



PE990663

APPENDIX-4

YELLOWTAIL-1, FORAMINIFERAL BIOSTRATIGRAPHY

by

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Paleontology Report: 1982/17

April 1982.

PART-1

INTERPRETATIVE DATA

Introduction

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INTRODUCTION
by
A.D. Partridge

The analysis of the foraminiferal sequence in Yellowtail-1, given in this report was made by David Taylor and presented as two "data packages" on March 31, 1982.

The aim of the study, and the reason for the format of this report, was to make a rapid reconnaissance examination of twenty eight sidewall core samples to give a breakdown of the marine sequence into foraminiferal zones and ages. No attempt has been made to fully document the foraminiferal assemblages or to prepare a detailed environmental and geological interpretation of the sequence. The rationale for this approach was to limit costs and to reduce the time spent by the principal investigator, David Taylor, on what is essentially routine age determinations and report preparation. It is also argued that since the Gippsland Basin is now a mature petroleum province detailed discussion of the individual foraminiferal zones in the well is not essential as it has been adequately treated in earlier reports.

EXPLANATION OF MATERIALS

by

David Taylor

Twenty eight processed sidewall cores from Yellowtail-1 were submitted for examination and delineation of planktonic biostratigraphy. Samples submitted from the transition "Greensand" unit below 2397, contained a Late Eocene, Zone K, Assemblage. The highest sample submitted was of a heavily recrystallised micrite with a poorly preserved Mid or Late Miocene fauna.

The list accompanying the samples had the following cautionary footnote: "All samples with exception of SWC's 62, 65, 72 and 79 are more than likely to be contaminated". However with the possible exception of SWC 80 at 1903.2 metres, no tangible evidence of contamination was seen and the faunal sequence followed the established biostratigraphic pattern for this area in Gippsland. A distinct hiatus is apparent between 2397 (= Zone J-2) and 2396 (= Zone H-1); both regard to biostratigraphic and sediment grain composition.

SUMMARY TABLE - YELLOWTAIL-1

SAMPLE	DEPTH(m)	ZONE	AGE
SWC 81	1871.0	C/B	Mid Miocene - Early Pliocene
SWC 80	1903.2	C/B	Mid Miocene - Early Pliocene
SWC 79	2236.2	F	late Early Miocene
SWC 78	2246.8	G	Early Miocene
SWC 77	2332.9	G	Early Miocene
SWC 75	2352.2	G	Early Miocene
SWC 74	2356.5	G	Early Miocene
SWC 73	2367.9	G	Early Miocene
SWC 72	2371.0	G	Early Miocene
SWC 71	2372.6	G	Early Miocene
SWC 70	2374.4	G	Early Miocene
SWC 69	2376.5	G	Early Miocene
SWC 68	2378.9	G	Early Miocene
SWC 67	2381.0	H-1	Early Miocene
SWC 66	2382.4	H-1	Early Miocene
SWC 65	2383.0	H-1	Early Miocene
SWC 64	2388.0	H-1	Early Miocene
SWC 62	2395.0	H-1	Early Miocene
SWC 61	2396.0	H-1	Early Miocene
SWC 60	2397.0	J-2	Early Oligocene
SWC 58	2399.0	J-2	Early Oligocene
SWC 57	2399.9	J-2 with D-2 Cont.	Early Oligocene
SWC 56	2401.0	J-2	Early Oligocene
SWC 55	2401.9	J-2	Early Oligocene
SWC 54	2402.9	J-2	Early Oligocene
SWC 53	2403.9	J-2	Early Oligocene
SWC 52	2405.0	K	Late Eocene
SWC 50	2407.0	NFF	- -

PART-2

BASIC DATA

Key to Data Codes and Abbreviations

Analysis of Samples

KEY TO DATA CODES AND ABBREVIATIONS

CC #2	= conventional core #2
SWC	= sidewall core
NFF	= no foraminifera found
J-2	= planktonic foram Zone J-2
K/J-2	= exact zonal entity uncertain combined zonal interval.
f	= fine grain size (.25)
m	= medium grain size (.25-5)
c	= coarse grain size (.5-1mm)
ang	= angular grains
subang	= subangular grains
subrd	= subround grains
rd	= round grains
qtz	= quartz
pyr	= pyrite
lim	= limonite
glauc	= glauconite
lst	= limestone
mic. lst	= micritic limestone
sdst	= sandstone
siltst	= siltstone
mdst	= mudstone
calc. siltst	= calcareous siltstone
calc. aren	= calcarenite
recryx	= recrystallised
plank	= significant grain component of planktonic foraminifera.

ANALYSIS OF SAMPLES

SWC 81 at 1871.0 metres

Lithology: Recryx. micrite.

Fauna: Planktonics: Preservation poor.

Globorotalia scitula

Globorotalia miozea conoidea

Orbulina universa

Globigerina bulloides

Globigerina decoraperta

Globigerina indeterminate

Dominance of: Cassidulina laevigata

Benthonics:

Cibicides including Cibicides subhaidingeri

Cassidulina laevigata

Bolivina

Other Fauna: sponge spicules

Count: ?1000

% Planks: ?50%

Comments: Shape and size sorting

SWC 80 at 1903.2 metres

Lithology: Recryx. micrite r. c-m ang. quartz

Fauna: Planktonics: Preservation very poor.

Orbulina universa

Globigerina woodi woodi

Globigerina decoraperta

Globigerina bulloides

Globigerina Indeterminate

Possible contamination of Globorotalia conomiozea (see explanatory notes)

Benthonics:

Cassidulina laevigata

Other Fauna: Sponge spicules ostra.

Count: ?500

% Planks: ?95%

SWC 79 at 2236.2 metres

Lithology: 90% plank. Forams pyr. infill & spotting.

Fauna: Planktonics: Preservation good.

Globigerinoides bisphericus

Globigerinoides trilobus

Globorotalia praescitula

Globorotalia miozea miozea

Globorotalia bella

Globorotalia zealandica zealandica

Globorotalia? conica?

Globorotalia nana

Turborotalids

Globigerina spp. - small

Globigerina woodi woodi

Dominance of: approx. 80%, approx. 2mm.

Benthonics:

Anomalinoides

Cibicides

Arenaceous

Bolivina

Sigmoidopsis

Count: 3000

% Planks: 99%

SWC 78 at 2246.8 metres

Lithology: Recryx. biomicrite pyrite spotting

Fauna: Planktonics: Preservation fair to poor

Globigerinoides trilobus

Globoquadrina dehiscens

Globorotalia? praescitula?

Globorotalia bella

Globorotalia zealandica zealandica

Globorotalia nana

Globorotalia continua

Turborotalia indeterminate

Globigerina indeterminate

Globigerina apertura

Globigerina woodi woodi

Dominance of: N.B. Dramatic increase in

Globigerinoides and departure of Globigerina woodi

connecta

Benthonics:

Siphouvigerina

Cibicides

Gyroidinoides

Martinotiella

Lagena

Other Fauna: Echinoid spines.

Count: ?1500

% Planks: ?95%

SWC 77 at 2332.9 metres

Lithology: 80% forams, 15% calc. siltstones r. pyrite mica.

Fauna: Planktonics: Preservation excellent.

Globigerinoides trilobus

Globigerina woodi connecta

Globigerina ?apertura

Globigerina woodi woodi

Globigerina praebullides

Globigerina ouachitaensis

Globorotalia zealaindica zealandica

Globorotalia bella

Globorotalia nana

Globorotalia continuosa

Turborotalids indeterminate

Dominance of: Approximately 75%, approximately .2mm of Globigerina and Turborotalids.

Benthonics:

Lenticulina

Bulimina

Bathysiphon

Count: 5000

% Planks: 99%

SWC 75 at 2352.2 metres:

Lithology: Recryx. biomicrite

Fauna: Planktonics: Preservation poor. Similar assemblage as SWC 74 at 2356.5 metres.

Dominance of: Spec. approximately .2mm

Benthonics:

Chilostomella

Lagena

Other Fauna: Echinoid spines.

Count: ?1000*

% Planks: ?90%*

Comments: * Preservation poor because of diagenesis.

SWC 74 at 2356.5 metres:

Lithology: Foram micrite. r. mica, glauc. c. ang. quartz.

Fauna: Planktonics: Preservation fair.

Globigerinoides trilobus

Globigerina woodi connecta

Globigerina woodi woodi

Globigerina praebulloides

Globigerina ouachitaensis

Globoquadrina dehiscens (s.s.)

Globoquadrina altispira

Globoquadrina advena

Turborotalids indeterminate

Dominance of: approximately 80%, approximately
.2mm of Globigerina and Turborotalids.

Benthonics:

"Haplophragmoides"

Discammina

Cassidulina laevigata

Other Fauna: oogenia.

Count: 3000

% Planks: 99%

SWC 73 at 2367.9 metres:

Lithology: Recryx. biomicrite, pyrite spotting and infill.

Fauna: Planktonics: Preservation very poor because of
recryx. Presumed to be similar to SWC 72 at 2371
metres.

Count: +1000

% Planks: uncertain.

SWC 72 at 2371 metres:

Lithology: Biomicrite. Pyrite spotting and infill.

Fauna: Planktonics: Preservation fair.

Globigerinoides trilobus

Globigerina woodi connecta

Globigerina woodi woodi

Globigerina ciperensis

Globigerina praebulloides

Globigerina ouachitaensis

Globoquadrina dehiscens (s.s.)

Globoquadrina advena

Globorotalia continua

Turborotalids indeterminate

Dominance of: .2mm Globigerina and Turborotalids
comprise approximately 90% of the fauna.

Benthonics:

"Haplophragmoides"

Discammina

Pseudoclavulina

Nodosaria

Other Fauna: Echinoid. spines and plates, bryozoa

Count: 2000

% Planks: 99%

SWC 71 at 2372.6 metres:

Lithology: Biomicrite. Pyrite spotting and infill.
Fauna: Planktonics: Preservation poor to fair. Diverse but small similar assemblage to SWC 70 at 2374.4 metres with the addition of Globigerina ciproensis
Benthonics:
Buliminella
Bulimina
Other Fauna: Ostr.
Count: 3000
% Planks: 99%

SWC 70 at 2374.4 metres:

Lithology: Biomicrite, pyrite spotting and infill.
Fauna: Planktonics: Preservation fair.
Globigerinoides trilobus
Globigerina woodi woodi
Globigerina woodi connecta
Globigerina Indeterminate
Globoquadrina dehiscens (s.s.)
Globoquadrina advena
Globoquadrina altispira
Globorotalia zealandica zealandica
Globorotalia bella
Catapsydrax dissimilis
Turborotalids Indeterminate
Dominance of: .2mm Globigerina and Turborotalids, comprise 8% of fauna.
Benthonics:
Gaudyrina convexa
Cibicides
Bathysiphon
Discammina
"Haplophragmoides"
Count: 3000
% Planks: 98%

SWC 69 at 2376.5 metres:

Lithology: Calc. shale.
Fauna: Planktonics: Preservation poor.
Globigerinoides trilobus
Globigerina woodi woodi
Globigerina woodi connecta

Globigerina praebulloides

Globigerina ouachitaensis

Globigerina? apertura

Globoquadrina advena

Benthonics:

Vulvulina

Other Fauna: oogenia.

Count: 1000

% Planks: 99%

SWC 68 at 2378.9 metres:

Lithology: Biomicrite. Pyrite spotting.

Fauna: Planktonics: Preservation poor.

Globigerinoides trilobus

Globigerina woodi woodi

Globigerina woodi connecta

Globigerina Indeterminate

Globoquadrina altispira

Globoquadrina dehiscens (s.s.)

Globoquadrina advena

Globorotalia nana

Globorotalia continuosa

Globorotalia bella

Globorotalia zealandica zealandica

Turborotalids Indeterminate

Dominance of: .2mm Globigerina and Turborotalids
comprise approximately 90% of fauna.

Benthonics:

Euuvigerina pickii

Discammina

"Haplophragmoides"

Lenticulina

Bathysiphon

Other Fauna: echinoid spines.

Count: 3000

% Planks: 98%

SWC 67 at 2381 metres:

Lithology: Biomicrite, pyrite spotting.

Fauna: Planktonics: Preservation fair.

Globigerina woodi connecta

Globigerinoides trilobus

Globigerina woodi woodi

Globigerina bulloides

Globigerina ouachitaensis
Globorotalia zealandica zealandica
Globorotalia bella
Globorotalia nana
Globorotalia continuosa

Dominance of: .2mm Globigerina and Turborotalids
comprise 90% of fauna.

Benthonics:

Cassidulina
Gyroidinoides
Melonis

Bathysiphon
Rhabdammina

Count: 3000

% Planks: 95%

SWC 66 at 2382.4 metres:

Lithology: Biomicrite, 10% pyrite and minor lim.

Fauna: Planktonics:

Globorotalia bella
Globorotalia zealandica zealandica
Globorotalia nana
Globorotalia continuosa, and as for SWC 65 and 64.

Benthonics:

Karrerella bradyi
Cassidulina laevigata, as below SWC's 65 and 65.

Other Fauna: Some ?pyrite sp. spicules.

Count: ?2000*

% Planks: ?95%

Comments: * Sugary texture.

SWC 65 at 2383 metres:

Lithology: Recryx. biomicrite, pyrite - much as infill.

Fauna: Planktonics: Preservation fair to poor

Globorotalia bella
Globorotalia zealandica zealandica
Globorotalia nana
Globorotalia continuosa
Turborotalids Indeterminate
Globoquadrina dehiscens
Globoquadrina altispira
Globoquadrina advena
Globigerina woodi connecta
Globigerina woodi woodi

Globigerina praebulloides

Globigerina ouachitaensis

Dominance of: Spec. approximately .2mm comprising approximately 75% of planks.

Benthonics:

Nodosaria

Lagena

Globobulimina

Bolivina

Gyroidinoides

Miliolids

Count: ?1500

% Planks: 95%

SWC 64 at 2388 metres:

Lithology:

Bimicrite forams - dom. r. m-c ang. quartz.

Fauna:

Planktonics: Preservation good compared with SWC 64.

Globigerina woodi woodi

Globigerina woodi connecta

Globigerina praebulloides

Globigerina ouachitaensis

Globoquadrina dehiscens (s.s.)

Globoquadrina advena

Globoquadrina altispira

Turborotalids - Dominant

Globorotalia nana

Globorotalia continuosa

Globorotalia bella

Globorotalia zealandica zealandica

Species .2mm of Globigerina and Turborotalids comprise approximately 75% of planktonics.

Benthonics:

Nodosaria

Lagena

Cibicides

Siphonina

Sphaeroidina

Melonis barleeaanum

Other Fauna: Echinoid spines.

Count: 3000

% Planks: 95%

N.B. No Melonis pompilioides

SWC 62 at 2395 metres:

Lithology: Recryx biomicrite. 10% amorphous glauc. some glauc. molds and pyrite and lim. after pyrite.

Fauna: Planktonics: Poor preservation.

Globoquadrina dehiscens (s.s)

Globoquadrina advena

Globorotalia nana

Globorotalia? kugleri?

Globorotalia bella

Globigerina woodi woodi

Globigerina? woodi connecta?

Globigerina Indeterminate

Benthonics:

Cibicides

Globobulimina

Martinotiella

Cassidulina

Miliolids

Count: 1500*

% Planks: 80-90%

Comments: * Preservation poor, sugary spec. because of diagenesis.

SWC 61 at 2396 metres:

Lithology: 90% foram biomicrite, 10% glauc. recryx, some as infill or pellets, r.c. ang. quartz.

Fauna: Planktonics:

Globigerina woodi connecta

Globigerina woodi woodi

Globoquadrina dehiscens (s.s)

Globoquadrina altispira

Globorotalia bella

Globorotalia zealandica zealandica

Globorotalia nana

Globigerina ciproensis

Globigerina praebulloides

Benthonics:

Discamina

Reophax

Textularia trochus

Martinottiella

Karreriella bradyi

Stilostomella

Gyroidinoides

Anomalinoides vitrinoda

Other Fauna: Fish teeth.

Count: 3000

% Planks: 95%

Comments: Preservation fair though some diagenesis.

SWC 60 at 2397 metres:

Lithology: Grey calc. siltstone. 20% foram and minor pyrite and lim. infill and spotting

Fauna: Planktonics:

Globoquadrina tripartita

Globigerina angiporoides angiporoides

Globigerina brevis

Globigerina praebulloides

Globorotalia gemma

Globorotalia munda

Globorotalia nana

Globorotalia continuosa

Globorotalia testarugosa

Globorotalia extans

Dominance of: Globoquadrina tripartita and

Globigerina angiporoides angiporoides

Benthonics:

Vulvulina granulosa

Bathysiphon

Rhabdammina

Reophax

Cribostomella

Ammodiscus (coarse)

Ammodiscus (opaline)

Discammina

Cribostomella

Sphaeroidina

Dominance of: Fine-grained "deep-water" arenaceous.

Count: 1500

% Planks: 90%

Comments: Preservation fair with some squashing. N.B.
Sudden change in fauna from SWC 61.

SWC 58 at 2399 metres

Lithology: Flaky calc. siltst.

Fauna: Planktonics: Very poor preservation
Globigerina angiporoides (s.s)
Globigerina brevis
+ Indeterminate
Benthonics: Indeterminate

SWC 57 at 2399.9 metres

Lithology: Flaky clac. siltst.

Fauna: Planktonics:
Globigerina brevis
Globigerina angiporoides (s.s)
Zone D contamination
Orbulina universa
Globigerina woodi woodi
Globorotalia miozea miozea

Comments: N.B. mud contamination.

SWC 56 at 2401 metres

Lithology: Flaky grey calc., siltst. forams. A-pellet glauc.

Fauna: Planktonics:
Similar Assemblage to SWC 60 at 2397 metres.
Benthonics:
Similar Assemblage to SWC 60 at 2397 metres.
Other Fauna: Fish.
Count: 1500
% Planks: 90%

SWC 55 at 2401.9 metres

Lithology: Flaky gry. calc. siltst. minor pyr/lim.

Fauna: Planktonics: Very poor preservation
Globigerina angiporoides (s.s)
Globigerina praebulloides
Globorotalia gemma
Otherwise indeterminate.
Benthonics: Indeterminate.
Count: ?100
% Planks: ?

SWC 54 at 2402.9 metres

Lithology: Flaky grey/bn calc., siltst. minor pyrite and c-m
ang. quartz and lim.

Fauna: Planktonics: Preservation fair.
Globigerina brevis
Globigerina angiporoides (s.s)

MICROPALAEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND

ELEVATION: KB: _____ GL: _____

WELL NAME: YELLOWTAIL # 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										
		D ₂										
		E ₁										
		E ₂										
	EARLY	F						2236.2	1			
		G	2246.8	1				2378.9	1			
		H ₁	2381	1				2396	1			
	OLIGOCENE	LATE	H ₂									
			I ₁									
		I ₂										
		EARLY	J ₁									
J ₂			2397	0				2403.9	0			
Eocene		K	2405	1				2405	1			
	Pre-K											

COMMENTS: D-2 contamination in SWC at 2399.9

- 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: PALTECH PTY. LTD.

DATE: February 16, 1982.

DATA REVISED BY: PALTECH PTY. LTD.

DATE: March 31, 1982.

Globigerina praebulloides

Globoquadrina tripartita

Globorotalia nana

Benthonics:

Sphaeroidina bulloides

Bathysiphon

Lenticulina

Other Fauna: Echinoid spines.

Count: 250

% Planks: 90%

SWC 53 at 2403.9 metres

Lithology: Grey calc. silts., 30% forams, minor pyrite.

Fauna: Planktonics: Preservation fair.

Globoquadrina tripartita

Globigerina angiporoides (s.s)

Globigerina brevis

Globigerina praebulloides

Globorotalia gemma

Globorotalia munda

Globorotalia nana

Globorotalia continuosa

Globigerinoides testarugosa

Globigerinoides extans

Benthonics:

Vulvulina granulosa

Bathysiphon

Rhabdammina

Reophax

Cribostomella

Ammodiscus (coarse)

Ammodiscus (opaline)

Discammina

Cribostomella

Sphaeroidina

Count: 1500

% Planks: 90%

SWC 52 at 2405 metres

Lithology: Calc. siltst. r. pyr. mica.

Fauna: Planktonics: Preservation sugary.

Globigerina brevis

Globigerina angiporoides (s.s)

Globigerina linaperta

Globoquadrina tripartita

Globorotalia munda

Globorotalia nana

Globorotalia insolita

Dominance of: No Globigerinatheka index seen after long search

Benthonics:

Siphonina

Anomalinoides

Sphaeroidina bulloides

Textularia conica

Pseudoclavulina

Bathysiphon

Haplophragmoides

Vulvulina

Lenticulina

Saccamina

Karreria

Other Fauna: Echinoid spines

Count: 500

% Planks: 60%

Comments: Suspect Browns Creek dinoflagellates

SWC 50 at 2407 metres

Lithology: 20% pebble, c-m subang-rd fractured clear and orange quartz. 50% m-f ang. quartz. 20% lim. pellet after glauc. r. glauc clay-pyrite.

Fauna: NFF