



WELL SUMMARY

SNAPPER - 3 (W568)

1 Folio No	2 Referred to	3 Date	4 Clearing Officer's Initials	1 Folio No.	2 Referred to	3 Date	4 Clearing Officer's Initials

FILE COVER INSTRUCTIONS FOR ACTION OFFICERS

- (1) FOLIO NUMBERS: Each subject paper attached to a file is to be given a consecutive number by the attaching officer. Papers must not be removed from or attached to a file without approval.
- (2) REFERRAL TO OTHER OFFICERS: When an Officer completes action on the file and further action is required by some other Officer, please initial Column (4) and on the next vacant line, enter the relevant folio number in Column (1), indicate to whom the file is to be forwarded in Column (2) and record the date in Column (3).
- (3) BRING UP MARKINGS: When action on a file is required at a later date, the officer will initial Column (4) and, on the next vacant line, enter the relevant folio number in Column (1), then write "B/U" followed by the action officer's name in Column (2) and the date the file is required in Column (3).
- (4) PUTAWAY MARKINGS: When ALL action on a file is completed the officer concerned will initial Column (4) and, on the next vacant line, write "P/A" in column (2).

LOCATION

SNAPPER-3 (W568)
Well Summary Report

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COMPUETION REPORT

COMPLETION REPORT

CONFIDENTIAL

Date June 1, 1970

I WELL DATA RECORD

LOCATION

WELL NAME SNAPPER-3	STATE Victoria	PERMIT or LICENCE Vic. P-1	GEOLOGICAL BASIN Gippsland	FIELD Snapper
CO-ORDINATES Lat. Long. X Y Surface 38°12'45"S 147°59'11"E 590,259 286,790 Bottom Hole Straight Hole		MAP PROJECTION Australian Transverse Mercator	GEOGRAPHICAL DESCRIPTION Offshore: 23 miles south of Lakes Entrance; 1.7 miles southwest of Snapper-1.	
<u>ELEVATIONS & DEPTHS</u>				
ELEVATIONS Ground KB 31 ft. RT Braden Head Top Deck Platform	WATER DEPTH 180ft. PLUG BACK DEPTH 400 ft;	TOTAL DEPTH M.D. 10,536 ft. T.V.D. REASONS FOR P.B. Abandonment;	Avg. Angle	
<u>DATES</u>				
MOVE IN 23.11.69	RIG UP 23.11.69	SPUDDED 24.11.69		
RIG DOWN COMPLETE 27.1.70	RIG RELEASED 27.1.70	PROD. UNIT - Start Rigging Up		
PROD. UNIT - Rig Down Complete		I.P. ESTABLISHED		
<u>MISCELLANEOUS</u>				
OPERATOR Esso	PERMITTEE or LICENCEE Hematite	ESSO INTEREST Well 100% Permit Nil	OTHER INTEREST	
CONTRACTOR Global Marine	RIG NAME Glomar III	EQUIPMENT TYPE Ship Shape Drilling Vessel		
TOTAL RIG DAYS 65.1	DRILLING AFE NO. 239117	COMPLETION NO.	TYPE COMPLETION	
LAHEE WELL	Before Drilling	Outpost		
CLASSIFICATION	After Drilling	Abandoned successful outpost.		

II INITIAL PRODUCTION TEST					
Date	WELL COMPLETION AS: Oil Well _____ Gas Well _____ Dry Hole _____				
Choke size, inch			Calculated P.I.		
Length of Test			Calculated A.O.F		
Oil, BPD			Perforations		
Water, BPD			Shut-In BHP		
Gas, MCFD			Flowing BHP		
Gas Liquids, BPD			Shut-In Tubing Press		
Gas-Oil Ratio			Flowing-Tubing Press		
Gravity, API			Flowing Temperature		

III PERFORATING RECORD (Prod. test, Completion, DST, FIT)						
INTERVAL	HPF	TOTAL SHOTS	SERV. CO.	DIFF. PRESS.	PERFORATION FLUID.	SIZE AND TYPE GUN

NOT A WELL SNAPPER

IV CASING -- LINER -- TUBING RECORD							
Type	Size	Weight	Grade	Thread	No. Joints	Amount	Depth
Conductor	30"x20"	Pile Joint		Vetco	1	39.57	
	20"	94	H-40	Vetco	8	342.99	583.56
Surface	13-3/8"	54.5	J-55	Butt.	61	2335.09	2536
Inter- mediate	9-5/8"	53	N-80	Butt.	3	129.93	
	9-5/8"	40	N-80	Butt.	124	5139.63	5468

V CEMENT RECORD			
String	20"	13-3/8"	9-5/8"
Type of Cement	550 sx w/2% Gel & 500 sx w/2% CaCl ₂	1100 sx w/2% Gel 550 sx Neat	415 sx w/2% Gel & 200 sx w/.4% HR-7
Number of FT ³	1475	2425	900
Average weight of slurry	13.7 ppg/15.7 ppg	13.5 ppg/15.6 ppg	13.8 ppg/15.4 ppg
Cement Top	Sea Floor	Sea Floor (Calc.)	3740' (Temp. Svy)
Casing Tested with	0	1500 psi	2500 spi
Number of Centralizers	0	5	23
Number of Scratchers	0	0	0
Stage Collar etc.	0	0	0
Remarks	Gel Prehydrated	Gel Prehydrated	Gel Prehydrated

R. L. GOOD
Engineer

VI SUBSURFACE COMPLETION EQUIPMENT DATE COMPLETED _____

Schematic	Equipment Description	Length	Depth

NOT APPLICABLE

WELL SNAPPER -3

VII SAMPLES, CONVENTIONAL CORES, SW CORES					
INTERVAL	TYPE	RECOVERED	INTERVAL	TYPE	RECOVERED
2580-10536	Cuttings	Every 10'			
5414-2550	swc	Shot 30 Recovered 27'			
10500-5746	swc	Shot 60 Recovered 37			
No conventional cores cut					

VIII WIRELINE LOGS AND SURVEYS (Incl. FIT)					
Type & Scale	From	To	Type & Scale	From	To
IES 2") 5")	10512-2536		FIT 1	4580	
			FIT 2	4598	
			FIT 3	4638	
			FIT 4	5496	
BHCS 2") 5")	10507-2536		FIT 5	4564	
			FIT 6	4502	
FDC-GR 2") 5")	10508-2536		FIT 7	10276	
			FIT 8	8800	
CDM 2") 5")	10507-2536		FIT 9	5886	
			FIT 10	6140	
			FIT 11	7600	
MLL 2") 5")	10501-9474		FIT 12	8388	
			FIT 13	8387	
GR-N 2") 5")	5000-4000		Velocity Survey		

B.G. McKay

Geologist

WELL SUMMARY

SNAPPER-3 WELL SUMMARY

TYPE OF WELL: Wildcat.

PURPOSE OF WELL: The Snapper-3 Well was drilled to define the size of the Snapper Field and to test the hydrocarbon potential within the downthrown western fault block of the Snapper structure.

STATUS: Plugged and abandoned.

LOCATION: Latitude 38° 12' 45" South
Longitude 147° 59' 11" East.

LEASE: Vic/Pl.

RIG: "Glomar III".

ELEVATION: Rotary table 31 feet above mean sea level.

WATER DEPTH: 180 feet.

SPUDED: November 24th, 1969.

ABANDONED: January 27th, 1970.

DRILLING TIME: 65 days.

TOTAL DEPTH: 10,536 feet.

CASING: 13 3/8 inch shoe set at 2536 feet.
9 5/8 inch shoe set at 5468 feet.
20 inch shoe set at 583 feet.

CEMENT PLUGS:

<u>Plug No.</u>	<u>Interval (ft.)</u>	<u>Sacks of Cement</u>
1	9210-9500	120 sacks of neat cement with 0.4% HR4. Top tagged.
2	5145-5500	120 sacks of neat cement and 2% Ca Cl ₂ .
3	400-600	55 sacks neat cement.

CORES:

No conventional cores were cut. 60 SWC's were attempted and 37 were recovered.

2.

MUDLOGS:

A continuous mudlog record was maintained by Core Laboratories in the interval 2580-10,536 feet (T.D.).

ELECTRIC LOGS:

<u>Log</u>	<u>Run</u>	<u>Interval (ft.)</u>
F.I.T.s ✓	1-7 7-13	
IES ✓	2	5468-10,512
IES	1	2536-5510
FDC	2	5468-10,508
FDC	1	3800-5502
BHCS - Cal	2	5468-10,508
BHCS - Cal	1	2538-5498
MLL ✓	1	9500-10,508
CDM ✓	1	2536-5502
CDM	2	5468-10,511
Neutron ✓	1	4000-5000

TESTING:

A total of 13 Formation Interval Tests were run, 11 of which were successful.

F.I.T. No.1	4580 feet	- Recovered 45 cubic feet gas, 150,000 cc's oil 39° A.P.I. GOR 450.
F.I.T. No.2	4598 feet	- Recovered mud with scum of oil (tight zone).
F.I.T. No.3	4638 feet	- Recovered formation water.
F.I.T. No.4	4596 feet	- Recovered mud only.
F.I.T. No.5	4564 feet	- Recovered 98.4 cubic feet gas, 500 cc's condensate, 1000 cc's mud.
F.I.T. No.6	4502 feet	- Recovered 95.2 cubic feet gas, 300 cc's condensate, 1700 cc's mud.
F.I.T. No.7	10,276 feet	- Packer failed.

TESTING (contd.)

F.I.T. No.8	8800 feet	- Recovered 1½ cubic feet gas, 20,000 cc's filtrate (2200 p.p.m. Nq Cl equivalent), scum of oil.
F.I.T. No.9	5886 feet	- Recovered 1.1 cubic feet gas, 21,000 cc's filtrate (as above), and scum of oil.
F.I.T. No.10	6140 feet	- Recovered 0.8 cubic feet gas, 22,000 cc's filtrate (as above) and scum of oil.
F.I.T. No.11	7600 feet	- Recovered 0.7 cubic feet gas, 21,000 cc's filtrate (as above) and scum of oil.
F.I.T. No.12	8386 feet	- Packer failed.
F.I.T. No.13	8387 feet	- Recovered 50 cc's muddy filtrate.

HYDROCARBONS:

The main hydrocarbon zone occurs in lower Lakes Entrance sand and at the top of the Latrobe Valley Formation with gas from 4196 to 4568 feet (net sand 284 feet) and oil in the interval 4578 to 4598 feet (net sand 12 feet).

Minor oil and gas shows were recorded at the following depths:

8796-8817 feet	Small gas kick in sandstone.
9440-9451 feet	Gas sand associated with coal seams.
10261-10362 feet	(Net sand 64 feet) some gas kicks, partly due to coal, and some fluorescence and blue cut.

STRATIGRAPHY:

<u>Formation</u>	<u>Top (R.T.) (ft.)</u>	<u>Subsea (ft.)</u>	<u>Thickness (ft.)</u>
Gippsland Formation	211	0	3899+
Lakes Entrance Formation	4110	3899	126
Latrobe Valley Formation	4236	4025	6300+

MES:YEF
13.4.70
Melbourne.

SNAPPER - 3

APPENDIX

LITHOLOGY:

Interval
(ft.)

Gippsland Formation

3113-4110 - Mainly Marl.

Lakes Entrance Formation

4110-4236 - Marl.
Sandstone, brown, very fine grained.
Sandstone, medium to very coarse grained, well rounded, well sorted, no fluorescence or cut.

Latrobe Valley

- 4236-4698 - Sandstone, as above.
Coal.
Mudstone, light grey, calcareous, plant and carbonaceous material.
- 5190-5510 - As above, with some minor Claystone.
- 5510-6390 - Siltstone, buff to light brown, carbonaceous.
Coal, grading to carbonaceous Shale.
Sandstone, light grey, quartzose, dolomitic, sub-angular to angular, fine to coarse grained, yellow mineral fluorescence.
- 6390-7415 - Shale, light to medium brown, carbonaceous.
Siltstone, white to light brown, occasionally sandy and dolomitic.
Coal some bleeding gas.
Sandstone, white, very fine to fine grained, light, dolomitic in part, mineral fluorescence.
- 7415-8004 - Shale, as above.
Siltstone, as above.
Sandstone, as above, at 7880 feet showed fluorescence and cut.
- 8004-9160 - Shale, as above, with occasional sand stringers.
Coal.
Siltstone, light grey to brown, hard and some sandy, carbonaceous, traces of Coal and Sandstone.
Sandstone, white to grey, very fine to

2.

Latrobe Valley (contd.)

fine grained, sub-angular, partly dolomitic, tight, some mineral fluorescence.

9160-10,340 - Sandstone, light grey, quartzose, dolomitic in part, blue and yellow fluorescence, mainly mineral, but occasional blue cut at below 10,250 feet.
Shale.
Siltstone, dark brown-grey, carbonaceous, micaceous.
Coal.

10,340-10,536 - Sandstone, white, quartzose, dolomitic cement, decreasing kaolinic cement increasing, occasional slight blue cut, no definite hydrocarbon fluorescence visible.
Siltstone, dark brown-grey, soft, carbonaceous.
Shale.
Coal.

BA
17/4/70

MES:YEF
Melbourne.

IX NAME	FORMATION TOPS/Zones					REMARKS
	Tops		Gross Interval (ft)	Net Pay (ft).		
	M.D.	Sub-sea		Gas	Oil	
GIPPSLAND FM.	Sea	Floor	3960			
GURNARD FM.	4174	-4143	77	34		
LATROBE N-1	4251	-4220				
N-1.1	4251	-4220	155	140		
N-1.2	4406	-4375	181	118		
N-1.3	4587	-4556	87	4		
Gas-water contact	4600	-4569	400			
N-1.4	4674	-4643	91			
N-1.5	4765	-4734	74			
N-1.6	4839	-4808	145			
N-1.7	4984	-4953	207			
M. diversus	4855	-4824	1063			
L. balmei	5918	-5887	3458			
T. lilliei	9370	-9339	1166+			

X GEOLOGIC ANALYSIS (Pre Drilling prognosis Vs actual results)

There were two main objectives in drilling the Snapper-3 outpost.

- (i) to evaluate reservoir character of any younger section and hydrocarbon distribution in the N-1 reservoir in the western fault block.
- (ii) to provide further information on the possibility of commercial intra-Latrobe sands.

In the Latrobe N-1 where correlations are very good, over 100' of new younger section was encountered as expected and this proved to contain excellent quality reservoir sands. The gas-water contact was essentially the same as found in Snapper -1 and Snapper -2, indicating that the faults which intersect the structure are probably not barriers.

In the intra-Latrobe, no significant shows were recorded. Snapper-3 runs between 350' and 1000' down dip from Snapper-1 and this may account for the lack of hydrocarbons.

Also a non-sealing fault between Snapper -1 and 3 would preclude the possibility of separate fault controlled reservoirs. Sand quality decreases markedly below 8600'.

PE905077

This is an enclosure indicator page.
The enclosure PE905077 is enclosed within the
container PE905074 at this location in this
document.

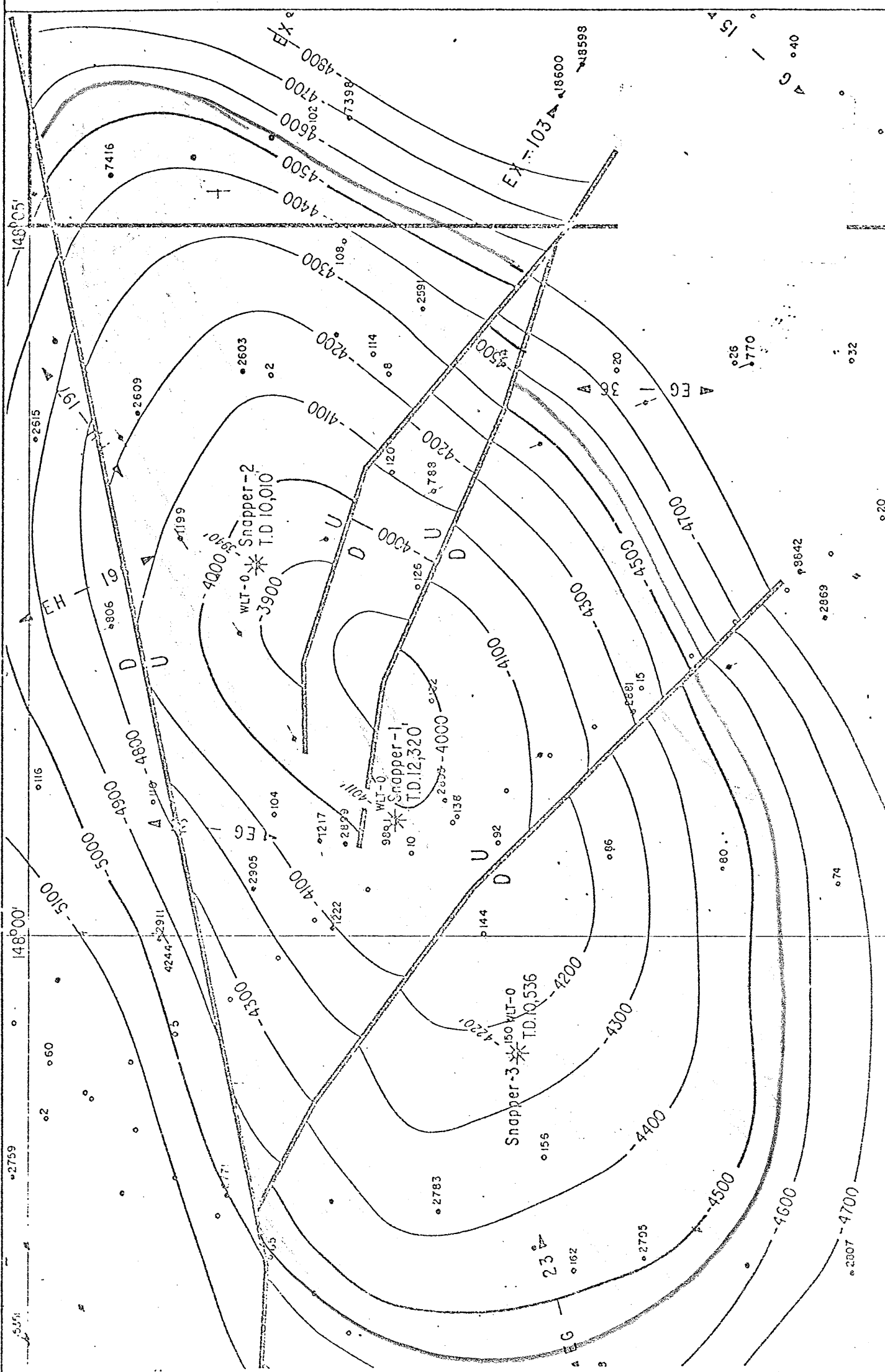
The enclosure PE905077 has the following characteristics:

ITEM_BARCODE = PE905077
CONTAINER_BARCODE = PE905074
 NAME = Structure Map
 BASIN = GIPPSLAND
 PERMIT = VIC/P1
 TYPE = SEISMIC
 SUBTYPE = HRZN_CNTR_MAP
DESCRIPTION = Structure Map of Latrobe Topographic
 Surface
REMARKS =
DATE_CREATED =
DATE_RECEIVED =
 W_NO = W568
 WELL_NAME = SNAPPER-3
CONTRACTOR =
CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

GEOLOGIC MAP OF AFTER DRILLING PICTURE

7/19



STRUCTURE MAP ON
 LATROBE TOPOGRAPHIC SURFACE
 SCALE 1:50,000

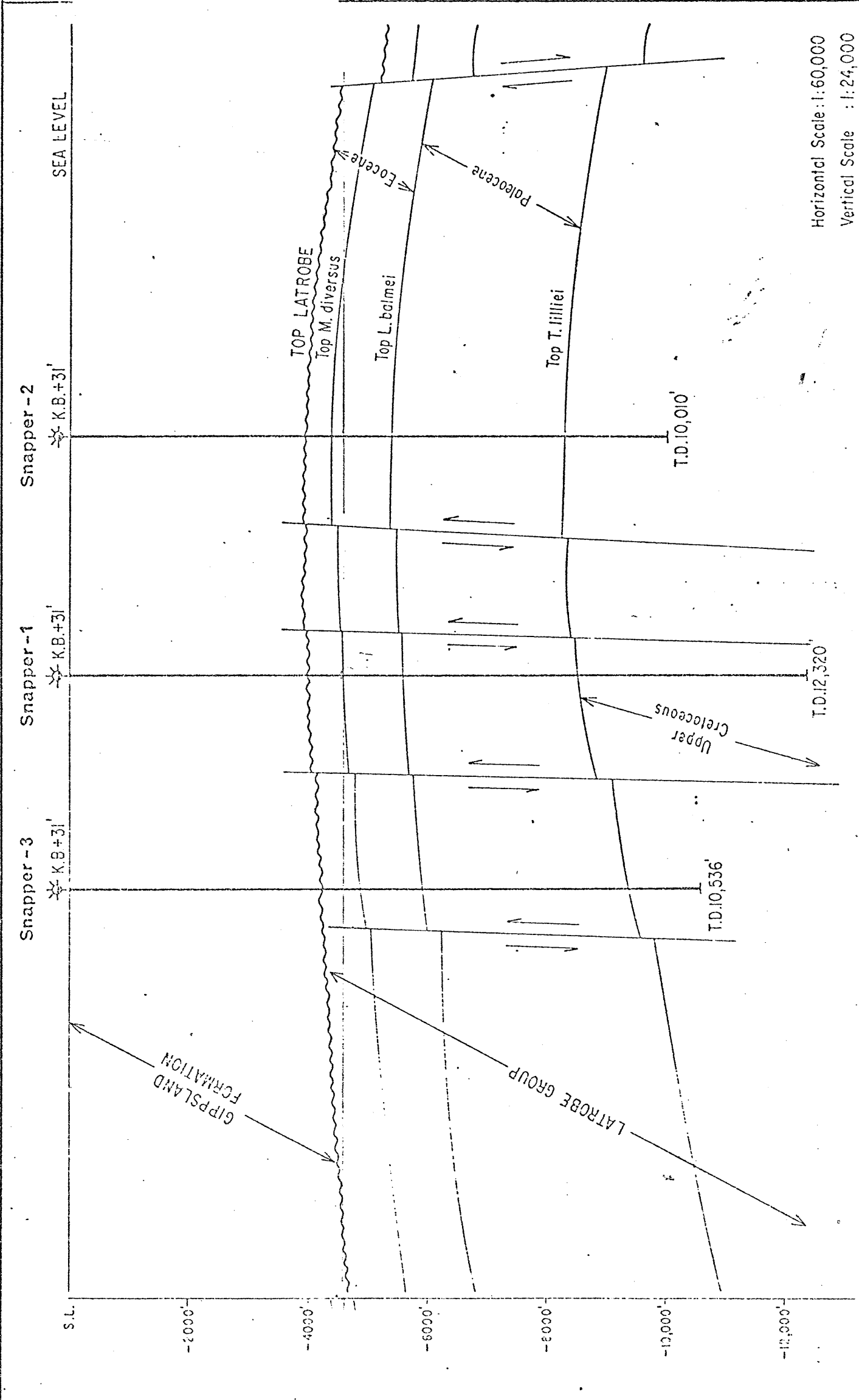
DEPT. NAT. RES & ENV



PE905077

CROSS SECTION OF AFTER DRILLING PICTURE

8/9





SIDEWALL CORE DESCRIPTIONS

SIDEWALL CORE DESCRIPTIONS - SNAPPER 3

Run 1.

<u>Depth</u>	<u>Recovery</u>	<u>Description</u>
5414'	1/2"	<u>Shale</u> ; dark grey and brown, fissility increasing; thin laminae and lenses of silt, very slightly calcareous, micaceous.
5250'		No recovery
5030'	1/2"	<u>Shale</u> ; light grey to buff colour, banded, crumbly, slightly micaceous, very slightly calcareous, abundant pyritic lenses. Faint bedding visible due to pyrite lenses, colour banding and silty layers.
4842'	1/2"	<u>Silty Shale</u> ; dark grey, crumbly slightly micaceous, even parallel bedding apparent due to variable amounts of silt.
4770'	3/4"	<u>Sandstone</u> ; (Quartz wacke) extremely clay choked sand. Dark brown, poorly sorted; fine, very coarse to conglomeratic sub-rounded-rounded quartz. Soft unconsolidated.
4708'	1 1/2"	<u>Mudstone</u> ; light grey buff, homogenous, no trace of bedding, crumbly, non calcareous.
4630'	1/2"	<u>Sandstone</u> ; even parallel, dark brown and black carbonaceous laminae. The sand is buff to very light grey, well sorted, fine-medium grained sub-rounded-rounded, slightly micaceous, no matrix discernable. Unconsolidated. No fluorescence. Good porosity and permeability.
4616'	1"	<u>Sandstone</u> ; light grey to white, even textured, well sorted, fine grained, sub-angular quartz, slightly silty, slightly micaceous. Unconsolidated. Scattered carbonaceous fragments, non calcareous. No fluorescence. Good porosity and permeability.
4598'	1"	<u>Sandstone</u> ; dark brown, very poorly sorted and clay choked; medium-very coarse grained, sub-rounded-rounded quartz. Carbonaceous matter common. Non calcareous, soft, mushy. Banded, light blue and yellow-green fluorescence, occurring where porosity, slow weak light blue cut. Very poor porosity and permeability.
4594'	1/2"	<u>Shale</u> with scattered grains of coarse to granular sub-rounded-rounded quartz. <u>Shale</u> ; dark brown non-calcareous, pyritic, carbonaceous, crumbly. No fluorescence - very tight. No porosity and permeability.
4582'	1"	<u>Sandstone</u> ; medium brown, abundant clay matrix. Moderately sorted tends to be bimodal, medium to very coarse with scattered granular, sub-rounded-rounded quartz grains; very slightly micaceous. Moderate porosity and permeability. Scattered points and banded light yellow fluorescence. Immediate weak, light blue cut.
4522'	1/2"	<u>Shale</u> ; very light grey to buff micaceous scattered carbonaceous fragments no trace of bedding, crumbly
4249'		No recovery.
4233'		No recovery.



 SIDEWALL CORE DESCRIPTIONS - SNAPPER 3

Run 1.

<u>Depth</u>	<u>Recovery</u>	<u>Description</u>
4220'	1"	<u>Sandstone</u> ; light-medium grey, well sorted, fine to medium, sub-angular to sub-rounded quartz grains. Abundant scattered medium glauconitic grains, slightly micaceous. Matrix sparse, one thin argillaceous lamina. Medium porosity and permeability. No fluorescence.
4206'	1"	<u>Sandstone</u> ; as above with greater volume of glauconite and matrix material.
4198	1"	<u>Glauconitic Sandstone</u> ; light grey-green, moderately sorted. Fine to medium, sub-angular sub-rounded quartz grains slightly silty in part, slightly pyritic and micaceous. Approximately 30% medium, rounded glauconite grains. Sparse clay matrix. Medium porosity and permeability. No fluorescence, soft crumbly.
4190'	1"	<u>Silty Sandy Mudstone</u> ; very dark grey, very hard dense, scattered glauconite (medium grain rounded), micaceous coarse - very coarse rounded quartz grains. Non calcareous.
4180'	1"	<u>Silty Glauconitic Mudstone</u> ; hard, compact 60% glauconite grains (medium rounded) slightly micaceous, scattered white clay lenses. Clay is very dark grey. Slightly calcareous.
4130'	1"	<u>Fossiliferous Mudstone</u> ; medium grey, homogeneous, compact, abundant scattered Foraminifera and bryozoal fragments. Very calcareous.
4010'	1"	<u>Fossiliferous Mudstone</u> ; as above light grey.
3910'	1"	<u>Fossiliferous Mudstone</u> ; as above, light green grey, and thin laminae of white silt.
3750'	1"	<u>Fossiliferous Mudstone or Marl</u> ; as above, apparent increase in calcareous content.
3600'	1½"	<u>Fossiliferous Mudstone or Marl</u> ; as above; grey-green, pyritic.
3400'	1"	<u>Fossiliferous Mudstone or Marl</u> ; as above.
3200'	1"	<u>Fossiliferous Mudstone or Marl</u> ; as above. Light grey-green.
3000'	1"	<u>Fossiliferous Mudstone or Marl</u> ; as above.
2850'	1"	<u>Fossiliferous Mudstone or Marl</u> ; as above.
2700'	1"	<u>Fossiliferous Mudstone or Marl</u> ; as above.
2550	1"	<u>Fossiliferous Mudstone or Marl</u> ; as above.

BIOSTRATIGRAPHY

BHP 1/12

INTERPRETATIVE

PALYNOLOGY OF SNAPPER -3 AND

REVIEW OF SNAPPER -1 AND -2

by

P.R. Evans

Palyn. Rept. 1970/33

July 1970.

INTRODUCTION

Samples from Snapper -3 were received on a routine basis for analysis during January 1970. They have been studied with a view to aiding correlations between wells on the Snapper structure, and as part of regional studies, particularly concerning the T. lilliei/L. balmei Zone boundary and the dinoflagellate content of the N. goniatus Zone.

The following report briefly summarizes data obtained from Snapper -3 by July 1970.

Some of the data obtained from Snapper -3 necessitated modification to views expressed about Snapper -1 and Snapper -2 in previous reports. Consequently data from the earlier wells have also been reviewed and correlations between them expressed graphically in the attached diagram.

Previous palynological reports concerning the Snapper well include: 1969/1, 1969/11, 1969/13, 1970/21.

INTERPRETATIVE

SUMMARY OF DETERMINATIONS
SNAPPER -3

Sample	Depth (ft)	Age	Zone
swc 16	4206	Late Eocene	<u>N. asperus</u> (<u>O. dictyoplokus</u>)
" 15	4220	"	"
" 12	4522	Eocene undiff.	<u>N. asperus</u>
" 11	4582	"	"
" 10	4594	"	"
" 9	4598	"	"
" 6	4705	"	<u>P. asperopolus</u>
" 4	4842	?Early Eocene	<u>P. asperopolus/u. M. diversus</u> (<u>Wetzeliella undiff.</u>)
" 58	5970	Paleocene	<u>L. balmei</u>
" 57	6306	"	"
" 55	6950	"	"
" 54	7274	"	"
" 47	8750	"	"
" 45	8934	"	"
" 40	9378	"	"
" 34	9948	"	"
" 31	10012	U. Cretaceous	<u>T. lilliei</u>
" 17	10056	"	"
" 10	10253	"	"
" 3	10409	"	Undiff.

INTERPRETATIVE

COMMENT ON SNAPPER -3

Both divisions of the N. goniatus Zone are well represented in Snapper -3. The samples are grouped into two: the upper, from immediately below the Miocene probably represent the O. dictyoplokus Zone, the dinoflagellate zone detected by L.E. Stover within the N. asperus spore-pollen zone (see palyn. rept. 1970/28 in prep.). Whether or not the underlying D. extensa dinoflagellate zone is present at Snapper -3 remains unknown in view of the gap between the upper sample group and the lower with very few dinoflagellates.

The P. asperopolus Zone is well represented at 4705' with a 10% abundance of P. asperopolus and P. pachyopolus. The sidewall core at 4842' carries a high proportion of T. harrisii relative to Nothofagidites and to be consistent with previous determinations should be at the base of the asperopolus Zone or the top of the M. diversus Zone. The few dinoflagellates from this horizon are consistent with those in the Flounder Formation (Palyn. Rept. 1970/2) but are insufficient to indicate which zone is represented (Palyn.Rept.1970/21).

The sample gap between 4842 and 5970 feet precludes accurate determination of the diversus/balmei boundary.

Allocation of the sidewall core 9948 feet to the balmei Zone and 10,012 feet to the lilliei Zone provides a relatively precise determination of the top of the lilliei Zone. This is based on criteria used at e.g. Barracouta and Tuna to identify the change between zones. If modifications to this choice appear necessary, the boundary should be lowered rather than raised.

The residue obtained from 10,409 feet was insufficient to determine whether the stratum at that depth should be referred to the T. lilliei or N. senectus Zone.

INTERPRETATIVE

CORRELATION BETWEEN SNAPPER 1, 2 AND 3

Sampled horizons in Snapper 1, 2 and 3 and the zones to which they are allocated are plotted in the attached figure.

N. goniatus Zone

The P. asperopolus Subzone of the N. goniatus Zone is represented by two samples in each well. The lower of each pair displays the high proportion of T. harrisii relative to Nothofagidites and the upper in a P. asperopolus/pachypolus count of 5-10%.

The overlying N. asperus Subzone is thickest in Snapper -3 where at the top of the zone species representing the O. dictyoplokus dinoflagellate zone are present in greensand. Stover (Palyn. Rept. 1970/21) tentatively referred main cores from Snapper -1 at 4105 and 4122 feet to the O. dictyoplokus Zone. If correct the dictyoplokus Zone extends into the quartzose sandstone portion of the asperus Subzone. Stover tentatively referred Snapper -2, 4232 feet to the D. extensa dinoflagellate Zone. Although the dinoflagellates are not abundant, based on Stover's determinations, it is apparent that most of the N. asperus Zone represents the D. extensa and O. dictyoplokus Zones at Snapper.

M. diversus Zone

Poorly represented by samples in any of the Snapper wells. Abundant dinoflagellates from Snapper -1 4586 feet, in the upper M. diversus Zone are indicative of the W. thompsonae dinoflagellate zone, as seen in the Flounder Formation (Palyn. Repts. 1970/2; 1970/21). The vertical extension of the thompsonae Zone at Snapper is unknown: only the core sample from Snapper -1, 4614 feet underlay the dinoflagellate horizon, but unfortunately was barren. Furthermore a large gap occurs between the upper and lower diversus Zone samples in Snapper -1 and -2 so that the transition from one subdivision to the next cannot be determined with useful accuracy.

L. balmei Zone

Assemblages indicative of the top of the L. balmei Zone are present in the highest samples referable to that zone in each well, and there is no reason to suppose other than continuous deposition occurred from balmei into lower diversus time.

INTERPRETATIVE

The zone is well represented by samples: all require more detailed study if subdivision of the zone is to be attempted. Dinoflagellates are generally absent from the Zone, although rare specimens were observed in Snapper -2 at 6608 feet.

The base of the balmei Zone is taken to the deepest occurrence of Tripunctisporis sp. prior to a rise in abundance of Nothofagidites spp.

T. lilliei Zone

On current means of definition, the top of the T. lilliei Zone is relatively accurately located in Snapper -3 between 9948 and 10012 feet. This is at a greater depth than in Snapper -1 and -2, explicable in terms of the fault between the -1 and -3 wells.

General

Re-examination of samples from Snapper-1 and -2 showed that choice of the top of the lilliei Zone needed to be lowered in those wells. In the -2 well the boundary appears to lie between 8620 and 8736 feet, but if quantitative data are taken into account to accord with data from Snapper -3, a boundary between 8736 and 8910 feet in Snapper -2 might be a better choice. This indicates a throw of about 1200 feet on the fault between Snapper -1 and -3 at the level of the top of the T. lilliei Zone. As there is about 350 feet difference in structural elevation between the top of the diversus Zone in these wells, about 850 feet of this throw developed during balmei and diversus time. Comparison of logs indicates that little of this throw developed during deposition of the M. diversus Zone.

INTERPRETATIVE

BASIN GIPPSLAND

DATE 17/9

WELL NAME SNAPPER - 3

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>										
	<u>L. N. asperus</u>	4206	0				4598	1			
	<u>P. asperopolus</u>	4705	1				4842	1			
	<u>U. M. diversus</u>										
	<u>M. M. diversus</u>										
	<u>L. M. diversus</u>										
PALEOCENE	<u>U. L. balmei</u>	5970	1				6806	1			
	<u>L. L. balmei</u>	6950	2				7274	1			
	<u>T. longus</u>	8750	2				9948	2			
LATE CRETACEOUS	<u>T. lilliei</u>	10012	2				10253				
	<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 / A.D.P.

DATE June 1971; Dec. 1971

DATA REVISED BY: A.D.P.

DATE Jan. 1975.

BASIN GIPPSLAND BASIN

BY David TAYLOR

WELL NAME SNAPPER -3

DATE 22 April 1971 WELL. +31'

Foram Zones

		Highest Data	Quality	2 Way Time	Lowest Date	Quality	2 Way Time
MIOCENE	A	Alternate					
	B	Alternate					
	C	2550	1		2550	1	
	D	2700	1		2550	3	
	D ₁	Alternate					
	D ₂	3400	0		3600	0	
	E	3700	3		3850	3	
	E	Alternate	3750	0			
	F	3910	0		3910	0	
	F	Alternate					
G	4010	0		4130	0		
G	Alternate						
H ₁	Alternate						
H ₂	Alternate						
OLIGOCENE	I ₁	Alternate					
	I ₂	Alternate					
	J ₁	Alternate					
	J ₂	Alternate					
EOG.	K	Alternate					
	Fre K						

COMMENTS:

Note: If highest or lowest data is a 3 or 4, then on 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 _____

BASIN GIPPELAND DATE _____
 WELL NAME SNAPPER -3 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
J.C. MIOC.	<u>T. bellus</u>										
	<u>P. tuberculatus</u>										
Eocene	<u>U. N. asperus</u>										
	<u>L. N. asperus</u>	4206 ⁶⁵⁷⁵	0			1075	4598 ⁶⁵⁵⁷	1			1158
	<u>P. asperopolus</u>	4705 ⁶⁵⁷⁵	1			1178	4842 ⁶⁵⁷⁵	1			1206
	<u>U. M. diversus</u>										
P. O. C.	<u>L. M. diversus</u>										
	<u>L. balnei</u>	5970 ⁷⁰²⁷	1			1937	7274 ⁷⁰²⁷	1			1677
LATE CRETACEOUS	<u>T. longus</u>	8750 ⁷⁷⁷³	2			1917	9948 ⁷⁷⁷³	1			2037
	<u>T. lilliei</u>	10012 ⁷⁷⁷³	1			2096	10253 ⁷⁷⁷³	1			2130
	<u>N. senectus</u>										
	<u>C. trip./T.pach.</u>										
EARLY CRETACEOUS	<u>C. distocarin.</u>										
	<u>T. pannosus</u>										
	<u>C. paradoxa</u>										
	<u>C. striatus</u>										
	<u>U. C. hughesii</u>										
Pre-Cretaceous	<u>L. C. hughesii</u>										
	<u>C. stylosus</u>										

COMMENTS: Probable M. diversus interval not sampled.
L. N. asperus at 4206' assigned to "A" subdivision
T.D. 10526 (2.176)

- 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: Corrected L. E. S. DATE Dec. 1971

ANALYSES

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

March 4, 1970

Esso Standard Oil (Australia) Ltd.
G. P. O. Box 4249
Sydney, New South Wales 2001

Attention: Mr. A. C. Pierce

Subject: Core, Mud and Cuttings Analysis
Snapper-3 Well
Stepout Field
Offshore-Bass Strait
Victoria, Australia

Gentlemen:

A Core Laboratories Australia combination drill cuttings and core analysis unit was present at the site of the subject well during drilling operations from 2580 feet to the total depth of 10536 feet.

Using standard equipment, a Programmed Hydrocarbon Detector and a Beckman Gas Chromatograph, the drilling fluid was monitored continuously for hydrocarbon content and the drill cuttings were checked at regular intervals for gas and oil content and lithology. Shale density determinations were made at regular intervals when applicable. The results of these operations are shown on the accompanying Grapholog.

Hydrocarbon Shows:

Hydrocarbons were detected in one zone during the drilling of this well. Details of this show are included on the attached Show Report No. 1.

Core Analysis:

No cores were cut and no core analysis was performed.

SHOW REPORT
CL-408A

CORE LABORATORIES AUSTRALIA LTD.

Operator ESSO STANDARD OIL (AUST.) LTD.
Well SNAPPER-3 AUSTRALIA State VICTORIA

No. 1
Date Nov. 30, 1969
CLANo. FL-155-21L

DESCRIPTION OF SHOW:

Show Interval 4200' To 4215'
Color of Flu Nil Intensity of Flu Nil
% Sand-Lime in Sample 50 % of Sand-Lime w/Flu Nil
Cut: Visual Nil Flu Nil
Lithology of Section: SANDSTONE: Med brn, v fine-fine gr, v glauconitic, some v crse to crse gr SANDSTONE, unconsolidated, subrndd.

GAS UNITS:

Mu	HOT WIRE			P/H/D (CHROMATOGRAPH)					
	Hi	Lo	Mud	Methane C ₁	Ethane (+) C ₂ (+)	Ethane C ₂	Propane C ₃	Butane C ₄	Pentane C ₅
From:	4	-		500	-	-	-	-	-
To:	350	-		250000	200000	-	180000	4000	9000
Cuttings			Cuttings						
From:	0	-			NOT MEASURED				
To:	50	-			NOT MEASURED				

ADDITIONAL INFORMATION:

Bit Condition New _____ Worn X Dull _____
Drilling Break Yes X No _____
Average Drilling Rate Controlled Rate _____ Before Break 0.5 During Break 0.2
Weight on Bit Changes Increased _____ Decreased _____ No Change X
Circulated Out Yes _____ No _____ Depth CO _____
Chloride Changes Before _____ After No change

FIELD EVALUATION:

Minor _____ Poor _____ Fair _____ Good X Remarks: Drilled through gas section anticipating gas-oil contact which did not eventuate.

FINAL EVALUATION: (It is recognized that other information such as other shows, side wall samples, etc. are necessary for the best evaluation. Consequently, this final opinion will be given at the end of the job after this data is available.)

HYDRO CARBON EVALUATION



11th. February, 1970.

Memorandum:

Director, Oil and Gas Branch:

Interpretation of Snapper 3.

The logs indicate the gas sands in the upper Latrobe formation approximate in depth those predicted after drilling Snapper 1 and reflected in the Latrobe Delta topographic survey submitted to our Department in April, 1969.

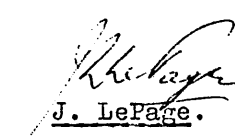
From 4,196' to 4,290', the logs would seem to indicate the presence of residual hydrocarbons in either the Lakes Entrance formation or the upper Latrobe complex.

As anticipated, gas is present in the interval 4,290'-4,568'. I estimate that a nett pay thickness of 215 feet exists at this well location with porosities around 30%.

Between 4,576' and 4,656', there exists a shaly sand zone containing an estimated nett pay of 38 feet of liquid hydrocarbons with water saturation varying from 40 - 60%. A very rough calculation indicates a possible oil in place quantity of 130 M bbls. assuming that the zone extends westwards from the major N.W/S.E. fault bisecting the field between the Snapper 1 and Snapper 3 wells.

At greater depths in the well the logs indicate zones of hydrocarbons. However, they are all too tight to be commercially productive. An interesting example of this is the zone between 7,577' and 7,584'. The gamma ray and the S.P logs indicate sand and the high reading of the induction log at first glance would indicate the presence of hydrocarbons. However, the formation density and the sonic log both indicate a tight cemented formation with practically nil porosities, and this cementation in turn has affected the resistivity log.

A detailed assessment of the various levels in the upper Latrobe Delta zone is included in the attached file. In conclusion I advise that in my opinion the drilling of Snapper 3 has confirmed the gas reserves in the Snapper field as being in excess of 3 T.C.F. and I recommend that a more detailed study be made of the Snapper 1, 2 and 3 logs to determine the total oil in place in the zone below the Snapper gasfield.


J. LePage.

*Noted with LePage
16/3/71*

SNAPPER FIELD PROPERTIES.

ROCK PROPERTIES

Permeability K (av) md 500

Porosity ϕ (%) 20

Average water saturation S_w

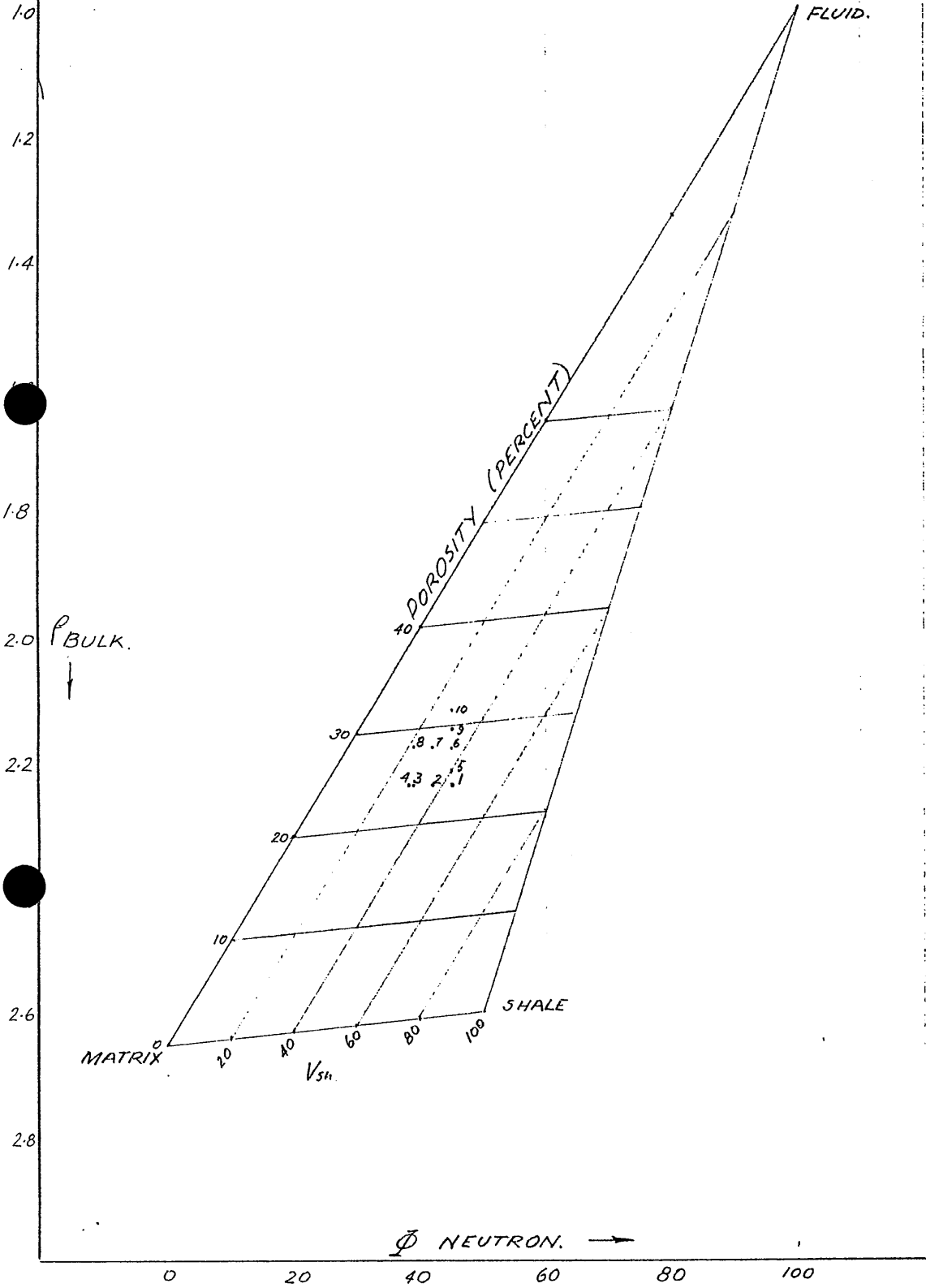
Snapper - 2.

Top of gas column 3938'

Gas-oil contact 4568'

Oil-water contact 4600'

SNAPPER 3 - DENSITY - NEUTRON POROSITY PLOT.



Jan 61

SNAPPER 3 ASSESSMENT

ZONE	NO	LEVEL	POROSITY & FORMATION FACTOR F											R _{xo}	R _t	R _{xo} /R _t	OSP	(R _{mt}) _c	(R _{wc}) _c	R _w	R _{mt} /R _w	S _w	
			F.D.C.		3HCS		NEUTROCI			FORMATION FACTOR F			= F _{mt}										(= R _{IL})
			P ₆	Φ _D	Δt	Φ _S	API	h _{mi}	P.I	Φ _N	Φ	V _{sh}											
4576 - 4656	1	4578	2.24	25	95	30	520	-	50	45	25	45	12	5.0	19	.6	-14	1.4	.30	.47	1.06	68	
	2	4582	2.24	25	106	38	545	-	45	42	25	35	12	5.0	15	.7	22	1.9	.22	.28	1.80	38	
	3	4598	2.24	25	98	32	570	-	40	35	25	30	12	5.0	8	.75	22	1.9	.22	.28	1.80	55	
	4	4600	2.24	25	98	32	585	-	38	33	25	28	12	6.0	7.5	.8	22	1.9	.22	.28	1.80	60	
	5	4616	2.22	26	104	36	510	-	50	45	26	40	11	5.5	14	.39	7	1.1	.39	.60	.83	62	
	6	4528	2.17	28	102	35	510	-	50	45	28	35	9.5	4.8	15	.32	5	1.1	.39	.60	.83	55	
	7	4630	2.18	28	104	36	535	-	45	42	28	30	9.5	4.8	14	.34	4	1.1	.39	.60	.83	58	
	8	4635	2.18	28	99	32	565	-	40	39	28	22	9.5	4.8	14	.34	2	1.02	.42	.70	.71	60	
	9	4540	2.15	30	105	37	510	-	50	45	30	30	3	4.0	14	.28	0	1	.425	.70	.71	57	
	10	4655	2.12	32	105	37	510	-	50	45	32	30	7	3.5	13	.27	4	1.1	.39	.60	.83	53	
	11	4530	2.24	25	106	38	545	-	45	42	25	35	12	6.0	13	.46	22	1.9	.22	.28	1.8	42	
7578 - 7593	12	7584	2.60	3	55	0																	
		7588	2.62	3	55	0																	

SUMMARY.

4577 - 4584	Assume porosity 25%	S _w = 40	V _{sh} = 35%	-	Net pay 7'				
4594 - 4602	"	"	25%	S _w = 60	V _{sh} = 30%	-	"	"	8'
4625 - 4644	"	"	30%	S _w = 60	V _{sh} = 30%	-	"	"	19'
4652 - 4656	"	"	30%	S _w = 60	V _{sh} = 30%	-	"	"	4'

$R_{mt} = 1.23 @ 60^{\circ}F = .50 @ 150^{\circ}F$ $(R_{mt})_c = .85 \times .50 = .425$
 $R_{mc} = 2.81 @ 60^{\circ}F = 1.18 @ 150^{\circ}F$

John P. 6/1/70.

The zones of interest in the upper Katoke Valley formation appear to be divided into six sections which are outlined below.

ZONES	TOTAL THICKNESS	TOTAL NET PAY	COMMENTS
4196 - 4290	94	70	The S.P and the I.E.S logs indicate sands with possible hydrate content in the region 4196'-4228' and 4252'-4292'. However, the Newton log clearly identifies the gas zone in the well as commencing at 4292'. The possible explanation is the presence of "residual hydrocarbons" in this formation.
4290 - 4406	116'	110'	The earlier analysis of this zone indicated gas to be present over the whole zone with porosity values averaging 30%.
4434 - 4450'	17'	13'	The earlier analysis of this zone indicated gas being present. Assume porosity 30%.
4458' - 4510'	52'	52'	This zone was assessed as gas bearing and will not be rechecked. Assume porosity 28%.
4528' - 4565'	40'	40'	This zone was assessed as gas bearing and no further check will be made. Assume porosity 30%.
4576 - 4656	80'	40'	This zone will be rechecked for water and hydrocarbon saturation and O.N.C. if discernible.
Gas sands .	225'	215'	
4290' - 4565'	270'		

PE603642

This is an enclosure indicator page.
The enclosure PE603642 is enclosed within the
container PE905074 at this location in this
document.

The enclosure PE603642 has the following characteristics:

ITEM_BARCODE = PE603642
CONTAINER_BARCODE = PE905074
NAME = Well Completion Log
BASIN = GIPPSLAND
PERMIT = VIC/P1
TYPE = WELL
SUBTYPE = COMPLETION_LOG
DESCRIPTION = Well Completion Log for Snapper-3
REMARKS =
DATE_CREATED = 27/01/70
DATE_RECEIVED =
W_NO = W568
WELL_NAME = SNAPPER-3
CONTRACTOR =
CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE601482

This is an enclosure indicator page.
The enclosure PE601482 is enclosed within the
container PE905074 at this location in this
document.

The enclosure PE601482 has the following characteristics:

ITEM_BARCODE = PE601482
CONTAINER_BARCODE = PE905074
NAME = Corelab Grapholog Mudlog
BASIN = GIPPSLAND
PERMIT =
TYPE = WELL
SUBTYPE = MUD_LOG
DESCRIPTION = Corelab Grapholog Mudlog
REMARKS =
DATE_CREATED = 20/01/70
DATE_RECEIVED =
W_NO = W568
WELL_NAME = Snapper-3
CONTRACTOR = CORE LABORATORIES
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE905075

This is an enclosure indicator page.
The enclosure PE905075 is enclosed within the
container PE905074 at this location in this
document.

The enclosure PE905075 has the following characteristics:

- ITEM_BARCODE = PE905075
- CONTAINER_BARCODE = PE905074
- NAME = Time-Depth Curve
- BASIN = GIPPSLAND
- PERMIT = VIC/P1
- TYPE = WELL
- SUBTYPE = VELOCITY_CHART
- DESCRIPTION = Time Depth Curve (Interpretative) for
Snapper-3
- REMARKS =
- DATE_CREATED = 1/09/70
- DATE_RECEIVED =
- W_NO = W568
- WELL_NAME = SNAPPER-3
- CONTRACTOR =
- CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE905076

This is an enclosure indicator page.
The enclosure PE905076 is enclosed within the
container PE905074 at this location in this
document.

The enclosure PE905076 has the following characteristics:

- ITEM_BARCODE = PE905076
- CONTAINER_BARCODE = PE905074
 - NAME = FIT Data
 - BASIN = GIPPSLAND
 - PERMIT = VIC/P1
 - TYPE = WELL
 - SUBTYPE = FIT
- DESCRIPTION = FIT Recovery Data
- REMARKS =
- DATE_CREATED =
- DATE_RECEIVED =
 - W_NO = W568
 - WELL_NAME = SNAPPER-3
 - CONTRACTOR = SCHLUMBERGER
 - CLIENT_OP_CO = ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)