FORAMINIFERAL ANALYSIS OF WIRRAH-2, GIPPSLAND BASIN.

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PART 1

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INTRODUCTION

Sidewall core samples from Wirrah-2 range in age from Zone H1 to Zone D. (early Early Miocene to Middle Miocene) a very similar pattern to that obtained in Wirrah-1 (Rexilius 1983).

Because of extensive caving at the base of the Lakes Entrance Formation/Top of Latrobe Group no sidewall cores were able to be taken over this critical interval therefore cuttings have been examined. Ages obtained from these samples are, however, inconclusive. Lithological evidence suggests that the top of Latrobe boundary occurs within the 5m. interval between 1485.0m and 1490.0m.

TABLE 1, GEOLOGICAL SUMMARY - WIRRAH 2.

sea floor			
Middle Miocene	GIPPSLAND LIMESTONE	Preservation deteriorating. Abundant bryozoal remains, sponge spicules and echinoid spines.	Zone D (840.14m to 1179.37m)
Late Early Miocene			Zone F (1249.01m to 1271.19m)
Early Miocene	LAKES ENTRANCE FORMATION	Increasing amount of carbonate	Zone G (1313.99m to 1456.63m)
Early Early Miocene		Sandy, glauconitic at base	Zone H 1 (1463.65m)
between 1485 and 1490m			
Early Oligocene or older	? GURNARD FORMATION	Dominately glauconite	Minimum age ZONE J2
between 1505 and 1510m			
	LATROBE COARSE CLASTICS		
TD 3084.0m			

GEOLOGICAL COMMENTS

1. TOP OF LATROBE

Caving across the top of Latrobe Group makes the exact placement of the Latrobe Group/Lakes Entrance Formation boundary almost impossible. Lithological examination of the washed residues of cuttings between 1510.0m and 1480.0m suggests that the boundary lies within the five metre interval between 1485.0m and 1490.0m. This conclusion is derived from the amount of glauconite in washed residues.

The sample from 1510.0m to 1505.0m is a fine grained quartz sand containing less than 5% glauconite. Upsection, glauconite levels increase reaching 40-50% between 1485.0 and 1490.0m suggesting that this sample is largely from the Gurnard Formation. In the next sample (from 1480.0m to 1485.0m,) glauconite levels decrease sharply (Basal Lakes Entrance Formation). Continuing upsection glauconite levels quickly drop away to Zero. At the same time the carbonate content of samples increase.

The ages of the cuttings are imprecise due to the swamping by downhole contamination. Samples from above the top of the Latrobe Group are of indeterminate age whereas those from below this level are assigned a minimum age of J2 (Early Oligocene).

2. COMPARISON WITH WIRRAH-2.

For the most part the age determinations reported here are identical with Wirrah-1, there are two exceptions:

a) the thickness of H1 (Early Miocene) is thinner in Wirrah-2 than in Wirrah-1, this is probably due to :
   1) better sidewall core control in Wirrah-2, and
   2) difficulty in consistantly separating Globigerinoides quadrilobatus trilobus and Globigerina woodi connecta.

b) The lack of Zone C in Wirrah-2 is due to the non-recognition of Globorotalia miotumida miotumida. Supporting evidence for the absence of this zone is the recognition of Globorotalia fosi peripheroronda up to the topmost sample examined.

BIOSTRATIGRAPHY

1. Preservation.

In the lowest part of the marine section of Wirrah-2 (Zones Hl to F) is, in general, very good. Both the planktonic and benthonic assemblages obtained from samples within this interval are quite diverse. Unfortunately this situation does not continue up section. Above Zone F the carbonates become increasingly recrystalised, preservation and yield deteriorates and zonal assignments become more difficult.

2. Zonal determination.

Zone J2 (Early Oligocene) or older, cuttings between 1510.0m and 1475.0m.
Planktonic assemblages derived from this interval are well preserved and exceedingly diverse. Unfortunately only Globigerina angiporoides and Globorotalia postcretcea can be considered as not being derived from down-hole contaminants and hence used to derive an age. The presence of these species suggests a minimum age of J2 (Early Oligocene). A painstaking search for species such Globigerina linaperta which would have further refined the age determination was unsuccessful.

Zone Hl (early Early Miocene), SWC 12 (1463.65m).
The presence in this single sample of Globigerina woodi connecta without Globigerinoides quadrilobatus trilobus is indicative of an Early Miocene (Hl) age. The sample yielded a moderately diverse assemblage including Globorotalia obesa, Globorotalia opima nana and Catapsyderax dissimilis.

Zone G (Early Miocene), SWC 13 (1456.63m) to SWC 20 (1313.99m).
The appearance of Globigerina quadrilobatus trilobus in sidewall core 13 at 1456.63m marks the base of a thick (150m) sequence of Zone G age sediments. Preservation throughout the interval is very good and planktonic diversity is moderate to high. As expected Catapsyderax dissimilis is confined to the base of the sequence. SWC 20 at 1313.99m is unusual in the number of specimens of Globoquadrina dehiscens present. This species which normally only makes up a small proportion of an assemblage is here the most dominant planktonic form. Both the ss and sl forms are present.

Zone F (late Early Miocene), SWC 21 (1271.19m) to SWC 22 (1249.01m).
Both sidewall cores assigned to this zone contain Globigerinoides sicanus without Praeorbulina glomerosa or either form of Orbulina.

Zone D (Middle Miocene) SWC 23 (1179.37m) to SWC 30 (840.14m).
The presence of Orbulina universa in all remaining sidewall cores without Globorotalia miotumida miotumida is indicative of Zone D. The presence of Globorotalia fosi peripheroronda throughout the interval supports this zonal assignment. Restricted to this interval is Globorotalia praemenardii which Taylor has reported to be extinct by D1 time. However, because of the thickness of the interval (340.0m) one is hesitant to assign it all to D2: suggesting instead that this species ranges higher than previously thought.

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 21.0 GL: -50.0

WELL NAME: WIRRAH-2 TOTAL DEPTH: 2375.0

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										
		D_2	840.14	2				1179.37	1			
		E_1										
		E_2										
	EARLY	F	1249.01	0				1271.19	0			
		G	1313.99	1				1456.63	0			
		H_1	1463.65	1				1463.65	1			
OLIGOCENE	LATE	H_2										
		I_1										
		I_2										
	EARLY	J_1										
		J_2										
EOCENE		K										
		Pre-K										

COMMENTS: Cuttings from 1485.0m to 1510.0m are assigned a minimum age of J2.
The lack of Zone E is probably a result of a sample gap.

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.

DATA RECORDED BY: M.J. Hannah. DATE: 24th June, 1983.

DATA REVISED BY: DATE:

TABLE 2, INTERPRETATIVE DATA WIRRAH-2.

SIDEWALL CORE NO.	DEPTH (M)	MICROFOSSIL YIELD	MICROFISSIL PRESERVATION	PLANKTON DIVERSITY	ZONE (RATING)	AGE
SWC 30	840.14	Moderate	Poor	Low	D(2)	Middle Miocene
SWC 29	871.19	Very Low	Very Poor	Low	D(2)	Middle Miocene
SWC 28	933.88	Very Low	Very Poor	Low	D(2)	Middle Miocene
SWC 27	975.03	Very Low	Very Poor	Very Low	D(2)	Middle Miocene
SWC 26	1029.27	Very Low	Very Poor	Very Low	D(2)	Middle Miocene
SWC 25	1073.85	Very Low	Very Poor	Low	D(2)	Middle Miocene
SWC 24	1134.54	Moderate	Moderate	Low	D(1)	Middle Miocene
SWC 23	1179.37	Moderate	Poor	Low	D(1)	Middle Miocene
SWC 22	1249.01	High	Good	Moderate	F(0)	Early Miocene
SWC 21	1271.19	High	Very Good	High	F(0)	Early Miocene
SWC 20	1313.99	High	Very Poor	Moderate	G(1)	Early Miocene
SWC 19	1380.61	Moderate	Poor	Moderate	G(1)	Early Miocene
SWC 18	1431.98	High	Good	High	G(0)	Early Miocene
SWC 17	1441.85	High	Good	High	G(0)	Early Miocene
SWC 15	1450.67	Moderate	Good	High	G(0)	Early Miocene
SWC 14	1459.57	High	Good	Moderate	G(1)	Early Miocene
SWC 13	1456.63	High	Moderate	Moderate	G(0)	Early Miocene
SWC 12	1463.65	High	Moderate	Moderate	H1(1)	Early Miocene
CTS	1465.0-1470.0	High	Good	Moderate	?	Indeterminate
CTS	1470.0-1475.0	High	Good	Moderate	?	Indeterminate
CTS	1475.0-1480.0	High	Very Good	High	?	No younger than J2 (Early Oligocene)
CTS	1480.0-1485.0	High	Good	High	?	Indeterminate
CTS	1485.0-1490.0	High	Good	High	?	No younger than J2 (Early Oligocene)
CTS	1495.0-1500.0	High	Good	High	?	No younger than J2 (Early Oligocene)
CTS	1505.0-1510.0	High	Good	High	?	Indeterminate

BASIC DATA

SUMMARY TABLE

RANGE CHART

TABLE 2, INTERPRETATIVE DATA WIRRAH-2.

SIDEWALL CORE NO.	DEPTH (M)	MICROFOSSIL YIELD	MICROFOSSIL PRESERVATION	PLANKTON DIVERSITY
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SWC 21	1271.19	High	Very Good	High
SWC 20	1313.99	High	Very Poor	Moderate
SWC 19	1380.61	Moderate	Poor	Moderate
SWC 18	1431.98	High	Good	High
SWC 17	1441.85	High	Good	High
SWC 15	1450.67	Moderate	Good	High
SWC 14	1459.57	High	Good	Moderate
SWC 13	1456.63	High	Moderate	Moderate
SWC 12	1463.65	High	Moderate	Moderate
CTS	1465.0-1470.0	High	Good	Moderate
CTS	1470.0-1475.0	High	Good	Moderate
CTS	1475.0-1480.0	High	Very Good	High
CTS	1480.0-1485.0	High	Good	High
CTS	1485.0-1490.0	High	Good	High
CTS	1495.0-1500.0	High	Good	High
CTS	1505.0-1510.0	High	Good	High