SOUTH AUSTRALIAN OIL & GAS
CORPORATION PTY. LTD.

BC4/565

SOUTH AUSTRALIAN OIL & GAS CORPORATION PTY. LTD.

226 Melbourne Street, North Adelaide, S.A. 5006
Telephone: 267 5699 Telex: AA 88900
P.O. Box 470, North Adelaide, S.A. 5006

Our Ref. 1.MAWO1.MUO2

902536 002

SOUTH AUSTRALIAN OIL & GAS CORPORATION PTY. LTD. - COMSERV (779)

Page 2 of 70

OIL and GAS DIVISION

MILDURA WEST 1

25 OCT 1983

WELL COMPLETION REPORT

W822

PLEASE DO NOT TAKE APART.

Prepared by:
R.J. Suttill
SAOGC
July, 1983

IMPORTANT NOTICE

The contents of this document have been prepared from information supplied to and gathered by South Australian Oil & Gas Corporation Pty. Limited ("The Company") from a variety of primary and secondary sources. Whilst the Company has attempted to ensure that such information is up-to-date and accurate and that the conclusions and recommendations contained herein are reasonably and soundly based, no warranty is given as to the correctness of any such information and no reliance should be placed on the same or on any such conclusions or recommendations as no liability is accepted by the Company for any statement, opinion, error or omission contained herein or implied hereby and whether the result of negligence or mistake or any other cause whatsoever. The document has been prepared for internal use only, and its provision by the Company is strictly subject to this disclaimer. Any party in any way contemplating action based upon or related to its contents should beforehand seek complete and objective professional and/or technical information analysis and assessments in relation thereto and proceed with any such action specifically on the basis of the same rather than the contents of this document.

C O N T E N T S

Page No.

CONTENTS

WELL DATA CARD

LOCATION MAP

WELL HISTORY 1.

1. General Data 1.
2. Drilling Summary 2.
3. Drilling Data 5.

GEOLOGY 18.

1. Objectives 18.
2. Structure 18.
3. Results of Drilling 19.

(a) Stratigraphy 19.
(b) Stratigraphic Prognosis 22.
(c) Hydrocarbon Shows 23.

4. Conclusions 25.

APPENDICIES

1. Lithological Descriptions 26.
2. Core Descriptions 40.
3. Source Rock Analysis 42.
4. Depth vs Temperature 44.
5. Actual Depth-Time 45.

FIGURES	DRAWING NO.
1. Locality Map	MAW.001.2938
2. Geothermal Gradient	MAW.000.2939
3. Actual Depth-Time Curve	MAW.001.2940

ENCLOSURES	
1. Composite Well Log (GR-Neutron) 1:200	MAW.001.2941
2. SP - Resistivity Log 1:200	
3. Gearhart Mud Log 1:500	

WELL: MILDURA WEST 1

WELL CATEGORY: EXPLORATION

LAT: 34° 32' 30.84" S.
LONG: 141° 24' 26.28" E.
SEISMIC SP: 81-A2 (580)
ELEVATION GND: 63 m
KB: 67.63 m
MAP: MU000.2751
T.D. (LOG): 429.31 m
TD(DRLR): 428.25 m
PBTD: - m
RIG: ATCO-APM A3

PROSPECT TYPE: Structural Drape

INTEREST HOLDERS:

SAOGC	30%
Comserv (779)	70%

Participating Interests:

SAOGC	100%

SPD: 14-6-83 RIG RELEASED: 18-6-83
COMPLETED:
STATUS: PLUGGED AND ABANDONED
TYPE COMPLETION: -
IP: -
INTERVAL: -
ZONE(S): -

902536 005

CASING SIZE	SHOE DEPTH	TYPE
7"	85.58m	23PB, J55, LT & C Range 3

AGE	FORMATION OR ZONE TOPS	DEPTH (m) DRLD	DEPTH (m) SUBSEA	THICKNESS (m)	(H)IGH/(L)OW(m)
Quaternary	Undifferentiated and Blanchetown Clay	4.63	+ 63.0	22.2	0
Pliocene	Parilla Sand	26.8	+ 40.8	49.2	7.8(H)
Pliocene/Miocene	Bookpurnong Beds	76.0	- 8.4	38.8	8.6(H)
Miocene	Duddo Limestone	114.8	- 50.2	121.2	10.2(L)
Oligocene	Ettrick Formation	236.0	- 168.4	18.4	6.4(L)
Eocene	Olney Formation	254.4	- 186.8	106.4	6.8(L)
Eocene/Palaeocene	Warina Formation	Absent	Absent	Absent	Absent
Early Cretaceous	Monash Formation				
	Coombool Member	360.8	- 293.2	54.6	23.2(L)
	Merreti Member	Absent	Absent	Absent	Absent
Cambrian	Kanmantoo Group	415.4	- 374.8	> 13.91	77.2(H)
	Total Depth	429.31	- 361.71	-	73.29(H)

PERFORATIONS 4 SHOTS/m

UNIT	INTERVAL
NONE	

LOG	RUN	INTERVAL	BHT
BPB Logs:			
MCS	1	75m - 427m	44°C
CCS	1	Surface-429.31m	
NS	1	Surface-428m	
FE	1	80m - 428m	
SP-RES	1	80m - 428m	

LOG INTERPRETATION

INTERVAL	Ø	Sw	INTERVAL	Ø	Sw	INTERVAL	Ø	Sw

CORES

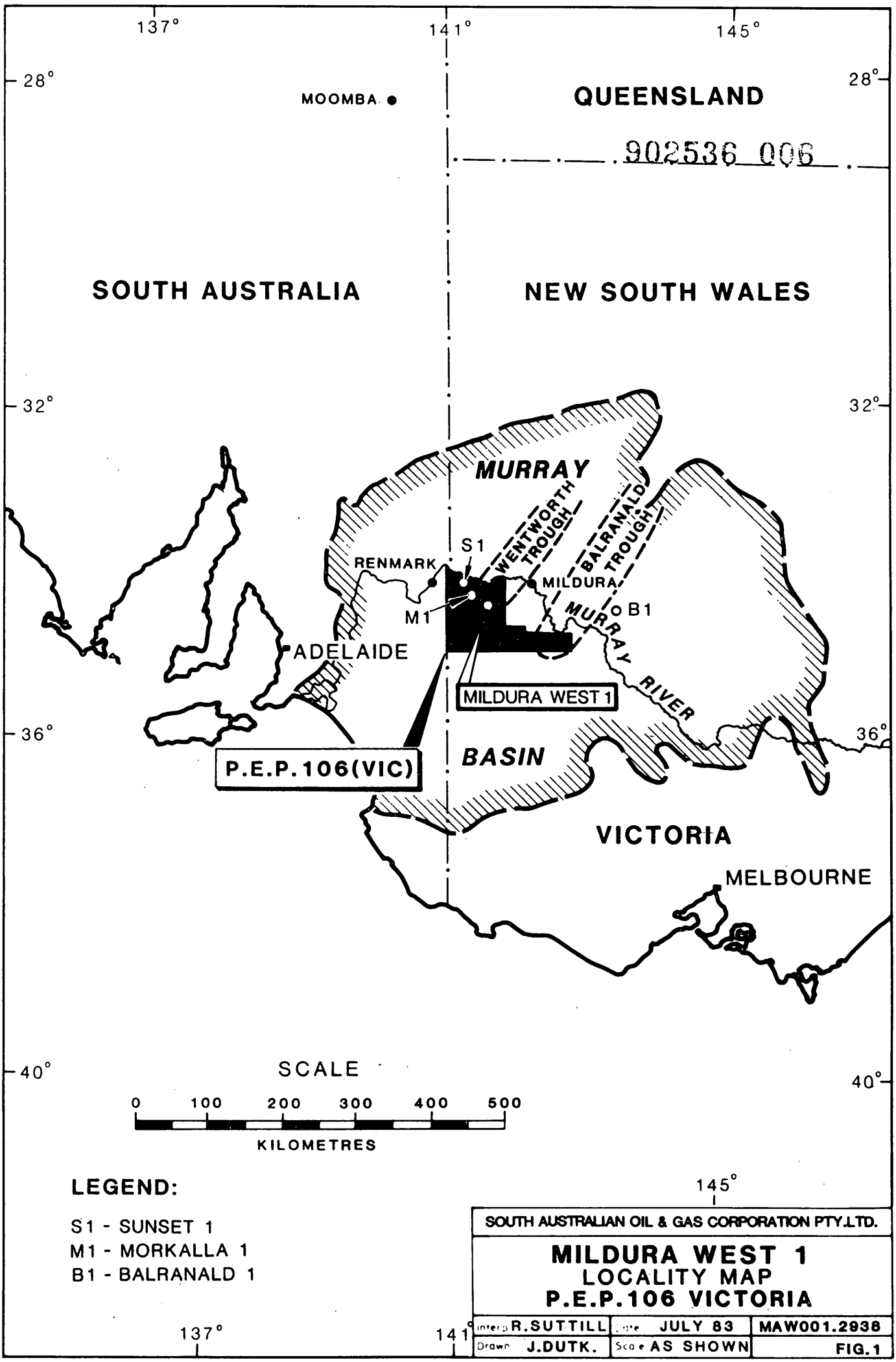
FORM	NO.	INTERVAL	CUT	REC.
Monash	1	367.89m - 373.53	5.64m	1.11m
Kanman-too	2	422.15 - 428.25	6.10m	2.13m

FORMATION TESTS

NO.	INTERVAL	IO	ISI	FO	FSI	1st FLOW IP/FP	ISIP	2nd FLOW IP/FP	FSIP	TC	BC	REMARKS
						N	O	N	E			

ADDITIONAL INFORMATION :

PREPARED: 18-7-83
UPDATED:


137°
141°
145°
28°
MOOMBA
QUEENSLAND
902536 006
SOUTH AUSTRALIA
NEW SOUTH WALES
32°
MURRAY
WENTWORTH TROUGH
BALRANALD TROUGH
S1
RENMARK
MILDURA
M1
B1
MURRAY RIVER
ADELAIDE
MILDURA WEST 1
36°
P.E.P.106(VIC)
BASIN
VICTORIA
MELBOURNE
40°
SCALE
0 100 200 300 400 500
KILOMETRES
LEGEND:
S1 - SUNSET 1
M1 - MORKALLA 1
B1 - BALRANALD 1
SOUTH AUSTRALIAN OIL & GAS CORPORATION PTY.LTD.
MILDURA WEST 1
LOCALITY MAP
P.E.P.106 VICTORIA
Interp R.SUTTILL
Date JULY 83
MAW001.2938
Drawn J.DUTK.
Scale AS SHOWN
FIG.1

WELL HISTORY

1. General Data

Interest Holders:	SAOGC	30%
	Comserv (779)	70%
Participating Interests:	SAOGC	100%

Surveyed Location: Latitude: 34°32'30.84"S (Subject to Survey)
Longitude: 141°24'26.28"E (Subject to Survey)

Surveyed Elevation: Ground Level: +63m (Subject to Survey)
Kelly Bushing: +67.63m (Subject to Survey)

Seismic Reference: 81-A2 (580) Mildura West Seismic Survey 1981

Total Depth: Driller: 428.25m
B.P.B. : 429.31m

2. Drilling Summary (All depths are to Driller's K.B. unless shown otherwise).

Mildura West 1 was spudded at 0400 hours on the 14th June 1983. It was plugged and abandoned as a dry hole on the 18th June 1983. A 8 3/4" (222.25mm) hole was drilled to 85.65m, this was then cased with 7 joints of 7" (177.80mm), 23 lb J55, LT & C, Range 3 casing, with a shoe at 85.58m. Casing was cemented with 72 sacks Class A cement (slurry weight 13.5ppg (SG 1.62) plus 2% calcium chloride).

A 6" (152.40mm) hole was drilled to 367.89m and Core 1 was cut from 367.89m to 373.53m with 1.11m (19.5%) being recovered. A 6" (152.40mm) hole was then drilled to 422.15m and Core 2 was cut from 422.15m to 428.25m with 2.13m (35.4%) being recovered.

Logs were run, then the well was plugged and abandoned with plugs set as shown in Appendix 5. The rig was released at 1400 hrs on the 18th June 1983.

(a) Drilling Make-up Water

The make-up water for Mildura West 1 was obtained by tanker from the Bambil South Storage Tank approximately 15 kilometres from the wellsite.

(b) Mud Logging

Mud logging operations for Mildura West 1 were carried out by Gearhart Pty. Ltd. (Geodata Division).

Ditch cutting samples were collected at 3m intervals from surface casing (85.65m) to a total depth of 428.25m. No samples for the interval from the surface to 85.65m were collected as a conductor pipe was not available.

Source rock samples were taken at 50m intervals from 85.65m to 428.25m (T.D.). All samples were described and checked for fluorescence and visual porosity.

A Gearhart mud logging unit was used to monitor ditch gas from 85.65m to 428.25m (T.D.). Total gas was recorded continuously using a Continental Laboratories 900 Series gas detector. Depth, rate of penetration and pump strokes were also monitored continuously.

(c) Testing

No drill stem tests were conducted in Mildura West 1.

(d) Coring

Two cores were cut:

Core 1 - Monash Formation (Coombool Member) 367.89m-373.53m

Core 2 - Kanmantoo Group 422.15m-428.25m

(e) Electric Logging (B.P.B. depths)

Electric logging of Mildura West 1 was carried out by British Plaster Boards Limited (B.P.B.)

Suite No. 1

MCS (Multichannel Sonic)	75m to 427m
CCS (Coal Combination Sonde)	Surface to 429.31m
NS (Neutron Sonde)	Surface to 428m
FE (Focussed Electric)	80m to 428m
SP-RES (Spontaneous Potential-Resistance)	80m to 428m

(f) Sidewall Cores

No sidewall coring programme was conducted in Mildura West 1.

(g) Temperature Control

A bottom hole temperature (BHT) of 44°C at a depth of 429.31m was recorded prior to running the CCS logging tool. The BHT was recorded 5 hours after circulation was

stopped. This gives a minimum BHT for the well of 44°C (11.2°F). As only one BHT is available it is not possible to calculate an extrapolated BHT in the conventional way. Data from the other two wells drilled in this programme, Mildura West 2 and Robinvale 1, are plotted on a depth-temperature plot (Appendix 4) which gives a minimum regional geothermal gradient of 4.5° C/100 m (2.46° F/100 ft) for this area.

(h) Deviation Surveys

Two deviation surveys were recorded, the first at 239m showed a 1° deviation from vertical and the second at 419m showed a 3/4° deviation from vertical.

(i) Velocity Survey

No Velocity Survey was conducted at Mildura West 1.

(j) Completion Details

Mildura West 1 was plugged and abandoned with two cement plugs. A 32 m plug was set across the casing shoe with 22 sacks of class 'A' cement over the interval 69.0 m to 101 m. A 6 m surface plug was set at the surface using 2 sacks of class 'A' cement. A steel cap inscribed with; the well name and number, the spud date, total depth and the plugged and abandoned date has been welded to the top of the casing.

The rig was released at 1400 hours on the 18th June 1983.

3. Drilling Data

Date drilling commenced: 14-6-83 @ 0400 hrs

Date drilling completed: 17-6-83 @ 1130 hrs

Date rig released: 18-6-83 @ 1400 hrs

Total rig time: 4 days, 10 hours

Contractor: ATCO-APM Drilling Pty. Ltd.

Rig: Trailer Mounted Franks Cabot Drilling Rig (Rig No. A3) Mounted on a 12' wide x 47' long Goose Neck Trailer, with a 24" Fabricated Channel Beam.

Tandem Rear Axles: 16 - 11R 22.5 Radial Tyres Hydraulic support legs: Four Locknut Feature Carrier is complete with 1/8" Steel Plated Deck, 2' x 8' long Folding type Walkways on each side, Handrails and Stairways to ground level. Dog House and Generator Set are mounted on Trailer.

Tag Axle:

1 - 45,000 lb rated Tandem Axle Booster with

8 - 11R 16.5 Tyres to offset overload weight on Rig Carrier during highway moves.

Drawworks:

Franks Cabot, Model 1287-TD Single Drum Drawworks

Main Drum Barrel Dia.	: 18 7/8" x 34" 1" Grooving
Brake Rim Dia./Width	: 42" x 12
Drum Clutch	: 24" - 2 Plate
Jackshaft Clutches	: 18" - 2 Plate
Drum Shaft Diameter	: 6"
Main Drum Drive Chain	: 1 1/4" - T
Jackshaft Drive Chain	: 1 1/4" - DBL
Hydromatic	: 22" SR Parmac

Drawworks Motor:

G.E. Series SGE-76101 Electric Motor, complete with Blower driven by a 5 h.p. Electric Motor.

Hydraulic System:

1 - 1/4" x 2" Hydraulic Pump, driven by a 50 h.p. Electric Motor, 575 volts, ID# 9002764-049, connected to a 270 gallon Fluid Reservoir.

S.C.R. System:

Manufactured by Integrated Power Systems Corporation.

Ratings:	Input Voltage	:	600 VAC 30-3W
	Output Voltage	:	0-750 VDC
	Input Current	:	600 ADC Cont.
			1250 ADC Int.

Generators A.C.:

Rig Light Plant:

Stamford Generator, 37.5 K.V.A., Type AC-244D, powered by a Chrysler Nissan Six Cylinder Diesel Engine.

Generator Nos. 1 and 2

E.M. Bemac Brushless Generator, S.N: 178235231

500 K.V.A., 400 KW, 600 Volts, Powered by a Caterpillar Model D-353E Diesel Engine.

Table Rotary Machine:

Ideco Model C-175 Rotary Table

Size: 17.5" x 44" complete with Split Master Bushings.

Substructure:

Two Section Box Style Substructure

Top Section : 11'W x 11'L x 9' High (BOP RACK)

Pony Sub : 11'W x 11'L x 3'8" High

Overall Size : 11'W x 11'L x 12'8" High

Top Floor Section Accommodates Rotary Table and Racking Platform has 3'6" Fold-Out Walkways on each side, wide square tubing Handrails, V-Door Ramp and Stairs to Catwalk 3' Fold-Out Stabilizers on each side.

Substructure is sheathed with 10 gauge steel panels and is pinned to the Rig Carrier.

Lighting:

Including: Mast Light String, Flood Lights, Building Lighting.

Mast:

96' Two Section Telescoping Type Mast, manufactured by Greco Steel Corp.

Raising/Lowering System: Two Double Acting, three stage, telescoping type Hydraulic Cylinders.

Top Section is raised with Bridle Line

Deadline Anchor: attached to Carrier

Crown Blocks:

Working Sheaves : 4 - 22" Dia. - 1" Grooving

Fastline Sheave : 1 - 32" Dia. - 1" Grooving

Blocks and Hook:

Sowa Hook-Block Assembly, 150 Ton Capacity, Model 3630-4, S/N: 3896-1 with 4 - 30" Sheaves, grooved for 1" Drilling Line.

Swivel:

Oilwell Model No. SA-150 Swivel, Job No. 2048

Kelly Spinner, Foster Model 77, S/N: 77-1-412 complete with 2 - 1" x 60' Long Hydraulic Hoses.

Kelly, Kelly Bushing, Kelly Cock and Stabbing Valve:

1- 4 1/4" x 40' long Kelly with 4 1/2" XH Pin and 6 5/8" Reg. Box.

1- Baash Ross 2RCS4 Kelly Bushings

1- Griffith Upper Kelly Cock, 5000 PSI, S/N: 5139 452U-33

1- Hydril Stabbing Valve with 4 1/2" XH Pin and Box

1- Grey Inside B.O.P. with 4 1/2'" XH Pin and Box

Pumps - Slush No. 1 and 2:

1 - TSM-500 Duplex Slush Pump,

Size: 7 1/2" x 16"

Maximum Pump Speed: 65 S.P.M.

Maximum Fluid End Test Pressure: 5000 PSI

No. 1 Pump Drive:

54" OD Sheave with 10 Grooves and Pressed on 6" dia Shaft complete with 10 Groove "V" Belt Power Bands and Steel Guard.

No. 1 Pump Engine:

G.E. Electric Motor, Model 5-GE-761-J1,

No. 2 Pump Drive:

1 - Pump Drive Pedestal Assembly with 20" Clutch, Drum Spider, Rotor Seal and Mounted on Skid with D-353 Caterpillar Engine.

1 - 58" 8V 10 Groove Pump Sheave V-Hub

2 - 15'" 8V 10 Groove Drive Sheave X-Hub

2 - (5) 8V3150 "Vee" Belts

No. 2 Pump Engine:

Caterpillar Model D-353 Diesel Engine, 435 H.P.

Tanks - Mud and Mud System:

Single Tank Mud System, 265 BBL Capacity.

One Tank - 3 Compartment Mud System with Sand Trap.

Low pressure Mud System with 3 Subsurface Guns.

2 - Grey Agitators Model 72-0-5, powered by 2 - 5 H.P. Electric Motors, Starozik Single Screen Shale Shaker Model SC-145, powered by a 5 H.P. Electric Motor.

1 - 2" x 3" Poor Boy Degasser

1 - 4" x 2" Standard Mud Mix Hopper

1 - 3 Cone Desander complete with 6" square Header Manifold and underflow Trough.

1 - B.J. Hughes 4" x 6" Centrifugal Pump model 112-6CW, powered by 75 H.P. Electric Motor, 575 Volts.

All connected to Mud System with 1 - 4"

1 - 6" and 1 - 8" Demco Butterfly Valves.

Blowout and Well Control Equipment:

1 - Shaffer "Annular" Blowout Preventer

3000 PSI, Assembly No. 5820

Trim : Internal H_2S

Top Connection : Studded

Btm Connection : Flanged

Bore Size : 11"

1 - Cameron 3000 PSI Double Gate Blowout Preventer,

Type "SS", No. 165

Bore Size : 11"

Top & Bottom

Connections : Studded

Outlets : 2 - 3" 3000 PSI Flanged

Extra Rams to Fit : 2 3/8", 2 7/8", 5 1/2" and 7"

Hydraulic Fluid Accumulator:

1 - Wagner Model 5-80-1BN Hydraulic Fluid

Accumulator Unit Four Station Control

Manifold with 4 - 20 gallon Bladder type

Accumulator Bottles, Hydraulic Pump Powered by a

5 H.P. Electric Motor.

2 - 220 Cu. Ft. Nitrogen Bottle Back-up System

2 - CPW 3000 and 5000 LB. Hydro Poise Read-Out Gauges,

A-B On/Off Switch Panel.

System is complete with Remote Control Panel, mounted

in Dog House.

Compressor - Air, Auxiliary:

Dresser Model 660-A Air Compressor

Belt driven by a C.G.E. 15 H.P. Electric Motor Model IF5295H, A-B Switch and Mounted on 24" dia x 66" long Air Receiver (Situated on Gooseneck of Rig Carrier)

B.O.P. Spools and Valves:

Including:

1 - 900 Series 10" Adapter Spool with 2 - 3" Flanged Outlets

1 - 3" 3000 PSI McEvoy Gate Valve with Otis Actuator

2 - 3" McEvoy 3000 PSI Gate Valves

2 - 3" 3000 PSI National Ball Valves

1 - 3" 3000 PSI Check Valve

Well Control Manifold:

McEvoy 3" x 2" Well Control Manifold consisting of:

8 - 2" 3000 LB Flanged McEvoy Gate Valves

2 - 3" 3000 LB Flanged McEvoy Gate Valves

2 - 2" Three Way Block Connectors

2 - 3"x3"x2"x2" Four Way Block Connectors

2 - Willis Multi-Orifice Chokes

1 - CPW, 21 MPA Pressure Gauge

1 - Marsh 20,000 LB Gauge complete with 100' 1/2" Hydraulic Hose.

Drilling Line:

2500' Wrights 1" Steel Drilling Line.

Drill Pipe:

58 - Joints (Approx 1815') 4 1/2" 16.60# Grade "E" Range 2 Armco seamless Drill Pipe W/ 6 1/4" ID 18 Deg. Reed 4 1/4" XH Tool Joints. Drill Pipe is complete with Hardfacing, Series 200 inspected and internally coated with PA-200.

137- Joints (approx 4288') 4 1/2" 16.60# Grade "E" Range 2 Armco Seamless Drill Pipe W/ 6 1/4" ID 18 Deg. Reed 4 1/2" XH Tool Joints. Drill Pipe is complete with Hardfacing, Series 200 inspected and internally coated with PA-2000.

10 - Joints 4 1/2" XH Heavi-Wate Drill Pipe Range 2 with 4 1/2" XH Box to Pin complete ID Tube cote and Hardfacing premium No. 1.

Drill Collars:

14 - 6 1/4" OD Drill Collars, Zip Lift, Hardbanded with 4 1/2" XH Connections.

Tongs - Rotary and Power Tongs:

1 - Set Web Wilson Type "B" Tongs with 4 1/4" - 6 3/4" Jaws.

2 - 13 3/8" Farr Model LW-13375 Hi-Torque Power Tongs, complete with 5 1/2", 7" and 9 5/8" Jaws, Torque Gauge and Single Hanger Assembly. Hydraulic Power Unit, driven by a Lister Four Cylinder Diesel Engine.

Elevators and Links:

1 - Set 1 3/4" x 72" B.J. Ruffneck Links.

1 - 4 1/2" B.J. Type "MAA" Centre Latch Elevators.

1 - 4 1/2" W.W. 18 Degree Type T-100 Centre Latch Elevators

1 - 7" W.W. Single Joint Pick-up Elevators with 5 1/2" Bushing.

1 - 7" Side Door Casing Elevators

1 - 10 3/4" W.W. H-150 Casing Elevators with 8 5/8" and 9 5/8" Bushings.

1 - 5 1/2" W.W. Type H-150 Casing Elevators

1 - 9 5/8" Single Joint Pick-up Elevators with 8 5/8" Insert.

Slips, Spider and Safety Clamps:

1 - 4 1/2" DU Req. Baash Ross Slips

1 - 5 1/2" - 7" Baash Ross Type "C" Drill Collars Slips

1 - Baash Ross Type "C" 5" - 7" Safety Clamp complete with Wrench and Box.

1 - Varco "CMSCL" Multi Segment 10 3/4" Casing Slips

1 - 4 1/2" DU Req. Baash Ross Slips with 2 3/8", 2 7/8" and 3 1/2" Dies.

1 - 7" Baash Ross Type "UC" Casing Slips

Instrumentation:

1 - Cameron Type "C" Weight Indicator, 180,000 LB, S.N 78D5431

2 - 2" Gauges Int. Mud Gauges Type "D" (Standpipe).

1 - 2" Cameron Type "F" Pressure Gauge (Pump).

Tool House:

11' 6" wide x 30' long x 8'4" high Broken Panel Steel Construction.

Dog House:

Mounted on Rig Carrier - Size: 12'W x 12'L x 7' High.

Dog House Contents:

1 - Knowledge Box

2 - NRL Light Fixtures recessed into roof of building

Combination Building:

Accumulator Building/Change Room/Water Tank.

Accumulator Bldg. Size: 11'6"W x 13'8"L x 8'6"H

Change Room Size : 7' W x 10' L x 8'6"H

Water Tank Size : 11'6"W x 17'4"L x 8'6"H (300 BBLS)

Fuel Section : 4'6"W x 10' L x 8'6"H (approx 1800 galls)

Overall Size : 11'6"W x 41' L x 8'6"H

Combination Building:

S.C.R. Building/Generator Room/Fuel Tank

Trailer Mounted Combination Building complete with 16 - 11R 22.5 Radial Tyres

S.C.R. Building Size : 12'W x 7'6"L x 8'8" High

Generator Bldg. Size : 12'W x 20' L x 8'8" High

Fuel Tank Size : 12'L x 6'6"H x 45" Deep (approx 1800 galls)

Overall Trailer Size : 12'W x 38'L x 12'6" High

S.C.R. Building has 2 - 48" NRL Light Fixtures

Generator Building has 2 - NLR 48" Fluorescent Light Fixtures.

Pump House No. 1 & 2:

12'W x 30'L x 9'6" High with Peaked Roof.

3 - NRL Model 484 Fluorescent Light Fixtures.

Catwalk - Pipe Racks:

Trailer Mounted Catwalk 8' Wide x 40' Long

Mounted on Tandem Axles with 8 - 10.00 x 20 Tyres, complete with 2 - 15' long fold-out Pipe Racks, constructed with 3 1/2" Pipe.

2 - Sets Pipe Racks built with 4" Square Tubing.

Miscellaneous Rig Up Parts:

Including:

Wireline, Manilla Rope, Snakeskin, Chain, Shackles, Clamps, Cable, Safety Hooks, Fuel, Oil, Gaskets and Grease.

1 - Lot of Piping, Valves and Fittings
Required for Air, Fuel and Water Lines.

1 - Junk Rack 5'W x 8': x 2'H mounted on Skid
with Steel Frame, expanded metal floor and sides.

1 - Baroid Mud Testing Equipment

1 - Combination Derrick Stand and Drilling Line Stand.

1 - Gavel Mud Saver Bucket complete with 4 1/2" End Seals.

1 - Chemical Mixing Barrel

1 - 52" Bug Blower with 3 HP explosion proof Electric Motor, 1800 RPM.

1 - Bell Nipple and Flow Line

6 - Assorted Bit Breakers

1 - 8 5/8" x 28' Long Mousehole

1 - 8 5/8" x 40' Long Rathole

Subs:

4 - Save Subs with 4 1/2" XH Pin and Box

2 - Bit Subs with 4 1/2" XH Box with 4 1/2" Reg. Box.

1 - Bell Sub with 4 1/2" Reg Box by 6 5/8" Reg Box.

1 - 7" Casing Cement Head

1 - Cementing Nubbin with 4 1/2" XH Pin

Pumps - Centrifugal:

Water Circulating:

1 - 2" x 2" Centrifugal Pump Driven by a 5 HP Lincoln Electric Motor.

Rig Wash Pump:

Magikist Model 32-C Triplex Pump driven by a 3 HP Brook Electric Motor, 230o460 volts Type "DP", S/N: X807080.

Fuel Transfer Pump:

1 - 1" x 1" Fuel Transfer Pump driven by a 3/4 HP Electric Motor.

Matting - Rig:

4 - 8' Wide x 20' Long x 8" High Rig Mats.

Winches:

Gearmatic Pullmaster Model H-10 Powered by a Commercial 1" x 1" Hydraulic Motor, Model D230-154-2, S/N: C39-647 complete with approx 300' - 1/2" Steel Cable.

1 - Wireline Survey Unit, powered by a Hydraulic Motor and complete with 7000' of .092 Wire Line.

Fishing Equipment:

1 - 8 1/8" OD Overshot with 4 1/2" FH Box Connection, complete with 4 3/8", 4 1/2", 5 3/4", 6", 6 1/8", 6 1/4" Basket Grapples and Mill Control Packers for each.

Swabbing Unit:

TSM Swabbing Unit consisting of IDECO H-25 Main Drum with 10,000' - 9/16" Sand Line Fawick Clutch. Kremco Right Angle Gear Box, 1 3/4" Single Drive Chain. Fuller Model T905-C 5 Speed Transmission and driven by a Detroit Diesel Engine Model 471, complete with 24 Volt Starter, Barber Rig Saver, Model 25-2191. Tu-Flo Air Compressor P.T.O. driven off engine with 10" dia. x 15" Long Air Receiver mounted on a 7'6" Wide x 15' Long Skid.

GEOLOGY

1. Objectives

Mildura West 1 was an exploration well designed to test the stratigraphy and structural closure on the eastern flank of the southern part of the Wentworth Trough (Fig.1). Primary targets were the sandstones of the Cretaceous Monash Formation in the Merreti and Coombool Members.

A further objective of the well was to gather source rock and maturity data from the Mesozoic sequence.

2. Structure

Structural mapping of the Mildura West area used 9 lines of the 1981 Mildura West Seismic Survey. The Survey covers the southern end of the Wentworth Trough which is an infrabasin to the main Murray Basin. In addition to the Tertiary Murray Basin sequence it was anticipated that a thin Mesozoic (probably Cretaceous) sequence would be present infilling a structural low indicated by the 'Z' reflector.

Seismic mapping to indicate structure used three seismic reflector horizons:

'W' - interpreted as the top of the Warina Formation

'BT'- interpreted as the base of the Tertiary sediments

'Z' - interpreted as the top of the Cambrian Kanmantoo Group

Well control for the Mildura West Seismic Survey was very poor as the nearest well, Morkalla 1, lies several hundred metres from seismic line 81-A4.

3. Results of Drilling

(a) Stratigraphy

The following stratigraphic section was intercepted at Mildura West 1.

Age	Formation	Depth (KB) (metres)	Subsea Elev (Subject to Survey)	Thickness (metres)
Quaternary	Undifferentiated and Blanchetown Clay	4.63	+ 63.0	22.2
Pliocene	Parilla Sand	26.8	+ 40.8	49.2
Pliocene/ Miocene	Bookpurnong Beds	76.0	- 8.4	38.8
Miocene	Duddo Limestone	114.8	- 50.2	121.2
Oligocene	Ettrick Formation	236.0	- 168.4	18.4
Eocene	Olney Formation	254.4	- 186.8	106.4
Palaeocene/ Eocene	Warina Formation	Absent	Absent	Absent
Early Cretaceous	Monash Formation			
	Coombool Member	360.8	- 293.2	54.6
	Merreti Member	Absent	Absent	Absent
Cambrian	Kanmantoo Group	415.4	- 347.8	13.91
Total Depth		429.31	- 361.71	

UNDIFFERENTIATED AND BLANCHETOWN CLAY
(RECENT)
Surface to 26.8 m — Shakers bypassed

PARILLA SAND
(PLIOCENE)
26.8 m TO 76.0 m — Shakers bypassed

BOOKPURNONG BEDS
(MIOCENE TO PLIOCENE)
76.0 m TO 114.8 m — CLAYSTONE and FOSSIL FRAGMENTS. CLAYSTONE: light-medium blue-grey, soft, sticky, non-swelling, calcareous, grading to siltstone. FOSSIL FRAGMENTS: Brachiopods, Echinoids and occasional Bryozoa at base.

DUDDO LIMESTONE
(MIOCENE)
114.8 m to 236 m — LIMESTONE and CLAYSTONE interbeds giving way to massive LIMESTONE. LIMESTONE: mudstone-wackestone, soft, white, occasionally light brown, firm-moderately hard, homogeneous,

very fine grained, microcrystalline grading to mudstone, shell fragments: bryozoa, echinoid spines, rare sand grains, occasional glauconite. CLAYSTONE: light-medium and occasionally dark grey, soft occasionally firm, non swelling, very calcareous.

ETTRICK FORMATION
(OLIGOCENE)
236 m to 254.4 m

MARL and SILTSTONE grading to MUDSTONE with trace SANDSTONE. MARL: light grey, soft, sticky, non swelling, occasional carbonaceous flecks. SILTSTONE: dark brown-black, firm, occasionally sticky, non-swelling, occasionally carbonaceous, interbedded with and grading to MUDSTONE: dark greyish-brown-black, firm-moderately hard, pyritic in part, massive, occasionally laminated. Trace fine SANDSTONE: yellowish brown, subrounded, subspherical, poor visual porosity, no fluorescence.

OLNEY FORMATION
(PALAEOCENE TO EOCENE)
254.4 m to 360.8 m

SILTSTONE and SANDSTONE with major COAL interbeds. SILTSTONE: medium brown-dark brown-reddish grey, firm-soft, sticky, swelling, calcareous in part, carbonaceous, trace glauconite, laminated in part, associated forams at base of sequence, pyritic. SANDSTONE: 2 types; (A) cream-white-light greyish brown, medium-coarse grained, subangular-subrounded, well sorted, trace lithic fragments, trace pyrite, good visual porosity, no fluorescence. (B) colourless-translucent, medium to very coarse grained, occasionally very fine grained, subangular, occasionally subrounded, fair visual porosity, no shows. COAL: dark reddish brown, soft fibrous, lignitic, occasionally dull black, hard, silty in part, trace pyrite.

MONASH FORMATION (COOMBOOL MEMBER)
(LOWER CRETACEOUS)
360.8 m to 415.4 m

CLAYSTONE and SANDSTONE with minor CLAY and DOLOMITE interbeds. CLAYSTONE: light-medium grey-white, predominantly non calcareous occasionally calcareous, non swelling, soft-firm. SANDSTONE: 2 types: (A) opaque-clear, occasionally frosted, unconsolidated, quartz grains, medium-coarse-very coarse, moderately well sorted, subangular-subrounded, subelongate, pyritic,

very good inferred porosity, no show. (B) white-light grey, quartz grained, predominantly subrounded, occasionally subangular, poorly sorted, subelongate-subspherical, very good inferred porosity, no show. CLAY: medium-dark brown, soft, sticky, calcareous. DOLOMITE: white-buff, mudstone, moderately hard, crumbly, slow acid reaction on heating, no shows.

KANMANTOO GROUP
(CAMBRIAN)
314.4 m to 429.31 m
(T.D.)

PHYLLITE: light grey-light greyish green, firm to moderately hard, crumbly, micaceous lustre, trace chlorite, micromicaceous (muscovite), quartzititic.

(b) Stratigraphic Prognosis

The table below summarizes the prognosed and actual depths of the Formations predicted and intercepted.

Formation	Prognosed Depth (KB)	Actual Depth (KB)	Variations From Prognosis	Thickness	Variations From Prognosis
QUATERNARY					
Undifferentiated and Blanchetown Clay	4.63	4.63	0	22.2	- 7.8
TERTIARY					
Parilla Sand	34.6	26.8	7.8 (H)	49.2	- 0.8
Bookpurnong Beds	84.6	76.0	8.6 (H)	38.8	+ 18.8
Duddo Limestone	104.6	114.8	10.2 (L)	121.2	- 3.8
Ettrick Marl	229.6	236.0	6.4 (L)	18.4	+ 0.4
Olney Formation	247.6	254.4	6.8 (L)	106.4	- 36.4
Warina Formation	317.6	Absent	Absent	Absent	- 20.0
CRETACEOUS					
Monash Formation					
Coombool Member	337.6	360.8	23.2 (L)	54.6	- 45.4
Merreti Member	437.6	Absent	Absent	Absent	- 50.0
CAMBRIAN					
Kanmantoo Group	492.6	415.4	77.2 (H)	>13.91	
Total Depth	502.6	429.31	73.29 (H)		

The stratigraphic prognosis in the Tertiary section was generally good considering the lack of well control. Most formation tops in the Tertiary were encountered within 10 metres of prognosis. The main deviation from the prognosis was the absence of the prognosed thin sequence of Warina Formation with the result that the Olney Formation rests directly on the Coombool Member of the Monash Formation. Prior to drilling it had been inferred that the lower Tertiary sediments had onlapped onto a pre-Tertiary topography. The absence of Warina Formation can still be explained simply by this model, as it was present down dip at Mildura

West 2, but onlap did not occur as far onto the structure as Mildura West 1.

The Monash Formation was then encountered and began as predicted with the Coombool Member. The Coombool Member was considerably reduced in thickness, 54.6m instead of a predicted 100m, and rested directly on the metasediments of the Kanmantoo Group. As a result the Kanmantoo Group was encountered 77.2 m high to the prognosed 'Z' reflector. This can be explained in terms of the interval velocity used of 2550 m/s, for calculating the depth to basement. The actual velocity after drilling the well, calculated using the sonic log, was 2110 m/s. Further evidence of this lower interval velocity is provided by the unconsolidated nature of the Cretaceous sediments. Consequently, no Merreti Member sediments were encountered in the well and it must be concluded that they onlap the structure down dip.

(c) Hydrocarbons

A gas detector was in operation from surface casing shoe at 85.58m to total depth (429.31m) and all cutting samples were checked for fluorescence in ultra-violet light. Two cores were cut, but these were for source rock and basement studies and not reservoir analysis.

Only a trace of gas was recorded in the section from the surface casing shoe to the base of the Bookpurnong Beds. In the Duddo Limestone very low gas values of 1 to 1.5 units were recorded.

At the base of the Duddo Limestone and throughout the Ettrick Formation only trace gas readings were detected.

Throughout the Renmark Group, comprising the Olney Formation gas readings were generally below 1 unit.

In the Cretaceous Monash Formation, which in this well consists of the Coombool Member, gas readings of up to 2.25 units were measured.

Zero to trace amounts of gas were recorded within the Cambrian Kanmantoo Group metasediments.

No shows of fluorescence were recorded in any of the samples analysed.

4. Conclusions

Mildura West 1 was an exploration well designed to test sands structurally draped over the eastern shelf of the southern part of the Wentworth Trough. Primary targets were the sandstones of the Monash Formation in the Merreti and Coombool Members. Total depth was 429.31m (Logger) which occurred in Cambrian metasediments. The Cambrian section was encountered 77.2m high to prognosis.

Source rock studies of two samples from the Coombool Member of the Monash Formation have indicated that the section is immature for hydrocarbon generation.

No shows were encountered in this well and no drill stem tests were run. The well was plugged and abandoned. No zones were suitable for completion as a water well.

APPENDIX 1 : LITHOLOGICAL DESCRIPTIONS

In accordance with the Mildura West 1 Prospect Sheet and Drilling Programme, ditch cuttings were collected, washed, split, bagged and described at 9m intervals from 90m-207m and at 3m intervals from 207m to 428.25m (Drillers T.D.) by Gearhart Pty. Ltd. (Geodata Division).

All lithological intervals and core intervals are quoted as drillers depths.

9 Metre Sampling

Depth	%	Description
90	80	Fossil Fragments: Brachiopods, Echinoid fragments.
	20	Claystone: light-medium blue grey, soft sticky, non swelling, calcareous, occasionally grading to siltstone.
99	70	Fossil Fragments: as above
	30	Claystone: as above
108	30	Fossil Fragments: as above with occasional Bryozoan.
	70	Claystone: as above
117	20	Fossil Fragments: as above
	70	Claystone: as above
	TR	Limestone: white, very fine grained, homogeneous.
126	20	Fossil Fragments: as above
	60	Claystone: light to medium and occasionally dark grey, soft and occasionally firm, non swelling.
	20	Limestone: Mudstone - Wackestone, off-white occasionally light brown, firm to moderately hard, homogeneous, very fine grained grading to mudstone. Numerous shell debris, occasional glauconite.
135	30	Fossil Fragments: as above
	60	Claystone: as above
	10	Limestone: as above
144	10	Fossil Fragments: as above
	90	Claystone: as above
	TR	Limestone: as above
153	40	Limestone: white, hard, mudstone, very fine grained, homogeneous, sucrosic texture increasing with depth, associated glauconite, rare sand grains.
	60	Fossil Fragments: mainly Bryozoan and occasional Echinoid spines.

Depth	%	Description
162	90	Limestone: as above, predominantly sucrosic texture.
	10	Fossil Fragments: as above
171	70	Limestone: as above
	30	Fossil Fragments: as above
180	70	Limestone: as above
	30	Fossil Fragments: as above
	TR	Claystone: light green, soft, non-swelling, extremely calcareous, marly.
189	70	Limestone: becoming argillaceous in part, light to medium brown occasionally chalky.
	30	Fossil Fragments: as above
	TR	Chert
198	100	Limestone: light brown, occasionally grey, occasionally white, moderately hard, becoming more argillaceous, occasionally silty.
	TR	Fossil Fragments: as above
	TR	Claystone: as above
3 Metre Sampling		
207	90	Limestone: as above, becoming increasingly argillaceous.
	10	Fossil Fragments: as above
210	90	Limestone: as above
	10	Fossil Fragments: as above
213	80	Limestone: light grey occasionally light grey-brown, sometimes white, hard, angular break, occasionally glauconitic, occasionally silty.
	20	Fossil Fragments: as above
216	90	Limestone: as above, but becoming increasingly silty, occasionally medium grained. Sand; light grey, fine grained.
	10	Fossil Fragments: as above
219	90	Limestone: as above
	10	Fossil Fragments: as above

Depth	%	Description
222	40	Limestone: white mudstone, cleaner.
	TR	Fossil Fragments: as above
	60	Marl: light grey, soft, sticky, non swelling, calcareous, occasionally carbonaceous flakes.
225	20	Limestone: light grey brown, soft to moderately hard, less well cemented.
	TR	Fossil Fragments: as above
	80	Marl: as above
228	30	Limestone: as above
	TR	Fossil Fragments: as above
	70	Marl: as above
231	20	Limestone: as above
	TR	Fossil Fragments: as above
	80	Marl: as above
234	30	Limestone: light-medium grey, moderately hard, abundant glauconite.
	TR	Fossil Fragments: as above
	70	Marl: as above
237	40	Limestone: as above
	TR	Fossil Fragments: as above
	60	Marl: as above
240	20	Limestone: as above
	TR	Fossil Fragments: as above
	80	Marl: as above
	TR	Sandstone: brown, fine grained, subrounded, subspherical, occasional iron staining, good visual porosity, no fluorescence.
243	TR	Limestone: as above
	TR	Fossil Fragments: as above

Depth	%	Description
	20	Siltstone: dark brown to black, firm occasionally sticky, non swelling, non calcareous, occasionally carbonaceous interbedded with and grading to mudstone: dark-grey brown to black firm to moderately hard, pyritic in part, massive occasionally laminated.
	20	Marl: as above
246	TR	Limestone: as above
	TR	Fossil Fragments: as above
	90	Siltstone: as above
	10	Marl: as above
	TR	Sandstone: fine, yellow-brown, subrounded subspherical.
249	TR	Limestone: as above
	TR	Fossil Fragments: as above
	90	Siltstone: as above
	10	Marl: as above
	TR	Sandstone: as above
252	TR	Limestone: as above
	TR	Fossil Fragments: as above
	90	Siltstone: as above
	10	Marl: as above
	TR	Sandstone: as above
255	TR	Limestone: as above
	TR	Fossil Fragments: as above
	90	Siltstone: as above becoming medium brown to dark brown and becoming soft, sticky, hygroclastic, calcareous in part, carbonaceous.
	10	Marl: as above
	TR	Sandstone: as above
258	TR	Limestone: as above
	TR	Fossil Fragments: as above
	90	Siltstone: as above

Depth	%	Description
	10	Marl: as above
	TR	Sandstone: as above
261	TR	Limestone: as above
	TR	Fossil Fragments: as above
	100	Siltstone: as above, but becoming soft in part, with trace glauconite.
	TR	Sandstone: as above
264	TR	Limestone: as above
	TR	Fossil Fragments: as above
	100	Siltstone: as above
	TR	Marl: as above
	TR	Sandstone: as above
267	60	Siltstone: dark red-brown, firm, occasionally soft, sticky, hygroclastic, sandy in part, very fine grained.
	40	Coal: dark reddish brown, soft, fibrous lignitic, occasionally dull black, hard silty in part, blocky break, trace pyrite decreasing lignite content with depth.
	TR	Limestone: as above
	TR	Sandstone: as above
270	40	Siltstone: as above
	60	Coal: as above
	TR	Limestone: as above
	TR	Sandstone: as above
273	40	Siltstone: as above
	60	Coal: as above
	TR	Limestone: as above
	TR	Sandstone: as above
276	80	Siltstone: as above, becoming medium-dark grey, predominantly sandy in part; fine occasionally medium sand, dull yellow, rounded to subrounded.
	20	Coal: as above

Depth	%	Description
	TR	Limestone: as above
	TR	Sandstone: as above
279	90	Siltstone: medium reddish grey to dark reddish brown, firm occasionally soft sticky, sand, trace carbonaceous material, trace pyrite.
	10	Coal: as above
	TR	Limestone: as above
	TR	Sandstone: as above
282	TR	Siltstone: as above
	10	Coal: as above
	TR	Limestone: as above
	90	Sandstone: cream white to light greyish brown, medium to coarse grained, subrounded to subangular, well sorted, trace lithics, trace framboidal pyrite, excellent visual porosity, no fluorescence, trace microfossils.
285	TR	Siltstone: as above
	10	Coal: as above
	TR	Limestone: as above
	90	Sandstone: as above
288	TR	Siltstone: as above
	10	Coal: as above
	TR	Limestone: as above
	90	Sandstone: as above
291	30	Siltstone: medium to dark reddish grey, soft occasionally firm, hygroturgid, trace pyrite, interbedded with coal.
	10	Coal: black, firm, blocky, silty, occasionally fine sand in part.
	TR	Limestone: as above
	60	Sandstone: as above
294	70	Siltstone: as above
	20	Coal: as above

Depth	%	Description
	TR	Limestone: as above
	10	Sandstone: as above
297	90	Siltstone: as above
	10	Coal: as above
	TR	Limestone: as above
	TR	Sandstone: colourless-translucent, coarse to medium grained, subrounded occasionally subangular, well-sorted, fair visual porosity, no fluorescence.
300	80	Siltstone: light green - light greyish green, firm, non swelling, laminated in part, grades to shale. Abundant shell fragments, occasional foraminifera.
	20	Coal: as above
	TR	Limestone: as above
303	80	Siltstone: as above
	20	Coal: as above
	TR	Limestone: as above
306	90	Siltstone: as above
	10	Coal: as above
	TR	Limestone: as above
309	90	Siltstone: as above
	10	Coal: as above
	TR	Limestone: as above
	TR	Sandstone: as above, becoming very coarse, buff-light brown, subangular - subrounded, subspherical, fair visual porosity, no fluorescence.
312	60	Siltstone: as above
	10	Coal: as above
	30	Sandstone: colourless - translucent, very coarse-medium grained occasionally very fine grained, subangular - subrounded, fair visual porosity, no fluorescence.
315	70	Siltstone: as above

Depth	%	Description
	10	Coal: as above
	20	Sandstone: colourless - translucent, very coarse - medium, occasionally very fine grained, subangular, occasionally subrounded, occasionally subelongate, fair visual porosity, no fluorescence.
318	80	Siltstone: dark reddish grey and light green, firm, non swelling, laminated in part, occasional shell fragments.
	10	Coal: as above
	10	Sandstone: as above
321	60	Siltstone: as above
	20	Coal: as above
	20	Sandstone: as above
324	70	Siltstone: as above
	TR	Coal: as above
	20	Sandstone: as above, but becoming glauconitic in part.
	10	Pyrite: massive, crystalline.
327	50	Siltstone: light greyish green, also dark reddish brown, firm, occasionally soft and swelling, contains bryozoa and foraminifera, carbonaceous and pyritic in part.
	TR	Coal: as above
	50	Sandtone: clear - translucent, occasionally milky white, subrounded to subangular in part, subspherical good visual porosity, no fluorescence, interbedded with siltstone (described above).
330	40	Siltstone: as above
	TR	Coal: as above
	60	Sandstone: as above
333	10	Siltstone: as above
	TR	Coal: as above
	90	Sandstone: as above

Depth	%	Description
336	40	Siltstone: as above
	10	Coal: dull black, firm occasionally soft, silty grading to siltstone, vitreous to subvitreous lustre.
	50	Sandstone: as above
339	10	Siltstone: as above
	90	Coal: as above, but becoming lignitic, fibrous in part.
	TR	Sandstone: as above
342	TR	Siltstone: as above
	TR	Coal: as above
	100	Sandstone: milky white - light grey, medium to coarse grained, subspherical occasionally subelongate, clean excellent visual porosity, no fluorescence.
345	TR	Siltstone: as above
	TR	Coal: as above
	100	Sandstone: as above
348	TR	Siltstone: as above
	60	Coal: black, firm, blocky, silky - subvitreous lustre, occasionally lignitic, dark reddish brown.
	40	Sandstone: as above
351	TR	Siltstone: dark reddish-brown, soft, slightly sticky, carbonaceous, swelling, associated microfossils (foraminifera), trace pyrite, massive.
	50	Coal: as above
	50	Sandstone: as above
354	TR	Siltstone: as above
	70	Coal: as above
	30	Sandstone: as above
357	TR	Siltstone: as above
	70	Coal: as above
	30	Sandstone: as above

Depth	%	Description
360	TR	Siltstone: as above
	10	Coal: as above
	90	Sandstone: light grey-milky white, medium, occasionally coarse grained, well sorted, subrounded, subspherical, clean, trace pyrite, massive, good visual porosity, no fluorescence, interbedded with Claystone: light grey brown, soft, sticky, swelling, carbonaceous in part.
363	TR	Siltstone: as above
	20	Coal: as above
	80	Sandstone: as above
366	TR	Siltstone: as above
	30	Coal: as above
	70	Sandstone: as above
367.89-378.53	**CORE 1**	**(see core description)**
375	TR	Coal: as above
	60	Sandstone: opaque-clear, occasionally frosted, unconsolidated, quartz grains, medium-coarse to very coarse; moderately well sorted, subangular - subrounded, subelongate, pyritic, very good inferred porosity, no show.
	40	Claystone: white, soft, sticky, non swelling non-calcareous, carbonaceous laminae.
378	TR	Coal: as above
	50	Sandstone: as above
	50	Claystone: as above
381	TR	Coal: as above
	20	Sandstone: as above
	80	Claystone: as above
384	TR	Coal: as above
	20	Sandstone: as above but becoming predominantly medium-coarse grained.
	80	Claystone: as above
387	60	Claystone: as above

Depth	%	Description
	40	Sandstone: opaque-clear, occasionally frosted, unconsolidated, quartz grains, medium-coarse-very coarse, moderately well sorted, subangular-subrounded, subelongate, pyritic, very good inferred porosity, no show.
	TR	Coal: as above
390	80	Claystone: as above
	20	Sandstone: as above
	TR	Coal: as above
393	80	Claystone: as above
	20	Sandstone: as above
	TR	Coal: as above
396	70	Claystone: as above
	30	Sandstone: as above, medium-coarse, to occasionally very coarse grained.
	TR	Coal: as above
399	70	Claystone: as above but becoming light grey.
	20	Sandstone: as above
	TR	Coal: as above
	10	Dolomite: white-buff, mudstone, moderately hard, crumbly, slow acid reaction (when warmed), no show.
402	60	Claystone: as above
	30	Sandstone: as above
	TR	Coal: as above
	10	Dolomite: as above
405	70	Claystone: light-medium grey, soft, sticky, calcareous, non swelling.
	20	Sandstone: as above
	TR	Coal: as above
	TR	Dolomite: as above
408	70	Claystone: as above, but non calcareous.
	30	Sandstone: as above

Depth	%	Description
	TR	Coal: as above
	TR	Dolomite: as above
411	70	Claystone: as above
	30	Sandstone: as above
	TR	Coal: as above
	TR	Dolomite: as above
414	50	Claystone: as above
	40	Sandstone: white-light grey, quartz grains, unconsolidated, medium-coarse-very coarse, predominantly subrounded, occasionally subangular poorly sorted, good visual porosity, no show.
	TR	Coal: as above
	TR	Dolomite: as above
417	40	Claystone: as above
	40	Sandstone: as above
	TR	Coal: as above
	TR	Dolomite: as above
	20	Phyllite: light greyish brown-brown moderately hard, crumbly, micaceous lustre.
420	TR	Claystone: as above
	40	Sandstone: as above
	TR	Coal: as above
	TR	Dolomite: as above
	60	Phyllite: as above with trace chlorite, micromicaceous (muscovite) and quartzitic.
423	TR	Claystone: as above
	20	Sandstone: as above
	TR	Coal: as above
	TR	Dolomite: as above
	80	Phyllite: as above

422.15-428.25 CORE 2 (see core description)

APPENDIX 2 : CORE DESCRIPTIONS

Core 1

Monash Formation (Coombool Member)
367.89m-373.89m (Driller)
368m-374m (BPB)
Cut 6m
Recovered 19.5%

Core 2

Kanmantoo Group
422.15m-428.25m (Driller)
423.21m-429.31m (B.P.B.)
Cut 6.1m
Recovered 35.4%

SOUTH AUSTRALIAN OIL AND GAS CORPORATION

CORE DESCRIPTION

Date 16-6-83

Page 1 of 3

CORE No 1

Well Name MILDURA WEST 1

Location : Lat 34° 32' 30.84"S

Long 141° 24' 26.28"E

Elevation G.L. +63m K.B + 67.63m

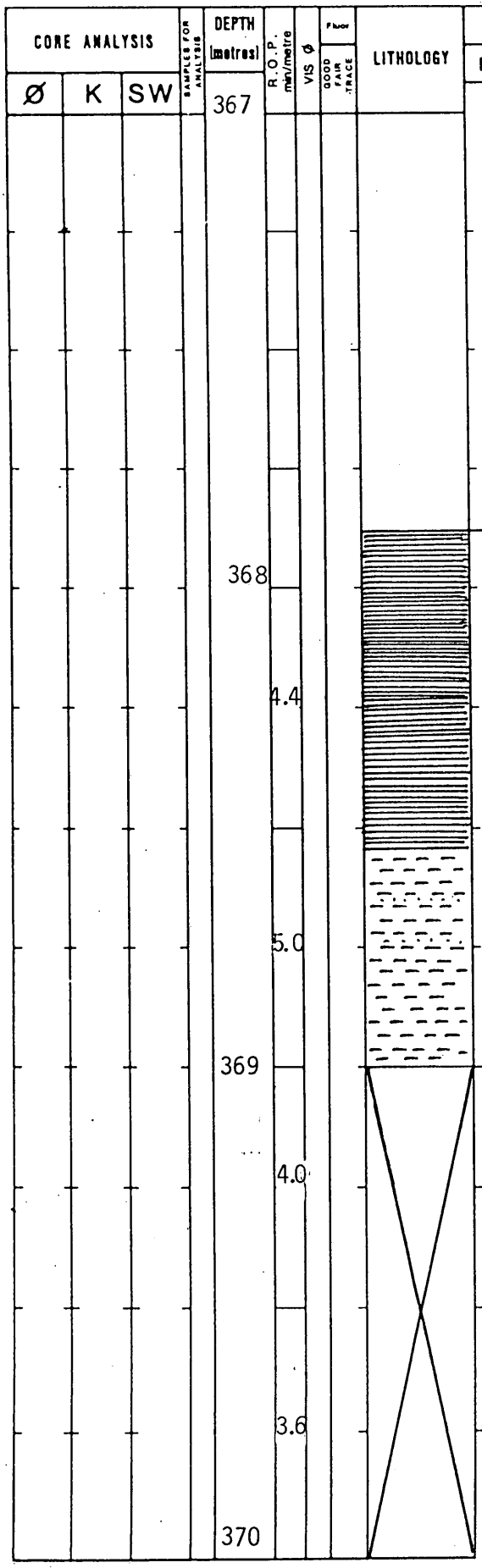
Geologist R.J. Suttill

Interval 367.89-373.5 Cut 5.64 m

Recovery 1.11 m 19.5 %

Formation Coombool Member

Age Early Cretaceous



DESCRIPTION

Legend :

902536 046

TOP OF CORE 367.89m

MUDSTONE: Dark Brown at Top Grading to Greenish Grey with Depth Firm. Becomes Dark Brown in Basal 15cms.

Clay; light grey, soft, silty in part laminated at base, non-calcareous.

SOUTH AUSTRALIAN OIL AND GAS CORPORATION

CORE DESCRIPTION

Date 16-6-83 | Page 2 of 3

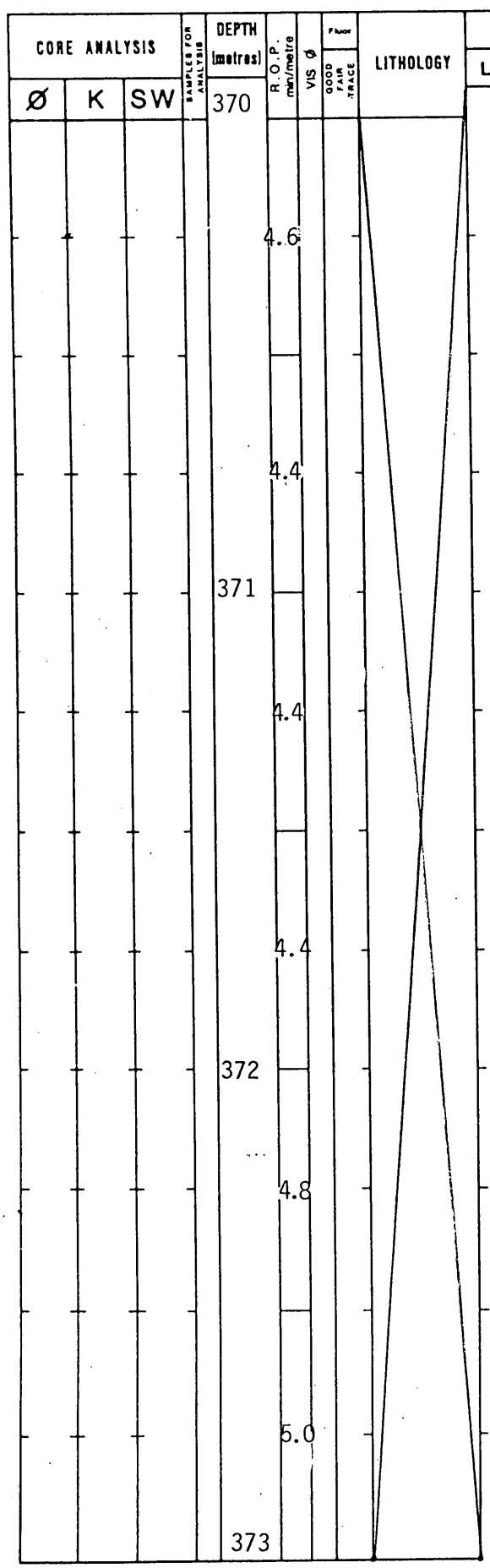
Well Name Mildura West 1 | CORE No 1

Location : Lat 34°32'30'84"S | Interval 367.89-373.5 Cut 5.64 m

Long 141°24' 26.28"E | Recovery 1.11 m 19.5 %

Elevation G.L. +63m K.B. + 67.63m | Formation Coombool Member

Geologist R.J. Suttill | Age Early Cretaceous



DESCRIPTION

Legend :

No Recovery

SOUTH AUSTRALIAN OIL AND GAS CORPORATION

Date 16-6-83

CORE DESCRIPTION

Well Name Mildura West 1

CORE No 1

Location : Lat 34°32'30'84"S

Long 141°24'26.28"E

Interval 367.89-373.5m Cut 5.64 m

Recovery 1.11 m 19.5 %

Elevation G.L. +63m K.B. + 67.63m

Formation Coombool Member

Geologist R.J. Suttill

Age Early Cretaceous

CORE ANALYSIS Ø	CORE ANALYSIS K	CORE ANALYSIS SW	SAMPLES FOR ANALYSIS	DEPTH (metres)	R.O.P. min/metre	VIS Ø	Fluor GOOD FAIR TRACE	LITHOLOGY	DESCRIPTION
				373					Legend :
					4.3				No Recovery
				373.5					Base of Cored Interval 373.5m

SOUTH AUSTRALIAN OIL AND GAS CORPORATION

502536 049

CORE DESCRIPTION

Page 1 of 3

Date 17-6-83

CORE No 2

Well Name Mildura West 1

Location : Lat 34°32'30'84"S

Long 141°24'26.28"E

Elevation G.L. +63m K.B. + 67.63m

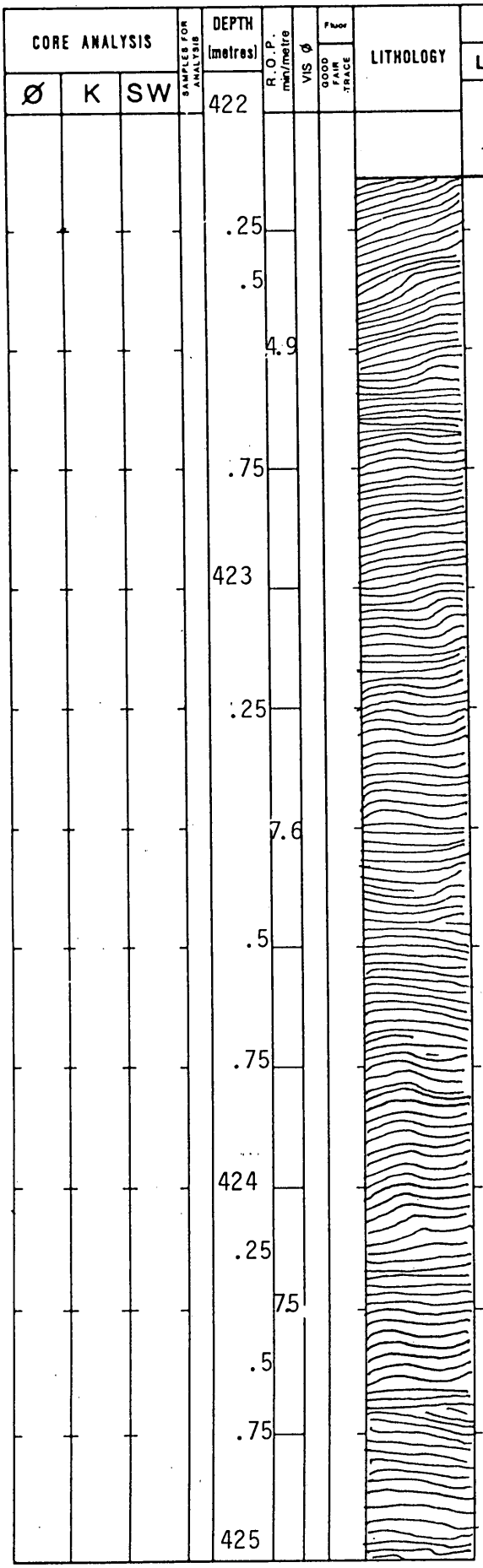
Geologist R.J. Suttill

Interval 422.15-428.25 Cut 6.01 m

Recovery 2.13 m 35.4 %

Formation Kanmantoo (Basement)

Age Cambrian



DESCRIPTION

Legend :

Top of Core at 422.15m

PHYLLITE - Light Grey to Grey Green, Firm, crumbly, becoming firmer with depth. TR Chlorite, Micaceous (Muscovite), Quartzitic.

SOUTH AUSTRALIAN OIL AND GAS CORPORATION

CORE DESCRIPTION

Date 17-6-83

Well Name Mildura West 1

Location : Lat 34°32'30'84"S

Long 141°24'26.28"E

Elevation G.L. +63m K.B. + 67.63m

Geologist R.J. Suttill

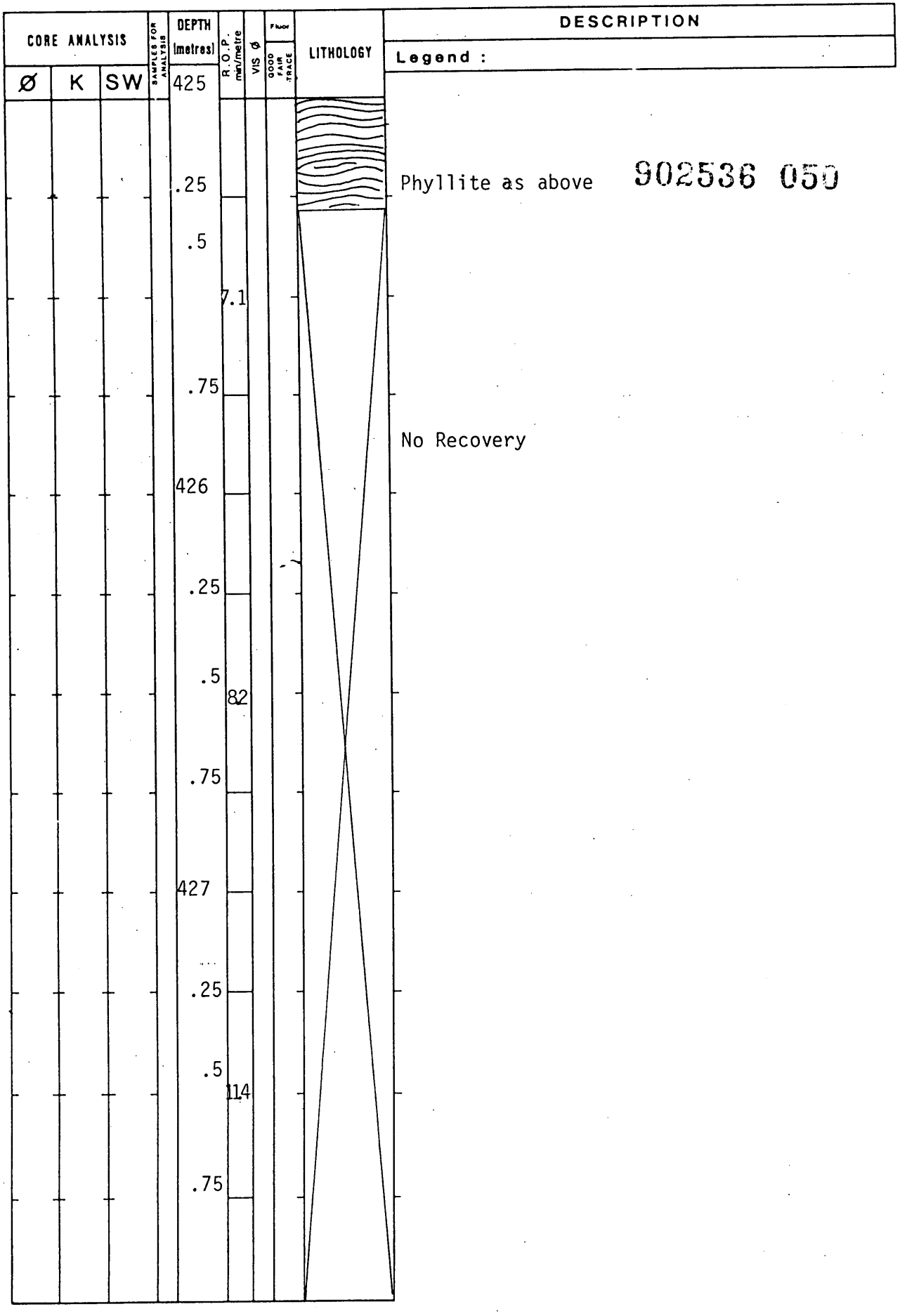
CORE No 2

Interval 422.15-428.25 Cut 6.01 m

Recovery 2.13 m 34.4 %

Formation Kanmantoo

Age Cambrian



SOUTH AUSTRALIAN OIL AND GAS CORPORATION

Date 17-6-83

CORE DESCRIPTION

CORE No 2

Well Name Mildura West 1

Location : Lat 34°32'30'84"S

Long 141°24'26.28"E

Elevation G.L. +63m K.B. + 67.63m

Geologist R.J. Suttill

Interval 422.15-428-25 Cut 6.01 m

Recovery 2.13 m 35.4%

Formation Kanmantoo

Age Cambrian

CORE ANALYSIS Ø	CORE ANALYSIS K	CORE ANALYSIS SW	SAMPLES FOR ANALYSIS	DEPTH (metres)	R.O.P. min/metre	VIS Ø	Fluor GOOD FAIR TRACE	LITHOLOGY	DESCRIPTION
				428					Legend :
				.25					No Recovery
									Base of Cored Interval 428.25m

APPENDIX 3 : SOURCE ROCK ANALYSIS

MILDURA WEST 1

The following samples were forwarded to Amdel for Source Rock Analysis.

Depth	Formation	
375 m	Monash Formation	(Coombool Member)
405 m	Monash Formation	(Coombool Member)

A report prepared by Amdel follows

HYDROCARBON SOURCE EVALUATION OF THE MONASH FORMATION, MILDURA WEST NOS. 1 & 2, MURRAY BASIN

South Australian Oil & Gas
Corporation Pty Limited

F4/454/2/0-5576/84 September 1983

The Australian Mineral Development Laboratories

lemington Street, Frewville
South Australia 5063
Phone Adelaide 79 1662
Telex AA82520

Please address all correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

amdel

902536 053

20 September 1983

F 4/454/2/0

South Australian Oil & Gas Corporation Pty Limited
PO Box 470
NORTH ADELAIDE SA 5006

Attention: Mr Richard Suttill

REPORT F 5576/84

YOUR REFERENCE:	Purchase Order No. 4048
MATERIAL:	Cuttings
LOCALITY:	Mildura West Nos. 1 & 2
IDENTIFICATION:	As specified in report
DATE RECEIVED:	15 July 1983
WORK REQUIRED:	Total organic carbon, Rock-Eval pyrolysis. Interpretation.

Investigation and Report by: Dr David M. McKirdy and Dr Robert E. Cox

Chief - Fuel Section: Dr Brian Steveson
Manager, Mineral and Materials Sciences Division: Dr William G. Spencer

Brian Steveson.

for Brian S. Hickman
Managing Director

caw

Head Office:
Flemington Street, Frewville
South Australia 5063
Telephone (08) 79 1662
Telex: Amdel AA82520
Pilot Plant:
Osman Place
Thebarton, S.A.
Telephone (08) 43 5733
Branch Laboratories:
Melbourne, Vic.
Telephone (03) 645 3093
Perth, W.A.
Telephone (09) 325 7311
Telex: Amdel AA94893
Townsville
Queensland 4814
Telephone (077) 75 1377

1. INTRODUCTION

Six cuttings samples of the Monash Formation from Mildura West 1 & 2 (Table 1) were received for source rock analysis. Total organic carbon and Rock-Eval data on these samples, together with some preliminary interpretative comments were communicated by telex to R.J. Suttill on 20 August 1983. This report is the formal presentation of the abovementioned information.

2. ANALYTICAL PROCEDURE

2.1 Sample Preparation

Each cuttings sample (as received) was ground in a Siebtechnik mill for 20-30 secs.

2.2 Total Organic Carbon (TOC)

Total organic carbon was determined by digestion of a known weight (2-10 g) of powdered rock in 50% HCl to remove carbonates, followed by combustion in oxygen in the induction furnace of Leco IR-12 Carbon Determinator and measurement of the resultant CO_2 by infra-red detection.

2.3 Rock-Eval Analysis

A 100 mg portion of powdered rock was analysed by the Rock-Eval pyrolysis technique (Girdel IFP-Fina Mark 2 instrument; operating mode , Cycle 1).

3. RESULTS

TOC and Rock-Eval data are summarised in Table 2. Figures 1 and 2 illustrate the type and maturity of the organic matter present in these sedimentary rocks.

4. DISCUSSION

4.1 Maturity

The low Tmax values (415-422°C: Table 2) indicate that the Monash Formation at both well localities is thermally immature (equivalent vitrinite reflectance <0.5%: Figs. 1 & 2).

4.2 Source Richness

Four of the six samples examined contain in excess of 1% TOC (Table 2). However, only two of these samples possess fair or better source richness, indicated by potential hydrocarbon yields ($S_1 + S_2$) of >2 kg/tonne, as follows:

Well	Depth (m)	TOC (%)	$S_1 + S_2$ (kg/tonne)	Source Richness
Mildura West-1	507	2.70	2.9	Fair
Mildura West-2	537*	5.35	6.8	Good

*Cuttings contain 30% Coal (Table 1).

On the assumption that the sandstone component of each cuttings sample listed in Table 1 is barren of dispersed organic matter, it is possible to calculate the aggregate richness of the more likely hydrocarbon source lithologies present (viz. claystone, siltstone, coal). These 'corrected' TOC values and potential hydrocarbon yields ($S_1 + S_2$) are given in Table 3.

4.3 Source Quality and Kerogen Type

Hydrogen indices in the range HI = 50-123 (Table 2) suggest that these rocks contain organic matter of humic Type III, tending to inertinitic Type IV, composition (Figs. 1 and 2). Such organic matter is gas-prone.

5. CONCLUSIONS

The Monash Formation at the Mildura West-1 and 2 well localities contains fair to good amounts of thermally immature, gas-prone, terrigenous organic matter.

TABLE 1: CUTTINGS SAMPLES SUBMITTED FOR SOURCE-ROCK ANALYSIS, MILDURA WEST - 1 & 2

Well	Depth (metres)	Formation/Member	Lithology*
Mildura West - 1	375	Monash/Coombool	60% sandstone, 40% claystone, trace coal
	405	Monash/Coombool	70% claystone, 20% sandstone, trace coal, trace dolomite
Mildura West - 2	498	Monash/Merreti	70% sandstone, 30% siltstone
	507	Monash/Merreti	70% sandstone, 30% siltstone, trace coal
	513	Monash/Pyap	60% sandstone, 30% siltstone, 10% coal
	537	Monash/Pyap	50% sandstone, 20% siltstone, 30% coal

*Information supplied by client.

TABLE 2: TOC AND ROCK-EVAL DATA, MONASH FORMATION, MILDURA WEST - 1 & 2

Well	Depth (m)	Tmax	S_1	S_2	S_3	PI	S_2/S_3	PC	TOC	HI	OI
Mildura West - 1	375	422	0.13	1.44	0.98	0.08	1.46	0.13	1.27	113	77
	405	415	0.02	0.22	39.0	0.08	0.00	0.02	0.44	50	8880
Mildura West - 2	498	-	-	-	-	-	-	-	0.18	-	-
	507	422	0.10	2.83	1.48	0.03	1.91	0.24	2.70	105	55
	513	420	0.03	0.88	1.71	0.03	0.51	0.07	1.44	61	119
	537	417	0.25	6.57	3.05	0.04	2.15	0.56	5.35	123	57

KEY TO ROCK-EVAL PYROLYSIS DATA SHEET

PARAMETER		SPECIFICITY
T max	position of S_2 peak in temperature program (^oC)	Maturity/Kerogen type
S_1	kg hydrocarbons (extractable)/tonne rock	Kerogen type/Maturity/Migrated oil
S_2	kg hydrocarbons (kerogen pyrolysate)/tonne rock	Kerogen type/Maturity
S_3	kg CO_2 (organic)/tonne rock	Kerogen type/Maturity *
$S_1 + S_2$	Potential Yield	Organic richness/Kerogen type
PI	Production Index ($S_1/S_1 + S_2$)	Maturity/Migrated Oil
PC	Pyrolysable Carbon (wt. percent)	Organic richness/Kerogen type/Maturity
TOC	Total Organic Carbon (wt. percent)	Organic richness
HI	Hydrogen Index (mg h'c (S_2)/g TOC)	Kerogen type/Maturity
OI	Oxygen Index (mg CO_2(S_3)/g TOC)	Kerogen type/Maturity *

*Also subject to interference by CO_2 from decomposition of carbonate minerals.

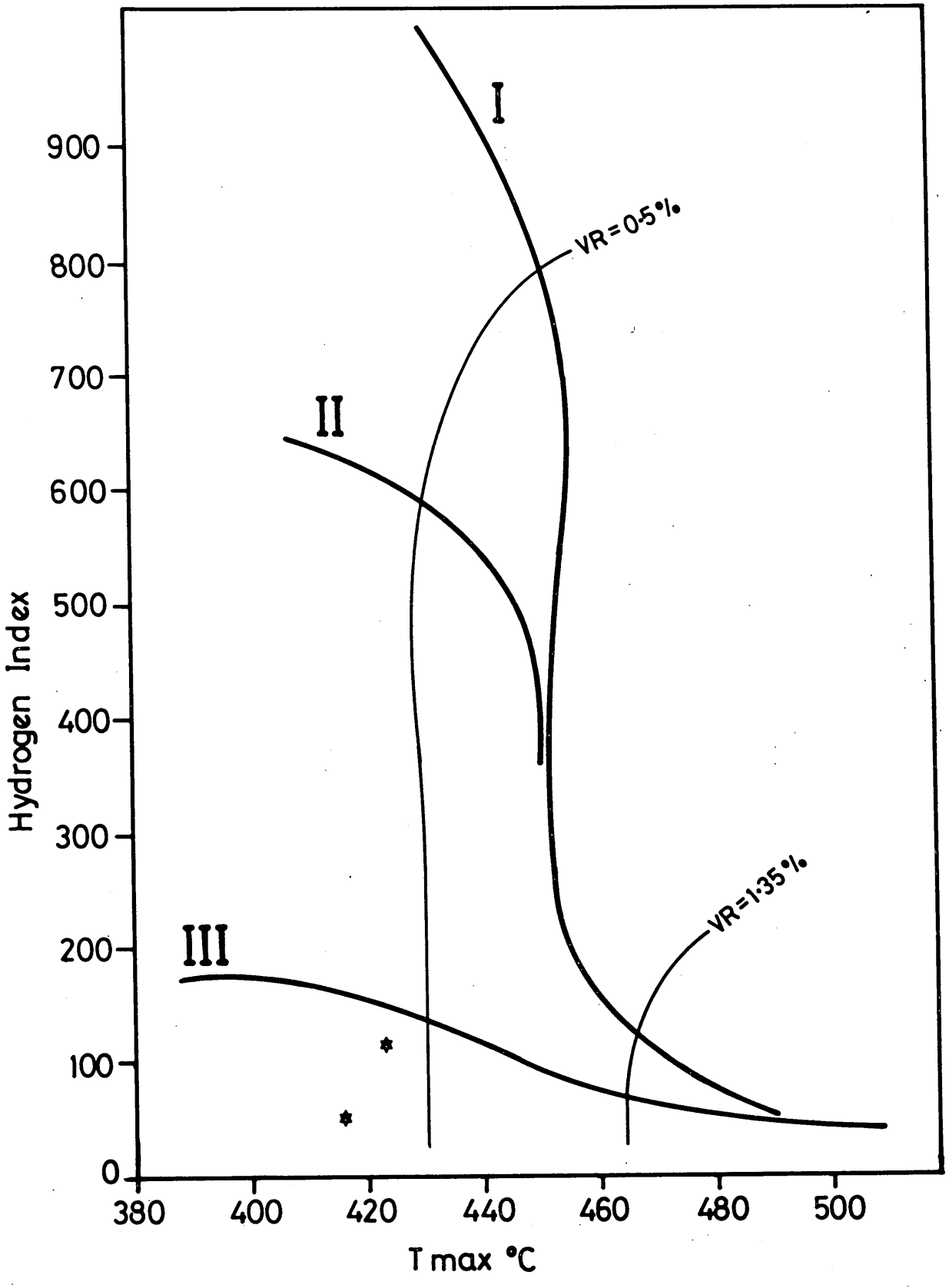
TABLE 3: SOURCE RICHNESS OF MONASH FORMATION CUTTINGS AFTER CORRECTION FOR PRESENCE OF BARREN SANDSTONE

Well	Depth	TOC	$S_1 + S_2$ (kg/tonne)	Source Richness
Mildura West - 1	375	3.2	3.9	fair
	405	0.6	0.3	poor
Mildura West - 2	498	0.6	-	poor
	507	9.0	9.8	good
	513	3.6	2.3	fair
	537	10.7	13.6	good

FIGURE 1

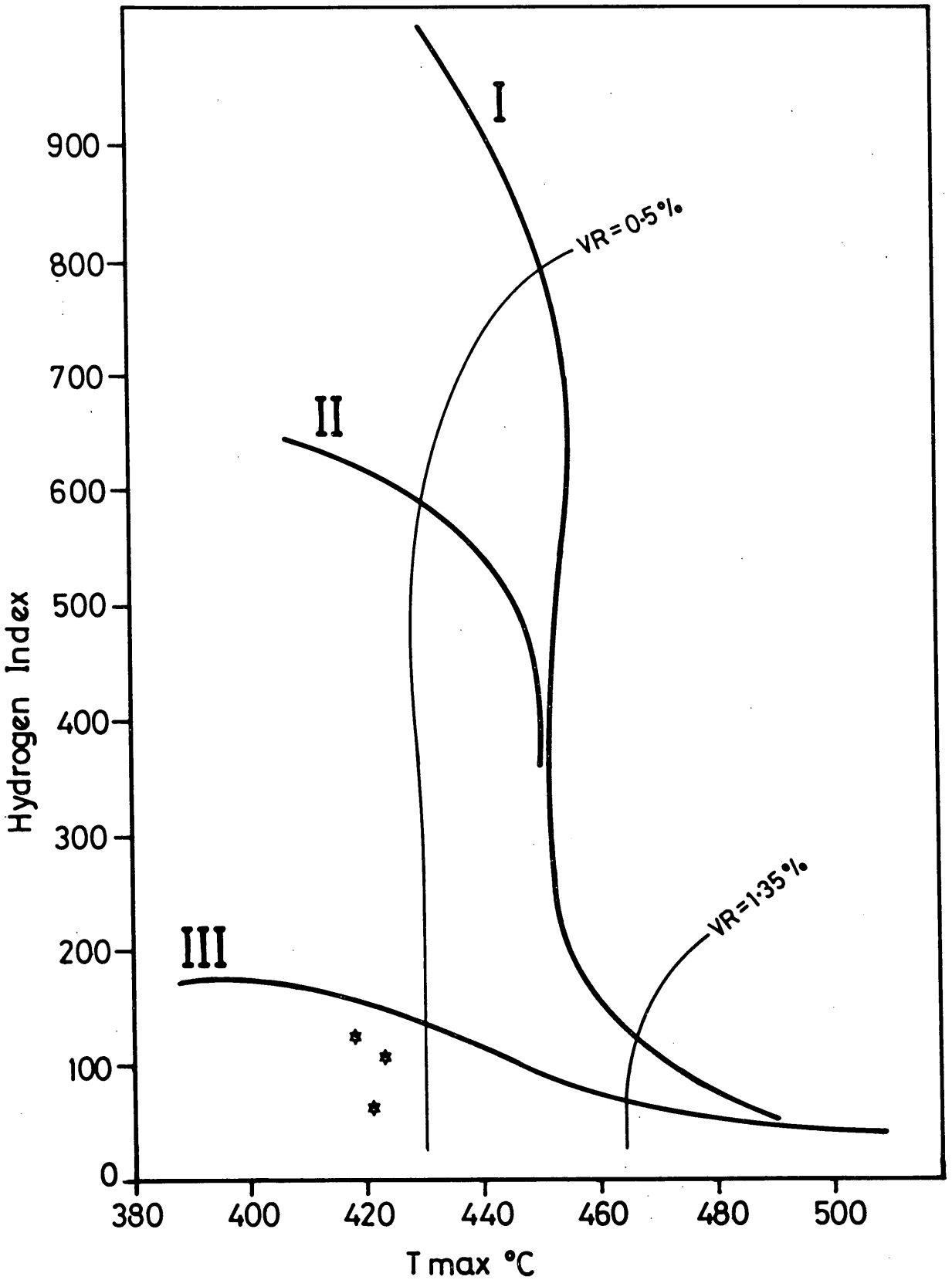
Client : SAOGC
Well : MILDURA WEST - #1
Interval : Monash Formation

902536 062

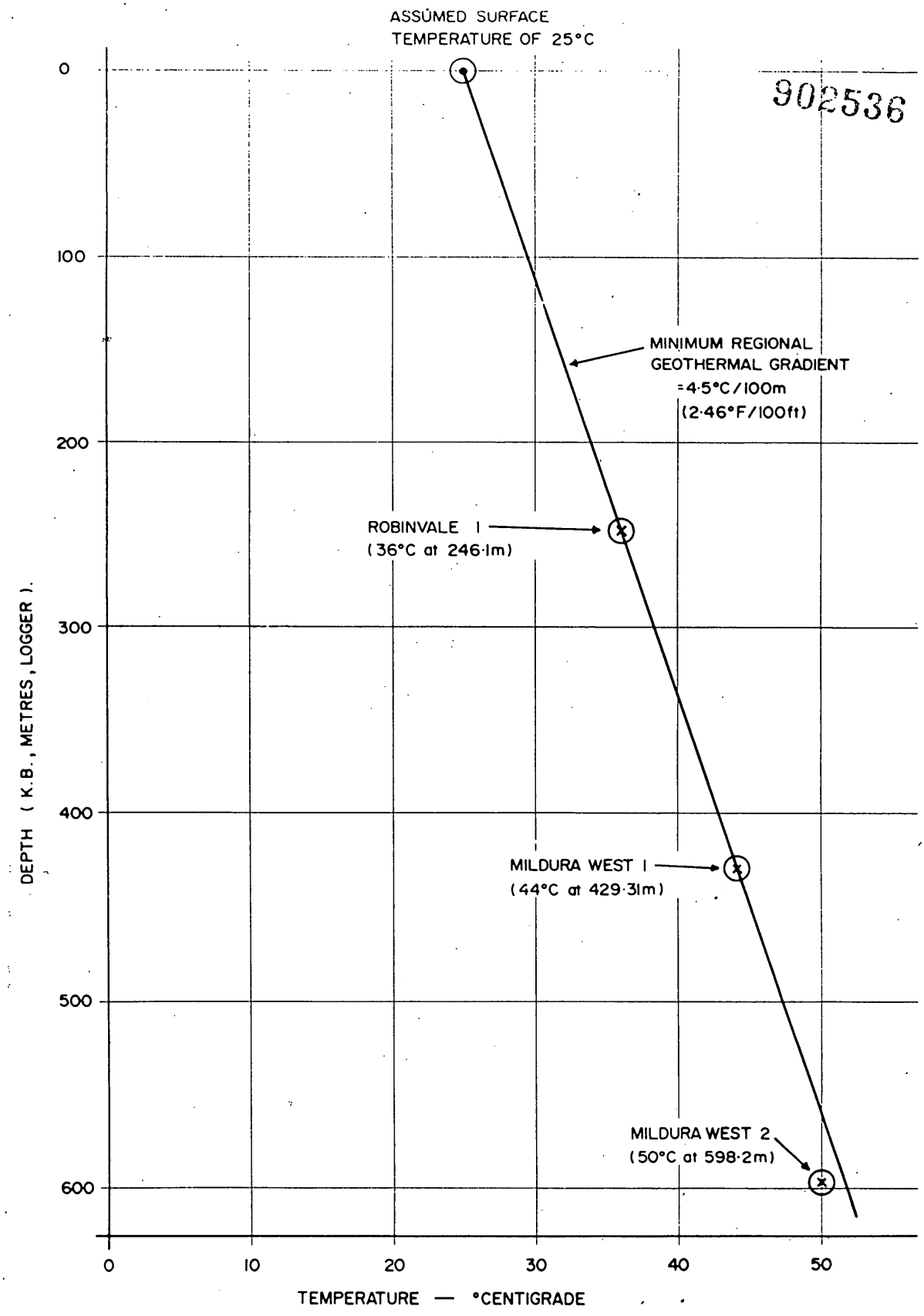


Client : SAOGC
Well : MILDURA WEST - #2
Interval : Monash Formation

FIGURE 2



APPENDIX 4 : DEPTH VS TEMPERATURE



SOUTH AUSTRALIAN OIL & GAS CORP. PTY. LTD.		
Mildura West 1 & 2, Robinvale 1		
GEOTHERMAL GRADIENT		
Interp. R.SUTTILL	Date JULY 83	MAW000.2939
Drawn. C.KAY	Scale AS SHOWN	FIG.2

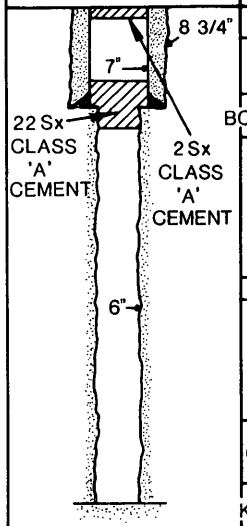
APPENDIX 5 : ACTUAL DEPTH-TIME CURVE

WELL: **MILDURA WEST 1**
LATITUDE. **34° 32'30.84" S**
LONGITUDE. **141° 24'26.28" E**
S.P. **81-A2 (580)**
ELEVATION. **G.L. 63m K.B. 67.63m**

ACTUAL DEPTH-TIME CURVE

CONTRACTOR. **ATCO-APM**
RIG No. **A3**
TYPE. **FRANKS CABOT**

WELL SECTION



T.D. 428.29 (driller)
429.31 (logger)

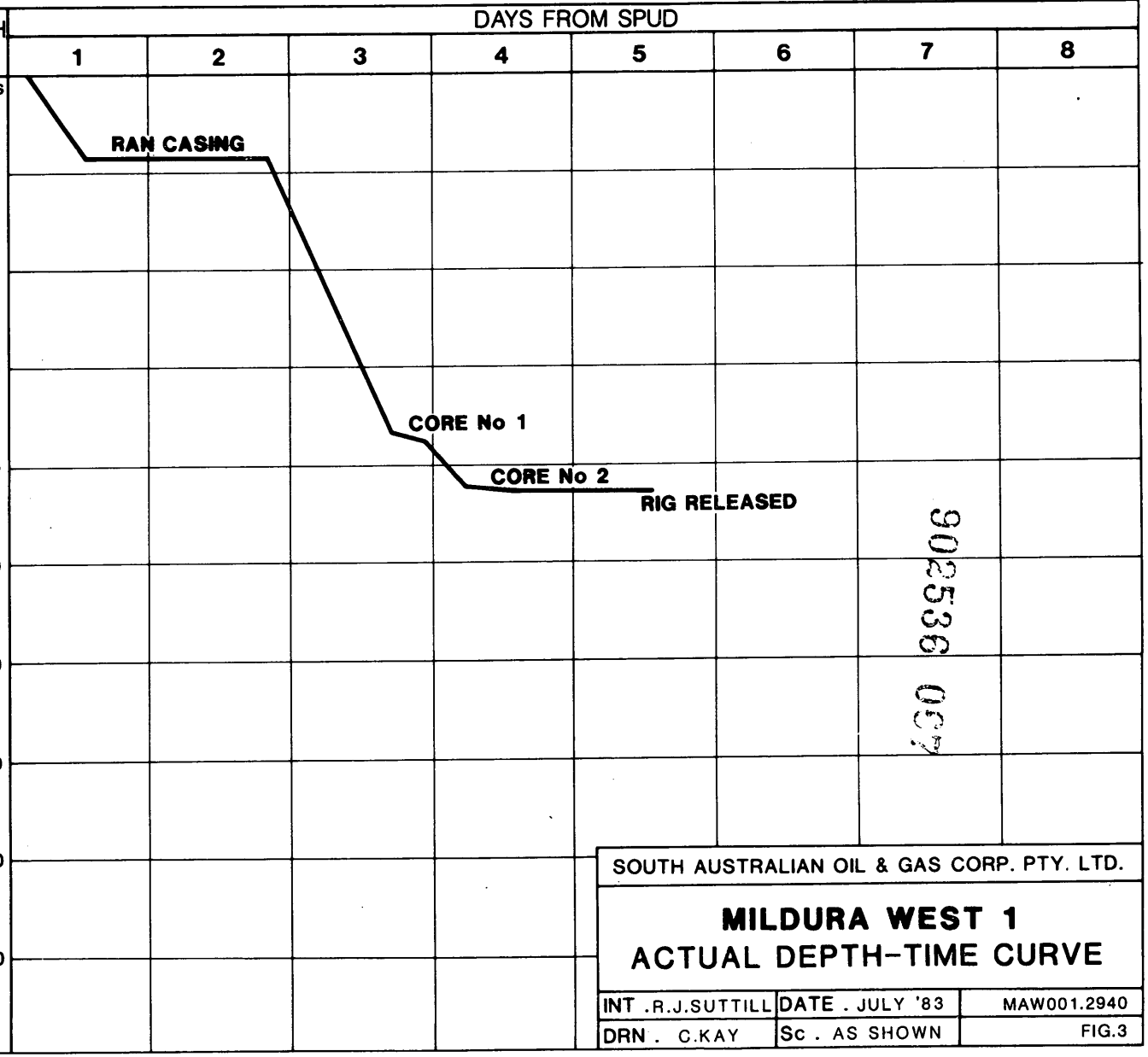
STRATIGRAPHY

FORMATION	K.B.
UNDIFF.	26.8
PARILLA	76.0
BOOKPURNONG	117.8
DUDDO	236.0
ETTRICK	254.4
OLNEY	360.8
COOMBOOL	415.4
KANMANTOO	

REMARKS (Drillers Depths)

DRILL 8 3/4" HOLE TO 85.65m
RUN 7Jts 7" CASING WITH 72sx CLASS 'A' CEMENT
DRILL 6" HOLE TO 367.89m

CUT CORE No1 TO 373.53m DRILL 6" HOLE TO 422.15m
CUT CORE No2 TO 428.25 (T.D.)



SOUTH AUSTRALIAN OIL & GAS CORP. PTY. LTD.

MILDURA WEST 1
ACTUAL DEPTH-TIME CURVE

INT .R.J.SUTTILL	DATE . JULY '83	MAW001.2940
DRN . C.KAY	Sc . AS SHOWN	FIG.3

902536 068

PE601256

This is an enclosure indicator page.
The enclosure PE601256 is enclosed within the container PE902536 at this location in this document.

The enclosure PE601256 has the following characteristics:

ITEM_BARCODE	= PE601256
CONTAINER_BARCODE	= PE902536
NAME	= Composite Well log Mildura West-1
BASIN	= MURRAY
OFFSHORE?	= Y
DATA_TYPE	= COMPOSITE_LOG
DATA_SUB_TYPE	= HARDCOPY-PAPER
DESCRIPTION	=
REMARKS	= 18-JUN-1983
DATE_WRITTEN	=
DATE_PROCESSED	= SA Oil Wells Corp LTD.
DATE_RECEIVED	=
RECEIVED_FROM	= 25-OCT-1983
WELL_NAME	=
CONTRACTOR	=
AUTHOR	=
ORIGINATOR	= xls_kb00
TOP_DEPTH	=
BOTTOM_DEPTH	=
ROW_CREATED_BY	=

(Inserted by DNRE - Vic Govt Mines Dept)

PE601257

This is an enclosure indicator page.
The enclosure PE601257 is enclosed within the container PE902536 at this location in this document.

The enclosure PE601257 has the following characteristics:

ITEM_BARCODE	= PE601257
CONTAINER_BARCODE	= PE902536
NAME	= SP Resistivity Log Mildura West-1
BASIN	= MURRAY
OFFSHORE?	= Y
DATA_TYPE	= WELL_LOG
DATA_SUB_TYPE	= HARDCOPY-PAPER
DESCRIPTION	=
REMARKS	= 17-JUN-1983
DATE_WRITTEN	=
DATE_PROCESSED	= SA Oil Wells Corp LTD.
DATE_RECEIVED	=
RECEIVED_FROM	= 25-OCT-1983
WELL_NAME	=
CONTRACTOR	=
AUTHOR	=
ORIGINATOR	= xls_kb00
TOP_DEPTH	=
BOTTOM_DEPTH	=
ROW_CREATED_BY	=

(Inserted by DNRE - Vic Govt Mines Dept)

902536 070

PE601258

This is an enclosure indicator page.
The enclosure PE601258 is enclosed within the container PE902536 at this location in this document.

The enclosure PE601258 has the following characteristics:

ITEM_BARCODE	= PE601258
CONTAINER_BARCODE	= PE902536
NAME	= Gearhart Mud Log Mildura West-1
BASIN	= MURRAY
OFFSHORE?	= Y
DATA_TYPE	= MUD_LOG
DATA_SUB_TYPE	= HARDCOPY-PAPER
DESCRIPTION	=
REMARKS	= 18-JUN-1983
DATE_WRITTEN	=
DATE_PROCESSED	= SA Oil Wells Corp LTD.
DATE_RECEIVED	=
RECEIVED_FROM	= 25-OCT-1983
WELL_NAME	= 89.93000
CONTRACTOR	=
AUTHOR	=
ORIGINATOR	= xls_kb00
TOP_DEPTH	=
BOTTOM_DEPTH	=
ROW_CREATED_BY	=

(Inserted by DNRE - Vic Govt Mines Dept)