FORAMINIFERAL SEQUENCE

KINGFISH # 7

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SUMMARY

The Oligocene to early Miocene faunas in Kingfish # 7 comprises the normal sequence of events of the deep water deposition in the Gippsland Basin. The mid Oligocene hiatus, "The Cobia Event" *is recognised both in Kingfish # 6 and # 7. In # 7 a speculated 500 feet water depth increase immediately after the hiatus may suggest that the event may have been partially due to a eustatic sea level decline.*

The samples between 6040 and 4650 were submitted in a labelled order which does not conform to the established faunal sequence of biostratigraphy and environmental events during the mid Miocene of Gippsland. The reason for this muddling is inexplicable at present. It may be coincidental, but 3 out of 9 Kingfish sequences were found to deviate from the norm, whilst only 3 of 61 other Gippsland offshore sequences showed any disorder.

INTRODUCTION

Five samples of conventional core # 2 and sixty four sidewall core samples were submitted for examination from KINGFISH # 7. No fauna was found in any of the conventional core samples whilst the twelve sidewall core samples between 7480 and 7420 were either barren of fauna or contained no diagnostic fauna (see Sample Data Sheets).

It is important to note that the data in this report and accompanying data sheets is related to the depths (in feet) and sample numbers as written on the sidewall core jars on the drilling ship immediately after retrieval of the sidewall cores.

Upon examination it was realized that thirteen sidewall cores between 6040 and 4650 were biostratigraphically muddled, in that the upwards zonal sequence was D-1 to E-1 to D-2, instead of the established sequence of E-1 to D-2 to D-1. Moreover the normal environmental sequence from a dominantly pelagic carbonate at the base of the slope to a canyon fill carbonate at the top of the slope was reversed. The reason for this apparent confusion is inexplicable and for the present unresolvable. The possibility of disturbance of the sequence by some geological phenomena has been considered and dismissed by Esso geologists. The suggestion that the sidewall cores were inadvertently mislabelled, either on the rig or during my processing, cannot be substained logically, as the foraminiferal evidence gives no pattern which can be corrected by straight substitution of depths and sidewall core numbers. This leads to the third possibility that my biostratigraphic scheme is "busted".

I could vehemently argue that my biostratigraphic sequence is firmly established by observation over southern Australia and that it correlates closely, if not exactly, with that in New Zealand. In the seventy Gippsland offshore wells examined, only four of the sequences have deviated from the established norm (including Kingfish # 7); i.e. 5.7% deviation. This percentage deviation of the biostratigraphic scheme is increased to 8.6%, if Kingfish # 1 & # 4 are included as they were in proper sequence yet could not be reconciled with the E-log correlations. Either figure is low and places more emphasis on the possibility of

of geological distrubance in Kingfish # 7 or of muddling at some stage during collection and processing of the samples.

However, when the nine wells from the Kingfish structure are considered, a 33.33% aberration is apparent, as Kingfish # 1, # 4 and # 7 do not conform biostratigraphically with E-log and seismic correlations. Upon comparison this is much greater than in the sixty one other Gippsland sequences where the deviation is only 4.9%. Unless this comparative unorthodoxy of the Kingfish structure is dismissed as sampling and/or labelling errors, then for some reason this structure is geologically anomalous.

Apart from the factual determinations (i.e. not reconciled) on the Sample Data Sheets, no data has been collated for samples above 6147 on the following attached data sheets:-

Distribution Chart Sheet 1 - showing distribution of planktonic foraminifera and the basis of biostratigraphic breakdown.

Distribution Chart Sheet 2 - giving the distribution of benthonic foraminifera and relative specimen count.

Four Sample Data Sheets - listing all samples, giving zonal entity and quality and summarizing residue grain character.

Biostratigraphic Data Sheet

BIOSTRATIGRAPHY

The Eocene/Oligocene/early Miocene sequence from 7435 to 6248 in Kingfish # 7 is a normal one in that all events occur in the established order, including the hiatus within the late Oligocene between 7386 and 7376. The muddled sequence above 6248 will be discussed in a separate section after the environmental discussion of the normal sequence.

LATE EOCENE - ? to 7435 to ?:- Occasional sample between 7465 and 7415 contain nondescript foraminiferal fauna, but the sidewall core at 7430 has a purely planktonic fauna consisting of *"Globigerina" ampliapertura*,

Subbotina angiporoides, S. linaperta and *Globorotalia insolita*. The first three listed species define a Zone K association, whilst the later species, a new record for southern Australia, has been found only in the *S. linaperta* Zone in New Zealand (Jenkins, 1971). This sample is believed to correlate with the top of the *S. linaperta* Zone in New Zealand.

EARLY OLIGOCENE - ? to 7410 to 7386:- The sample at 7415 contains *Subbotina angiporoides* and the benthonic nodosarid *Vaginulopsis gippslandica* which Crespin (1950) described from the basal part of the Lakes Entrance Formation. I have only observed it in this stratigraphic position and believe it to be restricted to the "Greensand" and the very basal level of the "marl". Although it is really a lithological correlation, the sample at 7415 is probably basal Oligocene as it shows all the faunal and sediment grain characters of the Lakes Entrance "Greensand".

Globigerina brevis was associated with the fauna at 7410 indicating the early Oligocene Zone J-2. A more diverse and characteristic (high quality) J-2 planktonic association was present at 7407. At 7405 the presence of *Globoquadrina tripartita tripartita* and *G. tripartita tapuriensis* was diagnostic of Zone J-1. The top of Zone J-1, which was the top of the early Oligocene is placed at the range top of *Subbotina angiporoides* at 7386. Although this sample is of low diversity and thus of poor quality, the selected biostratigraphic event is consistent with correlation of the top of J throughout the Basin.

MID OLIGOCENE HIATUS "THE COBIA EVENT" - 7386 to 7376:- Although the sample spacing was not as close as in Cobia # 2, a biostratigraphic gap is evident in Kingfish # 7 by the fact that the base of *Globoquadrina dehiscens* (S.L.) was only ten feet above the range top of *Subbotina angiporoides*. Other elements associated with *G. dehiscens* (S.L.) support a placement high in Zone I-1 for the sample at 7376. Therefore, as in Cobia # 2 (Taylor, 1977), Zone I-2, and the lower portion of Zone I-1 was missing.

A similar situation was reported by Taylor (1975) in Kingfish # 6 between 7589 and 7581.

LATE OLIGOCENE - 7376 to 7256:- As already stated, the association of *G. dehiscens* (S.L.) with *Globigerina euapertura* and *G. ciperoensis* places the sample at 7376 in the upper part of Zone I-1. The highest appearance of *G. euapertura* and *Globorotalia opima opima* marked the top of I-1 at 7356 and the incoming of *Globigerina woodi woodi* at 7336 the base of H-2.

EARLY MIOCENE - 7150 to 6248:- The base of the early Miocene and Zone H-1 in Kingfish # 7 was represented by numerically sparse, low diversity planktonic fauna so that the only diagnostic species was *G. woodi connecta*. The base was nowhere near as distinct as in other Kingfish wells (e.g. Kingfish # 6 - Taylor, 1975). This will be discussed in the section on environment. The only diverse planktonic fauna was at 6950 where a complete H-1 association, including *Globorotalia kugleri*, was present.

The normal Zone H-1 to G to F to E-2 sequence was recognised between 6950 and 6298 with the top of the early Miocene (=Zone E-2) being designated on the presence of *Praeorbulina glomerosa curva* at 6248.

ENVIRONMENT

This discussion is restricted to the normal Eocene/Oligocene/early Miocene sequence from 7435 to 6248. The confused section above 6248 is commented on in the succeeding section.

Benthonic foraminifera are so sparse in the probable late Eocene interval that no comment can be made. As mentioned, the sample at 7415 is regarded as an equivalent of the Lakes Entrance "Greensand", both faunally and sedimentologically. If this is correct then deposition would have been in relatively shallow water. However, the glauconite and solitary specimen of *Vaginulopsis gippslandica* could have been displaced into deeper water as the early Oligocene fauna at 7407 was certainly a deep water one in excess of 2000 feet of water.

The basal pure carbonate sample at 7410 is almost completely recrystalized as is common at the base of the carbonate sequence in most Gippsland

offshore sections. Immediately above, at 7407 there is a numerically rich and diverse planktonic fauna with dominantly arenaceous benthonic fauna which includes *Discammina compressa* and *Karreriella bradyi* with the calcareous benthonic species *Cibicides wuellerstorfi*. Such a fauna has a minimal depth of 1200 feet on the modern sea floor off Gippsland and is not noticeably abundant till 2000 feet (see discussion in Cobia # 2 report, p. 6-9 - Taylor, 1977). A continental rise situation is envisaged for the early Oligocene at 7407 in Kingfish # 7.

Between 7407 and 7386 the faunas fluctuate both numerically and in specific diversity with planktonic specimens being dominant (over 95%). At 7396 the total residue contained 70% juvenile and/or depauperate planktonic foraminifera (i.e. indeterminate). The fluctuations suggest changing circumstances in the physico-chemistry of the water mass which appears to have heralded the hiatus of "The Cobia Event" (refer Taylor, 1977, p.3-4) at or just above 7386 in Kingfish # 7, where a deep water sedimentation is evident.

After "The Cobia Event" (at 7376 in the late Oligocene) resumption of sedimentation was still in a deep water situation on the continental rise with a minimal depth, analagous with the present, of at least 2500 feet, assumed from the occurrence of *Osangularia* cf. *bengalensis* and *Epistominella exigua* (refer Taylor & Mee, 1970). Thus with an assumed water depth of 2000 feet below the hiatus and an assumed water depth of at least 2500 feet above the hiatus there could have been a eustatic sea level rise corresponding with the resumption of sedimentation. Although this is speculative a eustatic sea level decline may have been a causal phenomenon of"The Cobia Event". This postulated water depth increase after "The Cobia Event" is not apparent from the benthonic faunas in Kingfish # 6 or Cobia # 2 (Taylor 1975 & 1977).

The sharp decline in numerical frequency of planktonic foraminifera at the top of the Oligocene and basal Miocene is indicative of progressive paleotemperature drop. The benthonic components are the same as those at 7376 (late Oligocene) suggesting a maintenance of minimal water depth at 2500 feet. Paleotemperature warming is evident by a diverse H-1 fauna in the early Miocene at 6950. The benthonic fauna demonstrates a shallowing

with the initial appearance of the bathyal species *Euuvigerina maynei*. A modern analogue of this costate uvigerinid is not present off Gippsland today, but by comparative method it is believed to have been a continental slope inhabitant during the Neogene of southern Australia and New Zealand. A depositional situation at the base of the slope or on the lower slope could be interpreted with a minimal depth of 2000 feet, based on associated species. However, an appreciable increase in paleotemperature is apparent from the planktonic fauna, which could imply the lowering of the lysocline and the lowering of the minimal depth range of *E. maynei*. Thus the assumed water depth decrease may not have been real. Similar benthonic fauna continued to the top of the early Miocene, suggesting environmental maintenance with increasing sedimentation rate. But there were eposodic changes in the composition of the water mass, as shown by fluctuations in specimen numbers and the dominance of juvenile and/or depauperate planktonics during Zone G. This may have been a function of degree of penetration of a surface warm water mass rather than paleotemperature fluctuations.

THE CONFUSED SECTION

Thirteen side wall cores appear to have been biostratigraphically and environmentally muddled as discussed in the introduction and listed below:-

Side wall core #	Depth as on jar	Zone	Quality	Environment
74	4650	D-2	0	base of slope
73	4750	D-2	0	mid slope
72	4852	D-2	0	base of slope
71	4950	D-2	0	base of slope
70	5050	D-2	1	slope
69	5150	D-2	0	base of slope
68	No return			
67	5350	D-2	0	mid slope
66	5500	E-1	1	base of slope
65	5600	D-1	0	mid slope
64	5735	D-1	0	mid slope
63	5860	D-1	1	upper slope
62	5960	D-1	1	upper slope
61	6040	D-1	2	canyon

Above 4650 and below 6040 there are no obvious anomalies as the sequence of events are normal for the Kingfish structure.

Biostratigraphic disorder from 6040 to 4650 is immediately apparent as the up sequence events from E-2 to D-1, back to E-1 thence into D-2 suggests muddling. However, this cannot be explained easily by a model of sediment slumping down a slope or canyon as the quality and depositional environment of each of the samples in the Zone D-2 and D-1 groups are muddled and not in the established order of other Gippsland sequences.

(1) Normally the earliest D-1 samples are of high quality and the quality decreased upwards. The reverse is demonstrated in Kingfish # 7.

(2) The environmental trend on the Kingfish structure, during D-1 times was from a mid continental slope situation upwards into a submarine canyon carbonate fill. The reverse trend is interpreted for Kingfish # 7, using the same criteria as applied to other Kingfish sequences.

(3) Depositional environments during D-2 in Kingfish # 7, were haphazard and do not demonstrate a clear transition from a continental rise situation to one on the continental slope as would be expected from experience.

Therefore if the sediment had been slumped down the slope it would have occurred a number of times and not just once. But the major difficulty in the validity of this explanation is how deeper water deposits of Zones D-2 and E-1 came to be superimposed on the younger shallower water deposits of Zone D-1, without a major tectonic upheaval for which there is no other evidence on the Kingfish structure or elsewhere in Gippsland.

The sediment at and above 4550 was normal carbonate canyon fill, probably deposited in Zone D-1 times; planktonic fauna being as usual mostly indeterminate. At 3200 feet the Zone C planktonic fauna was associated with an outer continental shelf benthonic fauna.

A possible reconciliation to achieve the normal and established sequence of events over the muddled section between 6040 and 4650 could be as tabulated on page 8.

Side wall cores	# 61	
" " "	# 63 & # 62	D-1
" " "	# 64 & # 65	
" " "	# 69, # 71, # 72 & # 74	D-2
" " "	# 67, # 70 & # 73	
" " "	# 66	E-1
" " "	# 59	E-2
" " "	# 58 & # 57	F

REFERENCES

CRESPIN, I., 1950 - Some Tertiary foraminifera from Victoria, Australia. *Contr. Cushman Fdn. foram. Res.*, 1: 70-75.

JENKINS, D.G., 1971 - New Zealand Cenozoic planktonic foraminifera. *New Zealand Geol. Surv. Paleont. Bull.* 42.

TAYLOR, D., 1975 - Foraminiferal biostratigraphy and environmental analysis of Kingfish # 6. *Esso Aust. Paleont. Rep.*, 1975/2.

TAYLOR, D., 1977 - Foraminiferal sequence - Cobia # 2. *ibid*, 1977/21.

TAYLOR, D.J. & MEE, V.M., 1970 - Study of modern Gippsland sea floor. *ibid ?* .

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO: KINGFISH # 7 *DATE:* September 12, 7

PREPARED BY: DAVID TAYLOR *SHEET NO:* 1 of 4

DRAW:

DEPTH	*SAMPLE TYPE*	*SLIDES*	*ADDITIONAL INFORMATION*

WARNING

Side wall cores from 6147 to 4650 are biostratigraphically and environmentally disordered. They are listed factually according to depths and numbers on side wall core jars which may have been inadvertently mislabelled. The possibility of muddling due to sedimentary processes, such as slumping, cannot be considered from the evidence as the displaced D-2 faunas were originally deposited in deeper water than the D-1 faunas - see report.

7533	CC # 2	N.F.F. Dom f-c ang qtz, 20% py with ? glauc, 10% coal.
7545	CC # 2	N.F.F. Dom m-c ang qtz, 10% py with ? glauc, r c subr qtz.
7550' 10"	CC # 2	N.F.F. Dom c-m ang qtz, c subr qtz.
7555' 5"	CC # 2	N.F.F. Dom py silst, ? glauc, c ang qtz.
7556	CC # 2	N.F.F. Dom f-m ang qtz sdst, r c ang qtz.
7480	SWC 26	N.F.F. Dom m ang qtz sdst, r c ang qtz, r mica
7475	SWC 27	N.F.F. 50-50 m ang qtz sdst & lim slst, rc ang qtz, r mica
7470	SWC 28	N.F.F. ibid + r ? glauc
7465	SWC 29	U.C. indet, ibid.
7460	SWC 30	indet, ibid
7455	SWC 31	N.F.F. Dom m ang qtz with glauc clay, r mica
7450	SWC 32	N.F.F. Dom m-f ang qtz sdst wh clay
7445	SWC 33	N.F.F. ibid + r. py + r ? glauc
7440	SWC 34	N.F.F. Dom m-f ang qtz sdst with glauc lim clay + r mica
7435	SWC 35	K (1) ibid

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO: KINGFISH # 7

DATE: 13.9.77

PREPARED BY: DAVID TAYLOR

SHEET NO: 2 of 4

DRAW:

DEPTH	*SAMPLE TYPE*	*SLIDES*	*ADDITIONAL INFORMATION*
7430	SWC 36	N.F.F. Dom m-f ang qtz sdst with wh clay, r glauc r c ang qtz	
7425	SWC 37	N.F.F. Dom m-f ang qtz sdst with lim clay, 10% gla	
7420	SWC 38	indet Dom m-f ang qtz sdst with wh clay, 10% glauc	
7415	SWC 39	J-2(5) ? L.E. "Greensand" 60-40 m ang qtz & pel glauc	
7410	SWC 40	J-2(1) Most planks gone through recrylst,10% glauc	
7407	SWC 41	J-2(O) 50-50 fair planks & calc sh, lim staining	
7405	SWC 42	J-1(O) 60-40 calc sh & poor planks	
7396	SWC 43	J-1(1) 70-30 poor planks & calc sh, lim staining	
7386	SWC 44	J-1(2) Dom calc sh, lim staining	
7376	SWC 45	High I-1(1) Dom calc sh, lim staining	
7356	SWC 46	I-1(O) 60-40 planks & calc sh, lim staining	
7336	SWC 47	H-2(1) Dom calc sh	
7306	SWC 48	H-2(1) Dom calc sh, lim staining	
7256	SWC 49	H-2(1) Dom planks, lim staining	
7150	SWC 50	H-1(1) Dom calc sh, lim staining	
7050	SWC 51	H-1(1) Dom calc sh	
6950	SWC 52	H-1(O) 70-30 planks & calc sh, lim stain	
6860	SWC 53	High H-1(1) Dom calc sh	
6743	SWC 54	G(1) 60-40 Planks & calc sh	
6656	SWC 55	G(1) Dom planks	
6555	SWC 56	High G(1) V small res of calc sh & planks + r c ang qtz	
6445	SWC 57	F(1) Dom planks, r c ang qtz	
6353	SWC 58	F(O) 70-30 calc sh & planks	
6248	SWC 59	E-2(O) Dom planks	
6147	SWC 60	D-1(2) V small res, Dom mic	

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO: KINGFISH # 7 *DATE:* 13.9.77

PREPARED BY: DAVID TAYLOR *SHEET NO:* 3 of 4

DRAW:

DEPTH	*SAMPLE TYPE*	*SLIDES*	*ADDITIONAL INFORMATION*
6040	SWC 61	D-1(2)	Dom mic lim staining, r c ang qtz
5950	SWC 62	D-1(1)	70-30 calc sh & planks
5860	SWC 63	D-1(1)	Dom mic lim staining, r m ang qtz
5735	SWC 64	D-1(0)	70-30 planks & mic
5600	SWC 65	? D-1(0)	Dom planks, r c ang qtz
5500	SWC 66	E-1(1)	V small res, Dom plank
5350	SWC 67	D-2(0)	Sharp colour transition from mgy to lgy - both portions sampled. 70-30 planks & mic, lim staining.
5150	SWC 69	D-2(0)	80 planks, 10 mic, 10 *Bathysiphon* sp A, spic, r subrd qtz
5050	SWC 70	D-2(1)	V small res, Dom planks
4950	SWC 71	D-2(0)	planks
4852	SWC 72	D-2(0)	60 planks, 30 mic modules, 10 mic flakes lim staining
4758	SWC 73	D-2(0)	60-40 planks & mic,r c ang qtz
4650	SWC 74	D-2(0)	Abundant planks ? ooze
4550	SWC 75	indet, U.C.	Dom gy mic V. small juvenile or depauperate planks
4450	SWC 76	indet	*ibid*
4350	SWC 77	indet	*ibid*
4250	SWC 78	indet	*ibid*
4150	SWC 79	indet	*ibid*
4050	SWC 80	indet	*ibid*
3950	SWC 81	indet U.C.	*ibid*
3850	SWC 82	indet	*ibid*
3750	SWC 83	D/C(2)	Dom wh mic, V small juvenile or depauperate plank

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO: KINGFISH # 7 *DATE:* 13.9.77

PREPARED BY: DAVID TAYLOR *SHEET NO:* 4 of 4

DRAW:

DEPTH	*SAMPLE TYPE*	*SLIDES*	*ADDITIONAL INFORMATION*
3600	SWC 84	indet *ibid*	
3500	SWC 85	D/C(2) *ibid*	
3350	SWC 86	indet *ibid*	
3200	SWC 87	C(1) 50-50 planks & mic	
3050	SWC 88	C(1) 80-20 mic & planks	
2950	SWC 89	C(0) Dom planks & benths	
2870	SWC 90	C(0) Dom mic	

ABBREVIATION KEY used by David Taylor on summary date sheets.

R.C.	= rotary cuttings
S.W.C.	= side wall core
C.C.	= conventional core
U.C.	= unable to clean sample of drilling mud before washing, thus result may be spurious.
N.F.F.	= no fauna found
indet	= specifically indeterminate and/or biostratigraphically non diagnostic
J-2 (O)	= Zone J-2 planktonic fauna present and identification is of highest level of confidence.
B-1 (4)	= Zone B-1 suspected but lowest confidence indicated
Dom	= Dominant grain type - at least 90% of washed sample
r	= rare - less than 10 grains
60-40	= proportion of components
qtz	= quartz
py	= pyrite
glauc	= glauconite
lim	= limonite
sdst	= sandstone
siltst	= siltstone
mdst	= mudstone
calc sh	- calcareous shale
lst	= limestone
mic	= micritic limestone
calcar	= calcarenite
bio	= biogenic
bry	= bryozoa
moll	= molluscan fragments
plank	= planktonic foraminifera
calc benth	= calcarcous benthonic foraminifera
aren	= arenaceous foraminifera
ost	= ostracods
spic	= siliceous sponge spicules
ech	= echnioid spines

...2/

f	= fine grade
m	= medium grade
c	= coarse grade
f-c	= whole spectrum of grades
ang	= angular shape
subrd	= subround shape
rd	= round shape
ibid	= sample identical to that listed immediately above.

Form R 193 3/71

BASIN GIPPSLAND BY David Taylor

WELL NAME KINGFISH # 7 DATE 12.9.77 ELEV. _____

Foram Zonules

		Highest Data	Quality	2 Way Time	Lowest Data	Quality	2 Way Time
MIOCENE	A						
	Alternate						
	B						
	Alternate						
	C	2870	0		3200	1	
	Alternate						
	D_1						
	Alternate						
	D_2						
	Alternate						
	E				6248	0	
	Alternate						
	F	6353	0		6445	1	
	Alternate						
	G	6555	1		6743	1	
	Alternate						
	H_1	6860	1		7150	1	
	Alternate	6950	0				
	H_2	7256	1		7336	1	
	Alternate						
OLIGOCENE	I_1	7356	0		7376*	1	
	Alternate						
	I_2						
	Alternate						
	J_1	7386*	2		7405	0	
	Alternate	7396	1				
	J_2	7407	0		7415	4	
	Alternate				7410	1	
EOC.	K	7435	1		7435	1	
	Alternate						
	Pre K						

Side wall cores from 6147 to 4650 were biostratigraphically and environmentally disordered; in that 6147 to 5600 were D-1 from a continental slopesituation; 5550 was continental rise E-1 whilst 5350 - 4650 were D-2 at the base of the slope. Inadvertent mislabelling on side wall core jars is suspected. Samples 4550 to 3350, though indeterminate, were of canyon sediment and in place when compared with other Kingfish sequences. *All I-2 and ½ I-1 absent. Despite low confidence for J-1 at 7386 the highest appearance of *S. angiporoides* marks top J. This is the "Cobia Event" - it is also present in Kingfish # 6.

COMMENTS:

Note: If highest or lowest data is a 3 or 4, then an alternate 0, 1, 2 highest or lowest data will be filled in if control is available.

If a sample cannot be interpreted to be one zonule, as apart from the other, no entry should be made.

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).

Date Revised 13.10.77

By David Taylor.

KINGFISH # 7 Sheet 1 of 2 sheets

(does not include "muddled section" above 6248*)

Depth in feet not to scale
Sidewall cores

	6248	6353	6445	6555	6656	6743	6860	6950	7050	7150	7256	7306	7336	7356	7376	7386	7396	7405	7407	7410	7415	7420	7435	7460	7465
PLANKTONICS																									
1. *Praeorbulina glomerosa curva*	I																								
2. *Globigerinoides bisphericus*	I	I	°																						
3. *G. trilobus*	I	I	I	I	I	I																			
4. *Globorotalia praemenardii*	°																								
5. *G. miozea miozea*	I	I	I																						
6. *Globoquadrina dehiscens (S.S.)*	I				I			I																	
7. *Globigerina bulloides*	I	I	I																						
8. *G. woodi woodi*	I	I	I	I		I	I	I	I	I	I	I	I												
9. *Globorotalia praescitula*		°	°				°																		
10. *G. opima nana*		°					°	°					°												
11. *G. bella*		°		I		I		I																	
12. *Globigerinoides ruber*		°																							
13. *G. trilobus* - elongate		°																							
14. *Globorotalia zealandica*			°		°	°		°																	
15. *Globigerina praebulloides*			I	I	I	I	°	I	I	I	I	I	I	I	I	I	I	I	I	°					
16. *G. woodi connecta*				I		I	I	I	°	°															
17. *G. ciperoensis*						I	°	I			°				°										
18. *Globoquadrina altispira*							°																		
19. *G. dehiscens (S.L.)*								I				°	°	I	°										
20. *G. advena*								°				°		°	°										
21. *Globorotalia kugleri*								°																	
22. *Globigerina angulisuturalis*								I						I	°										
23. *Globigerina euapertura*														I	I	I	I	I							
24. *Catapsydrax unicavus*														°											
25. *Globorotalia opima opima*														°											
26. *Subbotina angiporoides*																I	I	I	I	°	°	°	°		
27. *Globoquadrina tripartita tripartita*																	°	I							
28. *G. tripartita tapuriensis*																		°							
29. *Globigerina trilocularis*																		I	I						
30. *G. ampliapertura euapertura*																			I						
31. *G. brevis*																			I	°					
32. *Tenuitella munda*																			°						
33. *T. gemma*																			°						
34. *"Globigerina" ampliapertura*																							°		
35. *"Globorotalia" insolita*																							°		
36. *Subbotina linaperta*																							°		
37. JUVENILE and/or DEPAUPERATE SPECIMENS					D												D								

Depth in feet to base of ZONE	6248	6445	6743	7150	7336	7376	7405	7410	7435
	E-2	F	G	H-1	H-2	I-1	J-1	J-2	? ? K ? ?

° = 1-20 specimens
I = 20
D = Dominant 70% total fauna

*refer Esso Aust. Paleont. Rep. 1977/23

KINGFISH # 7

Sheet 2 of 2 sheets

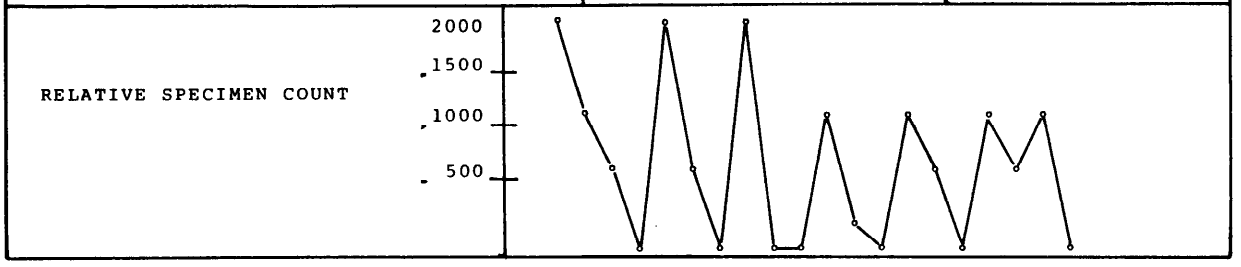
(does not include "muddled section" above 6248*)

Depth in feet not to scale

Sidewall cores

	6248	6353	6445	6555	6656	6743	6860	6950	7050	7150	7256	7306	7336	7356	7376	7386	7396	7405	7407	7410	7415	7420	7435	7460	7465
CALCAREOUS BENTHONICS																									
38. *Lenticulina spp.*	I		∘	∘	∘	∘				∘		∘							∘						
39. *L. mamilligera*	∘																								
40. *Nodosaria spp.*	I	∘	∘	∘		∘		∘			∘				∘		∘				∘				
41. *Pyrgo spp.*	∘				∘						I														
42. *Masalina sp.*	∘							∘		∘															
43. *Anomalina aotea*	∘																								
44. *Cassidulina subglobosa*	∘	∘				∘	∘															∘			
45. *Cibicides pseudoungerianus*	∘		I																						
46. *Euuvigerina maynei*	∘							∘																	
47. *Lagena spp.*		∘													∘										
48. *Osangularis cf. bengalensis*		∘									I				∘										
50. *Epistominella exigua*		∘										∘			I										
51. *Cibicides novozelandicus*		∘									∘				∘										
52. *C. thiara*			I																						
53. *C. mediocris*			∘																						
54. *Oridorsalis cf, tenera*			∘		∘	∘	∘																		
55. *Melonis barleeanum*			∘																						
56. *Siphonina australis*				∘		∘							∘						∘						
57. *Sphaeroidina bulloides*					∘				∘	∘	∘		∘												
58. *Gyroidinoides soldani*										∘															
59. *G. zelandica*											∘							∘							
60. *Spiroloculina sp.*											∘														
61. *Cibicides oerforatus*													∘												
62. *Anomalinoides procolligera*													∘												
63. *Cibicides wuellerstorfii*															∘				∘						
64. *Bolivina noblis*																∘									
65. *B. robusta*																	∘								
66. *Cibicides ihungia*																	∘								
67. *Vaginulopsis gippslandicus*																					∘				
68. *Discorbis cf. balcombensis*																						∘			
69. Mould of *Nonionella* or *Florilus*																									∘
ARENACEOUS BENTHONICS																									
70. *Bathysiphon sp. B.*	∘	∘	I	I		I																			
71. *Vulvulina granulosa*		∘				∘		∘																	
72. *Bathysiphon sp. A.*			∘	∘				I		I			I												
73. *"Cyclammina" cf. incisa*			∘																						
74. *Discammina compressa*			∘			∘		∘			∘		∘		∘				∘						
75. *Ammobaculites agglutinans*					∘							∘	∘												
76. *A. cylindricus*						∘																			
77. *Saccammina sp.*						∘																			
78. *Karreriella bradyi*											∘				∘				∘						
79. *Rhabdammina abyssorum*													∘	∘											
80. *Reophax agglutinatus*													∘												
81. *Ammodiscus mestayeri*													∘												
82. *Brachysiphon corbuliformis*														∘											
83. *"Cyclammina" cf. paupera*																			∘						
84. *? Reophax sp.*																								∘	

estimated Minimum water depth in feet	1500	2000	HIATUS 2000	= THE COBIA EVENT 1500 1500 ?



*refer Esso Aust., Paleont. Rep. 1977/23.