1.1. THE FORAMINIFERAL SEQUENCE in PISCES # 1.

Fifty sidewall cores were examined from PISCES # 1. The sequence is divisible into an upper, *carbonate* marine unit and an underlying series of *non-carbonate*, marginal marine to non-marine units. The absence of planktonic foraminifera in the *non-carbonate* series prohibits any comment regarding biostratigraphy or age in this report (refer Palynology). However, the *carbonate* unit contains a number of planktonic foraminiferal assemblages, thus permitting precise biostratigraphic designation as summarised below:-

Sidewall Cores Depth(m)	Approx. E-Log Unit Boundary	Age	Zone*	Paleoenvironment¶
1075.2 to 1155.0		Mid Miocene	D-1	Mid Shelf (≈100m)
	?			
1198.5 to 1464.0		Mid Miocene	D-1 to D-2	Outer Shelf Canyon (≈150m)
	?			
1475.0 to 1604.0		Mid Miocene	D-2 to E-1	Shelf Edge Canyon (≈200m)
	?			
1620.0 to 1681.5		Early Miocene	E-2	Shelf Edge Canyon (≈200m)
	?			
1684.5 to 1794.5		Early Miocene	F to G	Prograding Wedge at Shelf/Slope Break (≈200m)
	1796			
1796.5 to 2320.5		? No planktonic foraminifera found	?	Marginal marine *non-carbonates*

* Planktonic foraminiferal zonation after Taylor (in prep). This report includes distribution chart for Pisces on Table 1 with reliability of zonal determinations.

¶ Interpretation based on distribution of selected benthonic foraminiferal species and other sediment grains (<.075mm) as shown on Table 2 of this report. Paleobathymetric ranges are in parentheses.

The sidewall core at 1794.5 representing the base of the carbonate sequence, contains an "upper" Zone G assemblage, indicating an Early Miocene age at approximately 18 million years ago. The sequence continued, apparently uninterrupted,to at least the mid Miocene Zone D-1 at 1075. (The sidewall core at 1075.2m was the highest recovered in Pisces # 1.)

Faunal and other sediment grains in the basal part of the carbonate sequence (1794.5 to 1684.5) indicate a progr ding wedge of the shelf edge. This wedge probably resulted from distal, carbonate sediment discharge from a submarine canyon which was apparent as canyon fill at and above 1681.5m.

The *non-carbonate* series between 1796.5 and 2320 contain at least three lithological units, with no planktonic foraminifera and only sporadic benthonic foraminifera and fish fragments. However, some sidewall cores were heavily contaminated with mid Miocene from the carbonate unit above (for example at 2097).

Directly below the carbonate unit were two "Greensand" units; each lithologically distinct from the other. The higher one, from 1796.5 to 1803.0 was a fine quartz, qlauconitic clayey sandstone containing some coarse wind blown quartz grains. This unit may represent the "Lakes Entrance Greensand", but this cannot be confirmed either micropaleontologically or palynologically. The lower "Greensand", from 1808.5 to 1825, was coarser grained with distinct pellet glauconite which was oxidised to limonite in the top half of the unit (1808.5 to 1816.5).

Palynological examinations (see Palynology Report) revealed that dinoflagellates and spore/pollen were present only below this oxidised horizon (i.e. at and below 1820.5). These microfloras were of Late Cretaceous age and were dominated by low specific diversity dinoflagellate assemblages. The sporadic benthonic foraminiferal assemblages, between 1820.5 and 2320 were composed completely of arenaceous forms (refer Table 2 - this Report). These forms were euryhaline, tolerating fluctuating salinities; conditions also indicated by the low diversity nature of the dinoflagellate assemblages. Therefore we interpret that sedimentation between 1820.5 to at least 2320 took place in marginal marine situations such as lagoons, estuaries and delta fronts.

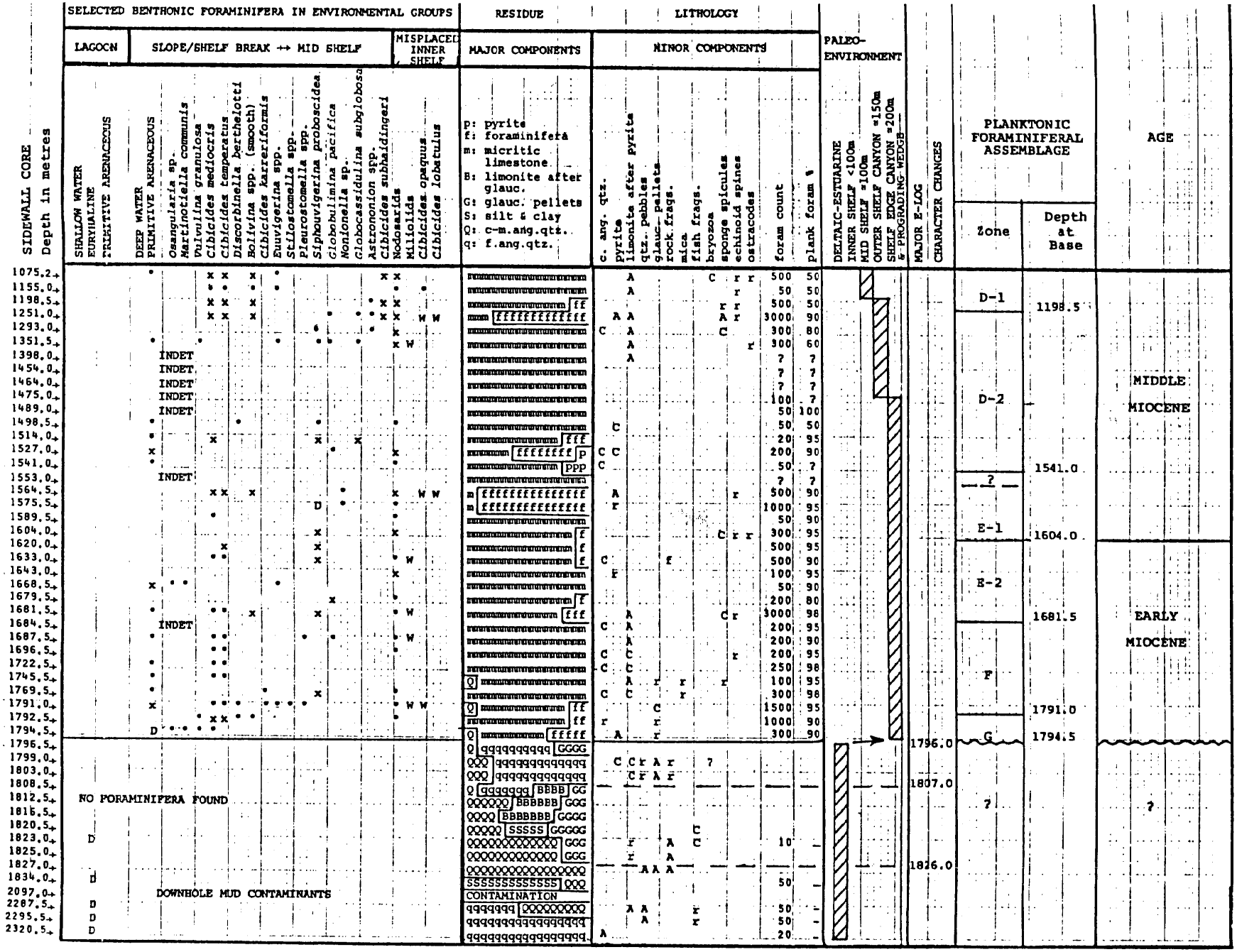
TABLE 1 PLANKTONIC FORAMINIFERAL DISTRIBUTION - PISCES # 1
Paltech Report 1982/18

SIDEWALL CORE Depth in metres	PLANKTONIC FORAMINIFERA																					PLANKTONIC FORAMINIFERAL ASSEMBLAGE		AGE
	G'oides trilobus	*G'alia bella*	*G'alia continuosa*	*G'alia nana*	*G'alia zealandica* (S.S.)	*G'quad dehiscens* (S.L.)	*G'quad dehiscens* (S.S.)	*G'quad advena*	*G'quad venezuelana*	*G'ina bulloides*	*G'ina woodi connecta*	*G'ina woodi woodi*	*Cat. dissimilis*	*G'oides bispherícus*	*G'oides trilobus* (elongate)	*G'alia siakensis*	*G'alia miozea miozea*	*G'alia praescitula*	*Praeorb. glomerosa*	*G'alia peripheronda*	*G'quad altispira*	*G'alia conica*	*Orb. suturalis*	*Orb. universa*	*G'alia praemenardii*	*G'alia miozea conoidea*	*G'ina ciperoensis*	ZONE	Depth at Base	
1075.2	x									x	x												x		x				
1155.0	x									x	x												x						
1198.5	x									x	x											o	x	o	x	o	D-1	1198.5	
1251.0	x	x			x					x	x		x			x	x	x	o	o		x	o	x	x	x	x		
1293.0	x									x			x				x	x					x	x	x				
1351.5	x									x							x	o					x	x	x				
1398.0										x	?												o		o				
1454.0										x	?												o		x				
1464.0										x	?												o		o				MIDDLE
1475.0	o					o				x				o			o						x				D-2		MIOCENE
1487.0						o				x							o	o					o	o					
1498.5										x													x						
1514.0	x			x		x	o			x	x		x			x	x	x			o	o	o	o					
1527.0	x			o		x	o			x	x		x				o	o				o	o						
1541.0	o			o						o	o		o				o						o					1541.0	
1553.0	INDET																										?		
1564.5	x	x		x						x	x	x	x				x	x	x	x		x							
1575.5	x	x		x						x	x	x	x				x	x	x			x							
1589.5							o			x									o								E-1		
1604.0	x			x			o			x	x	x					x	x	x			x						1604.0	
1620.0	x	x		x		x	o			x	x	x	x			o	x	x	x	o	o	o							
1633.0	x	x		x		x				x	x	x	x			o	x	x	x	o		o							
1643.0	o						o			o			o								o						E-2		
1668.5	o			o		o	o			o	o	o					o												
1679.5		x				x	x	x	x		x		x				x	x	x											
1681.5	x	x	x		o	x	x	?	x		x	x	x	x	x	x	x	x	x	x	o							1681.5		EARLY
1684.5	o			x		x			x		x		o				x	x												MIOCENE
1687.5						o	o		x		x		o				o													
1696.5	x	?	?	?							x		o																	
1722.5	x	o	x		x		o	?	x	o	x		x				x										F			
1745.5	o								x		x		o				o													
1769.5	x	o	x		o				x	x	x		x		o		o													
1791.0	x	x	x		x		x		x	x	x	x	x	x	x	x	x											1791.0		
1792.5	x	o	x	x	o	x	x			x	x	x	x																	
1794.5	x	o	x	x	o	o	o	o	o	x	x	x															G	1794.5		
1796.5	NO PLANKTONICS SEEN																										?		?	
1799.0																														
1803.0																														
1808.5																														
1812.5																														
1816.5																														
1820.5																														
1823.0																														
1825.0																														
1827.0																														
1834.0																														
2097.0	DOWNHOLE MUD CONTAMINANTS from Zone D-2																													
2287.5	NO PLANKTONICS SEEN																													
2295.5																														
2320.5																														

KEY:

o = <20 specimens
x = >20 specimens
D = Dominant >60% specimens

INDET = indeterminate because of recrystallisation
? = identification doubtful because of recyrstallisation.



KEY: * = <20 specimens
x = >20 specimens
D = Dominant >60% of assemblage
W = Worn specimens

TABLE 2: SIGNIFICANT BENTHONIC FORAMINIFERAL DISTRIBUTION, RESIDUE LITHOLOGY & PALEOENVIRONMENTAL ASSESSMENT- PISCES # 1

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 22.0m GL: 122.0m

WELL NAME: PISCES # 1 TOTAL DEPTH:

AGE		FORAM. ZONULES	HIGHEST DATA					LOWEST DATA				
			Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEISTOCENE		A_1										
		A_2										
PLIOCENE		A_3										
		A_4										
MIOCENE	LATE	B_1										
		B_2										
		C										
	MIDDLE	D_1	1075.0	2				1198.5	1			
		D_2	1251.0	0				1541.0*	1			
		E_1	1564.9*	0				1604.0	0			
		E_2	1620.0	0				1681.5	0			
	EARLY	F	1684.5	1				1791.0	0			
		G	1792.5	1				1794.5	0			
		H_1										
OLIGOCENE	LATE	H_2										
		I_1										
		I_2										
	EARLY	J_1										
		J_2										
EOCENE		K	?¶β					?¶β				
		Pre-K	¶α					¶α				

COMMENTS: * SWC at 1553 contained indeterminate planktonic specimens due to carbonate recrystallisation.

¶ 10 SWCs of "Greensand" sediments contained no planktonic assemblages, but can be divided lithologically into two units, namely:-

?¶β from 1796.5 to 1803.0 possibly ≡ "Lakes Entrance Greensand"

¶α and from 1808.5 to 1825.0 to ? 1827.0

CONFIDENCE RATING:

- 0: SWC or Core - Complete assemblage (very high confidence).
- 1: SWC or Core - Almost complete assemblage (high confidence).
- 2: SWC or Core - Close to zonule change but able to interpret (low confidence).
- 3: Cuttings - Complete assemblage (low confidence).
- 4: Cuttings - Incomplete assemblage, next to uninterpretable or SWC with depth suspicion (very low confidence).

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

[redacted]