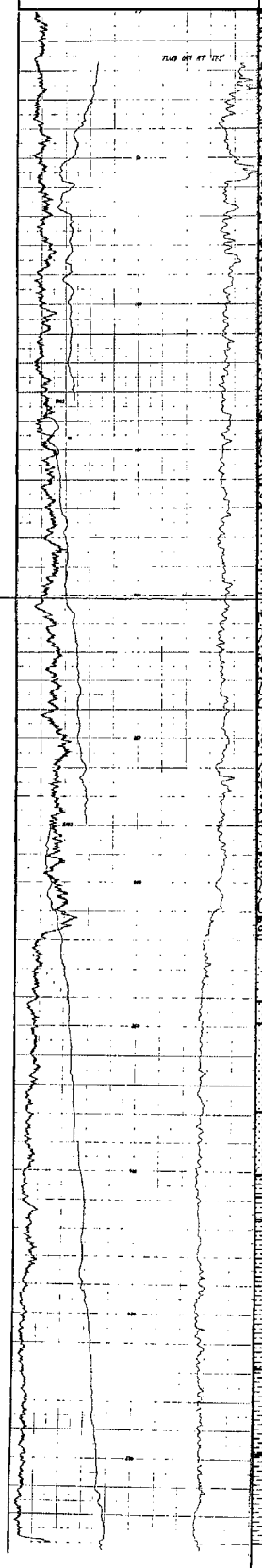
INTERVAL	DESCRIPTION
0' - 20' (Kelly)	SILTSTONE: reddish-brown, pebbles angular to sub-rounded 1-2cm of quartz and quartzite, sand medium to coarse, clay red-brown to cream.
20' - 50'	SILTSTONE: reddish-brown to cream, medium quartz sand, clay dark grey carbonaceious.
50' - 87.5	SILTSTONE: reddish-brown, small pebbles 1-2cm, medium to coarse granitic sands, clay reddish-brown to cream, minor carbonaceous matter and carbonate.
87.5- 95'	SANDSTONE: reddish-brown, angular quartz pebbles 1-3cm, coarse sand 1-4mm and minor carbonate.
95' -110'	SANDSTONE (SILTY): reddish-brown, fine to course sand, clay red-brown to cream with some unoxidized carbonaceous matter.
110' -125'	SILTSTONE: reddish-brown, large sub-rounded pebbles 2-5cm, sand to 3mm.
125' -155'	SANDSTONE: small quartz and quartzite pebbles 1-2cm, reddish-brown, fine to medium sand.
155' -170'	SANDSTONE: reddish-brown, clay red-brown to cream.
170' -200'	SANDSTONE (SILTY): reddish-brown.
200' -230'	SANDSTONE (SILTY): reddish-brown, coarse sand.
230' -260'	SANDSTONE (SILTY): reddish-brown.
260' -275'	SANDSTONE (SILTY): reddish-brown, clay red-brown to creamy grey.
275' -290'	SANDSTONE (SILTY): reddish-brown, red-brown to creamy grey, minor carbonaceous matter in grey clay and limonite stain in cream clay.
290' -320'	SANDSTONE: reddish-brown, clay red-brown to creamy.
320' -372.5	CLAYSTONE: reddish-brown, medium to coarse sands, red-brown to creamy silts, clay creamy grey, hematite and limonite stain.
372.5-410'	CLAYSTONE: mostly dark grey, some light grey and minor olive green and white, hematite and limonite stains in dark grey.
410' -447.5	CLAYSTONE: mostly dark grey as above and some minor gypsum.
447.5-485'	CLAYSTONE: mostly dark grey, minor olive green, red-brown and white clay, and gypsum.
485' -500'	CLAYSTONE: light to dark grey and as above.
500' -605'	CLAYSTONE: medium grey, and variegated colours, some quartz and feldspar sand ?
	End of hole.

174

DRILL HOLE LOG

HOLE No.	77-8	DATE DRILLED	7/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	8/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	8/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	110
LOCATION	L. Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	530'	LOGGING SPEED	20'/min	FLUID LEVEL	17.5'
GEOLOGIST	M. Bell	ELEVATION	144'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	6.40×10^{-5}		
LOGGER	R. McGurk			K-FACTOR			

LITHOLOGY : Gravel · Sand · Silt · Clay · Carbonate · Carbonaceous



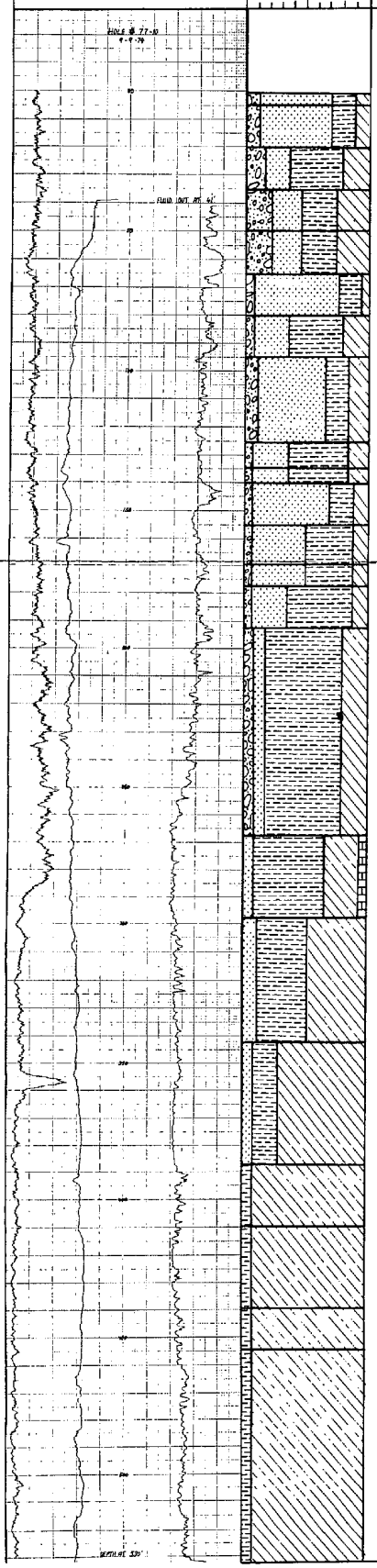
INTERVAL	DESCRIPTION
0' - 20' (Kelly)	GRAVEL: reddish-brown, angular to sub-rounded pebbles of quartzite 1-3cm, medium and coarse sand, and red-brown to cream clay.
20' - 50'	SILTSTONE: reddish-brown, with red-brown to cream clay.
50' - 72.5	SANDSTONE: reddish-brown.
72.5-110'	SILTSTONE: reddish-brown, pebbles 1-8cm, clay red-brown to cream, minor carbonate, medium to coarse sand.
110' -147.5	SANDSTONE: reddish-brown, fine to coarse sand with red-brown to cream clay.
147.5-162.5	SANDSTONE: reddish-brown, medium to coarse sand with red-brown to white clay, minor biotite mica.
162.5-170'	CLAYSTONE: reddish-brown to cream clay.
170' -192.5	SILTSTONE: reddish-brown, clay red-brown to cream, sand medium to coarse.
192.5-207.5	SILTSTONE: reddish-brown with clay reddish-brown to cream, minor biotite.
207.5-222-5	SANDSTONE: reddish-brown.
222.5-275'	SILTSTONE (SANDY): reddish-brown, medium to coarse sand, clay red-brown to creamy grey, minor carbonate and carbonaceous matter.
275' -312.5	SILTSTONE (SANDY): red-brown medium to coarse sand, small pebbles, clay red-brown to cream, minor carbonate and carbonaceous matter.
312.5-320'	SANDSTONE (SILTY): red-brown medium to coarse sand, clay red-brown to cream.
320' -342.5	SANDSTONE (SILTY): reddish-brown, as above with limonite stain.
342.5-350'	CLAYSTONE: creamy, minor limonite and hematite stain and minor carbonaceous matter.
350' -380'	CLAYSTONE: as above with more iron stain.
380' -402.5	As above becoming greyer with purple hematite stain.
402.5-410'	CLAYSTONE: mostly dark grey, minor light grey, silt red-brown to grey.
410' -440'	CLAYSTONE: mostly light grey, minor dark grey, minor limonite and hematite stain and minor carbonaceous matter.
440' -470'	CLAYSTONE: mostly medium grey, minor cream to white to red-brown clay.
470' -500'	CLAYSTONE: mostly dark grey, minor light grey, cream to white, minor limonite and hematite stains.
500' -530'	CLAYSTONE: mostly medium grey, minor cream to white to red-brown clay.
	End of hole.

DRILL HOLE LOG

175

HOLE No.	77-10	DATE DRILLED	9/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	9/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	9/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	110
LOCATION	L. Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	530'	LOGGING SPEED	20'/min	FLUID LEVEL	41.0'
GEOLOGIST	M. Bell	ELEVATION	131'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY: Gravel, Sand, Silt, Clay, Carbonate, Carbonaceous



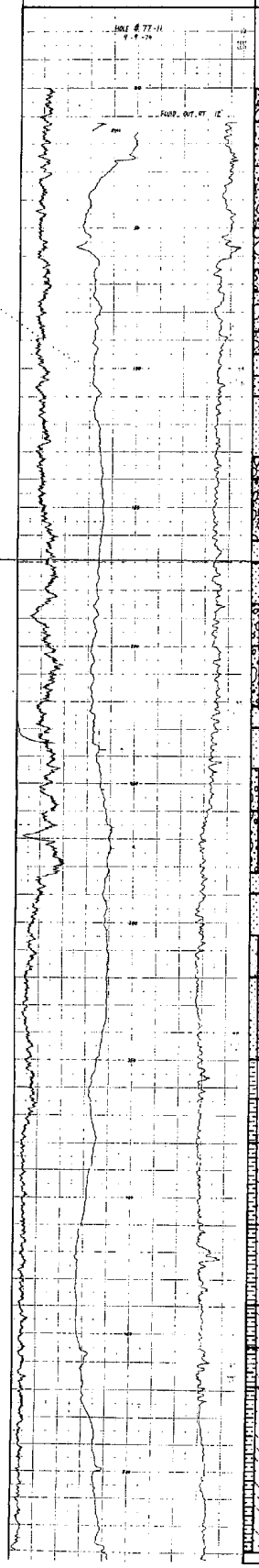
INTERVAL	DESCRIPTION
0' - 20' (Kelly)	MIXED CLASTICS: reddish-brown.
20' - 35'	MIXED CLASTICS: reddish-brown, pebbles 1-4cm, medium to coarse sand, clay red-brown to cream.
35' - 65'	CLASTICS: reddish-brown, pebbles 1-2cm, fine to medium sand, clay red-brown to cream.
65' - 80'	CLASTICS: reddish-brown, pebbles sub-rounded, sand medium to coarse, clay red-brown to cream, minor limestone
80' - 95'	CLASTICS: reddish-brown, pebbles of quartz and carbonate 1-3cm, sand fine to medium, silt and clay red-brown to cream.
95' -125'	CLASTICS: reddish-brown, pebbles and carbonate, sand medium to coarse, clay red-brown to cream.
125' -140'	CLASTICS: reddish-brown, pebbles quartz and carbonate, medium to coarse sand, silt and clay red-brown to cream.
140' -155'	SANDSTONE: reddish-brown to cream, (clean with hematite stain).
155' -177.5	CLASTICS: as above.
177.5-192.5	CLASTICS: reddish-brown to cream, minor carbonate.
192.5-267.5	SILTSTONE: greenish grey, limonite and hematite stain, minor carbonaceous matter.
267.5-297.5	SILTSTONE: dark red-brown silt clay, with minor carbonate.
297.5-342.5	CLAYSTONE (SILTY): greenish grey to cream.
342.5-387.5	CLAYSTONE: medium grey, much limonite and hematite stain, minor carbonate.
387.5-410'	CLAYSTONE: mostly dark grey with iron stain.
410' -440'	CLAYSTONE: medium grey, much limonite and hematite stain, minor carbonate.
440' -455'	CLAYSTONE: mostly dark grey with iron stain.
455' -530'	CLAYSTONE: mostly light grey, minor dark grey variegated red-brown, creamy to white clays, extensive hematite and limonite stains.
	End of hole.

DRILL HOLE LOG

176

HOLE No.	77-11	DATE DRILLED	9/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	9/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	9/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	110
LOCATION	L. Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	530'	LOGGING SPEED	20'/min	FLUID LEVEL	12.0'
GEOLOGIST	M. Bell	ELEVATION	134'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY: Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



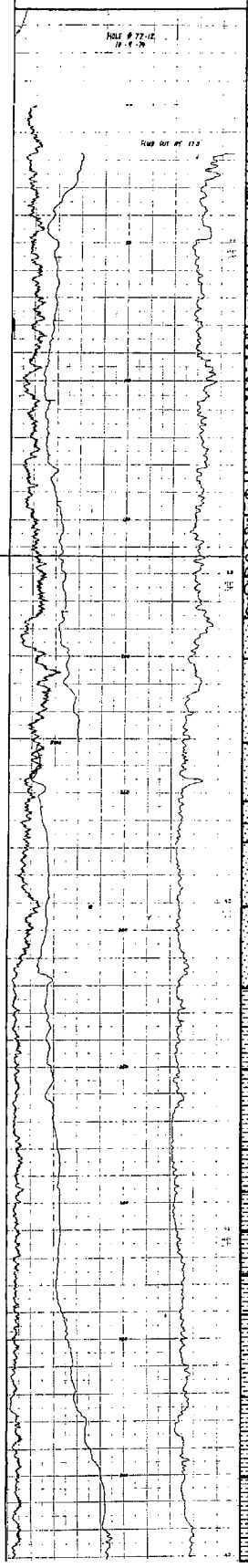
INTERVAL	DESCRIPTION
0' - 27.5	CLASTICS: reddish-brown, sub-rounded quartz pebbles,
27.5- 50'	CLASTICS: pebbles angular to sub-rounded 1-3cm, reddish-brown to cream silt and clay.
50' - 65'	SANDSTONE: reddish-brown, clay red-brown to cream.
65' - 72.5	CLASTICS: pebbles angular to sub-rounded, 1-3cm, reddish-brown to cream silt and clay.
72.5- 87.5	CLASTICS: reddish-brown, pebbles to 4cm, clay red-brown to cream.
87.5- 95'	CLASTICS: reddish-brown, clay red-brown to cream minor carbonate chips.
95' -102.5	SILTSTONE: red-brown to cream carbonate fragments.
102.5-132.5	SANDSTONE: reddish-brown, minor carbonate.
132.5-162.5	SANDSTONE: reddish-brown, minor carbonate.
162.5-170'	SILTSTONE: reddish-brown.
170' -185'	SANDSTONE: reddish-brown, medium to coarse sand.
185' -222.5	MIXED CLASTICS: siltand clay, reddish-brown to cream, minor carbonate.
222.5-245'	SANDSTONE: reddish-brown, minor carbonate.
245' -282.5	SANDSTONE (SILTY): silty clay reddish-brown to creamy grey, minor carbonate.
282.5-305'	SILTSTONE: reddish-brown silt, clay red-brown to green grey.
305' -350'	CLAYSTONE: light green grey, minor yellow-brown, iron stain.
350' -365'	CLAYSTONE: mostly med grey, minor green-grey to red-brown, occasional hematite stain.
365' -410'	CLAYSTONE: mostly dark grey, minor light green grey to red-brown occasional limonite stains.
410' -440'	CLAYSTONE: mostly medium grey, minor pale green-grey to creamy white. Occasional limonite stain.
440' -455'	CLAYSTONE: mostly light grey, minor creamy white to red-brownbrown clay.
455' -530'	CLAYSTONE: mostly medium grey, minor dark grey to creamy-red-brown.
	End of hole.

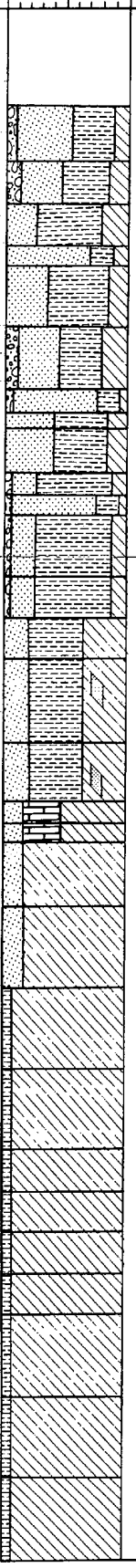
DRILL HOLE LOG

17

HOLE No.	77-12	DATE DRILLED	10/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	10/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	10/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	110
LOCATION	L. Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	530'	LOGGING SPEED	20'/min	FLUID LEVEL	17.5'
GEOLOGIST	M. Bell	ELEVATION	121'	BACK GROUND	15		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McCurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous





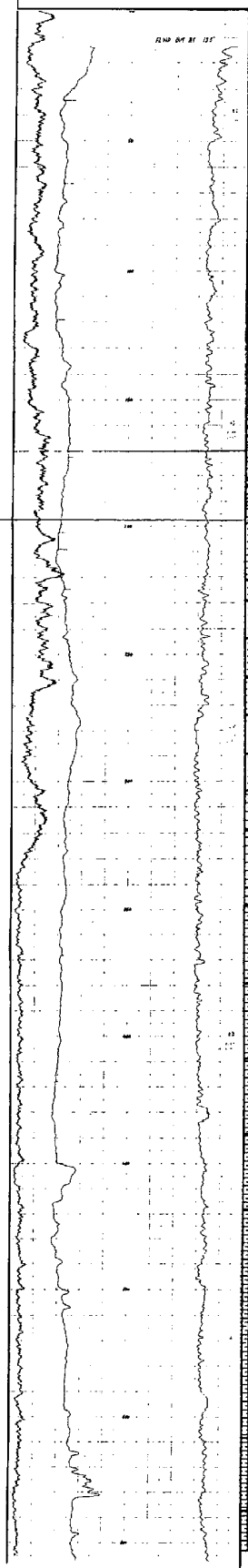
INTERVAL	DESCRIPTION
0' - 20'	CLASTICS: reddish-brown silt, clay red brown to cream, small pebbles 1-2cm.
20' - 35'	CLASTICS: reddish-brown, clay red-brown to creamy, small pebbles, quartz and carbonate.
35' - 50'	SILTSTONE: reddish brown to cream.
50' - 57.5	SANDSTONE: reddish brown, clay red-brown to cream.
57.5- 80'	SILTSTONE (SANDY): reddish brown to cream.
80' -102.5	MIXED CLASTICS: reddish brown, clay reddish-brown to cream minor carbonate fragments.
102.5-110'	SANDSTONE: reddish brown, clay reddish-brown to cream.
110' -132.5	MIXED CLASTICS: reddish brown to cream, minor carbonate.
132.5-140'	SILTSTONE: silt pale green-grey to red-brown, clay red-brown to green-grey.
140' -147.5	SANDSTONE: reddish brown.
147.5-185'	SILTSTONE: reddish brown-cream, pebbles 1-3cm, minor carbonate.
185' -200'	MIXED CLASTICS: reddish brown to grey-green, minor carbonate.
200' -252.5	MIXED CLASTICS: same as above plus white clay, minor carbonaceous matter and limonite stain.
252.5-267.5	CLAYSTONE: greenish-grey, minor carbonate, hematite and limonite stain.
267.5-320'	CLAYSTONE: medium to dark grey, minor creamy white clay, limonite and hematite stain.
320' -395'	CLAYSTONE: mostly dark grey, minor red-brown and creamy clay. Minor gypsum and iron stain.
395' -425'	CLAYSTONE: mostly medium grey, minor dark grey to creamy and red-brown minor gypsum, hematite and limonite stains.
425' -470'	CLAYSTONE: mostly green-grey, minor dark grey to medium grey, creamy and red-brown minor limonite and hematite stains.
470' -500'	CLAYSTONE: mostly green grey, minor medium grey and red-brown, hematite and limonite stains.
500' -530'	CLAYSTONE: mostly light-medium grey, minor green-cream-grey to red brown, limonite and hematite stain and minor gypsum.
	End of hole.

DRILL HOLE LOG

176

				GAMMA LOG		ELECTRIC LOG	
HOLE No.	77-13	DATE DRILLED	10/9/74	RANGE	200	RESIST. SCALE	HI
EXPL. LICENCE No.	77	DATE COMPLETED	10/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	110
PROJECT	Poontana	DATE LOGGED	10/9/74	PAPER SPEED	10'/in	BIAS	570
LOCATION	L.Frome	DRILLED DEPTH	605'	LOGGING SPEED	20'/min	FLUID LEVEL	13.5'
STATE	S.A.	LOGGED DEPTH	605'	BACK GROUND	15 s/c		
GEOLOGIST	M. Bell	ELEVATION	124'	TIME BASE	1.0 sec		
DRILLER	R. Brown	CO-ORDS		K-FACTOR	6.40×10^{-5}		
LOGGER	R. McGurk						

LITHOLOGY: Gravel, Sand, Silt, Clay, Carbonate, Carbonaceous



INTERVAL	DESCRIPTION
0' - 27.5	CLASTICS: reddish-brown, minor carbonate.
27.5-102.5	CLASTICS: reddish-brown to cream silt and clay, minor carbonate pebbles.
102.5-140'	SANDSTONE: reddish-brown, small pebbles 1-2cm, minor carbonate.
140' -155'	SANDSTONE (SILTY): reddish-brown-grey-cream.
155' -162.5	SANDSTONE: reddish-brown, minor carbonate.
162.5-170'	SILTSTONE: reddish-brown to grey-green, small quartzite pebbles 1-3cm.
170' -185'	SILTSTONE: reddish-brown to grey-green, small quartzite pebbles.
185' -200'	CLASTICS: reddish-brown-grey-green.
200' -222.5	SILTSTONE: reddish-brown-grey-green.
222.5-245'	SILTSTONE: grey-green, minor reddish-brown, limonite stain and minor carbonaceous matter.
245' -275'	MIXED CLASTICS: dark reddish-brown.
275' -305'	CLAYSTONE: grey-green to creamy clay limonite and hematite stain
305' -342.5	CLAYSTONE: mostly medium grey, minor grey green-red-brown, major limonite and hematite stains.
342.5-380'	CLAYSTONE: mostly dark grey, minor light grey to cream minor hematite stain.
380' -440'	CLAYSTONE: mostly medium grey, minor light grey to cream to dark grey, minor limonite and hematite stains.
440' -560'	CLAYSTONE: mostly dark grey, minor light grey to cream, medium grey to brown, minor limonite and hematite stains.
560' -590'	CLAYSTONE: mostly medium to dark grey, minor light grey to cream, red-brown, and yellow-brown to green, limonitic.
590' -605'	CLAYSTONE: mostly creamy grey, minor creamy medium grey, dark grey, red-brown.
	End of hole.

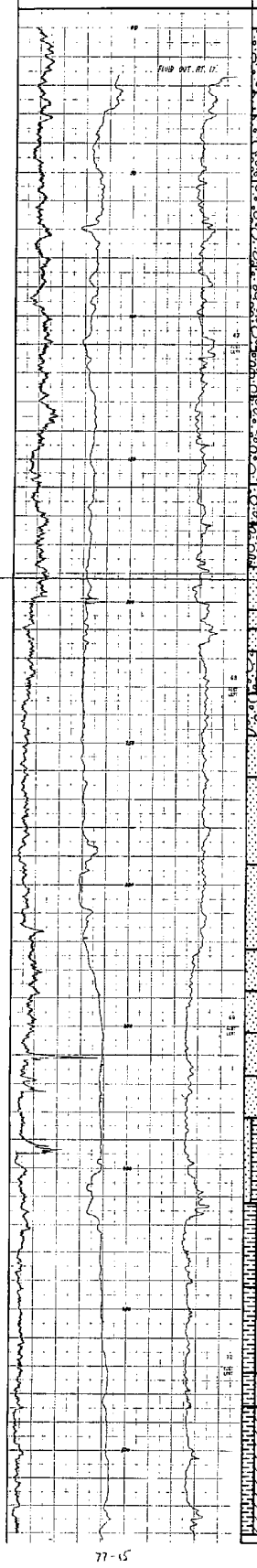
TS 13680

DRILL HOLE LOG

179

HOLE No.	77-15	DATE DRILLED	11/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	12/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	12/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	110
LOCATION	L.Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	530'	LOGGING SPEED	20'/min	FLUID LEVEL	17.0'
GEOLOGIST	M. Bell	ELEVATION	157'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



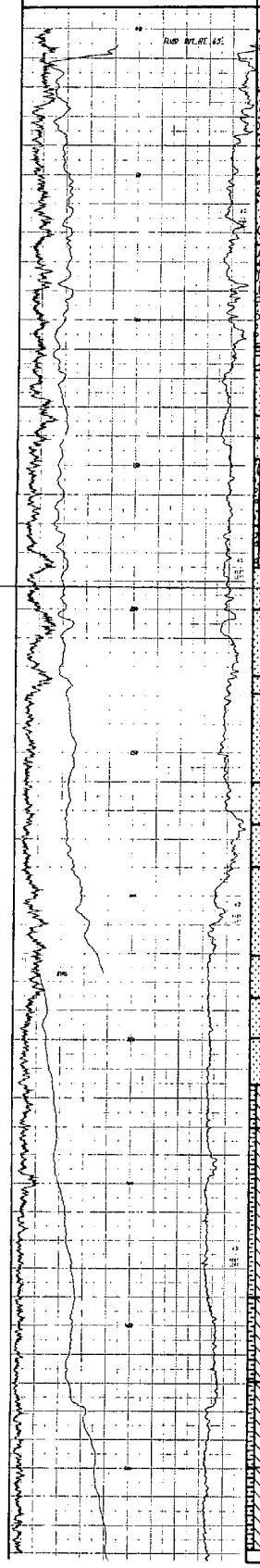
INTERVAL	DESCRIPTION
0' - 27.5	SANDSTONE: reddish brown, angular to sub-rounded quartzite pebbles 1-2cm.
27.5-117.5	CLASTICS: reddish brown, clay red-brown to cream, minor carbonate fragments and carbonaceous matter.
117.5-125'	CLASTICS: red-brown.
125' -170'	CLASTICS: red-brown, minor carbonate and carbonaceous matter.
170' -185'	CLASTICS: red-brown.
185' -207.5	SILTSTONE: reddish brown.
207.5-215'	CLASTICS: red-brown, minor carbonaceous matter.
215' -230'	CLASTICS: red-brown, rounded quartzite pebbles 1-3cm.
230' -245'	CLASTICS: red-brown.
245' -260'	CLASTICS: red-brown.
260' -320'	CLASTICS: light grey, occasional iron stain.
320' -335'	CLASTICS: red-brown, occasional light grey.
335' -365'	CLASTICS: light grey, hematite and limonite stains.
365' -380'	CLASTICS: light to medium grey.
380' -410'	CLAYSTONE: medium to dark grey.
410' -485'	CLAYSTONE: light to dark grey occasional hematite and limonite stain.
485' -530'	CLAYSTONE: mostly dark grey, minor light to red-brown occasional gypsum and hematite and limonite stains.
	End of hole.

DRILL HOLE LOG

180

HOLE No.	77-16	DATE DRILLED	12/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	12/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	15/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	110
LOCATION	L.Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	530'	LOGGING SPEED	20'/min	FLUID LEVEL	6.5'
GEOLOGIST	M. Bell	ELEVATION	144'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY: Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



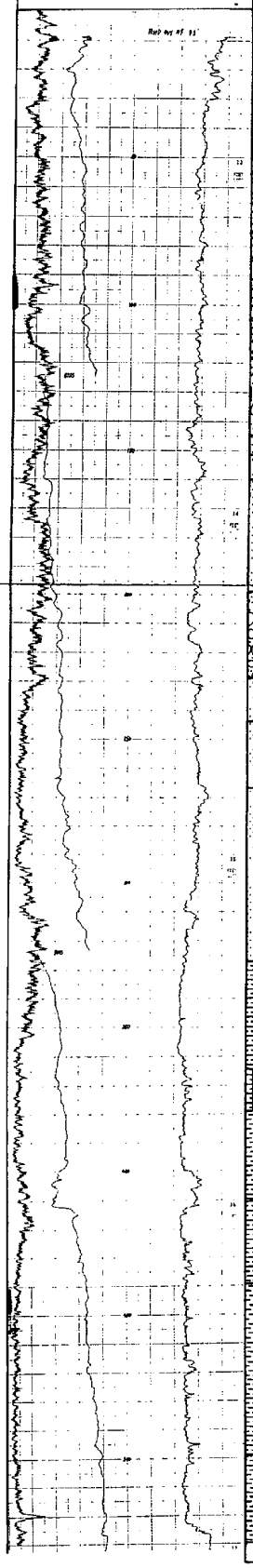
INTERVAL	DESCRIPTION
0' - 20'	CLASTICS: red-brown, sand 2-10mm.
20' - 35'	CLASTICS: red-brown, occasional carbonate fragments.
35' -117.5	CLASTICS: red-brown, occasional cream, minor limonite and carbonaceous matter.
117.5-132.5	CLASTICS: red-brown, carbonaceous fragments.
132.5-140'	CLASTICS: dark red-brown, minor carbonate.
140' -147.5	CLASTICS: red-brown, minor carbonate and carbonaceous matter.
147.5-185'	CLASTICS: red-brown, minor carbonate and carbonaceous matter.
185' -222.5	CLASTICS: red-brown, occasional grey.
222.5-275'	SANDY SILT: light grey-green, occasional red-brown, occasional carbonate.
275' -320'	SILTSTONE: light grey, limonite mottling.
320' -335'	SANDY SILT: light grey to red-brown, sand very fine.
335' -365'	CLAYSTONE: mostly light grey, minor mid grey to red-brown, hematite and limonite stain.
365' -440'	CLAYSTONE: mostly medium grey, minor light grey to cream and red-brown, hematite and limonite stain.
440' -470'	CLAYSTONE: mostly dark grey, minor light to medium grey, creamy to red brown, hematite and limonite stains.
470' -500'	CLAYSTONE: mostly green-grey, minor medium grey to dark grey and red, hematite and limonite stain.
500' -530'	CLAYSTONE: mostly dark grey, minor green-grey to cream and red-brown, hematite and limonite stain.
	End of hole.

DRILL HOLE LOG

181

HOLE No.	77-17	DATE DRILLED	12/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	14/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	15/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	110
LOCATION	L.Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	530'	LOGGING SPEED	20'/min	FLUID LEVEL	8.5'
GEOLOGIST	M. Bell	ELEVATION	154'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY: Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



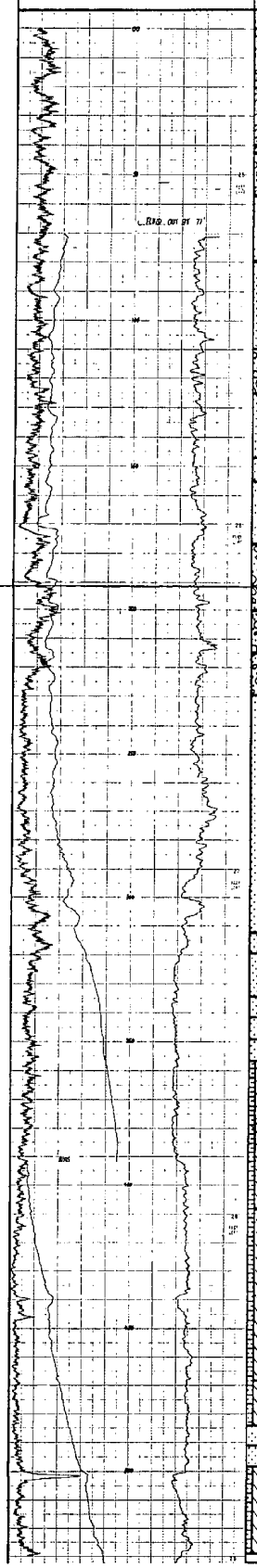
INTERVAL	DESCRIPTION
0' - 35'	CLASTICS: red-brown, small pebbles 1-3cm, angular to sub-rounded.
35' - 57.5	CLASTICS: red-brown, carbonate fragments, occasional light grey clay.
57.5-102.5	CLASTICS: red-brown, minor carbonate and carbonaceous matter.
102.5-147.5	SILTSTONE: reddish brown, occasional grey, carbonate fragments.
147.5-162.5	SILTSTONE: dark red-brown, minor carbonate fragments.
162.5-200'	SILTSTONE: light red-brown.
200' -230'	CLASTICS: red-brown, occasional light grey, minor carbonate.
230' -245'	SILTSTONE: red-brown to light green grey, minor carbonate.
245' -267.5	SILTSTONE: red-brown, occasional light grey.
267.5-327.5	SILTSTONE: light grey, mottled red-brown iron stain.
327.5-365'	CLAYSTONE: light to dark grey to greenish grey, hematite and limonite stain.
365' -380'	CLAYSTONE: grey to red-brown, purplish hematite and yellow limonite stain.
380' -410'	CLAYSTONE: mostly dark grey, minor hematite and limonite stain.
410' -440'	CLAYSTONE: mostly dark grey, minor creamy, red-brown.
440' -500'	CLAYSTONE: mostly medium grey to creamy green, hematite and limonite stain.
500' -530'	CLAYSTONE: mostly dark grey, minor red-brown to creamy grey, hematite and limonite stain.
	End of hole.

DRILL HOLE LOG

182

HOLE No.	77-18	DATE DRILLED	15/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	16/9/74	RANGE	200	RESIST. SCALE	HT
PROJECT	Poontana	DATE LOGGED	16/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	110
LOCATION	L.Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	530'	LOGGING SPEED	20'/min	FLUID LEVEL	71.0'
GEOLOGIST	M. Bell	ELEVATION	148'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



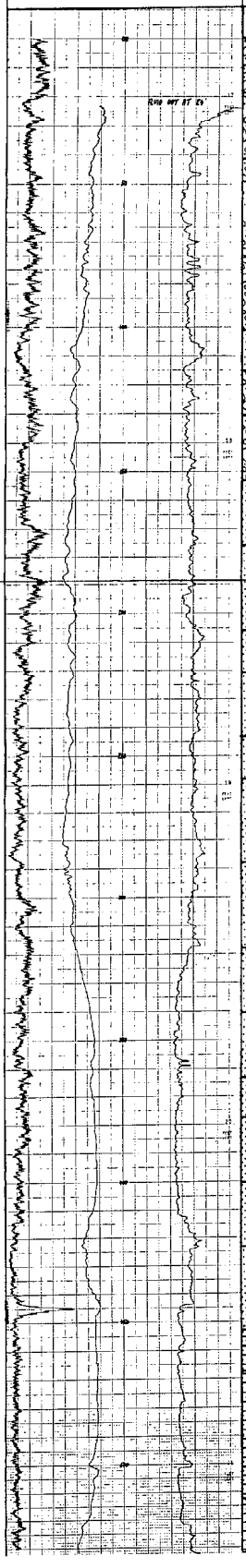
INTERVAL	DESCRIPTION
0' - 20'	MIXED CLASTICS: light reddish-brown in colour, small pebbles and fine to medium sand.
20' - 42.5	CLASTICS: light grey to reddish brown, fragments of quartz and limestone, minor limonitic stain and carbonaceous matter.
42.5- 57.5	CLASTICS: reddish-brown, but occasional light grey, small pebbles and fine to medium sand.
57.5- 80'	CLASTICS: dark reddish-brown, fine to coarse sands with minor limestone fragments, mainly silty.
80' -110'	SANDY SILTSTONE: dark reddish-brown and occasional light grey, fine to coarse sands, minor limestone and carbonaceous matter.
110' -125'	SILTY SANDSTONE: reddish-brown, limestone fragments (1mm - 1cm).
125' -155'	SANDY SILTSTONE : light brown to occasional light grey, minor limestone fragments and carbonaceous matter.
155' -177.5	SANDSTONE: reddish-brown, minor small fragments of limestone (1mm).
177.5-200'	SANDSTONE: reddish-brown, coarse quartz sand, pebbles (1cm), fine limestone fragments (1mm).
200' -215'	SILTY SANDSTONE: reddish-brown to occasional light grey-green, minor limestone.
215' -230'	SANDY SILTSTONE: light brown to light grey, limestone 1-2mm.
230' -312.5	MIXED CLASTICS: light grey with a mottling of dark reddish-brown, light grey clay with occasional Fe stain.
312.5-320'	SILTY SANDSTONE: light grey to reddish brown (limonitic stains).
320' -335'	CLAYSTONE: light grey to creamy clays, minor limonite and abundant hematite stain.
335' -342.5	SANDY CLAYSTONE: light grey to creamy, limonite and hematite staining.
342.5-350'	CLAYSTONE: light creamy grey, minor limestone, very fine to coarse sand.
350' -357.5	CLAYSTONE: medium grey to creamy grey clays, minor limonite stain.
357.5-380'	CLAYSTONE: mainly dark grey, minor light grey and reddish-brown, limonite and hematite stain, minor limestone.
380' -410'	CLAYSTONE: dark to light grey, minor reddish brown and creamy.
410' -470'	CLAYSTONE: mostly light grey, minor dark grey, reddish-brown and creamy, limonite and hematite stain.
470' -485'	CLAYSTONE: light to medium grey clay, minor creamy clay.
485' -492.5	SANDSTONE: fine light grey sand.
492.5-500'	SANDY CLAYSTONE: mostly light grey, minor dark grey, reddish brown and creamy clay.
500' -530'	CLAYSTONE: mostly light grey clays, minor sand, limonite and hematite stain, minor reddish-brown and creamy clays.
	End of hole.

DRILL HOLE LOG

183

HOLE No.	77-19	DATE DRILLED	16/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	16/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	16/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	110
LOCATION	L. Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	530'	LOGGING SPEED	20'/min	FLUID LEVEL	24.0'
GEOLOGIST	M. Bell	ELEVATION	154'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY: Gravel, Sand, Silt, Clay, Carbonate, Carbonaceous



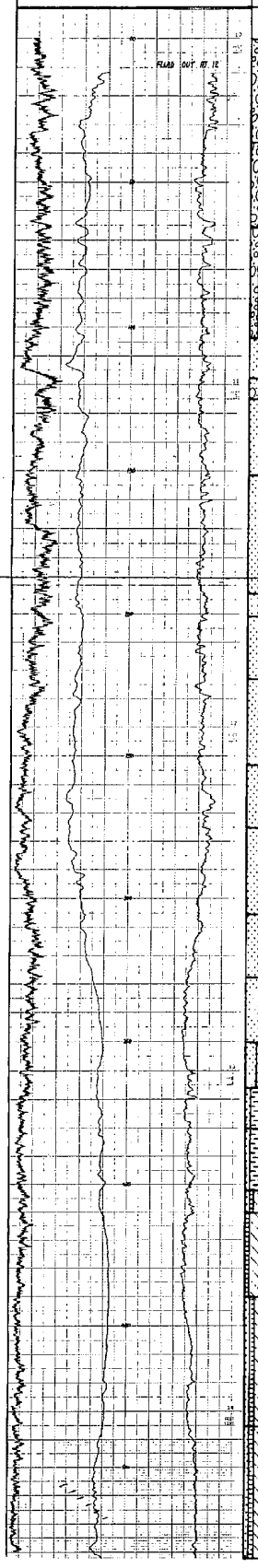
INTERVAL	DESCRIPTION
0' - 20'	MIXED CLASTICS: light reddish brown, angular quartzite pebbles (0.5 - 2cm).
20' - 42.5	MIXED CLASTICS: reddish brown, occasional creamy, small pebbles, minor limestone.
42.5-102.5	MIXED CLASTICS: reddish brown with occasional creamy, minor limestone fragments.
102.5-117.5	SILSTONE: reddish brown with occasional light grey, minor limestone.
117.5-132.5	SILTY SANDSTONE: reddish brown, small pebbles, occasional limestone.
132.5-155'	MIXED CLASTICS: reddish brown, minor limestone fragments.
155' -177.5	SILTSTONE: reddish brown, minor limestone.
177.5-207.5	SILTY SANDSTONE: reddish brown, minor limestone
207.5-222.5	SANDSTONE: light brown.
222.5-245'	SANDY SILTSTONE: reddish-brown, occasional light grey, occasional limestone fragments.
245' -260'	SANDSTONE: reddish brown, silt mottled to light grey, minor limestone.
260' -290'	CLAYEY SILTSTONE: light grey, mottled to reddish brown, minor limestone.
290' -320'	SANDY SILTSTONE: light grey and mottled reddish-brown, minor limestone.
320' -342.5	CLAYEY SILTSTONE: light grey, purplish hematite stain.
342.5-365'	CLAYSTONE: light greenish-grey, limonite stain.
365' -380'	CLAYSTONE: medium grey to light creamy grey, limonite and hematite stain.
380' -402.5	CLAYSTONE: mostly medium grey clay, minor creamy clay, limonite staining.
402.5-425'	CLAYSTONE: mostly dark grey, limonite stain.
425' -455'	SANDY SILTSTONE: light grey, clayey and silty, limonite staining.
455' -470'	CLAYSTONE: mostly light grey, occasional grains of quartz sand, limonite stain.
470' -515'	CLAYSTONE: mostly medium grey, limonite and hematite stain.
515' -530'	CLAYSTONE: light to dark grey, occasional reddish-brown and creamy clay, occasional coarse sand grains, limonite and hematite stain.
End of hole.	

DRILL HOLE LOG

184

HOLE No.	77-20	DATE DRILLED	17/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	17/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	17/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	110
LOCATION	L.Frome	DRILLED DEPTH	530'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	530'	LOGGING SPEED	20'/min	FLUID LEVEL	12.0'
GEOLOGIST	M. Bell	ELEVATION	151'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



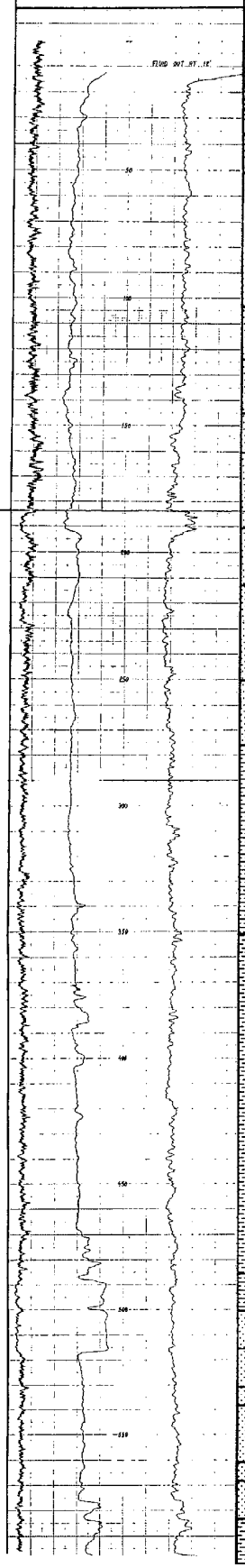
INTERVAL	DESCRIPTION
0' - 35'	MIXED CLASTICS: light reddish-brown to creamy, angular to sub-rounded quartzite pebbles, coarse sand, and minor limestone fragments.
35' - 65'	MIXED CLASTICS: reddish-brown, clay occasionally creamy, minor limestone and carbonaceous matter.
65' -102.5	SILTY SANDSTONE: reddish-brown, limestone pebbles and fragments.
102.5-117.5	SANDY SILTSTONE: reddish-brown, silt occasionally grey.
117.5-125'	MIXED CLASTICS: reddish-brown.
125' -192.5	SILTY SANDSTONE: dark reddish-brown.
192.5-200'	SILTY SANDSTONE: reddish-brown, minor limestone.
200' -222.5	MIXED CLASTICS: reddish-brown.
222.5-252.5	SANDY SILTSTONE: light brown.
252.5-275'	SANDY SILTSTONE: creamy grey, mottled with reddish brown Fe stains.
275' -305'	SILTY SANDSTONE: light grey, mottled reddish-brown.
305' -327.5	SILTY SANDSTONE: light creamy grey, mottled reddish-brown.
327.5-350'	SILTY CLAYSTONE: greenish-grey, with abundant limonite and hematite staining.
350' -365'	CLAYSTONE: mostly light creamy clay and some medium grey, minor limonite and hematite stain.
365' -402.5	SILTY CLAYSTONE: medium grey, hematite and limonite staining.
402.5-410'	CLAYSTONE: mostly very dark grey, minor limonite and hematite stain.
410' -440'	CLAYSTONE: dark to medium grey, some creamy grey clays, minor gypsum.
440' -485'	CLAYSTONE: medium grey to some creamy grey clays, minor reddish brown clay, abundant purplish hematite stain and minor limonite and gypsum.
485' -530'	CLAYSTONE: mostly medium to dark grey, minor creamy and red brown clay. Abundant limonite stain and minor gypsum.
	End of hole.

DRILL HOLE LOG

185

HOLE No.	77-23	DATE DRILLED	20/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	20/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	20/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	70
LOCATION	L.Frome	DRILLED DEPTH	600'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	596'	LOGGING SPEED	20'/min	FLUID LEVEL	12.0'
GEOLOGIST	M. Bell	ELEVATION	95'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY: Gravel, Sand, Silt, Clay, Carbonate, Carbonaceous



INTERVAL	DESCRIPTION
0' - 35'	MIXED CLASTICS: light brown, minor limestone.
35' - 50'	MIXED CLASTICS: mostly light greenish grey and reddish-brown, minor limestone.
50' -102.5	MIXED CLASTICS: mostly reddish-brown with some greenish-grey, minor limestone.
102.5-117.5	SILTSTONE: dark reddish-brown, minor limestone and carbonaceous matter.
117.5-140'	SILTSTONE: reddish-brown, some greenish-grey, minor carbonaceous matter.
140' -155'	MIXED CLASTICS: reddish-brown to grey green, minor limestone, carbonaceous matter and limonite stain.
155' -185'	MIXED CLASTICS: green-grey, minor limonite and limestone.
185' -207.5	MIXED CLASTICS: light brown to grey-green, minor gypsum and limonite stain.
207.5-245'	CLAYSTONE: light grey green, minor gypsum and limonite stain.
245' -275'	CLAYSTONE: light grey-green, minor red clay, minor gypsum, minor limonite and hematite stain in sands.
275' -327.5	CLAYSTONE: mostly medium grey clay, minor grey green clay, and red, minor gypsum and hematite and limonite stain.
327.5-350'	CLAYSTONE: medium to dark grey clay, minor creamy and reddish brown clay, minor gypsum, limonite, and hematite stain.
350' -485'	CLAYSTONE: medium grey clays, minor creamy and red brown clay, minor limonite and hematite stain.
485' -500'	CLAYSTONE: medium grey clays and creamy green clay, minor reddish brown.
500' -515'	SANDY CLAYSTONE: medium grey clays, minor creamy and reddish brown, minor gypsum, limonite, and hematite.
515' -537.5	SANDSTONE: fine grey quartz sand, medium grey to creamy clay, minor gypsum and limonite and hematite stain.
537.5-560'	SANDY CLAYSTONE: medium to dark grey, minor creamy clay, minor gypsum and quartzite pebbles, minor limonite and hematite stain.
560' -567.5	SANDY CLAYSTONE: medium grey to creamy clay, minor limonite and hematite stain.
567.5-582.5	CLAYSTONE: mostly medium grey, minor creamy clay, minor limonite and hematite stain.
582.5-600'	CLAYSTONE: light to medium grey clays, minor limestone and limonite and hematite stain.

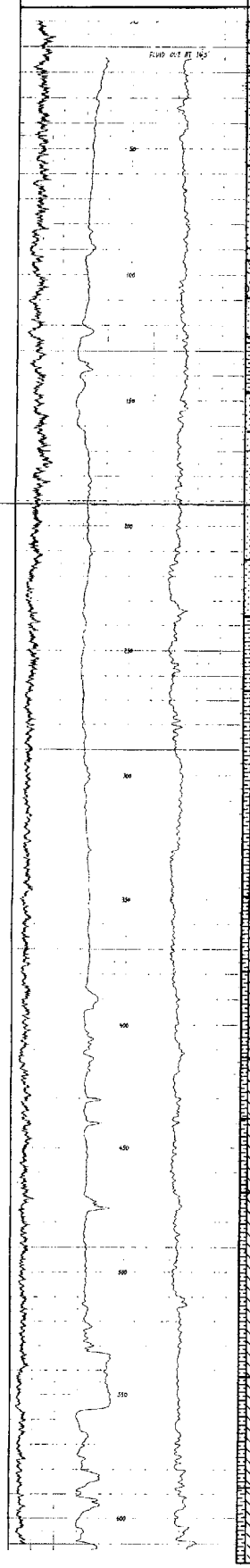
TS 1368 X

DRILL HOLE LOG

186

HOLE No.	77-24	DATE DRILLED	20/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	20/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	20/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	70
LOCATION	L.Frome	DRILLED DEPTH	610'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	610'	LOGGING SPEED	20'/min	FLUID LEVEL	14.5'
GEOLOGIST	M. Bell	ELEVATION	89'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



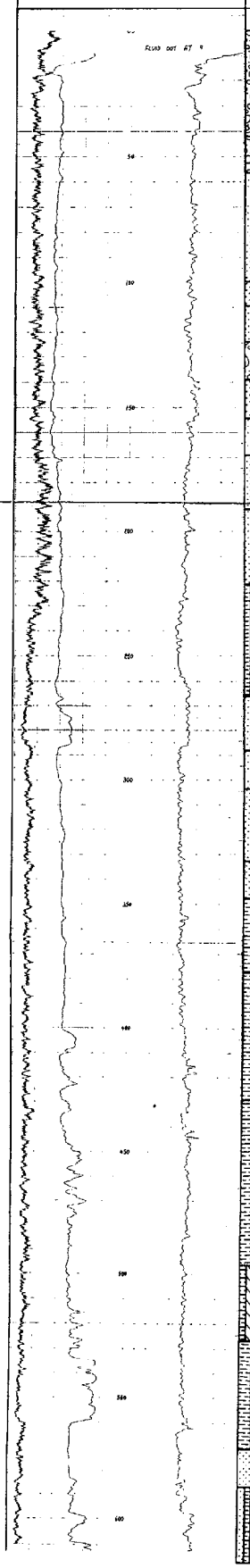
INTERVAL	DESCRIPTION
0' - 20'	MIXED CLASTICS: light brown to creamy.
20' - 57.5	MIXED CLASTICS creamy buff, minor gypsum and limonite.
57.5- 95'	SANDY SILTSTONE: mostly reddish-brown to green grey, minor limonite, limestone, and carbonaceous matter.
95' -110'	MIXED CLASTICS: mostly reddish-brown to green-grey.
110' -125'	SANDY SILTSTONE: dark reddish brown, minor carbonaceous matter.
125' -147.5	SANDSTONE: reddish-brown.
147.5-162.5	SANDY SILTSTONE: light brown to grey-green.
162.5-170'	SANDSTONE: reddish-brown.
170' -192.5	SANDY SILTSTONE: light brown to grey-green.
192.5-215'	MIXED CLASTICS: reddish-brown to grey-green, minor limestone and limonite.
215' -237.5	CLAYSTONE: grey-green, minor limonite, limestone, hematite, and gypsum.
237.5-267.5	CLAYSTONE: mostly very dark grey-green, minor medium grey and creamy clays, minor limonite and purplish hematite stain.
267.5-350'	CLAYSTONE: mostly medium grey, minor creamy, minor limestone and limonite and hematite stain.
350' -380'	CLAYSTONE: medium grey clays, minor dark grey and creamy, minor limonite and hematite and limestone.
380' -415'	CLAYSTONE: medium grey, minor creamy clay, limonite, hematite, and minor gypsum.
415' -440'	CLAYSTONE: light grey to creamy green clays, minor limonite, hematite, and gypsum.
440' -470'	CLAYSTONE: medium grey, minor creamy clay, limonite, hematite, and minor gypsum
470' -545'	CLAYSTONE: light grey to creamy-green clay, minor limonite, hematite, and gypsum.
545' -590'	CLAYSTONE: medium to dark grey, minor creamy clay, minor limonite, hematite, and gypsum.
590' -620'	CLAYSTONE: as above, minor hematite and limonite.
	End of hole.

DRILL HOLE LOG

137

HOLE No.	77-25	DATE DRILLED	21/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	21/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	21/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	70
LOCATION	L.Frome	DRILLED DEPTH	610'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	610'	LOGGING SPEED	20'/min	FLUID LEVEL	9.0'
GEOLOGIST	M. Bell	ELEVATION	102'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McCurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



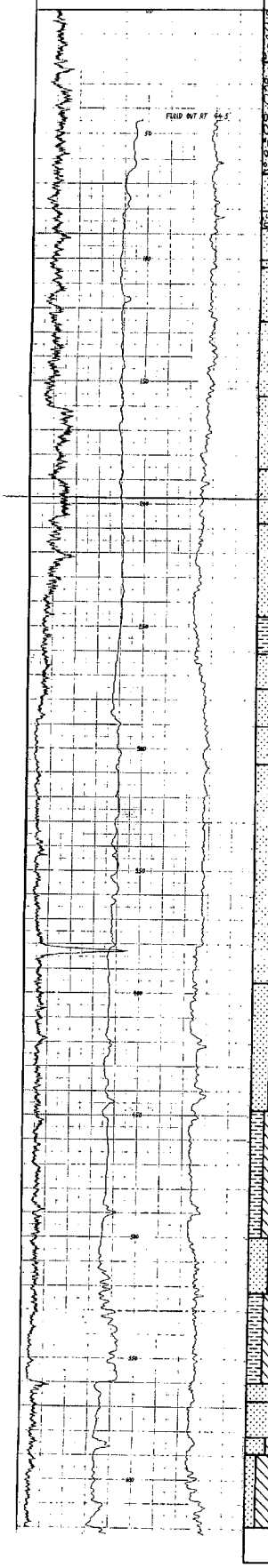
INTERVAL	DESCRIPTION
0' - 42.5	Mainly SAND: light brown with minor limestone.
42.5- 57.5	MIXED CLASTICS: green-grey to red-brown and minor carbonaceous matter
57.5-110'	Mainly SILT: red brown to grey green with minor limestone.
110' -125'	SILTSTONE: red brown to grey green with minor limestone.
125' -140'	SILTY SANDSTONE: red brown.
140' -155'	SILTSTONE: red brown to grey green with minor limestone.
155' -170'	SANDSTONE: green grey to red brown with minor limestone.
170' -192.5	Grey green to red brown SILTSTONE. Abundant red brown to yellow brown carbonaceous matter.
192.5-222.5	SILTSTONE: red brown to green grey.
222.5-267.5	CLASTICS: creamy to light grey with some limonate staining.
267.5-290'	CLASTICS: creamy to light grey with limonite and hematite stains.
290' -305'	CLASTICS: creamy to light grey with minor hematite and limonite.
305' -335'	CLASTICS: very dark grey with minor limestone and hematite limonite stains.
335' -350'	CLASTICS: dark grey to creamy with hematite and limonite stains and minor limestone and gypsum.
350' -365'	CLASTICS: dark grey to creamy with minor hematite and limonite stains, limestone and gypsum.
365' -380'	CLAY: creamy to dark grey with minor limonite and hematite and limestone and gypsum.
380' -402.5	CLAY: creamy to dark grey with limonite and hematite.
402.5-432.5	CLAY: mainly dark grey.
432.5-500'	CLAY: dark grey to creamy minor limonite and hematite and occasional quartz grains.
500' -530'	CLAY: creamy to dark grey with minor limonite and hematite also limestone and gypsum and occasional quartz grains.
530' -575'	CLAY: dark grey to creamy and minor limonite and hematite and limestone and gypsum.
575' -590'	CLAY: light grey and creamy, minor limonite and hematite, limestone and gypsum.
590' -620'	CLAY: light grey mainly with minor limonite and hematite, limestone and gypsum.
	End of hole

DRILL HOLE LOG

186

HOLE No.	77-27	DATE DRILLED	22/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	22/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	22/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	70
LOCATION	L. Frome	DRILLED DEPTH	620'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	620'	LOGGING SPEED	20'/min	FLUID LEVEL	44.5'
GEOLOGIST	M. Bell	ELEVATION	102'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



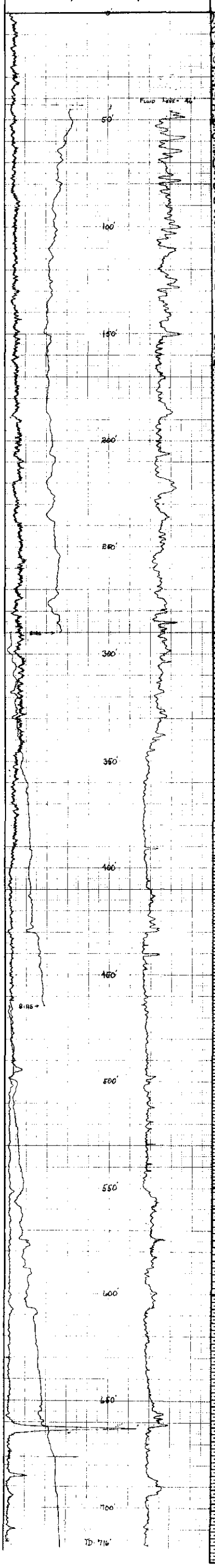
INTERVAL	DESCRIPTION
0' - 20'	MIXED CLASTICS: reddish brown.
20' - 65'	SANDY SILTSTONE: creamy brown to red brown with minor limestone and gypsum.
65' - 80'	MIXED CLASTICS: grey green with minor limestone and limonite stains.
80' - 87.5	SANDSTONE: grey green with small rounded quartz pebbles.
87.5-102.5	MIXED CLASTICS: grey green with minor limestone and limonite stains.
102.5-125'	MIXED CLASTICS: red brown to grey green, occasional coarse sands and limonite stains.
125' -155'	MIXED CLASTICS: dark red brown with small rounded quartzite pebbles.
155' -185'	SANDSTONE: grey green with minor limestone and limonite stains.
185' -207.5	SANDY SILTSTONE: grey green to red brown minor limestone and limonite and occasional pebbles of coarse sands.
207.5-245'	SANDY SILTSTONE: red brown to grey green with minor limestone.
245' -260'	CLAYSTONE: grey green.
260' -275'	CLAYSTONE: creamy with minor lignites and limonites.
275' -290'	CLAYSTONE: creamy to grey purplish minor limonite and hematite.
290' -305'	CLAYSTONE: creamy to purplish grey minor hematites and limonites.
305' -395'	SANDSTONE: grey white and well sorted quartz sands.
395' -447.5	CLAYSTONE: creamy to light grey.
447.5-500'	CLAYSTONE: creamy to dark grey minor hematite and limonite.
500' -522.5	CLAYSTONE
522.5-560'	CLAYSTONE: creamy to dark grey with light grey sands minor hematite and limonite.
560' -567.5	SANDSTONE: medium grey, medium grained well sorted quartz sand.
567.5-582.5	MIXED CLASTICS: medium grained well sorted quartz sand medium grey clay.
582.5-590'	CLAYSTONE: medium grey with well sorted quartz sand medium grained.
590' -620'	CLAYSTONE: creamy to dark grey with fine quartz sand.
	End of hole.

DRILL HOLE LOG

2328(#)-13

HOLE No.	77-1	DATE DRILLED	1/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	2/9/74	RANGE	500	RESIST. SCALE	HT
PROJECT	Poontana	DATE LOGGED	2/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	100
LOCATION	L. Frome	DRILLED DEPTH	725'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	716'	LOGGING SPEED	20'/min	FLUID LEVEL	46'
GEOLOGIST	M. HELL	ELEVATION		BACK GROUND	15 c/s		
DRILLER	G. Sadler	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	D. Stevens			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



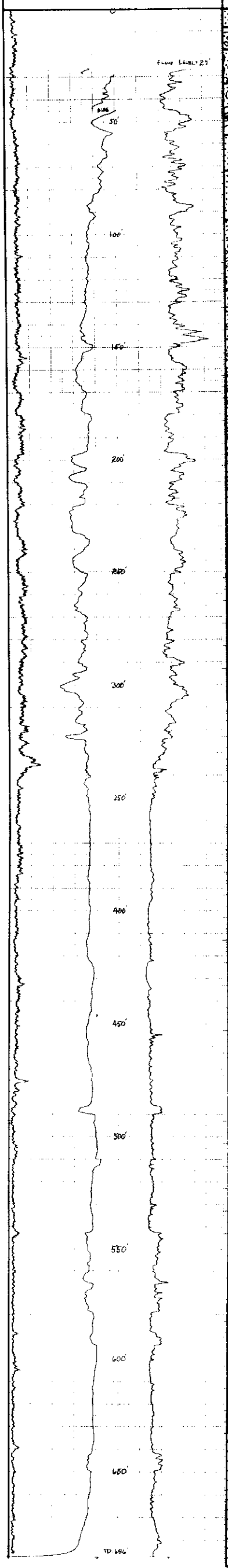
INTERVAL	DESCRIPTION
0'- 15'	Reddish-brown in colour. SANDSTONE 1-2mm, pebble 1-2cm; some feldspar with clay.
15'- 27'	SILCRETE: reddish-brown, coarse sand - angular to sub-rounded pebbles angular.
27'- 34'	SANDSTONE: reddish-brown; sand granitic.
34'- 50'	GRAVEL: reddish-brown; quartz chips to 5cm; pebbles sub-rounded to angular 1-2cm.
50'-165'	SILCRETE: reddish-brown; sub-rounded pebbles and chips to 2cm; coarse granitic sands from 1-2mm.
165'-250'	SILTSTONE: reddish-brown; sand sub-rounded to [illegible] some white and black minerals.
250'-290'	SANDSTONE: reddish-brown; sub-rounded sand 1-2mm.
290'-330'	SANDSTONE: reddish-brown-greyish; [illegible] stain; some clay; granitic [illegible].
330'-395'	CLAYSTONE: Light grey-green silty claystone: some white clay and some yellow stain.
395'-550'	CLAYSTONE: Grey, with some gypsum and limestone fragments to 1cm; some limonite stain, and occasional quartz grains.
550'-560'	CLAYSTONE: Black; angular quartz grains 1-3mm.
560'-600'	CLAYSTONE: Grey with limonite stain and occasional hematite stain.
600'-725'	CLAYSTONE: Light grey - dark grey clays with occasional limonite stain.
	End of hole.

RECEIVED
24 JUL 1975
DM
2328-II

DRILL HOLE LOG 2328(II)-14

HOLE No.	77-2	DATE DRILLED	2/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	3/9/74	RANGE	500	RESIST. SCALE	HI
PROJECT	~~Poontana~~	DATE LOGGED	3/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	100
LOCATION	~~L. Frome~~	DRILLED DEPTH	695'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	686'	LOGGING SPEED	20'/min	FLUID LEVEL	27.0'
GEOLOGIST	M Bell	ELEVATION	151'	BACK GROUND	15 c/s		
DRILLER	~~C. Sadler~~	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	~~D. Stevens~~			K-FACTOR	6.40×10^{-5}		

LITHOLOGY: Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



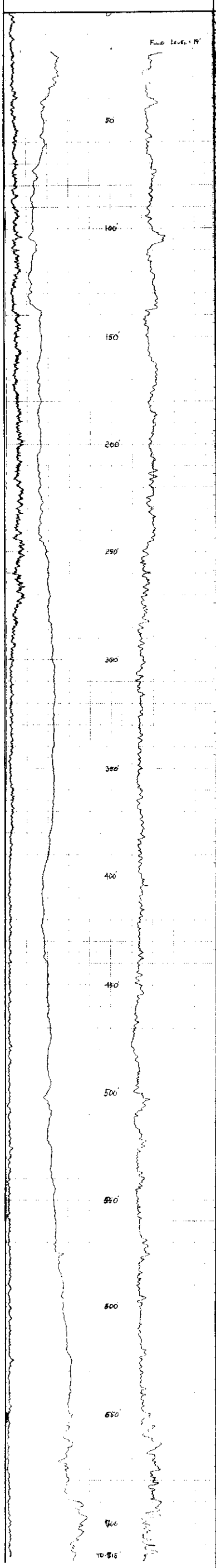
INTERVAL	DESCRIPTION
0'- 10'	SILTSTONE: reddish-brown.
10'- 20'	SILTSTONE: reddish-brown; angular quartzite pebbles to 1cm.
20'- 35'	SILTSTONE: angular to sub-rounded gravels. Grades down to 80% clayey-silt and 20% gravel. Feldspar and quartz fragments.
35'- 50'	SILTSTONE: reddish-brown to white in parts; angular to sub-rounded gravel (quartzitic and granitic)
50'- 57'	SANDSTONE: reddish-brown, coarse quartzitic sand, quartzite gravel to 2cm.
57'- 73'	SILTSTONE: in clay matrix, reddish-brown with white sections.
73'- 95'	SILTSTONE: reddish-brown.
95'-148'	SILTSTONE: reddish-brown; rounded quartz pebbles to 2cm.
148'-177'	SANDSTONE: reddish-brown coarse granitic sand; quartz pebbles angular to sub-rounded.
177'-193'	SANDSTONE: "as above"
193'-215'	SILTSTONE: "as above"
215'-230'	SILTSTONE: as 193'-215'
230'-260'	SANDSTONE: reddish-brown, coarse quartz sand 1-3mm; rounded pebbles 1-2cm, and occasional biotite and feldspar.
260'-275'	CLAYSTONE: grey with some quartz pebbles.
275'-290'	SANDSTONE: dark brown in colour.
290'-305'	CLAYSTONE: reddish-brown with some carbonate material.
305'-340'	SANDSTONE: reddish-brown with white sandy clay. Sand 1-5mm. quartz and minor feldspar.
340'-380'	CLAYSTONE: light greenish-grey, occasional black carbonaceous matter, and limonite stain.
380'-410'	CLAYSTONE: olive-grey, minor Fe stain; occasional quartz grains.
410'-425'	CLAYSTONE: dark grey clay, occasional purple, red and yellow stain.
425'-433'	CLAYSTONE: light olive-grey, with minor limestone fragments.
433'-455'	CLAYSTONE: dark grey.
455'-500'	CLAYSTONE: light grey, minor Fe stain, occasional quartz grains to 1cm.
500'-590'	CLAYSTONE: light to dark grey clays, minor Fe stain, some calcite crystals.
590'-695'	CLAYSTONE: dark grey, limonite stain, lumps of gypsum, greenish-olive clays and grey clays alternate.
	End of hole.

DRILL HOLE LOG

2328(II)-#15

HOLE No.	77-3	DATE DRILLED	3/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	4/9/74	RANGE	500	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	4/9/74	TIME CONSTANT	~~1.0 sec~~	SP. SCALE	100
LOCATION	L. Frome	DRILLED DEPTH	725'	PAPER SPEED	10'/min	BIAS	570
STATE	S.A.	LOGGED DEPTH	715'	LOGGING SPEED	20'/min	FLUID LEVEL	19.0'
GEOLOGIST	M. Bell	ELEVATION	157'	BACK GROUND	15 c/s		
DRILLER	G. Sadler	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	D. Stevens			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous

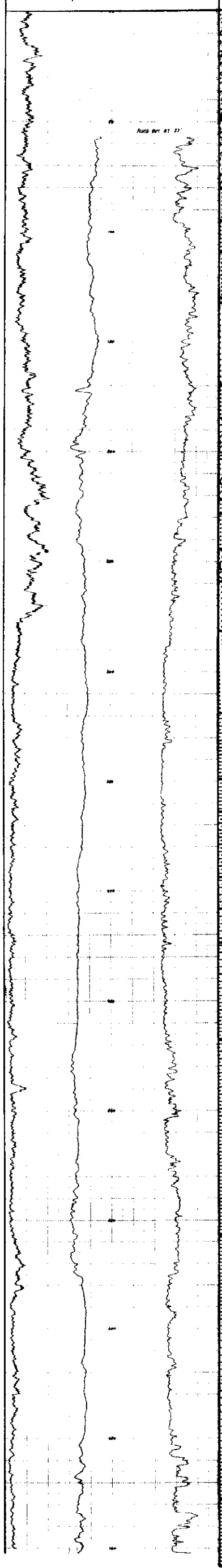


INTERVAL	DESCRIPTION
0'- 20'	GRAVEL:, reddish-brown; pebbles to 3cm; some gypsum, quartzite and granite fragments.
20'- 27.5	SILTSTONE: reddish-brown; pebbles to 1½cm.
27.5- 95'	SILTSTONE: pebble fragments to 2cm.
95'-102.5	SILTSTONE: reddish-brown; some grey clay, sub-rounded pebbles to 2cm.
102.5-110'	SILTSTONE: occasional pebble from 2-3cm, much hematite.
110'-117.5	GRAVEL: reddish-brown; hematite, quartzite, gneiss and gypsum fragments to 1cm, sub-rounded.
117.5-125'	SILTSTONE: Greyish, some hematite fine black minerals, quartzite fragments up to 2cm.
125'-147.5	SANDSTONE: pebbles and fragments up to 2cm, quartz sand 2mm, feldspar remnants.
147.5-177.5	SILTSTONE: grey, hematised, fine mica, broken pebbles or chips to 3cm.
177.5-185'	SANDSTONE: reddish-brown, mostly quartz up to 2mm.
185'-207.5	CLAYSTONE: greyish to reddish-brown, hematised, some limestone and quartz chips 1-2cm.
207.5-260'	CLAYSTONE: olive to brownish, occasional limestone and sand, black grains in clay, limestone in top 15 feet.
260'-275'	CLAYSTONE: greyish-brown to greyish-green, with hematite.
275'-305'	CLAYSTONE: light grey, some limonite and hematite stain.
305'-320'	CLAYSTONE: grey with some limonite and hematite.
320'-327.5	CLAYSTONE: purplish grey, some carbonaceous matter.
327.5-410'	CLAYSTONE: light to dark grey, occasional hematite stain.
410'-455'	CLAYSTONE: light grey, limestone chips to 2cm (possibly fallen down hole) some limonite stain.
455'-470'	CLAYSTONE: dark grey.
470'-500'	CLAYSTONE: light grey with hematite and limonite stain. limestone fragments.
500'-575'	CLAYSTONE: dark to light grey, minor Fe stain and carbonates.
575'-590'	CLAYSTONE: light grey, some dark grey and olive grey.
590'-650'	CLAYSTONE: light to dark grey, minor Fe stain, carbonates and white clay.
650'-680'	CLAYSTONE: light to dark grey, minor gypsum and olive green clay.
680'-710'	CLAYSTONE: light to dark and olive grey, some limonite stain.
710'-725'	CLAYSTONE: dark grey to white, minor Fe stain.
	End of hole.

DRILL HOLE LOG 2328(II)-16

HOLE No.	77-9	DATE DRILLED	8/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	8/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	8/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	110
LOCATION	L. Frome	DRILLED DEPTH	700'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	700'	LOGGING SPEED	20'/min	FLUID LEVEL	57.0'
GEOLOGIST	M/ Bell	ELEVATION	128'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous

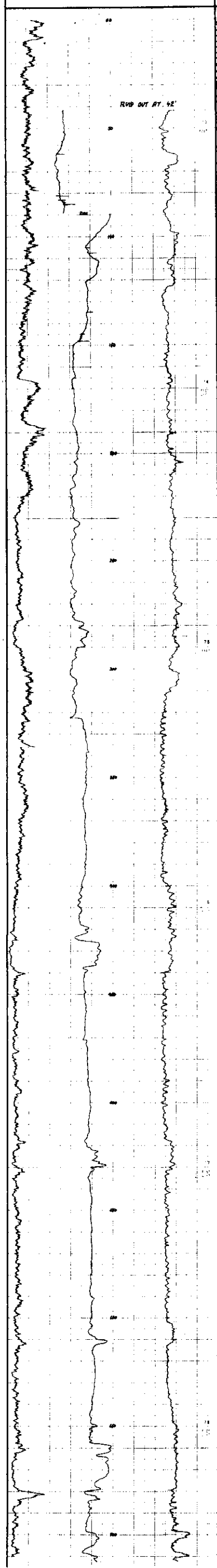


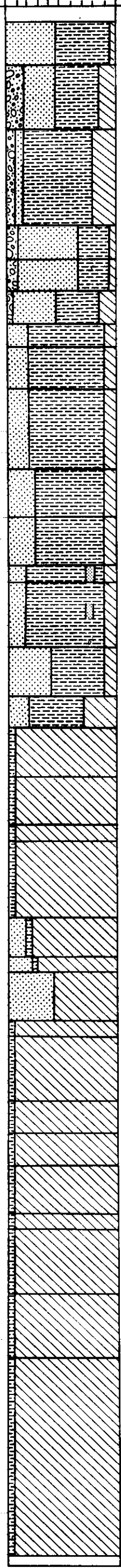
INTERVAL	DESCRIPTION
0' - 20' (Kelly)	SANDSTONE: reddish-brown, gravel 0.5-1cm, quartz and quartzite, clay and silt reddish-brown to cream.
20' - 50'	SANDSTONE (SILTY): reddish-brown creamy silt and clay, pebbles angular to sub-rounded 1-3cm.
50' - 80'	SANDSTONE (SILTY): as above, with minor carbonate and carbonaceous matter.
80' - 95'	SANSSTONE: reddish-brown.
95' -110'	SANDSTONE: reddish-brown, minor carbonate and carbonaceous matter.
110' -132.5	SANDSTONE (SILTY): reddish-brown to creamy silt and clay, minor carbonaceous matter.
132.5-170'	SANDSTONE: as above, minor carbonate and carbonaceous matter.
170' -185'	SANDSTONE: reddish-brown to cream, fine to medium sand.
185' -222.5	SANDSTONE: reddish-brown to cream.
222.5-230'	SILTSTONE: reddish-brown to creamy grey, medium to coarse sand.
230' -245'	SILTSTONE: as above, some limonite stain and minor carbonaceous matter.
245' -260'	SANDSTONE: reddish-brown to greenish-grey silt, clay red-brown to cream.
260' -282.5	SILTSTONE: reddish-brown to greenish grey, minor gypsum.
282.5-320'	CLAYSTONE: creamy grey, hematite and limonite stain, minor carbonaceous matter.
320' -350'	CLAYSTONE: light grey clay with hematite and limonite stains.
350' -365'	CLAYSTONE: grey, minor carbonaceous matter.
365' -395'	CLAYSTONE: mostly very dark grey, minor grey brown-creamy.
395' -410'	CLAYSTONE: grey, minor carbonaceous matter.
410' -425'	CLAYSTONE: mostly very dark grey, minor grey brown-creamy.
425' -440'	CLAYSTONE: mostly medium grey, minor light grey-red-brown to creamy.
440' -560'	CLAYSTONE: mostly dark grey, minor light grey to cream-reddish-brown clay, hematite and limonite stains.
560' -680'	CLAYSTONE: mostly dark grey, minor light grey to cream to red-brown. Olive green to yellow, brown to red-brown iron stains.
680' -710'	CLAYSTONE: mostly medium grey, minor red-brown clay, small carbonate bands.
	End of hole.

DRILL HOLE LOG 2328 (F) #17

HOLE No.	77-14	DATE DRILLED	11/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	11/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	11/9/74	TIME CONSTANT	2.0 sec	SP. SCALE	110
LOCATION	L.Frome	DRILLED DEPTH	710'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	710'	LOGGING SPEED	20'/min	FLUID LEVEL	42.0'
GEOLOGIST	M. Bell	ELEVATION	151'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous





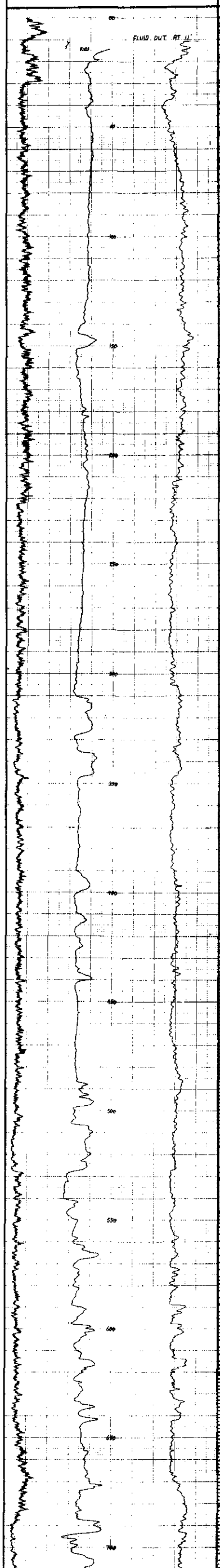
INTERVAL	DESCRIPTION
0' - 20'	CLASTICS: reddish brown.
20' - 50'	CLASTICS: reddish-brown, clay red-brown to cream, pebbles quartzite and carbonate.
50' - 95'	SILTSTONE: reddish brown, clay red-brown to cream, minor carbonate.
95' -125'	SANDSTONE (SILTY): reddish brown, clay red-brown to grey-green.
125' -140'	CLASTICS: reddish brown, minor carbonate.
140' -207.5	SILTSTONE: dark reddish brown.
207.5-252.5	SILTSTONE: red-brown to grey-green.
252.5-290'	SILTSTONE: brick red to light grey, minor carbonaceous matter.
290' -312.5	CLASTICS: reddish brown to light grey.
312.5-327.5	SILTSTONE: light grey to green-grey, minor limonite and hematite stain.
327.5-350'	CLAYSTONE: mostly dark grey, minor light cream to medium grey.
350' -372.5	CLAYSTONE: mostly medium grey, minor dark grey, light grey to cream and red-brown.
372.5-415'	CLAYSTONE: mostly dark grey, minor light grey and red-brown clay, minor limonite and hematite.
415' -432.5	CLAYSTONE: mostly medium grey, minor cream to red, minor limonite and hematite stain, fine white quartz sand.
432.5-440'	CLAYSTONE: mostly medium grey, minor cream, red-brown to dark grey, minor limonite and hematite stain.
440' -462.5	CLAYSTONE: mostly medium grey, minor red-brown to creamy and dark grey.
462.5-515'	CLAYSTONE: mostly medium grey, minor creamy, red-brown-dark grey, minor hematite and limonite stain.
515' -530'	CLAYSTONE: mostly dark grey, minor medium grey to creamy grey and red-brown limonite and hematite stains?
530' -552.5	CLAYSTONE: mostly medium grey, minor dark grey, creamy-grey to red-brown, hematite and limonite stain.
552.5-590'	CLAYSTONE: mostly dark and medium grey, minor creamy-grey to red-brown, hematite and limonite stain.
590' -620'	CLAYSTONE: mostly dark grey, minor medium grey to creamy grey and red-brown, limonite and hematite stain.
620' -710'	CLAYSTONE: mostly dark grey, minor medium grey to creamy grey and red-brown, hematite and limonite stains.
	End of hole.

TS 1368 U

DRILL HOLE LOG 2328(#)-18

HOLE No.	77-21	DATE DRILLED	17/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	17/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Penrhyn	DATE LOGGED	19/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	70
LOCATION	L. Frome	DRILLED DEPTH	710'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	710'	LOGGING SPEED	20'/min	FLUID LEVEL	11.0'
GEOLOGIST	M. Bell	ELEVATION	95'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McCrae			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



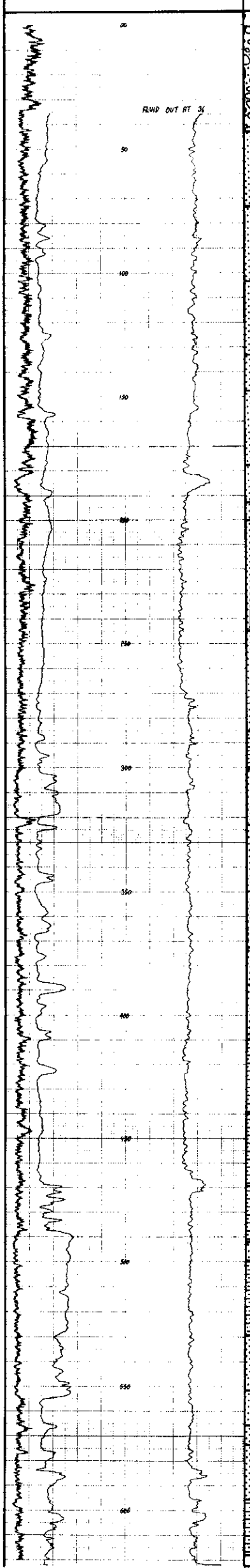
INTERVAL	DESCRIPTION
0' - 35'	MIXED CLASTICS: creamy buff colour, some muscovite and feldspars.
35' - 50'	MIXED CLASTICS: light creamy brown, small angular pebbles (1-2cm). Minor limonite.
50' - 65'	MIXED CLASTICS: reddish-brown, occasionally creamy grey, limestone fragments.
65' -110'	MIXED CLASTICS: reddish-brown, occasionally creamy grey, fine to medium sand, limestone fragments.
110' -125'	MIXED CLASTICS: reddish-brown, minor carbonaceous matter.
125' -155'	MIXED CLASTICS: light greenish grey (occasional reddish brown).
155' -170'	SANDSTONE: light grey, minor limestone fragments.
170' -185'	SILTSTONE: light greenish-grey to reddish-brown.
185' -245'	SILTY CLAYSTONE: light greenish-grey (occasional reddish-brown), minor limestone and limonite stains.
245' -267.5	CLAYSTONE: light grey, some hematite stained, minor limestone.
267.5-282.5	CLAYSTONE: medium grey, some hematite stained red clays.
282.5-290'	CLAYSTONE: dark grey, minor red clays and limestone.
290' -312.5	CLAYSTONE: medium grey, some hematite stained red clays.
312.5-320'	CLAYSTONE: mostly medium grey clays, minor dark grey, creamy and red clay.
320' -335'	CLAYSTONE: medium grey, sandy and silty, minor limonite.
335' -342.5	SANDSTONE: creamy and grey clay.
342.5-350'	SANDY CLAYSTONE: medium grey claystone, minor creamy and reddish brown.
350' -357.5	SANDY CLAYSTONE: creamy greenish-grey clays.
357.5-372.5	SANDY CLAYSTONE. medium grey clays, some creamy and reddish-brown.
372.5-515'	CLAYSTONE: medium grey clays, minor dark grey, creamy, and reddish-brown clay, minor limonite and hematite.
515' -530'	SANDY CLAYSTONE: medium grey clay, minor creamy and reddish brown clay.
530' -545'	SANDSTONE: medium grey.
545' -620'	CLAYSTONE: medium grey, minor creamy and reddish brown clays, limonite and hematite stain.
620' -680'	CLAYSTONE: medium grey, minor white and reddish-browns, limonite and hematite stain.
680' -710'	CLAYSTONE: mostly dark grey, minor cream white and reddish-brown clay.
	End of hole

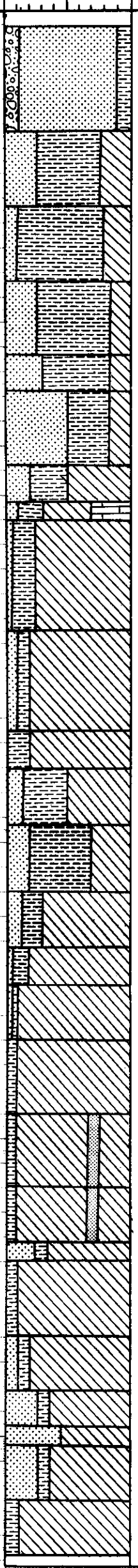
DRILL HOLE LOG

2328(II)-19

HOLE No.	77-22	DATE DRILLED	19/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	19/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	19/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	70
LOCATION	L. Frome	DRILLED DEPTH	620'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	620'	LOGGING SPEED	20'/min	FLUID LEVEL	36.0'
GEOLOGIST	M. Bell	ELEVATION	92'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McCourt			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous





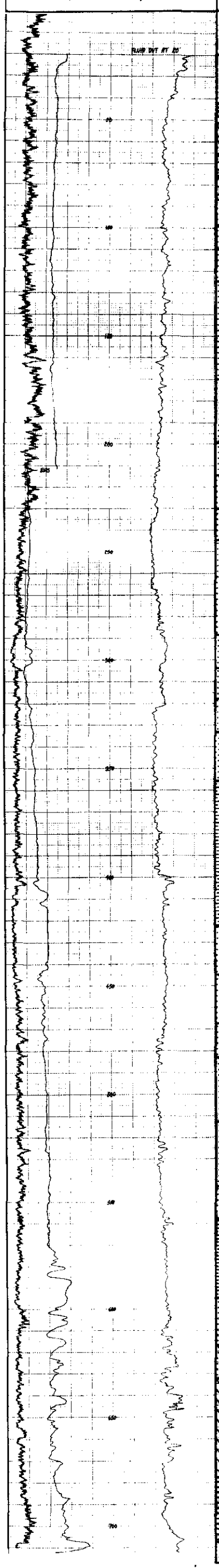
INTERVAL	DESCRIPTION
0' - 42.5	SANDY CLASTICS: Light brown, pebbles and limestone fragments (1-3cm).
42.5- 72.5	CLASTICS: reddish brown to grey-green, minor limestone and carbonaceous matter.
72.5-102.5	SILTSTONE: reddish brown to grey-green, minor lignites and limestone.
102.5-132.5	SANDY SILTSTONE: reddish-brown to grey green, minor limestone and carbonaceous matter.
132.5-177.5	SILTY SANDSTONE: greenish-grey, minor limonite and hematite stain.
177.5-192.5	MIXED CLASTICS: mostly reddish-brown, minor grey green.
192.5-200'	MIXED CLASTICS: greyish-green to reddish brown.
200' -245'	CLAYSTONE: grey-green, minor limonite and hematite stain.
245' -290'	CLAYSTONE: medium to dark grey, minor limonite and hematite sand.
290' -305'	CLAYSTONE: light grey clay, minor reddish-brown clay.
305' -327.5	MIXED CLASTICS: mostly olive brown, some grey clay, minor limonite stain.
327.5-350'	MIXED CLASTICS: light grey, minor creamy clay, limonite and hematite stains.
350' -372.5	CLAYSTONE: light grey-green, minor creamy clay.
372.5-387.5	CLAYSTONE: light grey, minor creamy and red brown.
387.5-410'	CLAYSTONE: mostly light grey, some creamy clay, minor limonite and hematite stain.
410' -440'	CLAYSTONE: medium grey, minor creamy clay, limonite and hematite stain.
440' -470'	CLAYSTONE: mostly medium to dark grey, abundant carbonaceous matter.
470' -492.5	CLAYSTONE: mostly medium to dark grey, some light grey and creamy, limonite and hematite stain.
492.5-500'	SANDY CLAYSTONE: medium grey clays, minor creamy clay.
500' -530'	CLAYSTONE: mostly medium to dark grey clays, some light grey and creamy.
530' -552.5	SANDY CLAYSTONE: mostly medium to dark grey clays, some creamy clays, limonite and hematite stain.
552.5-567.5	SANDY CLAYSTONE: medium to dark grey, some light grey.
567.5-575'	SANDY CLAYSTONE: medium to dark grey, some creamy clay.
575' -597.5	SANDY CLAYSTONE: medium to dark grey, some light grey.
597.5-620'	CLAYSTONE: medium to dark grey, some light grey and creamy clay.
	End of hole.

DRILL HOLE LOG

2328(II)-20

HOLE No.	77-26	DATE DRILLED	22/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	22/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	22/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	70
LOCATION	L. Frome	DRILLED DEPTH	710'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	710'	LOGGING SPEED	20'/min	FLUID LEVEL	20.0'
GEOLOGIST	M. Hall	ELEVATION	102'	BACK GROUND	15 c/s		
DRILLER	R. Wilson	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McCourt			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel · Sand · Silt · Clay · Carbonate · Carbonaceous



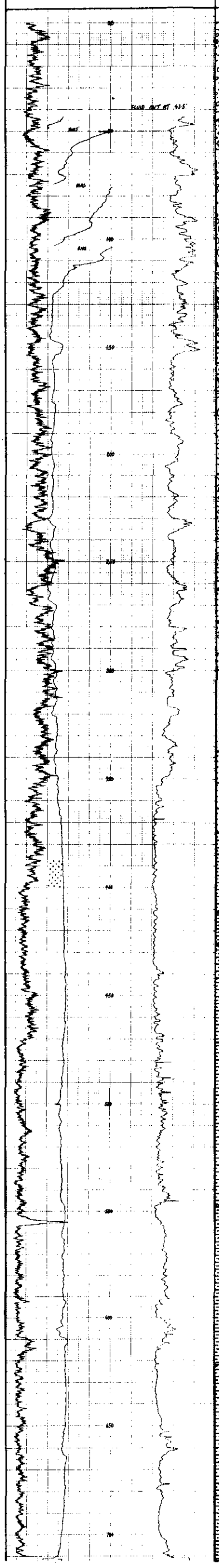
INTERVAL	DESCRIPTION
0' - 20'	SANDSTONE: light brown to creamy with minor limestone.
20' - 42.5	SANDSTONE: light brown with minor limestone.
42.5- 87.5	CLASTICS: light brown to grey green with limestone (mixed).
87.5-110'	SANDY SILTSTONE: light green grey to red brown with minor limestone, lignite and limonite.
110' -125'	SANDSTONE: creamy grey to red brown with minor limestone.
125' -170'	CLASTICS: grey green to red brown with occasional limestone fragments (mixed).
170' -200'	SANDSTONE: creamy grey to light brown.
200' -215'	SANDSTONE: creamy grey to red brown with minor limestone.
215' -230'	SANDSTONE: creamy grey to light brown.
230' -245'	MIXED CLASTICS: green grey to red brown with minor limestone.
245' -290'	MIXED CLASTICS: creamy to light grey with minor limonite and hematite stains.
290' -305'	MIXED CLASTICS: creamy to light grey with minor limonite and hematite stains.
305' -320'	SANDSTONE: creamy to reddish brown, minor limonite and hematite staining.
320' -335'	MIXED CLASTICS: creamy grey.
335' -357.5	CLAYSTONE: creamy to light grey with minor limonite.
357.5-425'	CLAYSTONE: creamy to grey with minor hematite and limonite.
425' -447.5	CLAYSTONE: creamy grey with minor limonite and hematite and occasional quartz grain up to 4mm.
447.5-470'	MIXED CLASTICS: white to dark grey, minor limonite and hematite.
470' -485'	CLAYSTONE: white to dark grey, minor limonite and hematite.
485' -515'	CLAYSTONE: white to dark grey with minor hematite and limonite.
515' -545'	CLAYSTONE: white to dark grey with minor hematite and limonite and occasional quartz grains.
545' -560'	CLAYSTONE: white to dark grey with minor hematite and limonite.
560' -597.5	CLAYSTONE: creamy to dark grey with minor hematite and limonite and occasional quartz grains.
597.5-620'	CLAYSTONE: white to dark grey with minor hematite and limonite.
620' -635'	CLAYSTONE: white to dark grey with minor hematite and limonite.
635' -680'	CLAYSTONE: cream to dark grey, minor limonite and hematite stains.
680' -710'	CLAYSTONE: cream to dark grey with minor limonite and hematite, occasional quartz grains.
	End of hole.

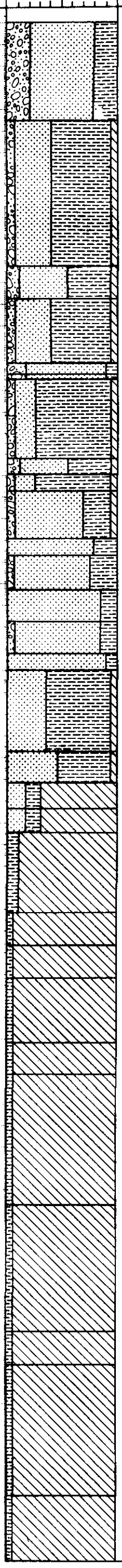
DRILL HOLE LOG

2328(II) 21

HOLE No.	77-28	DATE DRILLED	22/9/74	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	23/9/74	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	23/9/74	TIME CONSTANT	1.0 sec	SP. SCALE	70
LOCATION	L.Frome	DRILLED DEPTH	710'	PAPER SPEED	10'/in	BIAS	570
STATE	S.A.	LOGGED DEPTH	710'	LOGGING SPEED	20'/min	FLUID LEVEL	43.5'
GEOLOGIST	M. Bell	ELEVATION	164'	BACK GROUND	15 c/s		
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.0 sec		
LOGGER	R. McGurk			K-FACTOR	6.40×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous





INTERVAL	DESCRIPTION
0' - 42.5	Small PEBBLES angular to sub-rounded.
42.5-110'	Small PEBBLES, coarse and fine sand. Dark red brown silt, occasional light grey clay, occasional limestone.
110' -125'	Small PEBBLES including limestone fragments. Coarse, fine to medium sand, dark red brown silt, clay.
125' -155'	Small PEBBLES including limestone fragments. Coarse, fine to medium sand, dark brown red silt, clay.
155' -162.5	Small PEBBLES with coarse sand reddish brown and dark reddish brown silt.
162.5-200'	Small PEBBLES with dark reddish brown silt, dark reddish brown clay and fine sand.
200' -207.5	Small PEBBLES with dark reddish brown silt, dark reddish brown clay and fine sand.
207.5-215'	Small PEBBLES, coarse and fine sand. Dark reddish brown silt occasional light grey clay, occasional limestone.
215' -237.5	Fine to medium SAND, coarse sand and dark reddish brown silt, clay. Fine to medium sand and dark reddish brown
237.5-245'	Small PEBBLES, coarse sand and dark reddish brown silt.
245' -260'	Small PEBBLES, fine to medium sand and dark reddish brown silt.
260' -275'	Fine to medium SAND, coarse sand and dark reddish brown silt.
275' -290'	Small PEBBLES, dark reddish brown silt and coarse sand.
290' -297.5	Fine SAND and dark reddish brown silt.
297.5-335'	Coarse SAND, fine to medium sand and dark reddish brown silt clay. Minor limestone.
335' -350'	Coarse SAND, fine to medium sand and reddish brown to light creamy silt clay.
350' -372.5	Fine to medium SAND, creamy green grey to reddish brown silt clay.
372.5-410'	Light greeny grey SAND and light greeny grey clay. Minor limonite stains.
410' -425'	SILT and light greeny grey clay and purplish mid grey clay. Minor hematite stains.
425' -440'	SILT, dark grey clay, creamy light greeny grey clay. Minor limonite and hematite stains.
440' -470'	SILT, greenish grey clay, creamy clay and dark grey clay. Minor limonite and hematite stains.
470' -485'	SILT, dark grey clay, creamy clay, greenish grey clay, minor limonite, hematite and minor gypsum.
485' -545'	SILT, dark grey clay, creamy clay, greenish grey clay, minor limonite, hematite and minor gypsum.
545' -605'	SILT, light grey clay, mid grey clay, creamy clay, minor limonite and hematite and gypsum.
605' -620'	SILT, dark grey clay, mid grey clay and creamy clay, minor limonite, hematite and occasional quartz grain.
620' -680'	SILT: greenish grey clay, dark grey clay, creamy clay, minor limonite, hematite.
680' -710'	SILT: dark grey clay, mid grey clay, creamy clay, trace light grey clay.
	End of hole.

BP Minerals Australia Proprietary Limited
Incorporated in Victoria

189

1 Albert Road, Melbourne
Postal Address: G.P.O. Box 5222BB, Melbourne, 3001
Telephone: 26-6911 Telex: 30166 Telegraphic Address: "Austbeepee", Melbourne

The Director of Mines
Department of Mines
Box 38, Rundle Str. Post Office,
ADELAIDE S.A. 5000

Our Reference	Your Reference	Telephone Ext'n	Date
AG/27/16/14/1			16th September, 1975.

Dear Sir,

EXPLORATION LICENCE 77 - QUARTERLY REPORT FOR THE PERIOD ENDED JUNE 1975.

An application was lodged by BP Minerals Australia Pty Ltd on behalf of the registered holders to reapply for the area covered by Exploration Licence No. 77, which was due to expire on the 5th August.

An open-hole rotary drilling programme was completed on EL 77 during the quarter. Twenty holes were drilled and logged for gamma, resistivity and SP response for a total of 4,300 metres. The holes ranged in depth from 194 to 304 metres and were drilled in the Poontana Creek and Paralana Creek areas.

A summary of the drilling results is given in the attached Table I. The Eyre Formation was intersected in several holes but the results from the Eyre Formation were not encouraging.

Several good anomalies were picked up in the Paralana Creek area and in particular in drill hole 77-44 where seven radioactive zones were intersected between 532 and 900 feet. Five of the zones are below the limit of previous drilling. The new drill hole locations are indicated on the enclosed map.

..2

The preparation of a report on this drilling programme is in hand.

Quarterly expenditure statements have been forwarded to the department and receipt thereof acknowledged.

We regret the delay in lodging the quarterly report and hope that you have not been inconvenienced.

Yours faithfully,

Dr. J. H. Hills
Senior Geologist (Uranium)

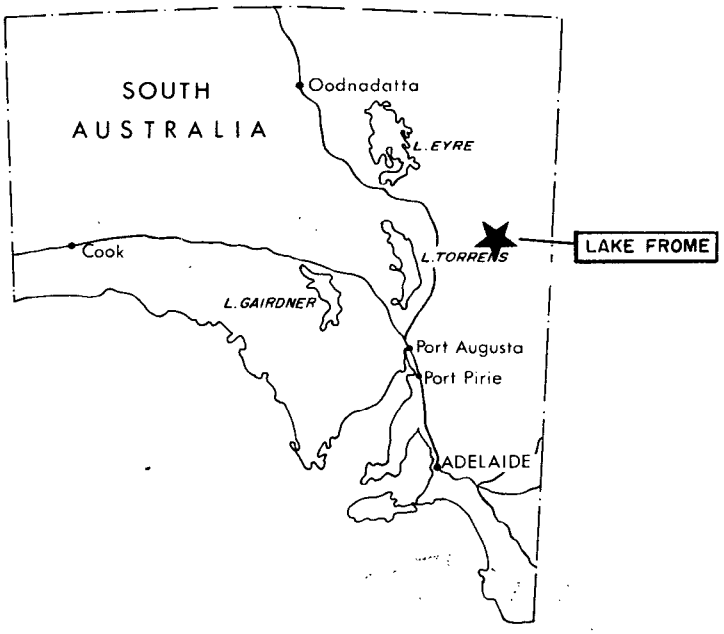
Enc.

Table I

DRILL DATA

HOLE N°	DATE COMPLETED	DRILLED DEPTH (M)	LOGGED DEPTH (M)	Radiometric Anomalies C/S	X BKG	DEPTH	THICKNESS
77 - 29	29/4/75	196.7	194.5	-	-	-	-
77 - 30	30/4	196.7	194.5	-	-	-	-
77 - 31	1/5	196.7	194.5	-	-	-	-
77 - 32	2/5	189.5	188.3	48	8-10	129.0	0.5
77 - 33	3/5	196.7	194.0	-	-	-	-
77 - 34	4/5	196.7	194.2	-	-	-	-
77 - 35	5/5	196.7	194.5	19	2.5	116.0	0.3
77 - 36	6/5	196.7	194.5	-	-	-	-
77 - 37	7/5	196.7	194.5	-	-	-	-
77 - 38	8/5	196.7	194.5	22	3.0	104.0	1.3
77 - 39	11/5	306.4	304.5	30	3.0	133.5	0.5
				32	2.5	201.0	0.6
77 - 40	12/5	196.7	194.5	35	6.0	86.8	0.5
				20	2.5	137.0	0.8
77 - 41	14/5	289.6	288.0	31	2.5	199.0	1.0
77 - 42	16/5	196.7	194.5	-	-	-	-
77 - 43	18/5	306.5	304.5	65	10.0	116.8	0.5
77 - 44	21/5	306.6	305.5	585	23.0	162.0	0.5
				550	22.0	172.0	0.4
				447	18.0	216.0	0.6
				46	3.0	234.0	0.4
				142	7.0	257.0	0.3
				48	5.0	263.7	0.4
				655	33.0	274.0	0.5
77 - 45	23/5	255.8	257.0	201	10.0	69.5	0.7
				108	5.0	117.5	0.5
77 - 46	25/5	306.6	304.5	50	5.0	129.0	0.3
77 - 46	25/5	306.6	304.5	85	8.5	136.0	0.6
				40	4.0	140.5	0.3
				32	3.2	163.5	0.5
				47	4.7	190.7	0.4
				45	4.5	206.7	0.4
77 - 47	27/5	215.5	214.0	92	9.2	131.3	0.5
				30	3.0	147.4	0.3

MSB/YT
5/6/1975



LOCATION MAP

1975

DRILLING PROGRAMME No.1

EL 77

LAKE FROME EMBAYMENT

SOUTH AUSTRALIA

2328
RECEIVED
21 OCT 1975
DEPT. OF MINES
SECURITY

BP MINERALS AUSTRALIA PTY LTD

1975 DRILLING PROGRAMME No. 1

EL 77

LAKE FROME EMBAYMENT, SOUTH AUSTRALIA

M.S. BELL
Melbourne - Victoria
September, 1975.

C O N T E N T S

SUMMARY

LIST OF ILLUSTRATIONS

		Page No.
1.	INTRODUCTION	1
2.	PREVIOUS EXPLORATION	1
3.	GEOLOGY	1
3.1	STRATIGRAPHY	1
3.2	STRUCTURAL INTERPRETATION	2
4.	1975 EXPLORATION PROGRAMME	3
4.1	DRILLING RESULTS	3
4.2	INTERPRETATION OF DRILLING AND LOGGING RESULTS	3
4.3	PERSONNEL	7
5.	CONCLUSIONS AND RECOMMENDATIONS	8
6.	REFERENCES	9
7.	APPENDICES - DRILL HOLE LOGS	9

S U M M A R Y

Exploration Licence 77 is located in the Lake Frome Embayment of South Australia, and approximately 400 miles north of Adelaide. The Embayment is an extension of the Great Artesian Basin, and is bounded on the west, south, and east by hills and mountains of Precambrian rocks.

Uranium mineralization is found in the Proterozoic rocks, and in the Tertiary sediments within the embayment.

Work commenced in April with a rotary drilling programme of 19 holes. The holes drilled in the 1974 programme were surveyed and waters sampled.

Drilling on the target near Poontana Creek did not locate any larger anomalies than those previously found.

Several anomalies were found in hole 77-44, drilled near Paralana Creek, on the south section of the licence.

L I S T O F I L L U S T R A T I O N S

TABLES (Following Page 9).

Table	I	Lithological Data
Table	II	Sand Horizons
Table	III	Radiometric Data
Table	IV	Drill Hole 77-44 - % e U_3O_8 From Gamma Log

FIGURES

FIG.	I	E.L. Location Map (after page 1)
FIG.	II	Drill Hole Location and Sections (In back pocket)
FIG.	III	Schematic Stratigraphic Column (After Page 3)
FIG.	IV	Structural Interpretation Showing Possible Faults and Channels (In back pocket)
FIG.	V	Section I (Sections in back pocket)
FIG.	VI	Section II
FIG.	VII	Section III
FIG.	VIII	Section IV
FIG.	IX	Section V
FIG.	X	Section VI A
FIG.	XI	Section VI B
FIG,	XII	Section VII
FIG.	XIII	Section VIII A
FIG.	XIV	Section VIII B

1. INTRODUCTION

197

Exploration Licence 77 (S.M.L. 586) was granted to Oilmin-Transoil-Petromin (O.T.P.) on 30 April, 1971. On 14th July, 1971 final agreement was reached on a farm-in between O.T.P. and Minad - Teton Australia Pty Ltd. (M.T.A.). The required work earned M.T.A. a 50% interest in the licence.

On 4th July, 1974 a joint-venture between the partners and BP Minerals Australia Pty Ltd. was ratified by the Minister of Mines of South Australia.

The exploration licence, covering approximately 311 square miles, is located on the alluvial planes of the Flinders Ranges, north west of the north end of Lake Frome. It adjoins EL 92 (S.M.L. 588) to the north; EL 153, EL 152 and another section of EL 92 (S.M.L. 564) to the west; another section of EL 92 (S.M.L. 587) to the south; and EL 176 (EL 19, or S.M.L. 634) to the southeast. The ground is open to the northeast towards the south end of Lake Callabonna.

The object of the drill programme was to do detailed drilling on the Poontana Creek target, and to test the Eyre Formation for radioactivity in the Poontana Creek and Paralana Creek areas.

2. PREVIOUS EXPLORATION

An account of the previous work done is given in the report on the 1974 drilling programme on EL 77 (Bell, 1975).

The 1974 programme included water sampling, resistivity surveying, and rotary drilling. The hole numbers were 77-1 to 77-28.

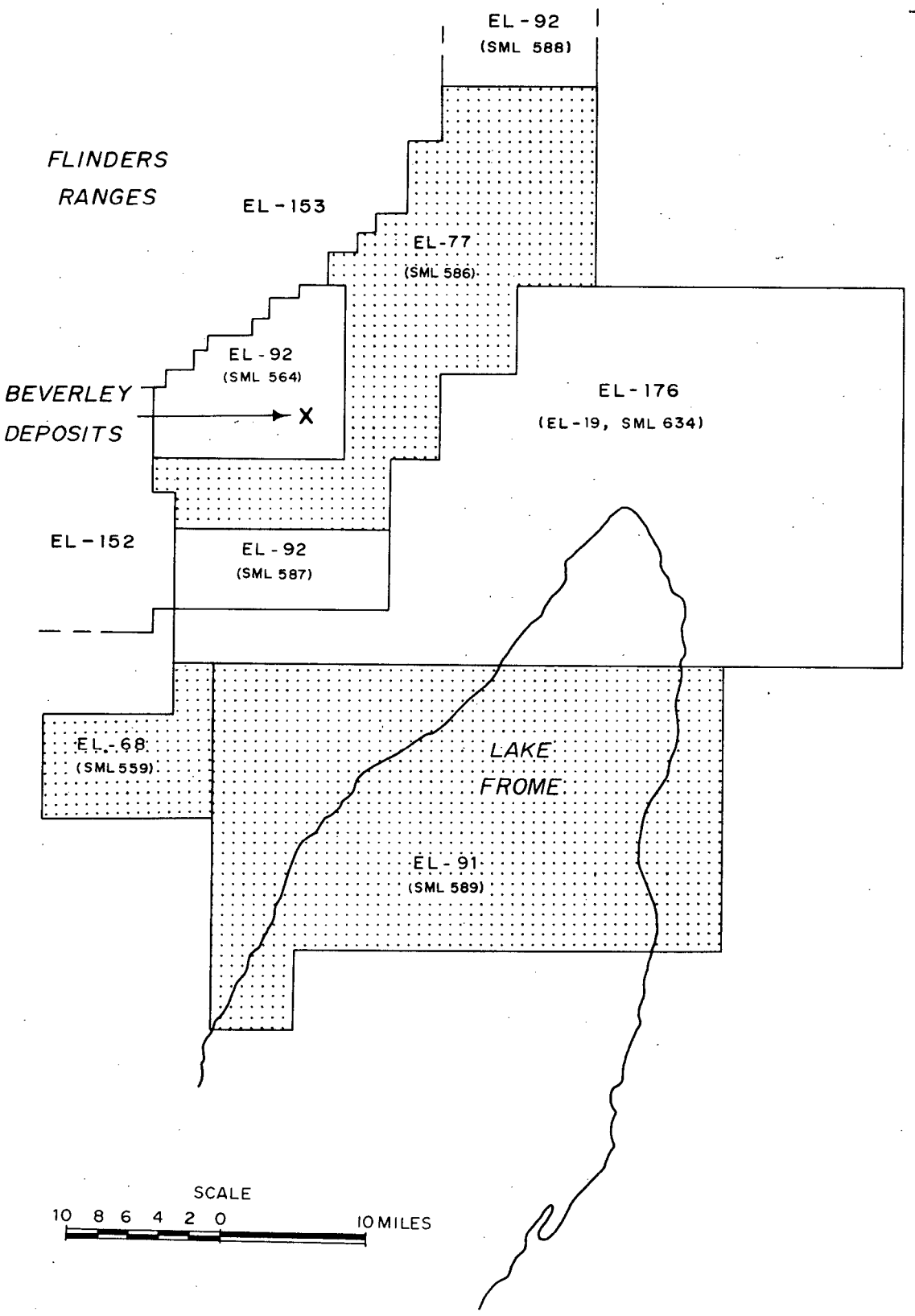
No outstanding anomalies were found, but a favourable sand horizon with minor anomalies was found in the Poontana Creek area (Bell,1975).

3. GEOLOGY

3.1 Stratigraphy (FIG. III)

The stratigraphy in the Poontana Sub-basin is discussed in the report on the 1974 drilling programme EL 77 (Bell, 1975).

A schematic stratigraphic column is shown in Figure III.



EXPLORATION LEASES ON NORTH WEST SIDE
OF LAKE FROME EMBAYMENT

FIGURE 1

Previous drilling by BP Minerals Australia P/L was confined to the Tertiary Formation (Upper and Lower Clays), but in the last programme four holes penetrated into the Eyre Formation (Lower Tertiary Sands).

The Cretaceous was not intersected in any of the holes.

3.2 Structural Interpretation

The major geological features in the licence area is the Poontana Sub-basin. This is a downwarp extending from the Lake Callabonna-Lake Frome lineament in the east, to the Flinders Ranges in the west and southwest, and the Mt. Painter Ridge in the north. This basin is believed to have existed from early Tertiary time to very recent times. (FIG.IV)

The major structure in the sub-basin is the Poontana fault-monocline towards the west side. This feature, with downthrow to the east, passes through Paralana out-station, the Paralana Block and extends in a N-S direction for at least 28 miles. About four miles north of the out-station it passes to the west of the Beverley deposit and eventually is lost in the Flinders Ranges. The southern limit of the Poontana structure is not known though it has been recognized in drilling 12 miles south of Paralana out-station. A geomorphic reflection of the structure can be seen in the linear alignment and sharp truncation of recent gravels extending out from the base of the Flinders Ranges from a line north of the Beverley deposit to the southern margin of the Paralana Block. In the sub-surface the position of the structure is identified by the abrupt drop of Tertiary marker beds to the east, and by the increase in thickness of the oxidized Upper Clastics. West of the Poontana structure the clastics average 180 feet thick, but to the east of the structure thickness increases to approximately 400 feet.

In addition to the major downwarping to the east along the Poontana structure, sagging has also taken place to the west, tending to make the structure a barrier between the groundwater systems of the west and of the east (Bryan 1971).

The latest drilling indicates a NE-SW striking stream, along the south-east side of the licence area. (FIG. IV), and not a delta as was first interpreted. Also the previously interrupted fault in the same area was not located.

Other structures indicated (FIG. IV) have been copied or interpreted mainly from topographic and geological maps.

4. 1975 EXPLORATION PROGRAMME

The latest exploration done on the licence included the open hole rotary drilling and logging of 19 holes, stadia surveying of the hole collars, and sampling waters in the 28 holes that weredrilled in the 1974 programme.

The drilling was done by Thompson Drilling Co. Pty Ltd. of Millicent, South Australia, and the down-hole logging was done by Geoscience Associates (Aust.) Pty Ltd of Adelaide, South Australia.

4.1 Drilling Results

From 28th April 1975 to 27th May 1975, 19 rotary non-coring holes were drilled on EL 77. A total of 4,303.2 metres was drilled and holes varied from 188.5 metres to 304.5 metres in depth (Table I). Three areas were drilled, as follows: Area IV (Poontana Creek) 15 holes; Area V (Paralana Creek) 2 holes; and Area VI (Pipeline) 2 holes. In area IV some thick sand horizons were located, and in Area V some anomalous radioactivity was detected.

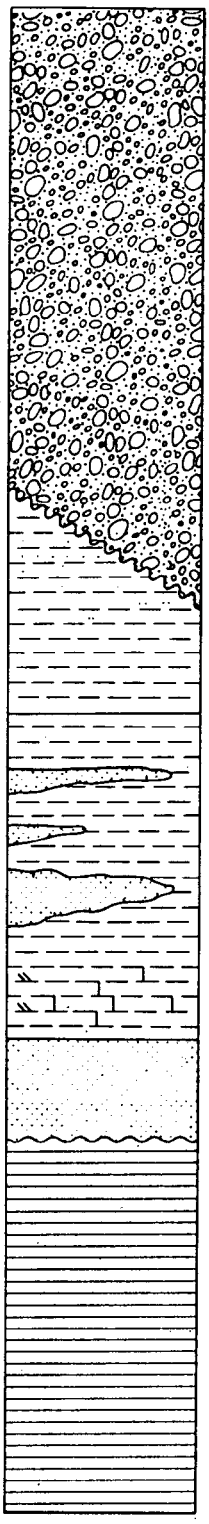
All holes were logged for gamma, self-potential and resistivity response. Due to delay in receiving the samples from depth, the drill hole logs do not correlate exactly with the geophysical logs and can differ by up to 10-15 metres (Appendix I).

4.2 Interpretation of Drilling and Logging Results.

The locations of the drill holes are indicated on Plan II and are shown on sections V to XIV. Drill hole and radiometric data are shown on Table I, II and III and the logs are in Appendix I.

On section I (FIG. V) are the holes 77-23, 77-36, 77-37, and 77-38. All of these holes except number 23 bottomed in the dolomitic horizon of the lower clay unit. Above the dolomitic horizon some gravels are indicated in 77-38 and in 77-23 there are "D" and "E" sands. In the Upper Clays which are about 35 metres thick, the "B" sand is indicated in hole number 77-38. Above the upper clays are about 65 metres of upper clastics. No lignitic material was found in any of the sands. A radiometric peak of 3 x BKG at 104 metres was recorded in 77-38

SCHEMATIC STRATIGRAPHIC COLUMN



QUATERNARY
—?— —?— —?

60' — 370'+

Oxidised Clastics :—

Piedmont deposits and surface oxidised clays and sands.

TERTIARY

0' — 200'

Upper Clays :—

Greenish grey clays with brown and olive grey clay.

ETADUNNA FORMATION

80' — 400'+

Lower Clays :—

Grey to dark grey clays, with interbedded fine sand and silt.

200' — 300'

Lower Tertiary Sands

(EYRE FORMATION)

CRETACEOUS

Cretaceous Claystone and Shales

FIGURE III

On section II (FIG. VI) are the holes 77-25, 77-21, 77-22, 77-24, and 77-39. Here 77-39 bottomed in the sands of Eyre Formation. The Eyre Formation was intersected at about 260 metres and approximately 40 metres was drilled into it. Above the Eyre Formation is about 160 metres of lower clays with the dolomitic horizon from 190-200 metres in hole number 39. Hole number 77-24 bottomed in the dolomitic horizon. Above the dolomitic horizon is a fairly extensive "D" sand at about 155 to 165 metres and this was intersected in holes 77-25,77-21, 77-22 and 77-24. In 77-22 the "E" sand is indicated on the lithological log. Above the lower clays are about 35 metres of upper clays with the "B" sand in all the holes except 77-24, and above the upper clays are about 70 metres of clastics.

Lignitic material was found in the lower clays below the dolomitic horizon and in the sands of the Eyre Formation. In 77-39 a small radiometric peak of 3 X BKG was recorded at 133 metres.

In section III (FIG. VII) are the holes 77-33, 77-34, and 77-35. All these holes bottomed in the dolomitic horizon of two lower clays. The "E" sand is found in hole number 77-35. The contact between the lower and upper clays is poorly defined except for the "B" sand in 77-33 which usually indicates the bottom of the upper clays. Above the upper clays is about 70 metres of clastics.

There is some lignitic material associated with the "B" sand in hole No. 77-33. In 77-35 a small radiometric peak of 2 X BKG was recorded at 115 metres.

On section IV (FIG. VIII) are holes 77-79, 77-27, 77-32, 77-30 and 77-31. All the holes bottomed in the dolomitic horizon except for 77-27 which was drilled to 189 metres. Above the dolomitic horizon there is an "E-" sand and possibly a "F-" sand indicated in holes 77-27, 77-32 and 77-30.

A "D-" sand is indicated in hole number 77-27 and a "C" sand is indicated in holes number 77-27, and 77-32. No sands are indicated in 77-29 and 77-31, although some lignitic material is found in both.

Above the lower clays is about 40 metres of upper clays. The "B" sand is found in holes 77-27 and 77-32 and in hole 77-27 the sand is quite thicker and well sorted.

On top of the upper clays are about 60-75 metres of clastics, with the clastics thinning towards the east.

Radiometric peaks of 7.0 X BKG at 116.5 metres in 77-27 and 8 X BKG at 129.5 metres in 77-32 were recorded.

On section V (FIG. IX) are the holes 77-13, 77-12, 77-43, and 77-26. Hole number 77-43 bottomed in the Eyre Formation. The dolomitic horizon was intersected in 77-43 and 77-26 from 200 to 225 metres in depth. The other two holes were not deep enough to intersect this horizon. In the lower clays, the "E" sand is found in hole number 77-43 and the "E", "D", and "C-" sands are found in hole number 77-26. In the upper clays the "B" sand is indicated in 77-43 and in 77-26 is quite thick. No sands were intersected in 77-12 and 77-13.

On section VI A (FIG. X) are the holes 77-43, 77-27 & 77-33. Hole number 77-43 bottomed in the Eyre Formation with the contact at 253 metres or possibly 288 metres. The dolomitic horizons are found in 77-43 and 77-33. The "D" sand is found in holes 77-43 and 77-27, and the "B" sand of the upper clays is found in all three holes. Above the upper clays are 70 to 75 metres of clastics.

Small radiometric anomalies of 7 to 8 X BKG are found in holes 77-27, and 77-43.

On section VI B (FIG. XI) are the holes 77-21, 77-38 and North Poontana Bore.

In hole number 77-21 the "B" sand and the "D" sand were intersected and in hole number 77-38 the "E" sand and the dolomitic horizon were intersected. In the North Poontana bore possible "B" sands and "D" sands are indicated and the dolomitic horizon, the Eyre Formation and the Lower Cretaceous (Roma Formation) were intersected by the drilling.

No anomalous radioactivity was recorded in either 77-21 or 77-38. Above the upper clays there are about 75 metres of upper clastics. A radiometric peak of 8 X BKG at 117 metres was recorded in hole number 77-43.

On section VII (FIG. XII) are the holes 77-40, 77-41 and 77-42. In hole number 77-41 the Eyre Formation was intersected at about 250 metres and the dolomitic horizon from 180 to 200 metres. The other two holes bottomed in the dolomitic horizon. The lower and upper clay contact is at approximately 100 metres and above this is 50 to 55 metres of upper clastics which thins out to the north.

No sand horizons were found in any of these three holes.

On sectionsVIII (FIG. XIII) are the holes E-28/14 (R. Spark, 1970), 77-26, and 77-32. Both 77-26 and 77-32 were bottomed on the dolomitic horizon. E-28/14 bottomed above the dolomitic horizon, in the clays. "E-" sand is found in 77-26 and 77-32, "D" sand is found in 77-26, "C-" sand is found in all three holes, and "B" sand is found in 77-26 and 77-32. Above the clays are approximately 110 metres of clastics.

On section VIII "B" (FIG. XIV) are the holes 77-35, 77-22 and 77-23. Only 77-35 bottomed in the dolomitic horizon. The "E" sand was intersected in all 3 holes the "D-" sand in 77-22 and 77-23, and the "B" sand in 77-22. Above the clays are about 70 metres of upper clastics.

Hole 77-44 intersected the Eyre Formation at 275 metres and another 30 metres were drilled into the formation. In the clays sands from "B" sand to "H" were intersected. Radiometric anomalies were found in the "D" and "G" & "H" sands. Another anomaly was also recorded in the lignitic clay just above the Eyre Formation (Table III). This hole is located on the Paralana block and the Upper Clastics unit is about 100 metres thick. Equivalent of U_3O_8 calculated from the gamma log of the anomalous zones are shown in Table IV.

Hole 77-45 is also on the Paralana Block and is located west of 77-44 and also west of the Poontana Lineament. Here the clastics are only 60 metres thick. This hole bottomed at 258 metres in Proterozoic Basement granites.

Several narrow sand horizons were picked up in the drill cuttings and some were indicated slightly in the electric logs.

Radiometric peaks were recorded at 78 metres and 117.5 metres (Table III).

Hole number 77-46 was drilled near the pipeline in the north-east corner of the Paralana Block. This hole bottomed in the Eyre Formation at 304 metres and has about 100 metres of clastics at the top. No definite sand horizons were picked up in the drill cuttings, however, some sand was found in the bottom 100 metres of the hole. Some small sand horizons are indicated both by the radiometric and electric logs. Minor peaks were recorded at 136, 192 and 206.5 metres (Table III).

Hole number 77-47 was drilled near the pipeline and about 1 mile south of hole number 77-46. This hole was drilled to 216 metres and bottomed in the Lower Clay Unit. Several narrow sand horizons were indicated in the drill cutting and in the geophysical work.

One radiometric peak was recorded at 131 metres (Table III).

4.3 PERSONNEL

BP Minerals Australia Pty Ltd.

Project Geologist	:	M.S. BELL
Prospecting Hands	:	M.J. Murphy
		R. Milner
Cook	:	D. Brown

CONTRACTORS

Thompson Drilling Co. Pty Ltd.

Driller	:	R. Brown
Assistants	:	J. Carter
		T. Auld

GEOSCIENCE ASSOCIATES (AUST.) PTY LTD.

Loggers	:	D. Stevens
		I. Hart
		J. Mortimer

5. CONCLUSIONS AND RECOMMENDATIONS

The latest drilling on the Poontana Creek target indicates it to be a NNE-SSW stream.

A good thickness of sands was indicated but radiometric anomalies were only 7 to 8 X BKG.

However, because of the wide spacing a few more holes are recommended on this target.

On the Paralana Creek target more deep holes are recommended, especially in the vicinity of hole No. 77-44.

Murdoch has recommended that a minimum of nine holes be drilled on the Paralana block to test the targets located on the latest resistivity survey (Murdoch, 1975).

6. REFERENCES

BELL, M.S., 1975 : 1974 Drilling Programme, EL 77 - Lake Frome Embayment, South Australia, Unpublished Geological Report to Department of Mines, S.A.

BRYAN, R., 1971 : Notes on the Uranium Prospects and Cainozoic Stratigraphy, Paralana Farm-in Block (S.M.L. 586). Unpublished Quarterly Report to Dept. of Mines. S.A.

CALLAN, R.A., 1973 : Lake Frome Area - Regional Geology and Tertiary Stratigraphy, Dept. of Mines, S.A., Report Bk. No.73.263

JARRE, G.A., and BRUNT, D.A., 1971 : Summary of Exploration on S.M.L. 586, Lake Frome Area, S.A., unpublished Quarterly Report to Dept. of Mines, S.A.

JOHNSON, R.L., 1971 : Drilling Report - S.M.L. 586 (Paralana) and Geological Evaluation - N.W. Frome Embayment. Unpublished Quarterly Report to Dept. of Mines, S.A.

MURDOCH, R., 1974 : A Resistivity Survey near Lake Frome, South Australia, for BP Minerals Australia Pty Ltd., Report No. 83 and Addendum.

MURDOCH, R., 1974 : A Second Resistivity Survey on EL 77 - Lake Frome South Australia, for BP Minerals Australia Pty Ltd., Report No. 91.

MURDOCH, R., 1975 : A Resistivity Survey on EL 77, Lake Frome, South Australia for BP Minerals Australia Pty Ltd., Report No.204.

SPARK, R., 1970 : Central Pacific Minerals N.L., S.M.L. 240, Lake Frome, S.A., Unpublished Progress Report to April 2nd., 1970 to Department of Mines, S.A., (Env. 1034).

7. APPENDICES

Appendix I Drill Logs (Geophysics and Lithology) (In back pocket)

TABLE I

(DRILL DATA)

HOLE NUMBER	ELEVATION	DRILLED DEPTH	DEPTH (m) TO BASE UPPER CLASTICS			DEPTH (m) TO BASE UPPER CLAYS			DEPTH (m) TO TOP DOLOMITIC HORIZON			DEPTH (m) TO BOTTOM DOLOMITIC HORIZON			DEPTH (m) TO TOP EYRE FORMATION		
			LITH LOG	GAMMA LOG	ELEC LOG	LITH LOG	GAMMA LOG	ELEC LOG	LITH LOG	GAMMA LOG	ELEC LOG	LITH LOG	GAMMA LOG	ELEC LOG	LITH LOG	GAMMA LOG	ELEC LOG
77-29	32.36m	196.4m	65.5	71.5	62.0	120?	98.0	98.0	193.0	183.0	183.0	196.7+	196.7+	196.7+	-	-	-
30	30.59m	195.6m	63.1	79.0	62.5	112?	?	?	189.1	182.5	182.5	196.7+	196.7+	196.7+	-	-	-
31	30.44m	194.5m	63.2	62.5	59.5	116.0	115.0	115.0	180.0	175.0	178.0	196.7+	196.7+	196.7+	-	-	-
32	31.28m	189.5m	77.0	70.0	57.0	107.0	129.5	128.5	189.0	185.0	185.0	192.1+	192.1+	192.1+	-	-	-
33	30.25m	195.4m	70.3	75.0	75.0	102.0	93.5	93.5	161.5	182.0	186.0	196.7+	196.7+	196.7+	-	-	-
34	31.43m	194.2m	74.8	68.0	61.0	100.0	?	104.0	193.7	?	180.0	196.7+	196.7+	196.7+	-	-	-
35	30.64m	195.6m	67.7	65.5	65.5	102.0	?	?	189.0	177.0	176.0	196.7+	196.7+	196.7+	-	-	-
36	28.16m	196.6m	67.7	72.0	66.5	96.0	108.5	116.5	180.0	?	170.0	196.7+	196.7+	196.7+	-	-	-
37	28.21m	196.6m	67.7	62.0	64.0	95.0	?	97.0	175.5	170.5	170.5	196.7+	196.7+	196.7+	-	-	-
38	28.74m	196.6m	63.2	66.5	66.5	97.5	106.0	106.0	188.0	168.0	179.0	196.7+	196.7+	196.7+	-	-	-
39	29.77m	306.4m	70.3	73.5	56.0	116.75	109.0	109.0	189.0	180.0	175.0	200.0	193.0	193.0	261.0	257.5	260.0
40	31.22m	196.6m	54.0	69.0	69.0	97.5	102.0	112.0	180.0	174.0	174.0	196.7+	174.5	174.0	-	-	-
41	30.08m	289.6m	49.5	48.0	48.5	86.0	95.0	95.0	177.8	166.0	166.0	203.0	191.0	187.0	230.0	255.5	255.5
42	28.76m	196.0m	49.5	62.5	61.0	?	107.0	107.0	173.0	165.0	165.0	196.7+	196.7+	196.7+	-	-	-
43	33.04m	306.5m	76.8	74.5	73.5	120.5	117.0	117.0	196.0	192.0	193.0	253.0	?	203.0	253.0	250.0	252.0
44		306.6m	106.75	101.5	103.0	?	?	127.0	-	-	-	-	-	-	275.0	?	276.0
45		255.8m	65.6	58.0	59.0	141.0	117.5	120.0	-	-	-	-	-	-	-	-	-
46		306.6m	99.8	112.0	94.5	127.0	143.0	142.0	208.0	223.0	221.0	-	237.0	237.0	304.0	283.0	283.0
47		215.5m	118.0	113.0	94.0	132.0	127.0	127.0	-	?	?	-	-	-	-		

TABLE II

(SAND HORIZONS)

HOLE NUMBER	B		C		D		E		F	
	DEPTH TO TOP	THICKNESS (m)	DEPTH TO TOP	THICKNESS (m)	DEPTH TO TOP	THICKNESS (m)	DEPTH TO TOP	THICKNESS (m)	DEPTH TO TOP	THICKNESS (m)
77-29	95.0	2.0	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-
32	95.0	12.0	110.5	9.0	-	-	178	1.5	-	-
33	88.0	5.5	-	-	121.0	1.0	-	-	-	-
34	-	-	111.5	2.0	131.0	2.5	153.5	157.0	-	-
35	-	-	-	-	-	-	157.0	6.5	-	-
36	-	-	-	-	113.5	3.0	-	-	-	-
37	80.0	17.0	-	-	115.0	3.0	151.5	2.0	-	-
38	85.0	9.0	-	-	-	-	-	-	-	-
39	-	-	100.8	10.5	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	-
42	100.0	7.0	-	-	-	-	-	-	-	-
43	103.0	14.0	-	-	161.5	1.5	172.0	3.5	-	-
44	115.5	11.5	143.5	3.0	161.0	2.0	-	-	190.0	7.5
45	108.0	2.0	-	-	162.0	10.0	-	-	-	-
46	-	-	139.0	2.0	-	-	176.5	1.0	191.0	1.0
47	123.0	4.5	-	-	160.5	3.5	-	-	-	-

TABLE III

(RADIOACTIVE DATA)

HOLE NUMBER	DEPTH LOGGED (METERS)	ANOMALOUS COUNTS (READING X BACKGROUND)
77-29	194.5m	-
30	194.5m	-
31	194.5m	-
32	188.3m	48c/s - 129.5m (8 x BKG)
33	194.0m	-
34	194.2m	-
35	194.5m	20c/s - 115 m (2 x BKG)
36	194.5m	-
37	194.5m	-
38	194.5m	20c/s - 104 m (3 x BKG)
39	304.5m	30c/s - 133 m (3 x BKG)
40	194.5m	32c/s - 201 m (2.5 x BKG)
41	288.0m	-
42	194.5m	-
43	304.5m	65c/s - 117 m (8 x BKG)
44	303.5m	585 c/s - 162 m (25 x BKG)
		550 c/s - 172 m (22 x BKG)
		447 c/s - 216 m (18 x BKG)
		140 c/s - 257 m (7 x BKG)
		655 c/s - 274 m (33 x BKG)
45	257.0	200 c/s - 70 m (10 x BKG)
		110 c/s - 117.5m (5.5 x BKG)
46	304.5	85 c/s - 136 m (8.5 x BKG)
47	214.0	90 c/s - 131 m (10 x BKG)

TABLE IV

DRILL HOLE 77-44 - % e U_3O_8 from gamma log. (Grade Calculated by D. BRUNT - Mines Administration Pty Ltd.).

DEPTH METRES	THICKNESS METRES	GRADE % e U_3O_8
161.8	0.3	.044
172.0	0.2	.048
215.7	0.6	.030
256.5	0.4	.021
274.2	0.4	.043

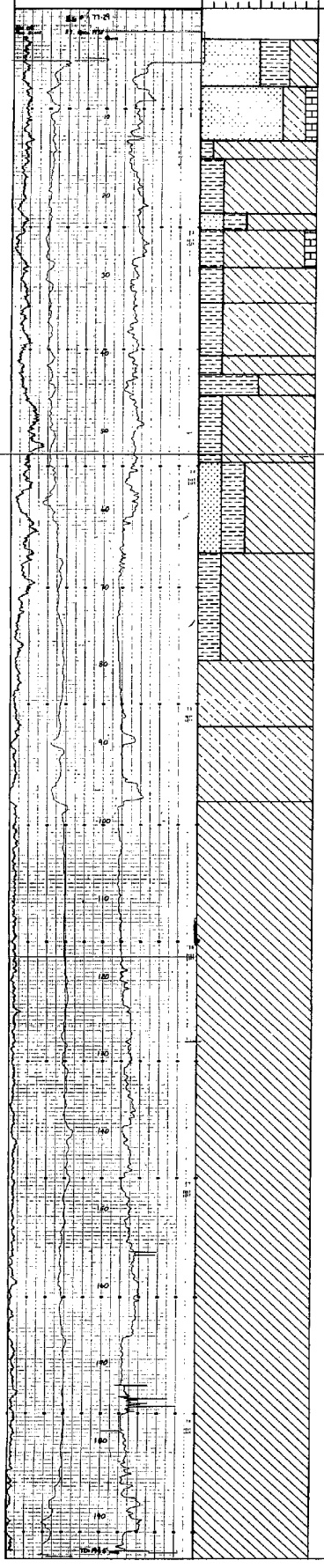
K - factor 1.32×10^5
Dead Time 6×10^6
Water factor 1.1.

DRILL HOLE LOG

212

HOLE No.	77-29	DATE DRILLED	28/4/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	29/4/75	RANGE	200 c/s	RESIST. SCALE	HT
PROJECT	Poontana	DATE LOGGED	29/4/75	TIME CONSTANT	2.0 sec	SP. SCALE	70
LOCATION	L. Frome	DRILLED DEPTH	196.4m	PAPER SPEED	1 cm/m	BIAS	630
STATE	S.A.	LOGGED DEPTH	194.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	3.0m
GEOLOGIST	M. Bell	ELEVATION	32.36m	BACK GROUND	8 c/s	PROBE No.	SO-314
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	633 c/s
LOGGER	D. Stevens			K-FACTOR	1.29×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



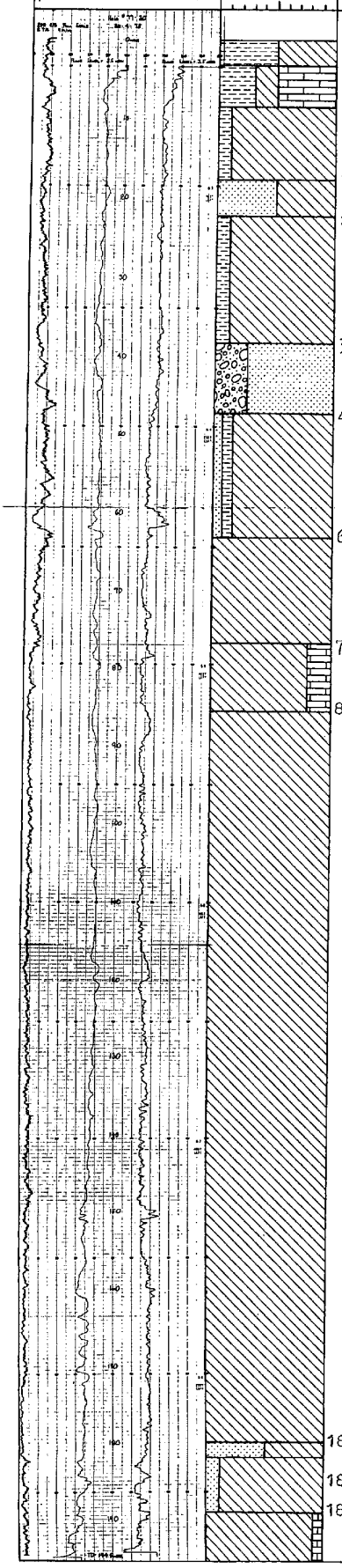
INTERVAL	DESCRIPTION
Metres	
0 - 6.1	Reddish-brown SAND & CLAY; sand quartzose to 1mm, sub-rounded; occasional black minerals.
6.1- 13.0	Light brown SAND; quartzose to 3mm; much clear calcite; weathered grey feldspar; red and white quartz; occasional mica and black minerals.
13.0- 15.3	CLAY: Greyish green; some fine black silt; occasional quartz chips 3 - 4cm.
15.3- 22.2	CLAY: Greyish-green, with reddish-brown stain; mica and quartz silt, becoming coarser towards bottom of section.
22.2- 24.4	"As above"
24.4- 29.0	CLAY: Greyish-green with brown staining; some white calcrete.
29.0- 33.5	CLAY: Grey-green to reddish-brown.
33.5- 40.4	CLAY: Grey-green to reddish-brown; sub-rounded quartz pebbles to 2cm.
40.4- 42.7	CLAY: Greyish-green to reddish-brown silty clay.
42.7- 45.5	Greyish-green CLAY and reddish-brown silt.
45.5- 54.0	CLAY: Grey-green to reddish-brown, and silty.
54.0- 65.5	CLAY: Reddish-brown with quartz sand; sub-rounded sand from 1mm - 10mm; also fine sand of 0.5mm; bottom part of section 50% coarse sand.
65.5- 79.5	CLAY: Greenish-grey and silty, with some white clay at top of section, red hematite staining
79.5- 88.0	CLAY: White to yellow to light grey, yellow limonite stain.
88.0- 97.5	CLAY: Light grey; yellow and purple due to limonite and hematite stain, some hematite nodules.
97.5-196.7	CLAY: Light to dark grey clay, with some lignitic sections; some crystalline gypsum at 143m; calcareous (dolomitic?) material 10% from 193 - 196m; occasional brown, and hematitic sections.
	End of hole.

DRILL HOLE LOG

213

HOLE No.	77-30	DATE DRILLED	30/4/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	30/4/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	30/4/75	TIME CONSTANT	2.0 sec	SP. SCALE	70
LOCATION	L. Frome	DRILLED DEPTH	195.6m	PAPER SPEED	1 cm/m	BIAS	630
STATE	S.A.	LOGGED DEPTH	194.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	3.5m
GEOLOGIST	M. Bell	ELEVATION	30.59	BACK GROUND	8 c/s	PROBE No.	SO-314
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	633 c/s
LOGGER	D. Stevens			K-FACTOR	1.29×10^{-5}		

LITHOLOGY: Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



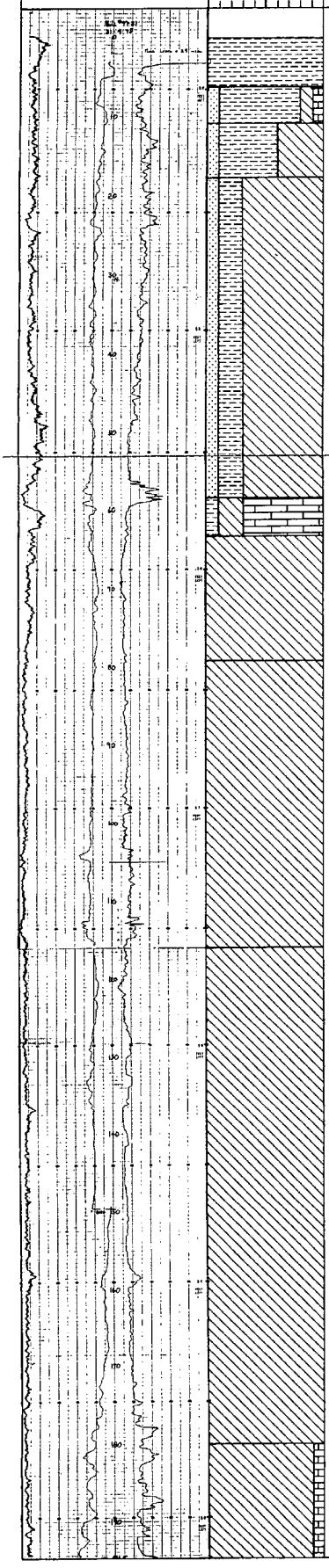
INTERVAL	DESCRIPTION
Metres	
0 – 3.05	SAND & CLAY: Brown.
3.05– 8.4	CALCAREOUS SILT: Brown silt and much ground up calcite; occasional quartzose pebble to 2cm.
8.4 – 17.6	CLAY: Light grey with minor brown stain; occasional quartzose pebble to 2cm.
17.6 – 22.2	SAND & CLAY: Light brown, sand, quartzose, sub-rounded to 1mm; sand brown and white, calcareous.
22.2 – 38.2	CLAY: Grey and reddish-brown.
38.2 – 47.2	SAND: Brown, quartzose, sub-rounded to 2mm; sub-rounded quartzite pebbles to 2cm; clay in last 2m.
47.2 – 63.1	CLAY: Grey and reddish-brown.
63.1 – 76.8	CLAY: Light yellow-grey, minor dark grey; crystalline gypsum at bottom of section; yellow limonite stain.
76.8 – 85.5	CLAY: Purplish-grey with much crystalline gypsum; hematite staining.
85.5 –180	CLAY: Light to dark grey, occasional brown, and occasional hematite stain.
180 –182	SAND & CLAY: Grey; sand sorted, quartzose, fine, and sub-rounded.
182 –189.1	CLAY: "As above".
189.1–196.7	CLAY: Light to dark grey; occasional brown and occasional hematite stain; some calcareous dolomitic material.
	End of hole.

DRILL HOLE LOG

214

HOLE No.	77-31	DATE DRILLED	30/4/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	1/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	1/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	80
LOCATION	L. Frome	DRILLED DEPTH	195.4m	PAPER SPEED	1 cm/m	BIAS	680
STATE	S.A.	LOGGED DEPTH	194.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	3.9m
GEOLOGIST	M. Bell	ELEVATION	30.44m	BACK GROUND	8	PROBE No.	SO-314
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	635 c/s
LOGGER	D. Stevens			K-FACTOR	1.29×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



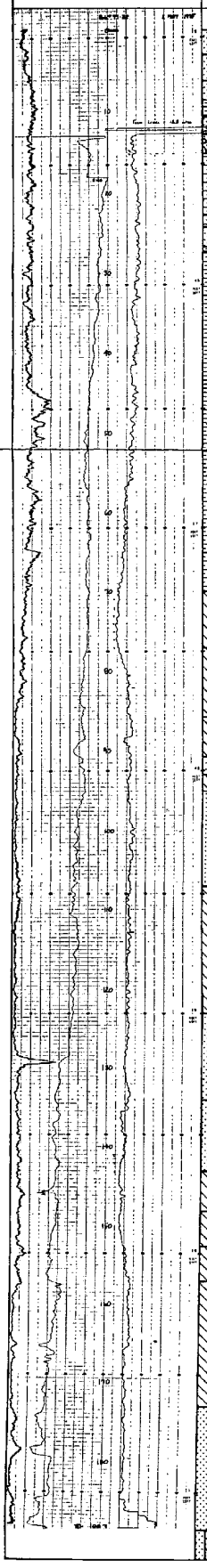
INTERVAL	DESCRIPTION
Metres 0 - 6.1	SILT: Brown
6.1- 10.7	SILT: Reddish-brown and speckled white with calcrete; sand, quartzose, and sub-rounded 1 - 2mm.
10.7- 17.6	SILT WITH CLAY: Reddish-brown; sand, quartzose and sub-rounded 1 - 2mm; occasional quartzite pebble, sub-rounded 2 - 3cm.
17.6- 58.5	CLAY: Light grey, with limonite and red oxide staining.
58.5- 63.2	CALCRETE: With buff coloured clay.
63.2- 79.2	CLAY: White to buff coloured.
79.2-116	CLAY: Medium to dark grey; lignitic in places.
116 -180	CLAY: Medium to dark grey with occasional bands. 116 - 122m lignitic.
180 -196.7	CLAY: Grey with brown and buff, speckled white with dolomitic material.
	End of hole.

DRILL HOLE LOG

215

HOLE No.	77-32	DATE DRILLED	1/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	2/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	2/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	102
LOCATION	L. Frome	DRILLED DEPTH	189.5m	PAPER SPEED	1 cm/m	BIAS	680
STATE	S.A	LOGGED DEPTH	188.3m	LOGGING SPEED	9 m/m	FLUID LEVEL	12.8m
GEOLOGIST	M. BELL	ELEVATION	31.28m	BACK GROUND	8	PROBE No.	SO-314
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	630 c/s
LOGGER	D. Stevens			K-FACTOR	1.29×10^5		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



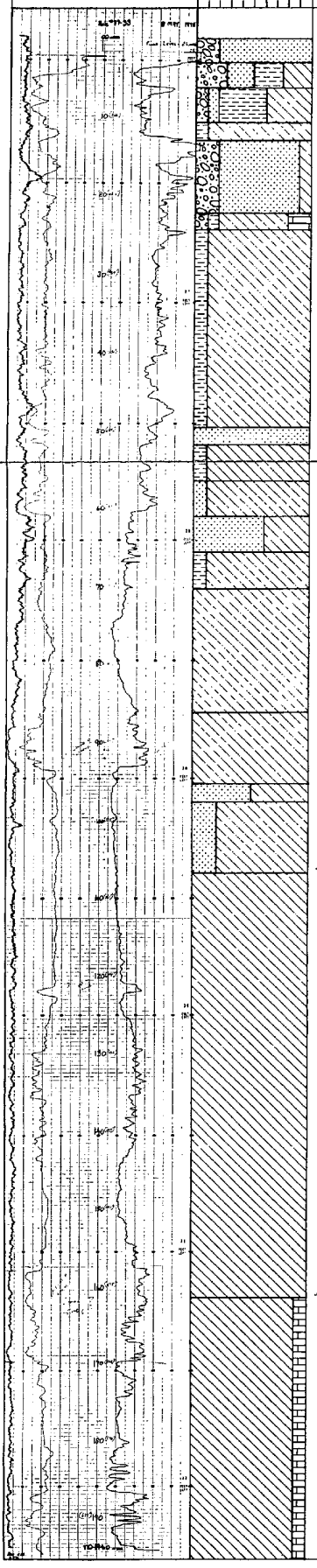
INTERVAL	DESCRIPTION
Metres	
0 - 3.05	SAND: Reddish-brown in colour; sub-rounded, quartzose to 1mm; some crystalline gypsum.
3.05- 6.1	SAND: Calcareous, reddish brown, subrounded, quartzose to 1mm. Much crystalline gypsum.
6.1 - 8.6	SAND: Reddish-brown with grey clay; subrounded quartzose sand to 3mm; occasional pebble to 2cm.
8.6 - 10.7	CLAY: Grey, stained with red oxide and occasional limonite stain.
10.7 - 12.95	SAND: Brownish; quartzose, and sub-rounded 0.5 - 3mm.
12.95- 15.25	SILTY CLAY: Reddish-brown; some calcrete; quartzose sub-rounded pebbles to 2cm.
15.25- 22.7	CLAY: grey with silt, and stained with iron oxide; mica flakes; occasional calcareous material.
22.7 - 24.4	CLAY: grey with some limonite stain; occasional quartzose pebbles to 2cm.
24.4 - 26.6	SAND: Brownish; different minerals, sub-rounded at 1mm; occasional sub-rounded quartzose pebbles to 2cm.
26.6 - 27.4	CLAY: Grey and reddish-brown; occasional quartzose sand to 3mm and pebbles to 4cm; occasional crystalline gypsum.
27.4 - 70	CLAY: as above; pebbles to 2cm.
70 - 77	CLAY: Grey with some iron oxide staining; trace of calcareous material.
77 - 85.7	CLAY: Grey with limonite stain.
85.7 - 90.7	CLAY: grey with hematite and limonite stain.
90.7 - 93	SAND: Buff coloured; sub-rounded, about 1mm in size; clay grey with hematite and limonite stain.
93 - 95	CLAY: Light grey to buff coloured; becoming silty; occasional brown and red oxide stain.
95 -107	SAND: Buff coloured; with clays as above.
107 -123	CLAY: As above
123 -134	SAND: Buff coloured, 0.5 - 1mm
134 -143	CLAY: Light grey variegated clays with buff coloured sand.
143 -148	CLAY: Light grey variegated clay, but becoming darker.
148 -152.5	CLAY: Grey to black; minor brown and buff coloured sections.
152.5 -157	CLAY: Very black.
157 -173	CLAY: Grey to black; minor brown and buff coloured sections.
173 -189	CLAY: As above, with very fine sand.
189 -192.1	CLAY: Grey to black; speckled with white dolomitic material. End of hole.

DRILL HOLE LOG

216

HOLE No.	77-33	DATE DRILLED	2/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	3/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	3/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	102
LOCATION	L. Frome	DRILLED DEPTH	195.4m	PAPER SPEED	1 cm/m	BIAS	900
STATE	S.A.	LOGGED DEPTH	194.0m	LOGGING SPEED	9 m/m	FLUID LEVEL	2.6m
GEOLOGIST	M. Bell	ELEVATION	30.25m	BACK GROUND	8	PROBE No.	SO-314
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	631 c/s
LOGGER	D. Stevens			K-FACTOR	1.29×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



INTERVAL	DESCRIPTION
Metres	
0 - 3.05	SAND: Brown, sub-rounded, quartzose to 3mm; pebbles, quartzose 2 - 10cm; occasional crystalline gypsum.
3.05- 6.1	MIXED CLASTICS: Light greyish-brown; pebbles to 10cm; much as above section.
6.1 - 10.7	MIXED CLASTICS: "As above"; quartz pebbles to 5cm.
10.7 - 13	CLAY: Light greenish-grey, coated in reddish-brown iron oxide.
13 - 22.2	SAND: Reddish-brown, sub-rounded, quartzose sand to 2mm; light greenish-grey clay; broken quartzite pebbles to 5cm; becoming calcareous.
22.2 - 24.4	CLAY: Greenish-grey; sub-rounded quartz pebbles 1 - 2cm; calcrete chips 2 - 5cm.
24.4 - 49.5	CLAY: Light greenish-grey and reddish-brown.
49.5 - 51.8	SAND: Brownish quartz sand, sub-rounded, 0.5 - 1mm.
51.8 - 56.4	CLAY: Light greenish-grey.
56.4 - 61	CLAY: Light greenish-grey.
61 - 65.5	SAND: Light brown coarse sand, sub-rounded and quartzose to 3mm; clay light greenish-grey.
65.5 - 70.25	CLAY: Light greenish-grey with reddish-brown oxide stain and some white calcareous clay.
70.25- 86.1	CLAY: Light grey with minor oxide stain, and limonite stain towards bottom of section.
86.1 - 95.1	CLAY: Light purplish-grey, with minor limonite stain.
95.1 - 97.5	SAND: Clean quartz sand to 1mm with clays "as above".
97.5 -106.75	SANDY CLAY: Medium to dark grey, some black lignitic; and some limonite stain.
106.75-161.5	CLAY: Light to medium grey clays and variegated clays and speckled with white calcareous clay.
161.5 -196.7	CLAY: Grey and black with variegated clays, speckled with dolomitic material.

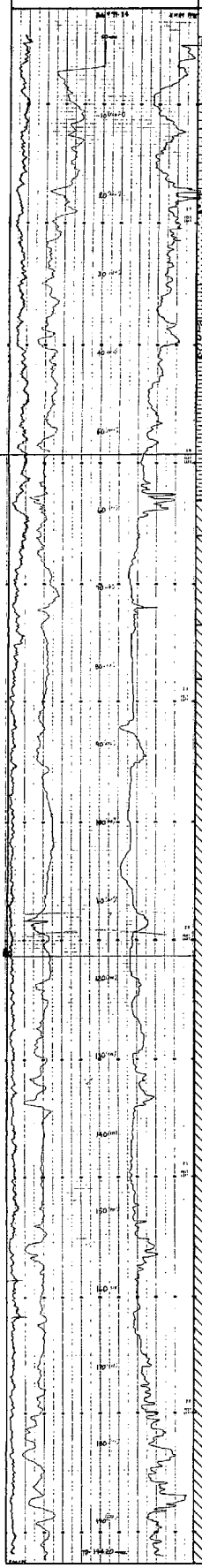
End of hole

DRILL HOLE LOG

21.

HOLE No.	77-34	DATE DRILLED	3/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	4/5/75	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	4/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	102
LOCATION	L. Frome	DRILLED DEPTH	195.4m	PAPER SPEED	1 cm/m	BIAS	700
STATE	S.A.	LOGGED DEPTH	194.2m	LOGGING SPEED	9 m/m	FLUID LEVEL	0.5m
GEOLOGIST	M. Bell	ELEVATION	31.43m	BACK GROUND	8 c/s	PROBE No.	SO-314
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	636 c/s
LOGGER	D. Stevens			K-FACTOR	1.29×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



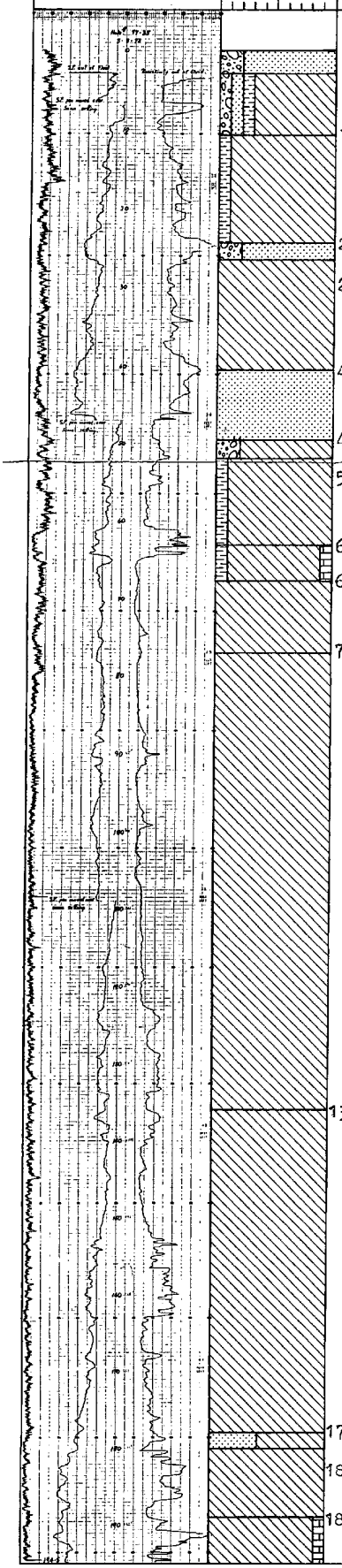
INTERVAL	DESCRIPTION
Metres	
0 - 8.4	MIXED CLASTICS: Light brown with much crystalline gypsum; sand quartzose, sub-rounded to 1mm.
8.4 - 19.8	CLAY: Light grey and reddish-brown; occasional chips of calcrete to 2cm.
19.8 - 22.2	SAND: Light brown, quartzose, sub-rounded to 2mm; chips and pebbles to 2cm.
22.2 - 31.3	CLAY: Light brown clay and sand.
31.3 - 35.8	CLAY: Reddish-brown, silty; some grey clasts; occasional pebbles in bottom of section.
35.8 - 40.5	MIXED CLASTICS: Reddish-brown; coarse sand, quartzose, sub-rounded to 3mm.
40.5 - 58.8	CLAY: Greyish with red oxide stain, silty; some limonite stain; occasional gypsum and quartz sand to 2mm.
58.8 - 63.3	CLAY: reddish-brown with white calcareous clay.
63.3 - 74.8	CLAY: Light greyish-green clays with some limonite and reddish-brown iron oxide stain.
74.8 - 81.6	CLAY: Dominantly purplish and light grey clays; some limonite stain.
81.6 -196.7	CLAY: Grey and black clays; and minor variegated clays; 10% white dolomite in last 3 metres (193.7 - 196.7)
	End of hole

DRILL HOLE LOG

215

HOLE No.	77-35	DATE DRILLED	4/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	5/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	5/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	300
LOCATION	L. Frome	DRILLED DEPTH	195.6m	PAPER SPEED	1 cm/m	BIAS	
STATE	S.A.	LOGGED DEPTH	194.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	3.0m
GEOLOGIST	M. Bell	ELEVATION	30.64m	BACK GROUND	8 c/s	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	670 c/s
LOGGER	I. Hart			K-FACTOR	1.32×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



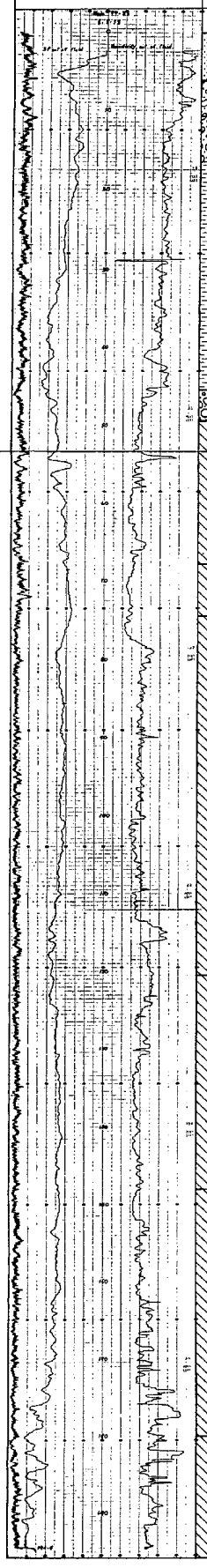
INTERVAL	DESCRIPTION
Metres	
0 - 3.05	SAND: Brown with some pebbles; poorly sorted, quartzose, sub-rounded sand 1mm; sub-rounded quartz pebbles 0.5 - 2cm.
3.05- 10.7	CLAYS: Grey, with silt and sand, some iron oxide stain; coarse sand and pebbles "as above".
10.7 - 24.4	CLAY: Greyish and reddish-brown.
24.4 - 26.6	SAND: Reddish-brown, quartzose, sub-rounded 1 - 2mm; pebbles to 1.5cm.
26.6 - 40.4	CLAY: Reddish-brown and minor greyish; trace of silt and mica.
40.4 - 49.5	SAND: Yellowish-brown, quartzose, sub-rounded 1 - 2mm; well sorted.
49.5 - 51.8	CLAY: Greyish with reddish-brown iron stain, with pebbles to 6cm.
51.8 - 63.2	CLAY: Grey with yellow-brown stain; occasional pebble to 4cm.
63.2 - 67.7	CLAY: Yellowish grey-green, with limestone, and mica.
67.7 - 77	CLAY: Light grey, sticky and waxy, with minor iron and limonite stain.
77 - 136	CLAY: Purplish medium grey.
136 -177.8	CLAY: Medium to dark grey clays.
177.8-180	SANDY CLAY: Medium to dark grey; grey sand, fine to 1mm, quartzose and sub-rounded.
180 -189	CLAY: Medium to dark grey.
189 -196.7	CLAY: Medium to dark grey; speckled with white dolomitic material.
	End of hole.

DRILL HOLE LOG

215

HOLE No.	77-36	DATE DRILLED	5/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	6/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	6/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	350
LOCATION	L. Frome	DRILLED DEPTH	196.6m	PAPER SPEED	1 cm/m	BIAS	750
STATE	S.A.	LOGGED DEPTH	194.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	2.5m
GEOLOGIST	M. Bell	ELEVATION	28.16m	BACK GROUND	6 c/s	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	666 c/s
LOGGER	I. Hart			K-FACTOR	1.32×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



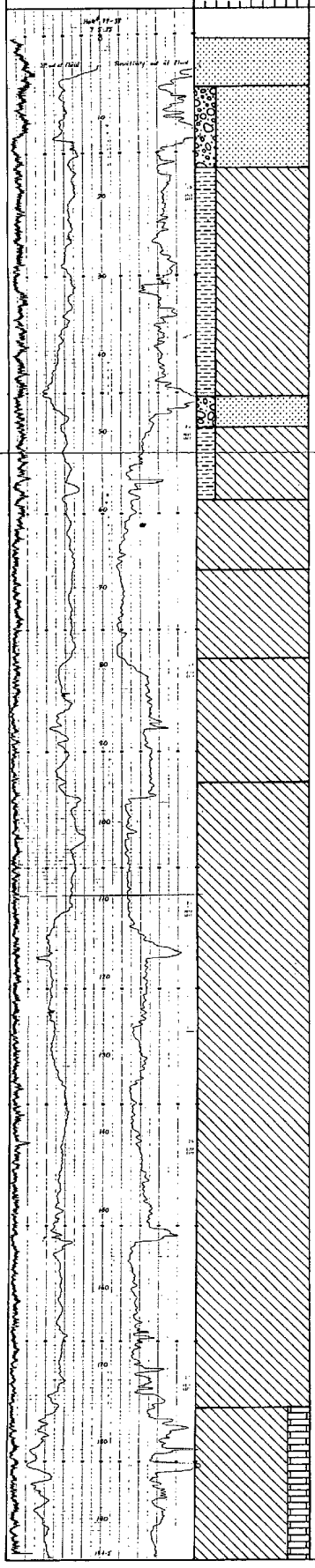
INTERVAL	DESCRIPTION
Metres 0 - 6.1	SAND: Brown, granitic and quartzose, sub-rounded to 3mm, poorly sorted; some crystalline gypsum.
6.1- 10.7	SAND: Greyish-brown, quartzose; granitic pebbles, sub-rounded to 2cm.
10.7- 16.5	SAND: "As above" with some siliceous calcrete.
16.5- 45.5	CLAY: Reddish-grey.
45.5- 49.5	SAND: Granitic, sub-rounded to 3 mm; pebbles to 3 cm.
49.5- 67.7	CLAY: Greyish-green and white calcareous clay with some reddish-brown iron stain.
67.7- 74.5	CLAY: Light purplish grey with crystalline gypsum; some limonite stain.
74.5-120.5	CLAY: Light to dark grey purplish and minor variegated.
120.5-148	CLAY: Light grey to black, with some variegated.
148 -180	CLAY: Mostly very dark grey to black, and some variegated.
180 -196.7	CLAY: "As above" speckled with white dolomitic material.
	End of hole.

DRILL HOLE LOG

220

HOLE No.	77-37	DATE DRILLED	6/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	7/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	7/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	400
LOCATION	L. Frome	DRILLED DEPTH	196.6m	PAPER SPEED	1 cm/m	BIAS	825
STATE	S.A.	LOGGED DEPTH	194.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	3.5m
GEOLOGIST	M. Bell	ELEVATION	28.21m	BACK GROUND	6	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	670 c/s
LOGGER	I. Hart			K-FACTOR	132×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



INTERVAL	DESCRIPTION
Metres	
0 - 6.1	SAND: Light brown granitic sand sub-rounded to 3mm, poorly sorted; some crystalline gypsum.
6.1- 16.5	SAND: Greyish brown, quartzose; granitic pebbles, sub-rounded to 2cm.
16.5- 45.5	CLAY: Reddish-grey.
45.5- 49.5	SAND: Granitic, sub-rounded to 3mm; pebbles to 3cm.
49.5- 58.8	CLAY: Reddish-grey.
58.8- 67.7	CLAY: Greyish with minor red iron and limonite stain.
67.7- 79.2	CLAY: Light purplish-grey.
79.2- 95	CLAY: Light to dark purplish-grey.
95 -175.5	CLAY: Medium to dark grey and variegated
175.5-196.7	CLAY: Light to medium grey and white dolomitic material.
	End of hole.

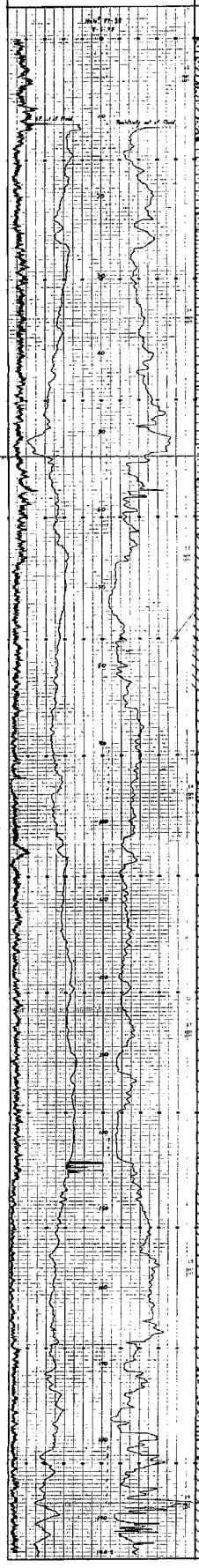
TS 1489 J

DRILL HOLE LOG

221

HOLE No.	77-38	DATE DRILLED	7/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	8/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	8/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	400
LOCATION	L. Frome	DRILLED DEPTH	196.6m	PAPER SPEED	1 cm/m	BIAS	775
STATE	S.A.	LOGGED DEPTH	194.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	11.0m
GEOLOGIST	M. Bell	ELEVATION	28.74m	BACK GROUND	1.0 sec	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.32×10^{-5}	STANDARD	671 c/s
LOGGER	I. Hart			K-FACTOR			

LITHOLOGY: Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



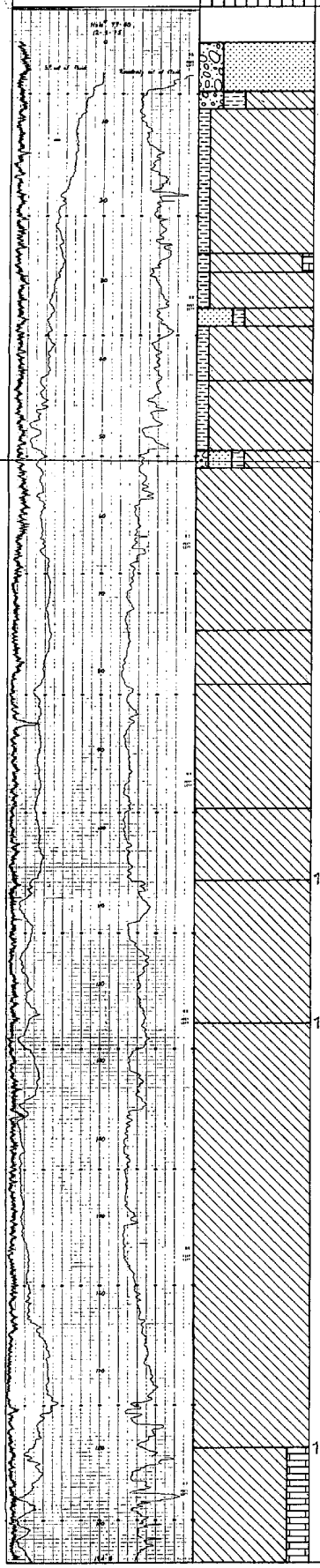
INTERVAL	DESCRIPTION
Metres	
0 - 6.1	SAND: Light brown, granitic, sub-rounded to 2mm; coarse sand and pebbles to 2cm, poorly sorted.
6.1 - 12.95	SAND: Greyish-brown "as above" but with some calcrete.
12.95- 22.2	CLAY: Reddish-grey.
22.2 - 24.4	MIXED CLASTICS: Clay, reddish-grey, fine quartzose sand to 1mm; minor pebbles to 1cm.
24.4 - 44.4	CLAY: Reddish-grey.
44.4 - 51.8	CLAY: Light brownish-grey.
51.8 - 56.3	SANDY CLAY: Brownish-grey; coarse poorly sorted granitic sands to 3mm.
56.3 - 63.2	CLAY: Light brownish-grey.
63.2 - 95.1	CLAY: Light grey, waxy; hematite and limonite stain; some white calcareous clay.
95.1 - 97.5	SILTY CLAY: Light grey, quartzose silt to very fine sand.
97.5 -143.4	CLAY: Medium-grey, some variegated; and some limonite and hematite stain.
143.4 -170.9	CLAY: Light grey to black; and "as above".
170.9 -180	CLAY: "As above" with some very fine silty sand; coarse sand and pebbles to 2cm.
180 -182.2	CLAY: Light grey to black.
182.2 -188	CLAY: Mainly light to dark grey, minor green; some dolomite.
188 -196.7	CLAY: Light grey with some white dolomite material.
	End of hole.

DRILL HOLE LOG

222

HOLE No.	77-40	DATE DRILLED	12/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	12/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	12/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	375
LOCATION	L. Frome	DRILLED DEPTH	196.6m	PAPER SPEED	1 cm/m	BIAS	700
STATE	S.A.	LOGGED DEPTH	194.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	4.0m
GEOLOGIST	M. Bell	ELEVATION	31.22m	BACK GROUND	5 c/s	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	670 c/s
LOGGER	L. Hart			K-FACTOR	1.32×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



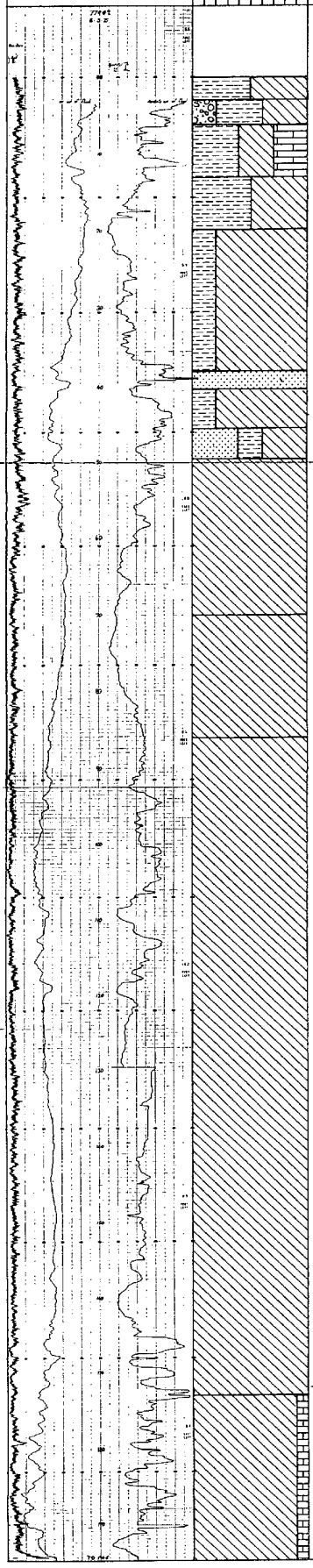
INTERVAL (Metres)	DESCRIPTION
0 - 6.1	SAND: Light brown, granitic and quartzose, sub-rounded to 3mm.
6.1- 8.4	CLAY: Reddish-grey with silt; pebbles quartzitic, rounded to 4cm.
8.4- 26.6	CLAY: Reddish-brown with grey clasts; occasional pebbles at top of section.
26.6- 29	CLAY: Reddish-brown with grey clasts; and calcrete.
29 - 33.5	CLAY: Reddish-brown with grey clasts.
33.5- 35.8	SANDY CLAY: Reddish-brown; with granitic and quartzose sand to 2mm.
35.8- 42.7	CLAY: Reddish-brown with grey clasts.
42.7- 51.8	CLAY: Creamy and reddish grey; mica in silt.
51.8- 54	MIXED CLASTICS: Creamy and reddish-grey; coarse sand to 3mm; sub-rounded pebbles to 1cm.
54 - 74.7	CLAY: Creamy grey, waxy, with a trace of silt.
74.7- 81.6	CLAY: Light to dark grey.
81.6- 97.5	CLAY: Medium grey to black lignitic; some variegated and hematite stain; minor gypsum.
97.5-106.75	CLAY: Very light grey to medium grey; some limestone stains 102 - 104m lignite pieces to 4cm.
106.75-125	CLAY: Dark grey to black, hematite stain, some variegated and grey-green clays.
125 -180	CLAY: Grey to black; lignite in places; some variegated clays.
180 -196.7	CLAY: Grey to black; speckled white with chips of dolomite.
	End of hole.

DRILL HOLE LOG

223

HOLE No.	77-42	DATE DRILLED	15/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	16/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	16/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	375
LOCATION	L. Frome	DRILLED DEPTH	196.0m	PAPER SPEED	1 cm/m	BIAS	700
STATE	S.A.	LOGGED DEPTH	194.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	3.7m
GEOLOGIST	M. Bell	ELEVATION	28.76m	BACK GROUND		PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE	1.32×10^{-5}	STANDARD	670 c/s
LOGGER	J. Mortimer			K-FACTOR			

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



INTERVAL	DESCRIPTION
Metres	
0 - 3.1	SILTY CLAY: Reddish-brown.
3.1- 6.1	MIXED CLASTICS: Greyish-brown silty clay, with sub-rounded pebbles to 1cm; occasional chips of calcrete.
6.1- 13	CLAYEY SILT: Brown, with calcrete chips to 2cm, occasional pebbles.
13 - 19.8	SILTY CLAY: Brownish with occasional chips of calcrete and pebbles.
19.8- 38	CLAY: reddish-brown and minor grey clay.
38 - 40.4	SAND: Light brown, angular to sub-rounded quartz sand to 2mm; occasional coarse sand to 5mm.
40.4- 45.5	CLAY: Reddish-brown and light grey.
45.5- 49.5	SAND: with reddish-brown and light grey clay.
49.5- 70	CLAY: Light creamy grey with limonite stain.
70 - 86.1	CLAY: Dark purplish-grey to black lignitic clay; hematite stain.
86.1-173	CLAY: Light grey to black and variegated; some green clay from 118 - 123m; occasional lignite.
173 -196.7	CLAY: "As above" and dolomite.
	End of hole.

T 1302

POONTANA PROJECT – 1975
DRILL HOLE LOCATION MAP

EL 77

EL 68

EL 91

Lake Frome

LOCATION DIAGRAM

REFERENCE TO AUSTRALIA STANDARD MAP SERIES

SH54-5 MARREE	SH54-6 CALLABONNA	SH54-7 MILPARINKA
SH54-9 COPLEY	SH54-10 FROME	SH54-11 COBHAM LAKE
SH54-13 PARACHILNA	SH54-14 CURNAMONA	SH54-15 BROKEN HILL

SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 30 KILOMETRES

RECEIVED
23 SEP 1975
DEPT. OF MINES
SECURITY
2328 III

LEGEND

- Road, loose surface all weather second class
- Road, unimproved earth
- Lake, river or stream intermittent
- Participation area

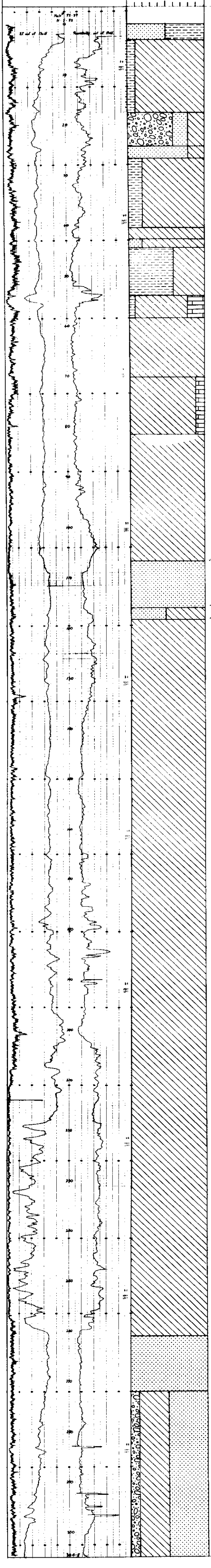
BP MINERALS AUST. PTY LTD	
Area: EL 77/LAKE FROME	
SOUTH AUSTRALIA	
REF:	
JUNE 1975	M.S. BELL

2328 (III) – 1

DRILL HOLE LOG 2328(III)-2

HOLE No.	77-39	DATE DRILLED	9/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	11/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	11/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	400
LOCATION	L. Frome	DRILLED DEPTH	306.4m	PAPER SPEED	1 cm/m	BIAS	730
STATE	S.A.	LOGGED DEPTH	304.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	1.8m
GEOLOGIST	M. Bell	ELEVATION	29.77m	BACK GROUND	7 c/s	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	673 c/s
LOGGER	I. Hart			K-FACTOR	1.32×10^{-3}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



INTERVAL	DESCRIPTION
Metres – 3.1	SAND: Brown surface sand with light brownish-grey clays.
3.1 – 17.3	CLAY: White and light grey, with minor brown and limonite stain; occasional large quartz pebbles to 4cm.
17.3 – 24.4	MIXED CLASTICS: Sub-rounded quartzose sand to 2mm; coarse sand and gravel from 6cm – 9cm; reddish-brown clay.
24.4 – 28.6	SAND: Brownish, quartzose sand to 1mm; light grey clay.
28.6 – 40.5	CLAY: Grey with reddish-brown stain.
40.5 – 42.7	CLAY: Light brownish-grey.
42.7 – 44.5	CLAY: Light brownish-grey, some oxide stain; quartzose sand to 1mm.
44.5 – 54.0	SILT: Greyish-brown, with some reddish-brown clay.
54.0 – 56.5	CLAY: Light brownish-grey with some reddish-brown; some white calcrete.
56.5 – 70.3	CLAY: White to light creamy grey, waxy, some limonite stain.
70.3 – 84.6	CLAY: Medium grey with limonite stain; some crystalline gypsum.
84.6 –106.75	CLAY: Dark grey to black.
106.75–116	SAND: Grey quartz sand, fine to 1mm.
116 –118.4	SAND: With clays as in above sections.
118.4 –261	CLAY: Dark grey to black, variegated in places from 181 – 204m 70% white carboraceous material (dolomite?); 217 – 236m very lignitic.
261 –272	SAND: Coarse quartz sand sub-rounded to 2mm.
272 –306	SAND: Coarse sands "as above" with dark grey to black and variegated clay; 274.9 – 294m silcrete capping. Some green clay and pyrite, some coarse sub-rounded to rounded quartz gravel to 1cm; quartz and chert, crystalline gypsum and lignite.
	End of hole.

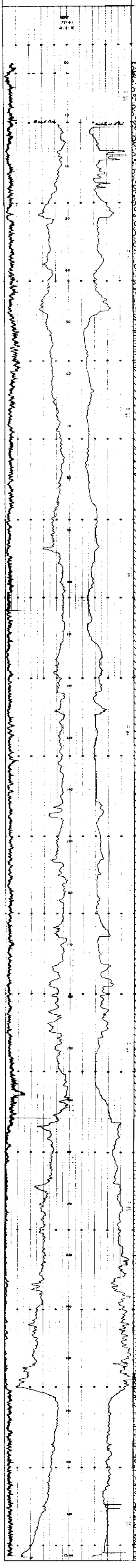
2328
RECEIVED
21 OCT 1975
DEPT. OF MINES
SECTION

DRILL HOLE LOG

2328(III)-3

HOLE No.	77-41	DATE DRILLED	13/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	14/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	14/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	375
LOCATION	L. Frome	DRILLED DEPTH	289.6m	PAPER SPEED	1 cm/m	BIAS	520
STATE	S.A.	LOGGED DEPTH	288.0m	LOGGING SPEED	9 m/m	FLUID LEVEL	12.0m
GEOLOGIST	M. Bell	ELEVATION	30.08m	BACK GROUND	5 c/s	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	670 c/s
LOGGER	~~J. Mortimer~~			K-FACTOR	1.32×10^{-5}		

LITHOLOGY : Gravel · Sand · Silt · Clay · Carbonate · Carbonaceous



INTERVAL (Metres)	DESCRIPTION
0 - 49.5	MIXED CLASTICS: Reddish-brown; some calcareous material; sub-rounded quartz sand to 3mm, poorly sorted; pebbles to 1cm.
49.5- 51.8	CLAY: Creamy grey-green clay with yellow limonite stain; sub-rounded, poorly sorted quartz sand to 3mm; occasional pebbles to 1cm.
51.8- 58.8	CLAY: Creamy greenish-grey clays with some calcrete.
58.8- 74.5	CLAY: Creamy greenish-grey, waxy, some reddish-brown iron stain.
74.5- 77	CLAY: Light purplish-grey with hematite stain.
77 - 79.2	CLAY: Dark grey to black.
79.2- 86.1	CLAY: Medium grey with crystalline gypsum.
86.1-141	CLAY: Light to medium grey and variegated.
141 -177.6	CLAY: Light to black and variegated.
177.6-203	CLAY: Light to black and variegated, much green clay, and white dolomite
203 -217	CLAY: Grey to black, and green; some lignite.
217 -230	SANDY CLAY: Grey to black and green; angular to sub-rounded quartz sand to 1mm; lignitic.
230 -253	SAND: "as above" with sand to 1mm.
253 -269	GRAVELS: Well washed and rounded quartz pebbles to 1cm; sand to 2mm; much pyrite.
269 -281	MIXED CLASTICS: As above with black clay and lignite.
281 -290	MIXED CLASTICS: "As above", sub-rounded pebbles to 4cm; also brown and creamy clays.
	End of hole

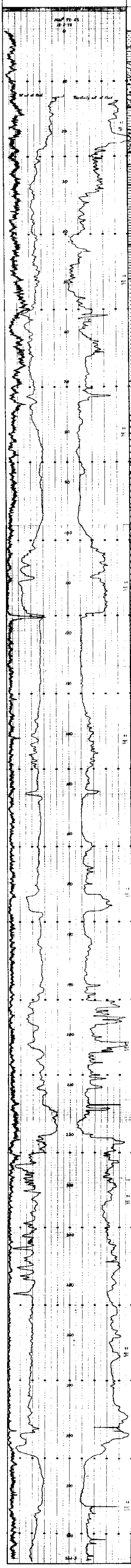
RECEIVED 21 OCT 1975 DEPT. OF MINES SECURITY

DRILL HOLE LOG

2328(III)-4

HOLE No.	77-43	DATE DRILLED	17/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	18/5/75	RANGE	200	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	18/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	350
LOCATION	L. Frome	DRILLED DEPTH	306.5m	PAPER SPEED	1 cm/m	BIAS	500
STATE	S.A.	LOGGED DEPTH	304.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	12.7m
GEOLOGIST	M. Bell	ELEVATION	33.04m	BACK GROUND	8	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	676 c/s
LOGGER	I. Hart			K-FACTOR	1.32×10^{-5}		

LITHOLOGY : Gravel · Sand · Silt · Clay · Carbonate · Carbonaceous



INTERVAL (Metres)	DESCRIPTION
0 – 3.1	SAND: Brown, fine sand and silts to 0.5mm.
3.1– 6.1	SILT: Brown.
6.1– 10.7	MIXED CLASTICS: Brown, sands quartzose and sub-rounded to 1mm; pebbles from 0.5cm to 4cm.
10.7– 15.3	MIXED CLASTICS: As above with some crystalline gypsum.
15.3– 19.8	CLAY: Grey and reddish-brown; occasional sand and pebbles.
19.8– 24.4	MIXED CLASTICS: Grey and reddish-brown; coarse quartzitic sand and sub-rounded pebbles to 1cm.
24.4– 26.6	SAND: Brown, quartzitic and sub-rounded to 2mm.
26.6– 30.7	CLAY: Greenish-grey to brown silty clay.
30.7– 42.7	CLAY: Greenish-grey to brown silty clay and some white calcareous clay.
42.7– 49.5	CLAY: Reddish-brown with greenish-grey clasts.
49.5– 70.0	SAND: Light brown; sub-rounded quartzitic sand to 2mm.
70.0– 76.8	CLAY: Reddish-brown with greenish-grey clasts.
76.8– 86.1	CLAY: Creamy white to creamy grey, waxy; yellow limonite stain.
86.1– 88.4	CLAY: Dark grey.
88.4– 95	CLAY: Creamy white to creamy grey, waxy; yellow limonite stain.
95 –111.3	CLAY: Mostly dark grey with occasional light grey.
111.3–120.5	SANDY CLAY: Dark grey with occasional light grey; sand fine and grey.
120.5–161.5	CLAY: Dark grey with occasional light grey; much hematite at 122 – 125m.
161.5–166	CLAY: Light to dark grey clay, and fine quartz sand.
166 –196	CLAY: Grey with occasional black sections.
196 –226	CLAY: Grey and minor black with dolomite.
226 –253	CLAY: Mainly grey, minor black, green and variegated; quartz sand to 2mm; lignite and dolomite.
253 –255	SANDY CLAY: "As above".
255 –262	CLAY: Mainly grey to occasional black, green and variegated; sand to 2mm; minor lignite and dolomite.
262 –281	SANDY CLAY: "As above".
281 –288	SAND: Coarse 1 – 3mm sub-rounded to rounded; clays "as above".
288 –303	SAND: Coarse sands as above; some rounded blue quartz; pyrite.
303 –306	SAND: "As above".

DRILL HOLE LOG 2328(III)-5

HOLE No.	77-44	DATE DRILLED	19/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	21/5/75	RANGE	200-500 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	21/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	300
LOCATION	L. Frome	DRILLED DEPTH	306.6m	PAPER SPEED	1 cm/m	BIAS	500
STATE	S.A.	LOGGED DEPTH	303.5m	LOGGING SPEED	9 & 3 m/m	FLUID LEVEL	11.0m
GEOLOGIST	M. Bell	ELEVATION	57.83m	BACK GROUND	6	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE	1 & 2 sec	STANDARD	665 c/s
LOGGER	I. Hart			K-FACTOR	1.32×10^{-5}		

LITHOLOGY : Gravel · Sand · Silt · Clay · Carbonate · Carbonaceous

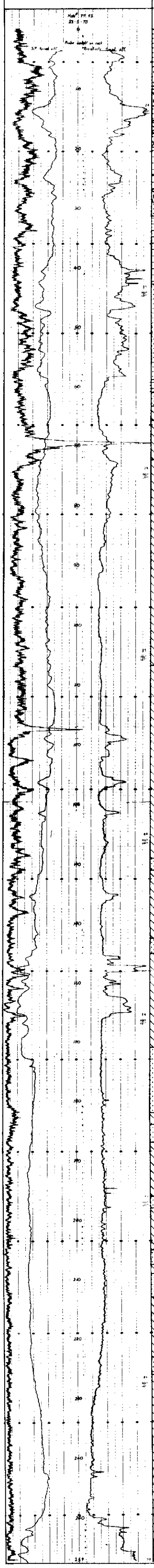
INTERVAL	DESCRIPTION
Metres	
0 - 17.6	GRAVELS: Light brown, poorly sorted stream sands and gravels, sub-rounded pebbles to 6cm; some calcrete.
17.6-106.75	MIXED CLASTICS: Reddish-brown; angular to sub-rounded siliceous sands.
106.75-143.5	CLAY: Brownish and grey silty clays with some siliceous sand.
143.5-145.5	SAND: Sub-rounded siliceous sand 2 - 3mm.
145.5-157	CLAY: Grey and white.
157 -171	CLAY: Light grey clay.
171 -173	CLAY: Grey to black and minor variegated.
173 -175.5	SAND: Fine quartz sand with clay "as above".
175.5-180	CLAY: Grey to black and minor variegated.
180 -182.5	CLAY: As above with some fine quartz sand.
182.5-221	CLAY: Grey to black and minor variegated.
221 -224	SANDY CLAY: As above sections.
224 -239	CLAY: Grey to black and minor variegated
239 -244	CLAY: As above with siliceous pebbles to 2cm.
244 -270	CLAY: Grey to black and minor variegated.
270 -272.5	SANDY CLAY: Clays grey to black and minor variegated: variegated quartz sand, and occasional pebble to 1cm.
272.5-275	CLAY: Grey to black lignitic clays; trace of sand.
275 -303	SANDY CLAY: Grey and variegated clays; sub-rounded coloured quartz sand to 2mm; fine pyrite.
303 -306	SANDY CLAY: As above.

RECEIVED 21 OCT 1975 DEPT. OF MINES SECURITY

DRILL HOLE LOG 2328(III)-6

HOLE No.	77-45	DATE DRILLED	21/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	23/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	23/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	300
LOCATION	L. Frome	DRILLED DEPTH	255.8m	PAPER SPEED	1 cm/m	BIAS	450
STATE	S.A.	LOGGED DEPTH	257.0m	LOGGING SPEED	9 m/m	FLUID LEVEL	3.6m
GEOLOGIST	M. Bell	ELEVATION	95.22m	BACK GROUND	9	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	662 c/s
LOGGER	I. Hart			K-FACTOR	1.32×10^{-5}		

LITHOLOGY : Gravel · Sand · Silt · Clay · Carbonate · Carbonaceous



Metres		Feet	DESCRIPTION
0	– 6.1		SAND: Brown and white quartz sand, mostly angular to 1mm; occasional sub-rounded pebble about 1cm; minor crystalline gypsum.
6.1	– 12.95		SILT: Reddish-brown; quartz pebbles to 4mm.
12.95	– 15.2		SAND: Reddish-brown and white; sub-rounded to 2mm; some crystalline gypsum.
15.2	– 17.5		MIXED CLASTICS: Reddish-brown and white quartz sand, sub-rounded to 2mm; quartz pebbles to 1cm.
17.5	– 19.8		SILT: Greenish-grey with red clayey silts; some quartz chips and pebbles to 2cm.
19.8	– 24.4		SILT: Greenish-grey with reddish-brown stain.
24.4	– 26.7		SILTY CLAY: Greenish-grey; more oxide stain than above section; much fine mica flakes.
26.7	– 29		SAND: Brownish quartz sand; sub-rounded to 2mm; quartz pebbles to 5cm.
29	– 31.5		SILTY SAND: Brownish, sub-rounded to 2mm.
31.5	– 42.7		SILT: Reddish-brown; minor greenish-grey colouring.
42.7	– 58.8		SILT: Greenish-grey with brown stain; some mica flakes.
58.8	– 61		SILT: Greenish-grey with brown and yellow stain.
61	– 63.2		SILTY SAND: Greenish-grey; quartz sand sub-rounded to 1mm.
63.2	– 66.6		CLAY: Greenish-grey with fine mica.
66.6	– 72.4		CLAY: Medium grey, waxy.
72.4	–106.8		CLAY: Light grey with white clay; minor hematite and limonite stain.
106.8	–139		CLAY: Medium grey.
139	–141		SAND: Grey; fine silty sand angular to sub-rounded to 1mm.
141	–152.5		CLAY: White to black lignitic clay and variegated.
152.5	–155		SAND: Grey, fine silty sand, angular to sub-rounded to 1mm.
155	–171		CLAY: Grey to black lignitic clay and variegated.
171	–182		SAND: White quartz sand, sub-rounded to rounded to 5mm.
182	–184		CLAY: Grey to black; lignitic.
184	–187		SAND: White, siliceous, sub-rounded to rounded to 5mm.
187	–196		CLAY: Grey to black lignitic clay.
196	–198		SAND: White, siliceous, sub-rounded to rounded to 5mm.
198	–205		CLAY: Grey to black lignitic and variegated clays.
205	–207.5		SAND: Sub-rounded quartz sand to 1mm.
207.5	–209		CLAY: Grey to black.
209	–213		SAND: Sub-rounded quartz sand to 1mm.
213	–223		CLAY: Grey to black and variegated.
223	–226		SAND: Sub-rounded quartz sand to 1mm.
226	–257		CLAY: Grey to black.
257	–258		GRAVEL: Granitic and quartz pebbles, sub-rounded to 4cm; some quartz-mica schist.

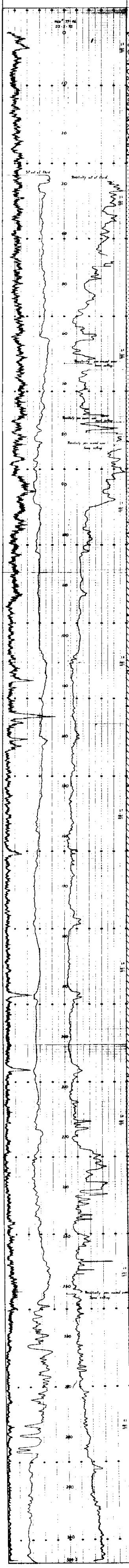
End of hole.

TS 1489 R

DRILL HOLE LOG 2328(III)-7

HOLE No.	77-46	DATE DRILLED	24/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	25/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	25/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	300
LOCATION	L. Frome	DRILLED DEPTH	306.6m	PAPER SPEED	1 cm/m	BIAS	550
STATE	S.A.	LOGGED DEPTH	304.5m	LOGGING SPEED	9 m/m	FLUID LEVEL	28.3m
GEOLOGIST	M. Bell	ELEVATION		BACK GROUND -	8 c/s	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	672
LOGGER	I. Hart			K-FACTOR	1.32×10^{-5}		

LITHOLOGY : Gravel · Sand · Silt · Clay · Carbonate · Carbonaceous



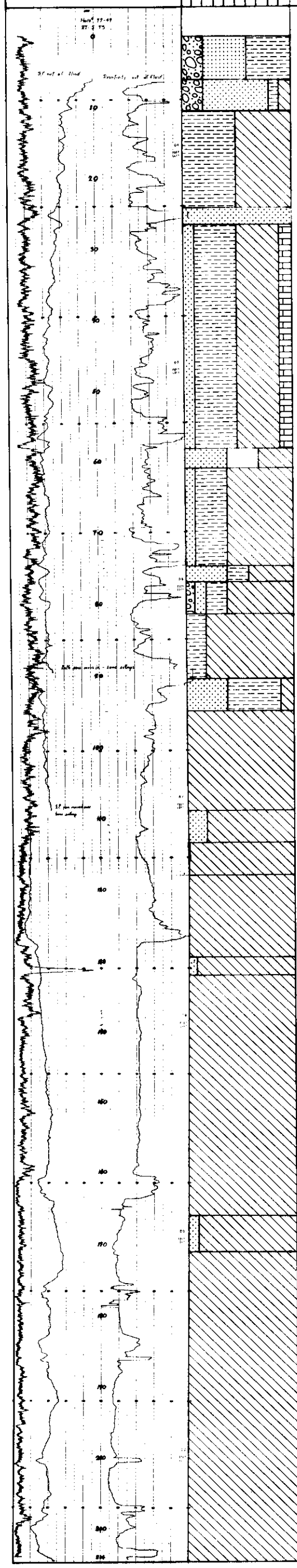
INTERVAL	DESCRIPTION
0 – 6.1	GRAVELY SAND: Brown
6.1– 15.3	MIXED CLASTICS: Brown sands and gravels with chips of calcrete.
15.3– 17.5	CLAY: Grey and silty with brown stain.
17.5– 24.4	MIXED CLASTICS: Grey with reddish-brown stain.
24.4– 81.5	SANDY GRAVEL: Pebble to 4cm.
81.5– 97.5	CLAYEY SILT: Reddish-brown with some pebbles.
97.5– 99.3	MIXED CLASTICS: Reddish-brown.
99.3–116	CLAY: Grey-green with some reddish-brown and yellow limonite stain.
116 –134	SILTY SAND: Reddish-brown, fine-medium to coarse.
134 –150	CLAY: Light olive green and minor white clay.
150 – 154	CLAY: Purplish-grey to dark grey, some limonite stain.
154 – 204	CLAY: Black lignitic.
204 – 208	CLAY: Light to dark grey with some limonite stain; traces of crystalline gypsum.
208 – 304	CLAY: Light grey to black and minor variegated clays; traces of gypsum.
304 –306	CLAY: Light grey to black and minor variegated clay; some quartz sand, gypsum and dolomite.
	SAND: "As above" with coarse quartz sand to 4mm.

2328 RECEIVED 21 OCT 1975 DEPT. OF MINES SECUR

DRILL HOLE LOG 2328(III)-8

HOLE No.	77-47	DATE DRILLED	26/5/75	GAMMA LOG		ELECTRIC LOG	
EXPL. LICENCE No.	77	DATE COMPLETED	27/5/75	RANGE	200 c/s	RESIST. SCALE	HI
PROJECT	Poontana	DATE LOGGED	27/5/75	TIME CONSTANT	2.0 sec	SP. SCALE	300
LOCATION	L. Frome	DRILLED DEPTH	215.5m	PAPER SPEED	1 cm/m	BIAS	650
STATE	S.A.	LOGGED DEPTH	214.0m	LOGGING SPEED	9 m/m	FLUID LEVEL	6.0m
GEOLOGIST	M. Bell	ELEVATION		BACK GROUND	9 c/s	PROBE No.	109
DRILLER	R. Brown	CO-ORDS		TIME BASE		STANDARD	660 c/s
LOGGER	I. Hart			K-FACTOR	1.32×10^{-5}		

LITHOLOGY : Gravel | Sand | Silt | Clay | Carbonate | Carbonaceous



INTERVAL (Metres)	DESCRIPTION
0 - 6.1	MIXED CLASTICS: Reddish-brown; sub-rounded quartz sand to 2mm; pebbles to 7cm.
6.1- 10.7	SAND: Reddish-brown coarse and poorly sorted quartz sand.
10.7- 24.4	SILTY CLAY: Reddish-brown with [illegible] clasts.
24.4- 26.6	SAND: Yellowish-brown quartz sand to 1mm; occasional pebbles to 2cm.
26.6- 50.7	SILTY CLAY: Reddish-brown; minor calcrete.
50.7- 61	MIXED CLASTICS: Reddish-brown quartz sand to 2mm.
61 - 74.7	SILTY CLAY: Reddish-brown with grey green lenses; some calcrete at 70m.
74.7- 77	MIXED CLASTICS: Reddish-brown.
77 - 81.5	CLAY: Reddish-brown.
81.5- 90.5	CLAY: Greenish-grey clays with minor red iron stain.
90.5- 95	SANDY SILT: Yellowish, reddish-brown and white quartz sand sub-rounded to 2mm; grey-green and reddish-brown clay.
95 -109	CLAY: Grey-green with yellow limonite stain.
109 -113.5	CLAY: Yellow grey; yellow, white and reddish-brown quartz sand sub-rounded to 1mm.
113.5-118	CLAY: Yellow-green, but with some small red hematite nodules; trace of sand.
118 -129.5	CLAY: Light grey with yellow limonite stain.
129.5-132	CLAY: Light grey with yellow limonite stain; some clean quartz sand.
132 -166	CLAY: Light yellow grey clay to medium grey clay, and purplish hematite clay, and other variegated clay.
166 -171	CLAY: Light grey; sub-rounded quartz sand to 1mm; minor crystalline gypsum.
171 -216	CLAY: Mainly light grey, minor dark grey and variegated clays.

End of hole

T 12948

POONTANA PROJECT - 1975
DRILL HOLE LOCATIONS & SECTIONS

EL 77

EL 68

EL 91

Lake

Frome

"Moolawatana"

"Old Moolawatana" (ruins)

"Mt Freeling"

"Mt Fitton"

"Paralana"

"North Mulga"

"Umberatana"

"Old Illinawortina"

"Yadoninna"

"Arkaroola"

"Yerelina"

"Wooltana"

"Balcanoona"

"Wertaloona"

"Arrowie"

"Wearing" (ruins)

"Mulga View"

"Willawortina"

SECTION I
SECTION II
SECTION III
SECTION IV
SECTION V
SECTION VI A
SECTION VI B
SECTION VII
SECTION VIII A
SECTION VIII B

Trinity Well
Village Well
Pelican Well
Billy Spring Bore
The MacDonnell Ranges
Tordiapinna Well
Mundowertina Well
Lonesome Bore
Mt Livingston Well and Spring
Tindelpina Creek
Great Gladstone Bore
Tindelpina Well
Canyon Bore
Daly Bore
Yudnamutana Bore
Overland Bore
Bend Well
Mt Thomas Well Bore
North Well
Mallee Well
Illinawortina Well
Boulder Bore
Nudlamutana Well
Bolla Bollana Creek
O'Donohue Castle Well
Merlinjina Well
Gunpowder Bore
Twelve Springs
Terropinna Bore
Terropinna Springs
Hamiltons Creek
Valley Bore
Speculation Well
Pepegoona Bore (I.D.)
Four Mile Well (P.D.)
Four Mile Bore
Paralana Hot Springs
Bore
N.35 Bore
Buxton Bore
Mulga Creek Well (P.D.)
Hotsprings
Paralana Creek
N.6 Bore (I.D.)
Arkaroola Creek
Weednamoka Well
John Brown Well
Caldina Creek
Roberts Well
N.12 Bore
N.1 Bore
Ewaroona Well
N.E. Ewaroona Bore
New Caldina Bore
Cockatoo Bore
Caldina Well
White Dam Bore
Woodlawoodiana Well
Acacia Park Well
Mulga Bore (P.D.)
Mulga Park Well
Mulga Bore
Muckalooona Well
Johnsons Dam
Home Rule Bore
John Well
One Gun Dam
Lake Well
Ti-Tree Bore
O'Reilly Dam
Dead Bullock Bore
Old Dam
Mulga Well
Lake Dam
Willawortina Dam
Moro Spring
Moro Creek
Nantoworrinna Bore
One Tree Bore
Ironstone Bore
Yates Well
Black Oak Well
Collins Dam
Double Dam
Willowie Bore No.3
Pauls Dam
Pauls Well
O'Connell Bore
Rockhole Bore
Wearing Well
No.1 and No.2 Wells
Horse Dam
Moorowie Well
Moorowie Bore
Little Bobmonie Well
Bell Bore
Bore (I.D.)
Bendleula Creek
Mosquito Creek Bore
Mulligan Dam
Woolatchi Creek
Woolatchi Bore
Bore
Skeleton Bore
Anderson Bore
Marks Bore
Little Bank Bore
Parabarana Bore
No.1 Bore
Box Bore
Middebank Bore
New Bore
Yagolin Dam
North Poontana Bore
Ned's Bore
Bar Bore
Poontana Creek
Moolawatana Bore
Callabonna Creek
Lake Callabonna
North Mulga Bore
Eagle Well
Christmas Bore
Ram Bore
Tea Tree Bore
Tea Tree Creek
Eagle Dam
Christmas Well
Mungeroonie Bore
Sandridge Bore
Lake Bail Well
Cootabarlow No.1 Bore
Lake Cootabarlow
Coombs Dam
Bore (I.D.)
Beltana Creek
Muloorina Creek
Mulga Bore
Johnsons Dam Creek
Mulga Creek
Wearyan Ck
Bell Ck
Pauls Creek
Paul Creek
Inalowie Creek
Balcanoona Creek
Netting Well Creek
Big John Creek
Moro Creek
Tea Tree Creek
Hamiltons Creek
Callabonna Creek
Poontana Creek
Four Mile Creek
Caldina Creek
Arkaroola Creek
Woolatchi Creek
Paralana Creek
Hotsprings Creek
Bolla Bollana Creek
Muloorina Creek
Beltana Creek
Bell Ck
Wearyan Ck
Pauls Creek
Paul Creek
Inalowie Creek
Balcanoona Creek
Netting Well Creek
Big John Creek
Moro Creek
Tea Tree Creek
Hamiltons Creek
Callabonna Creek
Poontana Creek
Four Mile Creek
Caldina Creek
Arkaroola Creek
Woolatchi Creek
Paralana Creek
Hotsprings Creek
Bolla Bollana Creek
Muloorina Creek
Beltana Creek

139°15'
139°30'
139°45'
140°00'
30°00'
30°15'
30°30'
30°45'

LOCATION DIAGRAM

REFERENCE TO AUSTRALIA STANDARD MAP SERIES

SH54-5 MARREE	SH54-6 CALLABONNA	SH54-7 MILPARINKA
SH54-9 COPLEY	SH54-10 FROME	SH54-11 COBHAM LAKE
SH54-13 PARACHILNA	SH54-14 CURNAMONA	SH54-15 BROKEN HILL

LEGEND

- Road, loose surface all weather second class
- Road, unimproved earth
- Lake, river or stream intermittent
- Participation area

SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 30 KILOMETRES

2328
21 OCT 1975
SECURITY COPY

2328(III)-9

FIGURE II

BP MINERALS AUST. PTY LTD	
Area: LAKE FROME	
EL-77	
REF: 2-B-41	
JULY, 1975	M.S.BELL

T 1294A

POONTANA PROJECT - 1975
STRUCTURAL INTERPRETATION SHOWING POSSIBLE FAULTS & CHANNELS

EL 77

EL 68

EL 91

POONTANA SUB-BASIN

LOWER TERTIARY CHANNELS

UPPER TERTIARY SANDS

AXIS

POONTANA FAULT

RANGES

FLINDERS

NORTH

CALLABONNA

LAKE

Lake Cootabarlow

Lake

Frome

"Mt Freeling"

"Mt Fitton"

"Moolawatana"

"Old Moolawatana" (ruins)

"Paratana"

"North Mulga"

"Umberatana"

"Old Illinawortina"

"Yadaninna"

"Arkaroola"

"Yerelina"

"Wooltana"

"Balcanoona"

"Wertaloona"

"Wearing" (ruins)

"Arrowie"

"Mulga View"

"Old Moolawatana" (ruins)

Trinity Well

Village Well

Billy Spring Bore

The MacDonnell Ranges

Pelican Well

Tardlapinna Well

Mundowertina Well

Lonesome Bore

Mt Livingston Well and Spring

Tindelpina Creek

Hamiltons Creek

Valley Bore

Great Gladstone Bore

Yerelina Creek

Tindelpina Well

Canyon Bore

Daly Bore

Yudnamutana Bore

Overland Bore

Bend Well

Mt Thomas Well

Mallee Well

Illinawortina Well

Boulder Bore

Arkaroola Creek

John Brown Well

Woodnamoka Well

Nudlamutana Well

Balla Balloona Creek

O'Donahue Castle Well

Merinjina Well

Rockhole Bore

Wearing Well

Netting Well

Balcanoona Creek

Muckalaoona Well

Home Rule Bore

Mallee Well

John Well

Willawortina Dam

Moro Spring

Nantawarrinna Bore

Moro Creek

One Tree Bore

Ironstone Bore

Yates Well

Mulga Bore

Mulga Bore (P.D.)

Mulga Creek Well (P.D.)

Buxton Bore

No.35 Bore

No.6 Bore (P.D.)

Paratana Hot Springs Bore

Four Mile Bore

Four Mile Well (P.D.)

Speculation Well

Gunpowder Bore

Twelve Springs

Terrapinna Bore

Terrapinna Springs

Marks Bore

Anderson Bore

Skeleton Bore

Bore

Mosquito Creek Bore

Mulligan Dam

Woolatchi Creek

Woolatchi Bore

Little Bank Bore

Middebank Bore

Box Bore

Poonbanana Bore (P.D.)

Yogalin Dam

North Poontana Bore

Bar Bore

Poontana Creek

Moolawatana Bore

Christmas Bore

Ram Bore

Tea Tree Bore

Tea Tree Creek

Eagle Dam

Eagle Well

Christmas Well

Mungaroonie Bore

Sandridge Bore

Lake Bell Well

Acacia Park Well

Woodlawoodlana Well

White Dam Bore

Ewaroona Well

Cockatoo Bore

Caldina Well

N.E. Ewaroona Bore

New Caldina Bore

No.1 Bore

No.12 Bore

Roberts Well

No.3 Bore

Johnsons Dam

Home Rule Bore

Lake Well

One Gun Dam

Tri-Tree Bore

O'Reilly Dam

Dead Bullock Bore

Old Dam

Mulga Well

Lake Dam

Black Oak Well

Collins Dam

Double Dam

Horse Dam

Willowie Bore No.3

Pauls Dam

Pauls Well

O'Connell Bore

Moorowie Well

Moorowie Bore

Little Bobmanie Well

Bell Bore

Bore (P.D.)

Coombs Dam

Nos.1 and 2 Wells

Wertaloona Well

Mallee Well

Netting Well Creek

Willowie Creek

Munyallina Creek

Bell Ck

Bendleuta Creek

Weetowie Creek

Paul Creek

Big John Creek

Hotsprings of Paratana Creek

Arkaroola Creek

Poontana Creek

Hamiltons Creek

Woolatchi Creek

Tea Tree Creek

Four Mile Creek

Balcanoona Creek

Johnsons Dam Creek

Moro Creek

Big John Creek

Paul Creek

Bell Ck

Bendleuta Creek

Weetowie Creek

Munyallina Creek

Arkaroola Creek

Poontana Creek

Hamiltons Creek

Woolatchi Creek

Tea Tree Creek

Four Mile Creek

Balcanoona Creek

Johnsons Dam Creek

Moro Creek

139° 15'

139° 30'

139° 45'

140° 00'

30° 00'

30° 15'

30° 30'

30° 45'

LOCATION DIAGRAM

REFERENCE TO AUSTRALIA STANDARD MAP SERIES

SH54-5 MARREE	SH54-6 CALLABONNA	SH54-7 MILPARINKA
SH54-9 COPLEY	SH54-10 FROME	SH54-11 COBHAM LAKE
SH54-13 PARACHILNA	SH54-14 CURNAMONA	SH54-15 BROKEN HILL

SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 30 KILOMETRES

2 1 OCT 1975

LEGEND

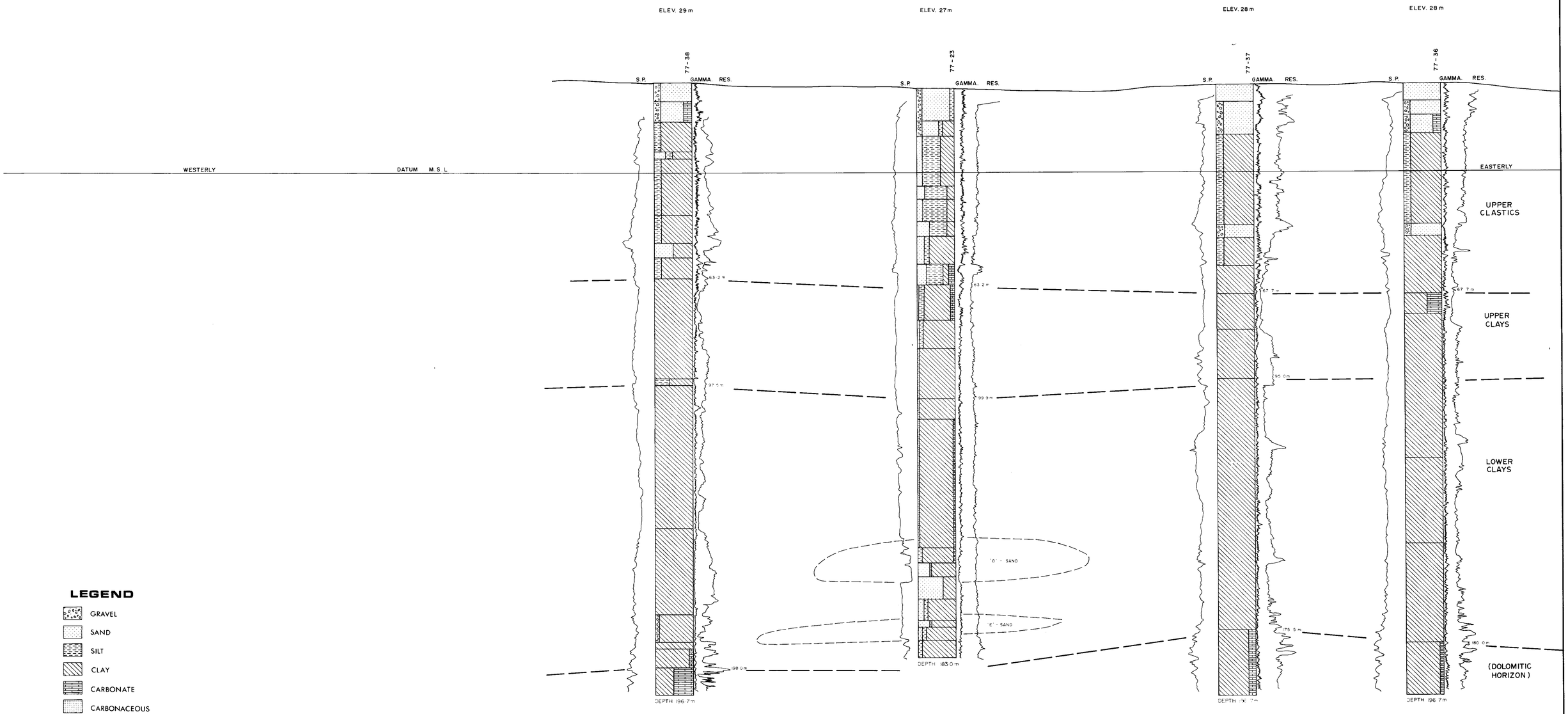
- Road, loose surface all weather second class
- Road, unimproved earth
- Lake, river or stream intermittent
- Participation area
- Faults

FIGURE IV

BP MINERALS AUST. PTY LTD	
Area: LAKE FROME	
EL-77	
REF: 2-B-41	
JULY, 1975	M.S. BELL

2328(III)-10

T 1352 A



LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

1975

POONTANA PROJECT

PROGRAM 1

EL-77

AREA IV

POONTANA CREEK

SECTION I

SCALE

VERTICAL: 1cm = 6m

HORIZONTAL: 1cm = 50m

2328 RECEIVED 21 OCT 1975 DEPT. OF MINES SECURITY DOC. III

2328 (III)-11 Figure V

FIGURE V

BP MINERALS AUST. PTY LTD	
Area: EL-77, LAKE FROME	
SOUTH AUSTRALIA	
Ref: 2-8-41	
SEPT. 1975	M.S. BELL

T 1352 I

ELEV. 27 m

ELEV. 28 m

ELEV. 26 m

ELEV. 29 m

ELEV. 30 m

S.P. | 77.25 | GAMMA | RES. | S.P. | 77.21 | GAMMA | RES. | S.P. | 77.22 | GAMMA | RES. | 77.24 | GAMMA | S.P. | RES. | S.P. | 77.37 | GAMMA | RES.

WESTERLY

DATUM M.S.L.

EASTERLY

UPPER CLASTICS

UPPER CLAYS

240'

270'

305

'B' - SAND

310'

350

'B' - SAND

490'

530'

'D' - SAND

530'

570'

590'

'D' - SAND

240

320'

360'

'B' - SAND

520'

560'

590'

'D' - SAND

70.3 m

110.0 m

189.0

200 m

(DOLOMITIC HORIZON)

(DOLOMITIC HORIZON)

?

?

DEPTH 620'

DEPTH 710'

DEPTH 620'

DEPTH 620'

DEPTH 306 m

EYRE FORMATION

LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

1975

POONTANA PROJECT

PROGRAM 1

EL - 77

AREA IV

POONTANA CREEK

SECTION II

SCALE

VERTICAL: 1cm = 6m ; 1" = 50'

HORIZONTAL: 1cm = 50m

RECEIVED 21 OCT 1975 DEPT. OF MINES SOUTH AUSTRALIA

Drawn Cartoscope Sydney

FIGURE VI

BP MINERALS AUST. PTY LTD	
Area: EL-77, LAKE FROME	
SOUTH AUSTRALIA	
Ref: 2-B-41	
SEPT. 1975	M.S.BELL

2328(III)-12

T 1352 C

ELEV. 30m

ELEV. 30·6m

ELEV. 31·43m

77 - 33

77 - 35

77 - 34

S.P. GAMMA RES.

WESTERLY

DATUM M.S.L.

EASTERLY

UPPER CLASTICS

UPPER CLAYS

'B' SAND

86 m

99·1 m

LOWER CLAYS

186·0 m

189·0 m

193·7 m

(DOLOMITIC HORIZON)

DEPTH 196·7m

DEPTH 196·7 m

DEPTH 196·7m

LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

1975

POONTANA PROJECT

PROGRAM 1

EL-77

AREA IV

POONTANA CREEK

SECTION III

SCALE

VERTICAL : 1cm = 6m

HORIZONTAL : 1cm = 50m

2328
RECEIVED
21 OCT 1975
DIV. OF MINES
SECURITY

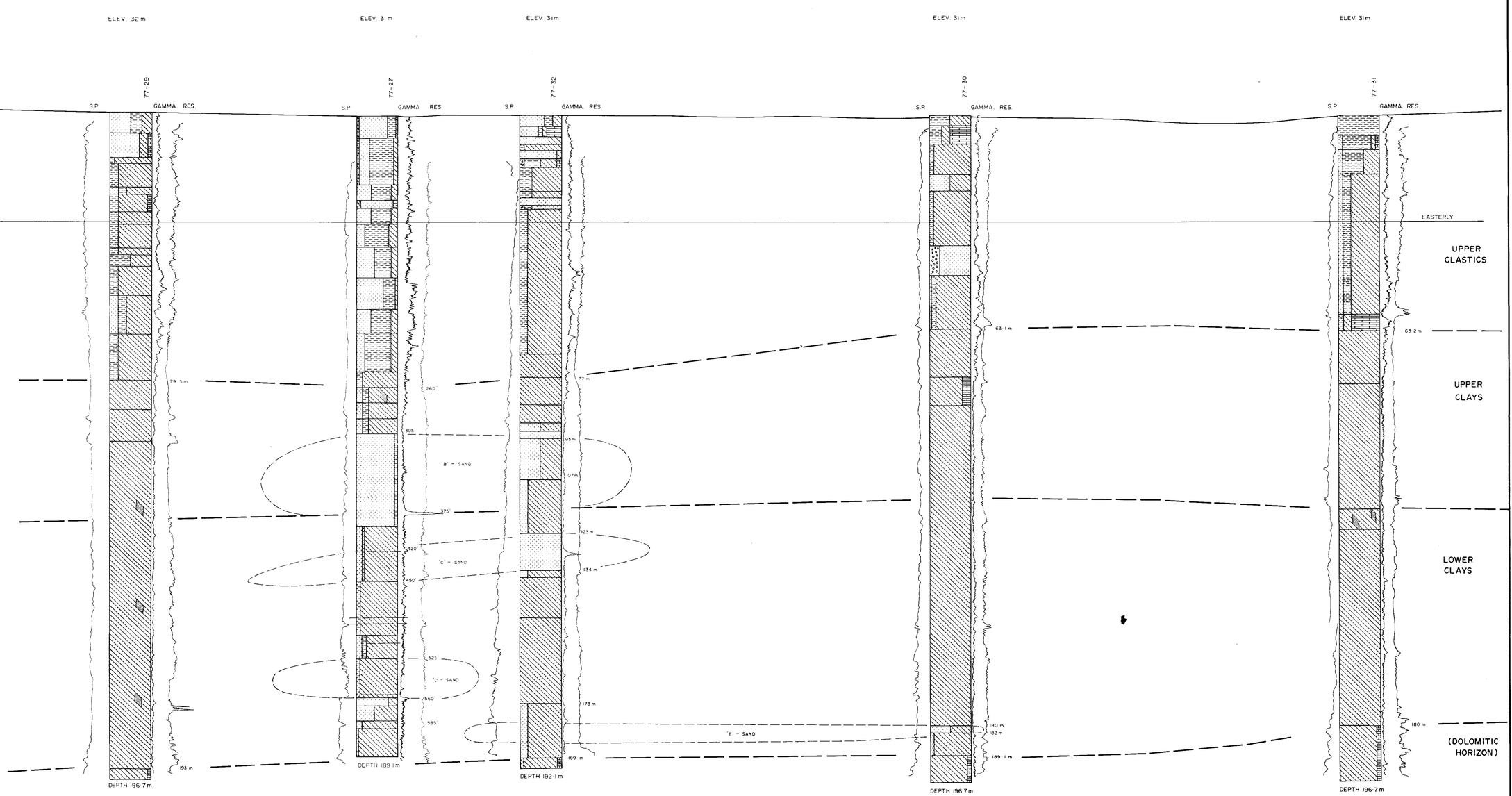
FIGURE VII

BP MINERALS AUST. PTY LTD	
Area: EL-77, LAKE FROME	
SOUTH AUSTRALIA	
Ref: 2-8-41	
SEPT. 1975	M. S. BELL

2328(III)-13

Drawn Cartoscope Sydney

T 1352 D



LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

1975

POONTANA PROJECT

PROGRAM 1

EL-77

AREA IV

POOTANA CREEK

SECTION IV

SCALE

VERTICAL : 1cm = 6m

HORIZONTAL : 1cm = 50m

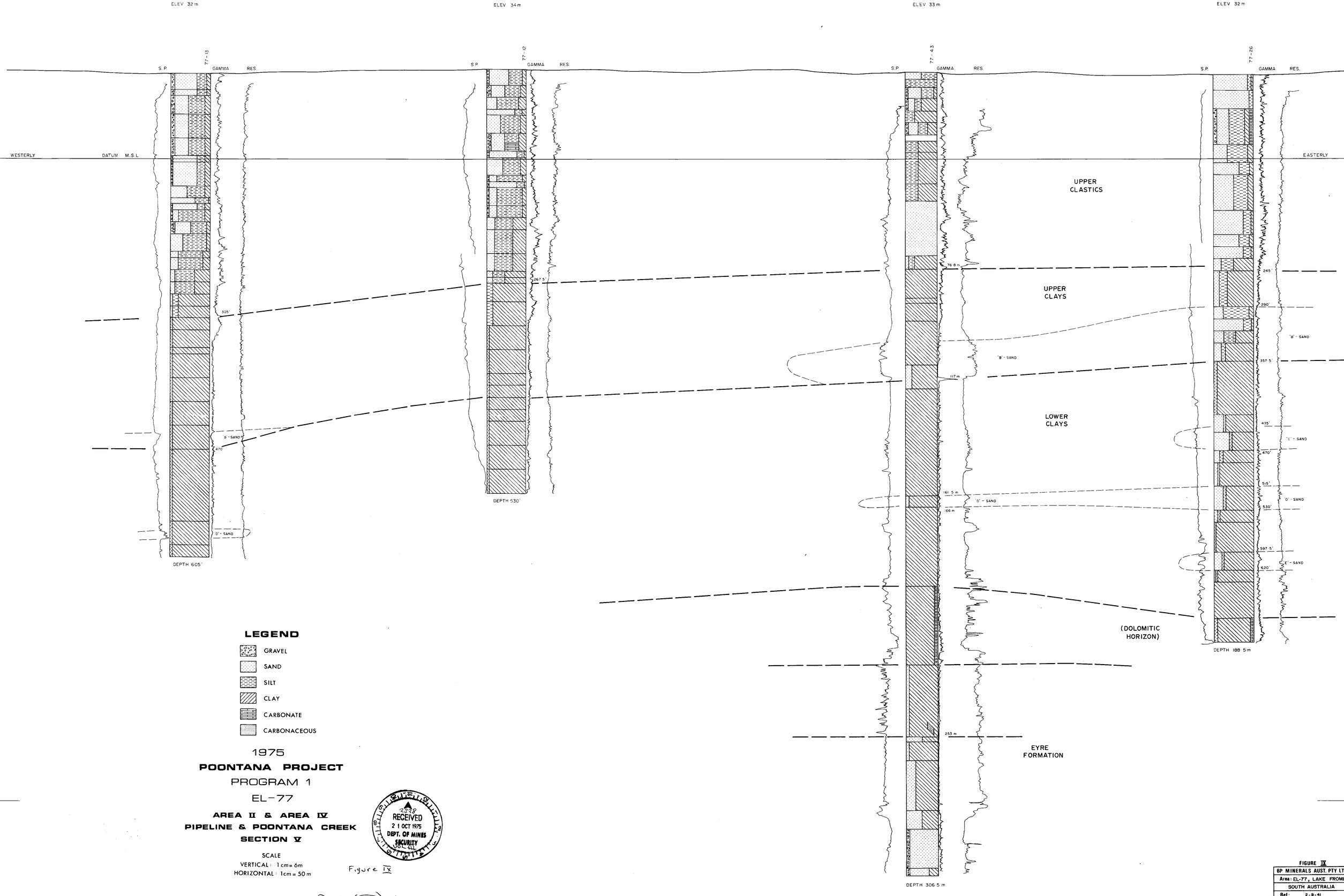
2328
RECEIVED
21 OCT 1975
DEPT. OF MINES
SECURITY
ADELAIDE

2328(III)-14 Figure VIII

FIGURE VIII

BP MINERALS AUST. PTY LTD	
Area: EL-77, LAKE FROME	
SOUTH AUSTRALIA	
Ref: 2-8-41	
SEPT. 1975	M.S.BELL

T 1382



LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

1975

POONTANA PROJECT

PROGRAM 1

EL-77

AREA II & AREA IV

PIPELINE & POONTANA CREEK

SECTION V

SCALE

VERTICAL: 1 cm = 6m

HORIZONTAL: 1 cm = 50 m

2328
RECEIVED
21 OCT 1975
DEPT. OF MINES
SECURITY

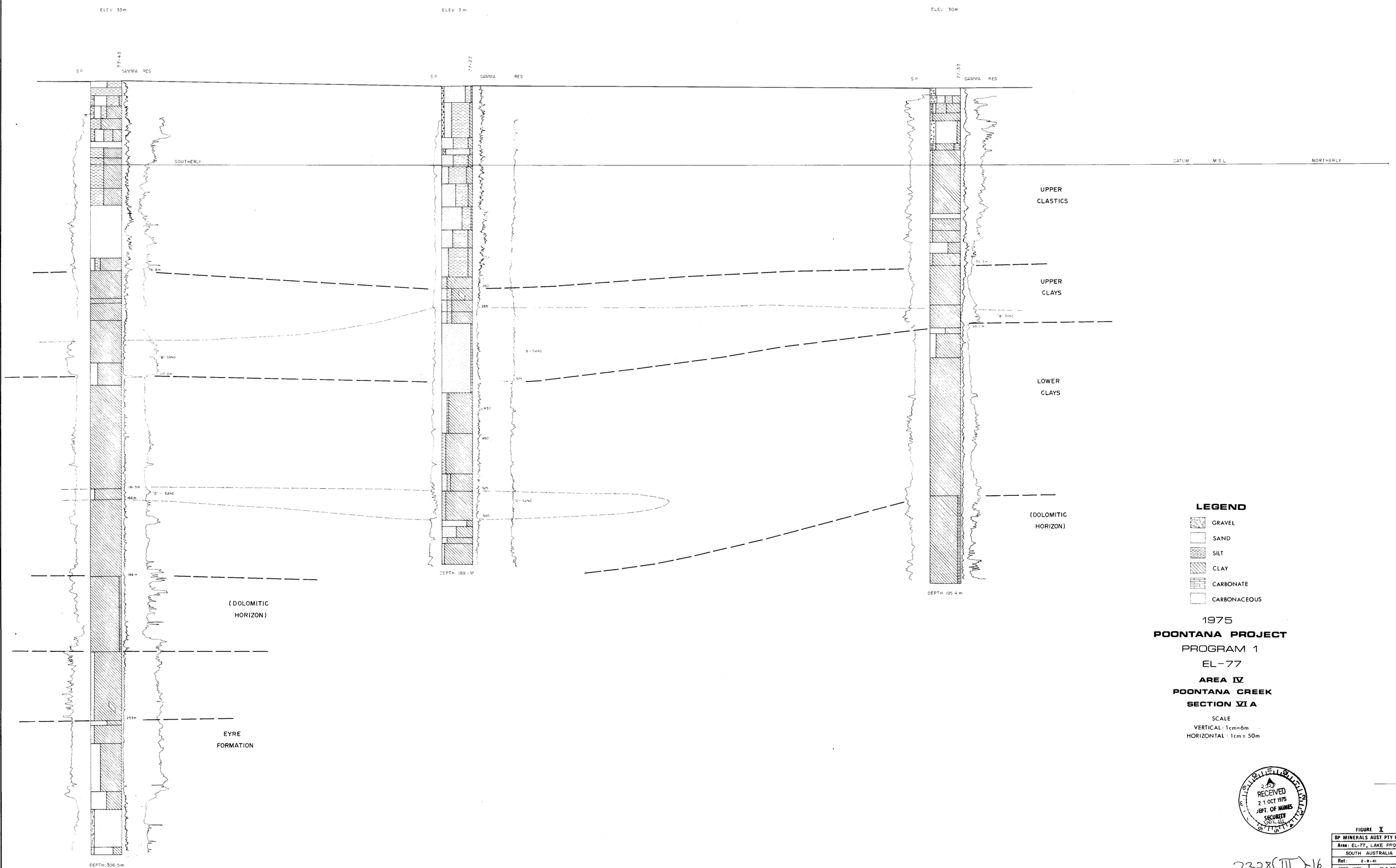
Figure IX

2328(VIII)-15

FIGURE IX

BP MINERALS AUST. PTY LTD	
Area: EL-77, LAKE FROME SOUTH AUSTRALIA	
Ref: 2-B-41	
SEPT. 1975	M. S. BELL

T 1352



LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

1975

POONTANA PROJECT

PROGRAM 1

EL-77

AREA IV

POONTANA CREEK

SECTION VI A

SCALE
VERTICAL : 1cm=6m
HORIZONTAL : 1cm = 50m

2328
RECEIVED
21 OCT 1975
DEPT. OF MINES
SECURITY
ADELAIDE SOUTH AUSTRALIA

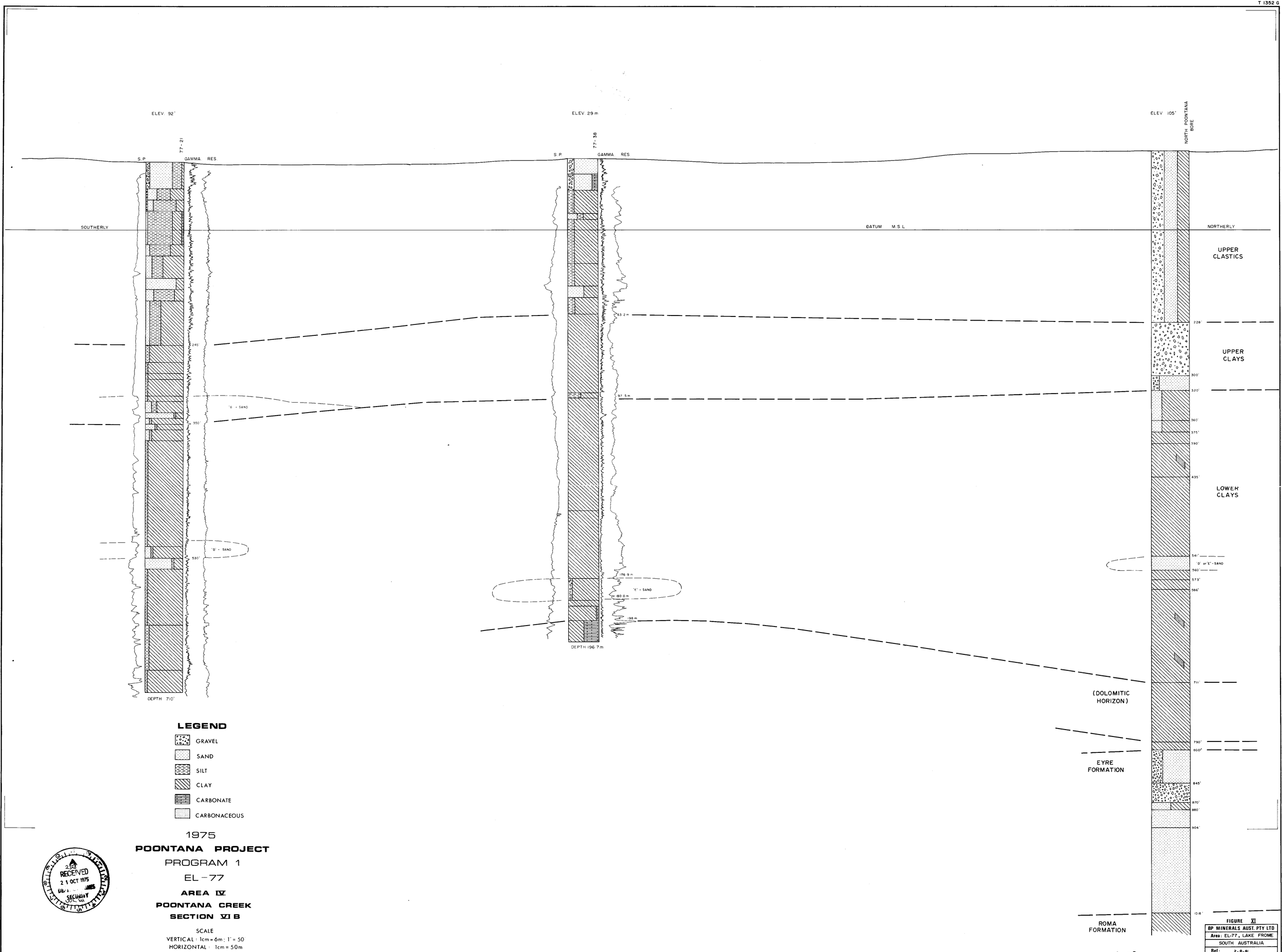
FIGURE X

BP MINERALS AUST. PTY LTD	
Area: EL-77, LAKE EROME	
SOUTH AUSTRALIA	
Ref: 2-8-41	
SEPT. 1975	M.S. BELL

Drawn Cartoscope Sydney

2328(III)-16

T 1352



LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

1975

POONTANA PROJECT

PROGRAM 1

EL-77

AREA IV

POONTANA CREEK

SECTION VI B

SCALE

VERTICAL : 1cm = 6m ; 1" = 50'

HORIZONTAL : 1cm = 50m

RECEIVED
21 OCT 1975
SECURITY

FIGURE XI

BP MINERALS AUST. PTY LTD	
Area: EL-77, LAKE FROME	
SOUTH AUSTRALIA	
Ref: 2-8-41	
SEPT. 1975	M.S.BELL

2328(III)-17

T 1352 H

ELEV. 31m.

S.P. 77-40 GAMMA RES.

SOUTHERLY

74.7m

?

?

?

?

180m

DEPTH 196.7m

ELEV. 30m.

S.P. 77-41 GAMMA RES.

74.5m

?

?

172.8m

203m

256m

DEPTH 290m

DATUM M.S.L.

UPPER CLASTICS

UPPER CLAYS

?

?

LOWER CLAYS

(DOLOMITIC HORIZON)

EYRE FORMATION

ELEV. 29m.

S.P. 77-42 GAMMA RES.

NORTHERLY

70m

?

173m

DEPTH 196.7m.

LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

1975

POONTANA PROJECT

PROGRAM 1

EL-77

AREA IV

POONTANA CREEK

SECTION VII

SCALE

VERTICAL 1cm = 6m

HORIZONTAL 1cm = 50m

2328 RECEIVED 21 OCT 1975 DEPT. OF MINES SECURITY

FIGURE XII

BP MINERALS AUST. PTY LTD	
Area: EL-77, LAKE FROME	
SOUTH AUSTRALIA	
Ref: 2-B-41	
SEPT. 1975	M. S. BELL

2328(III)-18

Drawn Cartoscope Sydney

T 1352 I

ELEV 30m

E - 28/14

SOUTHERLY

200'
212'
238'
280'
442'
'C' - SAND
470'

DEPTH 620'

ELEV 32 m

77-26

S.P. GAMMA RES.

245'
290'
'B' - SAND
357.5'
425'
'C' - SAND
460'
515'
530'
'D' - SAND
597.5'
'E' - SAND
620'
680'

DEPTH 710'

ELEV 31 m

77-32

S.P. GAMMA RES.

DATUM M.S.L.

NORTHERLY

UPPER CLASTICS

77 m
UPPER CLAYS
55 m
'B' - SAND
107 m
123 m
'C' - SAND
130 m
LOWER CLAYS
177 m
'E' - SAND
185 m
189 m

DEPTH 192 I m

(DOLOMITIC HORIZON)

LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

1975

POONTANA PROJECT

PROGRAM 1

EL-77

AREA IV

POONTANA CREEK

SECTION VIII A

SCALE
VERTICAL: 1cm = 6m; 1" = 50'
HORIZONTAL: 1cm = 50m

RECEIVED
21 OCT 1975
DEPT. OF MINES
SECURITY

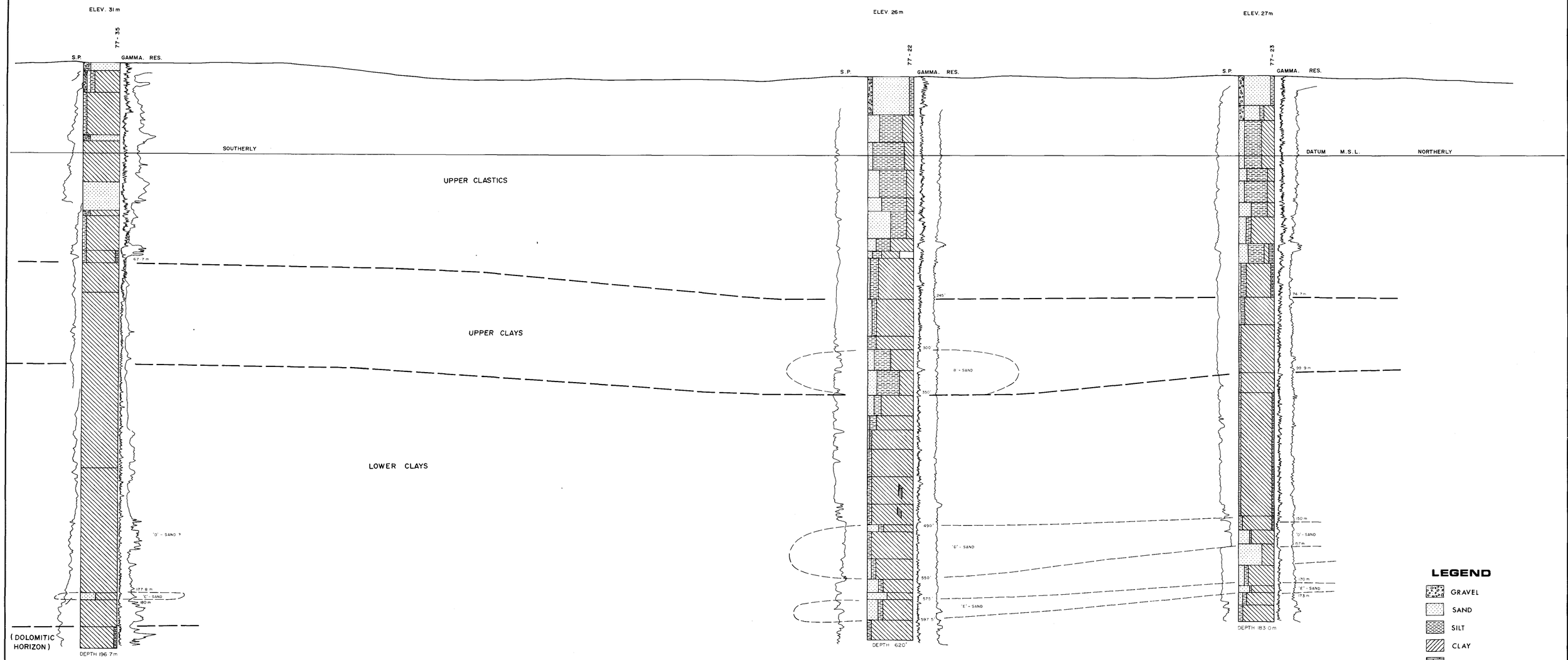
FIGURE XIII

BP MINERALS AUST. PTY LTD	
Area: EL-77, LAKE FROME	
SOUTH AUSTRALIA	
Ref: 2-B-41	
SEPT. 1975	M. S. BELL

2328(III)-19

Drawn Cartescope Sydney

T 1352 J



LEGEND

- GRAVEL
- SAND
- SILT
- CLAY
- CARBONATE
- CARBONACEOUS

1975

POONTANA PROJECT

PROGRAM 1

EL – 77

AREA IV

POONTANA CREEK

SECTION VIII B

SCALE

VERTICAL: 1cm = 6m ; 1" = 50'

HORIZONTAL: 1cm = 50m

2.12
RECEIVED
21 OCT 1975
Dept. of MINES
SECURITY

Drawn: Cartoscope Sydney

FIGURE XIV

BP MINERALS AUST. PTY LTD	
Area: EL-77, LAKE FROME	
SOUTH AUSTRALIA	
Ref: 2-9-41	
SEPT. 1975	M.S. BELL

2328 (III) – 20