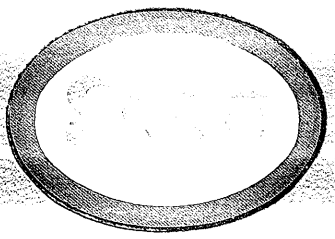
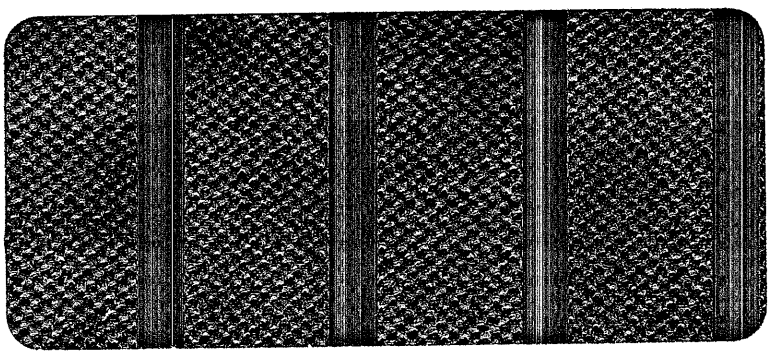




WCR

SWEEP-1

(W704)

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

84 pages
8 encls

Rec. 2/4/79. VDME

WELL COMPLETION REPORT W704

SWEEP-1

GIPPSLAND BASIN VICTORIA

R.C.N. Thornton
R. Do Rozario

September 1978

CONTENTS

ATTACHMENT

EXTENDED SERVICE WELL REPORT

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

COMPLETION REPORT

I WELL DATA RECORD

September, 1978

LOCATION

WELL NAME	STATE	PERMIT or LICENCE	GEOLOGICAL BASIN	FIELD
SWEEP-1	VIC	VIC/P1	GIPPSLAND	NEW FIELD WILDCAT

CO-ORDINATES		MAP PROJECTION	GEOGRAPHICAL DESCRIPTION:
Lat: 38°03'26.73"S	X = 643,612mE	AMG-AGD Zone 55	SWEEP is 137Km W of Sale, Victoria 8 km WSW of WAHOO-1 WELL
Long: 148°38'12.98"E	Y = 5,786,534mN		

ELEVATIONS & DEPTHS

ELEVATIONS	WATER DEPTH	TOTAL DEPTH	
Ground MSL	69m	M.D. 900m	Average Angle Straight Hole
KB 25m			
	PLUG BACK DEPTH	REASONS FOR PLUGGING BACK	
	124m	ABANDONMENT	

DATES

MOVE IN	RIG UP	SPUDDED
16th July 1978	16-18th July 1978	0445 hours, 18th July 1978
RIG DOWN COMPLETE	RIG RELEASED	
29th July 1978	16.30 hours 29th July 1978	

MISCELLANEOUS

OPERATOR	PERMITTEE or LICENCEE	ESSO INTEREST	OTHER INTEREST
Esso Australia Ltd	Hematite Petroleum Pty Ltd	50%	50%

CONTRACTOR	RIG NAME	EQUIPMENT TYPE
Australian Odeco Pty Ltd	Ocean Endeavour	Semi-submersible rotary Drilling vessel

TOTAL RIG DAYS	DRILLING AFE NUMBER		
13.1	238003		

LAHEE WELL CLASSIFICATION	
Before Drilling:	New field Wildcat
After Drilling:	Dry Hole, plugged and abandoned.

R. DOROZARIO

Geologist

II. - SUMMARY OF SWEEP-1 FIT & RFT DATA - for Details see Appendix 8

FIT No.	Depth (m) KB	SS	Recovery (litres) GAS OIL FILTRATE	Po PSIG	Kh MD/FT
1	801	776	No recovery, tool malfunction.	-	-
2	795	720	Recovered mud due to seal failure.	-	-
RFT	No RFT's run due to tool malfunction.				

WELL: SWEEP-1 EXPLORATION WELL

III	CASING - TUBING RECORD						
TYPE	SIZE	WEIGHT	GRADE	THREAD	NO. OF JOINTS	LENGTH m (ft)	DEPTH - MDKB m (ft)
Pile Joint	24"	670#	-	CC	1		
Cross Over	20"	129#	X-52	JV-CC	1		
Conductor Casing	20"	94#	X-52	JV	9		
Float Joint & Shoe	20"	94#	X-52	JV	1		227 (745)
Casing Hanger	18-3/4"x 13-3/8"	-	-	-	1		
Pup Joint	13-3/8"	54.5#	K-55	BUTT	1		
Surface Casing	13-3/8"	54.5#	K-55	BUTT			
Float Collar	13-3/8"	-	-	BUTT	1		
Float Joint	13-3/8"	54.5#	K-55	BUTT	1		
Float Collar	13-3/8"	-	-	BUTT	1		601.2 (1973)

IVa	CEMENT RECORD			
STRING	20" Conductor Casing		13-3/8" Surface Casing	
TYPE OF CEMENT	Aust 'N' Neat + 12% Gel	Aust 'N' Neat + 2% $CaCl_2$	Aust 'N' Neat	Aust 'N' Neat + 1% $CaCl_2$
SLURRY VOLUME m^3 (ft^3)	45.8 (1617)	11.7 (413)	16.7 (590)	7.70 (272)
SLURRY DENSITY	SG 1.45 (12.1 ppg)	SG 1.87 (15.6 ppg)	SG 1.87 (15.6 ppg)	
CEMENT TOP	Seafloor		238 m (782 ft)	
CASING TEST PRESSURE	72.5 kPa (500 psi)		10,342 kPa (1500 psi)	
NO. OF CENTRALISERS	6		8	
NO. OF SCRATCHERS	-		-	
STAGE COLLAR, ETC.	-		-	
REMARKS				

The rig pipe tally showing details of casing strings run into the hole have been lost and as a consequence the above information is incomplete.

G.W. WEYBURY

ENGINEER

CEMENT PLUGS

PLUG NO.	1	2	3
Cement Type	Neat	Neat	Neat
Volume	326 Sx	291 Sx	196 Sx
Top of Plug	684m	539m	139m
	2244 ft.	1768 ft.	456 ft.
Bottom of Plug	802m	631m	220m
	2630 ft.	2070 ft.	722 ft.
Remarks		Retainer set at 575 metres.	

WELL SWEEP-1

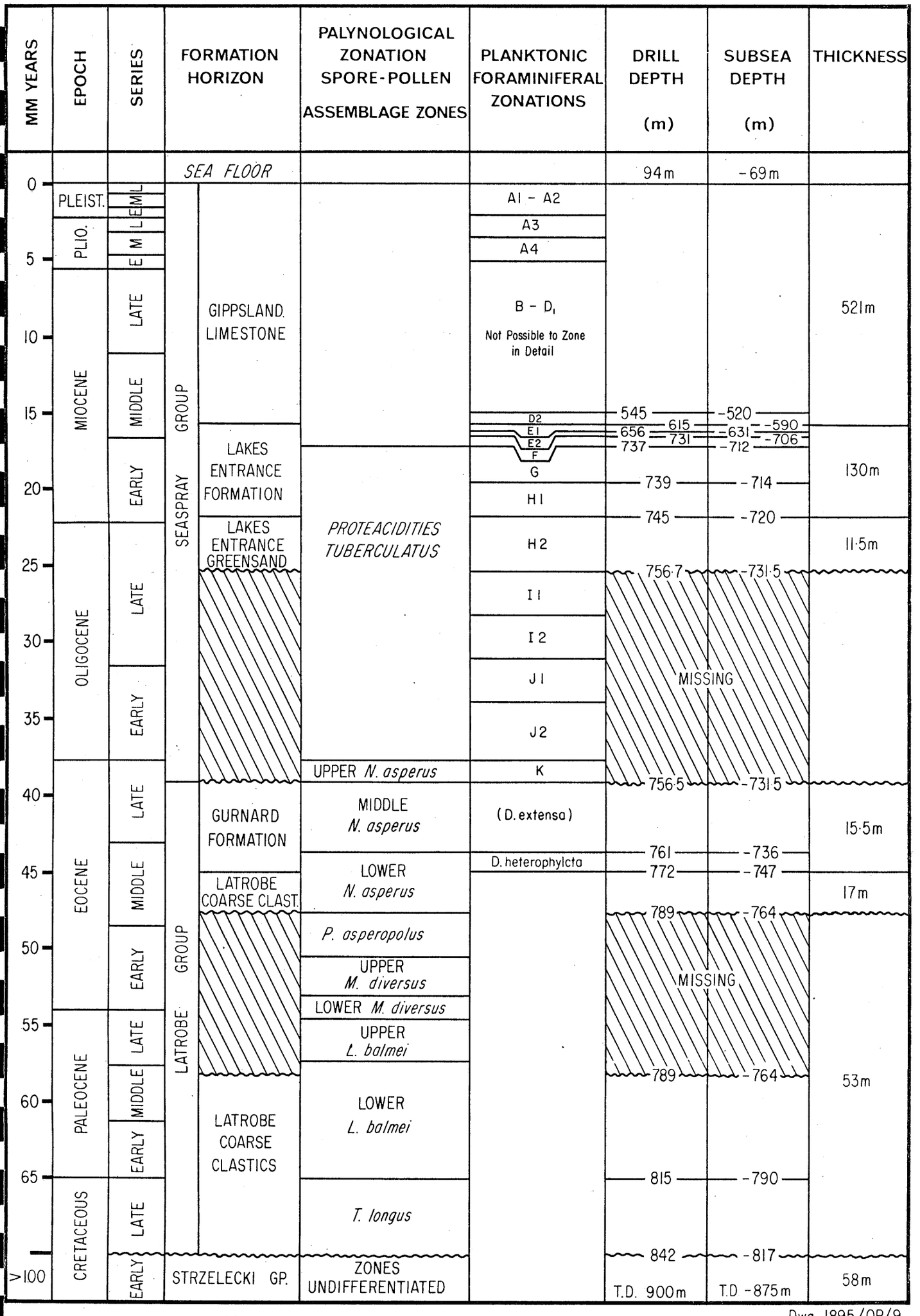
V SAMPLES, CONVENTIONAL CORES, SW CORES

INTERVAL	TYPE	RECOVERED	INTERVAL	TYPE	RECOVERED
Every 10m 240 - 620m and Every 5m 620 - 900m	5 sets of washed and dried cuttings, one unwashed sack of cuttings		605 - 230.5m 897 - 630 m 889 - 622 m Note: No conventional cores cut	SWC Run #1 SWC Run #2 SWC Run #3	25 out of 30 28 out of 30 23 out of 30
Every 25m 240 - 900m	composite cuttings canned				

VI WIRELINE LOGS AND SURVEYS (Incl. FIT)

Type & Scale	From To	Type & Scale	From To
ISF-SONIC Run 1 1:200 and 1:500	613.5 - 227.5m		
ISF-SONIC-MSFL Run 2 1:200 and 1:500	900.2 - 601m		
FDC-GR Run 1 1:200 and 1:500	606-227.5m (-95m GR)	Ran 2 FIT's:	
		FIT-1	801m
FDC-CNL-GR Run 2 1:200 and 1:500	902.0 - 601.0	FIT-2	795m
HDT Run 1	901 - 601 m		
Velocity Survey	10 levels 300-896m		

SWEEP-1
STRATIGRAPHIC TABLE



Dwg. 1895/OP/9

DESCRIPTION OF LITHOLOGICAL UNITS

GIPPSLAND LIMESTONE 94-615m

240-420m

Skeletal Limestone: Light grey to white,predominantly loose fossil bryozoans, sponge spicules, echinoid spines, minor foraminifera, and other calcareous forms, with bivalve ? fragments up to 4mm. No evidence of matrix.

and

Ditrital Limestone: Light to medium grey, buff, firm to moderately hard (increasing hardness with depth), comprising 0.1-0.25mm calcareous fossil fragments, forams, and sponge spicules, some impregnated with modular light to dark green glauconite. Clayey calcareous cement.

420-615mm

Marl: Very light to light grey, very soft to slightly firm, with fine grained calcareous grains, forams and bryozoans included as minor constituents with traces of glauconite and pyrite.

and

Detrital Limestone: Medium grey, soft to moderately firm,micritic with very fine to siltsize calcareous grains, rare glauconite and pyrite, matrix contains varying amounts of clay.

LAKES ENTRANCE FORMATION 615-745m

615-745m

Marl: Very light to light grey as previous interval, but grading in part to:

Calcareous Mudstone: Medium grey, grey-brown, firm, slightly fissile, fossiliferous with fine to silt-size bryozoan fragments and forams, minor glauconite and pyrite grains.

LAKES ENTRANCE: GREENSLAND FACIES 745-756.5

745-756.5

Greensand: Dark green to brown, firm, glauconite pellets, well rounded, fine to coarse grained, very poorly sorted, in part altered to pyrite (brown), minor white forams, set in 30% calcareous clay matrix.

LATROBE GROUP 756.5-842m
GURNARD FORMATION 756.5-772m

756.5-772m

Siltstone: Brown, hard, very pyritic, with pyrite occuring as nodules.

Sandstone: Light grey to dark brown, very fine to fine grained, clear, subangular to rounded quartz grains, well sorted, friable to moderately hard, very glauconitic, with dark green glauconite nodules comprising 20-30% of rock.

LATROBE "COARSE CLASTICS" 772-842m

772-842m

Sandstone: Loose medium grained to granule sized, mostly coarse to very coarse quartz grains, predominantly clear, minor polished to frosted, and trace blue to grey quartz, subangular to well rounded.

minor Shale: Very dark grey, pyritic, fissile, associated with:

Coal: Black, with finely disseminated pyrite, and minor white clay and mica.

STRZELECKI GROUP 842-900m

842-900m

Sandstone: Quartzose, multicoloured and speckled, mainly green (chloritic), brown, yellow, grey and orange, mainly fine grained, minor medium, moderately well sorted, angular to subrounded, clear to frosted hard, with 10-20% grey clay matrix and silica cement, minor scattered black carbonaceous specks and white feldspar grains. Trace pyrite.

Claystone: Multicoloured, mainly white to green, brown, pink, moderately hard, slightly calcareous, with minor silt size to very fine quartz grains.

GEOLOGICAL AND GEOPHYSICAL ANALYSIS

GEOLOGICAL DATA:

Age	Formation/Horizon	Depth (m) Predicted	Depth (m) Actual	Depth (m) Subsea	Thickness (m)
Miocene-Pliocene	Gippsland Lime-Stone	94	94	-69	521
Miocene	Lakes Entrance Formation	-	615	-590	130
Late Oligocene	Lakes Entrance: Greensland Facies	-	745	-720	11.5
Late Cretaceous-Late Eocene	Latrobe Group	755	756.5	-731.5	85.5
Middle-Late Eocene	Gurnard Formation	755	756.5	-731.5	15.5
Late Cretaceous - Paleocene	Latrobe "Coarse Clastics"	780	772	-747	70
Early Cretaceous	Strzelecki Group	830	842	-817	58
T.D.			900	-875	

GEOLOGICAL ANALYSIS:

Location and Structure:

Sweep-1 is located 11km SE of Flathead-1 and 8km WSW of Wahoo-1. It was drilled to a total depth of 900m KB (-875 subsea) on a structure consisting of a small WSW-ENE trending anticlinal culmination, comprising three en echelon anticlines, which coalesce with depth to have a single lowest closing contour. The structure is believed to have formed by compression between two converging shear faults having right lateral movement.

Objectives:

(a) To assess the oil potential of the Latrobe Group sands, and

(b) To evaluate the uppermost Strzelecki Group, which was hydrocarbon bearing at Flathead-1.

Results:

Sweep-1 encountered no hydrocarbons in either the Latrobe Group or Strzelecki Group. Post drill geophysical reinterpretation confirmed the presence of a valid structure. Consequently, the reason for the lack of hydrocarbons has to be attributed to either non-generation, migration prior to structuring, or lack of valid seal.

Stratigraphy:

The overlying Gippsland Limestone consists of an impermeable section of detrital and skeletal limestone, which grades down to marls and calcareous mudstones of the Lakes Entrance Formation. This appears to be an effective seal to the underlying Latrobe and Strzelecki Groups.

Beneath the Lakes Entrance Formation, Sweep-1 encountered two greensand facies, which consist of very glauconitic and pyritic marine fine grained sandstone and siltstone. The top unit is 11.5m thick and is age equivalent to the Lakes Entrance Formation, whereas the bottom 15.5m thick unit equates with the Latrobe Gurnard Formation. A depositional hiatus of about 13 million years separates the two units. Depositional rates are exceedingly low for both.

The Latrobe Group "Coarse Clastics" intersected in the well comprises two lithologic units, separated by an unconformity. The upper one is Lower N.asperus in age and consists of marginal marine fine grained sandstone. Beneath the unconformity "Coarse Clastics" of T.Longus to L.balmei age comprise coarse to granular clean porous sands, minor coals and shales, of terrestrial to near-shore origin.

A 58m section of the underlying Strzelecki Group was drilled to T.D. The dominant lithology is one of immature fine grained sandstone and minor claystone, commonly associated with feldspar and diagenetic chlorite.

GEOPHYSICAL ANALYSIS:

Following the G77A Seismic Survey, the top of Latrobe Group was re-mapped over the Sweep anticlinal structure. The predicted depth at the wellsite was 730m subsea. In actuality, the top of Latrobe Group in Sweep-1 came in at 731.5 metres subsea, only 1.5 metres lower than anticipated. Check shot times from the well indicate the pre-drill time pick to be correct and the true velocity to top of Latrobe Group to be 2035 metres per second.

The top of Strzelecki Group was encountered at 817 metres subsea, 12 metres low to prediction. Check shot times indicate that the seismic time pick should be revised to 0.795 seconds two-way time and the interval velocity for the Latrobe Group sediments to 3490 metres/second.

APPENDIX 1

APPENDIX 1

SAMPLE DESCRIPTIONS

SWEEP-1

LITHOLOGICAL DESCRIPTIONS

P. KEMP
R.C.N. THORNTON

21.7.78

DEPTH	%	DESCRIPTION
		Tag cement at 222m. Drill out at 239m at 1910 hours.
240m-250m	80%	Skeletal Limestone - very light grey, sample contains abundant loose fossils - dominantly ? bryozoans. Some larger ? bivalve calcareous chips to 3mm.
	20%	Detrital Limestone - medium light grey, dominantly calcareous grains, minor dark grains insolvent in HCl which include nodular glauconite and rare pyrite. Limestone is soft to slightly firm. Trace cement.
250m-260m	70%	Skeletal Limestone - As above.
	30%	Detrital Limestone - As above, some rare grains, very pyritic.
260m-270m	90%	Skeletal Limestone - As above, foraminifera abundant for first time, appears to have:-
	10%	Detrital Limestone - As above.
270m-280m	90%	Skeletal Limestone - probably a Boundstone - very light grey, entirely loose fossils, many branching bryozoans, some larger (to 4mm) chips of ? bivalves. Foraminifera to 2mm common.
	10%	Detrital Limestone - medium light grey, dominantly calcareous grains, minor dark grains which include nodular glauconite, some enclosed fossils, slight to moderately firm.
280m-290m	80%	Skeletal Limestone - As above.
	20%	Detrital Limestone - As above.
290m-300m	90%	Skeletal Limestone - As above.
	10%	Detrital Limestone - As above.
300m-310m	90%	Skeletal Limestone - As above.
	10%	Detrital Limestone - As above.
310m-320m	80%	Skeletal Limestone - (? boundstone) abundant fossils with no evidence of a matrix. Fossils include framework bryozoans with branches of 1mm diameter on a 2mm x 2mm grid, ? calcareous sponge spicules, minor foraminifera and many other calcareous fossil forms. Colour is light grey to white, and rock would have excellent growth framework and interparticular porosity.
	20%	Detrital Limestone - light to medium grey, moderately firm to hard, (increasing hardness with depth) calcareous fine grains, minor dark minerals and nodular light to dark green glauconite. Note: In rare cases pyrite fills growth framework porosity.
320m-330m	60%	Skeletal Limestone - As above, foraminifera more abundant.
	40%	Detrital Limestone - As above.
330m-340m	60%	Skeletal Limestone - As above, bryozoans not quite as abundant.

2/....

SWEEP-1

P. KEMP
R.C.N. THORNTON

LITHOLOGICAL DESCRIPTIONS

21.7.78

DEPTH	%	DESCRIPTION
330m-340m		Continued/....
	40%	Detrital Limestone - As above.
340m-350m	80%	Detrital Limestone - light to medium grey, moderately firm to moderately hard, fine to medium calcareous grains, minor fine grained nodular glauconite, minor trace dark grains, tight.
	20%	Skeletal Limestone - (boundstone) abundant fossils including bryozoans and forams. Colour light grey to white, excellent porosity.
350m-360m	50%	Skeletal Limestone - As above, predominantly bryozoan, with fragments up to 5mm long, also echinoid spines, colour light grey to white, excellent porosity, minor pyrite infilling porosity.
	50%	Detrital Limestone - (packstone), buff to light grey, firm to moderately hard, comprising ¼-1/8mm fossil fragments, some white, others including glauconite impregnated forams, and sponge spicules set in clayey calcareous cement.
		Trace - 1% Loose forams, up to 22m diameter, mainly coiled forams, but including Uvigerina, Orbulina.
360m-370m	80%	Detrital Limestone - As above.
	20%	Skeletal Limestone - As above.
		Trace - 1% Forams, as above.
370m-380m	60%	Detrital Limestone - As above.
	35%	Skeletal Limestone - As above, virtually all bryozoan fragments.
	5%	Loose Forams, up to 4mm diameter, abundant pyrite.
380m-390m	80%	Detrital Limestone - (packstone), buff to light grey, soft to mainly moderately hard, comprising 1/8-¼mm fossil fragments, forams, some glauconite impregnated and sponge spicules set in clayey calcareous matrix.
		Trace of coarser Limestone with fragments set in sparry calcite cement.
	15%	Skeletal Limestone - very light grey, virtually all bryozoan fragments, up to 5mm long.
	5%	Loose forams, up to 3mm diameter, including Uvigerina, pyrite aggregates, ostracod.
390m-400m	85%	Detrital Limestone - As above.
	10%	Skeletal Limestone - As above.
	5%	Loose forams, as above, including globular forams, pyrite.
400m-410m	80%	Detrital Limestone - As above.
	15%	Skeletal Limestone - As above.
	5%	Loose forams, as above, pyrite. Siltstone, medium grey to brown, angular quartz, abundant

3/....

DEPTH	%	DESCRIPTION
400m-410m		Continued/....
		glauconite, slightly calcareous.
410m-420m	80%	Detrital Limestone - As above, amount of clay in the matrix varies considerably, and limestone varies from micrite to sparite, micritic limestone tends to be softer than sparry limestone.
	15%	Skeletal Limestone - As above.
	5%	Loose forams, pyrite.
420m-430m	50%	Marl - very light grey, very soft, very calcareous clay, containing fossil fragments and forams - envelopes all cuttings.
	50%	Limestone - As above.
430m-440m	70%	Detrital Limestone - As above, particularly soft.
	20%	Marl - As above.
	8%	Skeletal Limestone - As above.
	2%	Loose Forams, as above, pyrite.
440m-450m	80%	Marl - As above, gradational with detrital limestone (i.e., more clayey and much softer).
	10%	Detrital Limestone - As above.
	10%	Bryozoan fragments, forams.
450m-460m	80%	Marl - As above, gradational with:-
	10%	Detrital Limestone - As above.
	10%	Bryozoan fragments, forams, including spherical, globular forams (? Orbulina), trace siltstone, hard, brown, glauconite.
460m-470m	50%	Detrital Limestone - As above, in part pyritic, gradational with:
	40%	Marl - As above.
	10%	Bryozoan fragments (in part pyritic), large, loose forams, as above
470m-480m	60%	Marl - As above, gradational with:-
	30%	Detrital Limestone - As above.
	10%	Bryozoan fragments, as above, loose forams, as above.
480m-490m	80%	Marl - very light grey to light grey, very soft to slightly firm, very calcareous, clayey, contains fossils including forams (many fossils loose: ? after washing.
	20%	Detrital Limestone - medium light grey, fine calcareous grains, fossils included, no glauconite evident, moderately firm.
490m-500m	50%	Marl - medium light grey, very calcareous, clayey, fine grained calcareous grains included as minor constituent, also bryozoans and forams, very soft to slightly firm.

4/....

SWEEP-1 P. KEMP

LITHOLOGICAL DESCRIPTIONS 22.7.78

DEPTH	%	DESCRIPTION
490m-500m		Continued/....
	40%	Detrital Limestone - medium grey, micritic with fine calcareous grains, some darker grains which include rare glauconite and very rare pyrite, slightly firm.
	10%	Loose fossil fragments, dominantly forams and bryozoans.
500m-510m	?30%	Marl - very soft as above (% difficult to estimate as washes out and covers all grains).
	60%	Detrital Limestone - As above, rare pyrite replacing fossils.
	10%	Loose fossils mainly forams (including ? fusulinids) and bryozoans.
510m-520m	80%	Marl - As above.
	20%	Detrital Limestone - as grains become finer it tends to marl with fossil fragments. Fossils also include spicules.
		Some loose fossil fragments including rare chips (to 3mm) of larger ? bivalves.
520m-530m	50%	Marl - light grey to very light grey, minor fine grained clear carbonate grains, some fossils, soft to firm.
	40%	Detrital Limestone - medium grey, moderately firm to hard, fine to very fine grained, glauconite present, fossils common, pyrite is abundant on some grains.
	10%	Loose fossil fragments, dominantly forams and bryozoans.
530m-540m	50%	Marl - As above.
	40%	Detrital Limestone - As above, micritic and tends to marl in part.
	10%	Fossils loose and fossil fragments.
540m-550m	70%	Marl - As above, more dark grains some of which are glauconite.
	20%	Detrital Limestone - As above.
	10%	Fossils loose, forams include ? orbulina.
550m-560m	100%	Detrital Limestone - very fine to siltsize calcareous grains, minor dark grains, rare glauconite, pyrite, white fossil fragments, micritic in part and tends to marl, slightly firm.
		Trace loose fossils, bryozoans and forams not nearly as abundant.
		Note: Marl may be washing out.
560m-570m	90%	Detrital Limestone - As above.
	10%	Loose fossils predominantly foraminifera.
570m-580m	90%	Detrital Limestone - As above, varies from very soft to moderately firm.
	10%	Loose fossil fragments.

5/....

DEPTH	%	DESCRIPTION
580m-590m	100%	Detrital Limestone - As above.
	<10%	Loose fossil fragments.
590m-600m	100%	Detrital Limestone - As above, generally very micritic tends to marl.
	<10%	Loose fossils dominantly foraminifera.
600m-610m	100%	Detrital Limestone - As above, glauconite becoming common.
		Minor loose fossils dominantly forams.
610m-619m	100%	Detrital Limestone - As above.
		Minor loose fossils.
		Stop drilling for casing at 1415 hours.
		Had to ream 10m on wiper trip to bottom. 4 units trip gas.
		24.7.78 R.C.N.THORNTO
		Run in hole with X3A Bit 12¼". Condition mud. Start drilling cement at 1900 hours, tagged at 584m. Casing shoe at 601m. Drill to 627m 2200 hours.
618m-620m		Mostly cement, Minor Detrital Limestone - medium light grey, very fine to silty grains, trace glauconite, moderately firm.
620m-625m		Mostly cement, Minor Detrital Limestone - As above.
		627m Formation Integrity Test. 0130 hours commenced drilling, mudweight 11.2 ppg.
625m-630m	60%	Marl - very light grey, very soft, comprising 0-20% fossil fragments generally <.5mm in size, including bryozoans, forams, sponge spicules in calcareous clay matrix, trace glauconite and pyrite.
		Gradational with:
	40%	Detrital Limestone - light to medium grey, soft to firm, fossils in calcite matrix containing varying amounts of clay, trace glauconite and pyrite.
		Trace Loose, large (up 3mm diameter) forams and fossil fragments, large pyrite infilled cylindrical fossils (1mm diameter) - ? worm burrows.
630m-635m	95%	Marl - As above, some forams pyrite impregnated.
	5%	Detrital Limestone - As above.
		Trace Loose, large forams.
635m-640m	95%	Marl - As above.

6/....

DEPTH	%	DESCRIPTION
635m-640m		Continued/....
	5%	Detrital Limestone - As above.
		Trace Loose, large forams and bryozoan fragments.
640m-645m	100%	Marl - As above.
645m-650m	100%	Marl - As above.
650m-655m	90%	Marl - As above.
	10%	Sparry Limestone - firm, clear to white, sparite containing minor glauconite impregnated forams.
		Trace Loose forams and fossil fragments.
655m-660m	95%	Marl - As above, fossils comprise about 10-20%, mostly about 1/8mm in size.
	5%	Sparry Limestone - As above.
660m-665m	100%	Marl - very light grey, very soft, comprising 10-20% forams, some of them impregnated by glauconite and fossil fragments, including bryozoans, mostly 1/8-¼mm in size, minor pyrite set in a highly calcareous clay matrix.
		Trace loose forams and bryozoan fragments up to 1-2mm.
665m-670m	100%	Marl - As above.
670m-675m	100%	Marl - As above.
		Trace Sparry Detrital Limestone - hard, slightly fossiliferous, sparry cement, trace glauconite.
675m-680m	100%	Marl - light grey, very soft and tends to wash out, foraminifera common, trace glauconite, minor unidentified dark minerals.
680m-685m	100%	Marl - As above.
685m-690m	100%	Marl - As above.
		Trace mica, very finely disseminated.
690m-695m	100%	Marl - As above.
695m-700m	95%	Marl - As above.
	5%	Calcareous Mudstone - medium grey, firm, slightly fissile, slightly fossiliferous, pyritic, carbonaceous.
		Trace Quartz grains, clear , fractured, medium to very coarse grained.
		0825: Circulate bottoms up 714.2m.
700-705m	100%	Marl - As above.
705m-710m	100%	Marl - As above.

7/....

DEPTH	%	DESCRIPTION
710m-714.2m	100%	Marl - As above.
		Trace Calcareous Mudstone - As above.
714.2m-715m	70%	Marl - As above.
	30%	Calcareous Mudstone - medium grey, firm to slightly fissile, slightly fossiliferous, pyritic.
		Trace Pyrite nodules.
715m-720m	60%	Marl - As above, except slightly firmer. Some Marl shows very slight tinge of green colour.
	40%	Calcareous Mudstone - As above.
		Trace Glauconite pellets, pyrite nodules, sparry Limestone, calcite vein material, loose forams, bryozoan fragments, spotty mineral fluorescence.
720m-725m	80%	Marl - As above, slightly greater concentration of calcite in the matrix, and slightly more fossiliferous.
	20%	Calcareous Mudstone
		Trace Glauconite pellets, very minor spotty mineral fluorescence.
725m-730m	100%	Marl - very light grey, very soft, comprising 10-20%, 1/8-¼mm sized forams and fossil fragments set in calcareous clay matrix, trace glauconite, pyrite.
		Trace Glauconite pellets, loose forams, bryozoan fragments, pyrite nodules.
730m-735m	70%	Marl - As above.
	30%	Calcareous Mudstone - medium, grey to brown, moderately fissile, firm, fossiliferous, mostly 1/8-¼mm fossil fragments (bryozoans), and forams, slightly pyritic, slightly glauconitic (in forams).
		Trace Pyrite nodules, large loose forams and bryozoan fragments, glauconite, sparry calcite.
735m-740m	70%	Marl - As above.
	30%	Calcareous Mudstone - As above, some very green with some disseminated glauconite.
		Trace pyrite, loose forams and other fossil fragments, glauconite nodules.
740m-745m	70%	Marl - As above, heavily glauconitic, glauconite constituent 20% of sample ~50% fine marl.
	30%	Mudstone - As above.
745m-750m	70%	Siltstone (?) Greyish red, ? heavily pyritic, some grains banded (brainlike) some? forams pyritised, hard.
	30%	Mudstone - As above, Trace Marl.

8/....

SWEEP-1

P. KEMP
R.C.N. THORNTON

LITHOLOGICAL DESCRIPTIONS

25.7.78

DEPTH	%	DESCRIPTION
745m-750m		Trace loose Quartz Grains, with pyrite, no fluorescence, coarse grained, subangular to broken, loose forams. Loose glauconite grains coarse grained.
750m-755m	30%	Mudstone - As above, light grey.
		Minor Marl as above.
	70%	Siltstone (?) Greyish red, heavily ? pyritic, grains very brown, some minor typical pyrite.
		Minor loose Quartz Grains, as above, no shows.
		Minor loose forams.
		(2.5m samples identical)
755m-760m	70%	Siltstone - brown, hard pyritic - perhaps almost all pyrite, occur as well rounded, coarse to very coarse grained nodules.
	20%	Glauconite - dark green, hard, well rounded, mostly coarse to very coarse grained nodules.
	10%	Sandstone - clear to light brown, unconsolidated, quartz, fine grained, clear, mostly well sorted, angular, medium grained, well rounded, dark green glauconite nodules, friable to moderately hard, poor to good porosity, no fluorescence.
		Trace coarse quartz grains.
760m-765m	20%	Sandstone - medium grey to light grey, fine grained, clear quartz, well sorted, glauconite, dirty, no shows.
	60%	Siltstone - brown, hard, pyritic - perhaps all pyrite.
	20%	Marl and Mudstone - As above.
765m-770m	10%	Sandstone - As above, no shows.
	50%	Siltstone - As above.
	30%	Marl and Mudstone - As above.
	10%	Glauconite nodules, loose, minor loose quartz grains, coarse grained, subrounded to subangular, no shows and forams, minor crystalline cubic pyrite.
770m-775m 775m-780m	60%	? Siltstone - brown, pyritic, hard, pyrite occasionally only mineral visible.
	10%	Mudstone - light grey, firm, no glauconite.
	10%	Sandstone - fine grained to very fine grained, dirty, glauconite, medium to well sorted, no shows.
	10%	Pyritic, crystalline.
	10%	Nodular glauconite.
		Trace yellow clay, slightly firm, quartz and glauconite grains included.

9/....

SWEEP-1

LITHOLOGICAL DESCRIPTIONS

P. KEMP
R.C.N. THORNTON

25.7.78

DEPTH	%	DESCRIPTION
770m-775m 775m-780m		Continued/....
		Trace coarse grained quartz, subrounded, no shows.
		Trace loose fossils forams and bryozoans.
780m-785m	50%	Siltstone - As above.
	10%	Mudstone - As above.
	10%	Sandstone - As above.
	10%	Pyrite - As above.
	10%	Glauconite - As above.
	10%	Loose Quartz Grains, as above.
785m-788m	70%	Loose Quartz Grains.
	30%	Siltstone/Mudstone/Pyrite/Glauconite A/A
		R.C.N. THORNTON
788m-790m	95%	Quartz Grains - clear, polished to frosted, coarse to very coarse grained, even granule size, subangular to subrounded.
	5%	Pyrite, Glauconite, forams, greensand, black coal, no fluorescence.
790m-795m	95%	Quartz Grains - As above, except mostly coarse grained, minor medium grained to very coarse grained.
	5%	Coal - pyrite, glauconite, greensand.
795m-800m	98%	Quartz Grains - As above.
	2%	Coal
		Trace white mica, pyrite, glauconite.
800m-805m	70%	Quartz Grains - As above.
	25%	Coal - black, with finely disseminated pyrite.
	5%	Shale - very dark grey, pyritic, fissile.
		Trace Pyrite nodules.
805m-810m	100%	Quartz Grains - mostly clear, minor milky very minor blue to grey, polished to frosted, medium grained to granule, mostly coarse to very coarse grained, subangular to wellrounded.
		Trace Coal, large white mica flakes, pyrite.
810m-815m	100%	Quartz Grains - As above.
		Trace Coal, pyrite.
		10/....

DEPTH	%	DESCRIPTION
815m-820m	100%	Quartz Grains - As above.
		Trace Coal, pyrite, very dark grey shale, mica.
820m-825m	98%	Quartz Grains - As above.
	2%	Coal
		Trace Pyrite, shale.
825m-830m	80%	Quartz Grains - As above.
	20%	Feldspar grains, white, medium to coarse grained, minor very coarse grained, angular to subrounded.
		Trace Pyrite, shale, mica, coal, fine grained sandstone, green clay.
830m-835m	80%	Quartz Grains - As above, mainly medium to coarse grained.
	20%	Feldspar Grains - As above, often pyrite encrusted.
		Trace white clay and claystone, fine grained sandstone, pyrite, mica, coal.
835m-840m	70%	Quartz Grains - As above.
	10%	Feldspar Grains - As above.
	10%	Claystone - pink, white, green to brown, firm to moderately hard, very slightly carbonaceous, very slightly silty, slightly calcareous.
	5%	Sandstone - white, light brown to grey, fine grained, moderately hard to hard, slightly calcareous matrix.
	5%	Siltstone - brown, moderately hard.
		Trace Pyrite, dark grey shale.
840m-845m	70%	Quartz Grains - As above, mostly clear, minor milky.
	5%	Feldspar Grains - As above.
	5%	Sandstone - green, brown, moderately hard to hard, fine grained, in part pyritic, tight.
	15%	Claystone - white to green, pink, light brown, very dark grey to black.
	5%	Siltstone - brown, moderately hard.
		Trace Pyrite.
845m-850m	50%	Quartz Grains - As above.
	30%	Sandstone - especially green, brown, fine grained as above, calcareous in part, tight.
	5%	Siltstone - especially green, brown, as above, calcareous in part

11/....

DEPTH	%	DESCRIPTION
845m-850m		Continued/....
	15%	Claystone - especially green, pink, white, as above, calcareous in part.
		Trace Pyrite, feldspar.
850m-855m	40%	Quartz Grains
	30%	Sandstone - As above, especially green.
	30%	Claystone - As above, especially buff, green, yellow.
		Trace Pyrite, feldspar.
855m-860m	50%	Sandstone - fine grained, quartz, moderately hard to hard, multicoloured and speckled, mainly green, brown, yellow, light grey, orange, minor medium grained, tight, silica cement.
	20%	Claystone - firm, multicoloured, mainly buff, green.
	30%	Quartz Grains - As above.
		Trace mica, pyrite nodules, feldspar, dark grey shale.
860m-865m	50%	Sandstone - multicoloured, as above.
	30%	Claystone - multicoloured, as above.
	20%	Quartz Grains - As above.
		Trace Pyrite, forams, fossil fragments.
865m-870m	50%	Claystone - multicoloured, as above, hard.
	30%	Sandstone - multicoloured, as above, very hard.
	20%	Quartz Grains - As above.
		Trace Pyrite.
870m-875m	50%	Sandstone - As above.
	20%	Claystone - As above.
	20%	? Dolomite - blue, green, orange, yellow, very hard, crystalline.
	10%	Quartz Grains - As above.
875m-880m	50%	Sandstone - As above.
	10%	Claystone - As above.
	10%	? Dolomite
	30%	Quartz Grains
		Trace half pebble, wellrounded of ? dolomite.
880m-885m	60%	Sandstone - especially speckled green, also clear, brown, red, orange, blue, speckled brown and white, hard, mainly fine grained,

12/....

SWEEP-1 R.C.N. THORNTON

LITHOLOGICAL DESCRIPTIONS 25.7.78

DEPTH	%	DESCRIPTION
880m-885m		Continued/....
		also medium grained quartz set in clear cement, in part calcareous.
	20%	Claystone - red, yellow, buff, dark brown, hard.
	10%	? Dolomite - blue, green, yellow, very hard, crystalline.
	10%	Quartz Grains - clear, polished to frosted, mainly coarse grained subangular to rounded.
885m-890m	60%	Sandstone - As above.
	20%	Claystone - As above.
	10%	? Dolomite - As above.
	10%	Quartz Grains - As above.
890m-895m	70%	Sandstone - As above.
	20%	Quartz Grains - As above.
	10%	Claystone - As above.
895m-900m	80%	Sandstone - As above.
	10%	Quartz Grains - As above.
	10%	Claystone - As above.
		Total depth reached 0015 hours, 26.7.78.

APPENDIX 2

APPENDIX 2

SIDEWALL CORE DESCRIPTIONS

SIDEWALL CORE DESCRIPTIONS

SWEEP-1 P. KEMP

23.7.78

SWC NO.	DEPTH	RECOVERED cm	DESCRIPTION
			GUN-1
1	605m	4.7	Marl - medium light grey, very calcareous, minor fossils, homogenous sample, moderately firm.
2	592m	5.8	Marl - medium light grey, very calcareous, minor fossils, including forams, soft, trace glauconite (nodular).
3	582m	0	LOST
4	563.3m	3.8	Marl - medium light grey with some light grey bands, minor fossils, mainly forams, moderately firm, trace pyrite.
5	553m	5.0	Marl - As above.
6	537m	5.0	Marl - medium light grey, lightly speckled with white fossil fragments to 1.5mm long. Otherwise massive soft.
7	533.7m	4.0	Marl - medium light grey, massive, no fossils evident or accessory minerals, soft.
8	527.5m	4.5	Marl - medium light grey, speckled with white fossil fragments or calcareous matter and clear forams, soft.
9	517m	4.8	Marl - As above.
10	507.5m	5.0	Marl - As above.
11	498.2m	5.0	Marl - As above, some larger ? bryozoan fragments to 1cm long.
12	485m	0	MISFIRE
13	469m	5.0	Marl - medium light grey, massive except for white calcareous material - fossil fragments - throughout core. Forams rare, soft.
14	446.5m	5.0	Marl - As above, forams common, very rare pyrite and mica.
15	430.6m	4.8	Marl - As above.
16	410.5m	3.5	Marl - As above, contains clear calcareous fossil fragments to 1.5mm.
17	397m	4.3	Marl - medium light grey, massive minor white and clear.Calcareous fossil fragments speckle sample, soft.
18	382.5m	5.2	Detrital Limestone - medium light grey, clear calcareous grains more abundant than last sample, micritic and tends to marl, some white fossil fragments to 3mm. Slightly firm.
19	367m	0	CORE LOST.
20	351m	5.2	Detrital Limestone - As above, minor pyrite and fossils include forams, slightly firm.

2/...

SIDEWALL CORE DESCRIPTIONS

SWEEP-1

P. KEMP

23.7.78

SWC NO.	DEPTH	RECOVERED cm	DESCRIPTION
21	343m	0	CORE LOST
22	327m	5.1	Marl - medium light grey, minor clear and white calcareous fragments including forams, rare pyrite, soft.
23	315.5m	4.9	Marl - As above, minor pyrite.
24	300m	4.5	Marl - As above, very soft, fossils rare.
25	287.5m	0	MISFIRE
26	273.5m	5.0	Marl - medium light grey, soft, minor clear and white calcareous fragments (generally silt size) but fossil fragments to 2mm.
27	264.5m	5.0	Marl - As above.
28	254.3m	5.1	Marl - As above.
29	241.5m	5.3	Limestone - detrital, medium light grey, fossiliferous, contains fossil (bryozoans, forams and others) and cemented calcareous fragments in a micritic matrix. Sample is very soft and gritty to feel. Suggests skeletal limestone described in cuttings may have micritic matrix which has washed out.
30	230.5m	5.0	Marl - medium light grey, soft, minor clear calcareous fragments and white fossil fragments, bryozoans, and forams. Trace pyrite and glauconite.

SIDEWALL CORE DESCRIPTIONS

SWEEP-1 R.C.N. THORNTON

23.7.78

SWC NO.	DEPTH	RECOVERED mm	DESCRIPTION
			Run No. 2.
31	897m	20mm	Siltstone - dark grey, very hard, very well cemented, fractured.
32	883m	40mm	Sandstone - dark grey, friable, predominantly quartz clear, yellow, brown, red, black, trace feldspar white, medium grained, moderate to well sorted, angular to subrounded, frosted with less than 5% grey clay matrix. Good porosity.
33	871m	30mm	Conglomerate, comprising well rounded, flat pebbles, up to 25mm across, of Claystone, red, slightly sandy, hard, fractured, with quartz veins; Sandstone - dark grey, fine grained, very hard, silica cement, tight; set in soft, grey sandstone matrix, fine to medium grained, subangular to rounded quartz, clay rich.
34	855m	50mm	Sandstone - dark grey, friable, fine to medium grained, poor sorting, quartz, clean, red, brown, yellow, subangular to subrounded, trace feldspar, white, set in 5% soft grey clay matrix. Good porosity.
35	838m	25mm	Sandstone - medium grey, semi-friable, fine grained, well sorted quartz, clear, angular to subrounded, minor white mica, trace red grains, pyrite bands, set in 10-20% soft clay matrix, low porosity.
36	828m	25mm	Sandstone - light to dark grey, friable, medium to very coarse grained, very poorly sorted quartz, clear, subangular to subrounded, clear to frosted, pyrite bands, set in 10% very soft clay, mostly light grey, in part very dark red and carbonaceous, no fluorescence. Good porosity.
37	819m	60mm	Sandstone - light brown, speckled dark brown, semi-friable, quartz, clear, yellow, orange, fine grained, well sorted, angular to subangular, abundant dark brown carbonaceous patches, trace white mica, set in 10% soft clay matrix. Low porosity.
38	812m	55mm	Sandstone - light brown, semi-friable, quartz, fine to medium grained, moderately sorted, clear, frosted, subangular to subrounded, trace white mica, 5% thin (1mm) carbonaceous bands, set in 20% soft clay matrix. Low to fair porosity.
39	804.5m	20mm	Sandstone - light grey, semi-friable, quartz, fine grained to trace coarse grained, mostly moderately sorted, clear, milky, grey, polished to frosted, angular to rounded, set in 10% soft clay matrix. Low porosity.
40	795m	40mm	Sandstone - light grey, friable, quartz, fine to coarse grained, very poor sorting, clear, grey, polished angular to rounded, trace pyrite, very minor carbonaceous flecks set in 10% very soft clay matrix. Good porosity.
41	785m	60mm	Sandstone - dark brown to grey, friable, quartz, fine grained, well sorted, clear, yellow, subangular to subrounded, very minor white mica, set in 20% soft

2/....

SIDEWALL CORE DESCRIPTIONS

SWEEP-1 R.C.N. THORNTON

23.7.78

SWC NO.	DEPTH	RECOVERED mm	DESCRIPTION
41	785m	60mm	Continued/.... clay matrix. Poor porosity.
42	774m	40mm	Sandstone - dark brown to grey, friable, quartz, fine grained, well sorted, clear, subrounded to rounded very minor white mica, set in 20% very soft clay matrix. Poor porosity.
43	771m	50mm	Sandstone - dark brown, semi-friable, quartz, very fine to fine grained, moderately sorted, subangular to rounded, minor white mica, abundant yellow blotches of partially oxidised pyrite, trace glauconite, trace very coarse grained quartz, set in 20-30% soft clay matrix. Poor porosity.
44	767m	50mm	Sandstone - dark brown, semi-friable, comprising 80% quartz, very fine to fine grained, subangular to subrounded, well sorted, 20% glauconite pellets, bright green round, fine to medium grained, minor mica, set in 30% soft clay matrix. Poor porosity.
45	763m	30mm	Sandstone - dark brown, semi-friable, comprising 70% quartz, clear, brown, very fine to fine grained, subangular to subrounded, well sorted, 30% glauconite pellets, bright green, round, fine to medium grained, minor mica, set in 30% soft clay matrix. Poor porosity.
46	759m	60mm	Sandstone - very dark brown, firm, as for 763m except that glauconite has been altered in part to pyrite.
47	755m	20mm	Greensand - dark green to brown, firm, glauconite pellets, well rounded, fine to coarse grained, very poorly sorted, in part altered to pyrite (brown), minor white forams, set in 30% soft calcareous clay matrix. Tight.
48	751m	0mm	BULLET LOST.
49	747m	25mm	Greensand - as for 755m, clay matrix highly calcareous.
50	743.5m	0mm	BULLET LOST.
51	740m	50mm	Mudstone - dark grey to green, very firm, subfissile, abundant bryozoan fragments lying along bedding planes, highly calcareous, trace pyrite.
52	736m	30mm	Mudstone - dark green to grey, very firm, massive, bryozoan fragments, forams, glauconite, highly calcareous.
53	732m	60mm	Mudstone - dark green to grey, very firm, massive, abundant forams, bryozoan fragments, trace pyrite glauconite, highly calcareous.
54	728m	10mm	Mudcake
55	724m	30mm	Mudstone - green, very firm, massive, abundant forams, minor bryozoan fragments, glauconite, highly calcareous.

3/...

SIDEWALL CORE DESCRIPTIONS

SWEEP-1

P. KEMP
R.C.N. THORNTON

23.7.78

SWC NO.	DEPTH	RECOVERED mm	DESCRIPTION
56	709m	50mm	Fossiliferous Mudstone - dark green to brown, speckled white, very firm, massive, consisting of 30% forams, minor bryozoan fragments and glauconite, set in highly calcareous matrix.
57	690m	35mm	Siltstone - dark green to grey, very firm, very fine quartz silt, abundant forams, some glauconite impregnated, white mica, trace pyrite set in highly calcareous clay matrix.
58	670m	45mm	Mudstone - dark green to brown, speckled white, very firm, massive, containing forams, pyrite, bivalve shell fragments, mica, highly calcareous.
59	650m	45mm	Mudstone - dark green to grey, very firm, massive, containing forams, pyrite nodules, highly calcareous.
60	630m	50mm	Mudstone - dark grey, very firm, massive, containing forams, bryozoan fragments, highly calcareous.
RUN NO. 3			P. KEMP
61	889m	20mm	Sandstone - medium green, chlorite, coarse grained, angular, poorly sorted with white soft clay cement, disseminated chlorite, carbonaceous fragments.
62	876m	40mm	Siltstone - heavily chloritic, dark green, poorly sorted minor white clay, fine grained sand, but mainly silty, angular, ~ 10% black carbonaceous material, slightly hard.
63	863.5m	20mm	Sandstone - grey red to green to grey in bands, very poorly sorted, very fine to medium grained, minor clay cement, angular, minor chlorite, minor coal fragments.
64	845m	40mm	Sandstone - sample contains one very large fragment of medium dark grey quartz (1cm thick, full diameter) massive except for several fragments of feldspar 2mm across. Remainder of sample is very poorly sorted, very fine to medium grained, chloritic Sandstone, white clay cement, soft, medium green colour.
65	833m	50mm	Claystone - very light grey, contains large (1cm) weathered feldspar grain and white clay with minor silt to fine grained quartz grains, soft.
66	826m	20mm	Siltstone - medium grey, clayey and contains black carbonaceous material finely disseminated, firm, poorly sorted.
67	814m	40mm	Sandstone - medium grey, very coarse (to 5mm) to very fine grained, very poorly sorted, white clay cement, white? Feldspar weathered, soft.
68	807.5m	0mm	LOST BULLET.
69	798m	0mm	LOST BULLET.
70	790m	50mm	Claystone - light grey, silty, soft, trace carbonaceous specks.
71	780.5m	20mm	Siltstone - light grey, slightly clayey, minor

4/....

SIDEWALL CORE DESCRIPTIONS

SWEEP-1 R.C.N. THORNTON

23.7.78

SWC NO.	DEPTH	RECOVERED mm	DESCRIPTION
71	780.5m	20mm	Continued/.... very fine grained sand, quartz, well sorted.
72	772m	0mm	LOST BULLET.
73	769m	50mm	Sandstone - dark green, grey, chloritic (? glauconite) very soft mineral, vitreous lustre, very fine grained, dirty with some minor clay, well indurated, firm.
74	765m	50mm	Sandstone - As above, tends to silt in part.
75	761m	50mm	Siltstone - dark green grey, clayey, chloritic (? glauconite), soft, trace mica, trace pyrite,.
76	757m	50mm	Siltstone - As above, contains about 30% ? iron nodules, to .5mm, spheroidal cleavage, iron colour.
77	753m	0mm	LOST BULLET.
78	749m	50mm	Sandstone - fine grained, dark green grey, grains are mainly ?Iron nodules and glauconite nodules, rarely quartz, well rounded, well sorted, white clay cement, very firm.
79	744.5m	50 mm	Claystone - green grey, soft, 50% clay, 50% fine grained, well rounded, glauconite nodules, fossils mainly forams present, very calcareous.
80	742m	50mm	LOST BULLET.
81	738m	50mm	Marl - light olive grey, very calcareous, uniform except for minor white calcareous fossil fragments, firm.
82	734m	50mm	Marl - As above.
83	730m	50mm	Marl - As above.
84	727m	0mm	LOST BULLET.
85	720m	50mm	Marl - green to grey, firm to slightly hard, uniform except for minor white calcareous fossil fragments.
86	700m	50mm	Marl - As above.
87	680m	50mm	Marl - As above, trace pyrite, minor forams.
88	660m	30mm	Marl - light green to grey, soft, uniform minor forams.
89	639.5m	0mm	LOST BULLET.
90	622m	50mm	Marl - light green to grey, firm, minor forams, minor bedding apparent.

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

PAGE 1 OF 2
ATT 30 REC 25
DATE 23.7.78
IES RUN NO 1 SWC RUN NO 1
SERVICE CO SCHLUMBERGER
GEOLOGIST P. KEMP
WELL SWEEP-1

NO. 1a	DEPTH 1	REC cm 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
1	605	4.7	MARL	-	V	medium light grey	firm	-	-	-													
2	592	5.8	MARL	Trace glauconite	V	medium light grey	soft	-	-	-													
3	582	0																					CORE LOST
4	563.3	3.8	MARL		V	medium light grey	moderately firm																
5	553.0	5.0	MARL		V	medium light grey	soft																
6	537	5.0	MARL		V	medium light grey	soft																
7	533.7	4.0	MARL		V	medium light grey	soft																
8	527.5	4.5	MARL		V	medium light grey	soft																
9	517	4.8	MARL		V	medium light grey	soft																
10	507.5	5.0	MARL		V	medium light grey	soft																
11	498.2	5.0	MARL		V	medium light grey	soft																
12	485	0																					MISFIRE
13	469	5.0	MARL		V	medium light grey	soft																
14	446.5	5.0	MARL		V	medium light grey	soft																
15	430.6	4.8	MARL		V	medium light grey	soft																

FORM R 257 3 72

2/....

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

WELL SWEEP-1 PAGE 2 OF 2
GEOLOGIST P. KEMP ATT 30 REC 25
SERVICE CO SCHLUMBERGER DATE 23.7.78
IES RUN NO 1 SWC RUN NO 1

NO. 1a	DEPTH 1	REC cm 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
16	410.5	3.5	MARL	-	V	medium light grey	slightly firm																
17	397	4.3	MARL		V	medium light grey	slightly firm																
18	382.5	5.2	LIME-STONE	Detrital	V	medium light grey	slightly firm	very fine to silt															
19	367	0																					CORE LOST
20	351	5.2	LIME-STONE	Detrital	V	medium light grey	slightly firm	very fine to silt															
21	343	0																					CORE LOST
22	327	5.1	MARL		V	medium light grey	soft																
23	315.5	4.9	MARL		V	medium light grey	soft																
24	300	4.5	MARL		V	medium light grey	very soft																
25	287.5	0																					MISFIRE
26	273.5	5.0	MARL		V	medium light grey	very soft																
27	264.5	5.0	MARL		V	medium light grey	very soft																
28	254.3	5.1	MARL		V	medium light grey	very soft																
29	241.5	5.3	LIME-STONE	Detrital	V	medium light grey	very soft	fine grained															
30	230.5	5.0	MARL		V	medium light grey	soft																

FORM R 257 3.72

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

PAGE 1 OF 4 | ATT 30 REC 28 | DATE 28.7.78 | SWC RUN NO 2 | IES RUN NO 2 | WELL SWEEP-1 | GEOLOGIST R.C.N. THORNTON | SERVICE CO SCHLUMBERGER

NO.	DEPTH	REC mm	ROCK TYPE	MODIFIERS	CAL	COLOR	INDUR DEG	GRAIN SIZE	SRTG	RND	DISS CLAY	STAIN	FLOURESCENCE %	FLOURESCENCE DISTR	FLOURESCENCE INTEN	FLOURESCENCE COLOR	CUT FLUOR. INTEN	CUT FLUOR. COLOR	CUT RESIDUE QUAN	CUT RESIDUE COLOR	SHOW	PROB PROD	REMARKS - GAS
1a	1	2	3	4	5	6	7	8	9	10	11	12	RK	14	15	16	17	18	19	20	21	22	23
31	897	20	SILT-STONE			dark grey	very hard																
32	884	40	SAND-STONE	Quartz, trace feld-spar		dark grey	fri-able	medium	mod	a-sr	5												
33	871	30	CON-GLOM-ERATE	Sandstone, Mudstone pebbles		dark grey	soft		very poor	sa-r													
34	855	50	SAND-STONE	Quartz, trace feld-spar		dark grey	fri-able	fine to medium	poor	sa-sr	5												
35	838	25	SAND-STONE	Quartz, mica		medium grey	semi-fri-able	fine	good	a-sr	10-20												
36	828	25	SAND-STONE	Quartz		light to dark grey	fri-able	medium to very coarse	very poor	sa-sr	10												
37	819	60	SAND-STONE	Quartz, carbonaceous		brown	semi-fri-able	fine	good	a-sa	10												
38	812	55	SAND-STONE	Quartz, carbonaceous		light brown	semi-fri-able	fine to medium	mod	sa-sr	20												
39	804.5	20	SAND-STONE	Quartz		light grey	semi-fri-able	fine to coarse	mod	a-r	10												
40	795	40	SAND-STONE	Quartz, trace mica		light grey	fri-able	fine to coarse	very poor	a-r	10												
41	785	60	SAND-STONE	Quartz, trace mica		dark brown to grey	fri-able	fine	good	sa-sr	20												
42	774	40	SAND-STONE	Quartz, trace mica		dark brown to grey	fri-able	fine	good	sr-r	20												
43	771	50	SAND-STONE	Quartz, pyrite, mica, glauconite.		dark brown	semi-fri-able	very fine to fine	mod	sa-r	20-30												
44	767	50	SAND-STONE	Quartz, glauconite, mica.		dark brown	semi-fri-able	very fine to fine	good	sa-sr	30												

FORM R 257 3-72

PAGE 2 OF 4

ATT 30 REC 28

DATE 28.7.78

ESSO AUSTRALIA LTD.

SIDEWALL CORE DESCRIPTIONS

IES RUN NO 2 SWC RUN NO 2

WELL SWEEP-1

GEOLOGIST R.C.N. THORNTON

SERVICE CO. SCHLUMBERGER

NO. 1a	DEPTH 1	REC mm 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
45	763	30	SAND-STONE	Quartz, glauconite, mica.		dark brown	semi-friable	very fine to fine	mod	sa-sr	30												
46	759	60	SAND-STONE	Quartz, glauconite, pyrite, mica		very dark brown	firm	very fine to fine	mod	sa-sr	30												
47	755	20	SAND-STONE	Glauconite	V	dark green to brown	firm	fine to coarse	very poor	rnd	30												
48	751	0	-																				BULLET LOST
49	747	25	SAND-STONE	Glauconite	V	dark green to brown	firm	fine to coarse	very poor	rnd	30												
50	743.5	0	-																				BULLET LOST
51	740	50	MUD-STONE	Bryozoan	V	dark grey	very firm																
52	736	30	MUD-STONE	Bryozoan forams	V	dark green to grey	very firm																
53	732	60	MUD-STONE	Forams, bryozoans, pyrite, glauconite	V	dark green to grey	very firm																
54	728	0	-																				MUDCAKE
55	724	30	MUD-STONE	Forams, bryozoans, glauconite	V	green	very firm																
56	709	50	MUD-STONE	Forams, bryozoans, glauconite	V	green to brown	very firm																
57	690	35	SILT-STONE	Foram, glauconite, pyrite.	V	dark green to grey	very firm																
58	670	45	MUD-STONE	Foram, bivalve	V	dark green to grey	very firm																
59	650	45	MUD-STONE	Forams, pyrite	V	dark green to grey	very firm																
60	630	50	MUD-STONE	Forams, pyrite	V	dark grey	very firm																

FORM R 257 3.72

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

PAGE 3 OF 4 REC 23
ATT 30 DATE 28.7.78
SWC RUN NO 3
IES RUN NO 2
WELL SWEEP-1
GEOLOGIST P. KEMP
SERVICE CO SCHLUMBERGER

NO. 1a	DEPTH 1	REC mm 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
61	889	20	SAND-STONE	Chlorite	SLI	medium grain-ed	sli-ghtly firm	coarse	Poor	ang													
62	876	40	SILT-STONE	Very Chloritic	NON	dark green	sli-ghtly hard	sli-ghtly firm	Poor	ang													
63	863.5	20	SILT-STONE	Chloritic	NON	grey to red to green to grey	firm	very fine to medium	Poor	ang													
64	845	40	SAND-STONE	Large Quartz pebble	NON	medium grain-ed	soft	-	very poor	ang													
65	833	50	CLAY-STONE	Feldspathic	NON	very light grey	soft	-	-	-													
66	826	20	SILT-STONE	Clayey	NON	medium grey	firm	-	Poor	-													
67	814	40	SAND-STONE		NON	medium grey	firm	very fine to very coarse	Poor	ang													
68	807.5	0																					LOST BULLET
69	798	0																					LOST BULLET
70	790	50	CLAY-STONE	Silty	NON	light grey	soft	-	-	-													
71	780.5	20	SILT-STONE		NON	light grey	soft	-	-	-													
72	772	0																					LOST BULLET
73	769	50	SAND-STONE	Chloritic	NON	dark green to grey	firm	very fine grain-ed	Poor	well													
74	765	50	SAND-STONE	Chloritic	NON	dark green to grey	firm	very fine grain-ed	Poor	well													
75	761	50	SILT-STONE	Chloritic	NON	dark green to grey	soft	-	-	-													
76	757	50	SILT-STONE	Chloritic Iron nodules	NON	dark green to grey	soft	-	-	-													

FORM R 257 3.72

ESSO AUSTRALIA LTD.
SIDEWALL CORE DESCRIPTIONS

WELL SWEEP-1 PAGE 4 OF 4
GEOLOGIST P. KEMP ATT 30 REC 23
SERVICE CO SCHLUMBERGER DATE 28.7.78
IES RUN NO 2 SWC RUN NO 3

NO. 1a	DEPTH 1	REC mm 2	ROCK TYPE 3	MODIFIERS 4	CAL 5	COLOR 6	INDUR DEG 7	GRAIN SIZE 8	SRTG 9	RND 10	DISS CLAY 11	STAIN 12	FLOURESCENCE % RK	FLOURESCENCE DISTR 14	FLOURESCENCE INTEN 15	FLOURESCENCE COLOR 16	CUT FLUOR. INTEN 17	CUT FLUOR. COLOR 18	CUT RESIDUE QUAN 19	CUT RESIDUE COLOR 20	SHOW 21	PROB PROD 22	REMARKS - GAS 23
77	753	0																					LOST BULLET
78	749	50	SAND-STONE	Trace nodules, glauconite		dark green to grey	firm	fine grained	well	well													
79	744.5	50	CLAY-STONE	Glauconite	V	green to grey	soft	-	-	-													
80	742	0																					LOST BULLET
81	738	50	MARL	Minor fossils	V	light olive grey	firm	-	-	-													
82	734	50	MARL	Minor fossils	V	light olive grey	firm	-	-	-													
83	730	50	MARL	Minor fossils	V	light olive grey	firm																
84	727	0																					LOST BULLET
85	720	50	MARL	Minor fossils	V	light olive grey	firm																
86	700	50	MARL	Minor fossils	V	light olive grey	firm																
87	680	50	MARL	Trace Pyrite, forams	V	light olive grey	firm	-	-	-													
88	660	30	MARL	Minor forams	V	light olive grey	soft	-	-	-													
89	639.5	0																					LOST BULLET
90	622	50	MARL	Minor forams	V	light olive grey	firm	-	-	-													

FORM R 257 3.72

APPENDIX 3

APPENDIX 3

PALYNOLOGICAL ANALYSIS OF SWEEP-1

GIPPSLAND BASIN

by

A.D. Partridge

and

H.E. Stacey

INTRODUCTION

Twenty-three sidewall core samples from Sweep-1 were examined for palynology. In general, fossil recovery was poor to fair, although good, diverse assemblages were obtained in few cases.

Formation and zone subdivision from the basal part of the Lakes Entrance Formation to the bottom of the well is summarised below. Table 1 lists all samples examined and summarises the findings, while individual fossil occurrence is recorded on the accompanying distribution charts.

SUMMARY

UNIT/FACIES	ZONE	DEPTH (in metres)
Lakes Entrance Formation "Micaceous Marl Member"	*P. tuberculatus*	744.5m
745m		
Lakes Entrance Formation "Greensand Member"	*P. tuberculatus*	747 - 755
756.5m	Unconformity	
Gurnard Formation (Glauconitic Sandstone)	Middle *N. asperus*	759
	Lower *N. asperus* and *D. heterophylcta*	761 - 771
772m		
Latrobe Group Coarse Clastics	Lower *N. asperus*	774 - 785
789m	Unconformity	
Latrobe Group Coarse Clastics	Lower *L. balmei*	790 - 812
	T. longus	819 - 838
842m	Unconformity	
Strzelecki Group	(barren)	855 - 901
TD-900m		

..../2

GEOLOGICAL COMMENTS

1. GREENSAND UNIT AND UNCONFORMITY:

In Sweep-1 a greensand or glauconitic sandstone unit was intersected between 745m and 772m. As is typical for the Gippsland Basin this unit lies between the coarse clastics of the Latrobe Group and the marine marls typical of the Lakes Entrance Formation.

The palynology and the micropalaeontology indicates that this greensand unit can be separated into two distinct units. The lower unit from 756.5m to 772m consists of fine grained moderately well sorted glauconitic sandstone of Middle to Late Eocene in age (Lower and Middle N. asperus Zones). As such it is lithological and age equivalent to the Gurnard Formation recognised in the offshore part of the Gippsland Basin. The upper unit from 745m to 756.5m is a poorly sorted glauconitic sandstone of Late Oligocene age (Planktonic foraminiferal Zone H2). In the eastern onshore part of the Gippsland Basin a slightly older Oligocene greensand is given member status at the base of the Lakes Entrance Formation. It was called the Greensand Member by Carter (1964) and renamed the Cunningham Greensand Member by Hocking (1976), (See Abele et al. 1976, pp. 257-259 for discussion).

A hitus of approximately 11 million years representing all of the Early Oligocene and most of the Late Oligocene separates the two greensand units and is placed at 756m.

The adjacent wells Flathead-1, Wahoo-1 and Sole-1 also contain equivalent greensand units which probably have similar time duration. Unfortunately sidewall core sampling is in these wells too widely spaced to adequately delineate the ages of these greensands.

The results from Sweep-1, where a significant unconformity lies within what has previously been regarded as a single lithological unit, once again indicates that the "greensand" development in the Gippsland Basin is best treated as a facies rather than a classical rock unit.

2. LATROBE GROUP COARSE CLASTICS

As in the greensand unit a significant unconformity occurs within the rock unit which is informally referred to as the Coarse Clastics. The unconformity is placed at 789m where there is a distinct break on the electric logs. The hiatus at the unconformity has a duration of approximately 10 million years, and is represented by the Lower N. asperus Zone overlying the L. balmei Zone within a sample gap of only 5 metres.

The situation of the Lower N. asperus Zone unconformably overlying the L. balmei Zone is characteristic of other wells along the margins of the Gippsland Basin and also the margins of the Bass and Otway Basins. This is interpreted as due to eustatic high stands of sea level during these zone intervals (See Steele, 1976, and Partridge, 1976). The absence of the Early Eocene spore-pollen zones at the Sweep-1 location is therefore interpreted as non-deposition rather than deposition followed by removal through erosion.

3. STRZELECKI GROUP

The samples examined from this unit were barren of spore-pollen and gave very low yields of mineral charcoal and woody types of particulate organic matter. The sediments are assigned to the Strzelecki Group solely on lithology and top of the unit is placed at the electric log break at 842 metres.

DISCUSSION OF ZONES

Tricolpites longus Zone 819 - 838m.

The top of the T. longus Zone is readily recognised by the highest occurrence of the zone species, Tricolpites longus, together with T. confessus and Proteacidites reticuloconcavus. Key species from other samples include Proteacidites prepolus, P. gemmatus, P. intracatus, P. palisadus and Ornamentifera sentosa, none of which range above the T. longus Zone. That the section is no older than the T. longus Zone is confirmed by the presence of Stereisporites (Tripunctisporis) at 826m. Unfortunately the sample at 833m was barren while that at 838m gave only a very limited assemblage. This last sample is assigned to this zone base on similarity to the higher assemblages, and consideration of the sequence recognised in Wahoo-1.

Lower Lygistepollenites balmei Zone 790m - 812m.

There were only two productive samples from the L. balmei Zone, and both can confidently be assigned to the zone based on the common occurrence of the nominated zone species. In the deeper sample this zone assignment is supported by the presence of Australopollis obscurus, Proteacidites angulatus and Polycolpites langstonii. In the higher sample, which unfortunately gave only a very low yield, the common occurrence of Haloragacidites harrisii suggests a position for the sample high in the L. balmei Zone, however

.../4

absence of any of the diagnostic zone species precludes assignment of the sample to the Upper L. balmei Zone.

Lower Nothofagidites asperus Zone 761m - 785m

The dominance of Nothofagidites pollen in the spore-pollen assemblages, which first occurs at 785m assigns this and the overlying samples to the Lower N. asperus Zone. This is supported by the first appearances of Tricolpites simatus at 780.5m, Proteacidites recavus at 774m and Nothofagidites falcatus which is first recorded from the base of the greensand unit at 771m.

The absence of Myrtaceidites tenuis and Intratriporopollenites notabilis indicates that a section equivalent to the P. asperopolus Zone in Flathead-1 is not present in Sweep-1.

Deflandrea heterophylcta Dinoflagellate Zone 761m - 771m

The base of the greensand unit lies within the upper part of the Lower N. asperus based on the occurrence of Deflandrea heteroplylcta, a key species for its nominated zone, in samples between 771m and 765m. Supporting species present include Wetzeliella glabra, Areosphaeridium dictyoplokus and Deflandrea oebisfeldensis. The occurrence of this species at 761m justifies extending this zone to that level even though D. heterophylcta was not recorded from the highest two samples.

Middle Nothofagidites asperus Zone 759m.

Only a very limited assemblage was recorded from the one sample assigned to this zone owing to very low palynomorph recovery. The sample is assigned to the Middle N. asperus Zone based on the presence of the dinoflagellates Schematophora speciosus and Corrodinium corrugatum.

Proteacidites tuberculatus Zone 744.5m - 755m

The occurrence of a number of morphologically relatively simple dinoflagellates which have been given the manuscript names Dinosphaera simplex, D. pontus and D. scabroellipticus, demonstrate a post-Eocene age for these sediments even though the P. tuberculatus zone marker fossils such as Cyatheacidites annulatus and the nominate species were not present.

.../5

REFERENCES:

ABELE, C., et al., 1976: Tertiary, in Geology of Victoria: J.G. Douglas & J.A. Ferguson, Eds., Spec. Publ. Geol. Soc. Aust., No. 5 pp. 1-528.

PARTRIDGE, A.D., 1976, The Geological Expression of Eustacy in the Early Tertiary of the Gippsland Basin, The APEA jour., Vol. 16, pt. 1, pp. 73-79.

STEELE, R.J., 1976: Some concepts of seismic stratigraphy with application to the Gippsland Basin, The APEA Jour., Vol. 16, pt.1, pp. 67-71.

BASIN GIPPSLAND DATE October 16, 1978

WELL NAME SWEEP-1 ELEVATION

AGE	PALYNOLOGIC ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time
OLIG-MIO.	P. tuberculatus	744.5m	1				755m	1			
EOCENE	U. N. asperus										
	M. N. asperus	759m	2								
	L. N. asperus	761m	0				785m	2			
	P. asperopolus										
	U. M. diversus										
	M. M. diversus										
	L. M. diversus										
PALEOCENE	U. L. balmei										
	L. L. balmei	790m	2				812m	1			
	T. longus	819m	1				838m	2			
LATE CRETACEOUS	T. lilliei										
	N. senectus										
	C. trip./T.pach.										
	C. distocarin.										
	T. pannosus										
EARLY CRETACEOUS											
PRE-CRETACEOUS											

COMMENTS: D. heterophylata dinoflagellate zone : 765m to 771m

RATINGS:
0; SWC or CORE, EXCELLENT CONFIDENCE, assemblage with zone species of spores, pollen and microplankton.
1; SWC or CORE, GOOD CONFIDENCE, assemblage with zone species of spores and pollen or microplankton.
2; SWC or CORE, POOR CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.
3; CUTTINGS, FAIR CONFIDENCE, assemblage with zone species of either spore and pollen or microplankton, or both.
4; CUTTINGS, NO CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If a sample cannot be assigned to one particular zone, then no entry should be made. Also, if an entry is given a 3 or 4 confidence rating, an alternate depth with a better confidence rating should be entered, if possible.

DATA RECORDED BY: _____ DATE _____

DATA REVISED BY: _____ DATE _____

FORM No R 315 12/72

TABLE 1 : SUMMARY OF PALYNOLOGICAL ANALYSES, SWEEP-1, GIPPSLAND BASIN

Sample	Depth (m)	Depth (ft.)	Zone	Age	Confidence Rating	Yield	Diversity	Comments
SWC-79	744.5	2441	P. tuberculatus	Oligocene	1	Poor	Low	D. pontus, D. simplex
SWC-49	747	2451	"	"	1	Poor	Moderate	Mostly Post-Latrobe dinoflagellates
SWC-78	749	2457	"	"	1	Poor	V.Low	One D. cf scabroellipticus
SWC-47	755	2477	"	"	1	Poor	Low	D. simplex
SWC-46	759	2490	Middle N. asperus	Middle to Upper Eocene	2	Poor	Moderate	Few dinoflagellates
SWC-75	761	2497	Lower N. asperus	Middle Eocene	0	Poor	High	Highest A. dictyoplokus
SWC-45	763	2503	--	--	-	V.Poor	V.Low	Almost barren
SWC-74	765	2510	"	"	1	Fair	High	D. heterophylcta present
SWC-44	767	2516	"	"	0	Good	High	"
SWC-73	769	2523	"	"	0	Fair	High	"
SWC-43	771	2529	"	"	0	Good	High	"
SWC-42	774	2539	"	"	2	Poor		Essentially Non-marine
SWC-71	780.5	2561	"	"	1	Low	High	"
SWC-41	785	2575	"	"	2	Low	High	"
SWC-70	790	2592	Lower L. balmei	Paleocene	2	Fair	Moderate	Common L. balmei, no other markers
SWC-38	812	2664	Lower L. balmei	"	1	Good	High	
SWC-37	819	2687	T. longus	Lower Paleocene	1	Good	Moderate	
SWC-66	826	2710	"	"	1	V.Good	High	
SWC-65	833	2733	--	--	-	Barren	--	Almost no organic material
SWC-35	838	2749	T. longus	Lower Paleocene	2	Poor	Fair	
SWC-34	855	2805	--	--	-	Barren	--	Practically no organic material
SWC-62	876	2874	--	--	-	Barren	--	Small amount charcoal/woody frags.
SWC-32	883	2897	--	--	-	Barren	--	Fine, black mineral charcoal

SWEEP-1 SPECIES LIST.

Well Name SWEEP-1 Basin GIPPSLAND Sheet No. 1 of 4

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S					
DEPTHS / PALYNOMORPHS	744.5	747	749	755	759	761	763	765	767	769	771	774	780.5	785	790	812	819	826	833	838	855	876	883						
A. qualumis																													
A. acutullus																													
A. luteoides																													
A. oculatus																													
A. sectus																													
A. triplaxis																													
A. obscurus																/													
B. disconformis																													
B. arcuatus											/		/																
B. elongatus																													
B. mutabilis																													
B. otwayensis																													
B. elegansiformis								/																					
B. trigonalis		/						/																					
B. verrucosus																													
B. bombaxoides																													
B. emaciatus																													
C. bullatus																													
C. heskermensis									cf																				
C. horrendus																													
C. meleosus																													
C. apiculatus																													
C. leptos																													
C. striatus																													
C. vanraadshoovenii																													
C. orthoteichus/major								/			/																		
C. annulatus																													
C. gigantis																													
C. splendens						/		/		/				/	/		/	/											
D. australiensis				/																									
D. granulatus	/		/							/			/	/		/													
D. tuberculatus	/				/				/				/			/													
D. delicatus																													
D. semilunatus																													
E. notensis																													
E. crassiexinus																													
F. balteus																													
F. crater																													
F. lucunosus																													
F. palaequetrus																													
G. edwardsii																	/												
G. rudata																	/	/											
G. divaricatus																													
G. gestus																													
G. catathus									/			/																	
G. cranwellae																		/											
G. wahooensis																													
G. bassensis																													
G. nebulosus																													
H. harrisii	/	/	/	/	/	/		/	/	/	/	/	/	/	/														
H. astrus																		/										
H. elliottii																													
I. anguloclavatus																													
I. antipodus																													
I. notabilis																													
I. gremius												/																	
I. irregularis								/	/				/	/															
J. peiratus																													
K. waterbolkii																													
L. amplus																		/										
L. crassus																													
L. ohaiensis																													
L. bainii																		/										
L. lanceolatus																													
L. balmei	RW													RW	/	/		/											
L. florinii			/			/			/	/	/	/		/	/	/													
M. diversus								/		/																			
M. duratus																													
M. grandis																													
M. perimagnus																													

*C=core; S=sidewall core; T=cuttings.

SWEEP-1 SPECIES LIST

Well Name SWEEP-1 Basin GIPPSLAND Sheet No. 2 of 4

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S					
DEPTHS / PALYNOMORPHS	744.5	747	749	755	759	761	763	765	767	769	771	774	780.5	785	790	812	819	826	833	838	855	876	883							
M. subtilis						/		/		/	/			/																
M. ornamentalis																														
M. hypolaenoides																														
M. homeopunctatus																														
M. parvus/mesonesus		/											/																	
M. tenuis																														
M. verrucosus																														
M. australis																														
N. asperus						/				/	/			/																
N. asperoides																														
N. brachyspinulosus								/					/	/																
N. deminutus																														
N. emarcidus/heterus	/		/	/		/		/			/																			
N. endurus																/		/												
N. falcatus								/		/																				
N. flemingii					/	/		/	/	/	/	/	/	/		/		/												
N. goniatus										/				/																
N. senectus																														
N. vansteenisii		/							/		/			/																
O. sentosa																		/												
P. ochesis																														
P. catastus																														
P. demarcatus																														
P. magnus																														
P. polyoratus														/	/	/		/												
P. vesicus																														
P. densus															/															
P. velosus													/	/																
P. morganii/jubatus																														
P. mawsonii		/	/	/	/	/		/			/		/	/		/		/		/										
P. reticulosaccatus																														
P. verrucosus																														
P. crescentis																														
P. esobalteus																														
P. langstonii																/														
P. reticulatus																														
P. simplex																														
P. varus																														
P. adenanthoides (Prot.)		RW								/			/	/																
P. alveolatus																														
P. amolosexinus																cf														
P. angulatus																/		cf												
P. annularis												/	/	/	/	/														
P. asperopolus																														
P. biornatus																														
P. clarus																														
P. cleinei																														
P. confragosus																														
P. crassis								/	/									/												
P. delicatus																														
P. formosus													/																	
P. grandis														/																
P. grevillaensis																														
P. incurvatus																														
P. intricatus																		/												
P. kopiensis									cf																					
P. lapis																														
P. latrobensis														cf																
P. leightonii		RW				/																								
P. obesolabrus																														
P. obscurus						/		cf		cf																				
P. ornatus																														
P. otwayensis																														
P. pachypolus						/		/	/	/																				
P. palisadus																		/												
P. parvus																														
P. plemmelus									/				/																	
P. prodigus																														
P. pseudomoides																														
P. recavus					/			/	/	/																				

*C = core; S = sidewall core; T = cuttings.

SWEEP-1. SPECIES LIST

Well Name SWEEP-1 Basin GIPPSLAND Sheet No. 3 of 4

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S					
DEPTHS / PALYNOMORPHS	744.5	747	749	755	759	761	763	765	767	769	771	774	780.5	785	790	812	819	826	833	838	855	876	883						
P. rectomarginis																													
P. reflexus																													
P. reticulatus																													
P. reticuloconcavus																													
P. reticuloscabratus																													
P. rugulatus																													
P. scitus																													
P. stipplatus																													
P. tenuiexinus																													
P. truncatus																													
P. tuberculatus																													
P. tuberculiformis																													
P. tuberculotumulatus																													
P. xestoformis (Prot.)																													
Q. brossus																													
R. boxatus																													
R. stellatus																													
R. mallatus																													
R. trophus																													
S. cainozoicus																													
S. rotundus																													
S. digitatoides																													
S. marlinensis																													
S. rarus																													
S. meridianus																													
S. prominatus																													
S. uvatus																													
S. punctatus																													
S. regium																													
T. multistrixus (CP4)																													
T. textus																													
T. verrucosus																													
T. securus																													
T. confessus (C3)																													
T. gillii																													
T. incisus																													
T. longus																													
T. phillipsii																													
T. renmarkensis																													
T. sabulosus																													
T. simatus																													
T. thomasii																													
T. waiparaensis																													
T. adelaidensis (CP3)																													
T. angurium																													
T. delicatus																													
T. geraniodes																													
T. leuros																													
T. lilliei																													
T. marginatus																													
T. moultonii																													
T. paenestriatus																													
T. retequetrus																													
T. scabratus																													
T. sphaerica																													
T. magnificus (P3)																													
T. spinosus																													
T. ambiguus																													
T. chnosus																													
T. helosus																													
T. scabratus																													
T. sectilis																													
V. attinatus																													
V. cristatus																													
V. kopukuensis																													

*C=core; S=sidewall core; T=cuttings.

SWEEP-1 SPECIES LIST

Well Name SWEEP-1 Basin GIPPSLAND Sheet No. 4 of 4

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S					
DEPTHS / PALYNOMORPHS	744.5	747	749	755	759	761	763	765	767	769	771	774	780.5	785	790	812	819	826	833	838	855	876	883						
Dino. pontus	/																												
Dino. simplex	/	/		/																									
Oper. centrocarpum	/	/	/	/	/	/				/																			
Leptodinium sp.	/	/		/						/																			
Achom. alcicornu	/									/																			
Spiniferites spp.	/	/		/				/		/																			
Caligod amiculum	/																												
Oper. brevum		/																											
Poly. varispinosum		/																											
Nema. cf. divergens		/																											
Ling. solarum		/		/																									
Pent. lactinctum		/																											
Cyclop. vieta		/																											
Poly. fibrosum		/	/																										
Dino. scabroellipticus			/																										
Lepto. leos				/																									
Emsl. australiense				/																									
Hemicystidinium sp.				/																									
Spinidinium sp.					/	/		/	/		/																		
Schem. speciosus					/																								
Tect. marlum					/																								
Corrod. corrugatum					/	/																							
Wetz. glabra						/			/	/																			
Areo. dictyoplokus						/			/	/	/																		
Defl. oebisfieldensis						/			/	/			cf.																
Areo. arcuatum						/																							
H'kolp. riguade						/				/																			
Defl. flounderensis						/																							
Defl. heterophylcta							/	/		/	/																		
Homot. tasmanensis							/																						
Thalasiphora sp.								/																					
Defl. leptodermata								/																					
Para. indentata								/			/																		
System. placantha									/																				
Phtham. coreoides									/																				
Hystr. tubiferum											/																		

*C = core; S = sidewall core; T = cuttings.

APPENDIX 4

APPENDIX 4

FORAMINIFERAL SEQUENCE - SWEEP-1

by

David Taylor

THE FORAMINIFERA SEQUENCE IN SWEEP-1,

GIPPSLAND BASIN

by

David Taylor, Consultant

ESSO AUSTRALIA LTD

PALAEONTOLOGICAL REPORT: 1979/8 MARCH 22, 1979

FORAMINIFERAL SEQUENCE

- SWEEP # 1

by DAVID TAYLOR

Consultant

Esso Australia Ltd.,
Paleontological Report 1979/8

March 22, 1979

SUMMARY

The foraminiferal sequence commenced in "Greensand" sediment deposited in the late Oliogcene (Zone H-2). Although the most biostratigraphic units, apart from B-2, were recognised, the sedimentary record is far from complete. This is demonstrated by dramatic fluctuations in the accumulation rates for the Zones. Episodic canyon cutting and filling cycles are evident over a period of some 14m.y., between late early Miocene (F) to Pliocene (A-3). This is the longest recorded span for submarine canyon activity in the Gippsland Basin. Probably the Sweep site was at the proximal end of the modern Bass Canyon and that the last fill episode did not cease till the Quaternary (17,000 yr. BP).

INTRODUCTION

Fiftynine sidewall cores were examined from SWEEP # 1. No planktonic fauna was found in the eleven SWCs between 785 and 757. All depths quoted are in metres as labelled on submitted samples.

Data is collated on the following sheets.

FACTUAL Biostratigraphic Data Sheet
FACTUAL Sample data Sheets with observations on residue grains.
FACTUAL Distribution Chart - Sheet 1 - for planktonic foraminifera.
FACTUAL Distribution Chart - Sheet 2 - for benthonic foraminifera and other grains.

BIOSTRATIGRAPHY.

LATE OLIGOCENE - ZONE H-2 - 755 to 747.

The foraminiferal sequence commences with a low diversity H-2 association of *Globigerina woodi woodi* and *G. ciperoensis*. The apparent condensation of the zonal interval was probably due to the slow sedimentation rate of the "Greensand" which contains the H-2 faunas.

EARLY MIOCENE - ZONES H-1 to E-2 - 744.5 to 660.

The base of early Miocene (= H-1) is designated at the *Globigerina woodi connecta* FAD*with the top (= E-2) at 660, below the *Orbulina* FAD at 650. Units H-1 and G were extremely condensed, suggesting very slow sedimentation rates (see Environment section).

MID MIOCENE - ZONES E-1 to C - 650 to 507.5.

The base of the mid Miocene corresponds to the appearance of a poorly preserved specimen of *Orbulina suturalis* within a typical E-1 association. The fauna

---

*FAD = First Appearance Datum.

at 630 was more diverse and contained definite, though rare, specimens of *O. suturalis*.

The Zones D-2 and D-1 intervals were unusually thin. This interval was designated as that between the *Orbulina universa* FAD (at 605) and the *Globorotalia miotumida miotumida* FAD at 553.

LATE MIOCENE - ZONE B-2 - ? Absent.

Zone B-2 faunas were not recorded in Sweep # 1. As there was little or no room for B-2 sediments between the *G. mayeri* LAD*at 507.5 (= Zone C) and the *G. conomiozea* FAD at 498.2, it must be concluded that Zone B-2 is absent or extremely condensed in this section.

PLIOCENE - ZONES B-1 to A-3; 498.2 to 241.5.

Base of Pliocene in Austral region is believed to approximate the *G. conomiozea* FAD. Base of Zone A-4 at 397 was established on *G. puncticulata* FAD, whilst base of Zone A-3 has been tentatively positioned in next sample above the *G. conomiozea* LAD.* The quality rating for the A-3 pick is very low as faunas at and above 327 lack definite *G. inflata*. As this cool temperate minimal layer species was normally common in A-3, its absence is puzzling. The presence of *G. miotumida* in Zones A-4 and A-3 is anomalous and probably due to reworking.

ENVIRONMENT.

Sweep # 1 is by far the best sample sequence on the northern margin of offshore Gippsland. A cyclic environmental pattern of:-

3) Shallow shelf platform sedimentation in
2) Episodic shelf and slope canyon cutting and filling events from high in the early Miocene (Zone F) to the Pliocene (? Zone A-3).
1) Shallow shelf platform sedimentation in latest Oligocene and early Miocene (Zones H-2, H-1 & G).

This pattern is evident from the benthic foraminiferal distribution chart (Sheet 2) on which species are grouped according to their comparative distribution in other sections. Distribution of other grains (e.g. sponge

---

* LAD = Last Appearance Datum.

spicules or bryozoal fragments) show coincidence with a particular benthic group. More detailed observations on grain components are summarised on the six data sheets.

Canyon fill sedimentation occupy a longer time span than normally observed in the Gippsland Miocene; some 14m.y. compared with 2 to 4m.y. in other sequences. The Sweep fill was characterised by reworked older planktonic foraminifera in younger faunas (e.g. D-2 mixed with C or B-1), together with deeper water benthic associations. Differences in preservation, both from corrosion and abrasion (e.g. the Battered *Robulus* fauna), separate the displaced specimens from the better preserved autochthonous specimens. Adhering limonite and pyrite as well as pyritic infilling (see below) is common on the allochthonous specimens.
Sporadic accumulation of siliceous sponge spicules are another feature of Gippsland canyon fills, as is size and/or shape sorting of foraminifera.

The fill indicators extend from 734 at base of F to 241.5 within ? A-3. However the canyon fill was episodic being interspersed by errosive canyon cutting episodes. This is evident from condensation or abbreviation or even absence of some biostratigraphic intervals interspersed with disproportionate developments of other units. This is illustrated by the following uncorrected accumulation rates (UR).

ZONE	SPAN IN M.Y.	THICKNESS IN M.	U.R. cm/1,000 yrs.
A-3	1	86	860
A-4	1	46	460
B-1	1.7	88	517
B-2	5.5	<9	16
C	2.5	45.5	182
D1/D2	1.3	41.7	321
E-1	.2	28	1400
E-2	.3	30	1000
F	.5	30	500

The UR for Zones D-2/D-1 are unusually low. For instance in Halibut # 1 the UR for D-2/D-1 approximates 8,000cm/1,000 years. But Halibut was in the distal canyon situation, compared with a proximal one for Sweep. Therefore the disproportionate difference in URs probably reflects an up canyon decline in nutrient availibility affecting biogenic productivity. Another factor is that canyon fill commenced in Zone F in Sweep, but later in Halibut (i.e. Zone D-2). The initial accumulation of most Gippsland Canyon fill sequences were coarser grained than higher in the sequences and thus had greater porosity and features, suggesting rapid dump/fill deposition. This could explain also the differences in URs for Zones D-2/D-1 between initial rapid filling (i.e. Halibut) and finer grained later sequence fill in Sweep.

It can be logically ascertained that canyons developed from the shelf into deeper water in a progressive and diachronous manner of cutting and filling with fill higher in the canyon constantly being redistributed down the canyon. Therefore the UR values for Sweep are artificial in that they imply constant sedimentation during a selected time span. The abbreviation of some units and exaggeration of thickness of other units indicates cycles of dumping, followed by non deposition and/or removal of previous fill, then more dumping. This model assumes fluctuation in energy within the system and rapid burial of accumulations. Fluctuating down canyon current energy is apparent from such observations as specimen number, benthic diversity, size and shape sorting and specimen abrasion. Rapidity of burial is an essential phenomenon in the anaerobic formation of iron sulphides from protoplasm in the presence of iron sulphates (e.g. Sugden, 1966). The observations of limonite and pyrite adhering or infilling foraminiferal specimens is noted on the data sheets.

Thus the Sweep canyon fill sequence is regarded as a discontinuous one; recording repeated episodes of cutting, filling and probably non deposition in a proximal or "Canyon Head" situation. The depth to the canyon floor, at any one time, is difficult to estimate as a number of the Basin Deep species (listed on Distribution Sheet 2) could have been "elevated" by the upwelling of cold, nutrient enriched waters. This "faunal elevation" was demonstrated by Taylor & Mee (1970) in modern Gippsland Canyon floor samples. However the canyon

initiation was sudden with a drop in base level at base of Zone F. This base level drop could have been from 100m with an inner shelf Zone G fauna to 200m, with an "elevated" slope fauna at base of Zone F.

Although circumstantial, the geographic linear fit of the Snowy River mouth, Sweep and the northern Tributary of the Bass Canyon (refer Conolly, 1968, figs. 1 & 2) is more than coincidental. Samples from the present North Bass Canyon floor (Taylor & Mee, 1970) showed that the canyon was dormant regarding mass sediment dumping, but that there was a steady supply of debris from the sponge gardens and bryozoal forests at the canyon head. This canyon head is an exposure at 120m of consolidated Quaternary calcarenite, which has all the features of having been deposited in much shallower water during a glacio-eustatic sea level low (21,000 to 14,-00 years, BP-data in Jongsma, 1970). This barrier would have caused backfill of the canyon towards the shoreline.

The paucity of terrestial detritus in the Sweep Canyon fills, could preclude the connection with the Snowy River. But it must be remembered that the bed of the Snowy is at present incised and obviously a rejuvenation of the meandering, tortuous course it took pre-uplift. The terrestial detritus reaching the sea, would have been minimal. This is confirmed by the purity of the Miocene (Zones F to D-2 - pers. obs.) calcarenites outcropping along the Snowy Valley in the vicinity of Orbost.

REFERENCES

CONOLLY, J.R., 1968 - Submarine canyons of the continental margin, East Bass Strait. *Marine Geol.*, 6; 449-461.

JONGSMA, D., 1970 - Eustatic sea level changes in the Arafura Sea. *Nature*, 228; 150-1.

SUGDEN, W., 1966 - Pyrite staining of pellety debris in carbonate sediments from the Middle East and elsewhere. *Geol. Mag.*, 103(3); 250-256.

TAYLOR, D & MEE, V., 1970 - Report to Esso on Gippsland seafloor sampling.

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO. SWEEP # 1. *DATE:* 21.1.79.

PREPARED BY: DAVID TAYLOR.

SHEET NO. 1 of 6.

DRAW:

DEPTH IN METRES	*SAMPLE TYPE*	*SLIDE*	*ADDITIONAL INFORMATION*
785	SWC 41		N.F.F. - Dom - m ang qtz - rare subrd. qtz. & rock frags.
780.5	SWC 71		N.F.F. *ibid*
774	SWC 42		N.F.F. *ibid*
771	SWC 43		N.F.F. orange f-m ang qtz sdst - r. green glauc. but common limonite "books" after glauc, after mica.
769	SWC 73		N.F.F. dom m. ang qtz. sdst with pellet glauc - r. c. ang. & subrd. rock frags. (? Paleozoic quatzite).
767	SWC 44		*Cassidulina* sp? (5 specs) "L.E. GREENSAND" Dom. m. ang. qtz. sdst + 20% glauc of 2 species - (1) book - brighter green (2) irregular pellets light apple green.
765	SWC 74		N.F.F. 60% f-m ang clear qtz,. 40% orange f ang qtz sdst.
763	SWC 45		N.F.F. Dom orange f ang qtz sdst with 10% "book" & irreg. pellet glauc; r ang. rock frags.
761	SWC 75		N.F.F. Dom clear f-c ang qtz sdst 10% glauc - "book" pellet & irregular in various stages of oxidation. 5% pyrite. (? biogenic) r subr rock frags.
759	SWC 46		N.F.F. Dom l. bn limonitic clay after glauc - some in pellet form. 10% orange f. ang. qtz sdst; r c subr. qtz. Bioturbation evident.
757	SWC 76		*ibid* + 10% gn glauc clay.
755	SWC 47		H-2(1) - Dom pellet glauc & limonite. shallow water benths with Dom. *Cibicides*.
749	SWC 78		H-2(1) - *ibid* + fish teeth.
747	SWC 49		H-2(1) *ibid*
744.5	SWC 79		H-1(1) - 70% pellet glauc - 25% forams + r f ang qtz sdst & bry count 500. 10% planks benth diversity 20, all shallow water.

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO. SWEEP # 1. *DATE:* 21.1.79.

PREPARED BY: DAVID TAYLOR.

SHEET NO. 2 of 6.

DRAW:

DEPTH IN METRES	*SAMPLE TYPE*	*SLIDE*	*ADDITIONAL INFORMATION*
740	SWC 51	H-1(1)	- bry. calcaren ± r. f. ang. qtz. sdst. with orange limonite staining + r. ech. count 1000, 40% planks - v. shallow benths with abundant *Carpentaria* spp., *Cibicides* spp. & *Karrieras*pp.
738	SWC 81	G(1)	- bry. calcaren with ech spines, fecal pellets - coal frags. Count 100, 40% planks, benth suggest slight deepening.
736	SWC 52	G(1)	- c. bry. calcaren with ech spines & count 800, 35% planks, displaced incl. rafted bry. adherent benths.
734	SWC 82	F(0)	- Dom limonitic stained lst. frags. r ang qtz & sponge spics bry, ech, ost. count 800, planks 50% benth diversity 15-17 + ? reworked. N.B. r *Cassidulina carinate*.
732	SWC 53	F(1)	75% forams 20% limonitic stained lst. frags + r. glauc & bry. count 1500, 60% planks, benths indicate slight deepening. not as diverse as 734.
730	SWC 83	F(1).	Dom l gy. calc. mdst. + limonite, v.r. dirty coal frags, vein qtz frags, mica, bry. ech. *Tubiporid coral* Count 1900, 45% planks. good pres. benth diversity 16 with rafted adherent forms & corroded miliolids. Obvious deepening & mixing with shallow water displaced spp.
728	SWC 54	F(0)	Dom forams. r. ang. qtz., ? epidote & botryoidal glauc. Charophyphyites. Some glauc in filling of planks. Count 9000 planks 70%. good pres. Benth diversity 12 + displaced spp. incl. BATTERED *ROBULUS*. Shelf edge.
724	SWC 55	F(1)	Dom. forams, limonite staining, r.c. ang. qtz. lst. frags, r. coal epidote & glauc ech. count 800. 85% planks pres. poor sugary recryst. Benth low diversity. Spherical spap sorted (benth planks & benth). High energy shelf edge.
720	SWC 85	F(1)	- Dom Forams, ost. bry. ech. count 3500, planks 70% - mod. pres sugary. Benth diversity 12 + etched miliolids. Shelf/slope break.

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO. SWEEP # 1. *DATE:* 28/2/79.

PREPARED BY: DAVID TAYLOR.

SHEET NO. 3 of 6.

DRAW:

DEPTH IN METRES	*SAMPLE TYPE*	*SLIDE*	*ADDITIONAL INFORMATION*
709	SWC 56	F(1)	Dom forams - 10% bright grn. blauc. r. pyr. Count 4500, 65% planks. Benths with 45% reworked limonitic stained shallow water spp.
700	SWC 86		indet - Dom micrite r. ost. ech. spic. count 10 - lens shape sorted. High energy shelf/slope break.
690	SWC 57	E-2(1)	Dom micrite Count 500, 60% planks. Pres. poor - recryst. after limonite stained slope benths + displaced spp. ? Canyon Head.
680	SWC 87	E-2(0)	Dom forams, 20% micrite frags, worn bry. frags. spic. count 6000, 70% planks. pres. good often limonite stained. Slope benths + 10% displaced spp. incl. BATTERED *ROBULUS*.
670	SWC 58	E-2(1).	Dom forams count 2000. planks 60%.Slope Benths + displaced spp. with adherent limonite.
660	SWC 88	E-2(0)	Dom. forams. r.c. rd. qtz. common spics. 2 spp. charophytes, count 10,000, planks 80%. Small residue, spec. size 90% .2mm. size sorted. High energy slope benths + displaced spp.
650	SWC 59	E-1(2)	60% forams, 30% micrite, limonite adherent grains. Count 4500, 75% planks. Slope benths + displaced spp.
630	SWC 60	E-1(0)	Dom forams r. adherent pyr. & limonite. r. pitted subrd. qtz. Count 3000, 65% planks slope benths.
622	SWC 90	E-1(1)	- 60 % forams, 30% limonitic lst, 10% pyrite infilled cibicidids. r. rd. qtz, ech, worn bry. frags. count 450, 35% planks slope benths - high energy canyon fill (e.g. *Cassidulina carinata)*. Displaced *Cibicides* with twofold burial history.
605	SWC 1	D-2(0)	- forams, abundant limonite, r. adherent pyr. common spics, ost., count 800 40% planks. slope benths (Dom. *Siphouvigerina canariensis*) + displaced shalf benths & planks.

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO. SWEEP # 1 *DATE:* 28/2/79.

PREPARED BY: DAVID TAYLOR.

DRAW: *SHEET NO.* 4 of 6.

DEPTH IN METRES	*SAMPLE TYPE*	*SLIDE*	*ADDITIONAL INFORMATION*
592	SWC 2	D-2(1) - Dom forams. 30% benths pyr. infilled & limonitic stained + pyr. infilled ech. spines. Count 500, 30% planks. Most benths displaced with Dom. *Cibicides victoriensis*.
563.3	SWC 4	D-1(2) - Dom forams (recryz). limonite to pyrite adherents r. ang. qtz. spics (4), osts. count 450, 45% planks, slope benths (e.g. *Cassidulina carinata*) + displaced spp. High energy canyon fill.
553	SWC 5	C(1) - Dom forams with adherent limonite, spics, ech., count 2500, 65% planks, shelf/slope break benths + displaced shelf benths + reworked planks (D-2 or E).
537	SWC 6	C(1) - Dom forams - limonite + r. pyr. adhering. Count 2400, 65% planks - mainly reworked D-2 spp. High % ? displaced benths.
533.7	SWC 7	C(1) - Dom C_a, F_e bonded clay (difficult to dis limonite & pyr. after limonite abundant common spics, ech, bry. ost. Most specs. pyr. infilled. Count 120, 40% planks, 90% infilled, displaced & recrys. see below.
527.5	SWC 8	C(2) - Dom forams. Abundant limonite & pyr after limonite. Common pyr. infilling of both *Cibicides* spp. & reworked *Globorotalia* spp. Pyr. also adhering to externally *Cibicides* spp. Count 2000, 50% planks, 90% displaced specs incl. D-2 planks. Rapidly buried in anaerobic environment of high energy proximal canyon fill.
517	SWC 9	C(2) Dom forams. Abundant limonite, common spics, r. charophytes & reworked gastr. Count 6000, planks 60%, reworked shallow benths & D-2 planks - 90% Canyon fill but not as rapid as at 527.5 & 533.7 (note absence of Pyr.).
507.5	SWC 10	C(1) foram & calc. clay abundant limonite, commom spics, r. ost. count 500, 30% planks incl. D-2 reworkings. 90% displaced benths (incl. *Massilina lapidera* & corroded miliolids) with outer shelf *Cassidulina carinate*. Most specs, recrys. Proximal canyon fill but not instantaneous burial.
498.2	SWC 11	B-1(1). Dom. planks Count 4500, 75% planks, incl. some reworked D-2 spp. Outer shelf *Cibicides* spp. and *Cassidulina carinata*.

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO. SWEEP # 1 *DATE:* 28/2/79

PREPARED BY: DAVID TAYLOR.

*SHEET NO.*5 of 6.

DRAW:

DEPTH IN METRES.	*SAMPLE TYPE*	*SLIDE*	*ADDITIONAL INFORMATION*
469	SWC 13	B-1(1)	Dom. forams & clay. Abundant limonite. ech. bry. ost. Count 1200, 60% planks with minor D-2 reworked. Outer to mid shelf benths. with minor displaced spp. inc. rafted.
446.5	SWC 14	B-1(1).	Dom forams & clay. Common spics. ech. ostr. Count 1200, 65% planks incl. reworked Zone C. Benths mid to outer shelf with displaced forms incl. *Massilina lapidigera* & corod. miliolids.Pres. poor.
430.6	SWC 15	B-1(1).	Dom. forams & clay limonite common. Abundant spics. r. ech. & ost. Count 3000, 45% planks. Shelf benths + reworked incl. corroded miliolids.
410.5	SWC 16	B-1(2) -	Dom calc. clay with secondary calcite. Abundant spics, ost. ech., gast., Pres. poor. Count 200, 10% planks shelf benths incl. corroded miliolids.
397	SWC 17	A-4(1).	Calc. clay with limonite - limonitic infills of forams with pyr. externally as aggregates or isolated "spots". Common spics, v. poorly pres. bry. frags. Count 400, 30% planks of v. small size. *Cibicides* spp = Dom benth -some incoarse fraction.
382.5	A-4(1).	Dom	limonitic calc. clay + 40% forams. Abundant spics, gastr., ost., Count 1000, 10% planks - heavy calc. overgrowth on most specs. Diverse mid to innershelf benths + abundant corroded miliolids.
351	SWC 20	A-4(1) -	Dom. biogenic with abundant diverse bry. gastr & ech Count 3000, 20% planks diverse inner shelf benths - similar in composition to modern fauna (e.g. "Challenger" Sta. 162).
327	SWC 22	A-3(2) -	calc. clay + spic, bry., ech., ost. Count 500 55% planks. Inner shelf benths.
315.5	SWC 23		- calc. clay v.r. glauc. Count 300, 10% planks. Inner shelf benths with ? reworking (e.g. ? *Hofkerina semiornata).*
300	SWC 24		- bryo. calcaren + ech. ostr. Count 300, 15% planks - shallow shelf benths. Dom. *Cibicides.*

MICROPALEONTOLOGICAL MATERIAL

WELL NAME AND NO. *SWEEP # 1* *DATE:* *28/2/79.*

PREPARED BY: *DAVID TAYLOR.*

SHEET NO. 6 of 6.

DRAW:

DEPTH IN METRES.	*SAMPLE TYPE*	*SLIDE*	*ADDITIONAL INFORMATION*
273.5	SWC 26		*ibid* - Count 100, 10% planks shallow shelf benths. Dom. *Cibicides.*
264.5	SWC 27		*ibid* - Count 500, 10% planks, very shallow water benths. N.B. *Lenticulina megalophoto* & *Elphidium crassatum.* Dom. *Cibicides* & adherent spp.
254.3	SWC 28		80% bry. Count 500 - 5% planks. Shallow water benths as for 264.5.
241.5	SWC 29		bry calcaren. Mixture of fresh & worn bry. frags. & ech spines. Count 1000, 15% planks. Shallow benths as for 264.5. Highest occurrence of reworked planks(eg. *G.miotumida)*
230.5	SWC 30		80% bry. frags. + ech. Moll. ostr, tubiporid coral, count 400, 10% planks. Shallow benths

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: +25.3m GL: -69m

WELL NAME: SWEEP # 1 TOTAL DEPTH: 900m

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	241.5	2				327	2			
		A_4	351	1				397	1			
MIOCENE	LATE	B_1	410.5	2	430.6	1		498.2	1			
		B_2										
	MIDDLE	C	507.5	1				553	1			
		D_1	563.3	2				563.3	2			
		D_2	592	1				605	0			
		E_1	622	1				650	2	630	0	
		E_2	660	1				690	1			
	EARLY	F	709	0				734	1			
		G	736	1				738	1			
		H_1	740	1				744.5	1			
OLIGOCENE	LATE	H_2	747	1				755	1			
		I_1										
		I_2										
	EARLY	J_1										
		J_2										
EOCENE		K										
		Pre-K										

COMMENTS:

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: DAVID TAYLOR DATE: NOVEMBER 10, 1978

DATA REVISED BY: DAVID TAYLOR DATE: FEBRUARY 26, 1979.

SWEEP #1

PLANKTIC SPECIES GROUP	SIDEWALL CORES IN METRES	230.5	241.5	254.3	264.5	273.5	300	315.5	327	351	382.5	397	410.5	430.6	446.5	469	498.2	507.5	527.5	533.7	537	553	563.3	592	605	622	630	650	660	670	680	690	700	709	720	724	728	730	732	734	736	738	740	744.5	747	749	755
ORBULINA UNIVERSA		°	°		°		°			I	I		°	I	I		I		I		I	°		I																					
GLOBIGERINA DECORAPERTA		°	°	°	°	°		°	°			°										°				°		°								cf										
G. BULLOIDES		°	°	°	°	°	°		°	°			°	I	I			I	I	I		°	I	I		I	I		I	I	I		I	I	I	I	I		°		°				
G. NEPENTHES		?								?						?																														
G. FALCONENSIS		°	°																																										
GLOBOROTALIA CONTINUOSA		°		°		°	?			°	?								?						°																				
G. PUNCTICULATA		°									?	°		cf																																
GLOBIGERINOIDES spp. indet		°																																											
G. TRILOBUS			°	°	°	°	°							°	I	I	I	I	I	I	°		I	I	I	I	°	I	°	I	I	I		I	I	I	D	I	I	I	cf	°	°				
GLOBOROTALIA INFLATA			cf																																											
G. MIOTUMIDA MIOTUMIDA			▪		▫	▫	▫	▫	I		▫	▫		°	°	°			°			?	°																							
GLOBOQUADRINA DEHISCENS (S.S.)			°							°	°			°						°					°					°	°	°										°		I	°		
GLOBIGERINA APERTURA			°	°																																										
GLOBIGERINOIDES RUBER				?						?									°						°		°	°	°	°	°		°	°		°			?						
GLOBOROTALIA MIOZEA MIOZEA					?					▫				▫	▫	▫			▫		▫	▫	°		°	°	°	°	°		°	°	°	?	°											
G. CRASSAFORMIS						?				°																																				
G. MIOCENICA						▫																																								
GLOBIGERINA WOODI WOODI							°	°	°	°															°		I		°	°			I		°	I	I		I	I	I	°	°	°	°	
GLOBOROTALIA CONOMIOZEA										°	°		cf		°		°	cf																												
G. MIOZEA CONOIDEA										°						°	°	G	°	°	°	°	°					cf		cf																
G. SCITULA										°					°	?																														
G. SPHERICOMIOZEA											°																																		
GLOBOQUADRINA ADVENA											°																															°				
GLOBOROTALIA PRAEMENARDII												?		°	°	°		▫	▫		▫		°	°	°	°	°	°	°	°	°			°	°		°								
G. MENARDII														°						°		cf	°	°																						
G. OBESA														°	°	°		°	°	°																										
GLOBIGERINELLOIDES AEQUILATERALIS														°	°																														
GLOBOQUADRINA ALTISPIRA														?								?				°				°		°													
GLOBIGERINOIDES SACCULIFER															°																														
GLOBOROTALIA MAYERI															▫		▫	°		?			°																						
G. PANDA															°	▫			▫																											
G. PRAESCITULA																°	°		▫	▫	?				°	°	°	°		°		°	°		°			°		°					
GLOBIGERINOIDES SICANUS																°								°		°	°	°	°	°	°		°	°	I	?	I	I	°						
GLOBOROTALIA PERPHEROACUTA																	▫		▫		▫																								
G. PERIPHERORONDA																		▫	▫	▫		▫								°		°													
G. CONICA																		▫					▫		▫	?	?																			
PRAEORBULINA GLOMEROSA																		▫							°	°		°	?	?	°	°	?			?									
ORBULINA UNIVERSA PARKERAE																		°	°																											
GLOBIGERINA WOODI CONNECTA																						▫					I	°									°	I	°	°	I	I				
ORBULINA SUTURALIS																										°	▫	?																	
GLOBOROTALIA ZEALANDICA																										▫										°										
GLOBIGERINOIDES TRILOBUS (elongate)																												°								°									
GLOBOROTALIA SIAKENSIS																													°							°									
G. OPIMA CONTINUOSA																														°						°	°		°						
G. c.f. KUGLERI																																°				°									
G. BELLA																																°				°									
GLOBIGERINOIDES TRILOBUS — SICANUS																																				°									
GLOBIGERINA CIPEROENSIS																																										°	°		°		°
GLOBOQUADRINA DEHISCENS (S.L.)																																										°		I	°	°	°
GLOBOROTALIA NANA (S.L.)																																										°		I			
G. OPIMA NANA																																											°				
GLOBIGERINA PRAEBULLOIDES																																												I	I	°		°
G. EUAPERTURA																																													°		

Base in metres of ZONE	?	?	327 A-3	397 A-4	498.2 B-1	553 C	D/I	605 D-2	650 E-1	690 E-2	734 F	738 G	744 H-1	755 H-2

SWEEP #1

SIDEWALL CORES IN METRES: 230.5 241.5 254.3 264.5 273.5 300 315.5 327 351 382.5 397 410.5 430.6 446.5 469 498.2 507.5 517 527.5 533.7 551 553 563.3 592 605 622 630 650 660 670 680 690 700 709 720 724 728 730 732 734 736 738 740 744.5 747 749 755

BENTHIC SPECIES GROUP

MID to INNER SHELF

- *CIBICIDES LOBATULUS*
- " *OPAQUS*
- " *REFULGENS*
- " *SUBHAIDINIGERI*
- " *CYGNORUN*
- " *PERFORATUS*
- " *VICTORIENSIS*
- " *THIARA*
- " *BREVORALIS*
- " *NOVOZEALANDICUS*
- " *MEDIOCRIS*
- " *PSEUDOUNGERIANAS*
- *ROBULUS SPP.*
- *LINGULINA METUNGENSIS GROUP*
- *LAGENA SPP.*
- *NODOSARIA SPP.*
- *GLOBOCASSIDULINA SUBGLOBOSA*
- *GYROIDINOIDES SPP.*

SHALLOW WATER

- *LENTICULINA MEGALOPHOTA*
- *ROSALINA MITCHELLI*
- *STOMATORBINA CONCENTRICA*

SYMBIONTS on SEA GRASS & BRYOZOA

- *KARRERIA MAORIA*
- *HERONALLENIA SPP.*
- *CARPENTARIA SPP.*
- *ELPHIDIUM SPP.*
- *EPONIDES REPANDUS*
- *SIPHONINA AUSTRALIS*

SHALLOW WATER ARENACEOUS

- *HAPLOPHRAGMOIDES*
- *KARRERIELLA CYLINDRICA*
- *TEXTULARIA CONICA*
- *GOESII*
- *PSEUDOGRAMEN*
- *CARINATA*
- *GAUDYRINA CONVEXA*
- *AMMOSPHAEROIDINA SPHAERIFORMIS*
- *PSEUDOCLAVULINA BRADYANA*

"ELEVATED" BASIN DEEP or SLOPE SPECIES

- *MARTINOTIELLA COMMUNIS*
- *BATHYSIPHON*
- *KARRERIELLA BRADYI*
- *STILOSTOMELLA SP.*
- *"UVIGERINA" MAYNEI*
- *PROBOSCILEA*
- *CANARIENSIS*
- *PICKI*
- *SCHENKI*
- *CIBICIDES WUELLERSTORFI*

DISPLACED GRAINS

- *CASSIDULINA CARINATA*
- "BATTERED" ROBULUS
- "CORRODED MILIOLIDS"
- SPONGE SPICULES
- "PYRITISED FAUNA"
- QUARTZ

% BRYOZOA FRAGMENTS — 100% / 50% / 0%

% GLAUCONITE and/or LIMONITE PELLETS — 100% / 50% / 0%

ZONE: A - 3 | A - 4 | B - 1 | ? | C | D | E-1 | E-2 | F | G | H-1 | H-2

APPENDIX 5

APPENDIX 5

WELL LOG ANALYSIS

by

S. Patniyot

WELL LOG ANALYSIS REPORT

TO Well File,
c.c. B.R. Griffith, R.J. Coppin

OPERATOR Esso Australia Ltd. WELL Sweep #1 DATE 18th August 1978

STATE Victoria ELEV. 25.0m KB

DEPTH INTERVAL (m) ISF Depths	POROSITY ESTIMATE %	WATER SAT. ESTIMATE %	REMARKS All intervals listed are interpreted as being water productive.
782.0 - 84.5 (2.5)	26-28	100	V. shaley
784.5 - 85.5 (1.0)	25	"	V. shaley
787.5 - 88.0 (0.5)	22-23	"	V. shaley
788.0 - 88.5 (0.5)	25-27	"	V. shaley
788.5 - 89.5 (1.0)	21	"	V. shaley
790.5 - 91.0 (0.5)	23-27	"	" "
791.0 - 92.0 (1.0)	19-21	"	" "
792.0 - 93.0 (1.0)	22-24	"	Shaley
793.0 - 94.0 (1.0)	27-28	"	
794.0 - 94.5 (0.5)	28-30	"	
794.5 - 95.5 (1.0)	27-29	"	
795.5 - 97.0 (1.5)	29-32*	"	V. shaley
797.0 - 99.0 (2.0)	18-21	"	V. shaley
799.0 - 99.5 (0.5)	23-25	"	Shaley
799.5 - 80.0 (0.5)	26-28	"	
800.0 - 803.0 (3.0)	30-34*	"	V. Shaley
803.0 - 804.5 (1.5)	28-32*	"	
808.5 - 809.0 (0.5)	20-22	"	V. shaley
809.0 - 810.0 (1.0)	23-26	"	
810.0 - 811.0 (1.0)	28-32*	100	
811.0 - 11.5 (0.5)	33-34*	"	
811.5 - 13.0 (1.5)	25-27	"	
813.0 - 14.0 (1.0)	29-34*	"	
814.0 - 14.5 (0.5)	27-29	"	
814.5 - 16.0 (1.5)	29-34	"	
816.0 - 17.0 (1.0)	25-27	"	
817.0 - 18.0 (1.0)	20-23	"	Shaley
818.0 - 20.0 (2.0)	18-20	"	V. Shaley
824.5 - 25.0 (0.5)	23-25	"	
825.0 - 26.0 (1.0)	25-27	"	Shaley
826.0 - 27.0 (1.0)	22-24	"	"
827.0 - 28.5 (1.5)	25-26	"	
828.5 - 30.0 (1.5)	24-25	"	
830.0 - 30.5 (0.5)	21-23	"	
830.5 - 31.5 (1.0)	25-27	"	
831.5 - 35.0 (3.5)	21-23	"	Shaley

TESTS:

FIT's at 795 + 801m resulted in zero fluid recovery.

FORMATION:

Latrobe

LOGS:

ISF-MSFL-SONIC-GR
FDC-CNL-GR

COMMENTS:

This interpretation uses the density and neutron logs as porosity indicators and gamma ray log as clay indicator. An Rw value of 1.4 at 135°F was used in the estimation of water saturation and corresponds to 2000 ppm NaCl. An invasion study carried out over some of the sands using Schlumberger Chart Rint-5, 1977 chart book edition revealed that depth of invasion in the range 10-15" had occurred at he time of resistivity logging.

* Possibly reading too high, adversely affected by mud or washout.

S. Partridge

WELL Sweep #1

DEPTH INTERVAL (m)	POROSITY ESTIMATE %	WATER SAT. ESTIMATE %	REMARKS
835.0 - 38.5 (3.5)	19-22	100	Shaley
838.5 - 40.0 (1.5)	22-24	"	"
840.0 - 42.0 (2.0)	22-24	"	"
842.0 - 43.0 (1.0)	16-17	"	"
843.0 - 44.0 (1.0)	15-16	"	"
844.0 - 45.0 (1.0)	18-20	"	"
845.0 - 49.0 (4.0)	14-16	"	"
849.0 - 51.0 (2.0)	12-14	"	"
851.0 - 52.5 (1.5)	11-13	"	"
852.5 - 53.0 (0.5)	14	"	"
853.0 - 54.0 (1.0)	12-16	"	"
854.0 - 54.5 (0.5)	14-15	"	"
854.5 - 55.5 (1.0)	22-24	"	"
855.5 - 57.0 (1.5)	11-13	"	"
857.0 - 57.5 (0.5)	13-15	"	"
857.5 - 59.0 (1.5)	10-13	"	"
859.0 - 60.0 (1.0)	10-13	"	"
860.0 - 61.0 (1.0)	13-16	"	"
861.0 - 63.0 (2.0)	11-13	"	"
863.0 - 66.0 (3.0)	13-15	"	"
866.0 - 67.0 (1.0)	16-18	"	"
867.0 - 68.0 (1.0)	14-15	"	"
868.0 - 69.0 (1.0)	12	"	"
869.0 - 70.0 (1.0)	14-15	"	"
870.0 - 71.5 (1.5)	11-13	"	"
871.5 - 72.5 (1.0)	14-17	"	"
872.5 - 74.0 (1.5)	10-12	"	"
874.5 - 76.0 (1.0)	15-16	"	"
875.0 - 76.0 (1.0)	15-16	"	"
876.0 - 76.5 (0.5)	18	"	"
876.5 - 78.0 (1.5)	10-11	"	"
879.0 - 80.0 (1.0)	14-16	"	"
880.0 - 81.0 (1.0)	19-23	"	"
881.0 - 81.5 (0.5)	15-17	"	"
881.5 - 82.0 (0.5)	11-14	"	"
882.0 - 83.5 (1.5)	25-27	"	"
883.5 - 84.0 (0.5)	22-24	"	"
884.0 - 84.5 (0.5)	16-19	"	"
884.5 - 85.0 (0.5)	10-13	"	"
886.0 - 87.0 (1.0)	11	"	"
888.0 - 89.0 (1.0)	10-12	"	"
890.0 - 90.5 (0.5)	11-13	"	"
893.0 - 93.5 (0.5)	12	"	"
897.0 - 98.0 (1.0)	10-11	"	V. shaley
898.0 - 900.0 (2.0)	13-14	"	Shaley

APPENDIX 6

APPENDIX 6

VELOCITY SURVEY REPORT

VELOCITY SURVEY

Well ....SWEEP #1.....

Basin ...GIPPSLAND.....

INTRODUCTION

Esso personnel .....JOHN HUGHES.....

Contractor .....VELOCITY DATA PTY. LTD.....

Supplied (1) Instruments

(2) Personnel

Seismic Observer ..B. POTTER....

Marine Shooter ....R. DOYLE.....

Dynamite .....

(3) Seismic Souce

Gas Gun

Gas Pressures .....

Oxygen ....90 PSI.....

Propane ....50 PSI.....

(3) Licenced Shooting Boat

name .....

date loaded .....

date released .....

Agent .....

.....

amount of powder ..... lbs

size of cans ..... lbs

number of cans .....

number of caps .....

number of boosters .....

Personnel and Instruments

assembled at OCEAN ENDEAVOUR date 26/7/1978

boarded (rig). OCEAN. ENDEAVOUR. date..27/7/1978...

date of survey...26/7/1978.....

casing depth. 13-3/8 @ 601.2m..

T.D. when shot....900 m..... FTD 900 m

water depth.....69 m..... K.B..25.3.m.....

SURVEY PROCEDURE

Weather: sea .....0.5 m.....

rig movement ..NONE.....

rig noise ....MODERATE.....

Hydrophones: number ....THREE.....

depth below sea level .....12.2 m.....

position 2-1 m above bottom of gas gun

1- in moon pool.....

Shot Positioning and Charges:

marker buoys (number .....

(distance .....

(direction .....

charge depth ..... ft

number of shots .....charge size..... lbs.

number of shots .....charge size ..... lbs.

number of misfires .....

amount of powder .....

Gas gun

NO. OF POPS PER LEVEL: - 2 TO 3 POPS

amount of powder dumped .....lbs.

Well-phone positioning :

T-bar .....

number of depths .....10.....

Time: first shot .....1830 hrs.....

last shot .....2037 hrs.....

rig time .....3 hrs.....

RESULTS

Quality of records (good .....13.....
(fair .....7.....
(poor .....5.....
(not used .....

Comparison of Interval Times with sonic log

/△/average .....26.87.....microsec/m

/△max/ .....60.0.....microsec/m

CONCLUSION

Reliability of T-D curve .....FAIR.....

COMMENTS:

1) Traces 1: time break hydrophone
2-5: well geophone at 4 different gain settings
6: moon pool hydrophone
7: dead trace
8: time break hydrophone

2) The moonpool hydrophone was not working throughout the survey due to a break in the hydrophone cable. This could not be fixed without a considerable loss of time so it was decided to continue the survey without it.

3) A considerable amount of noise was experienced on most records. This was due to the shallow depth of the well.

Shothole information:- Elevation, Distance & Direction from Well

Company: ESSO EXPLORATION AUSTRALIA INC.

Well: SWEEP #1

Elevation (Derrick Floor): 25.3m

Total Depth: 900m

LOCATION

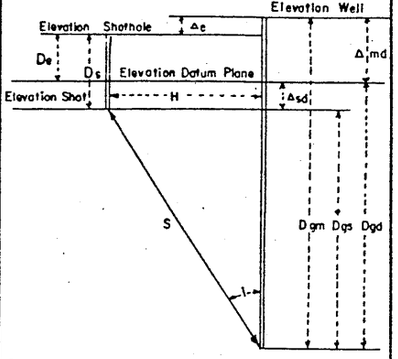
Coordinates: Lat. 38°03'26.73" Long. 148°38'12.98" DATUM : Mean Sea Level

Section, Township, Range

County

Area or Field: GIPPSLAND BASIN

Record Number	Shothole Number	Time of Shot	Dgm (m)	Ds	tus	tr	T Reading	T Polarity	T Grade	Dgs	H	TAN i	Cos i	Tgs	Δsd	Δsd/V	Tgd	Tgd Average	Dgd	ΔDgd	ΔTgd	Vi Interval Velocity	Va Average Velocity
24		2036	300	12.2.008			.145	D	G	262.5	36.6	.1394	.9904	.144	12.2.008		.152	.152	274.7				1807
25		2037	300	"	"		.145	D	G	"	"	"	"	.144	"	"	.152						
																				150	.066	2273	
1		1830	450	12.2.008			.211	D	F	412.5	36.6	.0887	.9961	.210	12.2.008		.218	.218	424.7				1948
2		1832	450	"	"		.211	D	F	"	"	"	"	.210	"	"	.218						
																				175	.083	2108	
3		1848	625	12.2.008			.294	D	G	587.5	36.6	.0623	.9981	.293	12.2.008		.301	.301	599.7				1992
4		1849	625	"	"		.294	D	G	"	"	"	"	.293	"	"	.301						
																				55	.024	2292	
22		2022	680	12.2.008			.318	D	F	642.5	36.6	.0570	.9984	.317	12.2.008		.325	.325	654.7				2014
23		2023	680	12.2.008			.318	D	P	"	"	"	"	.317	"	"	.325						
																				64	.030	2133	
19		2009	744	12.2.008			.347	D	G	706.5	36.6	.0518	.9987	.347	12.2.008		.355						
20		2010	744	12.2.008			.347	D	G	"	"	"	"	.347	"	"	.355	.355	718.7				2025
21		2011	744	"	"		.347	D	G	"	"	"	"	.347	"	"	.355						
																				28	.012	2333	
5		1901	772	12.2.008			.359	D	F	OFFSET DISTANCE				.359	12.2.008		.367						
6		1902	772	"	"		.359	D	G	DOES NOT AFFECT				.359	12.2.008		.367	.367	746.7				2035
7		1903	772	"	"		.359	D	G	TIME				.359	12.2.008		.367						
																				33	.013	2538	
16		1958	805	12.2.008			.371	D	P					.371	12.2.008		.379						
17		1959	805	12.2.008			.372	D	F					.372	12.2.008		.380	.380	779.7				2052
18		2000	805	12.2.008			.373	D	P					.373	12.2.008		.381						
																				22	.008	2750	
8		1915	827	12.2.008			.380	D	F					.380	12.2.008		.388						
9		1916	827	12.2.008			.381	D	G					.381	12.2.008		.389	.388	801.7				2066
10		1917	827	12.2.008			.380	D	G					.380	12.2.008		.388						
																				25	.008	3125	
14		1945	852	12.2.008			.389	D	G					.389	12.2.008		.397	.396	826.7				2088
15		1946	852	12.2.008			.388	D	G					.388	12.2.008		.396						
																				44	.014	3143	
11		1932	896	12.2.008			.403	D	P					.403	12.2.008		.411						
12		1933	896	12.2.008			.402	D	P					.402	12.2.008		.410	.410	870.7				2124
13		1934	896	12.2.008			.402	D	F					.402	12.2.008		.410						



Dgm = Geophone depth measured from well elevation

Dgs = " " " " shot "

Dgd = " " " " datum "

Ds = Depth of shot

De = Shothole elevation to datum plane

H = Horizontal distance from well to shotpoint

S = Straight line travel path from shot to well geophone

tus = Uphole time at shotpoint

T = Observed time from shotpoint to well geophone.

tr = " " to reference geophone.

Δe = Difference in elevation between well & shotpoint.

Δsd = " " " " shot & datum plane

Δsd = Ds - De

Dgs = Dgm - Ds ± Δe ; $\tan i = \frac{H}{Dgs}$

Tgs = cos i T = Vert. travel time from shot elev. to geophone

Tgd = $Tgs \pm \frac{\Delta sd}{V}$ = " " " " datum plane " "

Dgd = Dgm - Δmd

Vi = Interval velocity = $\frac{\Delta Dgd}{\Delta Tgd}$

Va = Average = $\frac{D\,gd}{T\,gd}$

Surveyed by: J. Hughes

Date: 26.7.78

Weathering Data :

Casing Record

13-3/8" @ 601.2m

SWEEP #1

VELOCITY SURVEY ERROR CHECK

Depth Rel. S.L.	Av. Vertical Travel Time (check shots)	Ti Check Shots (sec.)	Ti Sonic Log (sec.)	Δ (Millisecs.) Ti Check — Ti Sonic	Depth Interval (m)	Error (Microsec. per m)
275	.152	.066	.0675	-1.5	150	10.0
425	.218					
425	.218	.083	.0785	4.5	175	25.7
600	.301					
600	.301	.024	.023	1	55	18.2
655	.325					
655	.325	.030	.027	3	64	46.9
719	.355					
719	.355	.012	.013	-1	28	35.7
747	.367					
747	.367	.013	.013	0	33	0
780	.380					
780	.380	.008	.009	-1	22	45.4
802	.388					
802	.388	.008	.0095	-1.5	25	60.0
827	.396					
827	.396	.014	.014	0	44	0
871	.410					

VELOCITY DATA PTY. LTD.
P.O. Box 141, Kenmore, Queensland, 4069
Telephone (072) 78 4860 (Office)
(072) 93 1514 (Field Operations)

DATE OF SURVEY 26 July 78
CLIENT ESSO.
WELL Sweep # 1.

OBSERVERS REPORT

ENERGY SOURCE GAS GUN. RECORDING INSTRUMENTS RSU44 LOGGER Schlumberger
GEOPHONES: WELL WLS 1000 REFERENCE Not Used. SEA FLOOR REFRACTION
REFERENCE SENSOR OFFSET — DEPTH — DRILL SHIP Sean Endeavour SHIP HEADING
WEATHER Fine & Cold. SEAS Calm.

KB DEPTH	Record ~~BEARING~~	CHARGE	SHOT DEPTH	SHOT LOCATION	SHOT OFFSET	AMPLIFIER GAIN		TIME	COMMENTS
450m.	1	15Sec	40ft.	Port	150ft	2/1	0	1830	Strong break over heavy surface noise.
	2	"	"	Crane	"	"	"	1832	
625 m	3	"	"	"	"	"	"	1848	
	4	"	"	"	"	"	"	1849	
772 m	5	"	"	"	"	"	"	1901	
	6	"	"	"	"	"	"	1902	
	7	"	"	"	"	"	"	1903	
827 m	8	"	"	"	"	"	"	1915	
	9	"	"	"	"	"	"	1916	
	10	"	"	"	"	"	"	1917	
896 m	11	"	"	"	"	"	"	1932	
	12	"	"	"	"	"	"	1933	
	13	"	"	"	"	"	"	1934	
852m	14	"	"	"	"	"	"	1945	
	15	"	"	"	"	"	"	1946	
805 m.	16	"	"	"	"	"	"	1958	
	17	"	"	"	"	"	"	1959	
	18	"	"	"	"	"	"	2000	
744 m	19	"	"	"	"	"	"	2009	
	20	"	"	"	"	"	"	2010	
	21	"	"	"	"	"	"	2011	
680 m	22	"	"	"	"	"	"	2022	
	23	"	"	"	"	"	"	2023	
300m	24	"	"	"	"	"	"	2036	
	25	"	"	"	"	"	"	2037	

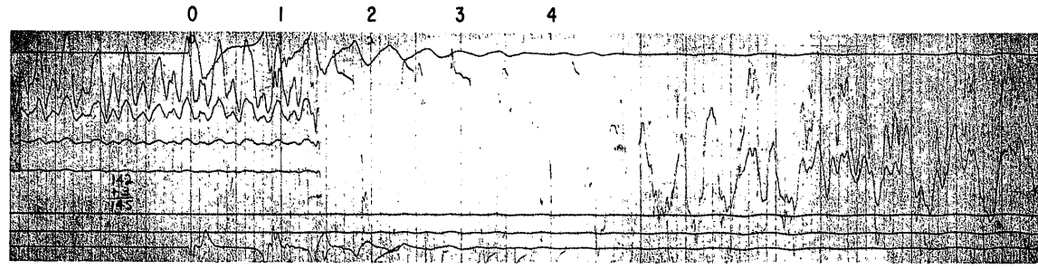
Note Moonpool phone found open circuit at start of survey & not replaced through lack of time.

NUMBER OF RECORDS 25 EXPLOSIVES USED: CAPS PRIMERS EXPLOSIVE
DEPART ~~BRISBANE~~ Perth 25 July 78 RETURN ~~BRISBANE~~ Perth 27 July 78 OBSERVER RK Potter

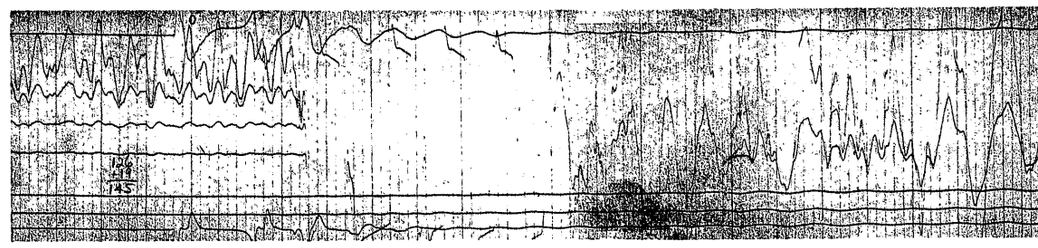
SWEEP – 1

WELL VELOCITY RECORD **26 - 7 - 1978**

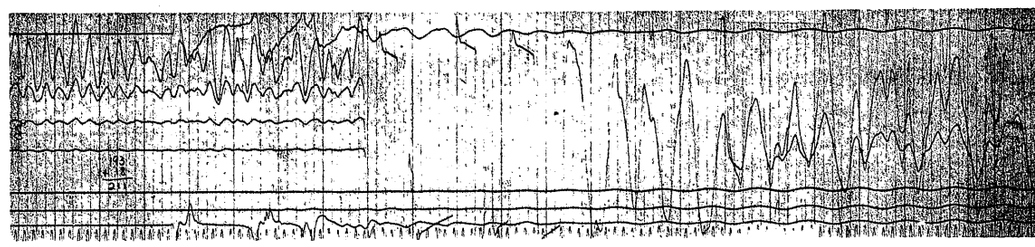
Rec. No. 24
300 m. K.B.



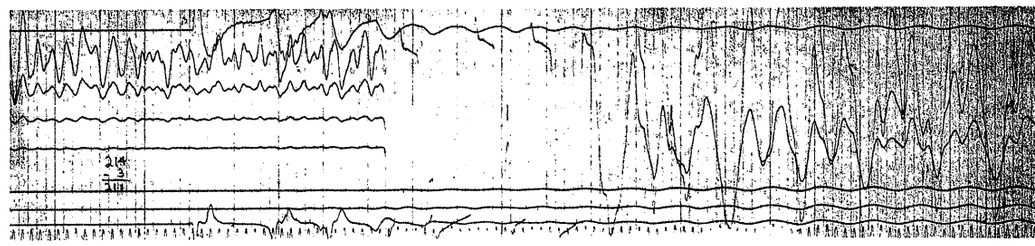
Rec. No. 25
300 m. K.B.



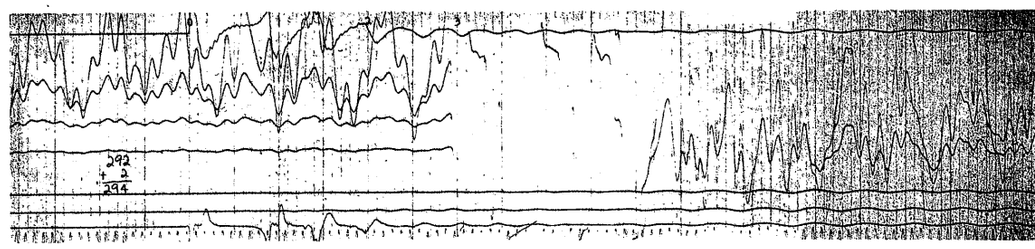
Rec. No. I
450 m. K.B.



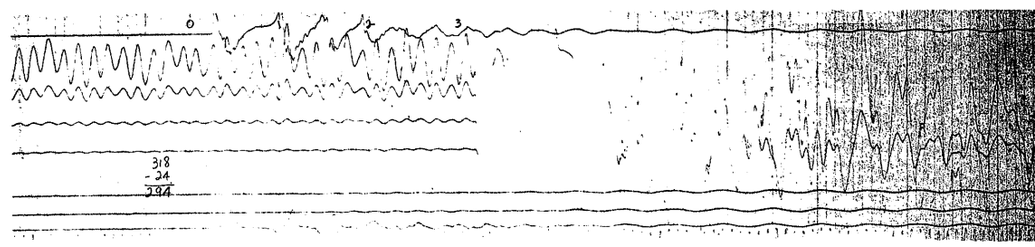
Rec. No. 2
450 m. K.B.



Rec. No. 3
625 m. K.B.



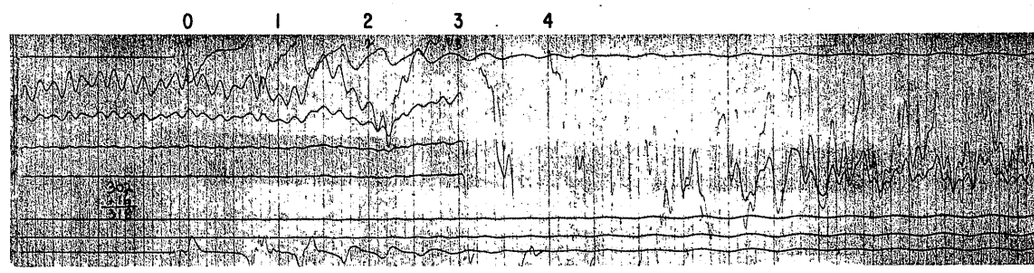
Rec. No. 4
625 m. K.B.



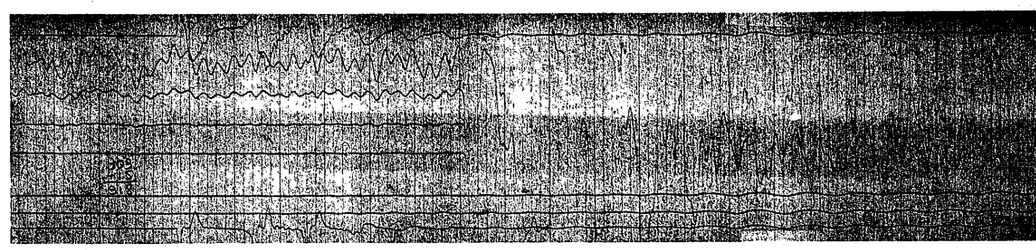
SWEEP – 1

WELL VELOCITY RECORD **26 - 7 - 1978**

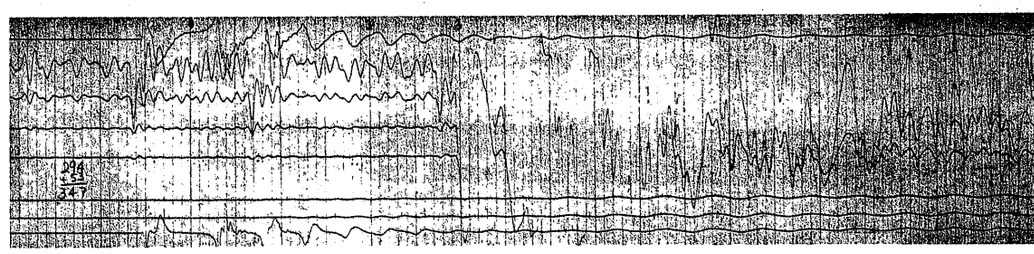
Rec. No. 22
680 m. K.B.



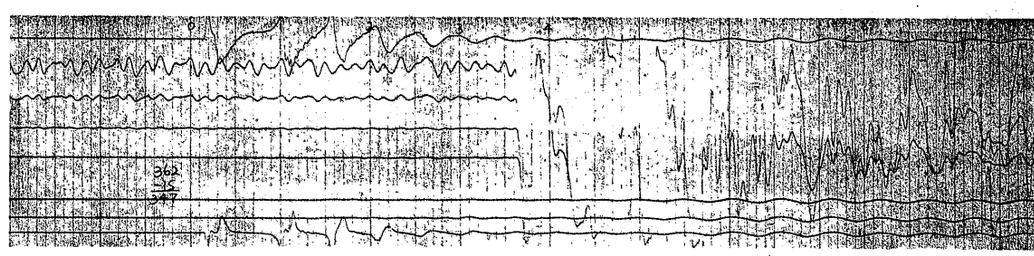
Rec. No. 23
680 m. K.B.



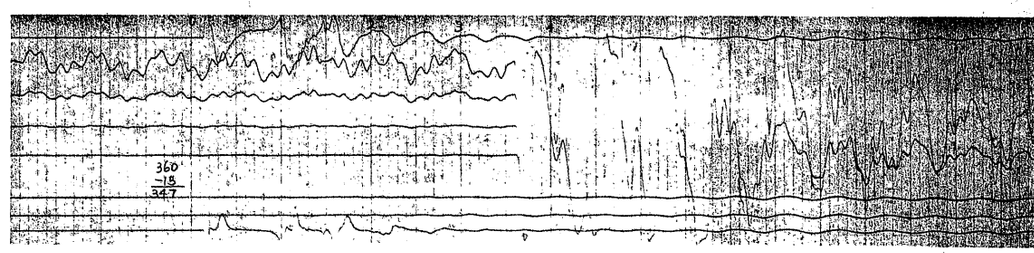
Rec. No. 19
744 m. K.B.



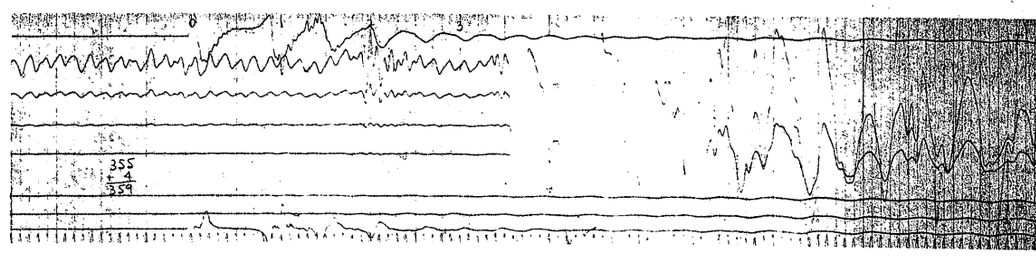
Rec. No. 20
744 m. K.B.



Rec. No. 21
744 m. K.B.



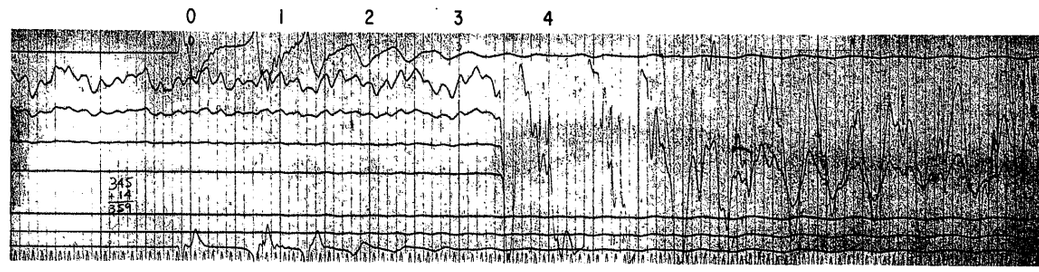
Rec. No. 5
772 m. K.B.



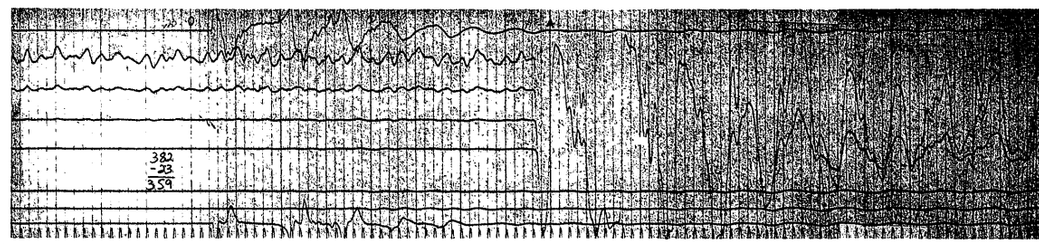
SWEEP – 1

WELL VELOCITY RECORD **26 - 7 - 1978**

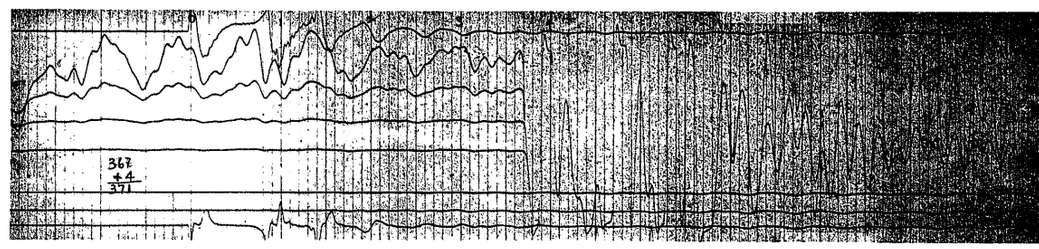
Rec. No. 6
772 m. K.B.



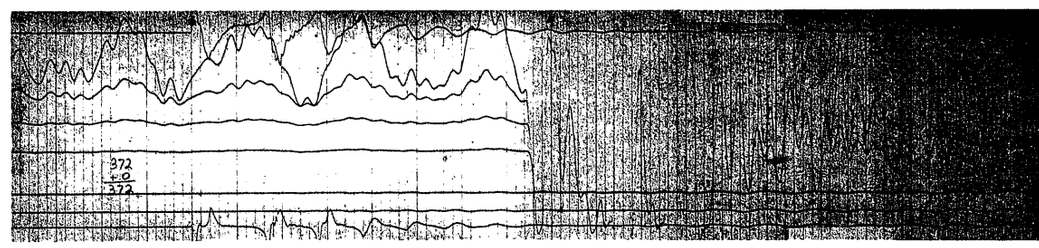
Rec. No. 7
772 m. K.B.



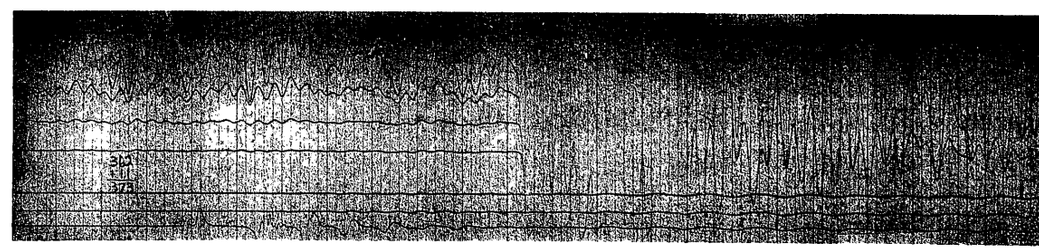
Rec. No. 16
805 m. K.B.



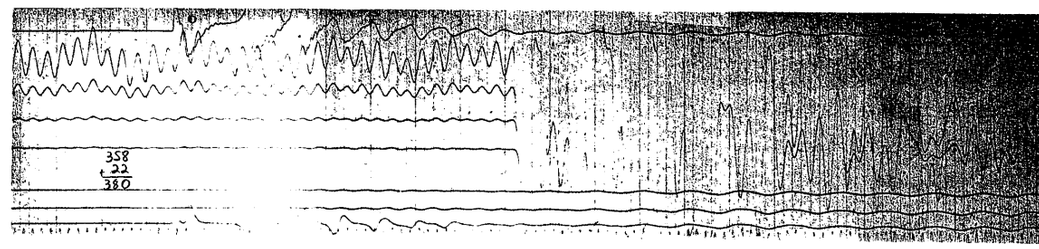
Rec. No. 17
805 m. K.B.



Rec. No. 18
805 m. K.B.



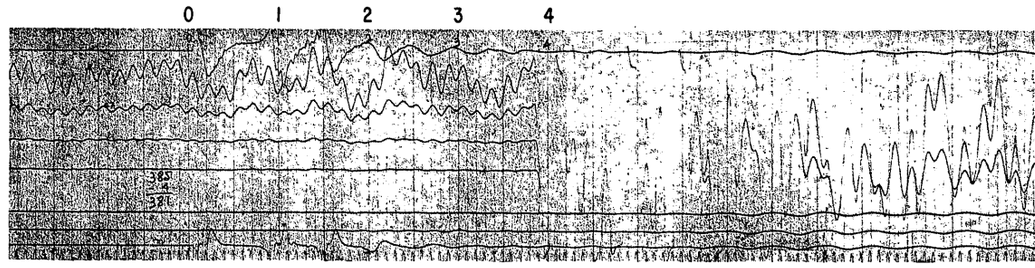
Rec. No. 8
827 m. K.B.



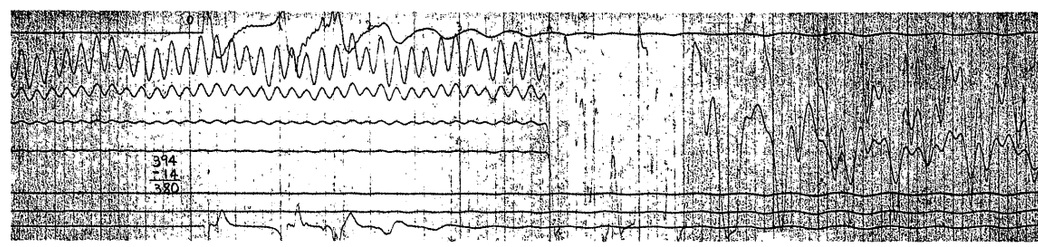
SWEEP – 1

WELL VELOCITY RECORD **26 -7 - 1978**

Rec. No. 9
827 m. K.B.

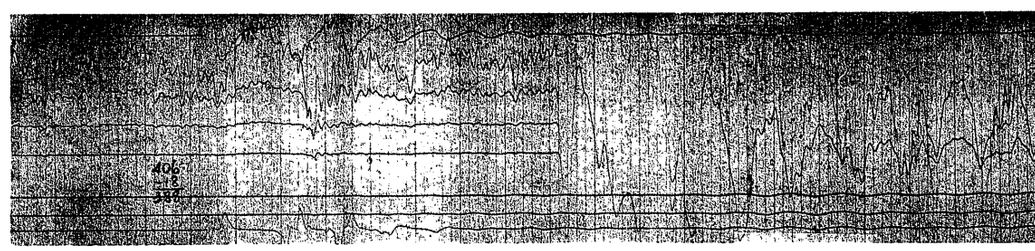


Rec. No. 10
827 m. K.B.

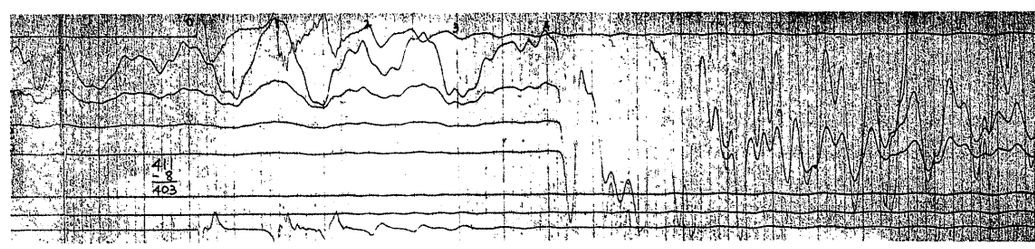


Rec. No. 14
852 m. K.B.

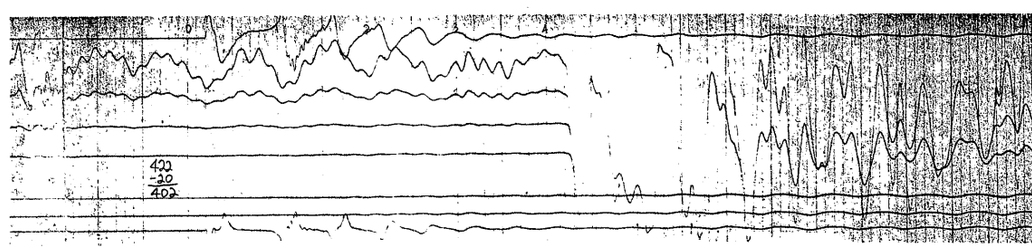
Rec. No. 15
852 m. K.B.



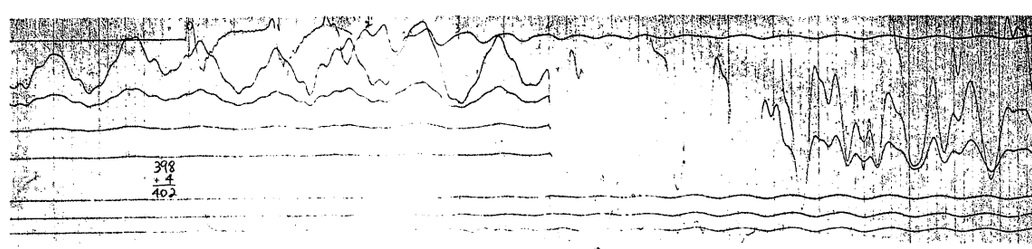
Rec. No. 11
896 m. K.B.



Rec. No. 12
896 m. K.B.



Rec. No. 13
896 m. K.B.



APPENDIX 7

APPENDIX 7

FORMATION TEST RECORDS

ANALYSIS OF FORMATION INTERVAL TESTS - SWEEP -1

Designation	Depth (KB)	Details
FIT-1	801m	Recovered: No recovery Pressures: Initial hydrostatic: 10.58MPa;(1535.6 psig). Sampling Pressure: 8.04MPa (1167 psig). Final hydrostatic: not recorded. Main chamber was open for 17 mins 38 secs. On opening tool pressure dropped from hydrostatic to the expected formation pressure of 8.04 MPa. Segregator was open for 1 min 26 secs. and pressure remained at 8.04MPa. No sample was recovered from main chamber or segregator. Piston malfunction suspected.
FIT-2	795m	Recovered: mud Pressures: Initial hydrostatic: 10.503MPa (1524.5 psig). Sampling pressure: 10.466MPa (1519 psig) fluctuating. Final hydrostatic: 10.503 MPa (1524.5 psig) Main chamber was open for 7 mins 21 secs. On setting tool, pressure increased from hydrostatic to a supercharge of 14.02-13.37 MPa. On opening tool, pressure dropped to 10.466 MPa (near hydrostatic) fluctuating by up to 1.37MPa. Segregator was opened and pressure dropped to a minimum of 4.009 MPa in 9 secs., increasing slowly to 4.37MPa after 1 min 49 secs. The very slow build up indicated tool was plugged, and the segregator was sealed and tool dumped. Recovered mud at surface indicating partial seal failure.

F.I.T. RECORD

GEOLOGIST/S: P. Kemp, R.C.N. Thornton

WELL: Sweep-1 F.I.T. NO: 1 @ 801 m (KB) DATE: 22.7.78

TEST RESULT: Unsuccessful. The tool was unable to take a sample

FIRING METHOD: Normal CHOKE SIZES: 1.02"

TIMES: Tool Set: 01:45 Tool Open: 03:35 Min.Open: 17 mins 38 secs.

Shaped Charge Shot: XXX/No at: _____ Min. Open: _____ Full After: Did not fill

Segregator Open: 21:13 Mins.Open: 1 min.26secs Full After: _____

Tool Closed: 22:39 Tool Off: 24:50

Segregator Type: _____ Number: _____

Segregator opened/transferred container No.: _____

MUD DATA: In Hole

Resistivity Rmf _____ Ω @ _____ °C, Equiv. Na. Cl. _____ ppm

Titration Cl^-: _____ ppm NO^-3: _____ ppm

SAMPLE TAKEN AT END OF LAST CIRCULATION

RECOVERY - MAIN CHAMBER _____ kPa Surface Pressure

_____ L. Gas _____ L. Filtrate

_____ L. Oil _____ L. Mud

_____ L. Formation Water _____ L. Other

PROPERTIES - MAIN CHAMBER

GAS	C_1	C_2	C_3	C_4	C_5	C_6	H_2S

OIL _____ °API @ _____ °F; Pour Point _____ °F

_____ Colour; _____ Fluorescent Colour

_____ G.O.R.

RESISTIVITY WATER/FILTRATE _____ Ω @ _____ °F Equiv. Na. Cl. _____ ppm

Titration Cl^-: _____ ppm NO^-3: _____ ppm

PRESSURES - MAIN CHAMBER

MPa-g	Schlumberger	Amerada	Agnew	Amerada		Hewlett Packard*
Initial Hydrostatic						10.58Mpa(1535.6 psig)
Sampling						8.04Mpa(1167.3 psig)
Final Shut-in						8.639Mpa(1166.9 psig)
Hydrostatic						Not recorded

Formation Pressure (Horner) _____ Sampling Time Min. 17 mins 38 secs

Shut-in Time Min. -

(*Corrected for Atmospheric pressure)

TEMPERATURES: (max recorded) _____ °C _____ °C

MAX. DEPTH TOOL REACHED: _____ m

TIME SINCE CIRCULATION: _____ Hrs

FORMATION TEMPERATURE (HORNER) _____ °C

REMARKS: No sample reached main chamber or segregator even though H.P. gauge indicated a flowing pressure of 1167 psig which was the expected formation pressure at that depth.

F.I.T. RECORD

GEOLOGIST/S: P. Kemp, R.C.N. Thornton

WELL: Sweep-1 F.I.T. NO: 2 @ 795 m (KB) DATE: 26.7.78

TEST RESULT: Unsuccessful. Tested mud due to seal failure

FIRING METHOD: Normal CHOKE SIZES: 1.02"

TIMES: Tool Set: 01:55 Tool Open: 04:02 Min.Open: 7 mins 21 secs

Shaped Charge Shot: ~~XXX~~/No at: _____ Min. Open: _____ Full After: _____

Segregator Open: 11:23 Mins.Open: 1 min 49 secs Full After: Not full

Tool Closed: 13:12 Tool Off: 13:16 Tool plugged @ ≈ 600 psi

Segregator Type: _____ Number: _____

Segregator opened/transferred container No.: _____

MUD DATA: In Hole

Resistivity Rmf _____ Ω @ _____ °C, Equiv. Na. Cl. _____ ppm

Titration Cl^-: _____ ppm NO^-3: _____ ppm

SAMPLE TAKEN AT END OF LAST CIRCULATION

RECOVERY - MAIN CHAMBER _____ kPa Surface Pressure

_____ L. Gas _____ L. Filtrate

_____ L. Oil _____ L. Mud

_____ L. Formation Water _____ L. Other

PROPERTIES - MAIN CHAMBER

GAS	C_1	C_2	C_3	C_4	C_5	C_6	H_2S

OIL _____ °API @ _____ °F; Pour Point _____ °F

_____ Colour; _____ Fluorescent Colour

_____ G.O.R.

RESISTIVITY WATER/FILTRATE _____ Ω @ _____ °F Equiv. Na. Cl. _____ ppm

Titration Cl^-: _____ ppm NO^-3: _____ ppm

PRESSURES - MAIN CHAMBER

MPa-g	Schlumberger	Amerada	Agnew _____	Amerada _____	Hewlett Packard*
Initial Hydrostatic					10.503Mpa (1524.5psig)
Sampling				fluctuating :-	10.466Mpa (1519psig)
Final Shut-in					-
Hydrostatic					10.503Mpa (1524.5psig)

Formation Pressure (Horner) _____ Sampling Time Min. _____

Shut-in Time Min. _____

(*Corrected for Atmospheric pressure)

TEMPERATURES: (max recorded) _____ °C _____ °C

MAX. DEPTH TOOL REACHED: _____ m

TIME SINCE CIRCULATION: _____ Hrs

FORMATION TEMPERATURE (HORNER) _____ °C

REMARKS: Partial Seal Failure. Tested Mud. Maximum Hydraulic Pressure used not sufficient at this depth.

ENCLOSURES

PE902748

This is an enclosure indicator page.
The enclosure PE902748 is enclosed within the container PE902747 at this location in this document.

The enclosure PE902748 has the following characteristics:

ITEM_BARCODE	= PE902748
CONTAINER_BARCODE	= PE902747
NAME	= Isopach Map Top of Latrobe Group - Top of Strzelecki Group
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= SEISMIC
SUBTYPE	= ISOPACH_MAP
DESCRIPTION	= Isopach Map Top of Latrobe Group - Top of Strzelecki Group
REMARKS	=
DATE_CREATED	= 1/11/78
DATE_RECEIVED	=
W_NO	= W704
WELL_NAME	= Sweep-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902746

This is an enclosure indicator page.
The enclosure PE902746 is enclosed within the container PE902747 at this location in this document.

The enclosure PE902746 has the following characteristics:

ITEM_BARCODE	= PE902746
CONTAINER_BARCODE	= PE902747
NAME	= Structure Map Top of Strzelecki Group
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= SEISMIC
SUBTYPE	= HRZN_CONTR_MAP
DESCRIPTION	= Structure Map Top of Strzelecki Group Post Sweep-1
REMARKS	=
DATE_CREATED	= 1/09/78
DATE_RECEIVED	=
W_NO	= W704
WELL_NAME	= Sweep-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902745

This is an enclosure indicator page.
The enclosure PE902745 is enclosed within the container PE902747 at this location in this document.

The enclosure PE902745 has the following characteristics:

ITEM_BARCODE	= PE902745
CONTAINER_BARCODE	= PE902747
NAME	= Structure Map Top of Latrobe Group
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= SEISMIC
SUBTYPE	= HRZN_CONTR_MAP
DESCRIPTION	= Structure Map Top of Latrobe Group Post Sweep-1
REMARKS	=
DATE_CREATED	= 1/09/78
DATE_RECEIVED	=
W_NO	= W704
WELL_NAME	= Sweep-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902749

This is an enclosure indicator page.
The enclosure PE902749 is enclosed within the container PE902747 at this location in this document.

The enclosure PE902749 has the following characteristics:

ITEM_BARCODE	= PE902749
CONTAINER_BARCODE	= PE902747
NAME	= Geological Cross Section A-A'
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= CROSS_SECTION
DESCRIPTION	= Geological Cross Section A-A'
REMARKS	=
DATE_CREATED	= 1/11/78
DATE_RECEIVED	=
W_NO	= W704
WELL_NAME	= Sweep-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902750

This is an enclosure indicator page.
The enclosure PE902750 is enclosed within the container PE902747 at this location in this document.

The enclosure PE902750 has the following characteristics:

ITEM_BARCODE	= PE902750
CONTAINER_BARCODE	= PE902747
NAME	= Sonic Calibration Curve
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Sonic Calibration Curve
REMARKS	=
DATE_CREATED	= 1/09/78
DATE_RECEIVED	=
W_NO	= W704
WELL_NAME	= Sweep-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE906357

This is an enclosure indicator page.
The enclosure PE906357 is enclosed within the container PE902747 at this location in this document.

The enclosure PE906357 has the following characteristics:

ITEM_BARCODE	= PE906357
CONTAINER_BARCODE	= PE902747
NAME	= Time Depth curve
BASIN	= GIPPSLAND
PERMIT	= VIC/P1
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Time Depth Curve for Sweep-1
REMARKS	=
DATE_CREATED	= 30/09/78
DATE_RECEIVED	= 2/04/79
W_NO	= W704
WELL_NAME	= SWEEP-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE902751

This is an enclosure indicator page.
The enclosure PE902751 is enclosed within the container PE902747 at this location in this document.

The enclosure PE902751 has the following characteristics:

ITEM_BARCODE	= PE902751
CONTAINER_BARCODE	= PE902747
NAME	= Drilling History Curve
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Drilling History Curve
REMARKS	=
DATE_CREATED	= 12/05/78
DATE_RECEIVED	=
W_NO	= W704
WELL_NAME	= Sweep-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601417

This is an enclosure indicator page.
The enclosure PE601417 is enclosed within the container PE902747 at this location in this document.

The enclosure PE601417 has the following characteristics:

ITEM_BARCODE	= PE601417
CONTAINER_BARCODE	= PE902747
NAME	= Well Completion Log
BASIN	= GIPPSLAND
PERMIT	=
TYPE	= WELL
SUBTYPE	= COMPLETION_LOG
DESCRIPTION	= Well Completion Log
REMARKS	=
DATE_CREATED	= 29/07/78
DATE_RECEIVED	=
W_NO	= W704
WELL_NAME	= Sweep-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)