



553

W558



WELL COMPLETION
REPORT

GROPER-2 (W558)

GROPER-2. ESSO, VIC. P/2.

COMP. 21-9-69.
T. D. 2870.

558

147 1410 13
W.D. 194' K.B.
GLOMA 2 III

I.E.S. RUN 1. 2" 45". 390' - 1230'
" " 2. 1498' - 2865'. SEPARATE LOGS. 2" AND 5"
" " 142. 390 - 1230. 1498 - 2865. " " 2" " 5"
B.H.C.S./G.R. R1. 2" 45". 382 - 1205.
" /CAL. R2. 1496' - 2865. " " 2" " 5"
" /G.R. R1 & 2. 382 - 1205. 1496 - 2865. " " 2" " 5"
F.D.C./G.R. R1. 1498 - 2866. " " 2" " 5"
C.D.M. R1. 5" 2" 1498 - 2863.
CORE LAB. MUDLOG. 1515' - 2870'.
CORE ANALYSIS RESULTS BY B.M.R.
" DESCRIPTIONS. 1 - 4.
S.W.C. " 1-22. 1820' - 2813'.
" " 450 - 2813'.
TIME DEPTH CURVE.
WELL SUMMARY.

MICROPALAEONTOLOGY REPORT BY D. TAYLOR.

PALAEONTOLOGY. " " " " .

PALYNOLOGY " " P. R. EVANS.

LOCALITY, GEOLOGICAL STRUCTURE, ISOPACH MAPS & GEOLOGICAL CROSS SECT. A -

WELL COMPLETION REPORT. G.R.

GEOLOGICAL LOC. MAP. LATROBE STRUCTURE MAP & GEOLOGICAL CROSS SECT. A -
BEFORE & AFTER DRILLING.

WELL COMPLETION REPORT.

PALYNOLOGY REPORT REVISED BY A. D. PARTRIDGE.

ESSO GROPER-2

WELL COMPLETION REPORT

Compiled by

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ESSO GROPER-2

WELL COMPLETION REPORT

CONTENTS

	<u>Page</u>
I. <u>SUMMARY</u>	1
(a) Drilling	1
(b) Geological	1
II. <u>INTRODUCTION</u>	2
(a) Concept of Prospect	2
(b) Structure	2
III. <u>WELL HISTORY</u>	2
1. General Data	2
2. Drilling Data	3
3. Formation Sampling	4
4. Logging & Surveys	5
5. Testing	6
IV. <u>GEOLOGY</u>	6
V. <u>REFERENCES</u>	8

APPENDICES

- I. Petrological Report
- II. Palynological Report
- III. Palaeontological Report
- IV. Core & Sidewall Core Descriptions
- V. List of Electric Logs & Interpretation

ENCLOSURES

- Plate 1. Geological Locality Map, Latrobe Structure Map and Geological Cross Section A-A' Before and After Drilling.
- Figure 1. Composite Well Log.
- Figure 2. Grapholog.
- Figure 3. Groper-2 Time-Depth Curve.

I. SUMMARY

(a) Drilling

The Groper-2 well was located in the Gippsland Basin at latitude $38^{\circ} 58' 39.93''$ S. and longitude $147^{\circ} 14' 12.83''$ E; approximately 27 miles offshore and 8 miles west-southwest of Groper-1 in 194' of water.

Glomar III arrived on location at 2230 hours on 8th September, 1969, 11½ hours after leaving the Barracouta-3 location, and was moored on a heading of 240° . Moorings were set on a $30^{\circ}/70^{\circ}$ pattern.

The well was spudded at 1600 hours on 9th September and moorings were released at 0215 hours on 25th September, when the rig departed for the Bluebone location. Total rig time was 16.63 days.

A 36" hole was drilled in one pass to 400' R.T.B. using a $17\frac{1}{2}''$ bit on a 36" hole opener and 30" casing was run and cemented at 382'. A $12\frac{1}{2}''$ hole was drilled out of the 30" casing to 1515' and logged. A string of 9 5/8" casing consisting of a special 13 5/8" x 30" C.I.W. housing made up on one joint of 13 3/8" casing, which was swaged down to the 9 5/8" was run and cemented at 1498'. The 13 5/8" B.O.P. stack and 16" riser were installed and drilling continued with $8\frac{1}{2}''$ hole to a total depth of 2870', at which depth a full suite of logs was run. A total of four cores were cut with 50% recovery.

A total of 6.09 days (36%) was spent waiting on weather to improve to carry out mooring operations, to run in the hole again after having drilled to 1515' prior to setting 9 5/8" casing.

Two abandonment plugs were set, 1650' to 1430' and 550' to 360', and the B.O.P. equipment retrieved.

(b) Geological

The Groper-2 well, 8 miles from Groper-1, was drilled to test the large stratigraphic trap that was first penetrated by Groper-1. The top of the Latrobe Fm. in Groper-2 was expected to be 800' updip from the depth it was penetrated in Groper-1. All horizons were penetrated lower than expected as the calculated values were based on generalized velocity data which gave slower values than expected.

Groper-2 probably penetrated Plio-Pleistocene sediments at the sea floor. The top of the Miocene Gippsland Fm. was not seen as there were no sample returns until 1550' and it is not possible to define it on the electric logs.

The Gippsland Formation is known to extend from 1515' to 2254' and consists mainly of very fossiliferous coquina with some interbedded well-sorted friable sands grading in depth to a light grey marl and grey-green glauconitic mudstone.

The top of the Oligocene Lakes Entrance is placed at 2254' based on cuttings and logs. Predominantly it is a grey-green glauconitic mudstone with the basal 6' being a highly glauconitic argillaceous sandstone.

The Latrobe Complex was encountered from 2501' to 2761' and consisted of interbedded sands and clays. The sands are excellent reservoir beds, having excellent porosity and fair to excellent permeability.

Basement was penetrated at 2761', being a red brown and white silty clay which is a weathered zone of the indurated shale of ? Upper Devonian Avon River Group affinities, which extends, from logs, from 2814' to T.D.

II. INTRODUCTION

(a) Concept of Prospect

Following the drilling of Groper-1 and Mullet-1 further work led to the seismic definition of a vast stratigraphic trap formed by the sealing of the Latrobe Complex pinchout by overlying Lakes Entrance marls and mudstones updip from Groper-1 along the Bassian Rise (see locality map).

No hydrocarbons were encountered in Groper-1 and it was hoped that a large reservoir existed updip from this well.

(b) Structure

No structure other than an updip pinchout exists in the prospect area. The trapping mechanism is dependent entirely on an upper seal being provided by the onlapping Lakes Entrance Fm. A lower seal is present and is provided by the underlying impermeable ? Devonian siltstones or granite in the area, or by their weathered equivalents.

Plate 1b is the revised structure contour map on the top of the Latrobe sands and it indicates the areal extent and attitude of this formation.

III. WELL HISTORY

1. General Data

- (a) Well Name: Groper-2
- (b) Operator: Esso Exploration & Production Australia, Inc.
380 Lonsdale Street,
Melbourne. Vic. 3000.
- (c) Tenement Holder: Hematite Petroleum Pty. Ltd.,
440 Collins Street,
Melbourne. Vic. 3000.
- (d) Details of Petroleum Tenement: VIC/P2. covering 150 blocks.
- (e) District: Gippsland Basin, offshore Victoria.
- (f) Location: Latitude: 38° 58' 39.93" S.
Longitude: 147° 14' 12.83" E.
- X 517,222
Y 195,127
- Zone 7, Shot Point 4022 on Line G69A-318.
- (g) Elevation: Mean sea level, K.B. 31' above M.S.L.
- (h) Water Depth: 194'
- Total Depth: 2870'
- (i) Date Drilling Commenced: September 9, 1969.
- (j) Date Drilling Completed: September 21, 1969.
- (k) Well Abandoned: 0730 hours September 23, 1969.
- (l) Rig Released: September 25, 1969 - Necessary to WOW before anchors could be pulled and vessel able to depart location.

- (m) Drilling Time to Total Depth: 26 hours. + 34½ Coring.
- (n) Status: Plugged and abandoned.
- (o) Total Cost: To be furnished later.

2. Drilling Data

- (a) Drilling Contractor: Global Marine Inc.
380 Lonsdale Street,
Melbourne. Vic. 3000.
- (b) Drilling Plant: Make: National
Type: 1625 DE
Rated Capacity: 20,000' with 5" DP
Motors: Cummins VT-12-GA-30
for electric power
- (c) Derrick: 136' x 58' x 34' special design, galvanised
1,000,000 lb Hookbad capacity.
- (d) Pumps: (2) Make: National
Type: G-1000-C Duplex
Size: 7¾" x 16"
Motors: Dual Electric independent drives
from above motors.
- (e) B.O.P. Equipment: Make: Hydril Hydril Cameron Triple U.
Size: 20" (MSP) 13 5/8"(GK) 13 5/8"
Working Pressure
(PSI): 12,000 5,000 5,000
- (f) Hole Sizes & Depth: 36" to 400'
12¼" to 1515'
8½" to total depth.

(g) <u>Casing & Liner & Cementing Details:</u>	<u>Size</u>	<u>Weight</u>	<u>Grade</u>	<u>Range</u>	<u>Depth</u>	
	30"	-	B	N/A	382'	Note 1.
	9 5/8"	40	N80	3	1498'	Note 2.
	2 jts. 13 3/8"	54	N80	3		

Baker Float Collar and Float Shoe.

Centralizers as follows:-

Centre bottom 2 jts, top float collar and top of every 2 jts. Total used 10.

Note 1: Cemented with 600 sacks Aust "N" plus 2% CaCl₂. Mixed with 75 bbls sea water, average slurry 15.6 ppg.

Note 2: Cemented with 1100 sacks Aust "N" plus 2% prehydrated gel (avg. slurry 13.5 ppg). Followed by 300 sacks Aust "N" plus 2% CaCl₂ (avg. slurry 15.3 ppg). Good cement returns throughout.



(h) Drilling Fluid: September 19-20

WT	11.7 p/gal.
VIS	47
F.LOSS	10.0 c.c.
F.CAKE	2/32 "
% SAND	1.14
% SOLIDS	1.7
OIL	-
pH	11.0
NaCl	-
Alk	0.69

(i) Water Supply: Water for drilling was transported to the Glomar III by the Pt. Coupee and stored in tanks on board.

(j) Perforation Record: No perforations.

(k) Plugs:

	1	2	3
Depth	1432-1650'	1202-1400'	360-560'
Amt.Cement(sx)	121	72	72
Type	Aust "N" with 2% CaCl ₂		

(l) Fishing Operations: No fishing operations performed.

(m) Sidetracked Hole: None.

3. Formation Sampling

(a) Ditch Cuttings

Cuttings were taken over a normal shale shaker at 30' intervals from 1550' to 1800' and at 10' intervals from 1800' to 2820'. All samples were lagged and caught by the mud logging personnel under the supervision of Esso geologists and are representative of the labelled depths. Representative suites of samples are stored with the B.M.R., the Victorian Mines Department and with EEPA at the Esso warehouse at Spottswood, Melbourne.

(b) Coring

The original coring program called for cores to be taken near the base of the Lakes Entrance Formation and in basement, as well as at any hydrocarbon shows.

Four cores were attempted from 2411' to total depth.

Core	Interval Cored	Feet Cut	Recovery (ft.)	Recovery (%)
1	2411-2413'	2	0	0
2	2413-2441'	28	0	0
3	2441-2458'	17	17	100
4	2820-2870'	50	50	100

A total of 97' of core was cut and 67' (69%) were recovered.

The cores were slabbed into three parts. One slab from each core is stored at the B.M.R., The Victorian Mines Department and Esso Spottswood Warehouse in Melbourne, respectively.

Core descriptions are included in Appendix IV.

(c) Sidewall Sampling

Two runs for sidewall cores were made between 382' and 2820', by Schlumberger Seaco, with a CST; of the 32 cores attempted 30 were recovered. Those that have been used for palynological and palaeontological studies have since been destroyed during analysis. Those not processed are stored in the Esso warehouse at Spottswood, Victoria. Descriptions of these are included in Appendix IV and depths at which these were taken are shown on the Well Completion Log (Figure I).

4. Logging & Surveys

(a) Electric & Other Logging

Wireline logging was carried out by Schlumberger Seaco. The following logs were run on Groper-2.

	Run 1	Run 2
I.E.S.	382-1229'	1498-2865'
BHCS/SP	382-1218'	1496-2865'
C.D.M.		1498-2867'
FDC/GR		1498-2867'

(G.R. ran through 13 3/8" casing to 1150')

A wave compensating device was used during all logging operations to compensate for movement of the drilling vessel. Due to bridging of the hole during Run 1, the penetration was only to 1229'.

Figure 1 is a Well Completion Log of the IES runs.

(b) Penetration Rate Log

A record of the penetration rate was kept at all times during drilling and is included in this report as part of Figure 2.

(c) Mud Gas Log

Mud gas logging services were carried out by Core Laboratories Inc. under the supervision of Esso geologists. In addition to the continuous hot wire, a gas chromatograph was used to detail all mud gas shows. A CO₂ analyzer was in operation during drilling of the well and a Waring Blender was used to enable cuttings gas to be recorded.

The cuttings were examined for stain and fluorescence. The mud gas log is included as part of the Grapholog (Figure 2).

(d) Deviation Surveys

No deviation surveys were performed.

(e) Temperature Surveys

None, except thermometer run on Schlumberger logs.

(f) Velocity Surveys

Velocity surveys were run from 1515' to T.D. (Figure 3) by United Geophysical Corporation under the supervision of an Esso geophysicist.

(g) Other Well Surveys

None

5. Testing

(a) Formation Testing

None

(b) Production Testing

None

IV. GEOLOGY

The following stratigraphy was encountered in Groper-2.

Age	Formation	Fm. Top	Subsea Depth	Thickness
	Water	31'	Sea level	194
Plio-Pleistocene	-	Sea floor 223	-194	?
Miocene	Gippsland	?	?	705+
Oligocene	Lakes Entrance	2254	-2223	247
Eocene	Latrobe	2501	-2470	260
? Devonian	Avon River Group	2761	-2730	109+
	Weathered Zone	2761	-2730	53
	Unweathered Zone	2814	-2783	56+
	T.D.	2870' (-2839')		

Gippsland Fm (? 1550' - 2254'; 705+)

The depth to the top of this formation is not known as cuttings samples were not recovered until at 1550'.

1550 - 1730' Interbedded coquina and mudstone.

Coquina - white to pink skeletal debris of bryozoal fragments, echinoid spines and foraminifera; sandy in part, poorly to moderately sorted.

Mudstone - grey-green; thin minor interbeds of moderately hard fossiliferous and glauconitic mudstone.

1730 - 1790' Sandstone and coquina.

Sandstones - Quartzose, unconsolidated, well rounded, moderately sorted; minor skeletal debris.

Coquina - pink and white, slightly glauconitic, as above.

1790 - 2200' Coquina - as above; with minor interbeds of grey-green glauconitic mudstone.

2200 - 2254' Mudstone - green, soft to moderately hard, fossiliferous (bryozoans and foraminifera) glauconitic, slightly calcareous, non fissile.

The contact with the underlying Lakes Entrance Formation is tentatively placed at 2254' and is based on the electric log interpretation and cuttings analysis.

Much of this section, containing sandy coquinas and friable sands, is very permeable. The equivalent section in Groper-1 is generally impermeable with no development of porous sandstone intervals, although it includes sandy coquinas and micritic limestones with traces of disseminated fine-grained quartz sand.

Lakes Entrance Fm (2254 - 2501'; 247')

- 2254 - 2380' Marl - white, very glauconitic, very soft to moderately hard, fossiliferous.
- 2380 - 2495' Mudstone - green-grey, massive, poorly bedded, glauconitic, and calcareous. Very fossiliferous and burrowed. Pyrite nodules common. This unit becomes more glauconitic towards the base.
- 2495 - 2501' Greensand - green, extremely glauconitic and sandy quartzose, fine to coarse-grained, subrounded to well rounded, moderately sorted, moderately friable to firm.

Electric log correlation between Groper-1 and Groper-2 shows that Groper-1 has 219' of older section of Lakes Entrance Formation than in Groper-2, suggesting onlapping to the south. Palaeontological work by D.J. Taylor has shown that the age of this formation in Groper-1 is Oligocene in age whilst in Groper-2 it is no older than Lower Miocene (Appendix III). However, a study of the electric log correlation would suggest that the Lakes Entrance Formation in Groper-2 would be Oligocene to Lower Miocene in age, rather than wholly Lower Miocene, and the former is preferred as the palaeontologic data is not conclusive.

The presence of a 6' thick basal 'greensand' in Groper-2 indicates that reworking of the Latrobe sands occurred during the Oligocene transgression.

The Lakes Entrance Formation at Groper-2, except possibly for the thin basal sand, is seen to act as a good top seal of the Latrobe sediments.

Latrobe Complex (2501 - 2761'; 260')

- 2501 - 2761' Interbedded sequence of sandstones, siltstones and clays.
 - Sandstones - greyish, quartzose, medium to coarse grained, poorly to moderately well sorted, subangular to subrounded with good to excellent porosities and permeabilities. Pyrite is common and slight carbonaceous material is present.
 - Siltstone - dark brown, carbonaceous, pyritic (disseminated and nodular), slightly sandy & micaceous.
 - Clays - white to grey, firm, kaolinitic, pyritic, blocky.

This unit is interpreted as being a braided stream sequence with occasional interbedded siltstones, possibly overbank deposits.

This formation was the anticipated pay zone. Unfortunately, no hydrocarbons were detected, the formation containing only water.

Of the 260' penetrated, a 139' nett sand column is present with the following porosities:-

<u>Footage</u>	<u>Porosity %</u>
28	< 15
8	15-20
25	20-25
35	25-30
<u>43</u>	> 30
Total ... 139	

The Latrobe section penetrated by Groper-2 is 34' thicker than that seen in Groper-1, whilst the basement surface is some 580' structurally higher in Groper-2.

The age of this formation, based on poor fossil recovery, is Middle to Upper Eocene. (Appendix III).

Basement

(? Upper Devonian - Avon River Group)
(2761 - 2870'; 109 +)

2761 - 2814'
(53')

A weathered basement zone was encountered in this interval; and consisted of a dark red-brown firm plastic clay.

2814 - T.D.
(56'+)

Siltstone - dark red-brown, very hard and dense; poor laminations dip at approximately 5° - 10° . Minor fine sandy beds show scour and fill and poor rippling.

This formation was quite unexpected and from a study of thin sections Dr. Talent has suggested that the unit shows affinities with the Upper Devonian Avon River Group found in south eastern Victoria (Appendix I). No fossils were found in samples of this rock. The relationship of the formation to the Devonian Granites found along the trend from Wilson's Promontory to Flinders Island is unknown.

V. REFERENCES

1. Esso G-69-A Marine Seismic Survey.

GROPER 2 - WELL SUMMARY

Type of Well: Wildcat

Purpose of Well: Groper 2 was sited on a seismically interpreted depositional embayment closure near the updip pinchout of the Latrobe Complex. It was predicted that the chances of obtaining the three critical parameters of good base seal, good top seal and the necessary geometrical configuration of the Latrobe sand wedge were better here than elsewhere on the pinchout trend.

Status: Plugged and abandoned.

Location: Latitude : 38° 58' 40" South
 Longitude : 147° 14' 12" East
 Shot-point 4022 on line G69 A-318.

Lease: Vic/P2.

Rig: Glomar III

Elevation: Rotary table 31 feet above mean sea level.

Water Depth: 190 feet.

Spudded: September 9th, 1969. (On location 22.30 hours, September 8th, 1969).

Abandoned: 0215 hours, September 25th, 1969.

Drilling Time: 17 days.

Total Depth: 2870 feet.

Casing: 30 inch shoe set at 382 feet
 9⁵/₈ inch shoe set at 1499 feet.

Cement Plugs:

<u>Plug No.</u>	<u>Interval (ft)</u>	<u>Cement (bags)</u>
1	1432-1650	121
2	1202-1400	72
3	360-560	72

Cores

Four conventional cores were cut, with aggregate footage of 97 feet and recovery of 67 feet (69%).

<u>Core No.</u>	<u>Interval (ft)</u>	<u>Recovery</u>
1	2411-2413	No recovery
2	2413-2441	No recovery
3	2441-2458	17 ft.
4	2820-2870	50 ft.

22 S.W. cores were attempted and 21 recovered.

Mudlogs

A continuous mudlog record was maintained by Core Laboratories in the interval 1515-2870 feet (T.D.).

Electric Logs

<u>Log</u>	<u>Run</u>	<u>Interval (ft)</u>
IES	1	382-1229
	2	1498-2866
Sonic	1	382-1218
	2	1496-2870
FDC	1	1498-2870
Dipmeter	1	1498-2866

A velocity survey was run.

Hydrocarbons

No significant hydrocarbon shows were encountered. Generalised gas detector readings were:-

<u>Interval (ft)</u>	<u>Drilling Mud</u>					<u>Hot Wire Cuttings</u>
	<u>Hot Wire</u>	<u>Chromatograph</u>				
		<u>C1</u>	<u>C2</u>	<u>C3</u>	<u>C02</u>	
1515-1730	1	90	-	-	-	0
1730-2458	½-1	50-150	-	-	-	0
2458-2820	½-1	90-190	-	-	-	0

Core Analysis

No samples were submitted for analysis.

Stratigraphy

<u>Formation</u>	<u>Age</u>	<u>Top (RT)</u>	<u>Subsea</u>	<u>Thickness</u>
Gippsland Formation	Oligocene to Lower Pliocene	221	190	2033
Lakes Entrance Formation	Upper Eocene	2254	2223	241
Latrobe Formation	Paleocene	2495	2464	275
? Weathered Basement		2770	2739	50
And Volcanic ? Basement		2820	2789	50 +
T.D.		2870	2839	

Lithology

1515-1730 feet Marl, possibly argillaceous, trace arenaceous.

1730-2200 feet Calcarenite.

2200-2254 feet Mudstone, green, firm, moderately hard; abundant glauconite.

2254-2411 feet Marl, white, soft with some interbedded mudstone, abundant glauconite.

Core 1

2411-2413 feet No recovery.

Core 2

2413-2441 feet No recovery.

Core 3

2441-2458 feet Cut 17ft., recovered 17 ft.
Mudstone, grey-green, slightly calcareous, glauconitic fossiliferous.

2458-2495 feet 50% Marl, light grey-white, puggy.
50% Mudstone, as above.

2495-2670 feet Sandstone, quartz, clear, milky, unconsolidated, medium to very coarse grained, well sorted, sub-rounded to rounded, good porosity and permeability no shows.

2670-2770 feet 90% Clay, white, sticky, blochy, non-calcareous.
10% Sandstone, as above.

2770-2820 feet 80% Clay, ochreous.
20% Sandstone, as above.

Core 4

2820-2870 feet Cut 50 feet, recovered 50 feet.
Acid volcanics? (Petrological report not yet available).



School of Earth Sciences
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NORTH RYDE NEW SOUTH WALES 2113

TELEPHONE: 887000

TELEGRAMS & CABLES: 'MACQUINIV' NORTH RYDE

8 October 1969

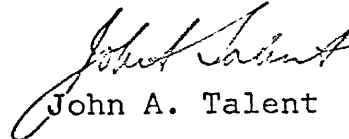
IN REPLY PLEASE QUOTE:

Mr. K.A. Richards,
Exploration Manager,
Esso Standard Oil (Australia) Ltd.,
G.P.O. Box 4047,
Sydney 2001

Dear Sir:

The samples of core material from Esso Groper 2 well submitted last week (61/BHL of 1 October), though unfossiliferous, are so strikingly like the late Devonian Avon River Group red beds outcropping onshore in the Gippsland Basin and also encountered subsurface there that we can be reasonably sure this is what they are. There are no other known comparable red beds in the onshore sequence, with the exception of minor developments within the early Devonian Snowy River Volcanics sequence - one would anticipate evidence of associated vulcanism if it happened to be some of these.

Yours sincerely,


John A. Talent

PALYNOLOGY OF

GRÖPER -2

P.R. Evans

November 21, 1969.

INTRODUCTIONPALYNOLOGY GRODER-2
P.R. EVANS

Ditch samples, sidewall cores and samples of main core 4, covering the interval 2500-2860' were submitted for routine palynological examination on September 24, 1969. A selection of these samples was processed, the remainder rejected because the rock type they represented was not suitable for study. All the sidewall cores and main cores considered are listed below, whether or not they were processed:

SUMMARY

Sample	Depth (ft.)	Age	Comment
Sidewall Core	2520	Indeterminate.	Sst. Not processed.
"	2530	"	" "
"	2548	"	" "
"	2582	M-U Eocene	
"	2596	Indeterminate	Sst. Not Processed.
"	2626	"	No yield.
"	2650	"	" "
"	2670	"	Sst. Not processed.
"	2690	"	No yield.
"	2702	"	Coarse Sst. Not proc.
"	2730	"	No yield.
"	2786	"	Red shale. Not proc.
"	2813	"	" " "
Core 4	2834/60	"	" " "

COMMENT

The microflora from 2588' was relatively abundant and included the following species -

<u>Nothofagidites emarcidus-heterus</u>	Very common.
<u>N. asperus</u>	
<u>N. flemingii</u>	Fairly common.
<u>N. goniatus</u>	
<u>Simplicipollis meridianus</u>	
<u>Dacrydiumites mawsonii</u>	
<u>Dacrycarpites australiensis</u>	
<u>Araucariacites australis</u>	
<u>Cycadopites sp.</u>	
<u>Microcachyridites antarcticus</u>	
<u>Laevigatosporites major</u>	
<u>Polypodiidites sp.</u>	
<u>Cupaneidites reticularis</u>	
<u>Malvacipollis diversus</u>	
<u>Periporopollenites polyoratus</u>	
<u>Proteacidites symphyenemoides</u>	
<u>Proteacidites spp. nov.</u>	Fairly common.
<u>?Gothanipollis sp.</u>	
<u>Tricolporites spp. nov.</u>	
<u>Triorites harrisii</u>	

This assemblage resembles others known from northern parts of the Gippsland Basin which are of Middle or Upper Eocene age.

BASIN GIPPSLAND DATE _____

WELL NAME GROPER-2 ELEVATION + 31 feet

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
Eocene	<u>P. tuberculatus</u>										
	<u>U. N. asperus</u>										
	<u>M. N. asperus</u>	2520	1				2548	1			
	<u>L. N. asperus</u>	2588	1				2690	2			
	<u>P. asperopolus</u>										
	<u>U. M. diversus</u>										
	<u>M. M. diversus</u>										
	<u>L. M. diversus</u>										
PALEOCENE	<u>U. L. balmei</u>										
	<u>L. L. balmei</u>										
	<u>T. longus</u>										
CRETACEOUS	<u>T. lilliei</u>										
	<u>N. senectus</u>										
	<u>C. trip./T.pach.</u>										
	<u>C. distocarin.</u>										
	<u>T. pannosus</u>										
EARLY CRETACEOUS											
PRE-CRETACEOUS											

COMMENTS:

- 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: LES / ADP DATE June 1971 / Dec. 1971

DATA REVISED BY: ADP DATE January 1975

BASIN GIPPSLAND DATE _____
 WELL NAME GROPER -2 ELEVATION + 31 feet

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
Eocene	<u>T. bellus</u>										
	<u>P. tuberculatus</u>										
Eocene	<u>U. N. asperus</u>										
	<u>L. N. asperus</u>	2588	1			.682	2588	1		.682	
	<u>P. asperatus</u>										
	<u>U. M. diversus</u>										
	<u>L. M. diversus</u>										
Paleocene	<u>L. balmei</u>										
	<u>T. longus</u>										
Late Cretaceous	<u>T. lilliei</u>										
	<u>N. senectus</u>										
	<u>C. trip./T.pach.</u>										
	<u>C. distocarin.</u>										
	<u>T. pannosus</u>										
	<u>C. paradoxa</u>										
Early Cretaceous	<u>C. striatus</u>										
	<u>U. C. hughesii</u>										
	<u>L. C. hughesii</u>										
	<u>C. stylosus</u>										
Pre-Cretaceous											

COMMENTS: 15 samples processed between 2520 and 2860 feet; only the sample from 2588 feet yielded workable palynomorph assemblage

T.D. 2870' (-743)

- 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 spores 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.

DATE RECORDED BY: L.E.S./ A.D.P. DATE June 1971
 DATA REVISED BY: _____ CHECKED: L.E.S. DATE Dec. 1971

PALAEOONTOLOGICAL REPORT

GROPER-2

D.J. Taylor.

Table I of this Appendix summarizes the samples examined from Groper-2. Distribution of Planktonic fauna is shown in the top left hand section. Horizontal lines indicate diagnostic species.

It will be noted that only 5 planktonic species were isolated and only 2 of these are really diagnostic (i.e. Globorotalia mayeri & G. praescitula), thus zonation is virtually impossible. The base of the foraminiferal sequence is no older than lower Miocene. * In GROPER-1 the base of the sequence is of lower Oligocene age. Thus the transgression in this marginal area was diachronous. Distribution of benthonic forms is shown on the rest of the sheet, with horizontal lines showing diagnostic species. Benthonic species are also sparse with few species or specimens between 1000' and 2100'. In this almost barren interval the fauna, including bryozoa, are both worn and fragmented with a frosted appearance. No deeper water species were recorded and the whole sequence is placed within the inner part (above 150') of the inner shelf. Wave and current activity is extreme in the almost barren interval but calmer conditions are apparent above 1000'. The presence of Amphistegina lessonii, between 1550' & 1820', suggests that this interval was on the seaward edge of a shallow marine embayment. Water depth was 100' and water temperature between 20°C & 22°C. Like the transgressive assemblage, this Amphistegina assemblage is diachronous.

* Refer to Page 7 for discussion of age used in the Well Completion Log and Cross-section (Plate 1d).

BASIN GIPPSLAND BASIN

BY DAVID TAYLOR

WELL NAME GROPER -2

DATE 12 April 1971 ELEV. +31'

Foram Zonules

		Highest Data	Quality	2 Way Time	Lowest Data	Quality	2 Way Time
MIOCENE	A	Alternate					
	B	Alternate					
	C	620	1		620	1	
		Alternate					
	D ₁	Alternate					
	D ₂	Alternate					
	E	Alternate					
	F	Alternate					
	G	Alternate					
	H ₁	2180	1		2458	1	
		Alternate					
OLIGOCENE	H ₂	Alternate					
	I ₁	Alternate					
	I ₂	Alternate					
	J ₁	Alternate					
EOC.	J ₂	Alternate					
	K	Alternate					
	Pre K						

COMMENTS:

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

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

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

Date Revised _____

By _____

GROPER-2CORE & SIDE WALL CORE DESCRIPTIONS

	<u>Core No.1</u>	<u>Core No.2</u>
<u>Interval Cored :</u>	2411-2413	2413-2441
<u>Cut (feet):</u>	2'	28'
<u>Recovered:</u>	0	0
<u>% Recovery:</u>	0	0
<u>Formation:</u>	Lakes Entrance	Lakes Entrance
<u>Bit Type:</u>	C14	C14
<u>Bit Size:</u>	8-7/16"	8-7/16"
<u>Penetration Rate (min/ft)</u>	-	7.5
<u>Date:</u>	19th Sept., 1969	20th Sept., 1969.

Cores 3 & 4 and SWC's described over.

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 3

WELL: GROPER-2

Interval Cored 2441-2458 ft., Cut 17 ft., Recovered 17 ft., (100%) Fm. Lakes Entrance

Bit Type C 11, Bit Size 8-5/16" in., Desc. by CURNOW Date 20.9.69

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 10 20	2440		2441-2458'	
				<p>Massive, poorly bedded, non fissile, green-grey glauconitic mudstone, calcareous, occasional pyritic modules up to 1/2" diameter. Very fossiliferous, occasional lensoid shale fragments and burrows.</p>
	2450			
	2460			

REMARKS: NO SHOWS
 BARREL JAMMED AT 2458'.

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 4

WELL: GROPER-2

Interval Cored 2820-2870 ft., Cut 50 ft., Recovered 50 ft., (100%) Fm. Basement

Bit Type C-20, Bit Size 8-5/16" in., Desc. by C.N. CURNOW Date 21.9.69

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0	2820		2820-2870'	
5	10			
				Hard, dense, dark red-brown silty shale with
				minor silt laminae, associated with minor
				cross bedding, scour and fill and ripple marks,
				? bedding approximately 5-10° to core axis.
	2830			
	2840			
	2850			
	2860			
	2870			

GROPER - 2. "

SIDE WALL CORE DESCRIPTIONS

Depth	Recovery	Description
450'	1½"	<u>Marl</u> : light grey, soft, with abundant fossil fragments, trace glauconite.
550'	2"	<u>Calcarenite</u> : buff, loosely consolidated, very fine to medium grained.
620'	¾"	<u>Marl</u> : light grey, soft, with abundant fossil fragments, trace glauconite.
703'	1½"	<u>Marl</u> : light grey, soft, with abundant fossil fragments, trace glauconite
787'	1-¾"	<u>Marl</u> : As above.
900'	2"	<u>Calcarenite</u> : buff, loosely consolidated, medium to coarse grained consisting of calcareous grains.
955'	½"	<u>Calcarenite</u> : buff, loosely consolidated, medium to coarse grained consisting of calcareous grains. Very fine to medium grained.
1030'	¾"	<u>Calcarenite</u> : buff, loosely consolidated, medium to coarse grained, consisting of calcareous grains.
1114'	No recovery	
1210'	¾"	<u>Limestone</u> : buff, fractured, hard in part, oolitic with abundant shells and fossil fragments.
1820'	1-¾"	<u>Sandstone</u> : grey, very friable, coarse grained, fossiliferous, sub-rounded to rounded, moderately sorted, very calcareous, good porosity and permeability.
1960'	1-¾"	<u>Calcarenite</u> : cream-yellow, fine to medium grained skeletal limestone, soft to friable.
2130'	½"	<u>Marl</u> : white-light grey, soft and plastic, fossiliferous
2180'	1-¾"	<u>Mudstone</u> : white and green, firm, glauconitic, fossiliferous, vague bedding, very calcareous.
2270'	1½"	<u>Clay</u> : brown and white, firm, very calcareous.
2350'	1¼"	<u>Shale</u> : grey-green, firm, silty and glauconitic, very calcareous.
2494'	1-¾"	<u>Siltstone</u> : dark brown, soft, carbonaceous, pyritic (disseminated and coarsely nodular), poorly defined thin bedding, trace coarse rounded quartz, very calcareous.
2500'	½"	<u>Sandstone</u> : grey-green, slightly friable, glauconitic, pyritic, moderately sorted, medium to coarse grained, sub-angular to rounded, very calcareous.
2520'	1-¾"	<u>Sandstone</u> : light grey, very friable, coarse grained, well sorted, sub-rounded to rounded,

APPENDIX IV.

GROPER-2

SIDE WALL CORE DESCRIPTIONS

Depth	Recovery	Description
2530'	1-3/4"	<u>Sandstone</u> : light grey, friable, coarse grained, well sorted, rounded to well rounded, good porosity and permeability.
2548'	1-3/4"	<u>Sandstone</u> : dark brown, very friable, very fine to fine grained, well sorted, 20% carbonaceous material some possible detrital coal, sub-angular to sub-rounded.
2582'	2"	<u>Siltstone</u> : dark brown, carbonaceous, slightly sandy and micaceous, strong odour of H ₂ S.
2596'	1 1/4"	<u>Sandstone</u> : grey, very friable, medium to coarse grained, moderately sorted, sub-angular to sub-rounded, excellent visible porosity and permeability.
2626'	1-3/4"	<u>Clay</u> : medium grey, firm to plastic, silty, moderately carbonaceous, strong H ₂ S odour.
2650'	2"	<u>Clay</u> : grey-white, firm, kaolinitic, plastic, plant remains.
2670'	1 1/4"	<u>Sandstone</u> : grey, friable, fine to coarse grained, fair sorting, sub-angular to sub-rounded.
2690'	2"	<u>Clay</u> : white, firm, kaolinitic, 10% pyrite (Disseminated and in large nodules)
2702'	1-3/4"	<u>Sandstone</u> : light grey, moderately firm, pyritic, poorly sorted, fine to coarse grained, trace clay.
2730'	1/2"	<u>Sandstone</u> : light grey, moderately firm, sub-angular to sub-rounded, moderately sorted, fine to medium grained, abundant clay in interstices.
2766'	No recovery	
2786'	3/4"	<u>Clay</u> : dark red and white, moderately soft, weathered equivalent of core No.4.
2813'	1"	<u>Siltstone</u> : very hard, dark red, as in core No.4.

LIST OF ELECTRICAL LOGS

On Groper -2 the following logs were run by Schlumberger Seaco:-

Log	Run	Interval
IES	1	382' - 1229'
IES	2	1498' - 2865'
BHCS/SP	1	382' - 1218'
BHCS/SP	2	1496' - 2865'
CDM	2	1498' - 2867'
FDC/GR	2	1498' - 2867'

The GR was run through casing to 1150'.

REMARKSMIOCENE - GIPPSLAND FORMATION

The induction log has generally low values in the calcarenite section of this formation with minor harder streaks having higher values.

In the softer marls interval transit times are greater (up to 140 m.sec/ft).

Dips are generally about 5° predominantly to the northeast.

LAKES ENTRANCE

The SP in this interval is lower than in the Gippsland Formation, corresponding to the change from the glauconitic fossiliferous marl to the underlying mudstone. A corresponding increase in SP and induction values is seen in the basal glauconitic greensand.

Interval transit times are affected by cavings. No obvious orientation of dips are seen in the lower part of this section.

LATROBE

The IES log shows a typical pattern through the water-wet sand-siltstone sequence of the Latrobe. The Density Log, together with the Gamma Ray Log indicates the presence of several clean coals.

Increasing velocities are seen as the depths increase in this formation.

Dipmeter results show generally low dips up to 10° to the west and northwest.

BASEMENT

This is characterized most strongly on the dipmeter logs from which the unit is seen to be dipping about 15 - 20° to the southwest.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. GROPER NO. 2

DATE ANALYSIS COMPLETED September 17, 1970

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil			
3	2443' 0"	2443' 10"	Calcareenite; silty pyr	29	4.3	11	2.19	2.99	82	NIL	N.D.	Neg.	NIL
3	2450' 2"	2450' 10"	as above	19	NIL	0.56	2.34	2.88	59	NIL	N.D.	Neg.	NIL
3	2455' 0"	2455' 8"	as above	23	0.54	0.70	2.21	2.87	84	NIL	N.D.	Neg.	NIL
4	2825' 3"	2825' 9"	Sh; calc silty	7.1	NIL	NIL	2.61	2.82	41	NIL	N.D.	Neg.	NIL
4	2855' 0"	2855' 4"	Sh; l. calc. mic.	6.1	NIL	NIL	2.64	2.81	47	NIL	N.D.	Neg.	NIL

Remarks: - CORE 1 & 2 - NO RECOVERY

General File No. 69/1414
Well File No. 69/2028

PE906098

This is an enclosure indicator page.
The enclosure PE906098 is enclosed within the
container PE902844 at this location in this
document.

The enclosure PE906098 has the following characteristics:

ITEM_BARCODE = PE906098
CONTAINER_BARCODE = PE902844
NAME = Micro-Faunal Distribution Chart
BASIN = GIPPSLAND
PERMIT = VIC/P2
TYPE = WELL
SUBTYPE = DIAGRAM
DESCRIPTION = Micro-Faunal Distribution Chart for
Groper-2. Table 1 of Appendix 3.
REMARKS =
DATE_CREATED =
DATE_RECEIVED =
W_NO = W558
WELL_NAME = GROPER-2
CONTRACTOR =
CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE902845

This is an enclosure indicator page.
The enclosure PE902845 is enclosed within the
container PE902844 at this location in this
document.

The enclosure PE902845 has the following characteristics:

- ITEM_BARCODE = PE902845
- CONTAINER_BARCODE = PE902844
- NAME = Time Depth Curve
- BASIN = GIPPSLAND
- PERMIT =
- TYPE = WELL
- SUBTYPE = VELOCITY_CHART
- DESCRIPTION = Time Depth Curve Groper 2
- REMARKS =
- DATE_CREATED =
- DATE_RECEIVED =
- W_NO = W558
- WELL_NAME = Groper-2
- CONTRACTOR = ESSO
- CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601487

This is an enclosure indicator page.
The enclosure PE601487 is enclosed within the
container PE902844 at this location in this
document.

The enclosure PE601487 has the following characteristics:

ITEM_BARCODE = PE601487
CONTAINER_BARCODE = PE902844
NAME = Well Completion Log
BASIN = GIPPSLAND
PERMIT =
TYPE = WELL
SUBTYPE = COMPLETION_LOG
DESCRIPTION = Well Completion Log Esso Groper 2
REMARKS =
DATE_CREATED = 23/09/1969
DATE_RECEIVED =
W_NO = W558
WELL_NAME = Groper-2
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE906099

This is an enclosure indicator page.
The enclosure PE906099 is enclosed within the
container PE902844 at this location in this
document.

The enclosure PE906099 has the following characteristics:

ITEM_BARCODE = PE906099
CONTAINER_BARCODE = PE902844
NAME = Geology and Structure Map
BASIN = GIPPSLAND
PERMIT = VIC/P2
TYPE = WELL
SUBTYPE = MONTAGE
DESCRIPTION = Geological locality map Latrobe
structure map and geological
cross-section for Groper-2. Plate 1 of
WCR
REMARKS =
DATE_CREATED = 30/11/1969
DATE_RECEIVED =
W_NO = W558
WELL_NAME = GROPER-2
CONTRACTOR =
CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE601488

This is an enclosure indicator page.
The enclosure PE601488 is enclosed within the
container PE902844 at this location in this
document.

The enclosure PE601488 has the following characteristics:

- ITEM_BARCODE = PE601488
- CONTAINER_BARCODE = PE902844
- NAME = Grapholog Mudlog
- BASIN = GIPPSLAND
- PERMIT =
- TYPE = WELL
- SUBTYPE = MUD_LOG
- DESCRIPTION = Corelab Grapholog Mud Log for Groper-2
- REMARKS =
- DATE_CREATED = 19/09/1969
- DATE_RECEIVED =
- W_NO = W558
- WELL_NAME = Groper-2
- CONTRACTOR = CORE LABORATORIES
- CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE905920

This is an enclosure indicator page.
The enclosure PE905920 is enclosed within the
container PE902844 at this location in this
document.

The enclosure PE905920 has the following characteristics:

- ITEM_BARCODE = PE905920
- CONTAINER_BARCODE = PE902844
 - NAME = Structure, Isopach Maps and Geological
Cross Sections
 - BASIN = GIPPSLAND BASIN
 - PERMIT = VIC/P2
 - TYPE = WELL
 - SUBTYPE = MONTAGE
- DESCRIPTION = Structure, Isopach Maps and Geological
Cross Sections A-A' and B-B' (enclosure
from WCR) for Groper-2
- REMARKS =
- DATE_CREATED = 21/09/69
- DATE_RECEIVED =
- W_NO = W558
- WELL_NAME = GROPER-2
- CONTRACTOR = ESSO
- CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)