Natural Resources and Environment

AGRICULTURE • RESOURCES • CONSERVATION • LAND MANAGEMENT

ATTACHMENT TO WCR
WELL SUMMARY INFO.
ANGLESEA-1
W345

OTWAY BASIN

1 Folio No	2 Referred to	3 Date	4 Clearing Officer's Initials
1922	[redacted]		

1 Folio No	2 Referred to	3 Date	Clea Offi Init
	ONSHORE		

South Australian Oil Wells Co. N.L.

WELL SUMMARY ANGLESEA-1
(W345)

CONTENTS:

APPENDIX:

APPENDIX 1:

PE903072

This is an enclosure indicator page.
The enclosure PE903072 is enclosed within the container PE905677 at this location in this document.

The enclosure PE903072 has the following characteristics:

ITEM_BARCODE	= PE903072
CONTAINER_BARCODE	= PE905677
NAME	= Well Card
BASIN	= Otway
PERMIT	=
TYPE	= WELL
SUBTYPE	= REPORT
DESCRIPTION	= Well Card (enclosure from Well Summary Information Folder—attachment to WCR) for Anglesea-1
REMARKS	=
DATE_CREATED	= 31/07/22
DATE_RECEIVED	=
W_NO	= W345
WELL_NAME	= Anglesea-1
CONTRACTOR	= Sth. Australia Oil Wells Co. N.L
CLIENT_OP_CO	= Sth. Australia Oil Wells Co. N.L

(Inserted by DNRE - Vic Govt Mines Dept)

W345

108

WELL ANGLESEA No.1 TYPE BASIN

Tenement Holder Sth.Aust. Oil Wells Co.N.L.

Operator

Tenement

Map Used Pt. Angahook. Sect. 13, near Anglesea River. Anglesea 1/Mile Mk.

Latitude 38° 24' 15" S

Longitude 144° 11' 20" E.

Elevation approx 5' Total Depth 462' Status Dry & Abandoned.

Spud June 1922 Completed Abandoned July 1922

Casing

STRATIGRAPHY

Ex. Mt. Barrabool, W. 1947. p.131-132

Clay yellow	0' - 39'
Mudstone, black, carbonaceous, pyritic	39' - 186'
Clay sandy	186' - 274'
Brown coal	274' - 282'
Sand with fragments of charcoal	282' - 294'
Clay, brown, with lignite	294' - 301'
Brown coal	301' - 312'
Clay	312' - 317'
Sand, grey, medium	317' - 319'
Clay, brown	319' - 324'
Sand, fine with a little clay	324' - 354'
Gravel	354' - 355'
Clay brown	355' - 390'
Sand fine	390' - 393'
Clay brown	393' - 399'
Sandy clay with lignite fragments	399' - 412'
Gravel coarse	412' - 413'
Clay Sandy	413' - 416'
Sand with fossil resin & Lignite	416' - 417'
Sandstone, black, hard	417' - 418'
Brown coal	418' - 429'
Clay, sdy, pale brown	429' - 446'
Clay, white, with seams of lignite	446' - 455'
Sand, coarse, rounded, silica	455' - 462'

FORMATION TESTS

LOG SUMMARY AND INTERPRETATION

~~Last Reading~~ ~~First Reading~~

~~ELECTRIC LOG.~~

~~MICRO LOG.~~

~~CONTINUOUS DIAMETER.~~

~~330'~~ ~~4800'~~
~~330'~~ ~~6000'~~
~~4800'~~ ~~6000'~~
~~6750'~~ ~~6000'~~
~~6602'~~ ~~786'~~

.A. Oil Wells. oN.L.
ANGLESEA No. 1

CORES

No.	Interval	Rec.	No.	Interval	Rec.	No.	Interval	Rec.	No.	Interval	Rec.

CHEMICAL ANALYSES (Oil, water, gas.)

Oil Show when Bailing.

GENERAL (Conclusion, structure, plugging, etc.)

W468 — 1

WELL ANGLESEA No1 TYPE N.F.W. BASIN Port Phillip

TEN. HOLDER ~~Ampolex~~ Oil Development N.L.② lat. 38°24'26"S 38°24' Ph. Jan Juc.

OPERATOR ~~A.O.D.~~ Oil Development NL. LOCATION. Long. 144°11'53"E 144°12'30"E

TENEMENT P.P.L. 256 Military Map. Anglesea 1 Mile Military

ELEVATION 65.06 GL. 78.06 KB (Datum) T.D. 10,065-Driller STATUS. D&A.

SPUD. 23 May 1962 COMPL. Drilling 7 Nov. 1962 ABD. 9 Nov. 1962

CASING 18 5/8" @ 30 C to S. (50sx) 13 3/8" @ 389 C to S. (350sx) 9 5/8" @ 2295 (350sx) C to. 1290 Contracts Reading + Bate.

STRATIGRAPHY.

AGE	FORMATION	DEPTH		THICKNESS
①Oligocene - Eocene.	Demons Bluff Fm. Anglesea Mmb.	0	+78	390
Eocene	Eastern View Coal. Ms.	390	-312	1542
L. Cret - Jur.	Otway Group.	1932	-1854.	8133+

Dellenbach 1965:-
Demon's Bluff Fm. (Anglesea Mmb.) 0'-370'
Eastern View Coal Ms. 370'-1816'
Proposed unit "H" 1816'-1921'
Otway Group 1921'-10065'
(2 Otway Subunits "M" 1921'-5710' "H₂" 5710'-10065')

① Name changed after this well drilled to Alliance Oil Development Australia N.L. (1-1-63)

FORMATION TESTS.

D.S.T. 1. 2220 - 2296 Packer failed
D.S.T. 2. 7683 - 7738. " "
D.S.T. 3. 7688 - 7738 " "
D.S.T. 4. 7672 - 7738 " "

LOG SUMMARY and INTERPRETATION

Type	Run	Interval	Date	Type	Run	Interval	Date	Interval	φ	Sw
E-Log	1	2289 - 390	6 Jun. '62	Microlog	1	2287 - 390	6 Jun '62			
	2	4233 - 2298	28 " "	"	2	4233 - 2298	28 Jun 62			
	3	6313 - 4050	20 Jul. 62	"	3	6313 - 4150	20 Jul "			
	4	7893 - 6200	29 Aug "	"	4	7893 - 6200	29 Aug "			
	5	8954 - 7700	16 Oct "	"	5	8954 - 7700	16 Oct "			
	6	10040 - 8830	8 Nov. "	"	6	10028 - 8700	8 Nov. "			
				+Velocity						
C.O.M.	1	5000 - 4800	29 Aug 62							
		6300 - 5750	"							
		7586 - 6602	"							

Alliance Oil Development N.L. ANGLESEA No 1 ①

Ref. Dellenbach J. 1965. A Petrological Examination of Sediments from O.D.N.L. Anglesea No 1 Well, Otway Basin, Victoria. B.M.R. Records. No. 1965/166.

CORES

No	Interval	Rec	No	Interval	Rec	No	Interval	Rec	No	Interval	Rec.
1	490-510	8'0"	16	4011-4021	10'6"	31	9156-9176	19'0"	S.W.	5206	
2	789-809	4'3"	17	4223-4234	11'0"	32	9641-9656	2'7"		5207	
3	1090-1110	5'7"	18	4517-4527	9'0"	33	10,045-10065	20'0"		5208	
4	1214-1234	3'10"	19	4819-4829	5'6"					5209	
5	1506-1526	10'0"	20	5161-5171	9'0"	S.W.	3771			5210	
6	1778-1798	11'0"	21	5487-5497	6'0"		3772			5211	
7	1931-1951	19'0"	22	5766-5776	7'0"		3773			5212	
8	2225-2245	20'0"	23	6237-6247	9'0"		3774				
9	2286-2296	9'0"	24	6723-6727	3'0"		5196				
10	2557-2567	10'0"	25	6759-6773	10'0"		5198				
11	2860-2870	10'6"	26	7255-7265	9'6"		5199				
12	3158-3168	5'6"	27	7544-7550	6'0"		5201				
13	3460-3470	7'0"	28	7857-7867	9'0"		5203				
14	3724-3734	2'0"	29	8190-8200	8'0"		5204				
15	3734-3744	Nil.	30	8690-8707	17'0"		5205				

CHEMICAL ANALYSES (OIL, WATER, GAS.)

Mines Dept. analysis of drill cuttings 4200-4210
"It would appear that traces of petroleum crude are present in the cuttings examined".

GENERAL (Conclusions, structure, abandonment programme, etc)

Drilling of Anglesea 1 has shown original seismic estimate of 4500' to top of otway measures, due to multiple reflections. Expected cretaceous absent, but may be present seawards

Dip as indicated by cores and C.V.M. is 20°-25° south. However at 8690'-8707' - Core 30. dip ca. 70° indicating a fault or its close proximity. Dip in succeeding cores range 35°-45°.

Possible paralic beds along the unconformity of otway & presumed L. Palaeozoic basement was not reached, however if they exist they may be intersected at a shallower depth further to the north and northeast towards the margin of the L. cretaceous basin, since Anglesea 1 was selected in an area where the maximum thickness of sediments could be expected in PPA. 256

Temp. Survey No continuous survey run but bottom hole temps recorded by Schlumberger Seaco. Inc. during logging operations are. 107°F at 2287'; 140°F. at 4233'; 152°F at 6313'; 168°F at 7894'; 186°F at 8954'; 240°F at 10,028'; The sharp increase in temp between 8954 and 10028 suggests T.D. was probably not far above basement.

Plugging
1. 7550 - 7450 - 50sx
2. 4900 - 4800 - 50sx
3. 2350 - 2250. - 50sx
4. 12' - Surface. - 5sx

A.O.D. - Westralian-Planet Group
under original agreement Westralian Oil Ltd holds 20%, A.O.D. holds [redacted] 60%. Planet earned 20% interest by meeting 25% of well costs

APPENDIX 2:

"BEST GAS SHOWS (?):
463 - 1509
1524 - 1567
1198 - 1207
2639 - 2679

STATE OF VICTORIA

DEPARTMENT OF MINERALS & ENERGY, OIL AND GAS DIVISION

WELL SHEET

1. WELL NAME/OP/RIG: ANGLESEA - 1 / ODNL (ALLIANCE OIL DEVELOPMENT) / RGB
2. BASIN/GRATICULE: OTWAY / TORQUAY EMBAYMENT
3. PERMIT: PETROLEUM PROSPECTING LICENCE No. 256
4. CLASSIFICATION: STRATIGRAPHIC TEST
5. STATUS/CERTIFICATION: DRY, PLUGGED AND ABANDONED; SUITABLE FOR SUBSEQUENT REENTRY.
6. SPUD DATE: 23.05.62
7. T.D. DATE: 07.11.62 TOTAL DEPTH (LOG): 3067.8 HOLE TVDSS:
8. RIG RELEASE DATE: 09.11.62
9. K.B. 23.8
10. G.L. 19.8
11. WATER DEPTH: —
12. TOPHOLE SOUTHERLY: 38° 24' 26" TOPHOLE EASTERLY: 144° 11' 53"
13. BOTTOMHOLE SOUTHERLY: BOTTOMHOLE EASTERLY: —
14. AVERAGE DEVIATION: ± 4° NET DRIFT (AZIMUTH):
15. OBJECTIVES: 1) MARINE WEDGE UNCONFORMABLY ABOVE OTWAY GROUP
16. 2) COARSE FLUVIAL ARENITES AT BASE OF OTWAY GROUP 3) INTRA OTWAY.
17. PERFORATED INTERVALS, SS: NONE
18.
19. SHOW TYPES & INTERVALS, MDKB: "SOME QUESTIONABLE TRACES OF CRUDE OIL" (SPOTTY CORE FLUORESCENCE (RESIDUAL?) THROUGHOUT OTWAY GROUP.
20. UPPER OTWAY GROUP), WITH HYDROCARBON GAS BELOW 1097M TO T.D.* CHECK OUT # CORE SAMPLE AT 460 m (E5) CUT AMBER, POSSIBLY FROM LIGNITE.
21. CUTTINGS SAMPLE INTERVALS, MDKB: 9 - 3067
22. LOGS RUN, LDKB: CAL, DLL - SP, MSFL (118.9 - 3056.0); HDT (1463.0 - 2403.5) JW GAS DETECTOR (853.4 - 3056.0); GEOLOGRAPH (9.1 - 3056.0)
23. RFT/DST RECOVERIES (INTERVALS), LDKB: NONE DUE TO PACKER FAILURES IN RUGOSE HOLE.
24. FSIP (DEPTH, TVDSS):
25. INTERVAL CORES RECOVERED, MDKB: 33 X CORES WITH 21% - 100% RECOVERY 149.3 - 3,067.7
26. N/A RW at °C at Metre, LDKB RESERVOIR NAME
27. N/A RW at °C at Metre, LDKB RESERVOIR NAME
28. CONDUCTOR CASING ml(") to M. - Hole Size (Metric) (Imperial)
29. SURFACE CASING ml(18-7/8") to 9.1 M. - Hole Size
30. INTERMEDIATE CASING ml(13-3/8") to 118.6 M. - Hole Size
31. LINER/FINAL CASING ml(9-5/8") from M. to 699.5 M.
32. NOTE: ALL LINEAR MEASUREMENTS REPORTED IN METRIC UNLESS OTHERWISE SPECIFIED.

* LATE - MIDDLE - EARLY

GEOLOGY: ANGLESEA NO. 1

FM./Key Bed	* AGE	KEY	LITH	LOG TOP, KB	SMPL TOP, KB	VDME TOP, SS	TVD, SS	TVT
ANGLESEA MBR. DEMONS BLUFF FM.	L. EO - E. OL		CLY & LS SD.	0				119+
EASTERN VIEW COAL MEASURES	PA - E. EO.		CONGL, CLY, LIGNITE	118.9				470+
OTWAY GROUP	E. CRET.		ARKOSE, SLTST & MUDST.	588.8				2,479+

RESERVOIRS:

OIL/GAS PAY ZONES	DEPTH INT, SS	RECD %	TOP SEAL THICK, TVT	BTM SEAL THICK, TVT

* "AEROMAGNETIC SURVEY SUGGESTS THAT TARGET PETROLIFEROUS (?) WEDGE SEDIMENTS MAY BE PRESENT IN THE OFFSHORE ARE TO THE SOUTHEAST OF THE ANGLESEA "TROUGH".

COMMENTS: LOCATION DESIGNED FOR OFF-STRUCTURE, STRATIGRAPHIC TEST IN SW CORNER OF PPL 256, WHERE SEISMIC INDICATED THAT SEDIMENTARY SECTION ABOVE THE LOWER PALEOZOIC BASEMENT COULD BE THICKEST. OWING TO 20-25° DIPS (SOUTH) THE HARD BEDS OF OTWAY GROUP BELOW 618 M, IT WAS DIFFICULT TO KEEP STRAIGHT HOLE. THE SHARP INCREASE IN TEMPERATURE BETWEEN 2729 M AND 3057M INDICATES PROXIMITY TO BASEMENT, ALTHOUGH A BASAL CONGLOMERATE WAS NOT ATTAINED AS PER TARGET PLAN. FURTHERMORE

* IT APPEARS LIKELY THAT SHOWS WERE NOT PROPERLY EVALUATED AND THAT AN OFFSET WELL SHOULD BE DRILLED ON STRUCTURE (?) TO BASEMENT WITH A PROPER MUD PROGRAMME TO WITHSTAND CAVING HOLE CONDITIONS AND TO ALLOW FOR COMPLETE AND ACCURATE HYDROCARBON EVALUATION VIA MODERN MUDLOGGING, ELECTRIC LOGGING, AND DRILLSTEM TESTING. "IT WAS HOPED THAT A WEDGE * (STRATIGRAPHIC PLAY ONLY?) OF THE MARINE MIDDLE AND UPPER CRETACEOUS SEDIMENTS WHICH YIELDED PETROLIFEROUS GAS IN THE ADJOINING OTWAY BASIN WOULD BE PRESENT AT THIS LOCATION, BELOW THE EASTERN VIEW COAL MEASURES AND RESTING UNCONFORMABLY ON THE OTWAY GROUP. HOWEVER, AS THIS PRIMARY TARGET PROVED TO BE ABSENT, THE SECONDARY OBJECTIVE OF SEEKING ϕ WITHIN OR AT THE BASE OF THE OTWAY GROUP WAS PURSUED TO THE MAXIMUM OF THE CAPACITY OF THE AVAILABLE EQUIPMENT." (COMPLETION REPORT, PAGE 5.)

NEEDS FURTHER RESEARCH

Anvgahook 8308

WELL NAME: Anglesea 1 BASIN

STATUS: RIG CONSEC. No.

DATE: Commenced Completed 1947 TOTAL DEPTH 140.9

ELEVATION (GL) 1.52 LOCATION AMG sheet 38 24 15 144 11 20

PARISH No A Anvgahook. N E

ENGINEERING DATA (casing plugs, completion details) S. A. OIL WELLS.

GEOPHYSICAL LOGS Logged by BHT

CORES: Conventional				Side Wall Cores			
From (m)	Thick	Recov	%	Depth (m)	Recov	Depth	Recov.

PALAEONTOLOGY: Foraminifera Det. by

Palynology Det. by

GROUNDWATER DATA: (T.D.S., screened intervals, S.L., Drawdown, Yield)

STRATIGRAPHY: Formation		Depth(m)	FROM	TO	Comments
	Newer Basalt	CXNV			
	Whalers Bluff Fm	CQWB			
	Moorabool Viaduct Sds.	CXMO			
Heytesbury Group (CMH)	PortCambell Lst Fm	CMPC			
	Gellibrand Marl	CMGM			
	Clifton Fm.	COCL			
Nirranda Group (CON)	Narrawaturk Marl	CONM			
	Mepunga Fm	CEME			
Wangerrrip Group (CPW)	Dilwyn Fm (Easter View)	CPDI			
	Older Volcanics	CEEV			
	Pember Mudstone	CPPM			
	Pebble Point Fm.	CPPP			
Sherbrook Group (MCS)	Paaratte Fm	MCPA			
	Timboon Sd (Skull Ck)	MCTS			
	Nullawaare Fm	MCNG			
	Belfast Mudstone	MCBM			
	Flaxmans Fm	MCFL			
	Waarre Snds Fm	MCWR			
Otway Group (MC02)	Eummeralla Fm	MCEU			
	Pretty Hill Sds (GELTWOOD BEACH)	MCPH			
	Palaeozoic Mudstones	PSMV			

OTHER DATA: (Velocity survey, seismic line, gas/oil show, tests)

DATA SOURCE, REFERENCES, COMMENTS

BRAGG GROUNDWATER 1947 PP 131-132

BASIN STUDIES SECTION - DEEP WELL SUMMARY SHEET - OIL & GAS WELLS

Jawjue 8241

WELL NAME Anglesea 1 BASIN

STATUS: RIG: FONSEE No:

DATE Commenced Completed 6.6.62 TOTAL DEPTH: 3062

ELEVATION (GL) 19.8 LOCATION AMG sheet

PARISH No N 38 24 20 E 144 11 52

ODE. SA Oil well.

ENGINEERING DATA (casing, plugs, completion details)

17" casing to 118
12 1/2 to 699
8 1/4 to 3062.

GEOPHYSICAL LOGS Logged by SCHLUMBERGER.

Microlog 3 runs to 1923
Dip meter
Electric

BHT
66.6 at 1923
75.5 at 2403
115°C at 3062

Core 1 at 5 12 – 3068

CORES:	Conventional				Side Wall Cores			
	From (m)		Thick	Recov	%	Depth (m)	Recov	Depth	Recov.
1									
2	240	246							
3	332	338							
4	370	376							
5	459	465							
6	542	548							
7	588	594							
8	678	681							

DRppm.

GROUNDWATER DATA: (T.D.S., screened intervals, S.L., Drawdown, Yield)

STRATIGRAPHY: Formation		Depth(m)	FROM	TO	Comments
	Newer Basalt	CXNV			
	Whalers Bluff Fm	CQWB			
	Moorabool Viaduct Sds.	CXMO			
Heytesbury Group (CMH)	PortCambell Lst Fm	CMPC			
	Gellibrand Marl	CMGM			
	Clifton Fm.	COCL			
Nirranda Group (CON)	~~Narrawaturk Marl~~ Demons Bluff	CONM	0		
	Mepunga Fm	CEME			
Wangerrrip Group (CPW)	~~Dilwyn~~ Fm (Easter View)	~~CPDI~~	118·8		
	Older Volcanics	CEEV			
	Pember Mudstone	CPPM			
	Pebble Point Fm.	CPPP			
Sherbrook Group (MCS)	Paaratte Fm	MCPA			
	Timboon Sd (Skull Ck)	MCTS			
	Nullawaare Fm	MCNG			
	Belfast Mudstone	MCBM			
	Flaxmans Fm	MCFL			
	Waarre Snds Fm	MCWA			
Otway Group (MCOZ)	Eumeralla Fm	MCEU	585	3065	
	Pretty Hill Sds (Greenwood Beach) MCGB	MCPH			
	Palaeozoic Mudstones	PSMV			

OTHER DATA: (Velocity survey seismic line, gas/oil show, tests)

DATA SOURCE, REFERENCES, COMMENTS

Douglas UR 63/18

Dellenbach BMR Rec 1965/66

Deltmann 1965. for Prom Koka Ltd Pl

LOCN LAT: 38 24' 26"S
LONG: 144 11' 53"E
EL. ABV GL: 65' DATUM: 78'
BASIN: Otway TOTAL DEPTH: 10065'
SPUD DATE: 23/ 5/62 COMPLN DATE: 9/11/62
TARGET: Stratigraphic test
DATA SOURCE: Well Completion Report

WELL NAME: Anglesea 1 Angahook 8308
STATUS: P & A
OPERATOR: Oil Development N.L.
PARTNERS: Planet
LEASE: Vic PPL 256
DRILLER: R & B RIG: National 50

FORMATION DATA: [Stach 1963]

			Top RKB	Subsea	Thickness
Oligocene	Demons Bluff Fm	Anglesea Mbr	Surface	+ 65'	377'
Palaeocene	Knight Gp	Eastern View Coal Measures	390'	- 312'	1542'
Early Cretaceous	Otway Gp		1932'	- 1854'	8133' +
	Total Depth		10065'	- 9987'	

SEISMIC HORIZONS:

ENGINEERING DATA: HOLE AND CASING DATA: 23" hole to 30', 18 7/8" Range 2 casing to 30', cemented to surface with 50 sacks, 17" hole to 389', 48# H40 Range 2 casing to 389', cemented to surface with 350 sacks. 12 1/4" hole to 2296', 9 5/8" 36# J 55 Range 2 casing to 2295', cemented to 1290' with 350 sacks. 8 3/4" hole to 10045' and 6 1/4" hole to 10065' TD.

ENGINEERING DATA: DRILL STEM TESTS:

1	2220' -	2296'	Misrun
2	7683' -	7738'	Misrun
3	7688' -	7738'	Misrun
4	7672' -	7738'	Misrun

ENGINEERING DATA: Plugs: # 1 [Temporary anchor for DST attempt] 7740' - 7840' with 44 sacks, # 2 7450' - 7550' with 50 sacks, # 3 4800' - 4900' with 50 sacks, # 4 2250' - 2350' with 50 sacks, and # 4 a 5 sack surface plug.

WIRELINE LOG DATA: [Schlumberger]

E-Log	390' - 10028'	ML-Cal	390' - 10028'
CDM	4800' - 7886'		

DIGITAL LOGS: [Wiltshire 1985]

SP	390.0' - 10050.0'	SN	392.0' - 10039.0'

MUD PROPERTIES:
at 2290': Type: FW Gel/Lignos SG: 1.24 Vis: 44 pH: 8 WL: 6.1
Rm: 6.05 @ 68 deg F Rmf: 6.00 @ 78 deg F Rmc: @ deg F
at 4234': Type: FW Gel/Lignos SG: 1.24 Vis: 53 pH: 8 WL: 8.5
Rm: 4.10 @ 102 deg F Rmf: 4.60 @ 70 deg F Rmc: 5.0 @ 70 deg F
at 6314': Type: FW Gel/Lignos SG: 1.29 Vis: 52 pH: 9 WL: 7.6
Rm: 5.0 @ 58 deg F Rmf: 4.24 @ 65 deg F Rmc:
at:7894': Type: FW Gel/Lignos SG: 1.32 Vis: 60 pH: 9 WL: 6.4
Rm: 3.30 @ 60 deg F Rmf: 2.70 @ 60 deg F Rmc:
at 8955': Type: FW Gel/Lignos SG: 1.28 Vis: 98 pH: 10 WL: 7.6
Rm: 1.00 @ 95 deg F Rmf: 1.10 @ 76 deg F Rmc: 2.30 @ 76 deg F
at 10065' Type: FW Gel/Lignos SG: 1.27 Vis: 190 pH: 10 WL: 7.6
Rm: 1.50 @ 75 deg F Rmf: 1.40 @ 75 deg F Rmc: 2.60 @ 75 deg F

SIDEWALL CORE POINTS:
3771' 3771' 3772' 3772' 3773' 3774' 5196'
5198' 5199' 5201' 5203' 5204' 5205' 5206' 5207'
5208' 5209' 5210' 5211' 5212'

CONVENTIONAL CORE DATA:

# 1	490′ - 510′	Rec 8.0′		# 2	789′ - 809′	Rec 4.3′	
# 3	1090′ - 1110′	5.0′		# 4	1214′ - 1234′	4.0′	
# 5	1506′ - 1526′	10.0′		# 6	1778′ - 1798′	11.0′	
# 7	1931′ - 1951′	19.0′		# 8	2225′ - 2245′	20.0′	
# 9	2286′ - 2296′	9.0′		# 10	2557′ - 2567′	10.0′	
# 11	2860′ - 2870′	10.0′		# 12	3158′ - 3168′	5.0′	
# 13	3460′ - 3470′	7.0′		# 14	3724′ - 3734′	2.0′	
# 15	3734′ - 3744′	nil		# 16	4011′ - 4021′	10.0′	
# 17	4223′ - 4234′	11.0′		# 18	4517′ - 4527′	10.0′	
# 19	4819′ - 4829′	5.5′		# 20	5161′ - 5171′	9.0′	
# 21	5487′ - 5497′	6.0′		# 22	5766′ - 5776′	7.0′	
# 23	6237′ - 6247′	9.0′		# 24	6723′ - 6727′	3.0′	
# 25	6759′ - 6773′	10.0′		# 26	7255′ - 7265′	8.0′	
# 27	7544′ - 7550′	6.0′		# 28	7857′ - 7867′	9.0′	
# 29	8190′ - 8200′	8.0′		# 30	8690′ - 8707′	17.0′	
# 31	9156′ - 9176′	19.0′		# 32	9641′ - 9656′	2.5′	
# 33	10045′ - 10065′	20.0′					

TEMPERATURES:

at 2287′	: 107 deg F on log run # 1
4233′	: 140 deg F on log run # 2
6313′	: 152 deg F on log run # 3
7894′	: 168 deg F on log run # 4
8954′	: 186 deg F on log run # 5
10028′	: 240 deg F on log run # 6

PALYNOLOGY: [Douglas/Taylor]

789′ - 809′	[Core 2]	- Tertiarty
1931′ - 1951′	[Core 7]	- Upper Eocene

HYDROCARBON SHOWS: [Leo Stach]

Core 5 [1509′] - strong golden colour in solvent [lignite ?]
Core 8 [2225′ - 2245′] - fluorescence [? residual oil]
Core 13 [3460′ - 3470′] - strong fluorescence
Mudlog gas present 3600′ to TD
Crude oil in cuttings at 4200′ - 4210′ [?] - fluorescence traces to 4300′

SOURCE POTENTIAL: No data

RESERVOIR DATA: [BMR Pet Tech Lab]

1509′ - 1510′ : Por 26%		1784′	Por 15%
1947′ : 11%		2231′	8%
2298′ - 2299′ : 12%		2561′ - 2562′	7%
2867′ - 2868′ : 4%		3162′ - 3734′	4% to 5%
4227′ - 4523.5′ : 5% to 8%		4821′ - 6764′	3% to 5%

Permeabilities were not measured.

REMARKS:

Located in the Torquay Embayment of the Port Phillip Basin, objective was to penetrate the Upper to Middle Cretaceous sediments, and to determine reservoir quality in the Otway Group and at its base.

The Tertiary sequence is thin and immature; reservoir quality in the Otway Group is very poor. Despite reported oil shows, no hydrocarbons were recovered, and the shows are regarded as being questionable.

APPENDIX 3:

S.A. O.W. Anglesea
No 1, 2.

No. 8 Bore, Moutajup, Allotment 3B of Section C, Jennawarra Parish. Owner, O. B. Mibus.

Packed up some plant @ ready for removal to Anglesea, Victoria. 25/1/22

Covering work done to 14th June, 1922:

No. 8 bore -

Log:
0' - 16' .. clay, alluvial
16' - 22' .. Clay and decomposed basalt.
22' - 201' .. Basalt, very hard in parts
201' - 223' .. Clay, sandy, yellow.
223' - 231' .. Sand and gravel
231' - 262' .. Sandstone, calcareous concretions, tertiary shells.
262' - 270' .. Conglomerate sand and gravel
270' - 272' .. Clay, yellowish
272' - 277' .. Clay, changing to shale or slate, yellow with blue inclusions, probably Ordovician in age.

Remarks: Water at 12', 38', 60', and on through the basalt. Oil films at 248'. Pulled all casing. Left in 25' of 6⅜" casing high at top for a water well.

SOUTH AUSTRALIAN OIL WELLS

7

Anglesea Bore:

Bore No. 1, Section 13, Parish Angahook, County Polwarth, near Anglesea River.

Log:
0' - 39' .. Clay, yellow
39' - 186' .. Mudstone, black, carbonaceous, pyritic
186' - 274' .. Clay, sandy
274' - 282' .. Brown coal
282' - 294' .. Sand with fragments of charcoal
294' - 301' .. Clay, brown with lignite
301' - 312' .. Brown coal
312' - 317' .. Clay
317' - 319' .. Sand, grey, medium
319' - 324' .. Clay, brown

324' - 354' .. Sand, fine with a little clay

354' - 355' .. Gravel

355' - 390' .. Clay, brown

390' - 393' .. Sand, fine

393' - 399' .. Clay, brown

399' - 412' .. Sandy clay with lignite fragments

412' - 413' .. Gravel, coarse

413' - 416' .. Clay, very sandy

416' - 417' .. Sand with fossil resin and lignite

417' - 418' .. Sandstone ?, black and hard

418' - 429' .. Brown coal

429' - 446' .. Clay, pale brown, sandy

446' - 455' .. Clay, white with seams of lignite

455' - 462' .. Sand, coarse, silica, rounded

Report to 31st July, 1922:

At Moutajup cleared up the camp and moved casing, tools, etc., to Anglesea. Abandoned this district.

At Anglesea, Bore No. 1 cemented off for the third time and now allowing cement to set.

No. 2 Bore, located 46 chains west of No. 1, and 250' higher. Started 24/7/22.

Log: 0' - 18' .. Clay, yellow

18' - 19' .. Conglomerate, hard, red

19' - 40' .. Clay, sandy, yellow

40' - 105' .. Clay, sandy, brown

105' - 158' .. Mudstone, black carbonaceous with frequent shows of gas.

Remark: 8" Casing to 120'.

Bore No. 1 bore - tested for water. Shut off but found that the cement had not acted. Oil showed again when bailing. Temporarily abandoned this bore and removed casing.

No. 2 Log, Continued:

158' - 300' .. Black mudstone

300' - 366' .. Clay, sandy, lighter colour

366' - 439' .. Clay, brown. Beds of fossil shells.

439' - 446' .. Clay, more sandy, brown

446' - 472'. Clay, dark brown, sticky; more fossils.

Remark: Water at 215 feet, very little, contains Fe, Mg, Al, Na @@@ as chlorides and sulphates.

On the 31st October, 1922, Company obtained a heavy @@@ plant of the Star type from the Goldfields Diamond Drilling Company, capable of going to 3,000 feet, an oregon derrick 42' high has been erected over No. 2 bore Anglesea and the plant installed. Cleaning out operations are now in progress, much clay having entered the hole $6\frac{3}{8}$" casing has been lowered to the bottom and will be continued to below the deep water sand, where it will be cemented.

Nov. 30th. Cleaned out hole to bottom & drilled to 553 ft in brown clay. oil films (crude) showed well from 540 ft onwards.

Report to 31/12/22:

No 2 Anglesea ran up above to 472

Log - 553' - 560' .. Clay, brown, sticky

560' - 568' .. Sand and clay

568' - 580' .. Clay, dark brown, oily films

580' - 582' .. Coal, brown, impure

582' - 604' .. Clay, brown with oily films

604' - 612' .. Clay, brown @@@@ more sandy, lighter color

612' - 636' .. Sand, fine packed hard, very little water

NOTE: No. 2 bore was deepened to 636'. Two trials to cut off water and sand were made. In each case another sand was discovered on going deeper, and the casing had to be loosened and lowered. $6\frac{3}{8}$" casing inserted to 584' shutting off top water. see p134

Lane Lease, Section 10, Angahook Parish.

Two hand bores were sunk on this lease during the month of December, 1922, the results being used in the construction of a structure contour map. Further work is in progress. These bores are only shallow ones, the deepest being 106 feet, and were being sunk to the black mudstone to determine the contour of the surface.

Month ending November ~~3rd~~ 30th, 1922:

No. 2 Bore, Noble Lease, Anglesea, Victoria - Cleaned out the hole to bottom. Have drilled to 553 feet, brown clay, fossiliferous.

Remark: Trouble arose with casing, so a pump was installed and @@@@ mud forced around the casing to prevent the walls from caving. Oil films (crude) showed well from 540 feet onwards. Gas bubbled through water in hole at times. Very little water making.

31st January, 1923:

No. 2 Bore, Noble Lease - see p133.

Log, Contd.

636' - 641' .. Sand, fine, grey, hard, absorbs water

641' - 648' .. Clay, hard, brown

648' - 722' .. Clay, brown, sandy with pyritic lumps. Dark oil films

722' - 726' .. Clay, dark, fissile clay

726' - 730' .. Sand, coarse, with @@@@ streaks

730' - 736' .. Clay, dark grey with sand streaks and lignite lumps

736' - 741' .. Clay or brown coal, probably the latter

741' - 742' .. Clay, whitish and @@@@@ talcose with seams of lignite.

Remarks: We put in 5" casing and worked it to 320 feet, when it "froze". In trying to loosen same by means of hydraulic jacks, we tore it apart at 300 feet. We then fished out the broken piece with a tap and screwed it together again. After pumping in water under heavy pressure, we broke through obstruction behind the casing and freed the latter. We have now withdrawn 5" pipe and intend to try to loosen the $6\frac{3}{8}$" and carry it down to 740' into the clay in order to shut off the upper waters.

NOTE: Five hand bores on adjoining leases were sunk to determine the structure of the black clay or mudstone underlying the surface deposits. No more will be sunk at present. All are shallow. No further particulars were given.

28th January, 1923: During month loosened $6\frac{3}{8}$" casing after a lot of trouble. The hole was then reamed out and the casing carried down to 638', where it became fast. In spite of the fact that we could get a good return @@@ of the circulating water, we could not loosen

jacks

the pipe even with hydraulic ~~taps~~. We then put in clay, mixed it to a mud, and forced the same behind the casing with a pump until the casing 'stalled.' More mud was drilled into the formations below the $6\frac{3}{8}$" casing and 5" pipe was put in. This was carried to 720', using thick mud to keep the walls of the hole up. The hole was cleaned out to 724', the previous bottom. Drilling is proceeding using the circulating system when necessary.

Report for week ending 31st May, 1923:

During May no work was done at Anglesea, but the crew returned there on the 31st and recommended. The idea is to loosen the $6\frac{3}{8}$" casing frozen at 638 feet, carry it to the sandstone at 753', and shut off the water; Then put back the 5" casing @@@@ in order to go deeper." Testing out some sand which showed oil on boring operations.

(see p151)

S.A.O.W. Anglesea

To follow Anglesea Bore: (N°32) (p135)

Casing 8", 46', shut off top water, salty.

Casing 6", 276', shut off water.

Casing 5", 408@', cemented off water. Water sands 24', salt.

At 186' and onwards, salt.

282', 319', 354', 390', each with better supplies.

462' almost fresh water rising to near the surface.

@@@@@@@@@

O I K: Films show at 312'. 324', 365', 390', 399' but the best showing is from 400' to 417'. The 416' sand is probably oil bearing if it can be isolated from the water. It is important.

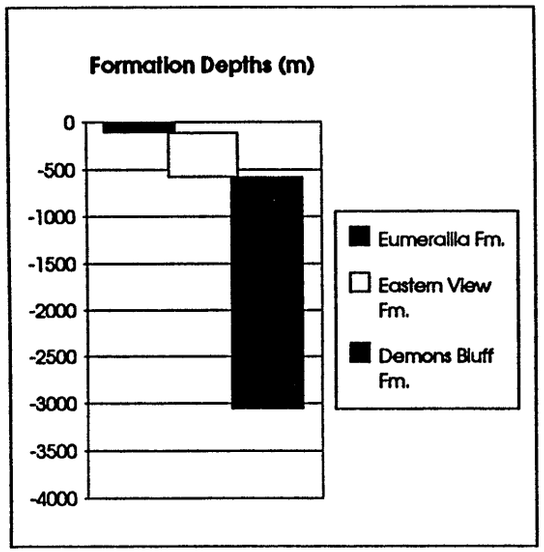
G A S: No concentration. Plentiful bubbles in water from 74' to 354'. Never enough to sample. This bore has twice been cemented. Work will begin again on 2nd June. 1923

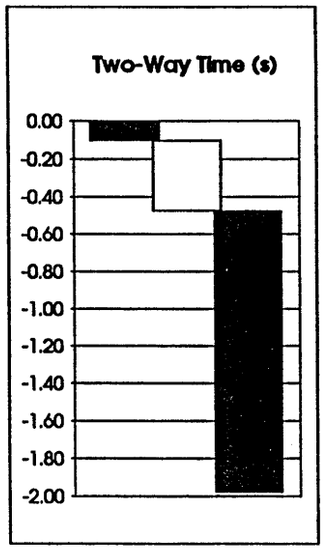
APPENDIX 4:

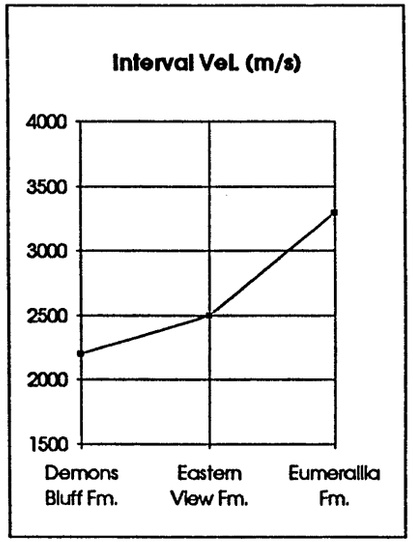
OTWAY BASIN **ANGLESEA NO.1**

Strat. log by - S. Tickell et al.(GSV) 1991
Lat: -38.407222 Long: 144.19806
KB Elev. (m ASL) 23.4 Grd. Elev. 19.8

Age	Unit	Remarks	Depth (m)	Thickness	Int. Vel. (m/s)	T-time (s)	2*T-time (s)	TWT Fm. top (s)
Eocen-Oligocene	Demons Bluff Fm.	Nirranda Gp.	-4	-114	2200	-0.05	-0.10	0.00
	Eastern View Fm.		-118	-466	2500	-0.19	-0.37	-0.10
E. Cret.	Eumeralla Fm.	Otway Gp.	-584	-2480	3300	-0.75	-1.50	-0.48
	TD		-3064					-1.98







APPENDIX 5:

TABLE 2

Summary of Extraction and Liquid Chromatography

Wellname: ANGLESEA 1

Date of Job: FEBRUARY 1987

A. Concentrations of Extracted Material

				-------Hydrocarbons--------			-----Nonhydrocarbons-----		
Depth(ft)	Weight of Rock Extd. (grams)	Total Extract (ppm)	Loss on Column (ppm)	Saturates (ppm)	Aromatics (ppm)	HC Total (ppm)	NSO's (ppm)	Asphaltenes (ppm)	NonHC Total (ppm)
497.0 Core 1	8.9	11674.2	4568.5	679.2	1724.2	2403.4	4702.2	nd	4702.2
2565.0 Core 10	30.3	343.2	75.9	145.2	19.8	165.0	102.3	nd	102.3
6239.0 Core 23	73.1	243.5	43.8	53.4	52.0	105.3	94.4	nd	94.4

TABLE 2

Summary of Extraction and Liquid Chromatography

Wellname: ANGLESEA 1

Date of Job: FEBRUARY 1987

B. Compositional Data

	-----Hydrocarbons------			-----Nonhydrocarbons------			EOM(mg)	SAT(mg)	SAT	ASPH	HC
Depth(ft)	%SAT.	%AROM.	%HC's	%NSO's	%ASPH.	%Non HC's	TOC(g)	TOC(g)	AROM	NSO	Non HC
497.0 Core 1	9.6	24.3	33.8	66.2	nd	66.2	24.5	1.4	.39	nd	.5
2565.0 Core 10	54.3	7.4	61.7	38.3	nd	38.3	41.4	17.5	7.33	nd	1.6
6239.0 Core 23	26.7	26.0	52.7	47.3	nd	47.3	28.3	6.2	1.03	nd	1.1

na = not applicable nd = no data

TABLE 3

Summary of Gas Chromatography Data

Wellname: ANGLESEA 1

Date of Job:FEBRUARY 1987

A. Alkane Compositional Data

Depth(ft)	Prist./Phyt.	Prist./n-C17	Phyt./n-C18	CPI(1)	CPI(2)	(C21+C22)/(C28+C29)
497.0 Core 1	.86	.50	.68	3.17	3.99	.29
2565.0 Core 10	.99	.46	.58	1.46	1.74	4.88
6239.0 Core 23	.90	.63	.85	nd	nd	nd

TABLE 3

Summary of Gas Chromatography Data

Wellname: ANGLESEA 1

Date of Job:FEBRUARY 1987

B. n-Alkane Distributions

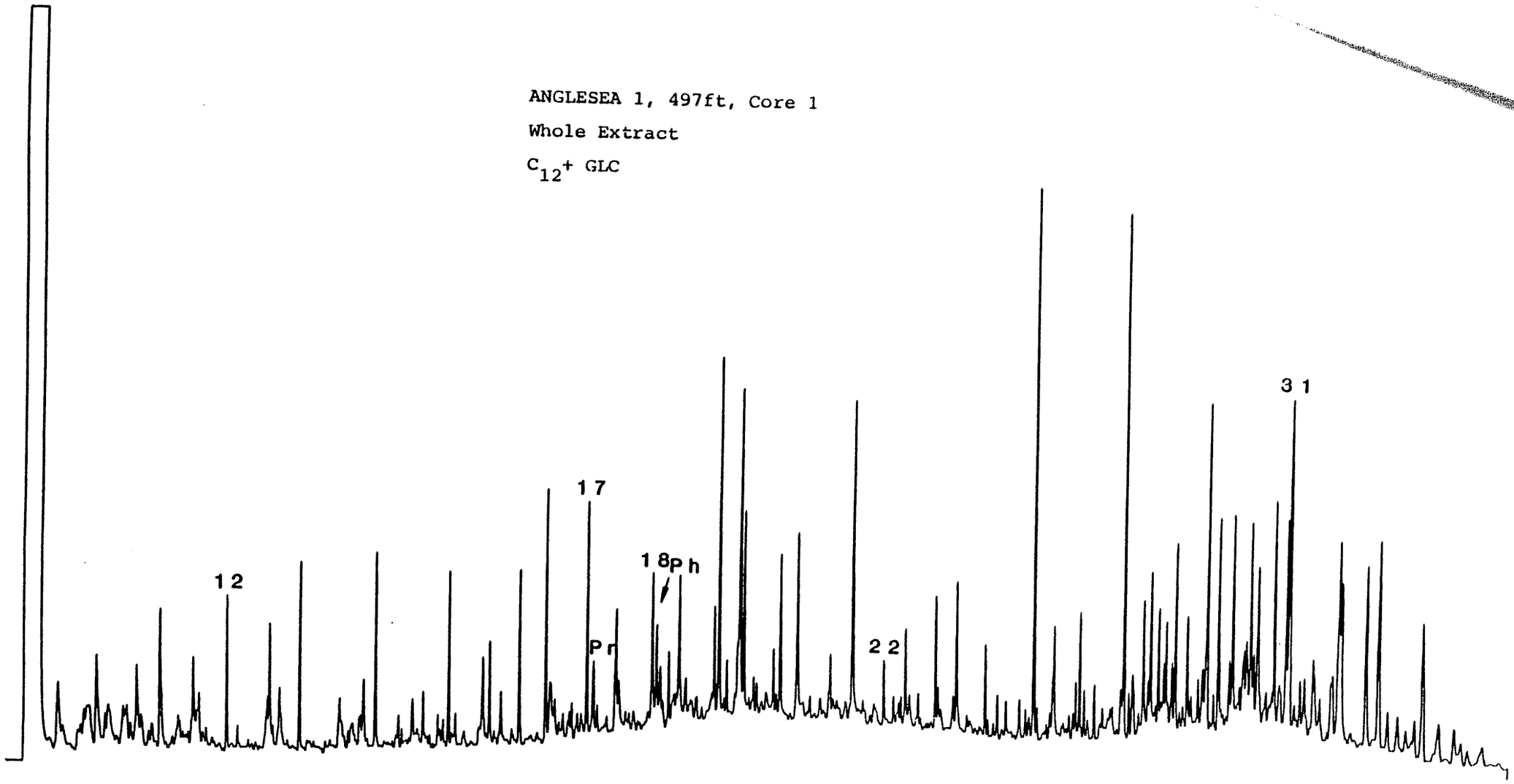
Depth(ft)	nC12	nC13	nC14	nC15	nC16	nC17	iC19	nC18	iC20	nC19	nC20	nC21	nC22	nC23	nC24	nC25	nC26	nC27	nC28	nC29	nC30	nC31
497.0 Core 1	3.5	4.3	4.4	3.6	3.9	5.1	2.6	4.4	3.0	2.8	1.6	1.5	1.7	3.0	2.1	12.3	3.3	12.4	2.3	8.7	4.7	8.8
2565.0 Core 10	5.3	6.8	9.3	6.5	8.5	12.3	5.6	9.8	5.6	6.5	4.1	2.7	4.6	1.9	1.4	2.9	1.1	1.3	.6	.9	1.3	1.2
6239.0 Core 23	7.7	8.2	15.9	7.4	8.5	9.2	5.8	7.6	6.5	8.4	3.7	2.4	5.2	3.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

na = not applicable nd = no data

ANGLESEA 1, 497ft, Core 1

Whole Extract

C_{12}^{+} GLC



APPENDIX 6:

PALYNOLOGICAL ANALYSIS OF SAMPLES FROM ANGLESEA-1, TORQUAY SUB-BASIN

by

M.K. MACPHAIL

Palaeontological report prepared 30 August 1989 for
The Shell Company of Australia Ltd.

Consultant Palynologist, 20 Abbey St., Gladesville, NSW 2111

PREAMBLE

Spore-pollen and dinoflagellates are amongst the most valuable tools available to the petroleum explorationist for dating and correlating rock units and interpreting the environment of deposition. However a number of important limitations exist. These are chiefly related to sample quality and differences in the time ranges of some species between sedimentary basins:

(A) DATING

Palynological zones are usually defined by overlaps in the vertical [= time] range of several to many spore-pollen or dinoflagellate species. Zone boundaries are mostly defined by first appearances, less often by extinctions. A few rare species are confined to one zone only.

It is important to remember that the times of first appearance and extinction of a species may differ over the geographical range of that species and zonation criteria developed for one basin may not be reliable in adjoining basins.

Nevertheless the zonation scheme developed by Esso Australia Ltd. for the Gippsland Basin has been found to provide reliable dates for conventional cores and, unless gross mud cake contamination has occurred, for sidewall cores in the adjoining basins along the southern margin of Australia. Age-determinations based on cuttings are usually unreliable because of difficulties in distinguishing between in situ, caved and [less frequent] recycled species. The reliability can only be improved by analysing a suite of closely spaced cuttings. Other criteria that are useful include relative abundance, differences in preservation and kerogen type [palynofacies] .

(B) PALAEOENVIRONMENT

The abundance and diversity of dinoflagellates provide a reliable indication of open and restricted marine environments, e.g. shoreface, tidal flat and lagoonal conditions. Several types of algal cysts are good evidence for freshwater lacustrine environments. The absence of dinoflagellates is assumed to indicate the absence of a marine influence

The great majority of spores and pollen recovered in both on- and offshore wells have been transported by wind and/or water from dryland plants, some growing at considerable distance. A variety of plant communities will be represented but because of uncertainties in the ecology of mostly extinct species,

spore-pollen can only provide a general indication of the palaeoenvironment, e.g. coastal plain, and climate, e.g. warm humid, if coastal tropical rainforest species are present. The most common terrestrial sediments preserving spore-pollen are fluvial and lacustrine silts and clays.

Some indication of relative abundance is necessary. As with dating, cuttings do not provide a reliable indication of palaeoenvironment.

INTRODUCTION

Sixteen conventional core samples, representing the interval 490-10,065ft. in Anglesea-1, were processed and analysed for spore-pollen and dinoflagellates.

Although yields and preservation were mostly good, many age-determinations are of low confidence due to the simultaneous occurrence of species which seldom overlap in time range or [Early Cretaceous units] carbonization and fragmentation of the spore-pollen. Uncertainties and alternative age-determinations are discussed in the Biostratigraphy Section.

Lithological units and palynological determinations are summarized below. Interpretative and basic data are given in Tables 1 and 2 respectively. Check lists of all species recorded are attached. Lithological and electric log data were not available.

SUMMARY

AGE	UNIT	ZONE	DEPTH RANGE (ft.)	ENVIRONMENT
Middle/Late Eocene	DEMONS BLUFF FORMATION?	Lower/Middle N. asperus	490 - 510	Coastal plain
		unconformity?		
Early Eocene	EASTERN VIEW FORMATION	P. asperopolus	789 - 809	Coastal plain
Paleocene	"	Upper L. balmei/ A. homomorpha	1090 - 1234	"
"	"	Lower L. balmei	1506 - 1526	"
Campanian	SHERBROOK GP EQUIVALENT	T. lilliei	1778 - 1798	Intra rift valley
		unconformity		
Lower Albian	OTWAY GROUP	C. striatus	1931 - 6347	Intra rift valley
		unconformity?		
latest Jurassic - Early Cretaceous	"	no older than C. australiensis	7544 - 10,065	"

TD 3068m

Mid-Eumeralla Heathfield.

GEOLOGICAL COMMENTS

1. Because of the absence of zone index species, it is not certain whether Core 1 [490-510ft.] was cut in Demons Bluff or Eastern View Formation. Core 2 [789-809ft.], 3 [1090-1110ft.] and 4 [1214-1234ft.] represent marine-influenced units within the Eastern View Formation.

2. The latter interval [1090-1234ft.] is correlated with the Apectodinium homomorpha marine transgression recorded in the Gippsland Basin. Despite the occurrence of Apectodinium hyperacantha at 789-809ft., it is unlikely that this sample is a correlative of the A. hyperacantha Zone transgression (cf. Partridge, 1976).

3. Conversely, the palynological data are definite that Anglesea-1 intersected a Late Cretaceous [Campanian] non-marine unit within the Eastern View Formation at 1778-1798ft. The occurrence of this unit, Sherbrook Group Equivalent, is of some interest given the reported absence of Late Cretaceous sediments in the adjacent Port Phillip Basin and Aire Embayment.

4. Because of poor preservation, it is unclear from the palynological data whether Anglesea-1 reached sediments of Neocomian age below 6247ft. but it is certain that the well bottomed [TD 3068m] in sediments no older than latest Jurassic, C. australiensis Zone.

5. TAI values within the Early Cretaceous interval increase from 3 at 1931-51ft. to 4 at 10,045-65ft.

PALAEOENVIRONMENTS

Consistent with its shoreline location, the Anglesea-1 wellsite site was not affected by encroachment of the Southern Ocean until the Paleocene. Based on the relative abundance of spore-pollen and dinoflagellates, the marine-influence was slight during the Eocene, with the wellsite becoming wholly terrestrial again by the Middle/Late Eocene. Cretaceous sediments appear to have accumulated under fluvial and [1778-98ft., 4011-4021ft.] lacustrine depositional conditions within a rift valley setting.

BIOSTRATIGRAPHY

Zone and age-determinations have been made using criteria proposed by Stover & Partridge (1973), Partridge (1976) and Helby et al. (1987), augmented where necessary by time-range data presented in Dettman (1963), Burger (1980), Morgan (1980) and Backhouse (1988) and unpublished observations made on Bass Strait wells drilled by Esso Australia Ltd. The informal subdivision of the T. longus Zone proposed by Macphail (1983: see Helby et al., ibid p.58) is followed here. Zone names have not been altered irrespective of nomenclatural changes to nominate species such as Tricolpites longus [now Forcipites longus: see Dettman & Jarzen, 1988].

In spite of carbonization and fragmentation of the Early Cretaceous palynomorphs, sufficient sculptural detail was preserved to allow reliable identification of the more robust types such as Cicatricosisporites australiensis. Nevertheless it is probable that the more delicate types, including the zone index species Crybelosporites striatus, have not always been preserved and only maximum ages can be given for samples below 7544ft., i.e. Cores 27-33. Recycled Paleozoic and Early Mesozoic spores are present in many samples.

7544-10,065ft. — No older than Cicatricosisporites australiensis Zone
latest Jurassic-Early Cretaceous

The five core samples in this interval yielded low to negligible numbers of carbonized spore-pollen [TAI 4- to 4] of which only Cicatricosisporites australiensis is useful biostratigraphically. Preservation is too poor to be certain that species which first appear in the F. wonthaggiensis to C. striatus Zones are absent. For example possible specimens of Foraminisporis asymmetricus occurs at 7544-50ft. and 10,045-65ft. [Cores 27, 33].

Crybelosporites striatus Zone 1931-6347ft. — Lower Albian

The base of this zone is placed provisionally at Core 23 [6327-47ft.], a sample yielding a carbonized [TAI 3+] palynoflora which includes probable fragments of the nominate species in addition to abundant Cicatricosisporites australiensis and zonate and psilate trilete fern spores.

The first unequivocal occurrence of Crybelosporites striatus is at 5161-71ft. [Core 20] and this species and Cicatricosisporites australiensis are abundant at 4011-21ft. [Core 16].

The excellent preservation [TAI 3] and yield suggest that the depositional environment was lacustrine.

The upper boundary of the zone is placed at 1931-51ft. [Core 7], a sample yielding Crybelosporites striatus and abundant Cicatricosisporites australiensis and other trilete Early Cretaceous spores but apparently not Coptospora paradoxa.

Tricolporites lilliei Zone 1778-1798ft. Campanian

One sample is assigned to this zone, based on multiple occurrences of the nominate species and other Late Cretaceous types that first appear in this zone, e.g. Triporopollenites sectilis, Tricolpites waiparensis, Tetradopollis securus, Proteacidites amolosexinus and P. otwayensis. Gambierina rudata and Late Cretaceous Nothofagidites spp. are abundant. Forcipites sabulosus indicates that the sample is no younger than Lower T. longus Zone.

Perfect preservation and the persistent presence of Rouseisporites reticulatus and Balmeisporites holodictyus indicate a lacustrine depositional environment.

Lower Lygistepollenites balmei Zone 1506-1526ft. Paleocene

The core sample at 1506-26ft. yielded a a palynoflora wholly dominated by small, undescribed species of Proteacidites and Tricolporites, an association typical of the Lower L. balmei Zone. Support for this age-determination is given by multiple occurrences of Amosopollis cruciformis, Tetracolporites verrucosus and the absence of Proteacidites spp. which first appear in the Upper L. balmei zone. The only indicator of a younger date is P. reticuloscabratus [well-preserved unlike the majority of palynomorphs and therefore a possible contaminant]. Tetracolporites multistrixus and Gambierina rudata indicate the sample is no older than Lower L. balmei Zone or younger than Upper L. balmei Zone respectively.

Upper Lygistepollenites balmei/Apectodinium homomorpha Zone 1090-1234ft. Paleocene

Two core samples are assigned to this zone. Both contain marine dinoflagellates [Apectodinium homomorpha, Glaphyracysta retiintexta, Spinidinium spp.] in addition to Lygistepollenites balmei, Gambierina rudata and pollen species which first appear in the Upper L. balmei Zone, e.g. Cyathidites gigantis, Proteacidites annularis and P. grandis.

Specimens of Tricolpites thomasii and Proteacidites

reticulatus indicate the palynoflora at 1214-34ft. is contaminated although it is noted that other typically Eocene species such as Anacolosidites acutullus, Cupanieidites orthoteichus and Malvacipollis spp. present in the core samples occur in assemblages of equivalent age in the Gippsland Basin.

Proteacidites asperopolus Zone 789-809ft. Early Eocene

Age-determinations for samples assigned to this and the Lower N. asperus Zone are of very low confidence due to the absence of zone index species and simultaneous occurrence of accessory species which normally do not overlap in range.

The core sample at 789-809ft. is provisionally dated as P. asperopolus Zone, based on occurrences of Apectodinium hyperacantha and Proteacidites tuberculotumulatus ms [species which range no higher than this zone] and Conbaculites apiculatus ms which first appears in this zone in the Gippsland and Bass Basins. An alternative but less likely age-determination is Lower M. diversus/A. hyperacantha Zone based on the association of Proteacidites pachypolus and Apectodinium hyperacantha. Irrespective of uncertainties in the zonal determination, the sample is Early Eocene.

Lower/Middle Nothofagidites asperus Zone 490-510ft. Middle -Late Eocene

This Nothofagidites-Proteacidites dominated palynoflora contains species which in the Gippsland and Bass Basins range no higher than the P. asperopolus Zone [Proteacidites ornatus] or Lower N. asperus Zone [P. asperopolus] associated with one species not previously recorded below the Middle N. asperus Zone. The unusual composition of this wholly terrestrial palynoflora is further highlighted by the presence of an undescribed parasyncolporate species smaller than but otherwise identical with the ms species Jaxtacolpus pieratus which is confined to Maastrichtian and Paleocene sediments in the Bass Basin.

On the data available the palynoflora is no older than P. asperopolus Zone or younger than Middle N. asperus Zone.

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BACKHOUSE, J. (1988). Late Jurassic and Early Cretaceous palynology of the Perth Basin, Western Australia.

TABLE 1: SUMMARY OF INTERPRETATIVE PALYNOLOGICAL DATA

ANGLESEA-1

SAMPLE NO.	DEPTH (m)	SPORE-POLLEN ZONE	DINOFLAGELLATE ZONE	AGE	CONFIDENCE RATING	COMMENTS
Core 1	490-510ft.	Lower/Middle N. asperus	-	Middle-Late Eocene	-	P. asperopolus, P. reticulatus, P. ornatus, P. recavus, P. rugulatus
Core 2	789-809ft.	P. asperopolus	-	Early Eocene	2	C. apiculatus, A. hyperacantha
Core 3	1090-1110ft.	Upper L. balmei	A. homomorpha	Paleocene	1	L. balmei. G. rudata, C. gigantis, P. annularis, C. orthoteichus
Core 4	1214-1234ft.	Upper L. balmei	A. homomorpha	Paleocene	1	As above
Core 5	1506-1526ft.	Lower L. balmei	-	Paleocene	2	G. rudata, abund. Proteacidites, Tricolporites spp.
Core 6	1778-1798ft.	T. lilliei	-	Campanian	1	T. lilliei, T. sectilis, abund. Nothofagidites & Gambierina spp.
Core 7	1931-1951ft.	C. striatus	-	Lower Albian	1	C. striatus, abund. C. australiensis
Core 12	3158-3168ft.	C. striatus	-	Lower Albian	1	As above
Core 16	4011-4021ft.	C. striatus	-	Lower Albian	0	Abund. C. striatus
Core 20	5161-5171ft.	C. striatus	-	Lower Albian	1	C. striatus
Core 23	6237-6247ft.	C. striatus	-	Lower Albian	2	C. australiensis common; possible carbonized spms. of C. striatus
Core 27	7544-7550ft.	No older than C. australiensis Zone		latest Jurassic-Early Cretaceous		C. australiensis
Core 30	8690-8707ft.	No older than C. australiensis Zone		latest Jurassic-Early Cretaceous		C. austrlaiensis fragment
Core 31	9156-9176ft.	Indeterminate		-		K. scaberis
Core 32	9641-9656ft.	Indeterminate		-		Gleicheniidites
Core 33	10,045-10,065ft.	No older than C. australiensis Zone		latest Jurassic-Early Cretaceous		C. australiensis frequent

TABLE : SUMMARY OF BASIC PALYNOLOGIC[illegible]DATA

ANGLESEA-1

DIVERSITY - low - medium high
S & P less than 10 10-30 greater than 30
D 1-3 3-10 10

SAMPLE NO.	DEPTH (m)	YIELD SPORE-POLLEN	YIELD DINOS	DIVERSITY SPORE-POLLEN	DIVERSITY DINOS	PRESERVATION	LITHOLOGY	PYRIZATION	COMMENTS
Core 1	490-510ft.	high	-	high	-	Good	-	-	
Core 2	789-809ft.	low	v. low	high	low	moderate	-	-	
Core 3	1090-1110ft.	high	medium	high	medium	good	-	-	
Core 4	1214-1234ft.	high	low	high	low	good	-	-	minor contam.
Core 5	1506-1526ft.	high	-	high	-	moderate	-	-	
Core 6	1778-1798ft.	hifh	-	high	-	good	-	-	
Core 7	1931-1951ft.	high	-	high	-	good	-	-	TAI 3
Core 12	3158-3168ft.	medium	-	medium	-	poor	-	-	TAI 3
Core 16	4011-4021ft.	high	-	medium	-	good	-	-	TAI 3
Core 20	5161-5171ft.	v. low	-	low	-	poor	-	-	TAI 3?
	1573.1 - 1576.1 m								
Core 23	6237-6247ft.	high	-	high	-	poor	-	-	TAI 3+
	1901 - 1904.1 m								
Core 27	7544-7550ft.	v. low	-	low	-	poor	-	-	TAI 4-?
	2299.4 - 2301.2 m								
Core 30	8690-8707ft.	v. low	-	low	-	poor	-	-	TAI 4-?
	2648.7 - 2653.9 m								
Core 31	9156-9176ft.	low	-	medium	-	poor	-	-	TAI 4-
	2790.1 - 2796.8								
Core 32	9641-9656ft.	low	-	low	-	poor	-	-	TAI 4-
	2938.6 - 2943.1								
Core 33	10,045-10,065ft.	medium	-	medium	-	poor	-	-	TAI 4
Glossary 9030 (3)									
	3061.7 - 3067.8								

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PE905784

This is an enclosure indicator page.
The enclosure PE905784 is enclosed within the container PE905677 at this location in this document.

The enclosure PE905784 has the following characteristics:

ITEM_BARCODE	= PE905784
CONTAINER_BARCODE	= PE905677
NAME	= Fossil Distribution Sheet for Anglesea-1(sheet 6 of 6)
BASIN	= OTWAY BASIN
PERMIT	= PPL/256
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Fossil distribution Data Sheet, sheet 6 of 6, (from Appendix 6 of WCR) for Anglesea-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W345
WELL_NAME	= ANGLESEA-1
CONTRACTOR	=
CLIENT_OP_CO	=

(Inserted by DNRE - Vic Govt Mines Dept)

PE905785

This is an enclosure indicator page.
The enclosure PE905785 is enclosed within the container PE905677 at this location in this document.

The enclosure PE905785 has the following characteristics:

ITEM_BARCODE	= PE905785
CONTAINER_BARCODE	= PE905677
NAME	= Fossil Distribution Sheet for Anglesea-1(sheet 5 of 6)
BASIN	= OTWAY BASIN
PERMIT	= PPL/256
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Fossil distribution Data Sheet, sheet 5 of 6, (from Appendix 6 of WCR) for Anglesea-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W345
WELL_NAME	= ANGLESEA-1
CONTRACTOR	=
CLIENT_OP_CO	=

(Inserted by DNRE - Vic Govt Mines Dept)

PE905786

This is an enclosure indicator page.
The enclosure PE905786 is enclosed within the container PE905677 at this location in this document.

The enclosure PE905786 has the following characteristics:

ITEM_BARCODE	= PE905786
CONTAINER_BARCODE	= PE905677
NAME	= Fossil Distribution Sheet for Anglesea-1(sheet 4 of 6)
BASIN	= OTWAY BASIN
PERMIT	= PPL/256
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Fossil distribution Data Sheet, sheet 4 of 6, (from Appendix 6 of WCR) for Anglesea-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W345
WELL_NAME	= ANGLESEA-1
CONTRACTOR	=
CLIENT_OP_CO	=

(Inserted by DNRE - Vic Govt Mines Dept)

PE905787

This is an enclosure indicator page.
The enclosure PE905787 is enclosed within the container PE905677 at this location in this document.

The enclosure PE905787 has the following characteristics:

ITEM_BARCODE	= PE905787
CONTAINER_BARCODE	= PE905677
NAME	= Fossil Distribution Sheet for Anglesea-1(sheet 3 of 6)
BASIN	= OTWAY BASIN
PERMIT	= PPL/256
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Fossil distribution Data Sheet, sheet 3 of 6, (from Appendix 6 of WCR) for Anglesea-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W345
WELL_NAME	= ANGLESEA-1
CONTRACTOR	=
CLIENT_OP_CO	=

(Inserted by DNRE - Vic Govt Mines Dept)

PE905788

This is an enclosure indicator page.
The enclosure PE905788 is enclosed within the container PE905677 at this location in this document.

The enclosure PE905788 has the following characteristics:

ITEM_BARCODE	= PE905788
CONTAINER_BARCODE	= PE905677
NAME	= Fossil Distribution Sheet for Anglesea-1(sheet 2 of 6)
BASIN	= OTWAY BASIN
PERMIT	= PPL/256
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Fossil distribution Data Sheet, sheet 2 of 6, (from Appendix 6 of WCR) for Anglesea-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W345
WELL_NAME	= ANGLESEA-1
CONTRACTOR	=
CLIENT_OP_CO	=

(Inserted by DNRE - Vic Govt Mines Dept)

PE905789

This is an enclosure indicator page.
The enclosure PE905789 is enclosed within the container PE905677 at this location in this document.

The enclosure PE905789 has the following characteristics:

ITEM_BARCODE	= PE905789
CONTAINER_BARCODE	= PE905677
NAME	= Fossil Distribution Sheet for Anglesea-1(sheet 1 of 6)
BASIN	= OTWAY BASIN
PERMIT	= PPL/256
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Fossil distribution Data Sheet, sheet 1 of 6, (from Appendix 6 of WCR) for Anglesea-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W345
WELL_NAME	= ANGLESEA-1
CONTRACTOR	=
CLIENT_OP_CO	=

(Inserted by DNRE - Vic Govt Mines Dept)

Visitor. For Your Records
REF ID. 11902
BRT
Feb. 87

PALYNOLOGY OF ANGLESEA - 1

TORQUAY EMBAYMENT, BASS BASIN, AUSTRALIA

R/4/87

BY

ROGER MORGAN

for AMOCO AUSTRALIA

January, 1987

PALYNOLOGY OF ANGLESEA - 1

TORQUAY EMBAYMENT, BASS BASIN, AUSTRALIA

BY

ROGER MORGAN

CONTENTS

I SUMMARY

497 ft. (core) - 1216 ft (core) : lower N. asperus Zone : Middle Eocene : marginally marine at the base, non-marine at the top : immature

P. asperopolus to L. balmei Zones not seen but may be partly present in the 300 ft. sample gap.

1515 ft. (core) : T. longus Zone : Maastrichtian : non-marine :immature.

1778 ft. (core) : T. lillei Zone ; Maastrichtian - Campanian : non-marine : immature.

N. senectus to C. paradoxa Zones not seen and probably largely absent on a hiatus in the 160 ft. sample gap.

1939 ft. (core) - 2862 ft. (core) : C. striatus Zone : early Albian : non-marine ; mature for oil, marginally mature for gas½condensate.

4019 ft. (core) ; indeterminate ; too lean of palynomorphs : mature for oil and gas/condensate.

4821 ft. (core) : C. hughesi Zone : Aptian : non-marine : fully mature for oil, mature for gas/condensate.

6239 ft. (core) - 7859 ft. (core) : indeterminate Cretaceous: post-mature for oil, fully mature for gas/condensate.

8701 ft. (core) - 10,060 ft. (core) : indeterminate Jurassic-Cretaceous : post-mature for oil, fully mature for gas/condensate.

II INTRODUCTION

Amoco requested palynology of these 16 core samples as part of a review of the Torquay Embayment. This area is open acreage and currently available for tender, having recently been gazetted. It also adjoins Amoco's extensive Bass Basin exploration leases.

Figure 1 shows the zonation outline. The Cretaceous Zones are most recently reviewed in Helby et al (1987) while those in the Tertiary are basically those of Stover and Partridge (1973) as modified for the Bass Basin by Partridge (1973).The Tertiary dinoflagellate Zones of Partridge (1976) connot be recognised in the Bass Basin.

AGE			SPORE – POLLEN ZONES	DINOFLAGELLATE ZONES
Early Tertiary	Early Oligocene		P. tuberculatus	
	Late Eocene		upper N. asperus	P. cematum
			middle N. asperus	V. extensa Zone
	Middle Eocene		lower N. asperus	D. heterophlycta
			P. asperopolus	W. echinosuturata
	Early Eocene		upper M. diversus	W. edwardsii W. thompsonae W. ornata
			middle M. diversus	W. waipawaensis
			lower M. diversus	W. hyperacantha
	Paleocene		upper L. balmei	A. homomorpha
			lower L. balmei	E. crassitabulata
				T. evittii
Late Cretaceous	Maastrichtian		T. longus	M. druggii
	Campanian		T. lilliei	I.korojonense
			N. senectus	X. australis
	Santonian		T. pachyexinus	N. aceras
	Coniacian		C. triplex	I. cretaceum O. porifera
	Turonian			C. striatoconus
	Cenomanian		A. distocarinatus	P. infusorioides
Early Cretaceous	Albian	Late	P. pannosus	
		Middle	upper C. paradoxa	
			lower C. paradoxa	
		Early	C. striatus	
	Aptian		upper C. hughesi	
			lower C. hughesi	
	Barremian		F. wonthaggiensis	
	Hauterivian			
	Valanginian		upper C. australiensis	
	Berriasian		lower C. australiensis	
Jurassic	Tithonian		R. watherooensis	

FIGURE 1 ZONATION

III PALYNOSTRATIGRAPHY

A. 497 ft. (core) - 1216 ft. (core) : lower N.asperus Zone.

This interval is assigned to the lower Nothofagidites asperus Zone at the top on the absence of younger indicators and at the base on oldest common Nothofagidites spp. including oldest N.falcatus and N.vansteenisii plus oldest Periporopollenites vesicus and Proteacidites rugulatus (all at 1216 ft) supported by oldest Milfordia homeopunctatus, Tricolpites simatus and Proteacidites reflexus (at 1093 ft) and oldest Milfordia hypolaenoides and Tricolporites leuros (at 799 ft.).

Marginally marine environments are indicated at 1093 ft. and 1216 ft. where very rare dinoflagellates were seen. Non-marine environments are indicated at 497 ft. and 799 ft. where dinoflagellates were not seen.

These features are normally seen in the topmost Eastern View Formation, with the overlying middle N. asperus Zone associated with the Demon's Bluff Formation.

Light yellow spore colours indicate immaturity for hydrocarbon generation.

B. P. asperopolus to L. balmei Zones : not seen.

These zones were not seen, but may be partly present in the large 300 ft. sample gap. They may also be largely absent b hiatus.

C. 1515 ft. (core) : T. longus Zone

Assignment of this sample is clearly indicated at the top by youngest Tricolpites confessus, T. longus and Tricolporites

pachyexinus, and at the base by oldest T. longus and Tripunctisporis punctatus. Within the assemblage, Proteacidites spp. are dominant with frequent Phyllocladidites mawsonii and Tricolpites phillipsii

Non-marine environments are indicated by the absence of dinoflagellates and the rare freshwater alga Botryococcus amongst the common and diverse spores and pollen.

These features are normally associated with the mid Eastern View Formation.

Yellow spore colours indicate immaturity for hydrocarbon generation.

D. 1778 ft. (core) : T. lillei Zone

Assignment of this sample is indicated at the top by the absence of younger indicators (supported by youngest frequent Nothofagidites senectus and N. endurus and at the base by oldest Tricolporites lillei, Stereisporites regium and Triporopollenites sectilis. Proteacidites spp. are dominant, but with frequent Nothofagidites spp.)

Non-marine environments are indicated by the absence of dinoflagellates and rare presence of algal acritarchs (Schizosporis) and Botryococcus.

Yellow spore colours indicate immaturity for hydrocarbon generation.

E. N. senectus to C. paradoxa Zones : not seen

These zones were not seen and are probably largely absent by hiatus in the 160 ft. sample gap. log data suggest a hiatus at 1921 ft. leaving room perhaps for some more Late Cretaceous zones, but little room for Early Cretaceous ones.

F. 1939 ft. (core) - 2862 ft. (core) : C. striatus Zone.

Assignment to the Crybelosporites striatus Zone is indicated at the top by the absence of younger indicators and at the base by oldest C. striatus. Youngest Dictyotosporites filosus (1939 ft.) and Pilosisporites parvispinosus (2225 ft.) occur in this interval. Cyathidites spp., Cicatricosisporites spp. and Falcisporites spp. are the common types.

Non-marine, possibly partly lacustrine, environments are indicated by the absence of dinoflagellates and rare presence of algal acritarchs (Schizosporis spp.)

These features are normally associated with the Eumeralla Formation of the Otway Group.

Spore colours of light to mid brown indicate early maturity for oil generation but only marinal maturity for gas/condensate.

G. 4019 ft. (core) : indeterminate.

Very few palynomorphs were recovered from this sample, and zonal assignment is not possible. Minor Triassic reworking and younger Cretaceous caving (? mud contamination of core) were noted.

Mid brown spore colours indicate full maturity for oil generation and early maturity for gas/condensate.

H. 4821 ft. (core) : C. hughesi Zone

Assignment to the Cyclosporites hughesi Zone is indicated at the top by youngest C. hughesi without younger indicators and at the base by oldest Foraminisporis asymmetricus and consistent Cicatricosisporites australiensis. Common forms

are Osmundacidites wellmanii and Falcisporites similis, but yields are very low.

Non-marine environments are indicated by the lack of dinoflagellates.

These features are normally seen in the lower Eumeralla Formation of the Otway Group.

Spore colours of mid to dark brown indicate peak maturity for oil, and full maturity for gas/condensate.

I. 6239 ft. (core) - 7859 ft. (core) : indeterminate Cretaceous.

Very poor yields (especially at 6239 ft) preclude zonal assignment, but oldest Cicatricosisporites australiensis at 7859 ft. indicates a Cretaceous age. Too few specimens were seen to make valid environmental conclusions.

Spore colours of very dark brown to black indicate post-maturity for oil and peak maturity for gas/condensate.

J. 8701 ft. (core) - 10,060 ft. (core) : indeterminate Jurassic-Cretaceous

Very poor yields (especially at 8701 ft.) preclude zonal assignment. However, the presence of Camarozonosporites clivosus and Corollina torosa indicate Jurassic or younger ages.

Too few specimens were seen for valid environmental conclusions.

Spore colours of very dark brown to black indicate post-maturity for oil and peak maturity for gas/condesate.

IV CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

1. Section beneath a log-based unconformity at 5710 ft. shown in Evans (1966) is essentially undated, but is probably all Cretaceous. Given the increased maturity beneath this point, it is not unlikely that the unconformity corresponds with the "top Pretty Hill unconformity" in the Otway Basin to the west. If so, this section would be Neocomian in age and a shale equivalent of the sandy Pretty Hill Formation of the Otway Basin.

2. The Aptian to early Albian section between the log based unconformities at 5710 ft. and 1921 ft. is equivalent to the lower Eumeralla Formation of the Otway Group.

3. The upper Eumeralla Formation equivalent (middle and late Albian) plus the lower Eastern View Formation (Cenomanian to Santonian) are lost on the hiatus at 1921 ft.

4. The Eastern View Formation comprises a lower non-marine section of Companian to Maastrichtian age (and on regional grounds may extend into the Paleocene in the unsampled interval), a probable hiatus removing part or all of the Paleocene to Middle Eocene and an upper partly marginal marine section of Middle Eocene age. The top of the Eastern View is presumably at top sand (370 ft.) and is conformably overlain by the Demon's Bluff Formation.

B. RECOMMENDATIONS

1. The 300 ft. wide sample gap between 1216 ft. and 1515 ft. may contain part or all of the six missing Paleocene to Middle Eocene Zones. Study of 30 ft. cuttings is recommended to try to detect the missing zones.

2. The 160 ft. wide samle gap between 1778 ft. and 1939 ft. may contain part of the five missing zones, although regional evidence suggests that only the N. senectus Zone is likely to be present. Study of 50 ft. cuttings is recommended to resolve the uncertainty.

3. Only a few of the available cores in the Otway Group have been studied, and this, along with poor yields and high maturity has resulted in poor resolution of the interval below the C. striatus Zone. Study of the other 16 available cores would increase resolution.

VI REFERENCES

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ANGLESEA #1 S/P

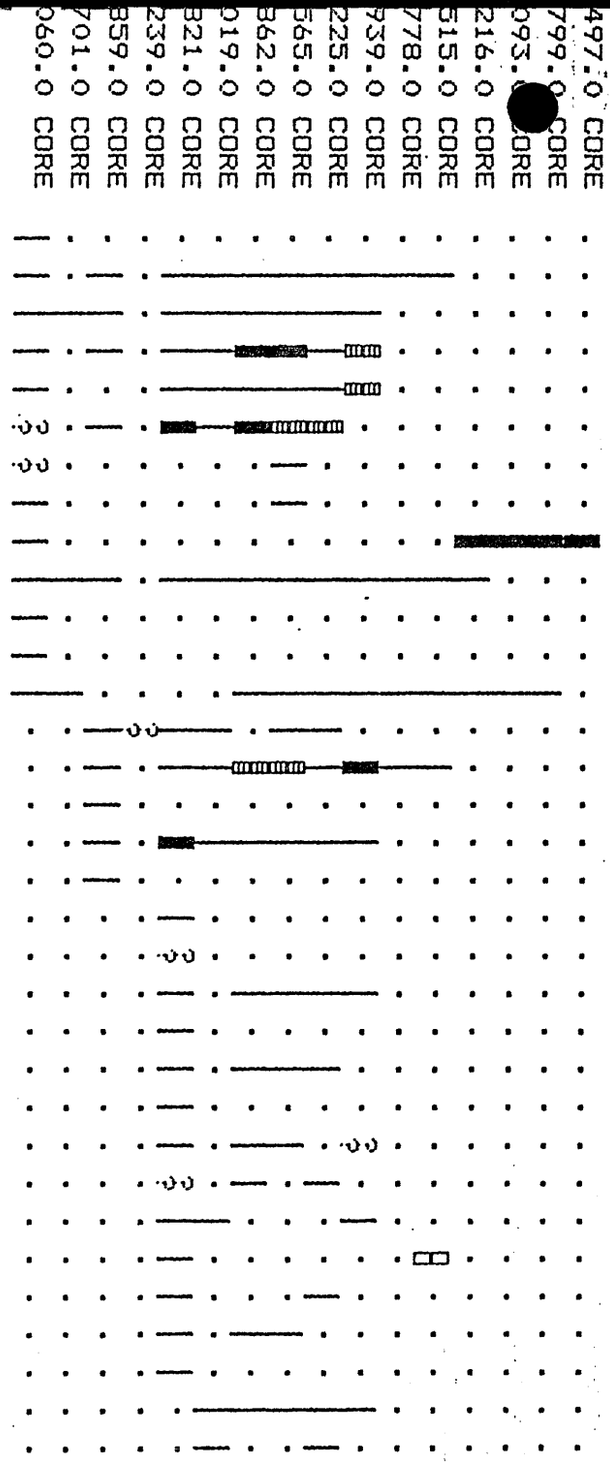
DESCRIPTION:

CHECKLIST OF GRAPHIC ABUNDANCE BY LOWEST APPEARANCE

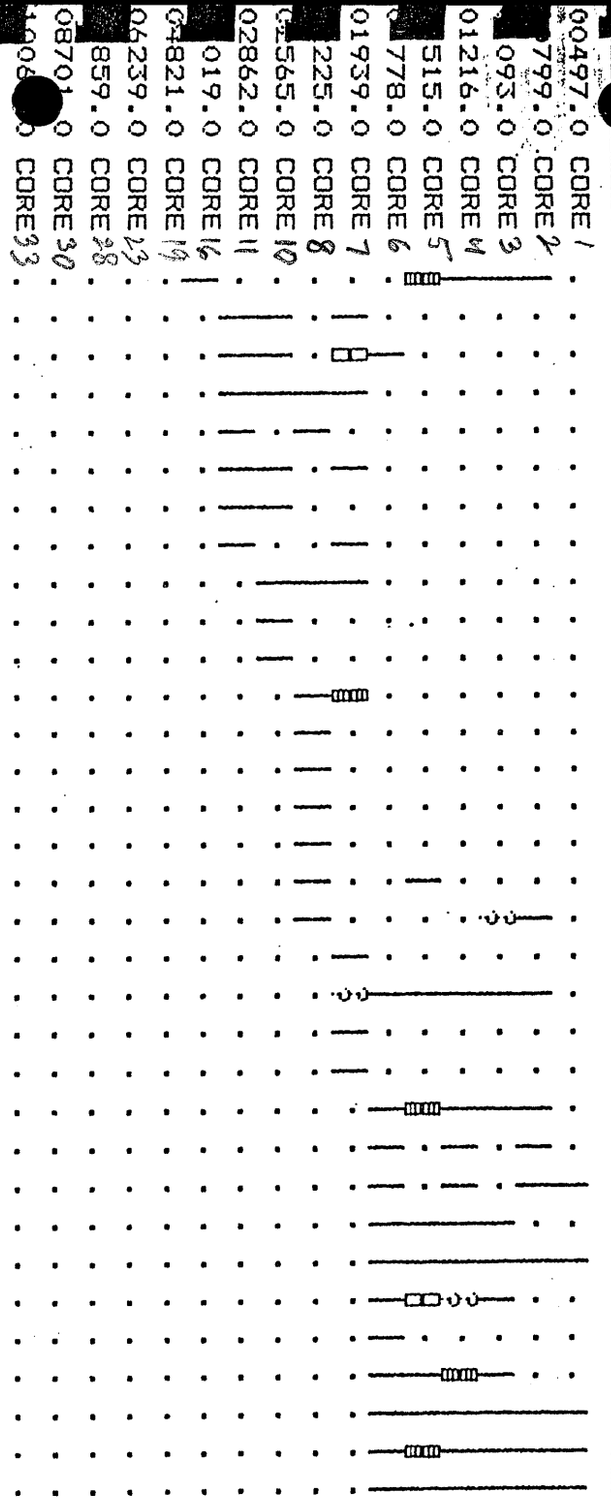

= Abundant
= Common
= Few
= Rare
= Very Rare

? = Questionably Present

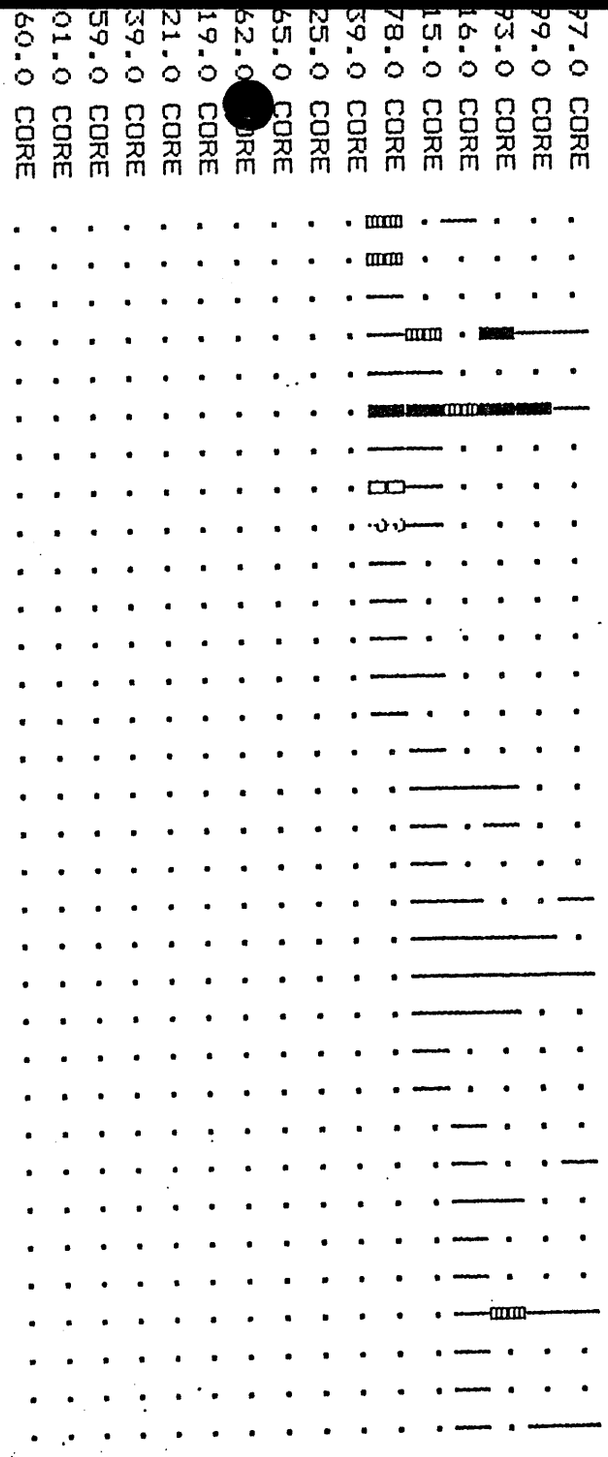
. = Not Present



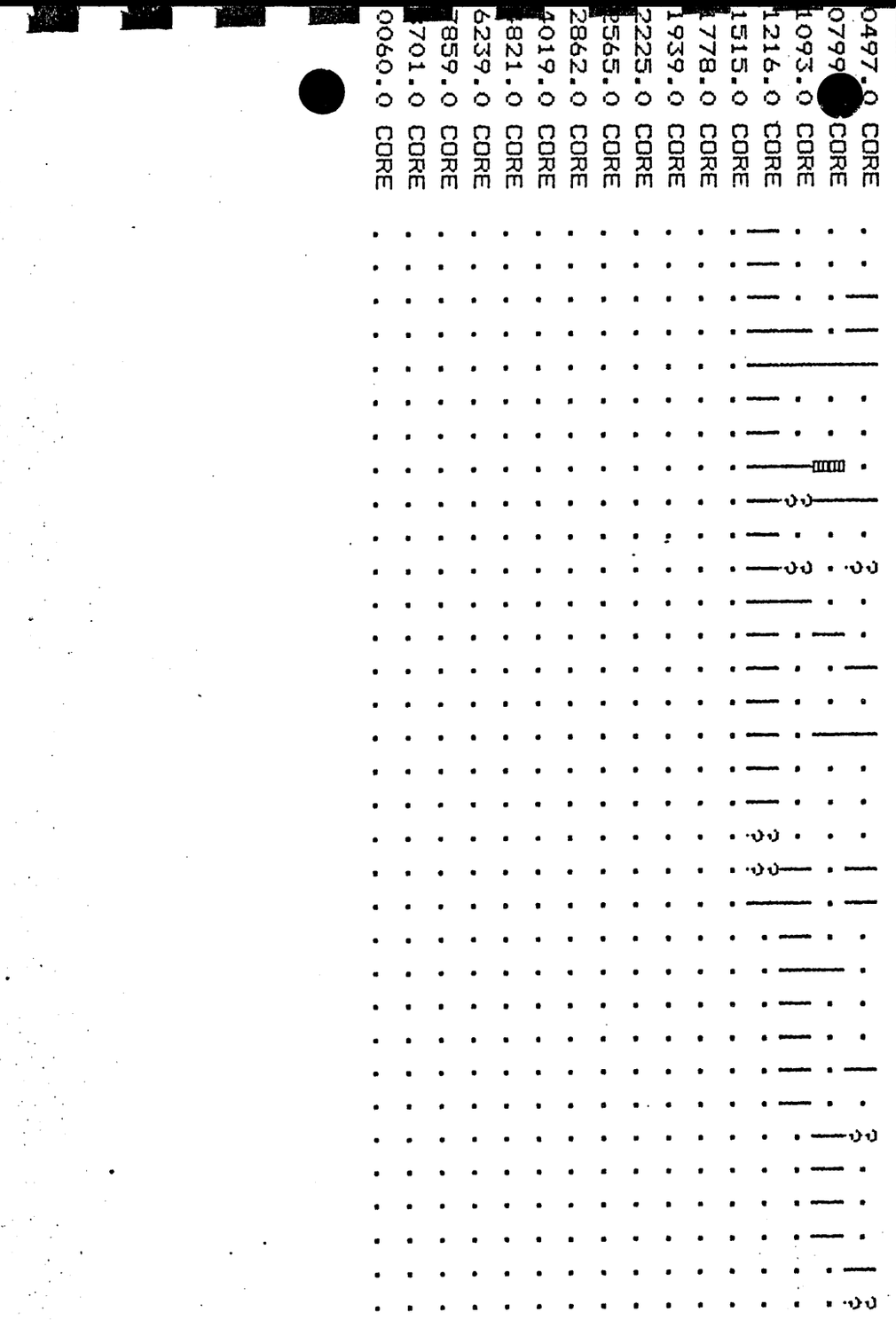
1	CAMEROZONOSPORITES CLIVOSUS
2	CERATOSPORITES EQUALIS
3	COROLLINA TOROSA
4	CYATHIDITES AUSTRALIS
5	CYATHIDITES MINOR
6	FALCISPORITES SIMILIS
7	ISCHYOSPORITES PUNCTATUS
8	KLUKISPORITES SCABERIS
9	NOTHOFAGIDITES EMARCIDUS/HETERUS
10	RETITRILETES AUSTROCLAVATIDITES
11	RETITRILETES EMINULUS
12	RETITRILETES NODOSUS
13	STEREISPORITES ANTIQUISPORITES
14	CALIALLASPORITES DAMPIERI
15	CICATRICOSISPORITES AUSTRALIENSI
16	NEORAISTRICKIA TRUNCATA
17	OSMUNDACIDITES WELLMANII
18	RETITRILETES CIRCOLUMENUS
19	ANNULISPORITES FOLLICULOSA
20	ANTULSPORITES VARIGRANULATUS
21	ARAUCARIACITES AUSTRALIS
22	CORONATISPORA PERFORATA
23	CYCADOPITES FOLLICULARIS
24	CYCLOSPORITES HUGHESI
25	FORAMINISPORIS ASYMMETRICUS
26	FORAMINISPORIS WONTHAGGIENSIS
27	FOVEOSPORITES MORETONENSIS
28	GAMBIERINA EDWARDSII
29	GLEICHENIIDITES
30	LEPTOLEPIDITES VERRUCATUS
31	VITREISPORITES PALLIDUS
32	CALIALLASPORITES TURBATUS
33	ROGALSKAISPORITES CICATRICOSUS



34 TRICOLPITES PHILLIPSII
35 AEQUITRIADITES SPINULOSUS
36 CRYBELOSPORITES STRIATUS
37 MICROCACHRYIDITES ANTARCTICUS
38 PILOSISPORITES PARVISPINOSUS
39 TRIPOROLETES RADIATUS
40 TRIPOROLETES SIMPLEX
41 VELOSPORITES TRIQUETRUS
42 FORAMINISPORIS DAILYI
43 JANUASPORITES SPINULOSUS
44 LEPTOLEPIDITES MAJOR
45 CICATRICOSISPORITES CUNEIFORMIS
46 CINGUTRILETES CLAVUS
47 CYATHIDITES ASPER
48 DICTYOTOSPORITES COMPLEX
49 FALCISPORITES GRANDIS
50 PHYLLOCLADIDITES VERRUCOSUS
51 PROTEACIDITES RECAVUS
52 AEQUITRIRADITES VERRUCOSUS
53 CLAVIFERA TRIPLEX
54 DICTYOTOSPORITES FILOSUS
55 RETITRILETES FACETUS
56 AUSTRALOPOLLIS OBSCURUS
57 CYATHIDITES SPLENDENS
58 DACRYCARPITES AUSTRALIENSIS
59 DILWYNITES GRANULATUS
60 ERICIPITES SCABRATUS
61 GAMBIERINA RUDATA
62 GEPHRAPOLLENITES WAHOOENSIS
63 GLEICHENIIDITES CIRCINIDITES
64 LATROBOSPORITES CRASSUS
65 LYGISTEPOLLENITES FLORINII
66 NOTHOFAGIDITES BRACHYSPINULOSUS



67 NOTHOFAGIDITES ENDURUS
68 NOTHOFAGIDITES SENECTUS
69 NOTHOFAGIDITES SPP.
70 PHYLLOCLADIDITES MAWSONII
71 PODOSPORITES MICROSACCATUS
72 PROTEACIDITES SPP.
73 STEREISPORITES REGIUM
74 TRICOLPITES CONFESSUS
75 TRICOLPITES GILLII
76 TRICOLPITES SABULOSUS
77 TRICOLPITES SPP
78 TRICOLPORITES LILLIEI
79 TRICOLPORITES PACHYEXINUS
80 TRIPOROPOLLENITES SECTILIS
81 AMOSOPOLLIS CRUCIFORMIS
82 DILWYNITES TUBERCULATUS
83 HERKOSPORITES ELLIOTTII
84 LATROBOSPORITES OHAIENSIS
85 NOTHOFAGIDITES FLEMINGII
86 PERIPOROPOLLENITES POLYORATUS
87 PROTEACIDITES ANNULARIS
88 STEREISPORITES (TRIPUNCTISPORIS) PUNCTATUS
89 TRICOLPITES LONGUS
90 TRICOLPORITES SP.A
91 BANKSIEACIDITES ARCUATUS
92 CUPANIEIDITES ORTHOTEICHUS
93 CYATHIDITES GIGANTIS
94 EPHEDRIPITES SP
95 GRANODIPORITES NEBULOSUS
96 HALORAGACIDITES HARRISII
97 LYGISTEPOLLENITES BALMEI
98 MALVACIPOLLIS DIVERSUS
99 MALVACIPOLLIS SUBTILIS



100	MYRTACEIDITES PARVUS/MESONESUS
101	NOTHOFAGIDITES FALCATUS
102	NOTHOFAGIDITES VANSTEENISII
103	PERIPOROPOLLENITES DEMARCATUS
104	PERIPOROPOLLENITES VESICUS
105	PROTEACIDITES ADENANTHOIDES
106	PROTEACIDITES CRASSUS
107	PROTEACIDITES GRANDIS
108	PROTEACIDITES INCURVATUS
109	PROTEACIDITES KOPIENSIS
110	PROTEACIDITES LAPIS
111	PROTEACIDITES LEIGHTONII
112	PROTEACIDITES ORNATUS
113	PROTEACIDITES PACHYPOLUS
114	PROTEACIDITES RECTOMARGINIS
115	PROTEACIDITES RUGULATUS
116	TETRACOLPORITES TEXTUS
117	TRICOLPORITES ESTOUTUS
118	TRIORITES MAGNIFICUS
119	TRIPOROPOLLENITES AMBIGUUS
120	VERRUCOSISPORITES KOPUKUENSIS
121	ILEXPOLLENITES SP
122	ISCHYOSPORITES GREMIUS
123	MILFORDIA HOMEOPUNCTATA
124	PROTEACIDITES OBSCURUS
125	PROTEACIDITES REFLEXUS
126	TRICOLPITES SIMATUS
127	BEAUPREAIDITES VERRUCOSUS
128	MILFORDIA HYPOLAENOIDES
129	RUGULATISPORITES MALLATUS
130	TRICOLPORITES LEUROS
131	BANKSIEACIDITES ELONGATUS
132	BEAUPREAIDITES ELEGANSIFORMIS

		133	134	135	136	137	138	139
		NOTHOFAGIDITES DEMINUTUS	PROTEACIDITES CLARUS	PROTEACIDITES SCITUS	SAPOTACEOIDAEPOLLENITES ROTUNDUS	TRIPOROPOLLENITES "FURRY"	TRIPOROPOLLENITES CHNOSUS	VERRUCATOSPORITES SP
00497.0	CORE	|	??	??	??	|	|	|
0799.0	CORE	.	.	.	.	.	.	.
1093.0	CORE	.	.	.	.	.	.	.
01216.0	CORE	.	.	.	.	.	.	.
1515.0	CORE	.	.	.	.	.	.	.
1778.0	CORE	.	.	.	.	.	.	.
01939.0	CORE	.	.	.	.	.	.	.
2225.0	CORE	.	.	.	.	.	.	.
2565.0	CORE	.	.	.	.	.	.	.
028[illegible]0	CORE	.	.	.	.	.	.	.
4019.0	CORE	.	.	.	.	.	.	.
4821.0	CORE	.	.	.	.	.	.	.
06239.0	CORE	.	.	.	.	.	.	.
7859.0	CORE	.	.	.	.	.	.	.
08701.0	CORE	.	.	.	.	.	.	.
10060.0	CORE	.	.	.	.	.	.	.

35	AEQUITRIADITES SPINULOSUS
52	AEQUITRIRADITES VERRUCOSUS
81	AMOSOPOLLIS CRUCIFORMIS
19	ANNULISPORITES FOLLICULOSA
20	ANTULSPORITES VARIGRANULATUS
21	ARAUCARIACITES AUSTRALIS
56	AUSTRALOPOLLIS OBSCURUS
91	BANKSIEACIDITES ARCUATUS
131	BANKSIEACIDITES ELONGATUS
132	BEAUPREAIDITES ELEGANSIFORMIS
127.4	BEAUPREAIDITES VERRUCOSUS
141	CALIALLASPORITES DAMPIERI
132	CALIALLASPORITES TURBATUS
1	CAMEROZONOSPORITES CLIVOSUS
2	CERATOSPORITES EQUALIS
15	CICATRICOSISPORITES AUSTRALIENSIS
45	CICATRICOSISPORITES CUNEIFORMIS
46	CINGUTRILETES CLAVUS
53	CLAVIFERA TRIPLEX
3	COROLLINA TOROSA
22	CORONATISPORA PERFORATA
36	CRYBELOSPORITES STRIATUS
92	CUPANIEIDITES ORTHOTEICHUS
47	CYATHIDITES ASPER
4	CYATHIDITES AUSTRALIS
93	CYATHIDITES GIGANTIS
5	CYATHIDITES MINOR
57	CYATHIDITES SPLENDENS
23	CYCADOPITES FOLLICULARIS
24	CYCLOSPORITES HUGHESI
58	DACRYCARPITES AUSTRALIENSIS
48	DICTYOTOSPORITES COMPLEX
54	DICTYOTOSPORITES FILOSUS
59	DILWYNITES GRANULATUS
82	DILWYNITES TUBERCULATUS
94	EPHEDRIPITES SP
60	ERICIPITES SCABRATUS
49	FALCISPORITES GRANDIS
6	FALCISPORITES SIMILIS
25	FORAMINISPORIS ASYMMETRICUS
42	FORAMINISPORIS DAILYI
26	FORAMINISPORIS WONTHAGGIENSIS
27	FOVEOSPORITES MORETONENSIS
28	GAMBIERINA EDWARDSII
61	GAMBIERINA RUDATA
62	GEPHRAPOLLENITES WAHOOENSIS
29	GLEICHENIIDITES
63	GLEICHENIIDITES CIRCINIDITES
95	GRANODIPORITES NEBULOSUS
96	HALORAGACIDITES HARRISII
83	HERKOSPORITES ELLIOTTII
121	ILEXPOLLENITES SP
122	ISCHYOSPORITES GREMIUS
7	ISCHYOSPORITES PUNCTATUS

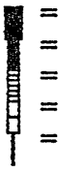
63	GLEICHENIIDITES CIRCINIDITES
95	GRANODIPORITES NEBULOSUS
96	HALORAGACIDITES HARRISII
83	HERKOSPORITES ELLIOTTII
121	ILEXPOLLENITES SP.
122	ISCHYOSPORITES GREMIUS
7	ISCHYOSPORITES PUNCTATUS
43	JANUASPORITES SPINULOSUS
8	KLUKISPORITES SCABERIS
64	LATROBOSPORITES CRASSUS
84	LATROBOSPORITES OHAIENSIS
44	LEPTOLEPIDITES MAJOR
30	LEPTOLEPIDITES VERRUCATUS
97	LYGISTEPOLLENITES BALMEI
65	LYGISTEPOLLENITES FLORINII
98	MALVACIPOLLIS DIVERSUS
99	MALVACIPOLLIS SUBTILIS
37	MICROCACHRYIDITES ANTARCTICUS
123	MILFORDIA HOMEOPUNCTATA
128	MILFORDIA HYPOLAENOIDES
[illegible]	MYRTACEIDITES PARVUS/MESONESUS
16	NEORAISTRICKIA TRUNCATA
66	NOTHOFAGIDITES BRACHYSPINULOSUS
133	NOTHOFAGIDITES DEMINUTUS
9	NOTHOFAGIDITES EMARCIDUS/HETERUS
67	NOTHOFAGIDITES ENDURUS
101	NOTHOFAGIDITES FALCATUS
85	NOTHOFAGIDITES FLEMINGII
68	NOTHOFAGIDITES SENECTUS
69	NOTHOFAGIDITES SPP.
102	NOTHOFAGIDITES VANSTEENISII
17	OSMUNDACIDITES WELLMANII
103	PERIPOROPOLLENITES DEMARCATUS
86	PERIPOROPOLLENITES POLYORATUS
104	PERIPOROPOLLENITES VESICUS
70	PHYLLOCLADIDITES MAWSONII
[illegible]	PHYLLOCLADIDITES VERRUCOSUS
38	PILOSISPORITES PARVISPINOSUS
71	PODOSPORITES MICROSACCATUS
105	PROTEACIDITES ADENANTHOIDES
87	PROTEACIDITES ANNULARIS
134	PROTEACIDITES CLARUS
106	PROTEACIDITES CRASSUS
107	PROTEACIDITES GRANDIS
108	PROTEACIDITES INCURVATUS
109	PROTEACIDITES KOPIENSIS
110	PROTEACIDITES LAPIS
111	PROTEACIDITES LEIGHTONII
124	PROTEACIDITES OBSCURUS
112	PROTEACIDITES ORNATUS
113	PROTEACIDITES PACHYPOLUS
51	PROTEACIDITES RECAVUS
114	PROTEACIDITES RECTOMARGINIS
125	PROTEACIDITES REFLEXUS
115	PROTEACIDITES RUGULATUS

125 PROTEACIDITES REFLEXUS
115 PROTEACIDITES RUGULATUS
135 PROTEACIDITES SCITUS
72 PROTEACIDITES SPP.
10 RETITRILETES AUSTROCLAVATIDITES
18 RETITRILETES CIRCOLUMENUS
11 RETITRILETES EMINULUS
55 RETITRILETES FACETUS
12 RETITRILETES NODOSUS
33 ROGALSKAISPORITES CICATRICOSUS
129 RUGULATISPORITES MALLATUS
136 SAPOTACEOIDAEPOLLENITES ROTUNDUS
88 STEREISPORITES (TRIPUNCTISPORIS) PUNCTATUS
13 STEREISPORITES ANTIQUISPORITES
73 STEREISPORITES REGIUM
116 TETRACOLPORITES TEXTUS
74 TRICOLPITES CONFESSUS
75 TRICOLPITES GILLII
89 TRICOLPITES LONGUS
34 TRICOLPITES PHILLIPSII
76 TRICOLPITES SABULOSUS
126 TRICOLPITES SIMATUS
77 TRICOLPITES SPP
117 TRICOLPORITES ESTOUTUS
130 TRICOLPORITES LEUROS
78 TRICOLPORITES LILLIEI
79 TRICOLPORITES PACHYEXINUS
90 TRICOLPORITES SP.A
118 TRIORITES MAGNIFICUS
39 TRIPOROLETES RADIATUS
40 TRIPOROLETES SIMPLEX
137 TRIPOROPOLLENITES "FURRY"
119 TRIPOROPOLLENITES AMBIGUUS
138 TRIPOROPOLLENITES CHNOSUS
80 TRIPOROPOLLENITES SECTILIS
41 VELOSPORITES TRIQUETRUS
139 VERRUCATOSPORITES SP
120 VERRUCOSISPORITES KOPUKUENSIS
31 VITREISPORITES PALLIDUS

ANGLESEA #1 DINOS

DESCRIPTION:

CHECKLIST OF GRAPHIC ABUNDANCE BY LOWEST APPEARANCE



= Abundant
= Common
= Few
= Rare
= Very Rare

? = Questionably Present
. = Not Present

	1 SCHIZOSPORIS PSILATUS	2 BOTRYOCOCCUS	3 SCHUZISOIRUS RETICULATUS	4 APECTODINIUM HOMOMORPHA (1. SP	5 APECTODINIUM HOMOMORPHA (SH. SP	6 DAPSILIDINIUM PASTIELSII	7 MORKALLACYSTA PYRAMIDALIS
00497.0 CORE	.	.	.	.	.	.	.
00799.0 CORE	.	|	.	.	.	.	.
01093.0 CORE	.	.	.	.	|	.	|
[illegible]216.0 CORE	.	|	.	|	|	|	|
01515.0 CORE	.	|	.	.	.	.	.
01778.0 CORE	.	|	|	.	.	.	.
01939.0 CORE	|	.	.	.	.	.	.
02225.0 CORE	.	.	.	.	.	.	.
02565.0 CORE	|	.	.	.	.	.	.
02862.0 CORE	|	.	.	.	.	.	.
04019.0 CORE	.	.	.	.	.	.	.
04821.0 CORE	.	.	.	.	.	.	.
06239.0 CORE	.	.	.	.	.	.	.
07859.0 CORE	.	.	.	.	.	.	.
08701.0 CORE	.	.	.	.	.	.	.
10060.0 CORE	.	.	.	.	.	.	.

PALYNOLOGICAL REPORT ON ODNL ANGLESEA NO.1 WELL

Twenty eight core samples from between 1506 feet and 10,065 feet in ODNL Anglesea No.1 well were submitted for palynological examination by Frome-Broken Hill Company Pty. Ltd. The majority of the samples yielded plant matter which in the lower part of the sequence (5161 feet and below) has been subjected to carbonization such that the spores and pollen grains are preserved as generically unidentifiable remnants. No microplanktonic organisms were observed in any of the samples. The spores and pollen grains identified in horizons between 1506-4829 feet indicate that this interval includes sediments of Lower Tertiary and Cretaceous age. Details of the microfloras obtained from the sequence are presented below (see also Table 1).

Microfloral Assemblages and Correlations

As mentioned previously no spores or pollen grains could be identified in samples from between 5161 feet and 10,065 feet.

The sample from 4819-29 feet yielded an extremely poorly preserved microflora in which Dictyotosporites speciosus Cookson & Dettmann was identified. This species diagnoses the presence of the Valanginian-Aptian Speciosus Assemblage. Succeeding samples (from between 3460-4527 feet) yielded only a few identifiable plant microfossils, the majority of which have little stratigraphical value. A more diverse and better preserved microflora was obtained from core 12 (3158-68 feet) which includes Dictyotosporites speciosus and Crybelosporites striatus (Cookson & Dettmann). The combined occurrence of these species indicates the presence of the younger (Aptian) category of the Speciosus Assemblage. This assemblage is known

from sequences elsewhere in the Otway Basin including Flaxmans Hill No.1 well between 10,801 feet and 11,528 feet (Dettmann 1964a).

Samples of cores 7 to 11 inclusive (1931-2870 feet) yielded microfloras which in containing Pilosisporites spp. and Foraminisporis asymmetricus (Cookson & Dettmann) are clearly Lower Cretaceous in age. However, the microfloras cannot be referred to either the Speciosus or Paradoxa Assemblages since no species confined to either of these assemblages was observed. Nevertheless, the presence of Pilosisporites notensis Cookson & Dettmann in cores 7 and 9 suggest that the sediments are no younger than Aptian (see Dettmann 1963, pp.38, 114).

Core 6 (1778-98 feet) yielded a sparse assemblage including cf. Gleicheniidites sp. and angiosperm grains indicating the presence of Assemblage III, and an age no older than the Cenomanian. The uppermost sample also yielded cf. Gleicheniidites sp. together with Nothofagus, Triorites edwardsii Cookson & Pike, and Dacrydium florinii Cookson. Triorites edwardsii, which is diagnostic of Cookson's (1954) Microflora B, indicates an uppermost Cretaceous or Lower Tertiary age and suggests correlation with Cooriejong No.1 bore at 1535-54 feet and its equivalents Dettmann 1964b).

References

Cookson, I.C. 1954. A palynological examination of No.1 bore, Birregurra, Victoria. Proc. Roy. Soc. Vict., 66, 119-128.

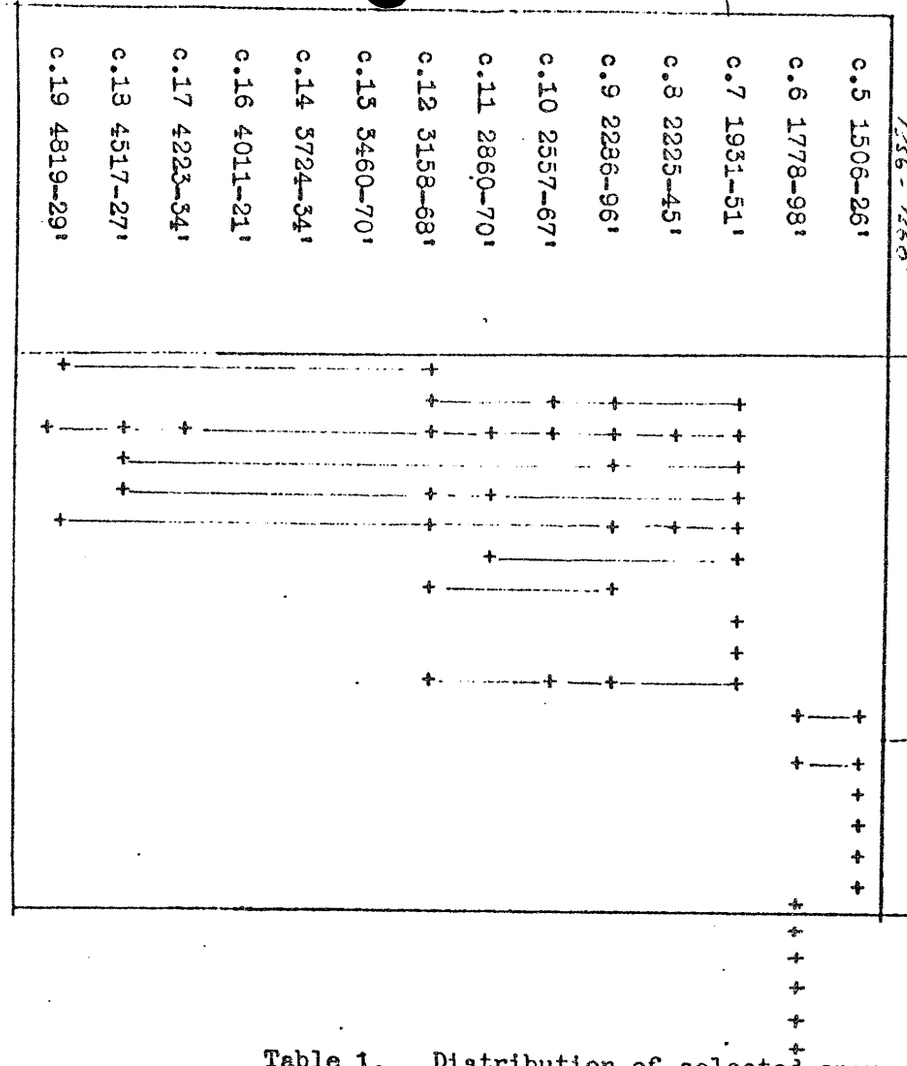
Dettmann, M.E. 1963. Upper Mesozoic microfloras from south-eastern Australia. Proc. Roy. Soc. Vict., 77, 1-148.

Dettmann, M.E. 1964a. Palynological report on Cretaceous core samples from F.B.H. Flaxmans No.1 well. Unpublished report submitted to Frome-Broken Hill Co. Pty. Ltd. 7/4/64.

Dettmann, M.E. 1964b. Palynology of core samples from Terang No.1, Carpendeit, Tandarook, Mepunga No.7, Panmure No.2, and Cooriejong No.1 bores. Unpublished report submitted to Frome-Broken Hill Co. Pty. Ltd. 17/12/64.

21st September, 1965

Mary E. Dettmann,
Department of Geology, University of Queensland, St. Lucia, Qld.



1. Dictyotosporites speciosus	Microspores
2. Aequitriradites spinulosus	
3. Cicatricosisporites australiensis	
4. Pilosisporites notensis	
5. Foraminisporis wonthaggiensis	
6. Foraminisporis asymmetricus	
7. Pilosisporites parvispinosis	
8. Rouseisporites reticulatus	
9. Rouseisporites simplex	
10. Januasporites spinulosus	
11. Crybelosporites striatus	
12. cf. Gleicheniidites sp.	
13. Tricolpites sp.	Pollen
14. triporate sp.A	
15. Nothofagus	
16. Triorites edwardsii	
17. Dacrydium florinii	
Ergdata.	
T Confessus	
N senectus	
T sectilis	
P amosbeexinous	
T sabulosus	
N emarcidus	
P adenanthoides	
T gillii	
P annularis	
R mallatus.	
T minor	
N heterus.	
C australis	
P mawsonii	

D granulates

Table 1. Distribution of selected spores and pollen grains in ODNL Anglesea No.1 well between 1506 feet and 4829 feet. Samples lower (5161 - 10,065 feet) in the sequence did not provide any identifiable species.

+ - species present

ANGLESEA 1

DEPTH OF SAMPLE	TYPE	DETERMINATION	REFERENCES
10065–5161 ft 3068–1573 m	28 CORES	NOT IDENTIFIABLE	DETTMANN
4829→4829 ft. 1469–1472	"	D. SPECIOSUS	"
3158–68 ft 962·5–21 m	CORE 12	D. SPECIOSUS ZONE	COOKSON & DETTMANN
1931–2870 ft. 588 – 875 m	CORES 7–11	F. ASYMMETRICUS UNIT D SPECIOSUS ZONE	COOKSON "
1478–98 ft 542 – 548m	CORE 6	T. LONGUS ZONE	D. RIPER CHART COOKSON (1954).

SOURCE: DETTMANN M. E 1965 PALYNOLOGICAL REPORT ON CONL ANGLESEA NO 1 WELL.

References

Cookson, I.C. 1954. A palynological examination of No.1 bore, Birregurra, Victoria. Proc. Roy. Soc. Vict., 66, 119-128.

Dettmann, M.E. 1963. Upper Mesozoic microfloras from south-eastern Australia. Proc. Roy. Soc. Vict., 77, 1-148.

Dettmann, M.E. 1964a. Palynological report on Cretaceous core samples from F.B.H. Flaxmans No.1 well. Unpublished report submitted to Frome-Broken Hill Co. Pty. Ltd. 7/4/64.

Dettmann, M.E. 1964b. Palynology of core samples from Terang No.1, Carpendeit, Tandarook, Mepunga No.7, Panmure No.2, and Cooriejong No.1 bores. Unpublished report submitted to Frome-Broken Hill Co. Pty. Ltd. 17/12/64.

21st September, 1965

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8 March 1993

Mr B Simons
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Geological Survey of Victoria
Department of Energy & Minerals
Private Bag No. 1
EAST MELBOURNE VIC 3002

Dear Bruce

I have reviewed the palynological reports on Anglesea-1 by Morgan (1987) and Macphail (1989) which I borrowed from you on 26 February. My interpretation of the data is synthesised into a single STRATDAT file given as an Excel file printout.

Both reports are fairly typical of contract palynological work and there is general agreement on zones and ages in the well. Most differences reflect different samples and different experience of the two palynologists.

The one glaring anomaly is that the sample from core-4 at 1216ft reported on by Roger Morgan is either badly contaminated or somehow mixed up. It contains a mixed assemblage of Eocene *N. asperus* Zone species with Paleocene *L. balmei* Zone species. Whilst it is not possible to say exactly what went wrong one or more of the following are possible:

i. Sample was poorly cleaned.
ii. Samples were cross-contaminated in laboratory.
iii. Slides were wrongly labelled.
iv. Species were assigned to wrong samples during computer entry of data for range chart.

The species list from the sample given on Morgan's range chart is rearranged on attachment according to *N. asperus* Zone species, *L. balmei* Zone species and long ranging species. Note that Macphail (1987) records 25 (71%) of the species from the *L. balmei* Zone and long ranging lists from his sample from this core. When this sample is accepted as Upper *L. balmei* Zone the rest of the data falls into place.

The other major comments to be made on the sequence in Anglesea-1 are as follows:

1. The limited palynological data suggests that the most reasonable geological interpretation is that at T.D. Anglesea-1 was still within the Otway Group and still within the Early Cretaceous.

2. Below about Core-19 at 4821+ feet all samples are carbonised yielding very poorly preserved and very limited assemblages. Any zone picked on this data must be used with extreme caution.

3. The differences in zone picks in the Otway Group between the reports is consistent with the use of different samples, different processing technique and different effort factor at the microscope. Palynomorph assemblages extracted from the Otway Group are notoriously <u>variable</u>. An amalgam of ages from both reports is considered best.

4. The deepest occurrences of the zones species in Macphail's report are used to pick the bases of the *C. striatus*, *C. hughesii* and *C. australiensis* Zones within the carbonised section. Because of the overall rarity of palynomorphs these picks are all likely to be TOO SHALLOW.

5. The limited assemblages recorded **force** both palynologist to give a broad Latest Jurassic to Early Cretaceous to the deepest samples. Both are relying on negative evidence as neither identified species which become extinct within the Jurassic.

6. The range of the diagnostic spore *Cicatricosisporites australiensis* further complicates the issue as whilst most palynologists take its first appearance as the base of the Cretaceous in Australia others extend its range a considerable distance into the Jurassic. I do not consider this argument relevant to Anglesea-1 because near the base of its range *C. australiensis* is always rare. Thus, this rarity, combined with the poor preservation and low yield in Anglesea-1 would virtually preclude the recording of this species.

7. Both authors record anomalous species ranges in their assemblages. I consider most represent laboratory contamination, because mud contamination is highly unusual with conventional cores.

Finally there is the question of what additional palynological work is warranted on Anglesea-1? Firstly, no further work is recommended on the Otway Group as it is unlikely to significantly improve the age dating. In the Tertiary and Late Cretaceous the cores 1, 2 and 5 are worth re-analysing as there are still some ambiguities on their assemblages and ages. Cuttings could also be used to fill in the gaps between the Tertiary and Upper Cretaceous zones identified in the cores if this was needed.

This review of Anglesea-1 is a good example of how different palynology reports can be synthesised to give a new and better interpretation. I hope it will help you when evaluating other reports in the future.

Yours sincerely

Alan Partridge

ALAN D. PARTRIDGE

ATTACHMENT 1

Species recorded from Core-4 at 1216 feet by Roger Morgan.

N. asperus Zone - 14 species.

Granodiporites nebulosus	
Nothofagidites emarcidus/heterus (common)	*
Nothofagidites falcatus	*
Nothofagidites vansteenisii	
Proteacidites crassus	
Proteacidites kopiensis	
Proteacidites leightonii	
Proteacidites ornatus (misidentified?)	
Proteacidites pachypolus	
Proteacidites rectomarginis	
Proteacidites rugulatus	
Tricolporites estoutus	
Triorites magnificus (?)	
Triporopolenites ambiguus (?)	

L. balmei Zone - 9 species.

Australopollis obscurus	*
Cyathidites gigantis	*
Ephedripites sp.	*
Gambierina rudata	*
Gleicheniidites circinidites (frequent)	*
Lygistepollenites balmei	*
Nothofagidites endurus	
Periporopollenites polyoratus	
Tetracolporites textus	

Long Ranging Species - 26 forms.

Clavifera triplex	*
Cupanieidites orthoteichus	*
Cyathidites splendens	*
Dacrycarpites australiensis	
Dilwynites granulatus	*
Dilwynites tuberculatus	
Ericipites scabratus	
Haloragicidites harrisii	*
Latrobosporites crassus	*
Lygistepollenites florinii	*
Malvacipollis diverus	
Malvacipollis subtilis	*
Myrtaceidites parvus/mesonesus	*
Nothofagidites brachyspinulosus	*
Nothofagidites flemingii	
Periporopollenites demarcatus	*
Proteacidites adenanthoides	*
Proteacidites annularis	*
Proteacidites grandis	*
Proteacidites incurvatus	*
Proteacidites lapis	
Proteacidites spp. (frequent)	*
Retitriletes austroclavatides	
Stereioporites antiquisporites	*
Stereisporites (Tripunctisporis) punctatus	*
Verrucosisporites kopukuensis	

* Identified by M.K. Macphail from same core.

	A	B	C	D	E	F	G	H	I	J	K
1	STRATDAT FILE FOR ANGLESEA-1, TORQUAY BASIN.										
2											
3	ABBREVIATION AT TOP OF COLUMNS										
4			CODE =	ZONE CODE							
5			/ =	TOP/BASE OF ZONE OR FORMATION							
6			PT =	PICK TYPES							
7			P/A =	PREFERRED/ALTERNATE DEPTH							
8			C =	CONFIDENCE RATING							
9			S =	SECURITY RATING							
10			R =	REFERENCE CODE							
11											
12	WELL NAME	DEPTH	DEPTH	CODE	/	ZONE NAME	PT	P/A	C	S	R
13		FEET	METRES								
14	ANGLESEA-1	490.0	149.4	S2110		LOWER N. ASPERUS	Y		A4	O	2
15	ANGLESEA-1	809.0	246.6	S2115		P. ASPEROPOLUS	M		A4	O	2
16	ANGLESEA-1	1090.0	332.2	S2155	H	UPPER L. BALMEI	Z	P	A2	O	2
17	ANGLESEA-1	1090.0	332.2	M2180	H	A. HOMOMORPHUM	Z	P	A3	O	2
18	ANGLESEA-1	1234.0	376.1	M2180	L	A. HOMOMORPHUM	Z	P	A3	O	2
19	ANGLESEA-1	1234.0	376.1	S2155	L	UPPER L. BALMEI	Z	P	A2	O	2
20	ANGLESEA-1	1506.0	459.0	S2160	H	LOWER L. BALMEI	Z	P	A2	O	2
21	ANGLESEA-1	1526.0	465.1	S2160	L	LOWER L. BALMEI	Z	P	A2	O	2
22	ANGLESEA-1	1778.0	541.9	S3110	H	T. LILLIEI	Z	P	A2	O	1
23	ANGLESEA-1	1798.0	548.0	S3110	L	T. LILLIEI	Z	P	A2	O	2
24	ANGLESEA-1	1931.0	588.6	S3145	H	C. STRIATUS	Z	P	A3	O	2
25	ANGLESEA-1	5171.0	1576.1	S3145	L	C. STRIATUS	Z	P	A3	O	2
26	ANGLESEA-1	~~6327.0~~	~~1928.5~~	S3150	H	C. HUGHESII	Z	P	A3	O	2
27	ANGLESEA-1	~~6347.0~~	~~1934.6~~	S3150	L	C. HUGHESII	Z	P	A3	O	2
28	ANGLESEA-1	10065.0	3067.8	S3160		C. AUSTRALIENSIS	M		A3	O	2
29											
30	REFERENCES:										
31	1. R. Morgan, Palynology report for AMOCO, January 1987 (R/4/87).										
32	2. M.K. Macphail, Palynology report for SHELL, August 1989 (R7423).										
33											
34	REMARKS:										
35	1. Palynology based on 32 samples from 21 cores.										
36	2. Palynomorphs carbonised and of low reliability below 4800 ft.										
37	3. Assemblage reported by R. Morgan from C-4 at 1216 ft is L. balmei Zone contaminated with										
38	N. asperus Zone fossils.										

6237' 1901 m

6247' 1904.1 m

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
sidewall core	4785	Nothofagidites
"	5030	"
"	5078	Tricolpites pachyexinus
"	5182	"
"	5300	"
"	5398	"
"	5650	"
"	5755	Clavifera triplex
"	5827	Appendicisporites distocarinatus
"	5920	Tricolpites pannosus

Reference: Dettmann 1967a,c,d,e,

1.13 Shell Nerita No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
sidewall core	3704	Triorites edwardsii Zone of Harris 1965
"	3867	lowermost Tertiary - uppermost Cretaceous
"	4065	"
"	4245	Nothofagidites
"	4372	"
"	4534	"
"	4660	"
"	4782	"
"	4804	?Crybelosporites striatus

Reference: Dettmann 1967b.

1.14 Oil Development Anglesea No.1

SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
core 5	1506-26	Triorites edwardsii Zone of Harris 1965.
" 6	1778-98	Nothofagidites
" 7	1931-51	Coptospora paradoxa or Crybelosporites striatus

Reference: Dettmann 1965c.

Dettmann (1967a). Data on the distribution of dinoflagellates and of reworked plant microfossils within the sequence is included within the latter report which has not been available during this study, since it was not brought to Canada. Samples between 5020 feet and 6165 feet warrant further investigation to determine if reworked microfossils of Lower Cretaceous age are represented in the microfloras.

3.17 Shell Nerita No. 1

	SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
	sidewall core	4732	Nothofagidites or Tricolpites pachyexinus
	" "	4804	not determinable
Lower Alla Fm "Unit 2"	" "	4944	Crybelosporites striatus
	" "	5257	" "
	" "	5561	" "
	" "	5900	" "
	" "	6068	" "
	" "	6456	not determinable

Reference and Comments: Microfloral details are documented by Dettmann (1967a), but this account has not been accessible during the present study.

3.19 Oil Development Anadarko No. 1

	SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
	core 6	1773-98	?Nothofagidites
	" 7	1931-51	Coptospora paradoxa or Crybelosporites striatus
	" 8	2225-45	" "
	" 9	2286-96	" "
	" 10	2557-67	Crybelosporites striatus
Lower Alla Fm "Unit 2"	" 11	2860-70	" "
	" 12	3153-68	" "
	" 13	3460-70	Foraminisporis asymmetricus
	" 14	3724-54	" "
	" 16	4011-21	" "
	" 17	4223-34	" "
	" 18	4517-27	" "
	" 19	4819-29	" "
	cores 20 - 33	5161 - 10,065	not determinable

69

Reference: Dettmann (1964c).

Comments: Microfloras obtained from the lower Cretaceous sequence are poorly to badly preserved (carbonized). Few spore-pollen types were identified in the lower part of the section between 5161 feet and 10,065 feet; in the upper intervals it was not possible to identify all forms present. Dinoflagellates were not observed in the material examined.

Government Water Bores

3.19 V.D.H. Timboon No.5

	SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
Emerella Fm "Unit 1"	core BA	3407-10	Appendicisporites distocarinatus
	" BB	3500-04	Tricolpites pannosus
	" BC	3562-69	Contesporo paradoxa (unnamed unit)
	" BD	3680-91	" "

Reference: Dettmann (1964c).

Comments: Dinoflagellates appear initially within the Appendicisporites distocarinatus Zone (core BA).

V.D.H. Wangoom No.2

	SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE
Eumerella Fm "Unit 1"	core AM	3136-55	?Appendicisporites distocarinatus
	" AN	3225-45	?Tricolpites pannosus
	" AO	3347-49	Tricolpites pannosus
	" AP	3437-43	" "
	" AQ	3670-72	not determinable
	" AR	3968-72	Contesporo paradoxa (unnamed unit)
	" AS	4224-46	?Contesporo paradoxa

Reference: Dettmann (1964f).

Comments: Dinoflagellates make their first appearance within the Tricolpites pachyexinus Zone (core AL, 3016-55 feet). Cores AM and AN contain extremely sparse microfloras that may be in part recycled.

3.21 V.D.H. Wangoom No.6

	SAMPLE	DEPTH (ft.)	SPORE-POLLEN ZONE	REMARKS FOSSILS
Belfast Fm	core AK	3252-56	Tricolpites pachyexinus	

see Douglas GR 63/18

COMPLETION REPORT

APPENDIX (c)

PRELIMINARY PALYNOLOGICAL
OIL DEVELOPMENT
BORE

Cores from
bore were treated by
solution method, and the
microscope. Types
isolated are listed

Sampling Depth	
Core 2	789-809'
Core 3	1090-1110'
Core 4	1214-1234'
Core 5	1506-1526'
Core 6	1778-1796'
	T e r t i a r y
	M e s o z o i c
Core 7	1931-1951'
Core 8	2225-2245'

Comments:

The
is marked
microspores
were isolated
at 789' - 809' which
by Deflandre and Cookson

J. Douglas, Geologist

Reference

Deflandre, C., and Cookson, Isabel, C., 1955

Fossil microplankton from Australian late Mesozoic and Tertiary sediments.

Aust. J. Mar. Freshw. Res. 6.2. 242-313

PALYNOLOGICAL REPORT ON ODNL ANGLESEA NO.1 WELL

Twenty eight core samples from between 1506 feet and 10,065 feet in ODNL Anglesea No.1 well were submitted for palynological examination by Frome-Broken Hill Company Pty. Ltd. The majority of the samples yielded plant matter which in the lower part of the sequence (5161 feet and below) has been subjected to carbonization such that the spores and pollen grains are preserved as generically unidentifiable remnants. No microplanktonic organisms were observed in any of the samples. The spores and pollen grains identified in horizons between 1506-4829 feet indicate that this interval includes sediments of Lower Tertiary and Cretaceous age. Details of the microfloras obtained from the sequence are presented below (see also Table 1).

Microfloral Assemblages and Correlations

As mentioned previously no spores or pollen grains could be identified in samples from between 5161 feet and 10,065 feet.

The sample from 4819-29 feet yielded an extremely poorly preserved microflora in which Dictyotosporites speciosus Cookson & Dettmann was identified. This species diagnoses the presence of the Valanginian-Aptian Speciosus Assemblage. Succeeding samples (from Between 3460-4527 feet) yielded only a few identifiable plant microfossils, the majority of which have little stratigraphical value. A more diverse and better preserved microflora was obtained from core 12 (3158-68 feet) which includes Dictyotosporites speciosus and Crybelosporites striatus (Cookson & Dettmann). The combined occurrence of these species indicates the presence of the younger (Aptian) category of the Speciosus Assemblage. This assemblage is known

from sequences elsewhere in the Otway Basin including Flaxmans Hill No.1 well between 10,801 feet and 11,528 feet (Dettmann 1964a).

Samples of cores 7 to 11 inclusive (1931-2870 feet) yielded microfloras which in containing Pilosisporites spp. and Foraminisporis asymmetricus (Cookson & Dettmann) are clearly Lower Cretaceous in age. However, the microfloras cannot be referred to either the Speciosus or Paradoxa Assemblages since no species confined to either of these assemblages was observed. Nevertheless, the presence of Pilosisporites notensis Cookson & Dettmann in cores 7 and 9 suggest that the sediments are no younger than Aptian (see Dettmann 1963, pp.38, 114).

Core 6 (1778-98 feet) yielded a sparse assemblage including cf. Gleicheniidites sp. and angiosperm grains indicating the presence of Assemblage III, and an age no older than the Cenomanian. The uppermost sample also yielded cf. Gleicheniidites sp. together with Nothofagus, Triorites edwardsii Cookson & Pike, and Dacrydium florinii Cookson. Triorites edwardsii, which is diagnostic of Cookson's (1954) Microflora B, indicates an uppermost Cretaceous or Lower Tertiary age and suggests correlation with Cooriejong No.1 bore at 1535-54 feet and its equivalents Dettmann 1964b).

References

Cookson, I.C. 1954. A palynological examination of No.1 bore, Birregurra, Victoria. Proc. Roy. Soc. Vict., 66, 119-128.

Dettmann, M.E. 1963. Upper Mesozoic microfloras from south-eastern Australia. Proc. Roy. Soc. Vict., 77, 1-148.

Dettmann, M.E. 1964a. Palynological report on Cretaceous core samples from F.B.H. Flaxmans No.1 well. Unpublished report submitted to Frome-Broken Hill Co. Pty. Ltd. 7/4/64.

Dettmann, M.E. 1964b. Palynology of core samples from Terang No.1, Carpendeit, Tandarook, Mepunga No.7, Panmure No.2, and Cooriejong No.1 bores. Unpublished report submitted to Frome-Broken Hill Co. Pty. Ltd. 17/12/64.

21st September, 1965

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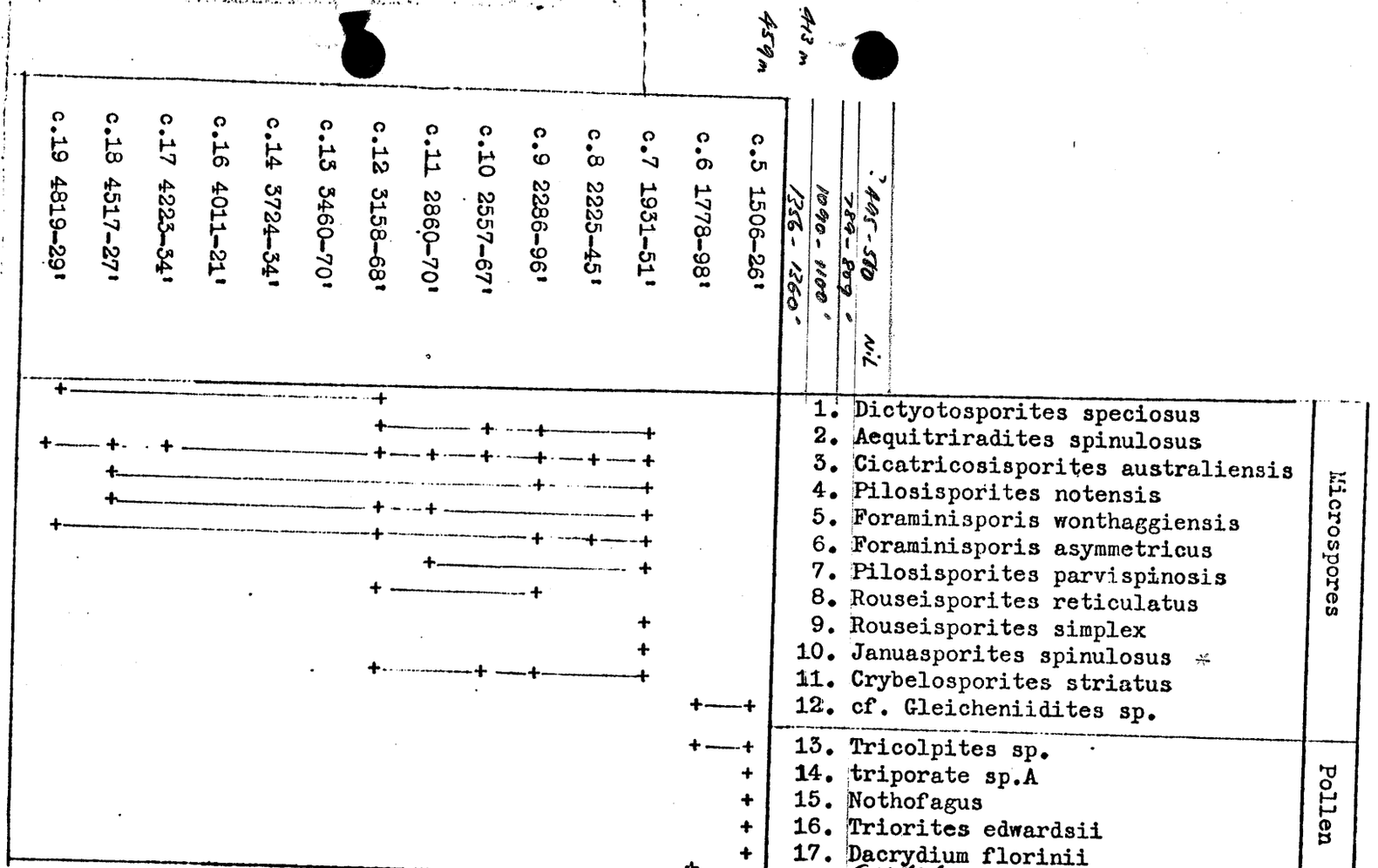

Table 1. Distribution of selected spores and pollen grains in ODNL Anglesea No.1 well between 1506 feet and 4829 feet. Samples lower (5161 - 10,065 feet) in the sequence did not provide any identifiable species.

\+ = species present