Natural Resources and Environment

AGRICULTURE • RESOURCES • CONSERVATION • LAND MANAGEMENT

WELL SUMMARY

TURRUM-1

W548

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).

REGISTRY MUST BE NOTIFIED OF ANY FILE MOVEMENTS BETWEEN OFFICERS

LOCATION

T.D. 10029'.

TURRUM—1 ESSO WILDCAT. 548 W.D. 146' A
OCEAN DIG

IES	Run 2.	3464' – 9990'.	Separate logs 2" and
"	Runs 1 & 2.	840 – 9990'.	" " 2" "
BHCS.	Run 2.	3464 – 9986.	" " 2" "
BHCS/GR.	Runs 1 & 2.	840 – 9986.	" " 2" "
FDC/GR	Run 1.	6300 – 9990.	" " 2" " +1c
CDM	" 1 & 5	3466 – 9990	" " 2" " s
FIT	" 1.	Tests 1–3.	+1c
Exploration's Mudlog.		884 – 10029.	+ fast 1c

COMPLETE SUITE LOGS LOG.

Cores 6 off. Received 1 5.

Core Descriptions 1–6. Esso

" Analysis Report 1–6 ~~Exploration logging~~

SWC Shot 61. Rec 60. comp.

" Descriptions.

Cuttings 910 – ~~3520~~ 10,000'. ~~3530–6270.~~ Sent to store

Completion Report

Time Depth Curve (needs masking) +1c +1c ½ scale

Palynological Report by L. E. Stover & A. D. Partridge. Plus revision

Palaeontology " " D. Taylor.

Petrographic Descriptions of Volcanics from 10,023'

Well Completion Log.

Structure Map on Intra L balmei Marker.

Cross Section of After Drilling picture

Hydrocarbon Report of Subsurface Gas Samples from 7059' EPR-2895-7c EPRC

Map. Marlin Field. Showing Turrum-1 Location.

~~Grid for Sonic – Resistivity or FD – Resistivity Plots.~~

U Cretaceous Structure.

Weekly Reports

Cuttings 910 – 10,029' received by B.M.R. 5/12/73.

PALYNOLOGY SHEET BY W.K. HARRIS

QUANTITATIVE LOG ANALYSIS 161184.

No BHCS RI for 2 and 5

RI 910–3521 to 2 and 5

Turrum-1
(W548)

Well Summary Report

Table of Contents

Enclosures

548

ESSO STANDARD OIL (AUSTRALIA) LTD.

COMPLETION REPORT

I WELL DATA RECORD

Date June 23, 1970

LOCATION

WELL NAME	STATE	PERMIT or LICENCE	GEOLOGICAL BASIN	FIELD
TURRUM 1	VICTORIA	Victoria L-3	GIPPSLAND	NFWC

CO-ORDINATES	Lat.	Long.	X	Y	MAP PROJECTION	GEOGRAPHICAL DESCRIPTION
Surface	38°12'10"	148°14'41"	615,033	287,406	Australian Transverse Mercator	OFFSHORE 10 miles SW of [illegible]
Bottom Hole						

ELEVATIONS & DEPTHS

ELEVATIONS	WATER DEPTH	TOTAL DEPTH	Av. Angle
Ground	196 FEET	M.D. 10,029 FEET	
KB 99		T.V.D.	
RT	PLUG BACK DEPTH	REASONS FOR P.B.	
Braden Head	395 FEET	ABANDONMENT	
Top Deck Platform			

DATES

MOVE IN	RIG UP	SPUDDED
14.5.69	14.5.69	15.5.69
RIG DOWN COMPLETE	**RIG RELEASED**	**PROD.UNIT - Start Rigging Up**
27.6.69	27.6.69	
PROD.UNIT - Rig Down Complete	**I.P. ESTABLISHED**	

MISCELLANEOUS

OPERATOR	PERMITTEE or LICENCEE	ESSO INTEREST	OTHER INTEREST
ESSO	ESSO	50%	HEMATITE 50%

CONTRACTOR	RIG NAME	EQUIPMENT TYPE
ODECO	OCEAN DIGGER	SEMI-SUBMERSIBLE DRILLING VESSEL

TOTAL RIG DAYS	DRILLING AFE NO.	COMPLETION NO.	TYPE COMPLETION
44.4	239107		

LAHEE WELL CLASSIFICATION		
	Before Drilling	New Field Wildcat
	After Drilling	Abandoned with shows of hydrocarbon.

P.M. COONEY

Geologist

WELL, TURRUM-1

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

Engineer

WELL TURRIM -1

VII SAMPLES, CONVENTIONAL CORES, SW CORES

INTERVAL	TYPE	RECOVERED	INTERVAL	TYPE	RECOVERED
840 - 9990	Cuttings	Samples collect -ed every 10'.			
3500 - 9925	Sidewall Cores	61 shot 60 recovered			
6393-6423	Conventional	18'			
7059 - 7085	"	26'			
7085-7107	"	22'			
7107 - 7162	"	28'			
7162 - 7192	"	30'			
10,000 - 10,029	"	27'			

VIII WIRELINE LOGS AND SURVEYS (Incl. FIT)

Type & Scale	From To	Type & Scale	From To
IES 2" and 5"	840 - 9990		
BHCS/SP 2" and 5"	840 - 9990		
FDC " "	6300 - 9990		
CDM " "	3464 - 9990		
Velocity Survey	4060 - 9440		
FIT	6797', 7158', 7555'.		

P.M. COONEY
Geologist

WELL TURRUM-1

VI SUBSURFACE COMPLETION EQUIPMENT

DATE COMPLETED _____

Schematic	Equipment Description	Length	Depth

Engineer

WELL TURRUM 1

IV CASING - LINER - TUBING RECORD

Type	Size	Weight	Grade	Thread	No. Joints	Amount	Depth
Conductor	30"	310 & 196	H-40	Cameron	3	123.56	412
Conductor	20"	94	H-40	Vetco	13	552	8[illegible]
Surface	13-3/8"	72	J-55	Butt.	2	79.8[illegible]	
	13-3/8"	X over 13 54.5	8-RD X Butt. J-55	8RD ST&C	77	9.19 3082.00	346[illegible]

V CEMENT RECORD

String	30"	20"	13-3/8"
Type of Cement	400 sx w/2% $CaCl_2$	900 sx w/6% gel 100 sx neat w/2% $CaCl_2$	833 sx w/1.5% Gel 500 sx Neat
Number of FT^3	472	1639	1806
Average weight of slurry	15.5	13.7	14.5
Cement Top	Sea Floor	Sea Floor	1200'± (Calc.)
Casing Tested with	0	500 psi	2000 psi
Number of Centralizers	0	0	6
Number of Scratchers	0	0	0
Stage Collar etc.	0	0	0
Remarks			Gel Prehydrated

R.L. Wood
Engineer

WELL TURRUM-1

IX	FORMATION TOPS/Zones					
NAME	Tops		Gross Interval (ft)	Net Pay (ft).		REMARKS
	M.D.	Sub-sea		Gas	Oil	
Gippsland Fmn.	Sea Floor	- 196	3955			
Lakes Entrance Fmn.	4250	-4151	2120			
Latrobe Group (N. goniatus)	6370	-6271	373			
M. diversus	missing					
L. balmei	6743	-6644	2257	105	-	700 [illegible]
				57	-	749 [illegible]
T. lilliei	9000	-8901				

INTERPRETATIVE

X GEOLOGIC ANALYSIS (Pre Drilling prognosis Vs actual results)

Pre-drilling:

Formation	Depth (ft.)
Water	192
Gippsland Formation	192
Lakes Entrance Formation	5050
Latrobe Group	6250
Top L. balmei	Truncated
Top Upper Cretaceous (T. lilliei)	7580

Depths from mean sea level; for drill depths add 99'.

Turrum-1 is located near the present day crest of the large Marlin faulted anticline, as mapped on intra-Latrobe horizons. This large faulted anticline was probably breached in late Eocene or Oligocene time by a large submarine canyon which trends nearly north-south. Rocks ranging in age from late Eocene through L. balmei have been truncated. The canyon fill material serves as a seal for the Upper Latrobe oil reservoir at Halibut. Turrum-1 is located near the axis of the canyon and will be the first well to drill this canyon fill material.

Post-drill: Formation tops as in section IX.

1. The structure of the Turrum prospect is in accord with the original structural interpretation.

2. The L. balmei section is truncated by an intra Latrobe unconformity overlain directly by paralic/marine sediments of the N. goniatus zone. The M. diversus zone is probably missing by erosion.

3. Two gas zones were encountered near the top of L. balmei section. The upper extends from 7000' to 7175' with 105' of net sand, the lower from 7490' to 7575' with 57' of net sand.

4. Below a depth of approximately 8000' porosities of the Latrobe Group sandstones are poor and are between 10%-15%.

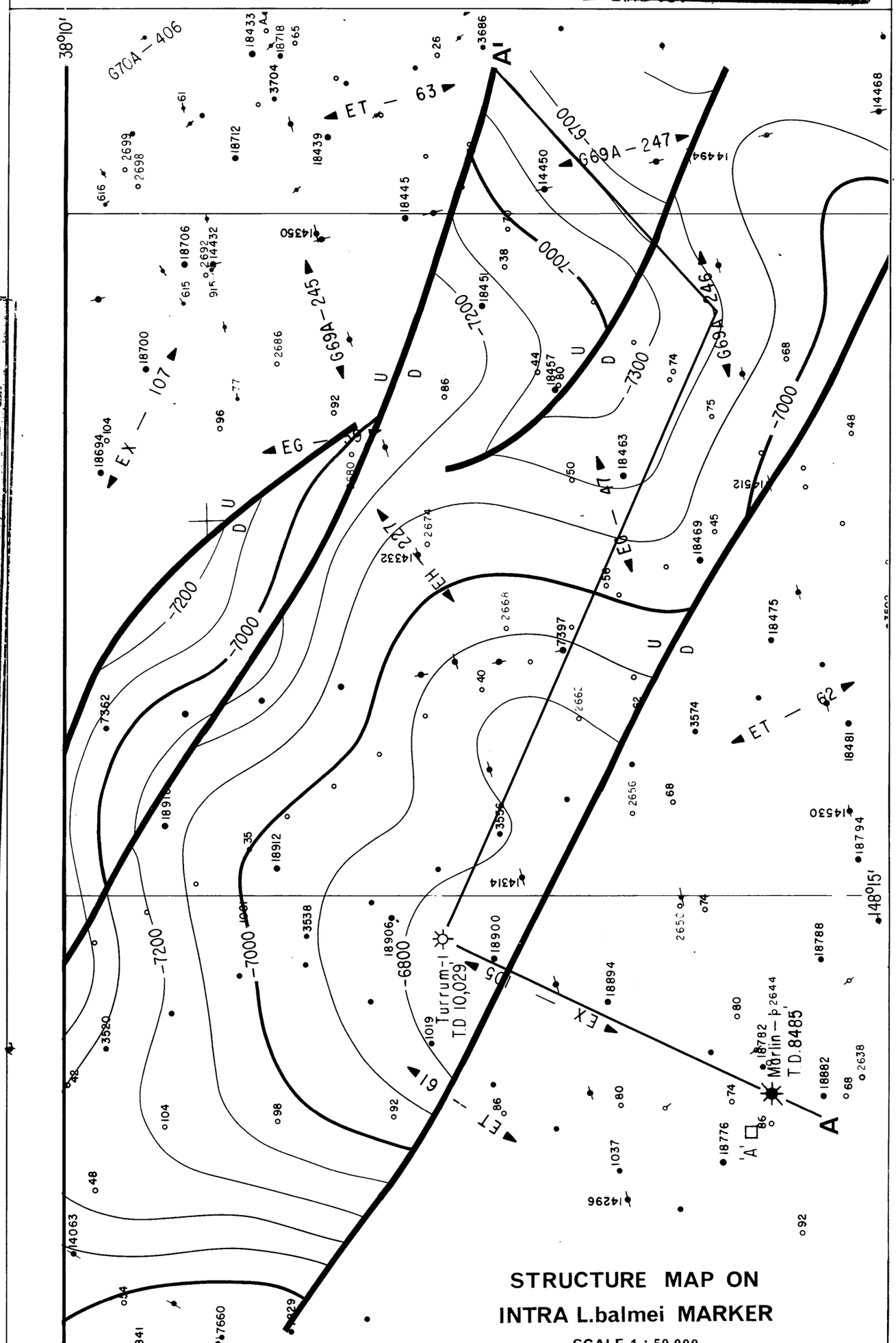
5. Fill material of the Marlin Oligocene submarine channel is composed entirely of shale.

P.M. Cooney
Geologist

WELL TURRUM -1

INTERPRETATIVE

GEOLOGIC MAP OF AFTER DRILLING PICTURE



INTERPRETATIVE

STRUCTURE MAP ON
INTRA L.balmei MARKER

SCALE 1 : 50,000

1 0 1

MILES

P. M. COONEY

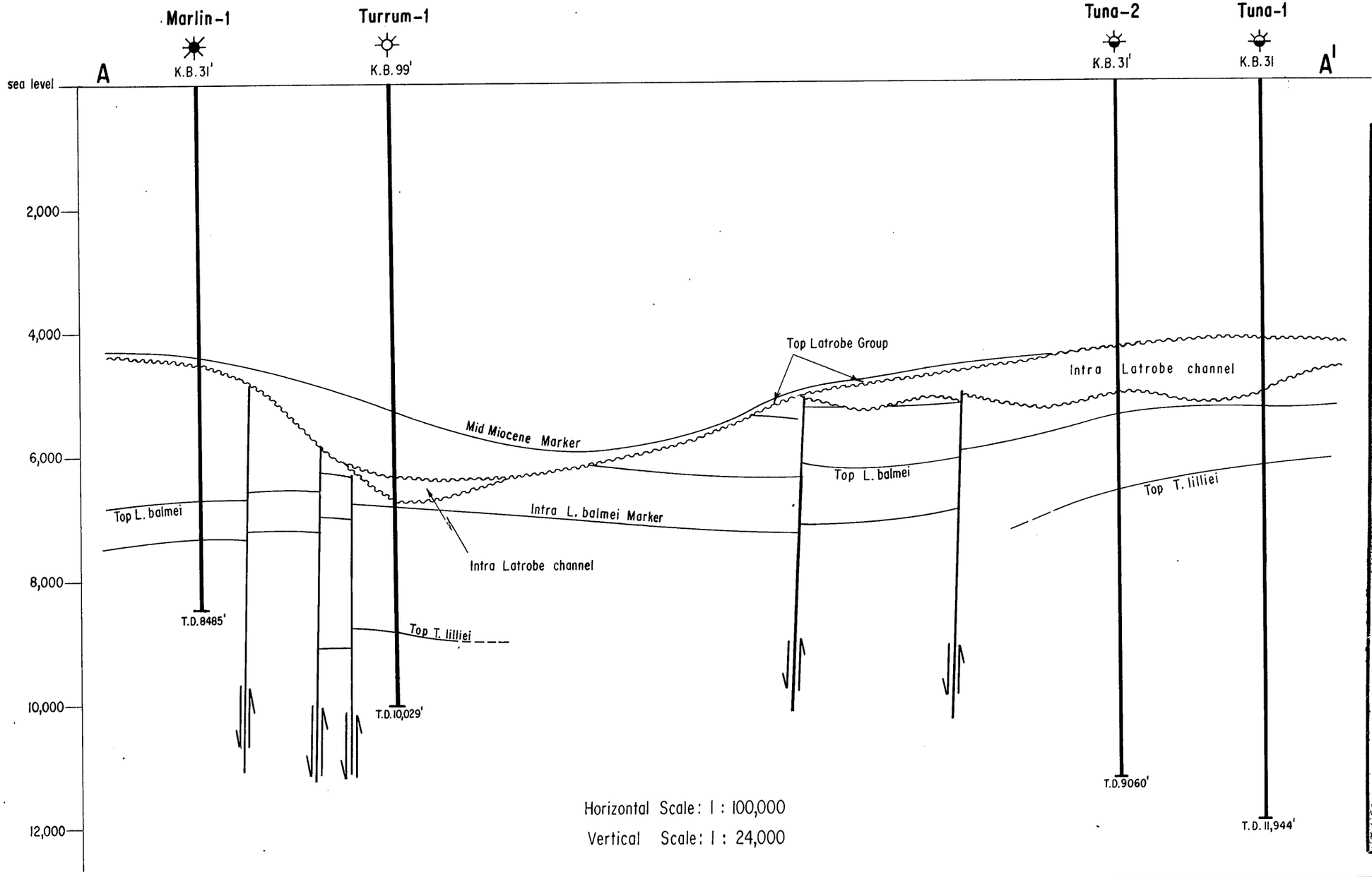
Geologist

COUNTOUR INTERVAL : 100'

DATUM : SEA LEVEL

1154/OP/12

WELL: Turrum - 1

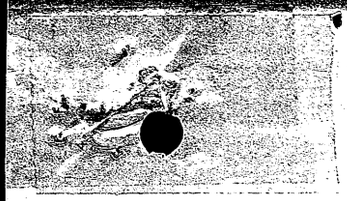


CROSS SECTION OF AFTER DRILLING PICTURE

P.M. Cooney
Geologist

Dwg: 1154/OP/11

CORE DESCRIPTIONS AND ANALYSES



ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 1

WELL: Turrum-1

Interval Cored 6398-6423 ft., Cut 25 ft., Recovered 18' ft., (70 %) Fm.

Bit Type C-22, Bit Size 8 5/16" in., Desc. by C.K. LUNT Date 29 May 1969

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0			6398-6405' 7'	No recovery
			6405-08' 3'	SANDSTONE: m-dk brn, non calc. silty f-v.crs. gr sub ang-sub round, mod hd qtzose. W/abund. glauconite some ϕ ≠ K.
			6408-22' 14'	SILTY SANDSTONE - SANDY SILTSTONE: m-dk brn, non calc. v-silty f-crs gr. w/occas pebble size, sub round. hd qtzose. W/abund glauconite. Occas. transitional 2-5" zones of siltstone w/few or no qtz grains. no ϕ ≠ K. Minor fault plain from 6408½' - 6410½' w/slickensides. Siltstn against sandstone. Flault ∠ = 70°
			6422-6423' 1'	SANDSTONE as by 6405-08'
				No distinct sedimentary structures

REMARKS:

2/6

RECEIVED
- 9 JUN 1969
MINES DEPT.

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 2

WELL: TURRUM - 1

Interval Cored 7059 - 7085 ft., Cut 26 ft., Recovered 26 ft., (100 %) Fm.

Bit Type C-20, Bit Size 8 5/16 in., Desc. by C.K. LUNT Date 1 June 1969

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 10 20		☼	7059 - 7059½'	½' SANDSTONE: lt. gry silty v.f - f gr. micaceous w/ widely scatt. carbonaceous frags throughout. Some ◊ ≠ K. No fluor or cut, good gas odor
			7059½ - 7070	10½' SILTSTONE: m. gry v. carbonaceous w/ fine interlaminations of vf gr. ss.
		☼	7070 - 7077	7' SANDSTONE: as in interval 7059 - 7059½' w/ occas carb. leaves
			7077 - 7080½'	3½' COAL: blk. vitreous
		☼	7080½ - 7085	4½' SILTSTONE: dk gry finely, contortedly interlaminated w/ ss: lt gry vf - f gr. No fluor or cut; good gas odor

REMARKS:

3/6

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 3

WELL: Turrum-1

Interval Cored 7085-7107 ft., Cut 22 ft., Recovered 22 ft., (100 %) Fm.

Bit Type C-20, Bit Size 8 5/16 in., Desc. by C.K. LUNT Date 1 June 1969

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 10 20				
		☼	7085-7088' 3'	SILTSTONE: dk gry, finely interlaminated w/ SS: lt yell gry vf-f gr, micaceous. Some ϕ ≠ K. No fluor, cut; wk gas odor
		☼	7088-7095' 7'	SANDSTONE: lt yell brn v silty, f gr w/ frequent patches of carbonaceous material (leaves etc), micaceous. Some ϕ ≠ K. No fluor or cut; gas odor
		☼	7095-7107' 12'	SILTSTONE as in interval 7085-7088' w/ occas zones up to 6" of SS: lt yell brn, vf-f gr. No fluor or cut; wk gas odor

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 4

WELL: Turum-1

Interval Cored 7107-7162 ft., Cut 55' ft., Recovered 28 ft., (51 %) Fm.

Bit Type C-20, Bit Size 8 5/16 in., Desc. by C.K. LUNT Date 2 ~~May~~ June 1969

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 10 20			7107-7111	4' MUDSTONE: dk gry hd non calc finely, contortedly interlaminated w/ SS: lt gy/gry. hd silt-vf gr., micaceous No fluor or cut; faint gas odor
			7111-7123'	12' MUDSTONE: dk gry. hd non calc massive w/ no sed structures
			7123-7128½'	5½' COAL: blk, vitreous
			7128½-7135'	6½' MUDSTONE as in interval 7111-7123' w/ abund carbonaceous material

REMARKS:

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 5

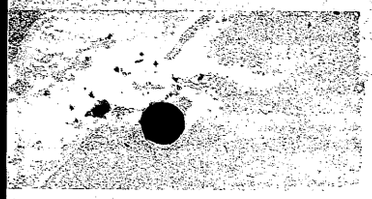
WELL: Turrum-1

Interval Cored 7162-7192 ft., Cut 30 ft., Recovered 30 ft., (100 %) Fm.

Bit Type C-20, Bit Size 8 5/16 in., Desc. by C K LUNT Date 3 June 1969

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 5 10			7162-7164'	2' SANDSTONE lt gry. v. hard f-v.crs gr. w/ >20% dolomitic cement. No ϕ ε K., no shows.
			7164-7188'	24' MUDSTONE: dk brn-gry. hard somewhat micaceous w/ carbonized plant remains. No sedimentary structures.
			7188-7192'	4' SANDSTONE: m. gry-brn v. silty v.f-f. gr. w/ occas. patches of carbonaceous material. Slight ϕ ε K., no shows.

REMARKS:



6/6

ESSO STANDARD OIL (AUSTRALIA) LTD.

CORE DESCRIPTION

Core No. 6

WELL: Turrum - 1

Interval Cored 10,000 - 10,029 ft., Cut 29 ft., Recovered 27 ft., (90 %) Fm. Latrobe

Bit Type C 20, Bit Size ... in., Desc. by BJW Date 21 - 6 - 69

Depth & Coring Rate (min./ft.)	Graphic (1" = 5')	Shows	Interval (ft.)	Descriptive Lithology
0 4 8			10,000	Siltstone, hd, md-dk gy bn, mica, carb., pyr., w/ coaly streaks. Bedding wavy, non parallel, disct., burrowed, contorted at base.
			10,004	Transition Zone: Lava intruding sediment.
			10,006	Volcanics, hd, lt. gy gn, fine grained intermediate lava w/ microcrystalline plagioclase laths and large vesicles filled w/ wh. & bn calcite. Probably trachytic in origin. Apparently an intrusive at shallow depth while sediment still soft.
	NO RECOVERY		10,027	No Recovery
			10,029	

REMARKS:

EXPLORATION LOGGING OF AUSTRALIA, INC.
A Geological-Engineering Service

PERTH ADDRESS 69 GREAT EASTERN HIGHWAY VICTORIA PARK WESTERN AUSTRALIA
PHONE 61 4437 CABLE EXLOGG PERTH

CORE ANALYSIS REPORT

COMPANY ESSO-BHP
WELL TURRUM 1
LOCATION/FIELD OFFSHORE/GIPPSLAND BASIN
COUNTY _____ STATE VICTORIA
COUNTRY AUSTRALIA
REMARKS RECOVERED 18 FEET SILTY SANDSTONE; MEDIUM BROWN, MEDIUM TO VERY COARSE GRAIN (WITH OCCASIONAL PEBBLES), NONCALCAREOUS, GLAUCONITIC, MICACEOUS, MODERATELY HARD. NO FLUORESCENCE, NO SHOWS.

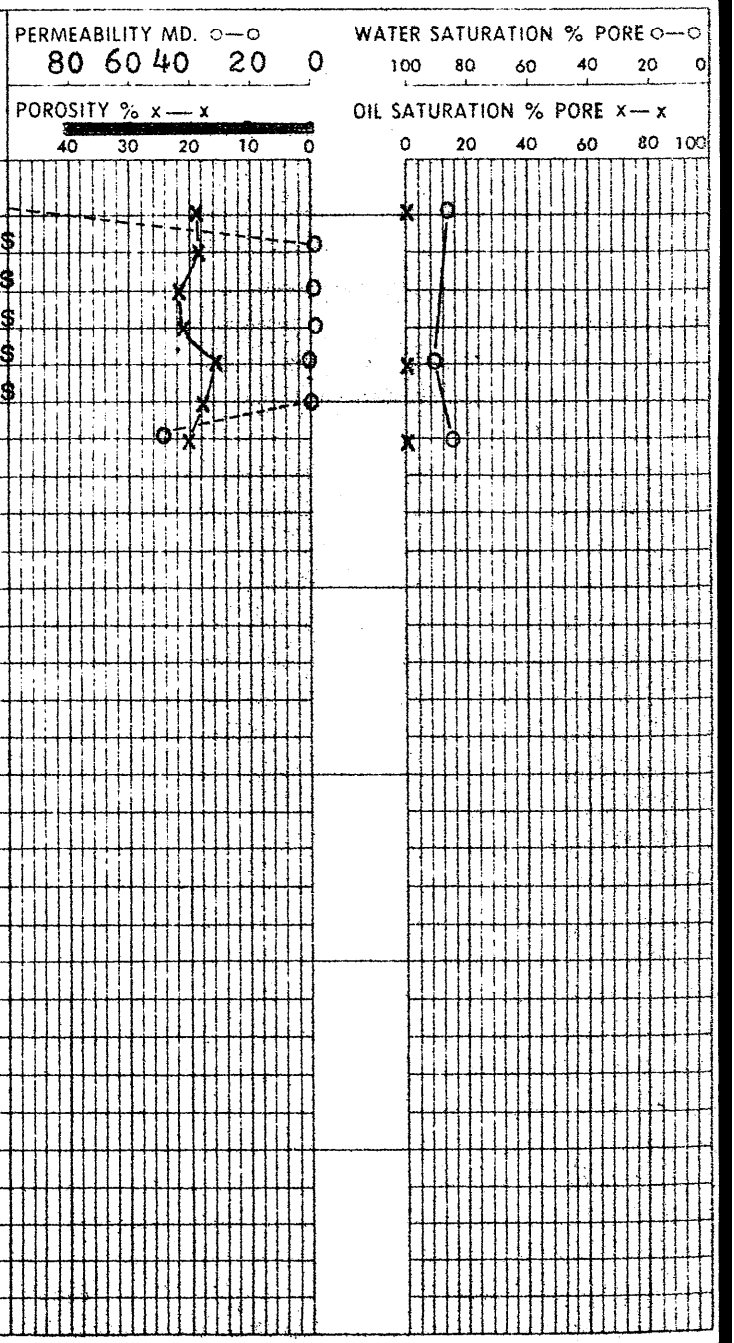
DATE MAY 28, 1969
DEPTH 6398 FT TO 6423 FT
GEO-ENGINEER ALBERT

SAND
SILTY SAND
SILTST.
SHALE
LIME
CONGL.

TABULAR DATA

SAMPLE NUMBER	CORE #1 DEPTH FEET	AIR PERM. MD.	POROSITY PERCENT	FLUID SATURATION % PORE VOLUME OIL	FLUID SATURATION % PORE VOLUME WATER	GRAVITY OIL °API	TOTAL CL' G/G	REMARKS LITH.
1	6408	430	19.5	0	87.3			SANDST
2	6410	0	18.6					SLTY SS
3	6411	0	21.5					SLTY SS
4	6414	0	20.9					SLTY SS
5	6415	0.6	15.8	0	93.0			SLTY SS
6	6419	1.0	17.5					SLTY SS
7	6423	50	19.8	0	85.5			SANDST

ANALYSIS GRAPH



EXPLORATION LOGGING OF AUSTRALIA, INC.
A Geological-Engineering Service

PERTH ADDRESS 69 GREAT EASTERN HIGHWAY VICTORIA PARK WESTERN AUSTRALIA
PHONE 61 4437 ABLE EXLOGG PERTH

CORE ANALYSIS REPORT

COMPANY ESSO-BHP
WELL TURRUM 1
LOCATION/FIELD OFFSHORE/GIPPSLAND BASIN
COUNTY _____ STATE VICTORIA
COUNTRY AUSTRALIA
REMARKS RECOVERED 26FT: 9FT LIGHT GREY, FINE TO MEDIUM GRAIN, MODERATELY HARD SANDSTONE; 12FT DARK GREY, SANDY SILTSTONE; 5FT COAL. TRACE DULL GOLD FLUORESCENCE IN SAND. TRACE MINERAL FLUORESCENCE.

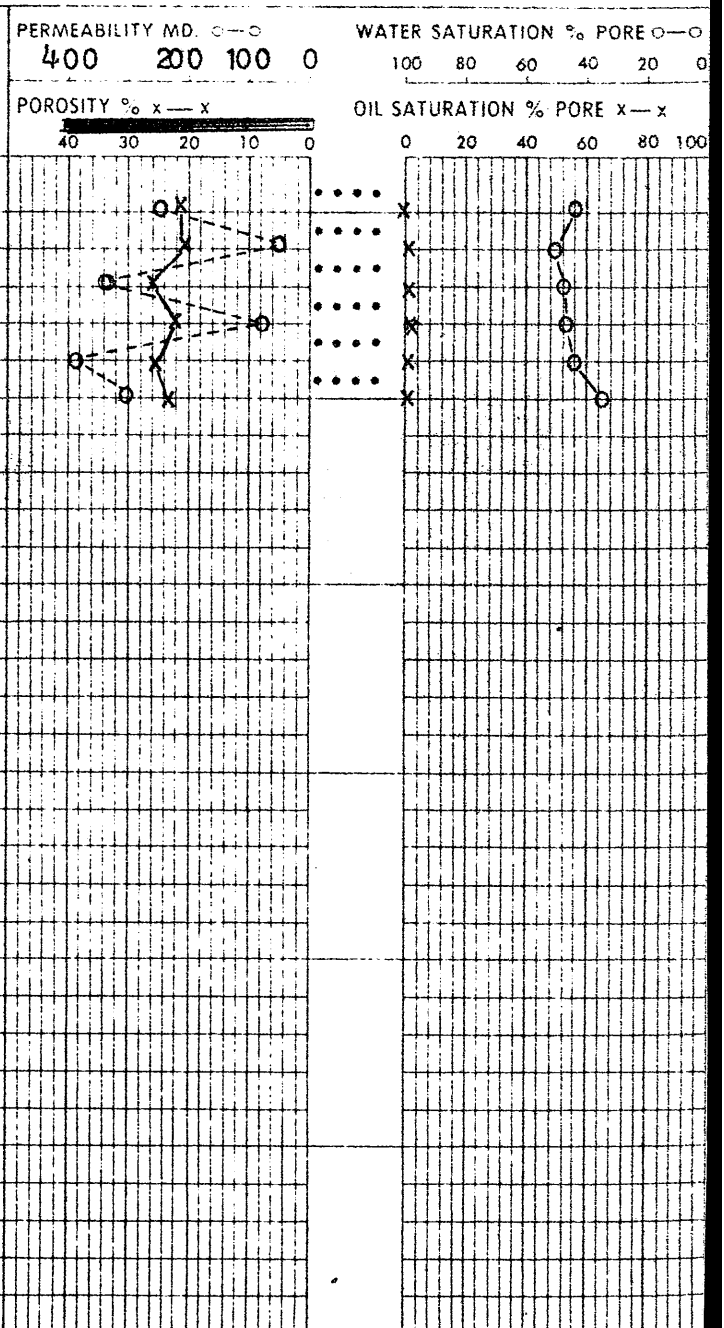
DATE JUNE 1, 1969
DEPTH 7059 FT TO 7085 FT
GEO-ENGINEER CRAIG

SAND
SILTY SAND
SILTST.
SHALE
LIME
CONGL.

TABULAR DATA

SAMPLE NUMBER	CORE #2 DEPTH FEET	AIR PERM. MD.	POROSITY PERCENT	FLUID SATURATION % PORE VOLUME OIL	FLUID SATURATION % PORE VOLUME WATER	DRY BULK ~~XXXX~~ OR ~~XX~~ DEN-SITY	TOTAL Cl^- G/G	REMARKS LITH.
1	7059½	260	22.4	0	43	2.08		SANDST
2	7070	49	20.5	0	52	2.12		SANDST
3	7071	312	25.1	0	47	2.00		SANDST
4	7073	79	21.5	0	48	2.08		SANDST
5	7075	379	24.9	0	44	2.00		SANDST
6	7076	298	23.6	0	34	2.03		SANDST

ANALYSIS GRAPH



EXPLORATION LOGGING OF AUSTRALIA, INC.
A Geological-Engineering Service

PERTH ADDRESS 69 GREAT EASTERN HIGHWAY VICTORIA PARK WESTERN AUSTRALIA
PHONE 61 4437 CAB E ELOGS PERTH

CORE ANALYSIS REPORT

COMPANY ESSO-BHP
WELL TURRUM 1
LOCATION/FIELD OFFSHORE/GIPPSLAND BASIN
COUNTY _____ STATE VICTORIA
COUNTRY AUSTRALIA
REMARKS RECOVERED 22':3' SILTSTONE FINELY LAMINATED SS; 7' SANDSTONE, SILTY-FINE GRAIN, CARB, MICA, SLIGHT GAS ODOR, NO FLU OR CUT; 12' SILTSTONE AS ABOVE VERY WEAK GAS ODOR, NO FLU OR CUT.

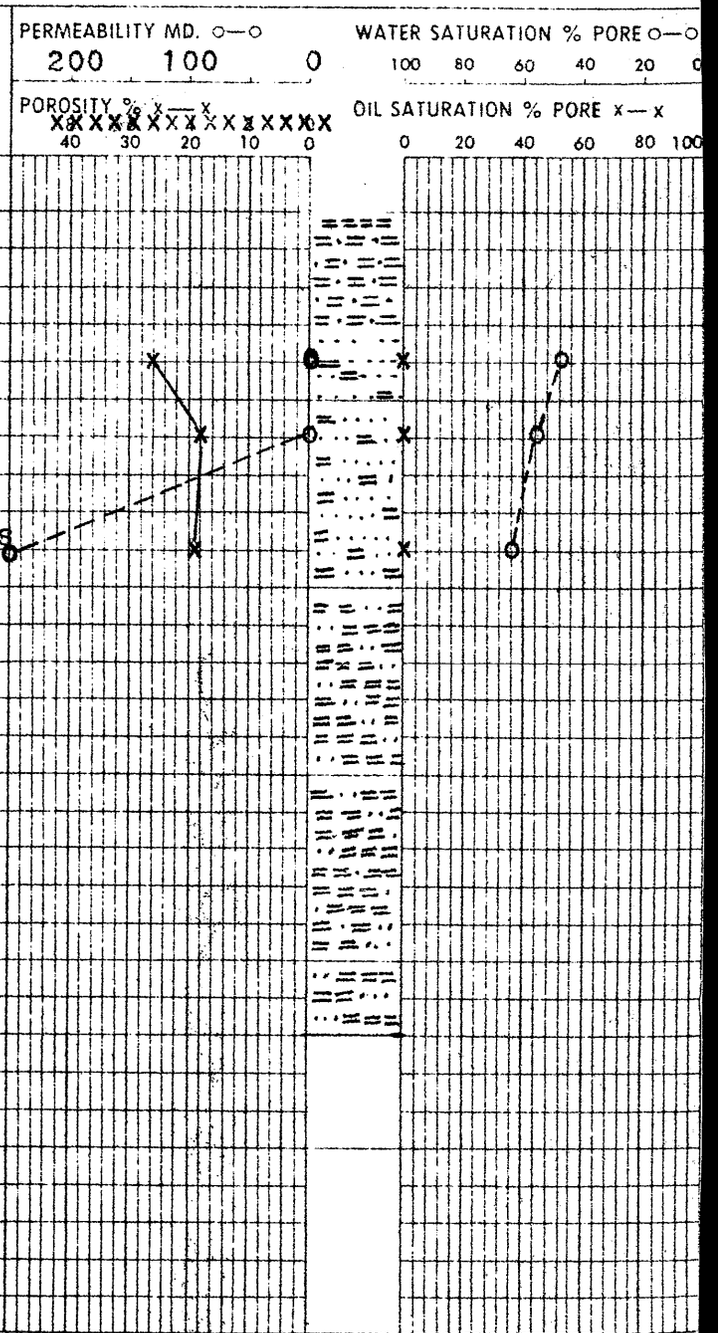
DATE JUNE 1, 1969
DEPTH 7085' TO 7107'
GEO-ENGINEER ALBERT

SAND · SILTY SAND · SILTST. · SHALE · LIME · CONGL.

TABULAR DATA

SAMPLE NUMBER	CORE #3 DEPTH FEET	AIR PERM. MD.	POROSITY PERCENT	FLUID SATURATION % PORE VOLUME OIL	FLUID SATURATION % PORE VOLUME WATER	GRAIN DEN-SITY	TOTAL Cl⁻ G/G	REMARKS LITH.
1	7089	0	25.6	0	48.0	2.67		Ss
2	7091	0	18.3	0	54.7	2.77		SLTYSs
3	7094	250	18.7	0	63.3	2.81		SH PTGS

ANALYSIS GRAPH



EXPLORATION LOGGING OF AUSTRALIA, INC.
A Geological-Engineering Service

PERTH ADDRESS 69 GREAT EASTERN HIGHWAY VICTORIA PARK WESTERN AUSTRALIA
PHONE 61 4437 CABLE EXLOGG PERTH

CORE ANALYSIS REPORT

COMPANY ESSO-BHP
WELL TURRUM 1
LOCATION/FIELD OFFSHORE/GIPPSLAND BASIN
COUNTY _____ STATE VICTORIA
COUNTRY AUSTRALIA
REMARKS REQ'D 28': 4' MUDSTONE, DK GRY W/ SILTY-VFG SS LAMS; 12' MUDSTONE, DK GRY, NON CALC, MASS; 5½' COAL; 6½' MUDSTONE AS ABOVE 12' W/ABUNDANT CARBONACEOUS MATERIAL.

DATE JUNE 2, 1969
DEPTH 7107' TO 7162'
GEO-ENGINEER CRAIG

SAND · · · · ·
SILTY SAND · · · · ·
SILTST. = = = = =
SHALE – – – – –
LIME □□□□□
CONGL. ○○○○○

TABULAR DATA

SAMPLE NUMBER	DEPTH FEET (Core 4)	AIR PERM. MD.	POROSITY PERCENT	FLUID SATURATION % PORE VOLUME: OIL	FLUID SATURATION % PORE VOLUME: WATER	GRAVITY OIL °API	TOTAL Cl⁻ G/G	REMARKS
	NO ANALYSES REQUIRED							

ANALYSIS GRAPH

PERMEABILITY MD. o—o
POROSITY % x—x
8 6 4 2 0
40 30 20 10 0

WATER SATURATION % PORE o—o
OIL SATURATION % PORE x—x
100 80 60 40 20 0
0 20 40 60 80 100

EXPLORATION LOGGING OF AUSTRALIA, INC.
A Geological-Engineering Service

PERTH ADDRESS 69 GREAT EASTERN HIGHWAY VICTORIA PARK WESTERN AUSTRALIA
PHONE 61 4437 CABLE EALOG PERTH

CORE ANALYSIS REPORT

COMPANY ESSO-BHP
WELL TURRUM 1
LOCATION/FIELD OFFSHORE/GIPPSLAND BASIN
COUNTY _____ STATE VICTORIA
COUNTRY AUSTRALIA
REMARKS RECOVERED 30FT: 24'MUDSTONE, DARK GREY/BROWN, HARD, CARBONIZED PLANT REMAINS; 6' SANDSTONE, MEDIUM GREY/BROWN, VERY FINE TO FINE GRAIN, SILTY, HARD TO VERY HARD(DOLOMITIC CEMENT). NO FLUORESCENCE. NO CUT

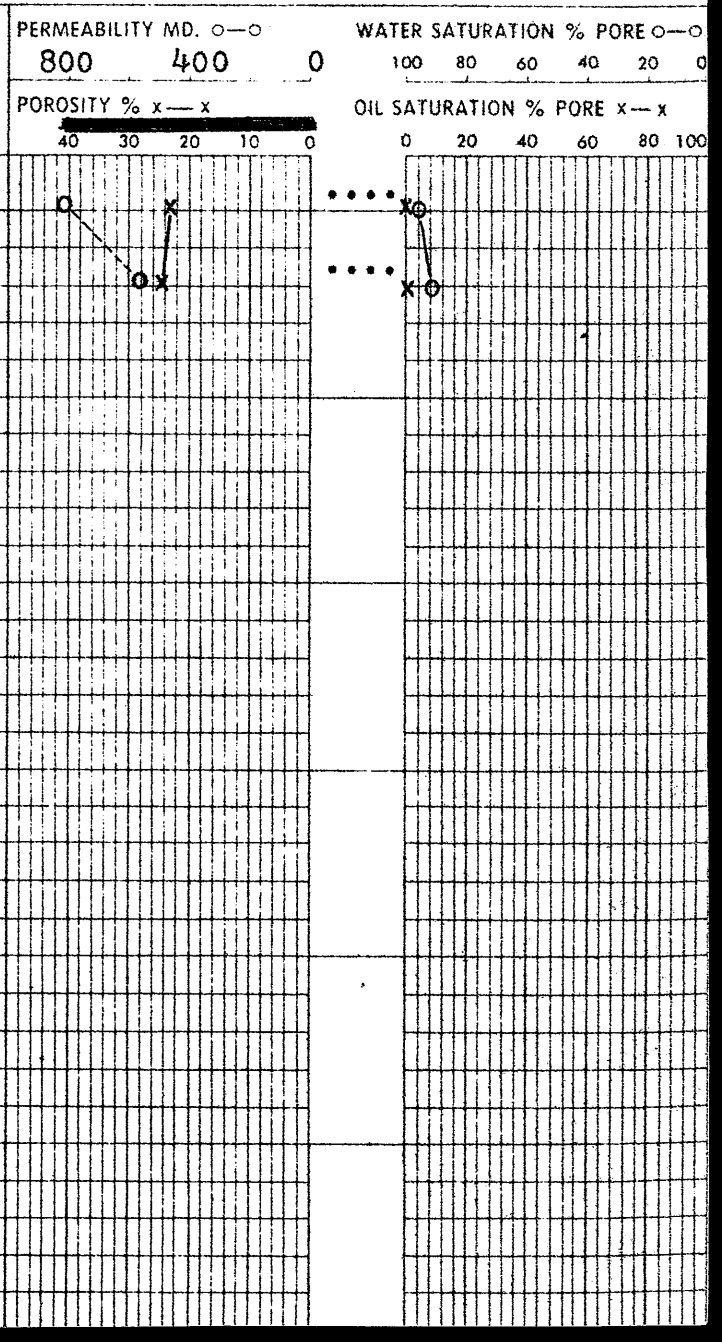
DATE JUNE 3, 1969
DEPTH 7162 FT TO 7192 FT
GEO-ENGINEER CRAIG

SAND
SILTY SAND
SILTST.
SHALE
LIME
CONGL.

TABULAR DATA

SAMPLE NUMBER	CORE #5 DEPTH FEET	AIR PERM. MD.	POROSITY PERCENT	FLUID SATURATION % PORE VOLUME OIL	FLUID SATURATION % PORE VOLUME WATER	GRAIN DENSITY	TOTAL CL⁻ G/G	REMARKS LITH.
1	7189	818	23.4	0	98	2.62		SANDST
2	7192	534	24.1	0	92	2.66		SANDST

ANALYSIS GRAPH



6/6

EXPLORATION LOGGING OF AUSTRALIA, INC.
A Geological-Engineering Service

PERTH ADDRESS 69 GREAT EASTERN HIGHWAY VICTORIA PARK WESTERN AUSTRALIA
PHONE 61 4437 CABLE EXLOGG PERTH

CORE ANALYSIS REPORT

COMPANY ESSO-BHP
WELL TURRUM 1
LOCATION/FIELD OFFSHORE/GIPPSLAND BASIN
COUNTY _____ STATE VICTORIA
COUNTRY AUSTRALIA
REMARKS RECOVERED 27FT: 4FT SILTSTONE, MED GREY-BROWN, CARBONACEOUS, MICACEOUS, PYRITIC, POORLY BEDDED, MINOR COAL; 23FT VOLCANIC, LT GREY-GREY GRN, INTERMEDIATE, W/AMYGDULS. NO SHOWS.

DATE 21ST JUNE, 1969.
DEPTH 10000 TO 10027
GEO-ENGINEER LEGG

SAND
SILTY SAND
SILTST.
SHALE
LIME
CONGL.

TABULAR DATA

SAMPLE NUMBER	CORE#6 DEPTH FEET	AIR PERM. MD.	POROSITY PERCENT	FLUID SATURATION % PORE VOLUME		GRAVITY OIL °API	TOTAL Cl^- G/G	REMARKS
				OIL	WATER			
	NO ANALYSIS REQUIRED.							

ANALYSIS GRAPH

PERMEABILITY MD. o—o
POROSITY % x—x
8 6 4 2 0
40 30 20 10 0

WATER SATURATION % PORE o—o
OIL SATURATION % PORE x—x
100 80 60 40 20 0
0 20 40 60 80 100

SIDEWALL CORE DESCRIPTIONS

SIDE WALL CORE DESCRIPTION

TURRUM-1

DEPTH	RECOVERY	DESCRIPTION
3500	1½"	Limestone, dark brown, grey-white, mottled, medium to coarse grained, highly fossiliferous, glauconitic, sparsely argillaceou
3560	1½"	Shale - light grey-green to grey-brown, sparsely micaceous, calcareous.
3850	2"	Shale, light grey-brown, as above.
3920	3/4"	Limestone, light grey to moderately grey to white, mottled, medium grained - coarse grained, highly fossiliferous, sparsely glauconitic, trace argillaceous (argillaceous, glauconitic, coquina), with dark brown carbonaceous partings and patches.
4000	3/4"	Limestone, as above.
4100	3/4"	Shale, dark to medium grey, (brownish) finely laminated, sparsely micaceous, calcareous. (Not laminated - massive)
4220	1½"	Shale, as above.
4350	2"	Shale, dark-medium grey (Brown) mottled, sparsely micaceous, trace carbonaceous, calcareous.
4500'	1½"	Shale, medium grey, brown, calcareous, fossiliferous, sparsely micaceous, dense, compact.
4650	2"	Shale, as above.
4800	3/4"	Shale, as above.
4950	1 3/4"	Shale, medium grey-green, calcareous, fossiliferous, micaceous, again some grey, less compact.
5100	1½"	Shale, as above.
5220	1"	Shale, medium grey-brown, calcareous, fossiliferous.
5300	1½"	Shale, medium grey, (no brownish tint), fossiliferous, calcareous, less dense, more grey.
5450	1½"	Shale, medium grey to light grey brown, mottled, calcareous, fossiliferous, sparsely micaceous.
5560	1½"	Shale, dark to medium grey brown, mottled, calcareous, fossiliferous, sparsely micaceous, with fine disseminated carbonaceous matrix.
5650	2"	Shale, as above, with sparse disseminated carbonaceous matrix.
5750	1½"	Shale, as above.
5850	2"	Shale, as above.
6050	2"	Shale, as above.
6200	1"	Shale, light grey, calcareous, fossiliferous, dense.

...../2

Sidewall Core Descriptions

TURRUM-1

DEPTH	RECOVERY	DESCRIPTION
6300	2"	Shale, light grey-grey brown, very calcareous, sparsely fossiliferous, sparsely glauconitic, pyritic, dense.
6350	1"	Shale, light grey-grey brown, as above.
6430	2"	Shale, dark grey-brown, slightly calcareous, sparsely pyritic, micaceous, slightly glauconitic.
6450	2"	Shale, as above, no glauconite.
6510	1½"	Shale, as above, with trace glauconite.
6520	1½"	Shale, as above.
6660	1¼"	Shale, as above, mico micaceous.
6490	2"	Shale, dark grey brown, silty, very fine, sandy micro micaceous
6530	1½"	Shale, medium grey-brown, silty, less sandy, sparsely micro micaceous, sparsly glauconitic, less sandy.
6580	1½"	Shale, as above, very fine, sandy.
6680	1½"	Shale, dark grey, very carbonaceous, micro micaceous.
6730 No Show	1½"	Sandstone, light grey, fine-medium grey, slightly angular, well sorted, moderately hard to friable, generally good permeability, quartz pressure solution slight, clay matrix plugging porosity.
6900	3/4"	Shale, dark grey, very carbonaceous, micro micaceous.
7255	3/4"	Shale, light grey, very fine sandy, silty, sparsely micro micaceous.
7450	1¼"	Shale, light grey, silty, sparsely carbonaceous and micro micaceous.
7745	2"	Shale, dark grey - black, very carbonaceous, grading to coal, irregular splint fracture.
7800 No show		Sandstone, as for 8160, quartz pressure solution slight.
8000	1"	Shale, dark grey, carbonaceous, silty, with fine lenses of very angular, glauconitic, silty, very fine grained sand.
8142	½"	Shale, dark grey, silty, carbonaceous, micro micaceous.
8160 Very Strong HC odour	¼"	Sandstone, grey white, fine to medium grained, well sorted, subangular to subrounded, abundant white clay matrix, slightly carbonaceous, porosity fair, permeability poor, moderately hard. Moderate quartz pressure solution with clay plugging.
8370 No show	3/4"	Sandstone, grey-white, silty, fine to very fine grained sandstone, subangular to subrounded, well sorted, moderately abundant white clay matrix, porosity fair, permeability poor. Quartz pressure solution slight.
8510	½"	Shale, dark grey, carbonaceous, sparsely micro micaceous.
8610 No show	½"	Sandstone, grey white, medium to coarse grained, subangular to rounded, well sorted, trace white clay matrix. Friable.

..../3

Sidewall Core Description

TORUM-1

DEPTH	RECOVERY	DESCRIPTION
8610 Cont'd.		Porosity good, permeability fair. Quartz pressure solution slight to moderate. Tends to break as welded clusters of grains.
8725	½"	Shale, dark grey, carbonaceous, sparsely micro micaceous, shale.
8790 ?	No recovery.	
8850	¼"	Shale, dark grey-dark grey brown, silty, sparsely carbonaceous, micro micaceous.
8892 No show	1"	Sandstone, grey white, silty, very fine to fine grained, subangular to subrounded, well sorted, with laminae of carbonaceous shale, moderate abundant white clay matrix. Porosity fair, permeability poor. Quartz pressure solution moderate with remaining intergranular pore space occupied by clay.
8920	½"	Shale, dark grey, carbonaceous, sparsely micro micaceous.
9210	¼"	Shale, dark grey, in part very silty, carbonaceous, micro micaceous.
9296	¼"	Sandstone, very friable, medium to coarse grained sandstone, subangular to subrounded, well sorted, poor recovery with no apparent quartz pressure solution. Slight HC odour no fluorescence.
9360	1"	Shale, light to medium grey, very silty and very fine, sandy, sparsely micro micaceous, and carbonaceous.
9490	1"	Sandstone, medium to coarse grained, subangular to rounded, angular, fairly well sorted, moderately hard, moderate abundant quartz pressure solution with remaining intergranular pore space occupied by clay. Slight HC odour, no fluorescence.
9570	¼"	Shale, dark grey, silty, sparsely micro micaceous, carbonaceous.
9660	¼"	Shale, dark grey, sparsely silty, micro micaceous, carbonaceous.
9790	1"	Siltstone, medium grey, very fine, sandy, very argillaceous, sparsely micro micaceous, carbonaceous.
9875	3/4"	Sandstone, grey-white, fine to medium grained, subangular to subrounded, fairly well sorted, very argillaceous, with abundant white clay matrix, carbonaceous, moderately hard. Porosity fair, permeability poor to fair. Slight to moderate quartz pressure solution due probably to high clay matrix. Slight HC odour, no fluorescence.
9925	3/4"	Shale, medium grey, medium grey brown, silty, sparsely carbonaceous.
RUN 1 (Misrun)		
9630		Sandstone, grey white, argillaceous, fine to medium grained, subangular to subrounded, fairly well sorted, with trace scattered subrounded coarse grained quartz sand, moderately hard. Porosity fair, permeability good. Moderate quartz press solution with intergranular pore space filled with clay.

PALYNOLOGY AND PALAEONTOLOGY

TURRUM-1.

REVIEW OF PALYNOLOGY OF BARRACOUTA AND MARLIN FIELDS AND TURRUM -1

by

P.R. Evans

Palyn. Rept. 1970/35

September, 1970.

INTRODUCTION

The following report is the last of a series in which checks have been made of the palynological sequence in groups of wells across the northern region of the off-shore Gippsland Basin. Previous reports covered Kingfish (1970/12), Tuna (1970/29), Flounder (1970/31), Snapper (1970/33) and the section Flounder-Batfish-Tuna (1970/32).

Samples from the Barracouta and Marlin fields were among the first to be studied from the Gippsland Basin (EPR 69-ES16). Further information about the Barracouta field was obtained from the -A3 development well (1969/5) and the -3 wildcat (1969/12). No useful material has been obtained from development wells at Marlin. However, data from the nearby Turrum -1 well (1969/14) are relevant to interpreting the Marlin field. Previously unreported data from Marlin -2, 5121-5158 feet are also available. Studies of dinoflagellates from Turrum -1 are summarized in palyn. rept. 1970/22.

COMMENT

Subdivisions of wells at Barracouta and Marlin from which spores and pollen have been obtained are illustrated in the accompanying figures.

A. Barracouta Field

Barracouta -1, 8,700 feet yielded an abundant microflora on which the concept of the T. lilliei assemblage was initially based (see comment below on the T. lilliei Zone at Marlin). A large gap between this horizon and the overlying samples precluded accurate determination of the top of the T. lilliei Zone and a "Transition Zone" was proposed, in this instance to include samples at 8679 and 8695 feet.

The better data from the -A3 well showed the T. lilliei Zone in that well extends at least up to a depth of 8080 feet. Lack of adequate samples again prevented acceptably adequate choice of boundary for the top of the zone, but the data are sufficient to indicate that the "Transition Zone" of Barracouta -1 is part of the lilliei zone. A similar sample gap in the -3 well also

prevents accurate choice of zone boundary. However, a combination of data from the -3 and -A3 wells suggests that the boundary runs through the latter in the vicinity of depths 7800-7900 feet.

The top of the L. balmei Zone overlies Barracouta -1, 5663 feet and -3, 5714 feet and underlies -1, 5263 feet and -A3, 5388 feet. It thus runs close to 5500 feet in the -A3 well.

The base of the P. asperopolus Subzone is identified with fair confidence in the -3 well at close to 4491 feet. The M. diversus Zone is thus about 1,100 feet thick at Barracouta.

On the basis of first appearance of e.g. S. cainczoicus, M. parvus, T. adelaidensis and a dominance of P. grandis/orantus over P. dilwynenis, an upper division of the diversus Zone is separated from a lower. The upper division is about 320 feet thick in the -3 well, and correlates into a major portion of the Flounder Formation at Flounder. However, no dinoflagellates were recognized in this interval (see Snapper and Marlin at the diversus/asperopolus boundary).

The N. goniatus Zone is about 900 feet thick in the -3 well, consisting mostly of the N. asperus subzone. A thicker development was probably encountered in the -A3 well.

Very rare specimens of the dinoflagellate Deflandrea extensa were present in -3 well, 3604-3608 feet (LES ident.).

B. Marlin Field & Turrum

Turrum -1 is included with the Marlin wells because of its proximity to the Marlin field and because it has supplied better data relevant to the top of the lilliei zone.

The T. lilliei zone is identified at least as high as 9660 feet in Turrum -1. The overlying samples at 9360 and 9210 feet are of uncertain position, although some data favour their inclusion in the L. balmei Zone so that the top of the lilliei Zone appears to lie between 9360 and 9660 feet at Turrum.

Previous records (EPR 69-ES 16) showed the lilliei Zone in Marlin -2 at 9877 feet. New data from this horizon indicate it should be placed in basal L. balmei Zone and that none of the Marlin wells encountered the Upper Cretaceous. The course of the approximate top of the lilliei zone below Marlin -1 demonstrated on the chart parallels log correlation markers within the balmei zone.

No useful estimate of the top of the L. balmei Zone is possible from Marlin on account of very large sample gaps in Marlin -1 and -2. The top of the zone depicted on the chart is based on the assumption that little variation has taken place in the thickness of the M. diversus Zone between Snapper and Marlin (vide constant thickness of this zone across the fault between Snapper -1 and -3 compared to variations in the balmei zone). This choice of boundary may be somewhat high because of the presence of "upper" L. balmei zone assemblages in the highest fossiliferous examples of the zone in Marlin -1 and -2, which suggest proximity to the base of the diversus Zone.

If these choices of upper and lower boundaries of the balmei Zone are acceptable, the zone is of the order of 4,200 feet thick at Marlin. About 1000 feet of this sequence has been eroded by the Marlin channel at Turrum.

Only the upper division of the M. diversus Zone appears to have been sampled at Marlin, but there is sufficient section in which the lower diversus Zone could be present (cf. Snapper and Barracouta).

The P. asperopolus Zone is well represented by samples in Marlin -1, -2 and -3. Cores at 5127 and 5146 feet were previously assigned to the upper M. diversus Zone (EPR 69-ES16), but additional observations favour allocation of these horizons to the basal P. asperopolus Subzone.

Core from the P. asperopolus Zone in Marlin -2, 5121, 5128 feet was notable for its dinoflagellate content. Taylor had previously reported benthomic foraminifera from this level. The occurrence of these fossils is to be linked with the dinoflagellates of the u. M. diversus/P. asperopolus Zone at Snapper -1 and -3 and within the Flounder Formation at Tuna and Flounder.

Adequate examples of the succeeding N. asperus Subzone are known in Marlin -1 and -2. However, the zone is also present at the base of the channel at Turrum, 2000 feet deeper than the zone at Marlin -1. At Turrum the asperus Zone includes the D. extensa and O. dictyoplokus dinoflagellate zones (1970/22). Neither of these zones have been identified at Marlin. However, the D. extensa Zone is present in Snapper -2 at 4232 feet, i.e. 2300 feet above its occurrence at Turrum, and within 100 feet of horizons referred to the P. asperopolus Subzone (1970/33). The possibility that some of the N. asperus Subzone at Marlin may represent the D. extensa dinoflagellate Zone should be born in mind.

Similarly the overlying O. dictyoplokus dinoflagellate Zone at Turrum is present at Snapper, towards the top of the N. asperus Subzone. It also may be present, but undetected at Marlin.

WELL NAME: TURRUM #1

DEPTH (FT)	SAMPLE TYPE	PRESER-VATION	DIVERSITY	SPORE/POLLEN ZONE	DINOFLAGELLATE ZONE	CONFIDENCE LEVEL	ENVIRONMENT
6660	SWC 31	Fair	Low	?N. asperus	?D. heterophylycta	3	Marginal marine
7083	Core 2	Poor	Low	L. balmei	-	4	Non-marine
7450	SWC 23	Poor	Low	L. balmei	-	4	Non-marine
8000	SWC 20	Poor	Low	?L. balmei	-	4	Non-marine
8510	SWC 16	Poor	Low	T. longus	-	4	Non-marine
9210	SWC 9	Fair	Low	T. longus	-	4	Non-marine
10001	Core 6	V. Poor	V. Low	?T. lilliei	-	3	Non-marine

OIL and GAS DIVISION - 3 FEB 1983

BY W. K. HARRIS

FOR AQUITAINE, PHILLIPS, SHELL.

PALYNOLOGICAL DATA.

PAGE 1 OF 1.

BASIN GIPPSLAND DATE 22/1/73

WELL NAME TURRUM - 1 ELEVATION + 99 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
OLIG. MIOC.	T. bellus										
	P. tuberculatus										
EOCENE	U. N. asperus										
	L. N. asperus	6409	0				6680	0			
	P. asperopolus										
	U. M. diversus										
	L. M. diversus										
PALEO.	L. balmei	6900	0				8000	1			
	T. longus	8142	1				9360	1			
LATE CRETACEOUS	T. lilliei	9660	1				10,001	1			
	N. senectus										
	C. trip./T.pach.										
	C. distocarin.										
	T. pannosus										
EARLY CRETACEOUS	C. paradoxa										
	C. striatus										
	U. C. hughesii										
	L. C. hughesii										
	C. stylosus										
Pre-Cretaceous											

COMMENTS: Only the 'Lower' subdivision of the L. balmei Zone is represented between 6900 - 8000 feet.

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. Stover & A.D. Partridge DATE Dec. 1971.

DATA REVISED BY: A.D. Partridge DATE January 1973

FORM [illegible] R200 4/71

BASIN GIPPSLAND DATE

WELL NAME TURRUM - 1 ELEVATION +99 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
MIO.	P. tuberculatus										
	U. N. asperus										
EOCENE	M. N. asperus	6409	1				6409	1			
	L. N. asperus	6415	1				6680	1			
	P. asperopolus										
	U. M. diversus										
	M. M. diversus										
	L. M. diversus										
PALEOCENE	U. L. balmei										
	L. L. balmei	6900	1				8000	1			
	T. longus	8142	0				9360	1			
LATE CRETACEOUS	T. lilliei	9660	1				10,001	1			
	N. senectus										
	C. trip./T.pach.										
	C. distocarin.										
	T. pannosus										
EARLY CRETACEOUS											
PRE-CRETACEOUS											

COMMENTS: DINOFLAGELLATE ZONES:
Deflandrea heterophylcta Zone 6415 (1) – 6680(1)
Eisenackia crassitabulata Zone 6900 (2) – 7116 (1)
Deflandrea druggii Zone 8142 (1)

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: L.E.S./A.D.P.; A.D.P. DATE Dec. 1971; Jan. 1973.

DATA REVISED BY: A.D.P. DATE Jan. 1975

FORM No R 315 12/72

BASIN GIPPSLAND BASIN BY David TAYLOR

WELL NAME TORRUM-1 DATE 22 April 1971 ELEV. +99'

Foram Zonules

		Highest Data	Quality	2 Way Time	Lowest Data	Quality	2 Way Time
MIOCENE	A						
	Alternate						
	B				1200	3	
	Alternate						
	C	1240	3		1800	3	
	Alternate						
	D_1	1840	3		4500	3	
	Alternate						
	D_2	4600	3		4900	3	
	Alternate						
	E	5000	3		5220	1	
	Alternate						
	F	5300	1		5560	1	
	Alternate						
	G	5650	1		5850	1	
	Alternate						
	H_1	5940	3		6000	3	
	Alternate						
	H_2	6050	1		6200	3	
	Alternate						
OLIGOCENE	I_1	6240	3		6390	1	
	Alternate	6300	1				
	I_2						
	Alternate						
	J_1						
	Alternate						
	J_2						
	Alternate						
EOC.	K	6409	2				
	Alternate						
	Pre K				6660	2	

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 _____

QUANTITATIVE LOG ANALYSIS

TURRUM-1

QUANTITATIVE LOG ANALYSIS

Interval: 2000-3045m KB
Analyst : L.J. Finlayson
Date : September, 1984

TURRUM #1 - QUANTITATIVE LOG ANALYSIS

Turrum #1 wireline logs have been analysed for effective porosity and water saturation over the interval 1925-3045m MDKB. Analysis was carried out using hydrocarbon and shale corrected porosities and inputting these into a Dual Water Saturation relationship.

Logs Used

ILD, RHOB(FDC), GR

Log Quality

All logs appear to be of reasonable quality. Logs were digitized and then converted to metres. All calculations and results are therefore metres KB. Rt was derived from ILD. No environmental corrections were made to the logs. The density log is 'on depth' with the resistivity log.

Analysis Parameters

Apparent shale density was read directly from the FDC log. Dry shale density was inferred from an LDT-CNL log run in nearby Turrum #2. These two logs enable us to calculate a dry shale density from a crossplot. RSH was read directly from the Rt log. Apparent formation water salinity was derived from and Rwa calculation in clean water sands. It is stressed that these are apparent formation water salinities based on assumed values of a, m and N. Different apparent salinities may be calculated if these assumed values are changed, however we have no special core analysis to suggest they should be.

A summary of analysis parameters is as follows:

a	1.00
m	2.00
n	2.00
Rmf @ BHT (104^{o})	0.58 ohm.m
Apparent Grain Density (RHOG)	2.65 gm/cc
Dry Shale Density (RHOBSH DRY)	3.00 gm/cc
Mud Filtrate Density (RHOF)	1.00 gm/cc
"Z"	0.4

Depth Interval (m KB)	GR min (API units)	GR max (API units)	RHOBSH (gm/cc)	RSH (ohm.m)
2000 - 2325	40	100	2.50	8
2325 - 3045	50	100	2.55	15

Shale Volume

Volume of shale was calculated using the following algorithm:

$$VSH = \frac{GR - GRmin}{GRmax - GRmin} \qquad - 1$$

Porosity

Total porosity (PHIT) was calculated from the raw density log using the following algorithms:

$$RHOBC = \frac{RHOB - VSH * RHOBSH}{1 - VSH} \qquad - 2$$

$$PHIA = \frac{RHOG - RHOBC}{RHOG - RHOF} \quad -3$$

$$PHIE = PHIA\ (1 - VSH) \quad -4$$

$$PHIT = PHIE + VSH * PHISH \quad -5$$

where $$PHISH = \frac{RHOBSH_{DRY} - RHOBSH}{RHOBSH_{DRY} - RHOF} \quad -6$$

Free Water Salinities

Apparent free water salinities were calculated using the following relationships:

$$Rw = \frac{Rt * PHIT^m}{a} \quad -7$$

$$Salinity\ (ppm) = \left(\frac{300{,}000}{Rw\ (Ti + 7) - 1}\right)^{1.05} \quad -8$$

where Ti = formation temperature in ^{o}F.

Listed below are the selected salinity values:

Depth Interval (m)	Salinity (ppm NaCleq)
2000 - 2440	40,000
2440 - 2760	30,000
2760 - 3045	20,000

Bound Water Resistivities (Rwb) and Saturation of Bound Water (Swb)

Rwb and Swb were calculated using the following relationships:

$$Rwb = \frac{RSH * PHISH^m}{a} \quad -9$$

$$Swb = \frac{VSH * PHISH}{PHIT} \quad -10$$

Water Saturations

Water saturations were determined from the Dual Water model using the following relationships:

$$\frac{1}{Rt} = SwT^n * \left(\frac{PHIT^m}{aRw}\right) + SwT^{(n-1)} \left[\frac{Swb * PHIT^m}{a}\left(\frac{1}{Rwb} - \frac{1}{Rw}\right)\right] \quad -11$$

Since no Rxo log was available, SxoT was calculated using the following relationship:

$$SxoT = SwT^{.4} \quad -12$$

where SwT = total saturation in the virgin formation
SxoT = total saturation in the invaded zone
Rmf = resistivity of mud filtrate
n = saturation exponent

Effective water saturation was calculated using the following relationship:

$$Swe = 1 - \frac{PHIT}{PHIE}\ (1 - SwT) \quad -13$$

If VSH was greater than 50% and PHIE less than 10%, then Swe was set to 100%.

Coals and carbonaceous states were edited for an output of VSH = 0, PHIE = 0 and Swe = 1.

Comments

1. All zones above 2089.5m are interpreted as being water wet.

2. Several hydrocarbon and water zones are interpreted below 2089.5 metres. They are as follows:

2089.75 - 2186.0m	12.25m net gas sand
2194.25 - 2198.0m	water bearing
2204.75 - 2307.74m	15.0m net gas sand
2336.75 - 2341.0m	water bearing
2370.0 - 2381.25m	water bearing
2395.75 - 2419.75m	11.5m net gas sand, high Sw
2421.5 to T.D.	water bearing.

3. Water saturations should be treated with caution as Rt is derived from an Induction Log which is notoriously unreliable in high resistivity zones (oil and in particular gas).

4. An FIT at 2073.1m recovered 3500cc mud.

5. An FIT at 2183.2m recovered 97.8 cfg, 500cc condensate and 3000 cc mud.

6. An FIT at 2304.3m recovered 10.9 cfg and 18,000cc mud.

7. Attached are a summary of results, a listing and a porosity/saturation depth plot.

TURRUM #1

SUMMARY OF RESULTS

Interval evaluated 2000 - 3045m MDKB.

Depth interval (m MDKB)	Gross Thickness	* Net Thickness	* Porosity Average	* Swe Average	Fluid Content
2023.00 - 2024.00	1.00	1.00	0.196±0.013	0.940	Water
2048.25 - 2054.25	6.00	6.00	0.202±0.027	0.984	Water
2089.75 - 2091.50**	1.75	1.75	0.159±0.021	0.606	Gas
2149.75 - 2154.50	4.25	4.75	0.193±0.041	0.228	Gas
2180.00 - 2186.00	5.50	6.00	0.242±0.040	0.266	Gas
2194.25 - 2198.00	3.75	3.75	0.232±0.028	0.957	Water
2204.75 - 2206.75	2.00	2.00	0.183±0.031	0.590	Gas?
2285.25 - 2288.25	3.00	3.00	0.144±0.021	0.439	Gas
2297.75 - 2307.75	10.00	10.00	0.169±0.032	0.441	Gas
2336.75 - 2341.00	4.25	4.25	0.236±0.024	1.000	Water
2370.00 - 2381.25	10.25	11.25	0.171±0.031	1.000	Water
2395.75 - 2399.50**	3.50	3.75	0.153±0.032	0.788	Gas-High Sw
2407.75 - 2419.75**	8.00	12.00	0.174±0.032	0.835	Gas-High Sw
2421.50 - 2433.75	10.00	12.25	0.185±0.035	0.939	Water
2442.75 - 2454.75	11.75	12.00	0.187±0.029	0.994	Water
2542.25 - 2544.75	2.50	2.50	0.150±0.021	0.867	Water
2620.75 - 2629.00	8.00	8.25	0.171±0.032	0.924	Water
2670.75 - 2673.00	2.25	2.25	0.128±0.014	0.800	Water
2684.25 - 2693.00	8.75	8.75	0.166±0.027	0.933	Water
2832.50 - 2835.80	3.25	3.25	0.149±0.019	1.000	Water
2890.00 - 2894.00	3.75	4.00	0.149±0.019	0.973	Water
2965.75 - 2968.50	2.75	2.75	0.138±0.017	0.950	Water
2966.25 - 2998.75	2.25	2.50	0.133±0.014	0.972	Water
3005.50 - 3016.50	8.75	11.00	0.122±0.014	0.978	Water

Very thin porous zones (less than 0.5m) that are interpreted as being hydrocarbon bearing occur at 2158m and 2166m.

* Net Thickness, Porosity Average and Swe Average refer to zones with calculated porosities in excess of 10%.

** These zones were not previously recognised as being hydrocarbon bearing.

ESSO AUSTRALIA LTD.

INCORPORATED IN NEW SOUTH WALES
G.P.O. BOX 4047 SYDNEY 2001 ★ TELEPHONE 236 2911 (AREA CODE 02)
ESSO HOUSE, 127 KENT STREET, SYDNEY, NEW SOUTH WALES
TELEGRAMS "ESSO" ★ CABLES "ESSOEAST"
TELEX: AA 120549 FAX: GP111 02 236 5085

SYDNEY 10th March, 1988

YOUR REF:

OUR REF: 6650/10 RMR/js

SUBJECT Marlin Preliminary Depth Intervals

Department of Industry,
Technology and Resources,
P.O. Box 173,
EAST MELBOURNE VIC. 3002.

15 MAR 1988

PETROLEUM DIVISION

Attention: Brij Agrawal

TURRUM – 1

Dear Sir,

Please find enclosed preliminary depth intervals of hydrocarbon and water sands for all, but six (6), of the Marlin exploration and production wells. The results are being reviewed and any corrections passed on to you.

The intervals for wells A5 and A16 should be used with caution as they are being re-surveyed to check for depth discrepancies that have arisen.

The results were compiled for porosity, water saturation and fluid content using the log suites. Wells; F18, A11, A12, A13, A15 and A22 are not included because of their limited log suites. The depth intervals for these wells are being prepared and will follow.

Yours faithfully,

S.A. REECKMANN
PRODUCTION GEOLOGY MANAGER

Encl:

3480F/55

TABLE 25.0

TURRUM-1

SUMMARY OF RESULTS

Interval Evaluated: 2000 - 3045 (m MDKB)

Depth Interval (m MDKB) KB=30.25m (99')	(m MDSS)	Sand[1] Unit	Gross Thickness (m)	Net** Thickness (m)	Porosity** Average	Swe** Average	Fluid Content
2023.00-2024.00	1992.75-1993.75		1.00	1.00	0.196±0.013	1.00	Water
2048.25-2054.25	2018.00-2024.00		6.00	6.00	0.202±0.027	1.00	Water
2089.75-2091.50	2059.50-2061.25		1.75	1.75	0.159±0.021	0.17+0.05	Gas*
2149.75-2154.50	2119.50-2124.25		4.75	4.25	0.193±0.041	0.13.0.04	Gas
2180.00-2186.00	2149.75-2155.75		6.00	5.50	0.242±0.040	0.07+0.02	Gas
2194.25-2198.00	2164.00-2167.75		3.75	3.75	0.232±0.028	1.00	Water
2204.75-2206.75	2174.50-2176.50		2.00	2.00	0.183±0.031	1.00	Water
2285.25-2288.25	2255.00-2258.00		3.00	3.00	0.144±0.021	0.20+0.05	Gas
2297.75-2307.75	2267.50-2277.50		10.00	10.00	0.169±0.032	0.16+0.04	Gas
2336.75-2341.00	2306.50-2310.75		4.25	4.25	0.236±0.024	1.00	Water
2370.00-2381.25	2339.75-2351.00		11.25	10.25	0.171±0.031	1.00	Water
2395.75-2399.50	2365.50-2369.25		3.75	3.75	0.153±0.032	1.00	Water
2407.75-2419.75	2377.50-2389.50		12.00	8.00	0.174±0.032	1.00	Water
2421.50-2433.75	2391.25-2403.50		12.25	10.00	0.185±0.035	1.00	Water
2442.75-2454.75	2412.50-2424.50		11.75	12.00	0.187±0.029	1.00	Water
2542.25-2544.75	2512.00-2514.50		2.50	2.50	0.150±0.021	1.00	Water
2620.75-2629.00	2590.50-2598.75		8.25	8.00	0.171±0.032	1.00	Water
2670.75-2673.00	2640.50-2642.75		2.25	2.25	0.128±0.014	1.00	Water
2684.25-2693.00	2654.00-2662.75		8.75	8.75	0.166±0.027	1.00	Water

Depth Interval (m MDKB) KB=9.5m (31')	(m MDSS)	Sand[1] Unit	Gross Thickness (m)	Net** Thickness (m)	Porosity** Average	Swe** Average	Fluid Content
2832.50-2835.80	2802.25-2805.55		3.25	3.25	0.149±0.019	1.00	Water
2890.00-2894.00	2859.75-2863.75		4.00	3.75	0.149±0.019	1.00	Water
2965.75-2968.50	2933.50-2938.25		2.75	2.75	0.138±0.017	1.00	Water
2996.25-2998.75	2966.00-2968.50		2.50	2.25	0.133±0.014	1.00	Water
3005.50-3016.50	2975.25-2986.25		11.00	8.75	0.122±0.014	1.00	Water

Very thin porous zones (less than 0.5m) that are interpreted as being hydrocarbon bearing occur at 2158m and 2166m.

* These zones were not previously recognised as being hydrocarbon bearing.

** Net Thickness, Porosity Average and Swe Average refer to zones with calculated porosities in excess of 10%.

(1) Sand Unit nomenclature as per Marlin Field - Post Development Report - 1986 B. Crowther, Esso Australia Ltd.

PETROGRAPHY

Petrography: TERNARY LOG

Well: Turrum 1 Sample No.: 75728 Depth: 3073'

HANDSPECIMEN DESCRIPTION: fine - medium grained sandstone

THINSECTION DESCRIPTION:

Detrital Mineralogy:

Muscovite	5 %	Ilmenite	< 5 %
Monocrystalline quartz	40 %	Pyrite	< 5 %
Polycrystalline quartz	10 %	Tourmaline	< 5 %
feldspar	15 %		
Lithics	25 %		

Textural Characteristics:

fine to medium grained sandstone.
Poorly rounded, moderately sorted.
Matrix is present.
Grain-grain contacts · point contacts generally, although some line contacts

Post-depositional Adjustments:

Kaolinite (and illite) replacement
Compaction effects are minor
Primary and secondary porosity are absent.
feldspar grains are overgrown.

Paragenetic Relations:

Difficult to determine since only adjustment is kaolinite replacement, and feldspar is overgrown. It is likely that feldspar overgrowths occur early in the paragenesis.

Key Features:

* Illite and kaolinite replace rock fragments
* No dolomite is present
* No quartz overgrowths present
* feldspar overgrowths.

Petrography:

Well: Turrum 1 Sample No.: 75731 Depth: 6417'

HANDSPECIMEN DESCRIPTION: coarse sandstone, glauconite is evident.

THINSECTION DESCRIPTION:

Detrital Mineralogy:

Monocrystalline Quartz 60%
Polycrystalline quartz 10%
Feldspar 15%
Rock fragments 15%

Textural Characteristics:

Medium to coarse grained sandstone
Apparent open framework packing
Poor sorting
Grains are angular (glauconite is spherical)

Post-depositional Adjustments:

Glauconite show evidence for reworking
Matrix is comprised of ankerite
Compaction has not been severe.
Porosity is absent

Paragenetic Relations:

Because glauconite shows evidence for reworking to some degree ⇒ early in paragenesis.
Secondary matrix is abundant and because of open framework appearance is replacing framework and matrix.

Key Features: * Extensive ankorite replacement has excluded porosity.

Petrography:

Well: Turrum 1 Sample No.: 75733 Depth: 7059'

HANDSPECIMEN DESCRIPTION: Medium grained sandstone.

THINSECTION DESCRIPTION:

Detrital Mineralogy:

Monocrystalline quartz	35%	feldspar	15%
Polycrystalline quartz	20%	Pyrite	<5%
Lithic fragments	25%		
Muscovite	5%		

Textural Characteristics:

Medium grained sandstone.
Moderate sorting
Poor rounding ie angular grains
Compaction is moderate - concavo-convex boundaries

Post-depositional Adjustments:

Kaolinite replacement of metasedimentary fragments.
Siderite replacement of framework + lithics (sedimentary framework)
Minor illite replacement of rock fragments.

Paragenetic Relations:

Siderite replacement occurs prior to kaolinite and illite replacement

Key Features:

* Saccrose siderite textures
* Secondary porosity is evident and probably produced by dissolution or less extensive siderite development, and incomplete precipitation of kaolinite.

Petrography:

Well: Turrum 1 Sample No.: 75737 Depth: 7104'

HANDSPECIMEN DESCRIPTION: carbonaceous layered sandstone.

THINSECTION DESCRIPTION:

Detrital Mineralogy:

- Monocrystalline quartz 55%
- Polycrystalline quartz 10%
- Feldspar 10%
- Metasediments 20%
- Muscovite <5%

Textural Characteristics:

- Medium grained sandstone with carbonaceous layering
- Moderate sorting
- Grains are angular
- Concave-convex grain relations

Post-depositional Adjustments:

- Quartz cement is present
- Hydrocarbon remnant pore linings
- Kaolinite partially replaces feldspars and metasediments
- Minor illite replaces lithics
- Kaolinite pore filling

Paragenetic Relations:

1. Quartz cement
2. Kaolinite/illite replacement of framework
3. Hydrocarbon migration
4. Occlusion of 2° porosity due to kaolinite ppt^{n}.

Key Features:

Although secondary porosity is evident, some occlusion post-hydrocarbon emplacement has occurred due to kaolinite precipitation in pore space.

Petrography:

Well: Turrum 1 Sample No.: 75740 Depth: 7160'

HANDSPECIMEN DESCRIPTION: Medium to coarse sst.

THINSECTION DESCRIPTION:

Detrital Mineralogy:

Monocrystalline quartz 35%
Polycrystalline quartz 20%
feldspar 20%
Metasediments 25%
Muscovite <5%

Textural Characteristics:

med - coarse grained
Angular grains
moderate sorting
Concavo - convex boundaries

Post-depositional Adjustments:

Dissolution of feldspar grains
Feldspar overgrowths
Kaolinite replacement of feldspar
Kaolinite ppt^{n} in pore space

Paragenetic Relations:

1. feldspar overgrowths.
2. feldspar dissolution
3. Kaolinite replacement of feldspar
4. Kaolinite ppt^{n} in pore space

Key Features:

* 2° ϕ is absent
* feldspar alteration

	TURRUM-2	MARLIN-A6		TURRUM-1			MARLIN-A18	
	75675	75686	75700	75731	75733	75737	75751	75755
Monocrystalline quartz	36.4	33.2	35.2	32.0	38.0	48.7	50.6	48.06
Polycrystalline quartz	16.6	18.0	5.2	5.33	12.6	9.6	10.0	21.2
Feldspar	2.8	2.8	3.0	2.0	2.6	4.7	1.2	0.52
Lithics	2.2	15.6	6.2	1.33	9.2	5.8	2.4	1.04
Carbonate	–	16.8	31.6	0.66	–	–	27.2	13.17
Mica	1.33	1.6	3.4	1.33	1.4	–	–	0.26
ϕ	8.6	1.4	0.8	2.67	12.4	–	8.4	12.14
Undifferent[d] matrix	23.4	8.0	13.4	40.67	20.0	27.33	0.20	0.52
Hydrocarbon	–	0.4	1.2	–	3.4	3.2	–	3.1
Accessories	8.67	0.2	–	14.0	0.4	0.67	–	–

Table 1: Compositions of Latrobe Group Sediments.

PETROGRAPHIC DESCRIPTION OF VOLCANICS FROM 10,023 FEET IN ESSO'S TURRUM I WELL

1. Sample: Representative core taken from Core 6 in Esso's Turrum I well, Gippsland Shelf. Sample depth is 10,023 ft.

2. Hand Specimen Description (Regd. No. 16827)

The rock is hard, crystalline and light grey/medium light grey (N) to greenish grey (5Y). It is seemingly homogeneous but for irregularly shaped 'spots', light greenish grey (5GY) and up to 4 mm across. There are also occasional circular ?amygdules of the same dimensions which are composed of a whitish carbonate mineral.

An acid solubility test revealed that much of the crystalline material of the sample is a carbonate, probably dolomitic. Dye staining confirmed that the carbonate was dolomite. A lighter-coloured sample at 10,022 feet was tested also and contained dolomite, but also some hairline veins filled with ankerite.
The writer believes it is possible that some carbonate found in the Gippsland Shelf volcanics described in earlier reports, and not tested by staining, might also be dolomite or ankerite.

3. Thin Section Description (Slide No. 9712)

3.1 Review

The rock is a basic igneous type and is inequigranular but not appreciably porphyritic, very fine-grained, holocrystalline, and with a pilotaxtic texture. It is the most severely altered of the Gippsland Shelf volcanics examined so far by the writer, and now consists of poorly preserved phenocrysts set in a groundmass dominated by feldspar, carbonate and clay mineral.

A very approximate visual estimation of the relative proportions of the components is as follows:

	%
Altered phenocrysts	7
Feldspar	45
Carbonate/clay mineral(groundmass)	45
Iron Ore	3

3.2 Details

There is evidence of former phenocrysts up to 2.4mm across, and rarely 4mm. In some the acute pyramidal outlines are preserved though generally the phenocrysts are now partially disaggregated and are anhedral. Their original composition was probably olivine but they have been intensely altered to kaolinite and optically continuous carbonate (for composition, refer above under Hand Specimen Description).

In the groundmass the plagioclase feldspar, a sodic andesine, occurs as anhedral to subhedral laths, and less commonly as equant crystals, with a maximum size of approximately 0.6 mm (and average 0.3mm). Though partially replaced by carbonate and clay mineral, the feldspars are relatively fresh.

--/2

PETROGRAPHIC DESCRIPTION OF VOLCANICS etc.

Groundmass carbonate is present in the form of very small anhedral to subhedral interlocking crystals with an overall cloudy grey-brown colouration due to clay mineral dissemination. The latter, which may also be concentrated in irregular patches (e.g. 1 mm across) appears to be Kaolinite. The greenish tinge noted in the hand specimen, but not clearly seen in the thin section, suggests that there is also an element of chlorite in the rock. In fact chlorite was most probably an intermediate stage in the Kaolinite formation.

Iron Ore occurs in the thin section mostly as thin elongate threads up to 0.35 mm long. Especially across the altered phenocrysts, they tend to be aligned and/or parallel. The iron ore is brown black to translucent brown, and pale brown in reflected light, and is believed to be a variety of limonite. Rare fresh crystals of magnetite in the section are an indication of the source of the limonite.

4. Conclusions

4.1 Rock Classification

The rock is severely altered olivine basalt. Because of alteration, all pyroxenes have been replaced and, but for poorly preserved altered phenocrysts, the rock now consists largely of carbonate and clay mineral.

4.2 Stratigraphic Implications

Making allowances for alteration, the sample appears to have the texture and former mineral composition of the 'Older Volcanics' found in other Gippsland Shelf wells and in onshore Gippsland.

Barry Hocking

30th January, 1970

J.B. HOCKING
Geologist,
Sedimentary Basin Studies Section.

PE902855

This is an enclosure indicator page.
The enclosure PE902855 is enclosed within the container PE906478 at this location in this document.

The enclosure PE902855 has the following characteristics:

ITEM_BARCODE	= PE902855
CONTAINER_BARCODE	= PE906478
NAME	= Structure Map
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= SEISMIC
SUBTYPE	= HRZN_CNTR_MAP
DESCRIPTION	= Structure Map Latrobe Delta Topographic Surface (enclosure from Well Summary) for Turrum-1
REMARKS	=
DATE_CREATED	= 30/04/69
DATE_RECEIVED	=
W_NO	= W548
WELL_NAME	= Turrum-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902856

This is an enclosure indicator page.
The enclosure PE902856 is enclosed within the container PE906478 at this location in this document.

The enclosure PE902856 has the following characteristics:

ITEM_BARCODE	= PE902856
CONTAINER_BARCODE	= PE906478
NAME	= Contour Map
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= SEISMIC
SUBTYPE	= HRZN_CNTR_MAP
DESCRIPTION	= Contour Map of Intra Latrobe Turrum Gas Sand Horizon 25' above Gas sand (-6901) ; enclosure from WCR for Turrum-1
REMARKS	=
DATE_CREATED	= 31/10/73
DATE_RECEIVED	=
W_NO	= W548
WELL_NAME	= Turrum-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE603832

This is an enclosure indicator page.
The enclosure PE603832 is enclosed within the container PE906478 at this location in this document.

The enclosure PE603832 has the following characteristics:

ITEM_BARCODE	= PE603832
CONTAINER_BARCODE	= PE906478
NAME	= Well Completion Log
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= WELL
SUBTYPE	= COMPLETION_LOG
DESCRIPTION	= Well Completion Log for Turrum-1
REMARKS	=
DATE_CREATED	= 27/06/69
DATE_RECEIVED	=
W_NO	= W548
WELL_NAME	= TURRUM-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE603833

This is an enclosure indicator page.
The enclosure PE603833 is enclosed within the container PE906478 at this location in this document.

The enclosure PE603833 has the following characteristics:

ITEM_BARCODE	= PE603833
CONTAINER_BARCODE	= PE906478
NAME	= Mud Log
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= WELL
SUBTYPE	= MUD_LOG
DESCRIPTION	= Mud Log for Turrum-1
REMARKS	=
DATE_CREATED	= 20/06/69
DATE_RECEIVED	= 1/07/69
W_NO	= W548
WELL_NAME	= TURRUM-1
CONTRACTOR	= EXPLORATION LOGGING INCORPORATED
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE902857

This is an enclosure indicator page.
The enclosure PE902857 is enclosed within the container PE906478 at this location in this document.

The enclosure PE902857 has the following characteristics:

ITEM_BARCODE	= PE902857
CONTAINER_BARCODE	= PE906478
NAME	= Time Depth Curve
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= WELL
SUBTYPE	= VELOCITY_CHART
DESCRIPTION	= Time Depth Curve Turrum 1
REMARKS	=
DATE_CREATED	= 27/06/69
DATE_RECEIVED	=
W_NO	= W548
WELL_NAME	= Turrum-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601494

This is an enclosure indicator page.
The enclosure PE601494 is enclosed within the container PE906478 at this location in this document.

The enclosure PE601494 has the following characteristics:

ITEM_BARCODE	= PE601494
CONTAINER_BARCODE	= PE906478
NAME	= CPI Quantative Log Analysis
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= CPI Quantative Log Analysis, 1:350, for Turrum-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	= 16/11/84
W_NO	= W548
WELL_NAME	= Turrum-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE601495

This is an enclosure indicator page.
The enclosure PE601495 is enclosed within the container PE906478 at this location in this document.

The enclosure PE601495 has the following characteristics:

ITEM_BARCODE	= PE601495
CONTAINER_BARCODE	= PE906478
NAME	= Quantitative Log Analysis
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Quanitative Log Analysis (Straight Hole Logs and Log Analysis) ,1:500, for Turrum-1
REMARKS	= Marlin/ Turrum Petrophysical Feild Study by ESSO
DATE_CREATED	=
DATE_RECEIVED	= 8/06/88
W_NO	= W548
WELL_NAME	= Turrum-1
CONTRACTOR	= ESSO
CLIENT_OP_CO	= ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE906480

This is an enclosure indicator page.
The enclosure PE906480 is enclosed within the container PE906478 at this location in this document.

The enclosure PE906480 has the following characteristics:

ITEM_BARCODE	= PE906480
CONTAINER_BARCODE	= PE906478
NAME	= Species List, 1 of 4
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Species List, Planktonics, for Turrum-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W548
WELL_NAME	= TURRUM-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE906481

This is an enclosure indicator page.
The enclosure PE906481 is enclosed within the container PE906478 at this location in this document.

The enclosure PE906481 has the following characteristics:

ITEM_BARCODE	= PE906481
CONTAINER_BARCODE	= PE906478
NAME	= Species List, 2 of 4
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Species List, Calc. Benthonics I-III, Turrum-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W548
WELL_NAME	= TURRUM-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE906482

This is an enclosure indicator page.
The enclosure PE906482 is enclosed within the container PE906478 at this location in this document.

The enclosure PE906482 has the following characteristics:

ITEM_BARCODE	= PE906482
CONTAINER_BARCODE	= PE906478
NAME	= Species List, 3 of 4
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Species List, Calc. Benthonics IV-VI, Turrum-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W548
WELL_NAME	= TURRUM-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE906483

This is an enclosure indicator page.
The enclosure PE906483 is enclosed within the container PE906478 at this location in this document.

The enclosure PE906483 has the following characteristics:

ITEM_BARCODE	= PE906483
CONTAINER_BARCODE	= PE906478
NAME	= Species List, 4 of 4
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Species List, Calc. Benthonics VII, Turrum-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W548
WELL_NAME	= TURRUM-1
CONTRACTOR	=
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)

PE906479

This is an enclosure indicator page.
The enclosure PE906479 is enclosed within the container PE906478 at this location in this document.

The enclosure PE906479 has the following characteristics:

ITEM_BARCODE	= PE906479
CONTAINER_BARCODE	= PE906478
NAME	= FIT Data
BASIN	= GIPPSLAND
PERMIT	= VIC/L3
TYPE	= WELL
SUBTYPE	= FIT
DESCRIPTION	= Formation Interval Tester Data for Turrum-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W548
WELL_NAME	= TURRUM-1
CONTRACTOR	= SCHLUMBERGER
CLIENT_OP_CO	= ESSO AUSTRALIA LIMITED

(Inserted by DNRE - Vic Govt Mines Dept)