PALYNOLOGICAL REPORT ON THE FAHLEY NO. 1 WELL FOR BEACH PETROLEUM N/L.

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INTRODUCTION

Samples from the Beach Petroleum well, Fahley No. 1, were examined for palynological dating purposes. The well is located near Dartmoor in south-western Victoria.

All the samples examined are cuttings and the reliability of the age determinations is only fair.

Contamination from uphole is evident in most of the samples, either from Tertiary (early Eocene and Paleocene) or from younger Late Cretaceous sediments.

There is also evidence of re-working of Permian and Early Cretaceous deposits.

A Kerogen and thermal maturation analysis was made for each of the samples although the reliability of this type of analysis for cuttings must also be considered to have low reliability.

RESULTS OF PALYNOLOGICAL DATING OF FAHLEY NO. 1

SAMPLE DEPTH (m)	CONFIDENCE RATING	AGE	SPORE-POLLEN ZONE (DETTMANN & PLAYFORD 1969)
2020-2030	3	Senonian : late Santonian to middle Campanian	
2300-2310	3	Senonian : early Santonian to middle Campanian	Mid T.pachyexinus Zone to middle Campanian
2400	3	Early Turonian to early Campanian	C.triplex Zone to early Campanian
2671	3	Early Turonian	Early C.triplex Zone
2815	3	Late Cenomanian to early Turonian	Late A.distocarinatus to early C.triplex Zones
2925	3	"	"
3055	3	Early-mid Cenomanian	Early A.distocarinatus Zone
3200	3	"	"

CONFIDENCE RATINGS.

0-2. Apply to SWC and core material only.
3. Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
4. Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

SPECIES LIST : FAHLEY NO.1

SPORE-POLLEN DEPTH (m)	2020-2030	2300-2310	2400	2671	2815	2925	3055	3200
Alisporites grandis				x			x	
Amosopollis cruciformis		x	x	x	x			
Appendicisporites distocarinatus							x	
Araucariacites australis	x							
Arcellites reticulatus				x			x	
Australopollis obscurus	x				c			
Baculatisporites comaumensis		x		x	x	x	x	
Balmeisporites glenelgensis				x			x	x
B.holodictyus				RW				x
Bankseidites elongatus			c					
Ceratosporites equalis	x		x					
Cicatricosisporites australiensis		x		x	x		x	x
C.cuneiformis	x		x	x	x		x	x
C.hughesi						x		
C.ludbrooki								RW
C.pseudotripartitus					x	x		x
Classopollis cf C.chateaunovi					x			x
C.classoides							x	
Clavifera triplex		x	x	x	x	c	c	
Cyathidites asper				x	x			
C.australis		x		x	x	x		x
C.minor	X							
Dictyotosporites complex		x		RW				
D.speciosus				RW	RW	RW		
Dilwynites granulatus		c						
Foraminisporis dailyi	x							
Gambierina edwardsii		c						

SPORE-POLLEN	DEPTH (m)	2020-2030	2300-2310	2400	2671	2815	2925	3055	3200
G.rudata		x	x						
Gingkocycadophytus nitidus					x				
Haloragacidites harrisii		c		c			c		
Intratriporopollenites notabilis					c				
Kraeuselisporites jubatus								x	
K.majus					RW			x	
Laevigatosporites major			x	x				x	
Latrobosporites amplus		x							
L.ohaiensis			x						
Lyqistepollenites florinii					c				
Malvacipollis diversus		c		c	c				
Microcachyridites antarcticus		x	x	x	x	x			x
Myrtaceidites sp.		c			c				
Nothofagidites endurus			c						
Ornamentifera sentosa		x	x						
Osmundacidites wellmanii		x	x	x	x				x
Parasaccites gondwanensis		RW	RW		RW	RW	RW		
Phimopollenites pannosus				x				x	x
Phyllocladidites mawsonii		x	x	x	x		x	x	
Pilosisporites grandis									RW
P.parvispinosus					RW				
Podocarpidites ellipticus				x					
Podosporites microsaccat us					x		x	x	x
Polycolpites sp.		c							
Proteacidites amolosexinus		x		c	c				
P. of P.angulatus		x							
P.crassus		c							
P.grandis		c	c		c				

SPORE-POLLEN	DEPTH (m)	2020-2030	2300-2310	2400	2671	2815	2925	3055	3200
P.kopiensis		C			C				
P.leightonii					C				
P.ornatus			C						
Tricolpites gillii		x							
Trilobosporites tribotrys			RW						
Triorites minor		x			x	x	x		
Triporopollenites cf T.sectilis		x							
Triporoletes reticulatus			x		x				
T.radiatus			x						
Tsugaepollenites dampieri								x	
T.trilobatus								x	

MICROPLANKTON	2020-2030	2300-2310	2400	2671	2815	2925	3055	3200
aff.Adnatosphaeridium chonetum	x							
Batiacasphaera scrobiculata	x							
Canningia rotundata	x							
Ceratiopsis obliquipes	c							
Cleistosphaeridium ancoriferum							x	
Cribroperidinium edwardsii				x				x
Cyclonephelium compactum		x			x		x	x
C.distinctum	x	x	x		x		x	x
Deflandrea spp.	x					x		
Dinogymnium nelsonense	x							
Exochosphaeridium cf.E.phragmites	x	x					x	
Fromea amphora		x						
F.fragilis				x	x	x		
Heterosphaeridium heteracanthum	x	x					x	
Hystrichosphaeridium cf.H.difficile	x							
Isabelidinium cretaceum	x							
I.sp. cf I.druggii		x						
aff.Kallosphaeridium romaense					x			
Leptodinium cf L.simplex	x							
O.operculata	x	x						
Oligosphaeridium pulcherrimum							x	
Spinidinium sp.		x						
Spiniferites ramosus	x	x		x	x		x	
S. cf S.wetzelii		x						
Trichodinium hirsutum	c							

c = cavings
RW = re-worked

KEROGEN ANALYSIS : FAHLEY NO.1

DEPTH (m)	TAI	SPORE-POLLEN (%)	MICROPLANKTON (%)	STRUCTURED TERRESTIAL (%)	BIODEGRADED TERRESTIAL (%)	INERT OPAQUE FUSIAN (%)	AMORPHOUS SAPROPELIC (%)
2020-2030	4	3.0	x	2.5	31.0	64.0	-
2300-2310	4	x	x	x	13.0	87.0	1.0
2400	4	0.5	x	x	6.5	93.0	-
2671	4	2.5	x	-	15.0	79.5	2.9
2815	4	1.0	x	-	24.0	72.5	2.5
2925	4	x	x	-	9.5	89.0	1.5
3055	+4	x	x	x	45.0	60.0	1.5
3200	+4	1.0	x	6.0	35.0	72.5	x

% to nearest 0.5

DISCUSSION AND CONCLUSIONS

a) PALYNOLOGY OF THE SEDIMENTS

2020-2030m: A possible age of late Santonian to middle Campanian is suggested by the occurrence of the spore-pollen species L.amplus, O.sentosa, T.gillii, P.amolosexinus and G.rudata. Dinoflagellate species present which are restricted to the Senonian, or have their first or final appearance during this time are I.cretaceum, H.heteracanthum, C.rotundata, D.nelsonense and O.operculata.

2300-2310m: The spore-pollen species O.sentosa, C.triplex and L.ohaiensis together in the assemblage, suggest an age range of early Santonian to middle Campanian.

2400m: The palynomorph yield from this deposit was low, and basing the age range on the species C.triplex alone (other index fossils not being observed) the possible age range is early Turonian to early Campanian. i.e. from the base of the C.triplex Zone to the early Campanian.

2671m: The assemblage contains the spore-pollen species B.glenelgensis which ranges from the early Cenomanian to the early Santonian, and the dinoflagellate species C.edwardsii which has its final appearance in the early Turonian. A possible age range of early Cenomanian to early Turonian is indicated. i.e. early A.distocarinatus to early C.triplex Zones. The presence of C.triplex, if not from cavings, may indicate the early part of the C.triplex Zone. i.e. early Turonian .

2815-2925m: The presence of the spore-pollen species T.minor suggests that the assemblage is not older than the late A.distocarinatus Zone. i.e. late Cenomanian.

3055m: This is the youngest sample in which the species A.distocarinatus is observed, and this species together with B.glenelgensis, P.pannosus and K.jubatus indicate an early-mid Cenomanian age. i.e. early A.distocarinatus Zone.

3200m: A similar assemblage to 3055m is present at this depth and a similar age is indicated.

b) KEROGEN ANALYSIS

The samples are all considered to be of 4 or 4+ on Batten's TAI scale. That is, based on a subjective observation of an unornamented spore(s) the colour corresponds to a 4. i.e. light-medium brown; or a +4, which lies between 4 and 5 (dark brown). This colour falls within the wet or dry hydrocarbon generation range. All samples are high in inert, opaque material. Structured terrestial material is low in all samples but biodegraded terrestial material occurs significantly in all samples, and is highest at 2020-2030m, 3055 and 3200m.

The organic constituents of these samples, while comprising mainly opaque material and recognizable plant debris, do contain some amorphous material. From Staplin 1969, a mixture of amorphous and recognizable plant material tends to have "wet" hydrocarbon potential.

It should be noted that the percentages determined do not take into account whether or not the material is derived from re-worked, in situ or caved material. As such, the reliability of the analysis cannot be accepted with a high degree of confidence.

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