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Mr B Simons
Manager, Basin Studies
Geological Survey of Victoria
Department of Energy & Minerals
Private Bag No. 1
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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 <u>force</u> 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