Department of Primary Industries and Energy
Bureau of Mineral Resources, Geology and Geophysics

Australian Petroleum Accumulations Report 3

Gippsland Basin, Victoria

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Resource Assessment Division

Australian Government Publishing Service Canberra 1987

DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY
Minister: The Hon. John Kerin, MP
Secretary: G.C. Evans

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS
Director: R.W.R. Rutland

Published for the Bureau of Mineral Resources, Geology and Geophysics by the Australian Government Publishing Service

ISSN 0817-9263
ISBN 0 644 0557 X

To permit early publication, this Report has not been formally edited. It was prepared for publication by the Petroleum Branch of the Resource Assessment Division, BMR.

Printed by Graphic Services Pty. Ltd. Northfield South Australia

FOREWORD

This is the third in a series of reports prepared by the Bureau of Mineral Resources, Geology & Geophysics (BMR) to present data on Australian petroleum accumulations. Each report provides information about the characteristics of the petroleum found so far in a particular sedimentary basin, and presents the data together with notes on the geographic and geologic setting, stratigraphy, structure, traps, reservoir and source rocks, reserves and any production developments. The reports are designed to provide a ready reference to those interested in petroleum exploration and development in Australia.

This report summarises the data from the 50 petroleum accumulations found to date in the Gippsland Basin. Other reports published to date cover the Amadeus and Bass Basins. Reports on the Adavale, Bonaparte, Otway, Surat, Bowen, Eromanga and Cooper basins are scheduled for publication within the next two years.

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ABSTRACT

The Gippsland Basin in southeastern Victoria, is Australia's major crude oil and natural gas producing province. To the end of 1986 the basin had supplied 88 per cent of Australia's cumulative crude oil production and 48 per cent of cumulative natural gas production. Crude oil and natural gas were first discovered onshore in 1924, near Lakes Entrance, Victoria. Since then over 125 onshore wells have been drilled, resulting in the discovery of one (1) subeconomic and six (6) uneconomic petroleum accumulations. More than 80 exploration and step-out wells have been drilled offshore, resulting in the discovery of eleven (11) economic, twenty-six (26) subeconomic and six (6) uneconomic petroleum accumulations.

The petroleum in the Gippsland Basin mainly occupies structural and structural/stratigraphic traps within the Oligocene, Eocene, Paleocene and Late Cretaceous marine, marginal marine and continental clastic sequences. The petroleum is believed to be of land-plant origin; crude oil results from thermal breakdown of exinite, and natural gas from thermal cracking of vitrinite and exinite.

The crude oils are generally very light and paraffinic, ranging from 40 to 60^{O}API. Some heavier oils discovered at shallow depths range from 14.6 to 26.5^{O}API and are thought to have been biologically degraded. The condensates range from 48 to 63^{O}API. The natural gases are generally low in condensate content. Some gas reservoirs contain a high proportion of carbon dioxide.

Production of natural gas and oil commenced in 1969 and 1970 respectively. Cumulative production to 31 December 1986 was 344.66 x $10^{6}m^{3}$ of oil, 9.68 x $10^{6}m^{3}$ of condensate, 41.75 x $10^{6}m^{3}$ of LPG and 66.14 x $10^{9}m^{3}$ of sales gas. The oil and gas produced is transported from the twelve offshore production facilities (platforms) by pipeline to gas and crude oil stabilisation plant at Longford, Victoria for processing, and then to storage and distribution centres.

Estimated remaining recoverable petroleum reserves in the Gippsland Basin as at 31 December 1986 are 202.44 x $10^{6}m^{3}$ of oil, 22.44 x $10^{6}m^{3}$ of condensate, 44.89 x $10^{6}m^{3}$ of liquid petroleum gas, and 206.39 x $10^{9}m^{3}$ of sales gas.

INTRODUCTION

This report summarises information on the petroleum accumulations found in the Gippsland Basin up to 30 June 1987 (Fig. 1). It describes the basin setting, structure and traps, reservoir and source rocks, nature of petroleum, and petroleum reserves and developments.

The objectives of the report are:

- to provide an overview of the distribution and character of petroleum accumulations in the Gippsland Basin;
- to provide information likely to assist in exploration for additional reserves, and in
- basic geological, and geochemical research.

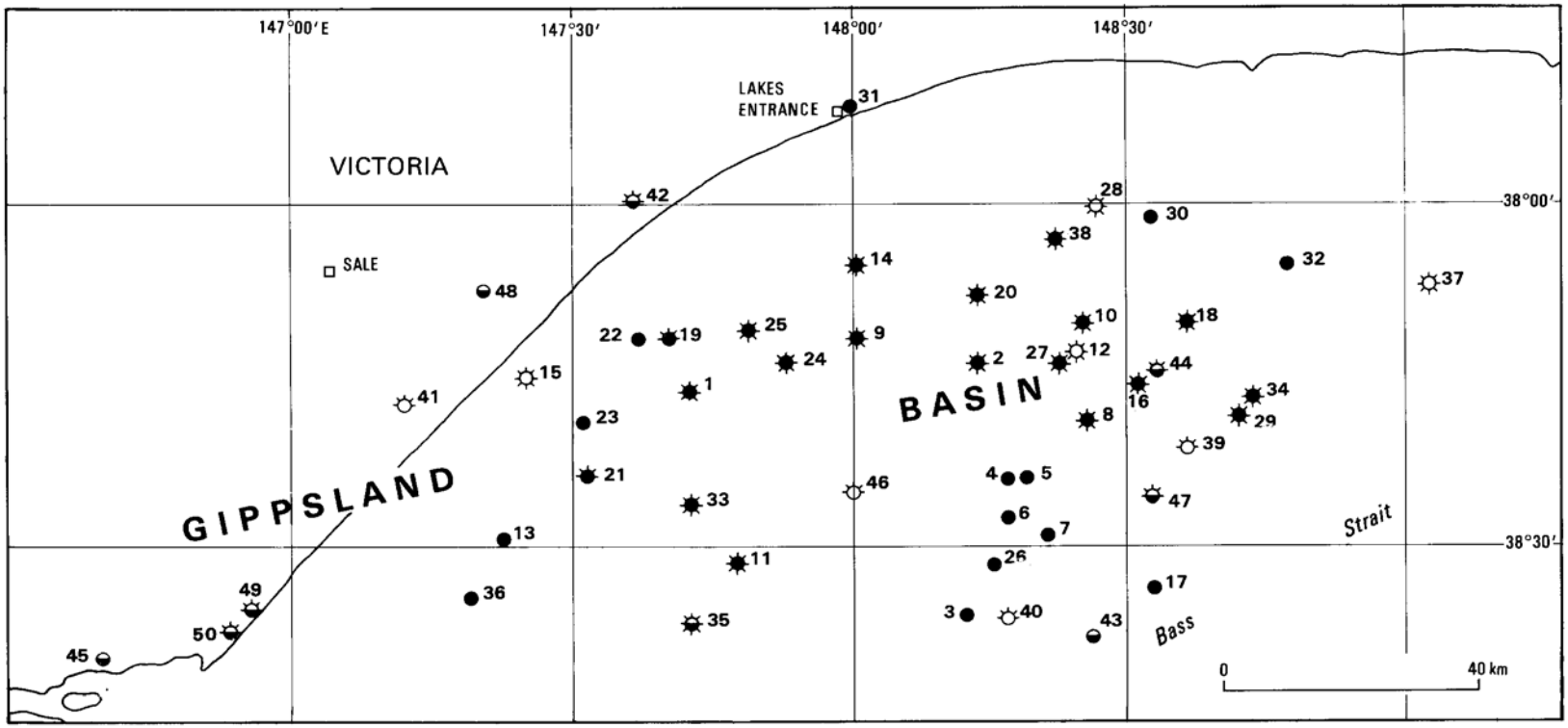
Data presented in this report were drawn from various sources including the results of petroleum exploration and development programs in the Gippsland Basin and assessments of individual accumulations released by operating companies.

BASIN SUMMARY

Setting and stratigraphy

The Gippsland Basin is a Late Mesozoic/Tertiary basin located mainly offshore in the northeastern part of Bass Strait between the mainland of Australia and Tasmania, underlying an area of some 63 000 km^2 to the 200 m bathymetric contour (Fig. 2). The northern boundary is an unconformable contact between basin sediments and rocks of the Tasman Fold Belt, and the northwestern boundary with the Otway Basin is the Selwyn Fault on Mornington Peninsula. The eastern boundary is undefined, but basin sediments extend beyond the shelf break, near the 200 m bathymetric contour. The Gippsland Basin is separated from the Bass Basin to the southwest by a southeast-trending basement ridge, the Bassian Rise.

The stratigraphy of the Gippsland Basin is shown in Figure 3 and in Plates 1 to 7 inclusive, and has been described in varying detail by Boutakoff (1964); James and Evans (1971); Hocking (1972); Threlfall and others (1976); Robertson and others (1978) and Brown (1987). The stratigraphic succession has been interpreted, in plate-tectonic terms, to represent the interplay of Cretaceous and Tertiary events leading to the opening of the Tasman Sea and Southern Ocean, and the development of the southeastern and southern continental margins. Geological cross-sections showing the relationship of main rock units of the Gippsland Basin are given in Figure 4.



NAME	LOCALITY MAP NUMBER	PLATE NUMBER
ANGELFISH	27	5
BALEEN	28	5
BARRACOUTA	1	1
BASKER	29	5
BATFISH	12	3
BIGNOSE	39	6
BREAM	11	3
COBIA	6	1
DOLPHIN	13	3
EMPEROR	14	3
FLATHEAD	30	5
FLOUNDER	8	2
FORTESCUE	4	1
GOLDEN BEACH 1A	15	3
GRUNTER	16	3
HALIBUT	5	1
HAPUKU	17	3

NAME	LOCALITY MAP NUMBER	PLATE NUMBER
HERMES	40	6
KINGFISH	3	1
KIPPER	18	4
LAKES ENTRANCE	31	5
LEATHERJACKET	32	5
LUDERICK	33	5
MACKEREL	7	1
MANTA	34	5
MARLIN	2	1
NORTH SEASPRAY	41	6
OMEO	35	5
PELICAN POINT	42	6
PERCH	36	6
SEAHORSE	19	4
SELENE	43	7
SNAPPER	9	2
SOLE	37	6

NAME	LOCALITY MAP NUMBER	PLATE NUMBER
SPERM WHALE	24	4
STONEFISH	44	7
SUNDAY ISLAND	45	7
SUNFISH	20	4
TARWHINE	21	4
TUNA	10	2
VEILFIN	46	7
VOLADOR	47	7
WELLINGTON PARK	48	7
WEST SEAHORSE	22	4
WHIPTAIL	23	4
WHITING	38	6
WIRRAH	25	4
WOODSIDE 1	49	7
WOODSIDE 2	50	7
YELLOWTAIL	26	5

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Fig. 1 Index to petroleum accumulations, Gippsland Basin

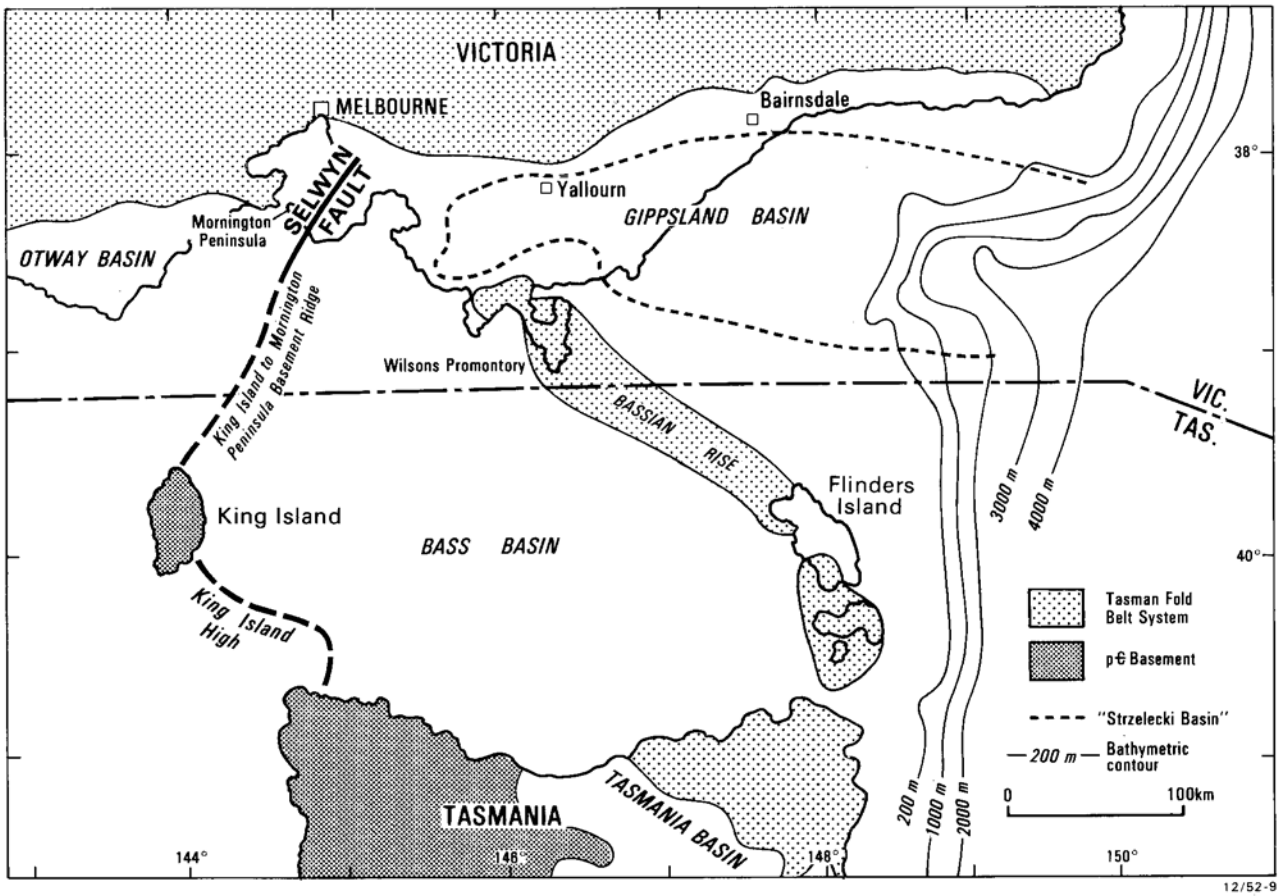
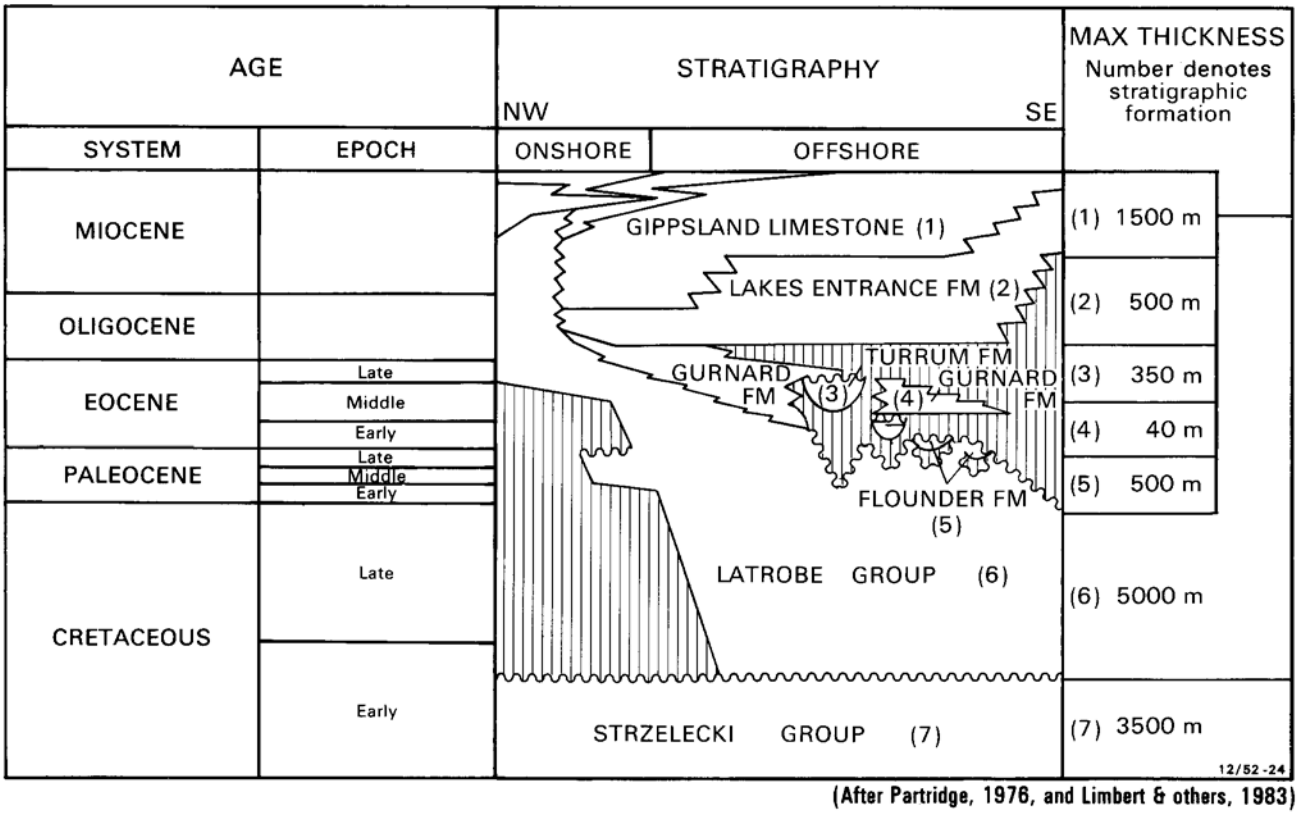


Fig. 1. Gippsland Basin setting

(After Robertson and others, 1978)



(After Partridge, 1976, and Limbert & others, 1983)

Fig. 2. Chronostratigraphic chart for the Gippsland Basin

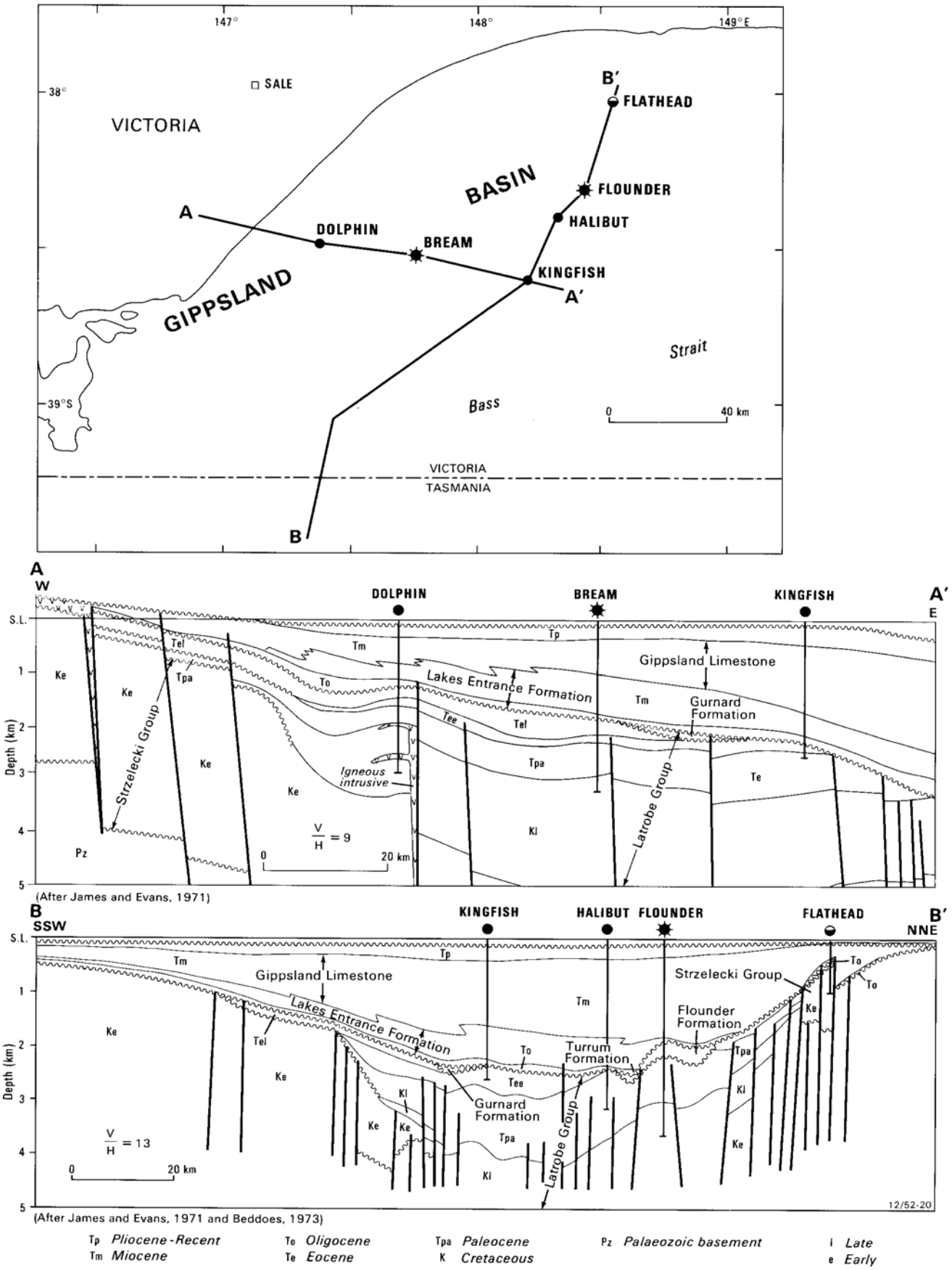


Fig. 4 Stratigraphic and structural relationship of main rock units, Gippsland Basin

The Early Cretaceous (? and Late Jurassic) Strzelecki Group occurs in a central north-west trending graben. Where intersected, near the margins of the graben, the sediments are continental, and the relationship with the overlying sequence, unconformable. Late Cretaceous graben-fill continental sediments in the lower part of the overlying Latrobe Group are overlain by a Late Cretaceous to Eocene sequence deposited during the northwesterly marine transgression of the basin which followed the onset of continental break-up. The latter sequence comprises fluvio-deltaic sediments, with marginal marine deposits preserved along the migrating shoreline. A widespread diachronous unconformity at the top of the sequence has been attributed by Partridge, (1976) to the non-preservation of sediments seaward of the marginal marine environment. The Tuna-Flounder and Marlin sub-marine channel systems, dissect the top of the Latrobe Group and reflect erosional episodes associated with structural movements in the Early and Late Eocene respectively.

The Oligocene to Recent section is a southeasterly prograding continental shelf sequence which exhibits a gradual change in the Miocene, from shale and marl of the Lakes Entrance Formation to marl and limestone comprising the Gippsland Limestone. Onshore continental deposition was continuous in the Latrobe Valley region and in southeastern Gippsland continental deposition returned following a marine regression in the Pliocene.

Petroleum accumulations

The offshore Gippsland Basin is Australia's major crude oil and natural gas producing province. Oil and gas were first discovered in 1924 by Lake Bunga No. 1 (Fig. 5) a water well near Lakes Entrance, Victoria (Robertson and others, 1978). Since then over 125 onshore wells have been drilled resulting in discovery of 1 subeconomic and 5 uneconomic accumulations. Over 80 exploration and step-out wells have been drilled offshore resulting in the discovery of 11 economic; 26 subeconomic and 6 uneconomic accumulations. The definitions of economic status of all discoveries are given in the Glossary (Page 252).

Economic accumulations

- Barracouta, oil and gas
- Marlin, oil and gas
- Kingfish, oil
- Fortescue, oil
- Halibut, oil
- Cobia, oil
- Mackerel, oil
- Flounder, oil and gas
- Snapper, oil and gas
- Tuna, oil and gas
- Bream, oil and gas

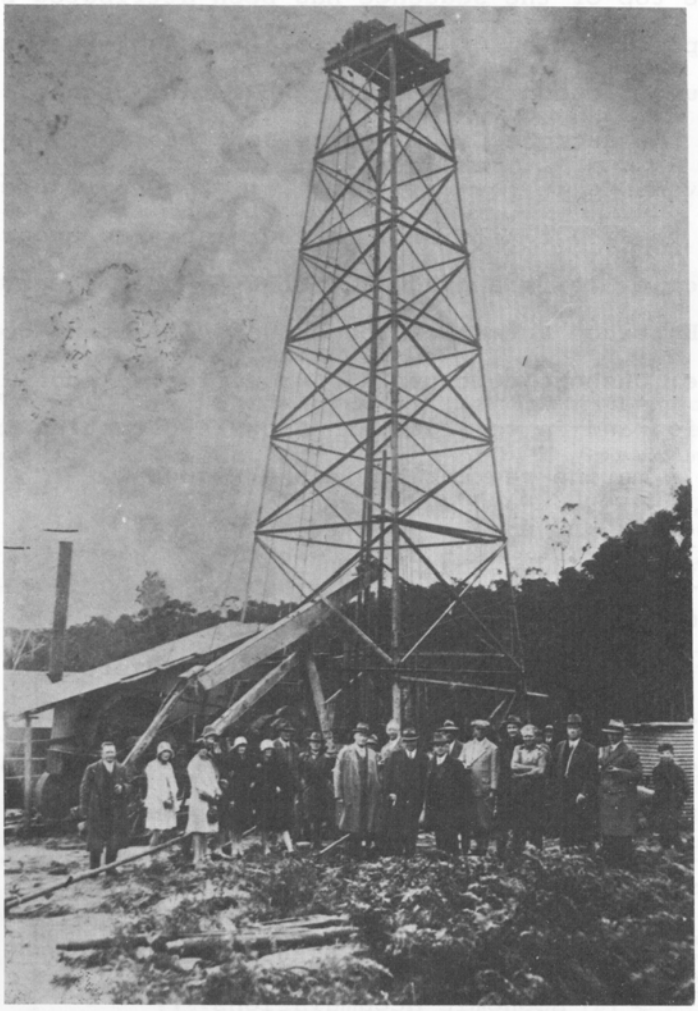


Fig. 5 Lake Bunga No. 1 in 1924 at Lakes Entrance, Victoria (By courtesy of Department of Industry, Technology and Resources, Victoria)

Subeconomic accumulations

- Batfish, gas
- Dolphin, oil
- Emperor, oil and gas
- Golden Beach, gas
- Grunter, oil and gas
- Hapuku, oil
- Kipper, gas and oil
- Seahorse, oil
- Sunfish, oil and gas
- Tarwhine, oil and gas
- West Seahorse, oil and gas
- Whiptail, oil
- Sperm Whale, oil
- Wirrah, oil and gas
- Yellowtail, oil
- Angelfish, oil and gas
- Baleen, gas
- Basker, oil and gas
- Flathead, oil and gas
- Lakes Entrance, oil
- Leatherjacket, oil and gas
- Luderick, oil and gas
- Manta, oil and gas
- Omeo, gas/condensate
- Perch, oil
- Sole, gas
- Whiting, oil and gas

Uneconomic accumulations

- Bignose, gas
- Hermes, gas
- North Seaspray, gas
- Pelican Point, oil and gas
- Selene, gas
- Stonefish, oil and gas
- Sunday Island, oil
- Veilfin, gas
- Volador, oil and gas
- Wellington Park, oil
- Woodside 1, oil and gas
- Woodside 2, oil and gas

Details of all the basin's accumulations are given in the 'Petroleum accumulations summaries' section of this report, and illustrated in Plates 1 to 7.

Nomenclature of traps and petroleum-bearing units

Plates 1 to 7 depict the geological age of the trap(s) and the stratigraphic position of individual petroleum-bearing units in each accumulation. The petroleum-bearing units are identified by a letter code based on the spore pollen-assemblages recognised in the Cretaceous to Oligocene sequence (Fig. 6), and numbered according to the downward order of occurrence within the assemblage. In the case of the Fortescue accumulation, which occurs in the same spore-pollen assemblage as the underlying Halibut-Cobia accumulations, the prefix 'F' is added to the unit identifications (Fig. 7).

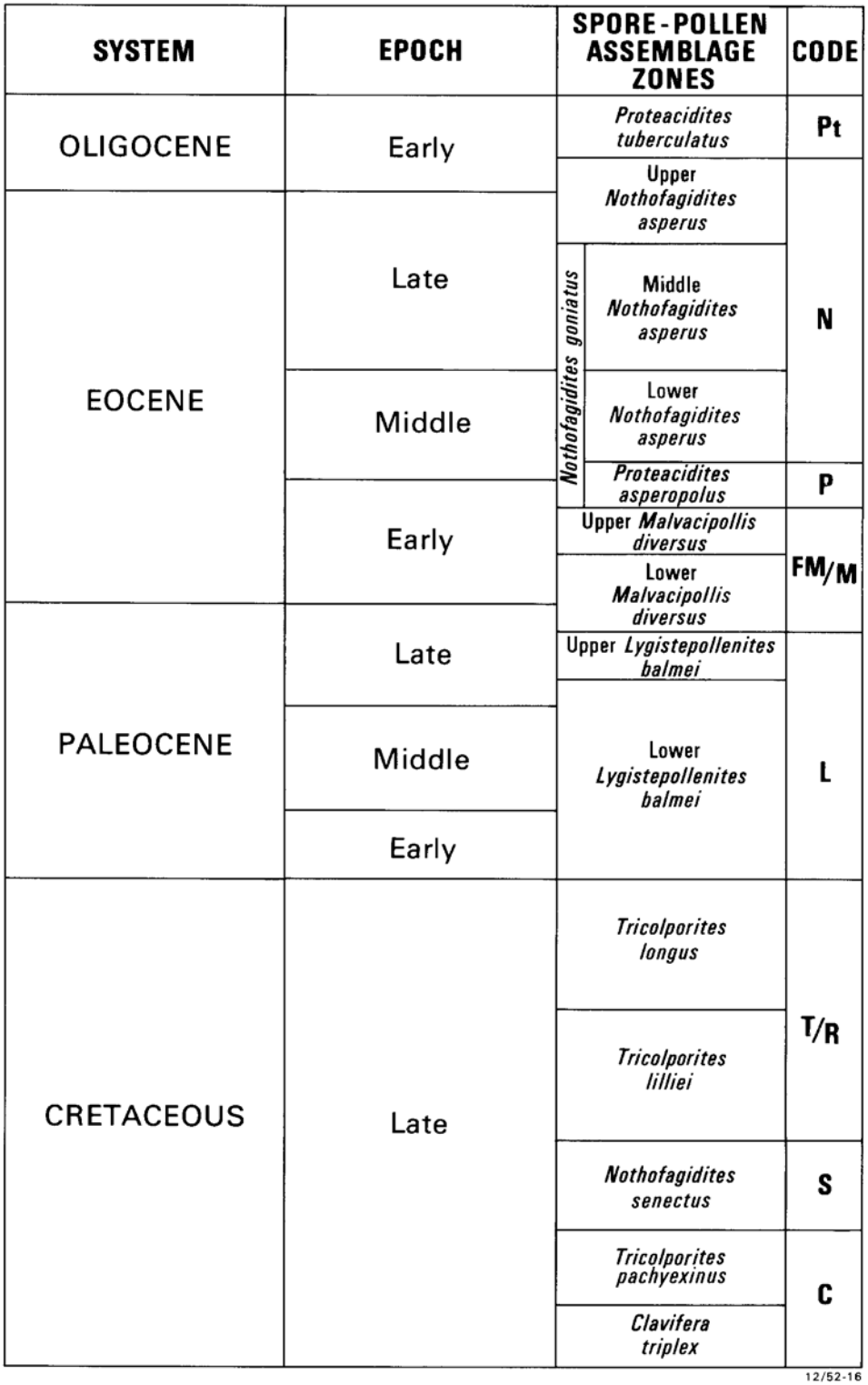


Fig. 6 Spore-pollen zonation, Gippsland Basin

(After Partridge, 1976)

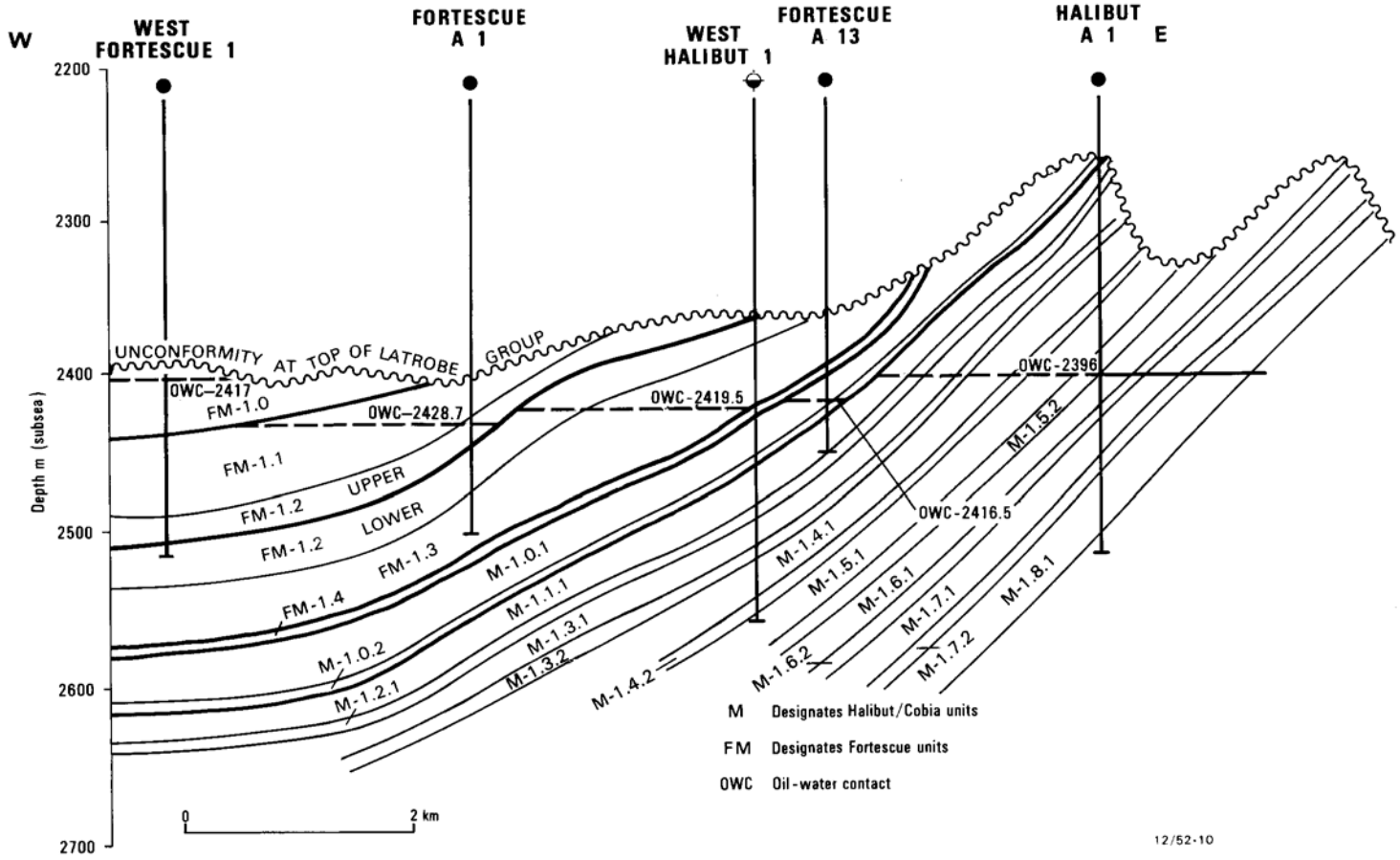


Fig. 7 Structural cross-section. Fortescue-Halibut-Cobia accumulations

(After Henzell and others, 1985)

Structure and traps

Two main structural elements are recognised in the Gippsland Basin; northwest-trending normal fault structures developed during a tensional tectonic regime operative from the Early Cretaceous (? and Late Jurassic) to the Early Eocene (Fig. 8), and the northeasterly to easterly-trending anticlines and associated wrench faults, developed under a compressional tectonic regime in the Late Eocene (Fig. 9). In addition, recent work by the Bureau of Mineral Resources, using BMR 1982 and company seismic data has identified major Early Cretaceous structural lineaments which traverse the basin at right-angles to the trend of the normal fault system. The lineament features have been interpreted by Etheridge & others (1985) as transfer faults which are analogous to oceanic transform faults. Reactivation of the transfer faults, and of the northwest-trending normal faults, is postulated to have been a major controlling factor in the development of the younger compressional structure (Etheridge and others, 1985).

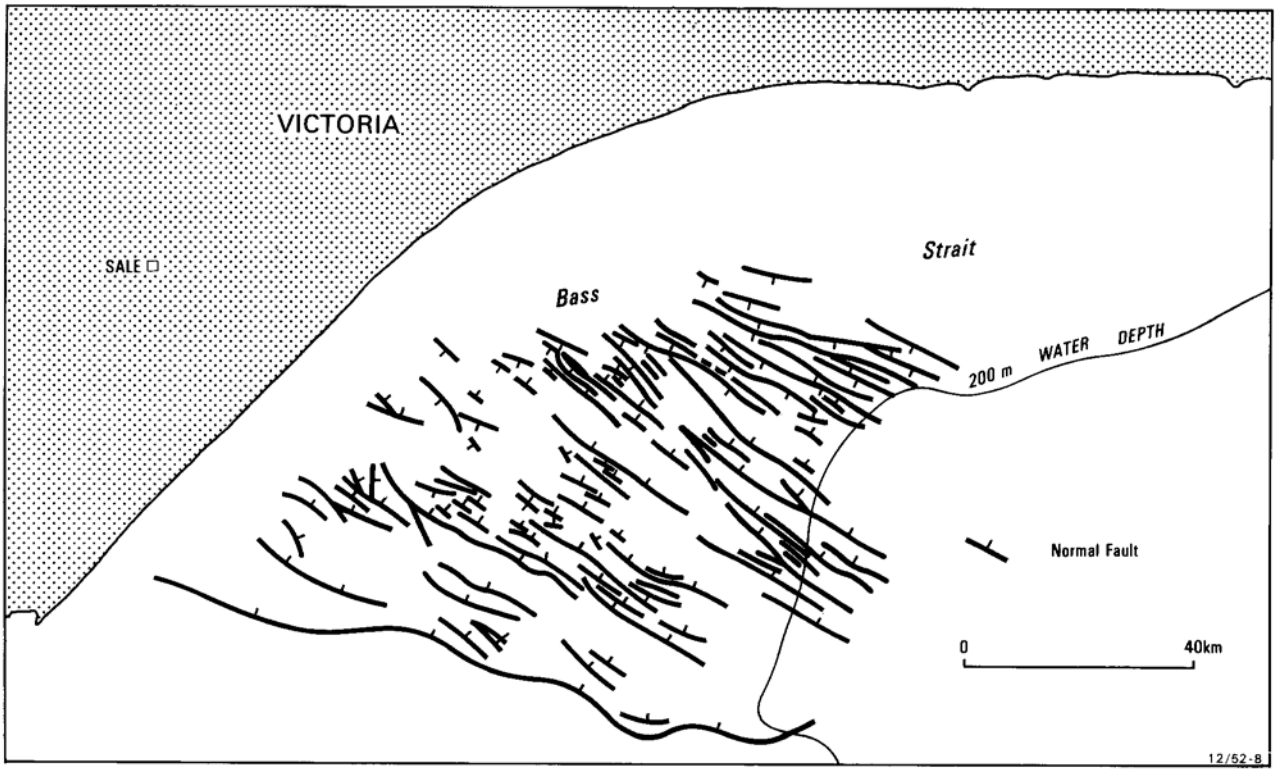


Figure 8. Early Cretaceous to Paleocene basin-forming normal faults, Gippsland Basin (after Threlfall & others, 1976; Ozimic & others, 1987)

The largest petroleum accumulations in the Gippsland Basin are present in the central part of the basin (Fig. 10; Plates 1, 2 & 3) immediately below the unconformity at the top of the Latrobe Group, in traps located along the axes of major anticlinal axes (Fig. 9). The traps are primarily structural, or structural/stratigraphic in origin, with vertical seal provided by the overlying marine shale and marl. Migration of oil to the top of the Latrobe Group was facilitated by a westerly regional dip of the sequence from the basin centre, and vertical pathways provided by normal faults. Petroleum is also trapped in sandstone reservoirs sealed by (intra-formationally) shale within the Latrobe Group. The trapping mechanism is either stratigraphic, resulting from pinchout of the reservoir sands, or structural, where sands are sealed across fault planes by the shale units.

In the Lakes Entrance accumulation, the only significant onshore discovery, oil is trapped stratigraphically within a glauconitic sandstone unit (Greensand Member) of the Oligocene Lakes Entrance Formation.

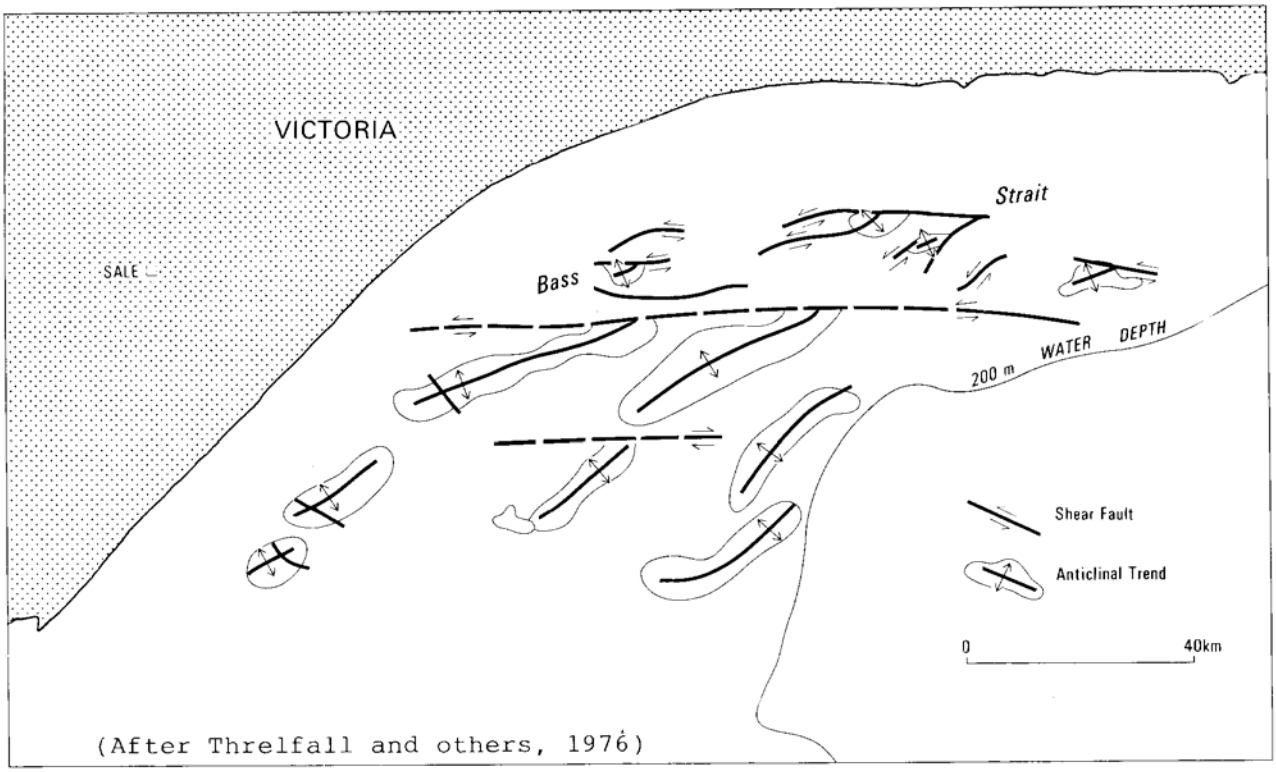


Fig. 9 Late Eocene-Early Oligocene and Late Miocene anticlines and shear faults, Gippsland Basin

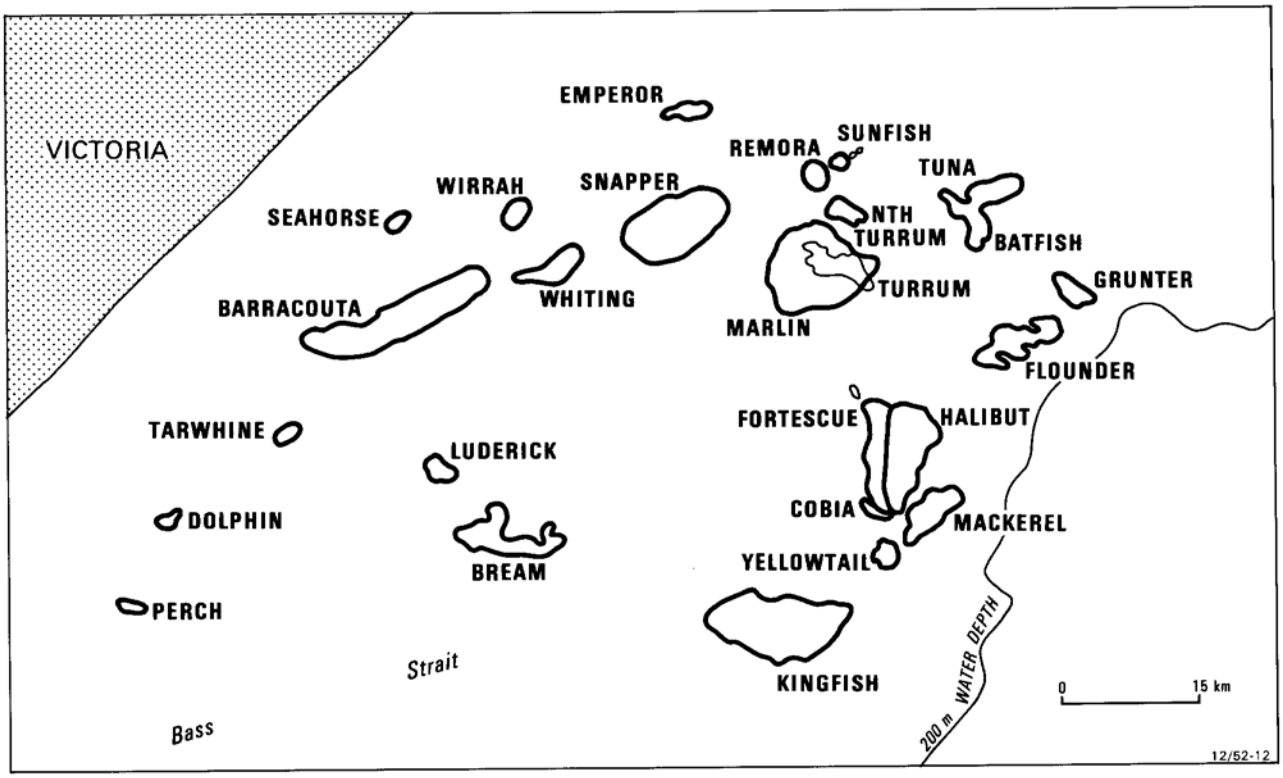


Fig. 10 Location of major petroleum accumulations, Gippsland Basin

Reservoir rocks

Latrobe Group reservoirs comprise four major lithofacies, including: alluvial valley; progradational coastal plain; coastal barrier, and near-shore marine. The Eocene Top Latrobe Group reservoirs which host most of the major petroleum accumulations comprise friable to unconsolidated sands with minor scattered zones of dolomitisation. The porosity of these reservoirs ranges from 15 to 30 per cent while permeabilities are frequently in excess of 1 Darcy. The Paleocene and Late Cretaceous intra-Latrobe Group reservoirs are somewhat compacted and porosity readings in these units ranges form 5 to 15 per cent with permeability of up to 1000 md.

Cap rocks to the Latrobe Group petroleum-bearing units are impervious sandstone, siltstone, shale, marl and coal.

The Lakes Entrance Formation contains a single petroleum-bearing unit, the Greensand Member which hosts the heavy tarry oil (15.7°API) of the Lakes Entrance accumulation (Plate 5). The quality of the Greensand Member reservoir is poor.

Source rocks and maturation

Geochemical work of Brooks and Smith (1969) and chromatographic analysis of crude oils from the Gippsland Basin (Powell and McKirdy, 1976; Shibaoka and others, 1978) suggest a terrestrial organic origin for the Gippsland Basin oil and gas.

Three distinct organic matter assemblages, or facies have been identified by Smith and Cook (1984). Two of these, Cretaceous to Early Eocene, and Middle and Late Eocene ages were first recognised in the Lower and Upper Eastern View coal measures of the Bass Basin and are named accordingly. The third, the Latrobe Valley facies, is recognised in the Latrobe Valley onshore and in nearshore areas of the Gippsland Basin. The distribution, type and abundance of organic matter in each of these three facies are shown in Table 1. The main hydrocarbon source is believed to be that part of the sequence currently at depths of 4 km. The oil being attributed to thermal breakdown of exinite, and gas to thermal cracking of vitrinite and some exinite.

The isoreflectance contours (R_V max per cent) estimated by Smith and Cook are shown in Figure 11, and a plot of vitrinite reflectance against depth in Figure 12. The data indicated an overall increase of reflectance values with depth, a decrease in reflectance gradient from the basin margin into the Central Deep, and an increase in gradient with depth.

Smith and Cook (1984) suggest that much of the oil in the Gippsland Basin is generated at a low coal rank (R_V max 0.4-0.8 per cent), from vitrinite and exinite which occurs at burial depths between 2 and 4 km. Stainforth (1984) in his evaluation of Gippsland Basin hydrocarbons has shown however that a R_V max 0.7 per cent maturity level is required for significant oil generation in these terrestrial plant source rocks. On the other hand there is direct chemical evidence for oil generation at approximately R_V max 1.0 per cent maturity level (Pers. comm. Dr T. Powell, BMR) and which is supported by gas isotope data from Burns and others, (1984).

Petroleum types

Oils and condensates found within the Gippsland Basin are paraffinic to napthenic in composition, they have a high wax content, and are characterised by high pristane to phytane ratios (Powell and McKirdy, 1976). A typical gas chromatograph signature of Gippsland Basin oils is illustrated in Figure 13. High wax content and high pristane to phytane

TABLE 1 - SUMMARY OF MAJOR CHARACTERISTICS OF OTHER ORGANIC MATTER FACIES IN THE GIPPSLAND BASIN (After Smith and Cook, 1984)

Facies		Lower Eastern View		Upper Eastern View	Latrobe Valley
		A	B		
Vitrinite	Content	High	Low-Moderate	High	High
	Mean %	87	61	86	92
	Range %	80-92	30-85	60-95	50-98
Exinite	Content	Low-Moderate	Low-Moderate	Low-Moderate	Low-Moderate
	Mean %	6	5	8	8
	Range %	1-15	2-15	2-25	2-45
Inertinite	Content	Moderate	Moderate-High	Low	Low
	Mean %	2.5	32	2	1
	Range %	1-5	5-60	0-5	0-4

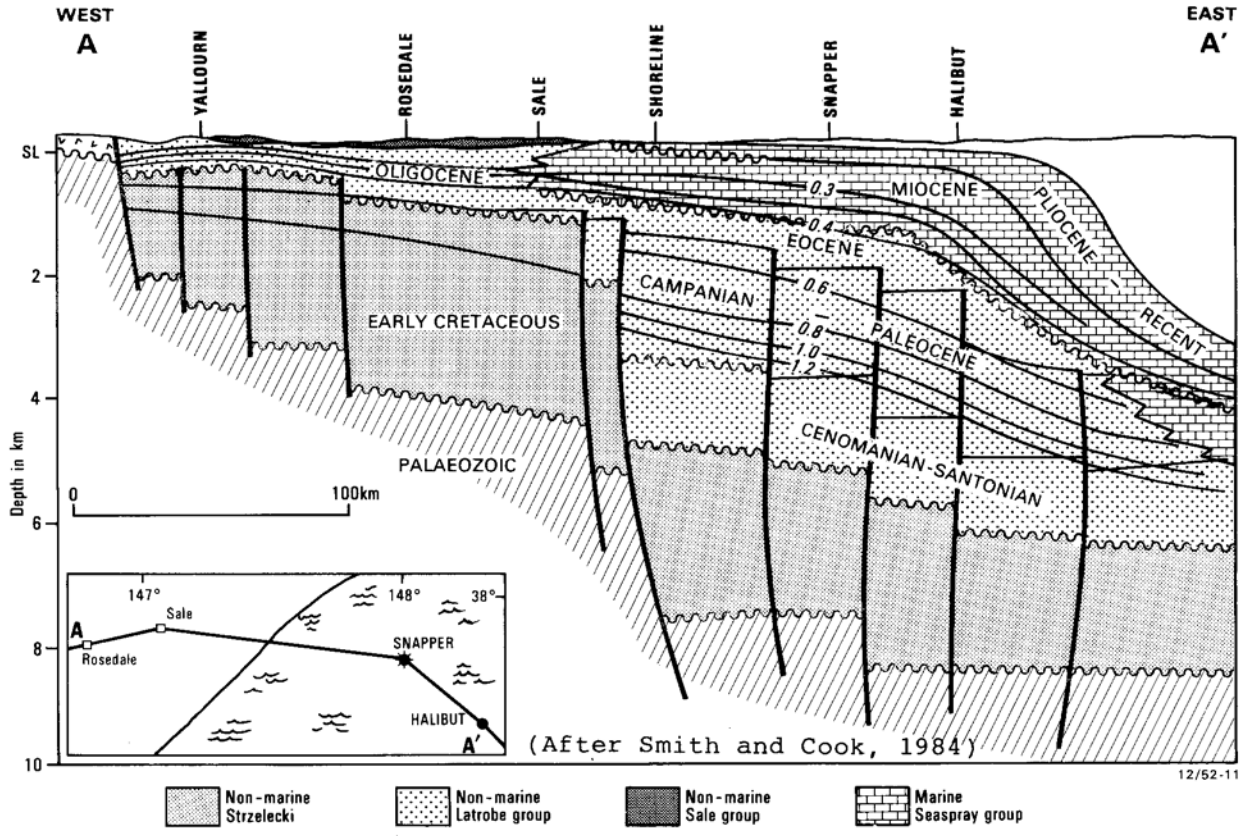


Fig. 11 Geological cross-section through Gippsland Basin with superimposed estimated isoreflectance (R_V max per cent) contours

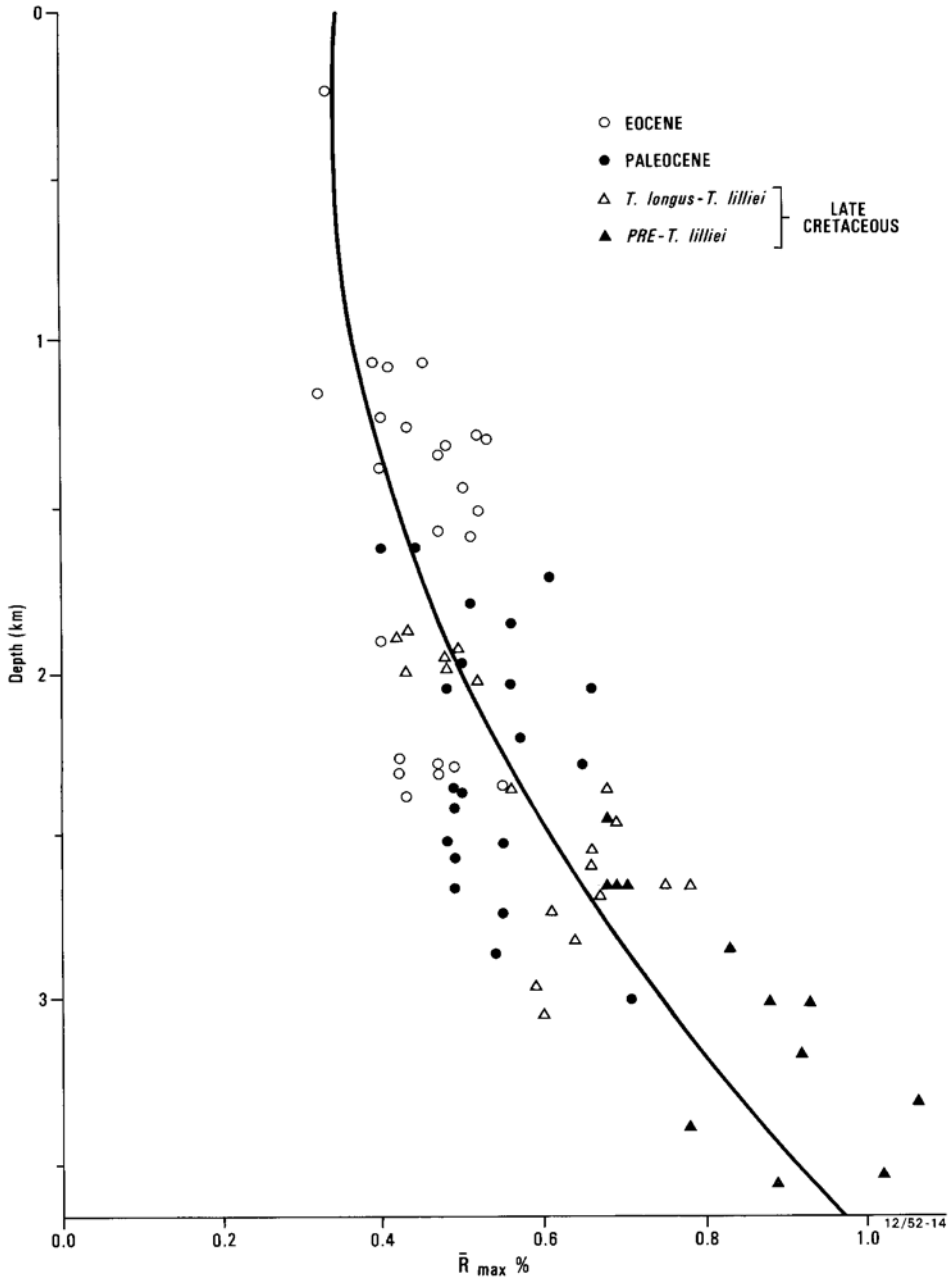


Figure 12. Plot of mean maximum vitrinite reflectance (Rv max per cent) versus depth, Gippsland Basin (after Smith & Cook, 1984)

ratios (greater than 5) are indicative of a terrestrial plant source. A feature in line with the conclusions reached by Brooks (1970), Saxby (1980), Burns and others (1984), and Smith and Cook (1984).

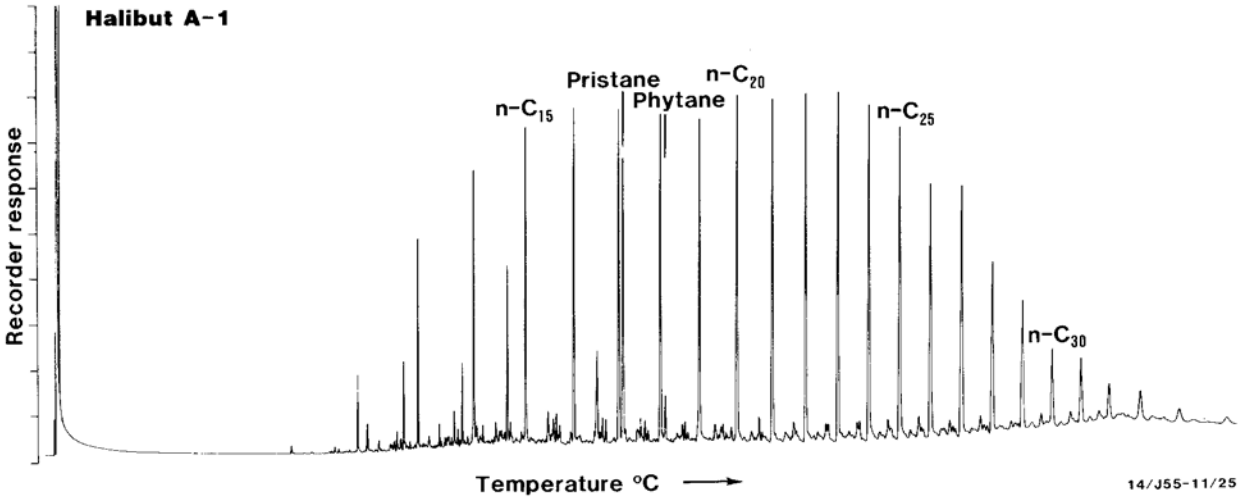


Fig. 13 Gas chromatograph of the saturated hydrocarbons obtained from the Halibut accumulation

The Gippsland Basin oils are generally light (Fig. 14) and have API gravities, ranging from 40 to 60°. Some heavier oils, discovered at shallow depths, have gravities of 14.6 to 26.5°API, and are thought to have been biologically degraded. Other properties of selected Gippsland Basin crude oils are given in Table 2. The gravity of Gippsland condensates range from 48 to 63°API.

In general, oils from terrestrial sources are classified as high wax oils (Hedberg, 1968) although a wide range of compositions can occur. In the Gippsland Basin some oils have condensate-like compositions with API gravities of 50°API or more, no wax content, and virtually no compounds heavier than about C_{22}. Other Gippsland oils have an API gravity of 35°, are extremely waxy and are made up of molecules heavier than C_{20}. In between these two extremes are many combinations and variations in such properties. Burns and others (1987) suggest that such compositional variations can be explained by the oils having been generated at different

TABLE 2 - CRUDE OIL PROPERTIES FROM SELECTED GIPPSLAND BASIN ACCUMULATIONS

Accumulation	Lakes Entrance	Barracouta*	Halibut*	Kingfish*	Hapuku*
Petroleum-bearing unit	P	M-1	M-1	M-1	
Gravity ^{O}API	15.7	42.0	43.8	47.0	45.9
Base	Asphaltic	Paraffinic	Paraffinic	Paraffinic	Paraffinic
Sulphur (%wt)	0.43 to 1.53	0.23	0.11	0.13	Nil
Wax content (%wt)	n/a	14.0	26.8	23.7	8.4
Initial gas/oil ratio	n/a	0.270 m^3/m^3 (60 scf/Bbl)	0.405 m^3/m^3 (90 scf/Bbl)	1.634 m^3/m^3 (363 scf/Bbl)	8.1 m^3/m^3 (1800 scf/Bbl)
Pour point	n/a	-42°C	+12.2°C	+15.6°C	+18.3°
Viscosity	95 cp @ 37.8°C	0.74 cp @ 37.8°C	3.02 cp @ 37.8°C	2.15 cp @ 37.8°C	0.178 cp @ 93°C

(After Beddoes, 1973) (* By Courtesy of Esso)

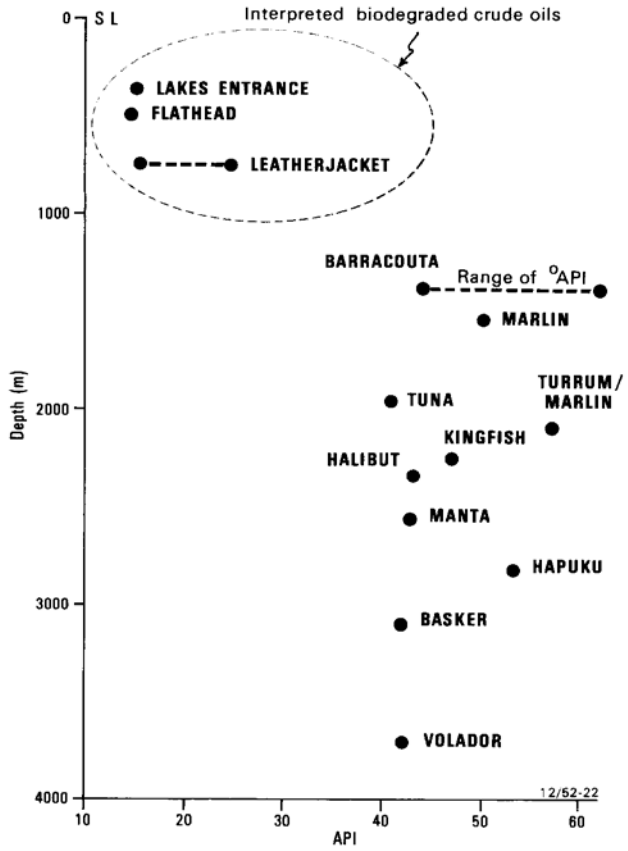


Figure 6. Plot of crude oil gravity (API) versus depth of selected Gippsland Basin oils (after Ozimic & others, 1987)

maturity levels, and possibly by separation migration. Bacterial degradation, which ranges from mild to severe, has introduced additional complexity and had varying effects on quality, depending on the initial oil composition.

The composition of natural gases recovered in the Gippsland Basin varies slightly but most accumulations have low condensate yields (less than 30 bbl/million scft). High carbon dioxide contents are observed in some cases. Analytical data on natural gases recovered from selected Gippsland Basin accumulations are listed in Table 3 and reflect the type and range of composition.

Non-petroleum gases

A number of gaseous and liquid petroleum accumulations discovered in the Gippsland Basin contain varying concentrations of carbon dioxide, hydrogen sulphide, nitrogen and helium (Table 4). Such non-petroleum gases

TABLE 3 NATURAL GAS ANALYSES FROM SELECTED GIPPSLAND BASIN ACCUMULATIONS

Accumulation: Barracouta Trap: Eocene (N) Petroleum-bearing unit: N-1		Accumulation: Marlin Trap: Palaeocene (L) Petroleum-bearing unit: L-2		Accumulation: Snapper Trap: Eocene (N) Petroleum-bearing unit: N-1.4	
Component	Molecular per cent	Component	Molecular per cent	Component	Molecular per cent
methane	86.70	methane	72.97	methane	84.30
ethane	6.15	ethane	4.82	ethane	6.30
propane	2.83	propane	2.20	propane	3.20
isobutane	1.00	isobutane	0.25	isobutane	0.80
n-butane	0.45	n-butane	0.34	n-butane	1.10
isopentane	0.61	isopentane	0.09	isopentane	0.40
n-pentane	0.02	n-pentane	0.08	n-pentane	0.40
hexane +	0.26	hexane +	0.19	hexane +	1.60
hydrogen sulphide	0.0004	hydrogen sulphide	0.002	hydrogen sulphide	trace
nitrogen	1.30	nitrogen	1.63	nitrogen	0.70
helium	0.00	helium	0.00	helium	0.00
carbon dioxide	0.68	carbon dioxide	17.43	carbon dioxide	1.20
Total	100.00	Total	100.00	Total	100.00
(After Blair, 1973)		(After Beddoes, 1973)		(After Beddoes, 1973)	

TABLE 3 (Cont'd) NATURAL GAS ANALYSES FROM SELECTED GIPPSLAND BASIN ACCUMULATIONS

Accumulation: Golden Beach Trap: Eocene (N) Petroleum-bearing unit: N-1		Accumulation: Sole* Trap: Eocene (M) Petroleum-bearing unit: M-1		Accumulation: Volador* Trap: Upper Cretaceous (T) Petroleum-bearing unit: T-2	
Component	Molecular per cent	Component	Molecular per cent	Component	Molecular per cent
methane	93.30	methane	96.10	methane	46.00
ethane	0.00	ethane	1.54	ethane	6.10
propane	0.00	propane	0.11	propane	5.50
isobutane	0.00	isobutane	0.01	isobutane	0.94
n-butane	0.00	n-butane	0.00	n-butane	1.28
isopentane	0.00	isopentane	0.00	isopentane	0.15
n-pentane	0.00	n-pentane	0.00	n-pentane	0.013
hexane +	0.00	hexane +	0.00	hexane +	0.01667
hydrogen sulphide	0.00	hydrogen sulphide	0.00	hydrogen sulphide	-
nitrogen	6.30	nitrogen	0.00	nitrogen	2.90
helium	0.00	helium	0.00	helium	-
carbon dioxide	0.01	carbon dioxide	1.5233	carbon dioxide	36.00
				oxygen + argon	0.22
Total	99.60	Total	100.00	Total	99.12217

(After Beddoes, 1973) (*By courtesy of Shell)

TABLE 4 DISTRIBUTION OF CARBON DIOXIDE, NITROGEN, HYDROGEN, SULPHIDE AND HELIUM, IN SELECTED GIPPSLAND BASIN PETROLEUM ACCUMULATIONS

Petroleum accumulation	Locality map number (Plate 1-7)	Petroleum-bearing rock unit	Petroleum contents	Associated non-petroleum gases (Composition in molecular percentage) Carbon dioxide (CO_2)	Nitrogen (N)	Hydrogen sulphide (H_2S)	Helium (He)
Barracouta	1	N-1	Gas	0.68	1.30	0.004	-
Seahorse	19	N-1	Oil	-	-	0.030	-
Bream	11	P-1	Gas	1.80	-	-	-
Golden Beach	15	N-1	Gas	0.01	6.30	-	-
Marlin (Eocene)	2	N-1.1	Gas	2.0	0.55	0.006	-
Marlin (Paleocene)	3	L-2	Gas	17.43	1.63	0.002	-
Snapper	9	N-1.4	Gas	1.20	0.70	-	-
West Seahorse	22	M-1,M-2	Oil	-	-	0.020	-
Sperm Whale	38	L-2	Gas	2.59	0.69	-	0.002
Turrum (Marlin)	2	L-2	Gas	8.20	0.16	-	-
Wirrah	25	T-1,T-2	Gas	5.00	-	0.002	-
Basker	29	T-1	Gas	5.00	-	0.003	-
Volador	46	T-2	Gas	36.00	2.90	-	-

(After Ozimic, 1987)

are significant potential by-products of petroleum production as they may result in equipment failure through corrosion or an environmental hazard.

The carbon dioxide is of organic origin (Stainforth, 1984). The origin of hydrogen sulphide and nitrogen have not been investigated.

The helium is undoubtedly related to some radioactive elements or isotopes in shales or granite basement underlying the basin.

Reserves and production

The Gippsland Basin is the most prolific petroleum producing basin in Australia. The estimated remaining recoverable petroleum reserves as at 31 December 1986 comprised 202.44 x 10^6m^3 of oil; 67.33 x 10^6m^3 of natural-gas liquids; and 206.39 x 10^6m^3 of sales gas (BMR, 1987). The commercial and non-commercial recoverable reserves as at 31 December 1986 are listed in Table 5. Cumulative production up to 31 December 1986 was 344.66 x 10^6m^3 of oil; 51.43 x 10^6m^3 of natural-gas liquids; and 66.14 x 10^9m^3 of sales gas (BMR, 1987).

Assessment of the basin's commercial plus non-commercial recoverable oil and sales gas reserve assessments from 1965 to 1986 is shown in Figure 15. On the same figure, cumulative oil and sales gas production is also shown.

TABLE 5 GIPPSLAND BASIN COMMERCIAL AND NON-COMMERCIAL RECOVERABLE RESERVES (AS AT 31 DECEMBER 1986)

	COMMERCIAL	NON-COMMERCIAL
Oil (10^6m^3)	172.77	29.67
Condensate (10^6m^3)	21.03	1.41
LPG (10^6m^3)	48.89	-
Sales Gas (10^9m^3)	164.56	41.84

Developments

Natural gas production commenced from the Barracouta accumulation in 1969, and oil production from the Halibut accumulation in 1970.

The first group of platforms: Barracouta, Marlin, Halibut and Kingfish A and B, were built at the Barry Beach marine terminal, 193 km southeast of Melbourne, and installed in Bass Strait between mid 1967 and late 1969. A second group; Mackerel, Tuna, Cobia, Snapper, Fortescue, West Kingfish, and Flounder were installed between 1976 and 1985.

There are currently 12 production platforms (Table 6) and each has a current capacity of between 10 and 27 wells per platform. Production

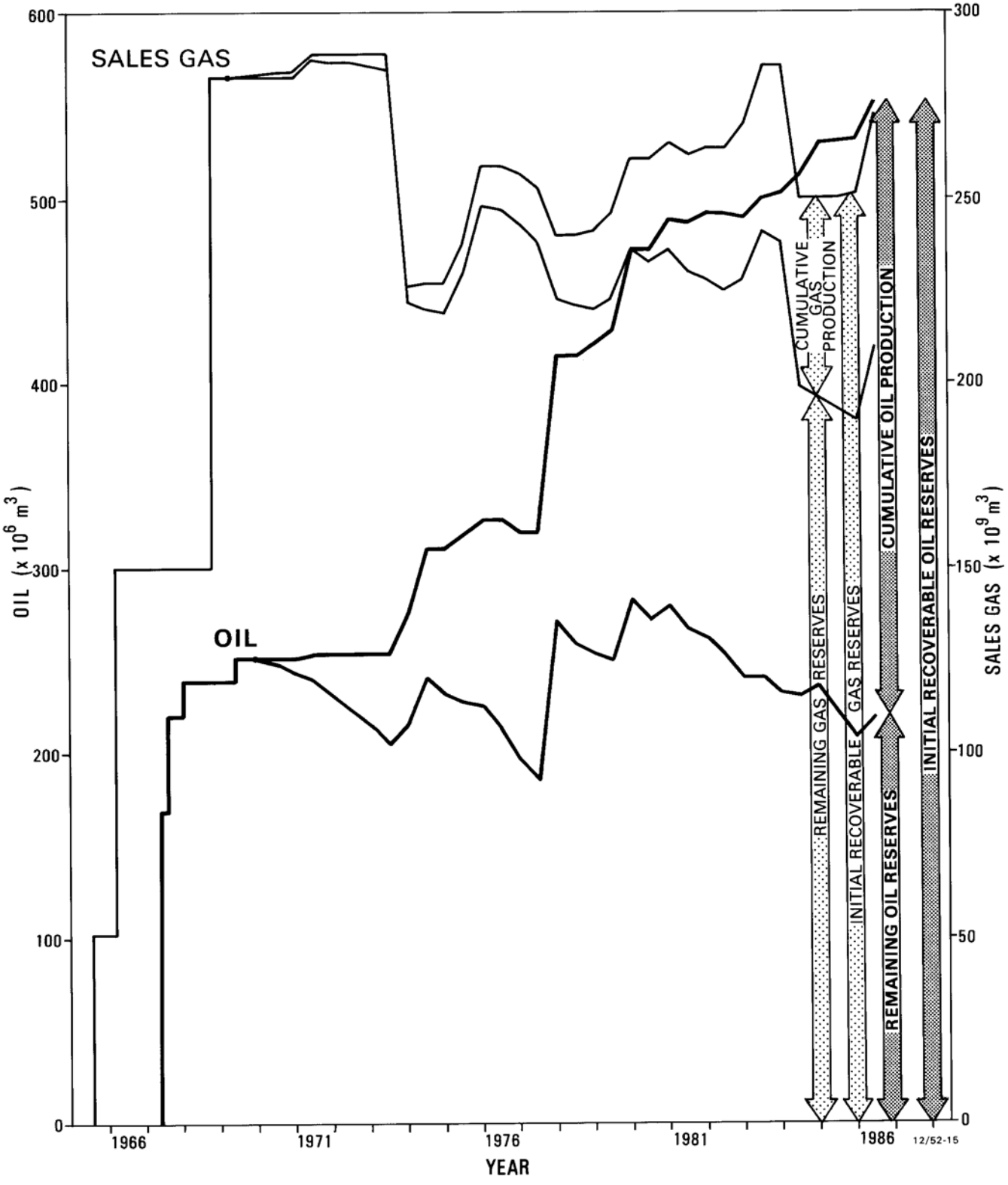


Fig. 15 Gippsland Basin commercial plus non commercial oil and gas reserves, 1965-1986, and cumulative production

TABLE 6 GIPPSLAND BASIN DEVELOPED PETROLEUM ACCUMULATIONS

Accumulation (Platform)	Locality map number (Plate 1-2)	Accumulation type	Distance from shore	Water depth	Number of well slots	Date production started
Barracouta	1	Gas & Oil	24.1 km	46 m	10	March 1969
Marlin	2	Gas & Oil	52.5 km	58.5 m	24	January 1970
Kingfish A	3	Oil	75.6 km	77.1 m	21	April 1971
Kingfish B	3	Oil	77.2 km	77.7 m	21	November 1971
West Kingfish	3	Oil		76.0 m	27	December 1982
Fortescue	4	Oil	65.0 km	69.0 m	21	May 1983 from Cobia platform
Halibut	5	Oil	64.4 km	72.5 m	21	March 1970
Cobia	6	Oil	66.0 km	78.0 m	21	April 1983
Mackerel	7	Oil	72.4 km	92.7 m	18	December 1977
Flounder	8	Oil & Gas	58.9 km	93.0 m	27	December 1984
Snapper	9	Gas & Oil	32.0 km	54.9 m	27	July 1981
Tuna	10	Oil & Gas	56.3 km	58.5 m	18	May 1979
Bream	11	Oil & Gas	under development		27	---

equipment on each platform separates and measures produced petroleum liquids, gas and water before they are transported by pipeline to gas processing and crude stabilisation plants at Longford. Each platform is also equipped with pumping and compression facilities. Most producing wells are equipped with dual, tandem or single completions, depending on the reservoir drainage requirements.

Development of the Bream accumulation commenced in 1987 with construction of a 27-conductor platform. Additional developments are planned for currently producing fields and undeveloped discoveries but the timing of these developments depends on economic conditions.

Production systems in the Gippsland Basin are depicted in Plates 1 to 7 (Petroleum Production System) and in Figure 16. Stabilisation at the Longford plant involves the separation of lighter hydrocarbons (methane, ethane, propane and butane) from the crude oil. The stabilised crude oil is piped over 188 km to a crude oil tank farm at Long Island Point, on Westernport Bay, where it awaits transport by tanker or pipeline to petroleum refineries. Gas from the offshore fields and light hydrocarbons

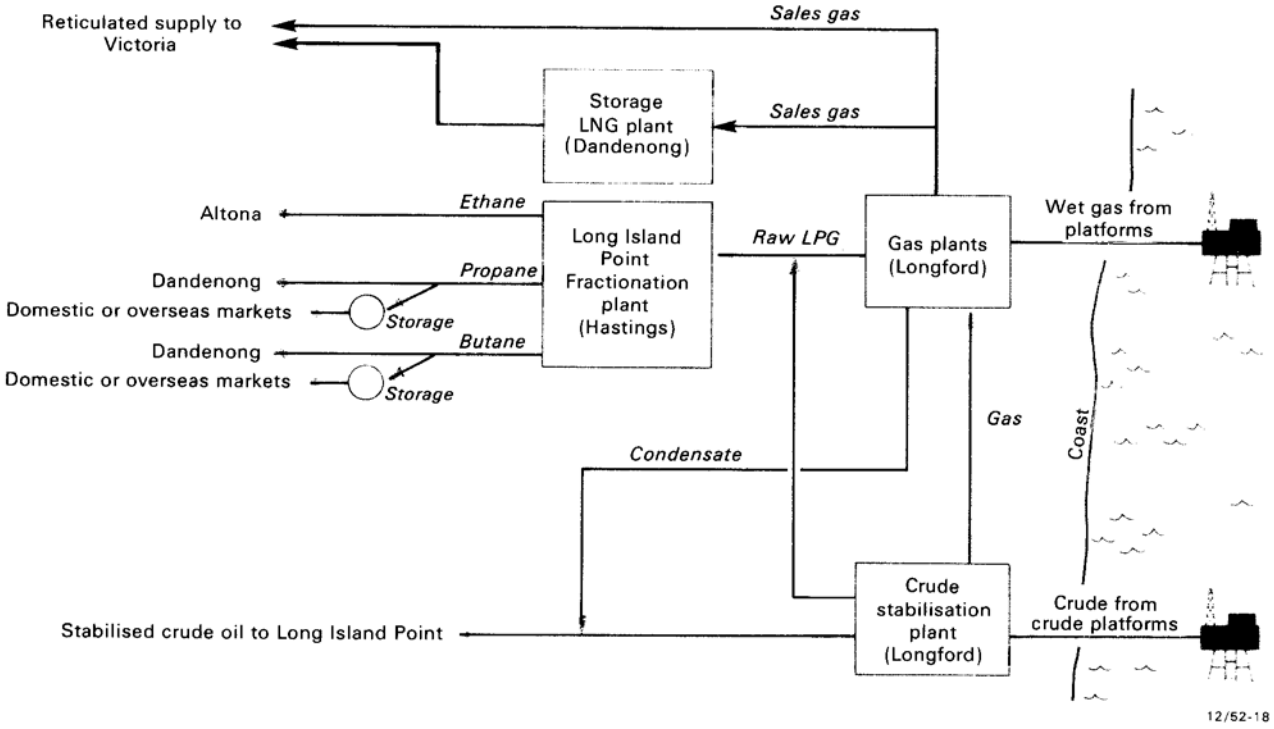


Fig. 16 Schematic of crude oil and natural gas production system in the Gippsland Basin

(By courtesy of Esso Australia Ltd and BHP Petroleum Pty Ltd)

produced by the crude stabilisation process are fed into the three gas plants where methane (and some oil) is separated. The remaining hydrocarbons are piped to Dandenong for storage and distribution. Product recovered from gas processing and crude stabilisation which comprises a mixture of ethane, propane and butane is liquified (by pressurising to 6895 Kp) and piped to the Long Island Fractionation Plant for final separation. Liquified petroleum gas (LPG) is stored offshore in the Barracouta M-1 petroleum-bearing unit and onshore in refrigerated tanks. Ethane is piped to a petrochemical plant at Altona where it is used as chemical feedstock. Petroleum carrying pipelines in the Gippsland Basin are listed in Table 7.

Sales gas and LPG storage

Considerable parts of the natural gas recovered from the Gippsland Basin fields are stored in underground and surface installations.

Some sales gas from the Longford gas plant is piped to Dandenong where it is liquified and stored (Fig. 16). The Dandenong liquid natural gas (LNG) plant was brought into service in 1980 which provides a back-up supply for the Gas & Fuel Corporation. The back-up supply increases capacity and improves the security of reticulated supply to urban, regional and industrial users in Victoria. The plant has a storage tank capacity of 12 000 tonnes of LNG or the equivalent of 20 x $10^6 m^3$ of natural gas (Burt, 1986).

In the offshore Gippsland Basin Esso/BHP are using the Barracouta partially depleted oil-bearing unit of the Barracouta accumulation to store liquified petroleum gas (LPG). This storage was developed in 1971 to avoid cutbacks to crude oil and natural gas production, due to limited onshore storage problems and maintenance shut-downs at the Long Island Point fractionation plant. Excess raw LPG from the onshore facilities is piped to the Barracouta platform and injected into the M-1 petroleum-bearing unit (Fig. 17, Plate 1). Since 1971, 420 000 m^3 of LPG have been injected of which 220 000 m^3 have been produced (Williams, 1986). The injected LPG has also acted as a gas miscible displacement mechanism in the reservoir and has improved oil recovery beyond that possible by primary methods.

TABLE 7 GIPPSLAND BASIN PETROLEUM PIPELINES

Pipeline	Length	Nominal diameter	Service
Barracouta to Longford			
Offshore	24.5 km	450 mm	Gas
Onshore	24.5 km	450 mm	Gas
Barracouta to Longford			
Offshore	23.6 km	150 mm	Oil/LPG
Onshore	30.6 km	150 mm	Oil/LPG
Marlin to Longford			
Offshore	53.1 km	500 mm	Gas
Onshore	55.2 km	500 mm	Gas
Halibut to Longford			
Offshore	75.5 km	600 mm	Oil
Onshore	56.3 km	650 mm	Oil
Kingfish B to Halibut	25.3 km	500 mm	Oil
Kingfish A to Kingfish B	3.9 km	400 mm	Oil
Loop Line	55.6 km	750 mm	Oil/Gas
Longford to Long Island Point (LIP)	189.9 km	250 mm	LPG
Longford to LIP	188.3 km	700 mm	Oil
LIP to Crib Point	11.3 km	1050 mm	Oil
Westernport to Altona	79.5 km	250 m	Ethane
Mackerel to Halibut	8.0 km	300 mm	Oil
Tuna to Marlin	19.3 km	300 mm	Gas
Snapper			
Offshore	37.5 km	600 mm	Gas/Oil
Onshore	1.3 km	600 mm	Gas/Oil
West Kingfish to Kingfish A	4.0 km	300 mm	Oil
Marlin to Halibut & Mackerel	32.0 km	100 mm	Fuel Gas

TABLE 7 (cont'd)

Pipeline	Length	Nominal diameter	Service
Tuna to Marlin	19.3 km	200 mm	Oil
Marlin to Halibut Shore pipeline	1.0 km	300 m	Oil
Cobia 2 to Mackerel	4.0 km (each)	2 x 100 mm	Oil
Halibut to Cobia	5.0 km	300 mm	Oil
Cobia to Halibut	5.0 km	100 mm	Fuel Gas
Halibut to Fortescue	4.0 km	300 mm	Oil
Fortescue to Halibut	4.0 km	100 mm	Fuel Gas
Flounder to Tuna	15.0 km	250 mm	Oil
Flounder to Tuna	15.0 km	250 mm	Gas
Snapper to Marlin	15.0 km	250 mm	Oil
Bream to W. Kingfish	30 km	400 mm	Oil
Westernport/Altona/ Geelong	135.8 km	600 mm	Oil
Longford/Melbourne (Dandenong)	173.5 km	750 mm	Gas

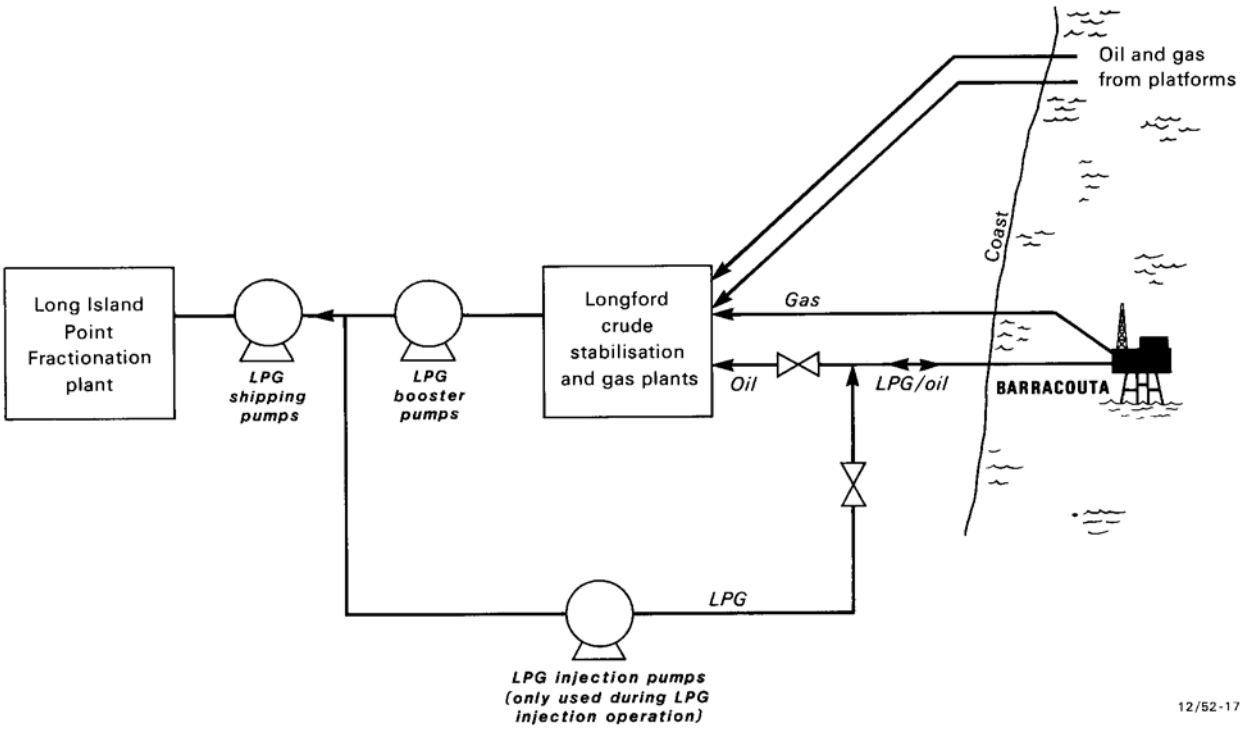


Fig. 17 Schematic of liquid petroleum gas injection and storage system in the Gippsland Basin

(By courtesy of Esso Australia Ltd and BHP Petroleum Pty Ltd)

Fig. 18 Drillship Glomar III in Bass Strait 1964
(By courtesy of Esso Australia Ltd and BHP Petroleum Pty Ltd)

PETROLEUM ACCUMULATIONS SUMMARIES

NOTES ON DEVELOPMENTS

BARRACOUTA: the beginning of Australia's offshore petroleum exploration and development . . . .

On a December dawn in 1964, off Gippsland's lonely Ninety Mile Beach, the drilling ship Glomar III broke sea bottom 46 metres below surface to spud in Australia's first offshore wildcat well.

The well Esso Gippsland Shelf No. 1 (later renamed Barracouta No. 1) discovered natural gas in February 1965. A second, or stepout, well was drilled in June and confirmed that gas existed in the Barracouta accumulation in commercial quantities.

Esso Gippsland Shelf No. 1 well was the first well drilled under an agreement reached in 1964 between Hematite Petroleum Pty Ltd, a BHP subsidiary, and Esso Exploration and Production Inc.

In December 1965 the Victorian Government reacted quickly to the Gippsland gas discovery and created a Ministry of Fuel and Power to control the development and use of Victoria's energy resources.

In April 1967, a Petroleum Production Licence was issued to Esso/BHP under the joint Commonwealth-State legislation to develop the Barracouta accumulation.

Gas production commenced in March 1969.

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Barracouta*

COMPILATION DATE: *02/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Gas and oil*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 249 km east of Melbourne; and 51 km southeast of Lakes Entrance, offshore Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1, Vic/L1, Vic/L2*

FIRST DISCOVERY WELL: *Esso Gippsland Shelf No.1 (Esso, 1965)*
- latitude: *38º16'41"* - longitude: *147º42'45"*
- discovery: *gas*
- date total depth reached: *May 1965*

SECOND DISCOVERY WELL: *Barracouta A-3 (Esso, 1968)*
- latitude: *38º17'53"* - longitude: *147º40'29"*
- discovery: *oil; gas-oil; gas*
- date total depth reached: *July 1968*

THIRD DISCOVERY WELL: *Barracouta A-7 (Esso, 1968)*
- latitude: *38º17'53"* - longitude: *147º40'29"*
- discovery: *oil*
- date total depth reached: *November 1968*

FOURTH DISCOVERY WELL: *Barracouta No.5 (Esso, 1985)*
- latitude: *38º18'04"* - longitude: *147º39'36"*
- discovery: *oil*
- date total depth reached: *February 1985*

NUMBER OF WELLS DRILLED: *5* exploration
10 development

STRUCTURE: *Anticline: northeast-southwest trending; divided by a traverse fault (Structure map, Plate 1)*
- areal closure: > *50 sq.km*
- vertical closure: > *180 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
5 traps
8 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil	gas	*1*	gas/condensate
Nil	gas/oil	*1*	oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *March 1969: gas (N-1)*
October 1969: oil (M-1)

From January 1971 to March 1974 the N-4 unit produced some 206,000 barrels of oil via Barracouta A-7 well. During the same period about 800 barrels of oil was also produced from the N-5 unit via Barracouta A-7 well.

The M-1 oil producing sand has been used for storage of liquid petroleum gas (LPG) since December 1971; LPG is injected into the M-1 unit at least twice a year and is produced as required.

PRODUCTION INFRASTRUCTURE: *Ten well platform in 46 m of water; connected via 49 km and 54.2 km long oil and gas pipelines to gas processing and crude oil stabilisation plant at Longford, Victoria*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): * *Gippsland Shelf No.1 (N-1)*

* *(Later renamed Barracouta No.1)*

Barracouta A-7 (N-4; N-5)

Barracouta No.5 (N-6)

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; unconsolidated; in parts calcareous; interbedded with carbonaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1319.47 m BSL*
POROSITY: *Up to 28%*
PERMEABILITY*: > 1 darcy*
TEMPERATURE GRADIENT: *4.86^{O}C/100 m*
PRESSURE GRADIENT: *9.79 KPa/m*

PETROLEUM-BEARING UNIT 2: *N-4*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; friable and dolomitic in parts; interbedded with siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1339.0 m BSL*
POROSITY: *Average 25%*
PERMEABILITY: *> 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *N-5*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; unconsolidated and calcareous; interbedded with minor siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1352.0 m BSL*
POROSITY: *Average 24%*
PERMEABILITY: *Up to 300 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 4: *N-6*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; friable and calcareous; interbedded with minor siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1379.5 m BSL*
POROSITY: *Average 26%*
PERMEABILITY: *Up to 300 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Eocene (M)*

DISCOVERY WELL(S): *Barracouta A-3*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; in parts interbedded with thin beds of carbonaceous siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1395.67 m BSL*
POROSITY: *Up to 27%*
PERMEABILITY*: Up to 5000 md*
TEMPERATURE GRADIENT: *5.19^{O}C/100 m*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 3: *Paleocene (L)*

DISCOVERY WELL(S): *Barracouta A-3*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1* (* denotes multiple units)*

PETROLEUM CONTENTS: *Gas-oil show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; calcareous and carbonaceous; interbedded with siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1758.39 m BSL*
POROSITY: *Up to 15%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 4: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Gippsland Shelf No.1*

** (Later renamed Barracouta No.1)*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1**

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous; interbedded siltstone, shale and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2671.57 m BSL*
POROSITY: *Up to 12%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.84^{o}C/100 m*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 5: *Late Cretaceous (S)*

DISCOVERY WELL(S): *Barracouta A-3*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *S-1**

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (N.senectus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; micaceous and calcareous; interbedded with siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3130.00 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

Fig. 19 Esso/BHP's Barracouta (10 well) oil and gas production platform in Bass Strait
(By courtesy of Esso Australia Ltd and BHP Petroleum Pty Ltd)

NOTES ON DEVELOPMENTS

MARLIN: the gas blowout . . . . . .

On 2 December 1968 a gas blowout occurred on the Marlin production platform while the drilling of the Marlin A-7 development well was in progress.

Gas from a sand within the Eocene blew out and erupted from the seabed near the platform without igniting.

After delays caused by bad weather the blowout was brought under control on 1 January 1969.

Full scale gas production commenced in November 1969.

Drilling from the platform was not resumed until 12 June 1972.

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Marlin*

COMPILATION DATE: *02/04/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Gas and oil*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 45 km offshore Victoria, and 44 km east of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L3, Vic/L4*

FIRST DISCOVERY WELL: *Esso Gippsland Shelf No.4 (Esso, 1965)*
- latitude: *38º14'03"* - longitude: *148º13'33"*
- discovery: *gas and oil*
- date total depth reached: *February 1966*

SECOND DISCOVERY WELL: *Marlin A-6 (Esso, 1968)*
- latitude: *38º13'55"* - longitude: *148º13'10"*
- discovery: *oil*
- date total depth reached: *November 1968*

THIRD DISCOVERY WELL: *Turrum No.1 (Esso, 1969)*
- latitude: *38º12'10"* - longitude: *148º14'41"*
- discovery: *gas*
- date total depth reached: *June 1969*

FOURTH DISCOVERY WELL: *Marlin A-24 (Esso, 1973)*
- latitude: *38º13'55"* - longitude: *148º13'11"*
- discovery: *gas*
- date total depth reached: *May 1973*

NUMBER OF WELLS DRILLED: *6* exploration
25 development

STRUCTURE: *Anticline: southwest-plunging structural nose; eroded to the northeast by the Marlin Channel; trapping along the southwestern flank of the structure (Structure map, Plate 1)*
- areal closure: *> 85 sq.km*
- vertical closure: *> 200 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
3 traps
9 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

1	gas	*Nil*	gas/condensate
Nil	gas/oil	*1*	oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *November 1969*

PRODUCTION INFRASTRUCTURE: *24 well platform in 59.5 m of water; connected via a 108.3 km gas pipeline to the gas processing and crude oil stabilisation plant at Longford, Victoria; and by a 1.0 km oil pipeline to the Halibut-Longford pipeline*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): ** Gippsland Shelf No.4*

** (Later renamed Marlin No.1)*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1.1* (* denotes multiple sand units)*

PETROLEUM CONTENTS: *Gas-oil show*
PRODUCTION STATUS: *Producing (gas only)*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; interbedded with siltstone, shale and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1369.0 m BSL*
POROSITY: *Up to 16%*
PERMEABILITY*: > 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.02 KPa/m*

PETROLEUM-BEARING UNIT 2: *N-1.2*

PETROLEUM CONTENTS: *Gas-oil show*
PRODUCTION STATUS: *Producing (gas only)*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1411.0 m BSL*
POROSITY: *Up to 27%*
PERMEABILITY*: Up to 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.02 KPa/m*

PETROLEUM-BEARING UNIT 3: *N-1.3*

PETROLEUM CONTENTS: *Gas-oil show*
PRODUCTION STATUS: *Producing (gas only)*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; interbedded with siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1437.0 m BSL*
POROSITY: *Up to 27%*
PERMEABILITY*: Up to 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.02 KPa/m*

PETROLEUM-BEARING UNIT 4: *N-1.4*

PETROLEUM CONTENTS: *Gas-oil show*
PRODUCTION STATUS: *Producing (gas only)*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.3*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1521.0 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: Up to 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.02 KPa/m*

PETROLEUM-BEARING UNIT 5: *N-1.5*

PETROLEUM CONTENTS: *Gas and oil*
PRODUCTION STATUS: *Producing (gas only)*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.3*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1536.0 m BSL*
POROSITY: *Up to 28%*
PERMEABILITY*: Up to 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.02 KPa/m*

TRAP

TRAP 2: *Eocene (M)*

DISCOVERY WELL(S): ** Gippsland Shelf No.4*

** (Later renamed Marlin No.1)*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing (oil only)*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; carbonaceous and calcareous; interbedded with siltstone, shale and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1549.3 m BSL*
POROSITY: *Up to 15%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.02 KPa/m*

TRAP

TRAP 3: *Marlin/Turrum Paleocene (L)*

DISCOVERY WELL(S): ** Gippsland Shelf No.4*
** (Later renamed Marlin No.1)*

Marlin A-24 (L-0)

Turrum No.1 (L-2, gas)

Marlin A-6 (L-2, oil)

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-0*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and calcareous; interbedded with siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2161.0 m BSL*
POROSITY: *Up to 17%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.4 KPa/m*

PETROLEUM-BEARING UNIT 2: *L-1**

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-0*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2181.2 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: Up to 430 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.32 KPa/m*

PETROLEUM-BEARING UNIT 3: *L-2**

PETROLEUM CONTENTS: *Gas and oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-0*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2254.0 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Up to 400 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.07 KPa/m*

NOTES ON DEVELOPMENTS

KINGFISH: a giant oil accumulation, 1000 million barrels plus . . . . . .

Up to April 1967 a commercial crude oil discovery had eluded the Gippsland Basin explorers.

This changed when during that month the drillship Glomar III spudded in the Kingfish No. 1 well, 77.2 km offshore, in water 78 metres deep.

In June of that year Esso/BHP declared that the Kingfish discovery was commercial, with initial recoverable reserves of 1000 million barrels plus, still the largest known oil accumulation in Australia.

By world standards the Kingfish discovery ranks among the giant oil accumulations. This discovery thrust Australia from almost total dependence on overseas oil supplies to one of near self-sufficiency.

Production from the Kingfish accumulation commenced in January 1971. Its production infrastructure comprises 3 platforms: Kingfish 'A', Kingfish 'B' and West Kingfish.

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Kingfish*

COMPILATION DATE: *24/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 81 km south of Lakes Entrance, offshore Victoria; and 57 km southeast of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L7, Vic/L8*

FIRST DISCOVERY WELL: *Kingfish No.1 (Esso, 1967)*
- latitude: *38º35'50"* - longitude: *148º12'35"*
- discovery: *oil*
- date total depth reached: *May 1967*

SECOND DISCOVERY WELL: *Kingfish No.3 (Esso, 1968)*
- latitude: *38º35'03"* - longitude: *148º06'07"*
- discovery: *oil*
- date total depth reached: *February 1968*

THIRD DISCOVERY WELL: *Kingfish A-1 (Esso, 1970)*
- latitude: *38º35'52"* - longitude: *148º08'39"*
- discovery: *oil*
- date total depth reached: *April 1970*

FOURTH DISCOVERY WELL: *Kingfish No.7 (Esso, 1977)*
- latitude: *38º35'14"* - longitude: *148º05'00"*
- discovery: *oil*
- date total depth reached: *June 1977*

NUMBER OF WELLS DRILLED: *7* exploration
63 development

STRUCTURE: *Anticline: eastwest trending; partly eroded to the west; trapping stratigraphic within the west dipping beds on the western flank of the structure (Structure map, Plate 1)*
- areal closure: *> 80 sq.km*
- vertical closure: *> 66 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
3 traps
7 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil	gas	*Nil*	gas/condensate
Nil	gas/oil	*5*	oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Kingfish 'B': January 1971*

Kingfish 'A': April 1971

West Kingfish: December 1982

PRODUCTION INFRASTRUCTURE: *Kingfish 'A': 21 well platform in 77.1 m of water; connected via a 4 km long pipeline to Kingfish 'B' platform.*

Kingfish 'B': 21 well platform in 77.7 m of water; connected via a 25.3 km long pipeline to Halibut platform.

West Kingfish: 27 well platform in 76 m of water; connected via a 4 km long pipeline to Kingfish 'A' platform.

TRAP

TRAP 1: *Intra-Gurnard (P)*

DISCOVERY WELL(S): *Kingfish No.7 (P-1.1)*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P-1.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Gurnard Formation*
AGE: *Early Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: marine; massive and clean; poorly cemented*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2254 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: > 100 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.80 KPa/m*

TRAP

TRAP 2: *West Kingfish (M)*

DISCOVERY WELL(S): *Kingfish No.3 (M-1.2; M-1.3; M-1.4)*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1.2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Middle Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: marginal marine; glauconitic, pyrite siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2264.3 m BSL*
POROSITY: *Up to 18%*
PERMEABILITY*: Up to 1000 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.36 KPa/m*

PETROLEUM-BEARING UNIT 2: *M-1.3*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Middle Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: marginal marine; glauconitic, pyrite siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2271 m BSL*
POROSITY: *Up to 19%*
PERMEABILITY*: Up to 1000 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.65 KPa/m*

PETROLEUM-BEARING UNIT 3: *M-1.4*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: marginal marine; interbedded with deltaic siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2301.5 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Up to 1000 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.78 KPa/m*

TRAP

TRAP 3: *Kingfish (M)*

DISCOVERY WELL(S): *Kingfish A-1 (M-1.5; M-1.6)*

Kingfish No.1 (M-1.7)

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1.5*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: continental; massive, in parts interbedded with micaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2239.9 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: > 1000 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.36 KPa/m*

PETROLEUM-BEARING UNIT 2: *M-1.6*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: continental to marginal marine; massive, clean and interbedded with minor siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2253.6 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Up to 1000 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.65 KPa/m*

PETROLEUM-BEARING UNIT 3: *M-1.7*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: marginal marine; massive, interbedded with minor siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2269.2 m BSL*
POROSITY: *Up to 18%*
PERMEABILITY*: > 1000 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.65 KPa/m*

NOTES ON DEVELOPMENTS

FORTESCUE: 'old' oil – 'new' oil . . . . . .

When in September 1978 the West Halibut No. 1 well encountered oil-bearing rocks at a depth below the original oil-water contact of the adjacent Halibut accumulation, it appeared that a separate oil accumulation may have been discovered. This discovery was subsequently designated the Fortescue accumulation.

The Fortescue discovery is interpreted as a separate oil accumulation discrete from the adjacent Halibut accumulation on the basis of a lower oil-water contact and a significant pressure differential across a rock unit separating the two accumulations.

The price of crude oil produced in Australia has been subject to government control since major production commenced in 1964. In September 1975, the then Prime Minister announced a policy which meant that, for the first time, there would be substantially different prices paid for oil from different accumulations.

Under the policy, oil from newly discovered accumulations was to be differentiated from oil produced from accumulations already discovered. 'New' oil was to attract a price at the nearest refinery port equivalent to the landed cost of imported crude (Import Parity Price) minus a levy.

The key elements in the definition of 'new' oil are:

1. *'New' oil means any crude oil, not including natural gas liquids or condensate, discovered after 17 September 1975.*

2. *Any such discovery shall be a naturally occurring discrete accumulation.*

The Fortescue oil discovery satisfied all the above key elements, and it therefore qualified as 'new' oil under the Commonwealth Government's crude oil pricing policy.

Production from the Fortescue accumulation commenced in May 1983 via the adjacent Cobia platform and in September 1983 via the Fortescue platform.

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Fortescue*

COMPILATION DATE: *30/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 63 km south-southeast of Lakes Entrance, offshore Victoria; and 19 km south-southeast of Marlin accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1, Vic/L5*

FIRST DISCOVERY WELL: *West Halibut No.1 (Esso, 1979)*
- latitude: *38º24'13"* - longitude: *148º16'56"*
- discovery: *oil*
- date total depth reached: *September 1978*

SECOND DISCOVERY WELL: *Fortescue A-1 (Esso, 1984)*
- latitude: *38º24'32"* - longitude: *148º16'37"*
- discovery: *oil*
- date total depth reached: *March 1984*

THIRD DISCOVERY WELL: *West Fortescue No.1 (Esso, 1984)*
- latitude: *38º21'56"* - longitude: *148º14'25"*
- discovery: *oil*
- date total depth reached: *May 1984*

NUMBER OF WELLS DRILLED: *4* exploration
29 development

STRUCTURE: *Anticline: north-south trending; eroded along the eastern flank; petroleum trapped within west dipping beds along the western flank (Structure map, Plate 1)*
- areal closure: *> 70 sq.km*
- vertical closure: *> 85 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
3 traps
6 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*4* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *May 1983: via Cobia platform;*

September 1983: via Fortescue platform

PRODUCTION INFRASTRUCTURE: *Cobia: 21 well platform in 79 m of water; production of oil from Fortescue accumulation via 8 Cobia platform wells.*

Fortescue: 21 well platform in 69 m of water.

Both production facilities (Cobia and Fortescue) are connected to Halibut platform via a 5 km (Cobia to Halibut) and a 4 km (Fortescue to Halibut) pipelines.

TRAP

TRAP 1: *Fortescue 'West' (FM)*

DISCOVERY WELL(S): *West Fortescue No.1 (FM-1.0)*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *FM-1.0*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: non-marine; glauconitic and silty in parts; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2402 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.7 KPa/m*

TRAP

TRAP 2: *Fortescue 'Central' (FM)*

DISCOVERY WELL(S): *Fortescue A-1 (FM-1.1; FM-1.2U) (U denotes upper)*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *FM-1.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: non-marine; silty sandstone mainly in the upper part of the unit; the lower unit comprises massive clean sandstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2401.6 m BSL*
POROSITY: *Up to 18.5%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.9^{o}C/100 m*
PRESSURE GRADIENT: *9.8 KPa/m*

PETROLEUM-BEARING UNIT 2: *FM-1.2U*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: non-marine; massive clean sandstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2423.2 m BSL*
POROSITY: *Average 17.8%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.75 KPa/m*

TRAP

TRAP 3: *Fortescue 'East' (FM)*

DISCOVERY WELL(S): *West Halibut No.1 (FM-1.2L; FM-1.3; FM-1.4)*

(L denotes lower)

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *FM-1.2L*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: non-marine; calcareous with traces of pyrite and glauconite; interbedded with minor calcareous mudstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2354 m BSL*
POROSITY: *Average 15%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.9^{o}C/100 m*
PRESSURE GRADIENT: *9.5 KPa/m*

PETROLEUM-BEARING UNIT 2: *FM-1.3*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: non-marine; calcareous and carbonaceous; in parts glauconitic; interbedded with minor siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2379 m BSL*
POROSITY: *Average 13%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.5 KPa/m*

PETROLEUM-BEARING UNIT 3: *FM-1.4*

PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Siltstone: non-marine; sandy in parts; carbonaceous and calcareous; interbedded with coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2411 m BSL*
POROSITY: *Average 16%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *11.31 KPa/m*

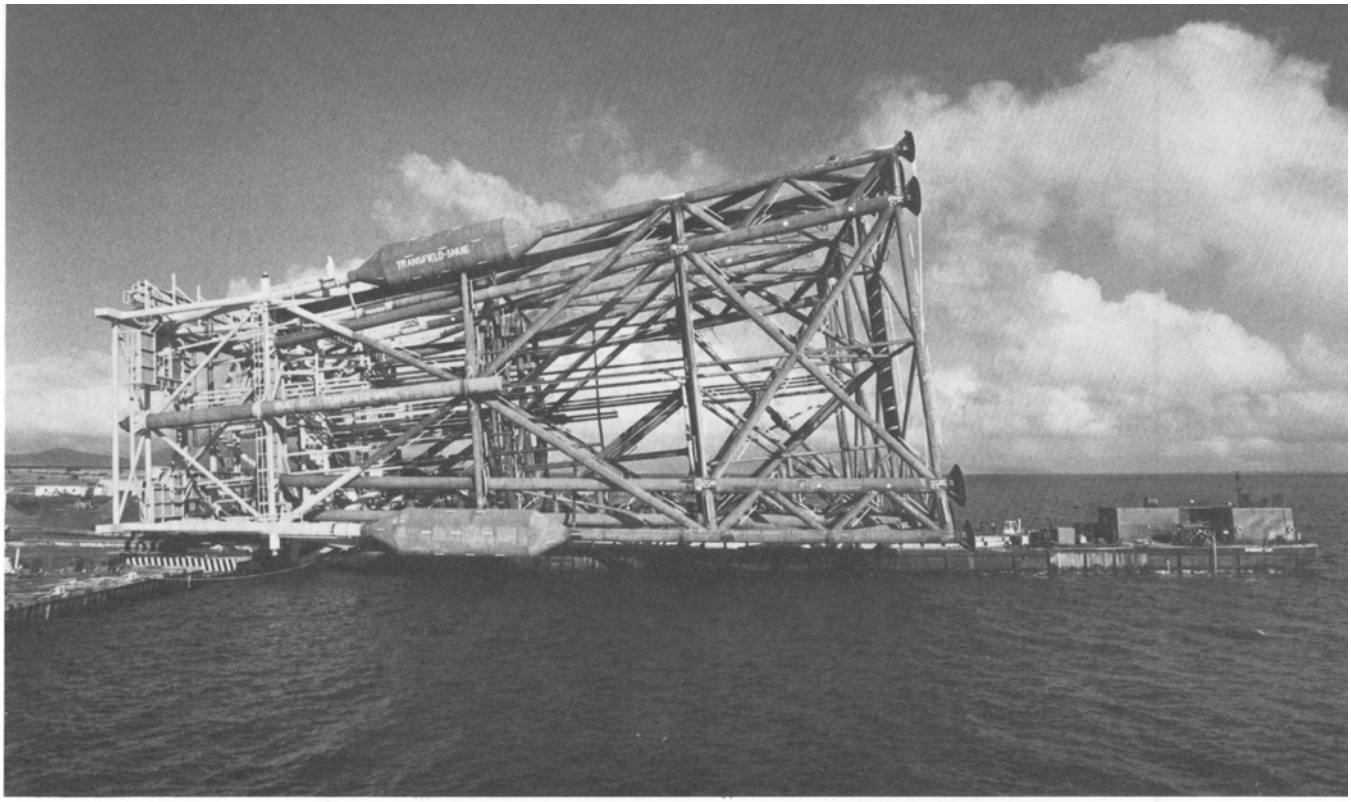


Fig. 20 Bream platform jacket at Barry Beach, Victoria
(By courtesy of Esso Australia Ltd and BHP Petroleum Pty Ltd)

NOTES ON DEVELOPMENTS

HALIBUT: a large petroleum production platform . . . .

Large platforms, like Halibut, are taller than a 25 storey building and on their sides are longer than a football field.

The Halibut 24 well capacity platform was erected early in 1968 about 78 km offshore, in water 72.5 metres deep. A total of 21 wells were drilled, of which 19 became oil producers. Production commenced in March 1970.

Barry Beach, a marine terminal in Victoria, is where the jackets of Gippsland Basin production platforms are built. After the onshore construction, the jackets are floated out into Bass Strait from Barry Beach on a barge. They are then positioned and completed as production platforms.

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Halibut*

COMPILATION DATE: *17/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 64 km south-southeast of Lakes Entrance, offshore Victoria; and 54 km southeast of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P5*

FIRST DISCOVERY WELL: *Halibut No.1 (Esso, 1967)*
- latitude: *38º23'56"* - longitude: *148º18'59"*
- discovery: *oil*
- date total depth reached: *July 1967*

SECOND DISCOVERY WELL: *Fortescue A-3 (Esso, 1984)*
- latitude: *38º24'31"* - longitude: *148º16'36"*
- discovery: *oil*
- date total depth reached: *January 1984*

NUMBER OF WELLS DRILLED: *1* exploration
23 development

STRUCTURE: *Anticline: north-northwest trending; eroded to the southwest; petroleum trapping mainly along the westerly dipping beds (Structure map, Plate 1)*
- areal closure: > *50 sq.km*
- vertical closure: > *130 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
10 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil	gas	*Nil*	gas/condensate
Nil	gas/oil	*8*	oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *March 1970*

PRODUCTION INFRASTRUCTURE: *24 well platform in 72.5 m of water; connected via 131.8 km long oil pipeline to crude oil stabilisation plant at Longford, Victoria*

TRAP

TRAP 1: *M-1.0 (M)*

DISCOVERY WELL(S): *Fortescue A-13*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1.0.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and lenticular; interbedded with siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2389.2 m BSL*
POROSITY: *Up to 18%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.9^{o}C/100 m*
PRESSURE GRADIENT: *9.42 KPa/m*

PETROLEUM-BEARING UNIT 2: *M-1.0.2*

PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone and siltstone: non-marine; interbedded with carbonaceous siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2405.1 m BSL*
POROSITY: *Up to 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.70 KPa/m*

TRAP

TRAP 2: *Halibut (M)*

DISCOVERY WELL(S): *Halibut No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1.1.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: non-marine; massive; interbedded with carbonaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2261.0 m BSL*
POROSITY: *Up to 28%*
PERMEABILITY*: Up to 2000 md*
TEMPERATURE GRADIENT: *3.9^{o}C/100 m*
PRESSURE GRADIENT: *9.70 KPa/m*

PETROLEUM-BEARING UNIT 2: *M-1.3.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: non-marine; massive; interbedded with carbonaceous siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2285.0 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: > 2000 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.7 KPa/m*

PETROLEUM-BEARING UNIT 3: *M-1.3.2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in M-1.3.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2314.0 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: > 2000 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.8 KPa/m*

PETROLEUM-BEARING UNIT 4: *M-1.4.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in M-1.3.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2324.5 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: > 1500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.8 KPa/m*

PETROLEUM-BEARING UNIT 5: *M-1.5.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in M-1.3.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2366.0 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: > 1500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.8 KPa/m*

PETROLEUM-BEARING UNIT 6: *M-1.6.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in M-1.3.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2436.3 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: > 1500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.8 KPa/m*

PETROLEUM-BEARING UNIT 7: *M-1.7.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in M-1.3.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2467.1 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: > 1000 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 8: *M-1.8.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in M-1.3.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2506.1 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: > 1000 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

NOTES ON DEVELOPMENTS

COBIA No. 2: a subsea production system – the first of its type for Australia . . . . . .

Prior to 1979, discoveries of petroleum in the Gippsland Basin were developed exclusively by the use of conventional platforms. Cobia No. 2, the first subsea production system in Australia, was brought on stream on June 30, 1979.

The subsea production system comprised five significant elements: downhole equipment; Christmas tree; flowlines; platform facilities; and control system.

The Cobia No. 2 Christmas tree was located in water 73 metres deep and was connected to the Mackerel platform by a flowline 4.4 km long.

The Cobia No. 2 subsea production system was dismantled after completion of the Cobia production platform in April 1983.

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Cobia*

COMPILATION DATE: *06/04/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 68 km south-southeast of Lakes Entrance, offshore Victoria; and 6 km south of Halibut accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L5*

DISCOVERY WELL: *Cobia No.1 (Esso, 1972)*
- latitude: *38º27'26"* - longitude: *148º17'01"*
- discovery: *oil*
- date total depth reached: *August 1972*

NUMBER OF WELLS DRILLED: *2* exploration
13 development

STRUCTURE: *Anticline: south-southwest trending; eroded to the north; partly separated from the Halibut structure by an east-west trending erosional channel; petroleum is trapped along the southwest dipping beds (Structure map, Plate 1)*
- areal closure: *> 35 sq.km*
- vertical closure: *> 60 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
4 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*4* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *June 1979, via Cobia-2 sub-sea production facility;*

April 1983: via Cobia platform.

PRODUCTION INFRASTRUCTURE: *Cobia: 21 well platform in 78 m of water; connected via a 4 km long oil pipeline to Halibut platform.*
Only 13 of the 21 Cobia platform wells are used for production of oil from the Cobia accumulation; the remaining 8 Cobia platform wells are used for production of oil from the adjacent Fortescue accumulation.

Cobia-2 sub-sea production facility was dismantled soon after the setting up of the Cobia platform in 1983.

TRAP

TRAP 1: *Cobia (M)*

DISCOVERY WELL(S): *Cobia No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1.1.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: non-marine; carbonaceous, occasionally pyritic and glauconitic; interbedded with siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2391.5 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: Up to 700 md*
TEMPERATURE GRADIENT: *3.9^{o}C/100 m*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *M-1.3.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in M-1.1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2433.5 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: > 200 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *M-1.4.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in M-1.1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2455.0 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: Up to 200 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 4: *M-1.5.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in M-1.1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2489.5 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: > 200 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

All the Bass Strait platforms have special safety measures. In the unlikely event of an escape of gas or a fire, the wells would be shut off, water or chemical foam would automatically cover the platform to kill the fire, horns would blare, and lights would flash. These safety measures mean most emergencies can be quickly brought under control. If the workers do have to leave the platform they report to their safety escape capsule, called a Brucker. Bruckers can travel over the sea even if there is burning oil on the water. They are stocked with emergency equipment and food.

Fig. 21 Brucker escape capsule
(By courtesy of Esso Australia Ltd and BHP Petroleum Pty Ltd)

NOTES ON DEVELOPMENTS

MACKEREL No. A-14: a very high angle well . . . . . .

In the early 1970s the location of Bass Strait production platforms was determined by using a 45% to 50% angle of deviation limit for directional wells.

This limit was gradually extended with each platform until a very significant change was achieved with the Mackerel No. A-14 well drilled with an average deviation angle of 69%.

The history of Mackerel No. A-14 begin in 1973 when the Mackerel No. 4 exploration well was drilled with the objective of evaluating the Mackerel southern fault block. While the well encountered a significant oil column, there was much uncertainty as to the true geological structure of the fault block. It is believed that either minimum or no communication exists between the oil trapped by the fault block and the oil contained in the main Mackerel field being drained by the Mackerel A platform.

Feasibility studies indicated that the most economical methods of producing this oil was either through a subsea completion, similar to Cobia No. 2, or through a very high angle well drilled from the Mackerel A platform.

The Mackerel No. A-14 well achieved a combination of extremely high angle (69%), together with deep true vertical depth of approximately 2400 metres by drilling 5200 metres of directional hole.

Production from the well commenced in November 1979.

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Mackerel*

COMPILATION DATE: *17/07/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 73 km south-southeast of Lakes Entrance, offshore Victoria; and 10 south of Halibut accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L5*

DISCOVERY WELL: *Mackerel No.1 (Esso, 1969)*
- latitude: *38º28'54"* - longitude: *148º21'26"*
- discovery: *oil*
- date total depth reached: *April 1969*

NUMBER OF WELLS DRILLED: *1* exploration
21 development

STRUCTURE: *Anticline: north-northeast trending; faulted by major northwest-southeast trending faults (Structure map, Plate 1)*
- areal closure: *> 27 sq.km*
- vertical closure: *> 95 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*1* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *December 1977*

PRODUCTION INFRASTRUCTURE: *18 well platform in 92.7 m of water; connected via a 8 km long pipeline to Halibut platform*

Fig. 22 Drilling crew working on the Mackerel platform
(By courtesy of Esso Australia Ltd and BHP Petroleum Pty Ltd)

TRAP

TRAP 1: *Mackerel (L)*

DISCOVERY WELL(S): *Mackerel No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1**

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: non-marine; interbedded with carbonaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2377.8 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: > 2000 md*
TEMPERATURE GRADIENT: *3.9^{o}C/100 m*
PRESSURE GRADIENT: *10.24 KPa/m*

NOTES ON DEVELOPMENTS

FLOUNDER: an abnormal pressure zone . . . . . .

In August 1968 drilling on the Flounder prospect had to be suspended when high pressure fluids were encountered.

In order to control the high pressure, drill-muds up to 30 percent heavier than normal were used. Despite this, wireline logging of the well was not possible.

As a result, the operator suspended drilling because equipment in use was not considered adequate for safety, and the rig was moved to another prospect.

Drilling of the Flounder prospect resumed in March 1969. Since then over 22 wells have been drilled, resulting in delineation of another major oil and gas accumulation in the Gippsland Basin.

Production of oil from Flounder commenced in December 1984.

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Flounder*

COMPILATION DATE: *08/04/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 60 km offshore Victoria; and 15 km north-east of the Halibut accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L4, Vic/L5, Vic/L6, Vic/11*

FIRST DISCOVERY WELL: *Flounder No.1 (Esso, 1968)*
- latitude: *38º18'32"* - longitude: *148º25'29"*
- discovery: *oil and gas*
- date total depth reached: *September 1968*

SECOND DISCOVERY WELL: *Flounder No.2 (Esso, 1969)*
- latitude: *38º19'17"* - longitude: *148º26'53"*
- discovery: *oil*
- date total depth reached: *March 1969*

THIRD DISCOVERY WELL: *Flounder No.4 (Esso, 1973)*
- latitude: *38º18'25"* - longitude: *148º29'45"*
- discovery: *oil*
- date total depth reached: *January 1973*

FOURTH DISCOVERY WELL: *Flounder No.6 (Esso, 1977)*
- latitude: *38º19'07"* - longitude: *148º26'08"*
- discovery: *gas*
- date total depth reached: *December 1977*

FIFTH DISCOVERY WELL: *Flounder A-1 (Esso, 1984)*
- latitude: *38º18'56"* - longitude: *148º26'56"*
- discovery: *gas*
- date total depth reached: *August 1984*

SIXTH DISCOVERY WELL: *Flounder A-26 (Esso, 1984)*
- latitude: *38º18'56"* - longitude: *148º26'56"*
- discovery: *oil*
- date total depth reached: *September 1984*

SEVENTH DISCOVERY WELL: *Flounder A-14 (Esso, 1984)*
- latitude: *38º18'56"* - longitude: *148º26'56"*
- discovery: *oil*
- date total depth reached: *November 1984*

EIGHT DISCOVERY WELL: *Flounder A-10 (Esso, 1985)*
- latitude: *38º18'56"* - longitude: *148º26'56"*
- discovery: *oil*
- date total depth reached: *September 1985*

NINTH DISCOVERY WELL: *Flounder A-2 (Esso, 1985)*
- latitude: *38º18'56"* - longitude: *148º26'56"*
- discovery: *oil*
- date total depth reached: *October 1985*

TENTH DISCOVERY WELL: *Flounder A-4 (Esso, 1986)*
- latitude: *38º18'56"* - longitude: *148º25'56"*
- discovery: *oil*
- date total depth reached: *July 1986*

ELEVENTH DISCOVERY WELL: *Flounder A-22 (Esso, 1986)*
- latitude: *38º18'05"* - longitude: *148º26'05"*
- discovery: *oil*
- date total depth reached: *October 1986*

NUMBER OF WELLS DRILLED: *1* exploration
22 development

STRUCTURE: *Anticline: east-northeast/west-southwest trending; cut by west-northwest trending tensional faults; the central downfaulted blocks trap the Late Cretaceous and Paleocene oil and gas; the channel fill sediments of the Flounder Formation trap the Eocene oil*
- areal closure: *> 40 sq.km*
- vertical closure: *> 100 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
5 traps
12 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
1 gas/oil	*4* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *December 1984, (oil only)*

PRODUCTION INFRASTRUCTURE: *24 well platform in 93 m of water; connected via two 15 km long pipelines (oil; gas) to Tuna platform.*

TRAP

TRAP 1: *Late Cretaceous 'Block C' (T)*

DISCOVERY WELL(S): *Flounder No.1 (oil)*

Flounder No.6 (gas)

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1.1*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing (oil only)*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; massive; minor siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2498.4 m BSL*
POROSITY: *Up to 21%*
PERMEABILITY*: > 100 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.61 KPa/m*

TRAP

TRAP 2: *Eocene (P)*

DISCOVERY WELL(S): *Flounder A-10 (P-2.1 oil)*

Flounder A-14 (P-2.2 oil)

Flounder A-26 (P-3.1 oil)

Flounder No.2 (P-3.2 oil)

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P-2.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Flounder Formation*
AGE: *Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: marine; glauconitic, pyritic and micaceous; interbedded with calcareous siltstone and claystone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2042.0 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *P-2.2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Flounder Formation*
AGE: *Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in P-2.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2057.9 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *P-3.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Flounder Formation*
AGE: *Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in P-2.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2078.0 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 4: *P-3.2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Flounder Formation*
AGE: *Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in P-2.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2094.3 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 3: *Paleocene 'Block B' (L)*

DISCOVERY WELL(S): *Flounder A-22 (L-1 oil)*

Flounder A-4 (L-2 oil)

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: marginal marine; pyritic and micaceous; interbedded with siltstone and claystone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2292.5 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *L-2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in L-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2412.0 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 4: *Late Cretaceous 'Block B' (T)*

DISCOVERY WELL(S): *Flounder No.1 (T-1.1 oil)*

Flounder A-1 (T-1.1 gas)

Flounder A-6 (T-1.2 oil)

Flounder A-22 (T-8 oil)

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1.1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; massive; interbedded with minor siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2496.0 m BSL*
POROSITY: *Up to 30%*
PERMEABILITY*: > 60 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.61 KPa/m*

PETROLEUM-BEARING UNIT 2: *T-1.2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in T-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2507.5 m BSL*
POROSITY: *Up to 30%*
PERMEABILITY*: > 60 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *T-4*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in T-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2644.5 m BSL*
POROSITY: *Up to 30%*
PERMEABILITY*: > 60 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 4: *T-8*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in T-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2723.5 m BSL*
POROSITY: *Up to 30%*
PERMEABILITY*: > 60 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 5: *Late Cretaceous 'Block A' (T)*

DISCOVERY WELL(S): *Flounder No.1 (oil)*

Flounder No.4 (gas)

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1.1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; interbedded with minor siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2506.0 m BSL*
POROSITY: *Up to 21%*
PERMEABILITY*: > 100 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

NOTES ON DEVELOPMENTS

SNAPPER: the development of 'pancake' type oil column . . . . . .

Oil columns of 2 to 15 metres overlying aquifers and underlying a large gas cap are generally referred to as 'pancake' type oil columns. These are common in Gippsland Basin accumulations.

Following the construction and placement of the Snapper platform in 1981, it was recognised by the operator that full gas deliverability was not required initially as the Marlin and Barracouta accumulations could meet existing demand. This situation enabled the Snapper development wells to be drilled with the initial objective of developing the thin 'pancake' oil column underlying the large gas cap.

Several high angle wells were required for oil production which presented drilling and logging problems. However, 16 of the 21 wells drilled succeeded in intersecting oil zones suitable for production. Subsequent performance of the oil wells was encouraging.

Snapper, the first development of a 'pancake' oil column in the Gippsland Basin, has provided valuable and encouraging experience in the well completions and surface equipment required for this type of operation.

Production of oil and gas commenced in July 1981.

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Snapper*

COMPILATION DATE: *06/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 36 km south of Lakes Entrance, offshore Victoria; and 27 km northeast of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L10*

FIRST DISCOVERY WELL: *Snapper No.1 (Esso, 1969)*
- latitude: *38º12'03"* - longitude: *148º00'00"*
- discovery: *gas*
- date total depth reached: *December 1968*

SECOND DISCOVERY WELL: *Snapper A-21 (Esso, 1981)*
- latitude: *38º11'44"* - longitude: *148º01'27"*
- discovery: *oil and gas*
- date total depth reached: *August 1981*

THIRD DISCOVERY WELL: *Snapper A-18 (Esso, 1982)*
- latitude: *38º11'44"* - longitude: *148º01'27"*
- discovery: *oil*
- date total depth reached: *June 1982*

FOURTH DISCOVERY WELL: *Snapper A-6 (Esso, 1983)*
- latitude: *38º11'44"* - longitude: *148º01'27"*
- discovery: *oil*
- date total depth reached: *November 1982*

FIFTH DISCOVERY WELL: *Snapper A-8 (Esso, 1983)*
- latitude: *38º11'44"* - longitude: *148º01'27"*
- discovery: *oil/gas*
- date total depth reached: *February 1983*

SIXTH DISCOVERY WELL: *Snapper A-27 (Esso, 1986)*
- latitude: *38º11'44"* - longitude: *148º01'27"*
- discovery: *oil*
- date total depth reached: *June 1986*

NUMBER OF WELLS DRILLED: *6* exploration
26 development

STRUCTURE: *Anticline: east-northeast/west-southwest trending; faulted by major northwest-southeast trending faults (Structure map, Plate 2)*
- areal closure: < *140 sq.km*
- vertical closure: > *200 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:

5 traps

16 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

1	gas	*Nil*	gas/condensate
5	gas/oil	*4*	oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *July 1981*

PRODUCTION INFRASTRUCTURE: *27 well platform in 54.9 m of water; connected via a 15 km long oil pipeline to Marlin platform, and via a 38.8 km long gas pipeline to gas processing plant at Longford, Victoria*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): *Snapper No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1.0*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Gurnard Formation*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine; glauconitic; interbedded with marine siltstone and marl*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1196.0 m BSL*
POROSITY: *Up to 24%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.25 KPa/m*

PETROLEUM-BEARING UNIT 2: *N-1.1*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1220.0 m BSL*
POROSITY: *Up to 24%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.25 KPa/m*

PETROLEUM-BEARING UNIT 3: *N-1.2*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1259.0 m BSL*
POROSITY: *> 20%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 4: *N-1.3*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1291.0 m BSL*
POROSITY: *> 20%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 5: *N-1.4*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing (gas only)*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1325.0 m BSL*
POROSITY: *> 20%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 6: *N-1.5*
PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1347.0 m BSL*
POROSITY: *> 20%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 7: *N-1.6*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Middle Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1375.0 m BSL*
POROSITY: *> 20%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 8: *N-1.7*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Middle Lower Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1412.0 m BSL*
POROSITY: *> 20%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 9: *N-1.8*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Middle Lower Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1432.0 m BSL*
POROSITY: *> 20%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Eocene (N)*

DISCOVERY WELL(S): *Snapper A-18*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1.9*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; interbedded with carbonaceous siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1417.0 m BSL*
POROSITY: *Up to 24%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.25 KPa/m*

TRAP

TRAP 3: *Eocene (N)*

DISCOVERY WELL(S): *Snapper A-27 (M-1)*

Snapper A-6 (M-2)

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and partly calcareous; interbedded with siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1507.0 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.25 KPa/m*

PETROLEUM-BEARING UNIT 2: *M-2**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in M-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1666.0 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: > 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.14 KPa/m*

TRAP

TRAP 4: *Paleocene (L)*

DISCOVERY WELL(S): *Snapper A-21 (L-1)*

Snapper A-6 (L-2)

Snapper A-8 (L-3)

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing (oil only)*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (Upper L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with carbonaceous and calcareous siltstone; minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1656.0 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: Up to 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.14 KPa/m*

PETROLEUM-BEARING UNIT 2: *L-2**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing (oil only)*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (Upper L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1831.0 m BSL*
POROSITY: *Up to 24%*
PERMEABILITY*: Up to 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.14 KPa/m*

PETROLEUM-BEARING UNIT 3 *L-3**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing (oil only)*
FORMATION: *Latrobe Group*
AGE: *Late-Early Paleocene (Lower L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1970.0 m BSL*
POROSITY: *Up to 24%*
PERMEABILITY*: Up to 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 5: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Snapper A-8*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2140.9 m BSL*
POROSITY: *> 15%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

NOTES ON DEVELOPMENTS

TUNA: what's in a name . . . .

In the offshore Gippsland Basin there are over forty petroleum accumulations that are named after species of fish. The Tuna accumulation bears a name of one of these (Thunnus albacares).

After a platform is placed in Bass Strait it soon becomes covered with marine organisms such as seaweed, shellfish etc. Seals can be seen sunning themselves on the mooring buoys or swimming around the platform jackets.

In order to keep the plants, birds, fish and seals safe, the platform operators have safety equipment on the platform so as to make certain that the surrounding environment is protected from environmental hazards.

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Tuna*

COMPILATION DATE: *23/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Gas and oil*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 42 km offshore Victoria; and 19 km northeast of marlin accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L4, Vic/L9*

FIRST DISCOVERY WELL: *Tuna No.1 (Esso, 1968)*
- latitude: *38º10'25"* - longitude: *148º25'03"*
- discovery: *oil and gas*
- date total depth reached: *October 1968*

SECOND DISCOVERY WELL: *Tuna No.3 (Esso, 1970)*
- latitude: *38º10'10"* - longitude: *148º26'50"*
- discovery: *oil and gas*
- date total depth reached: *April 1970*

THIRD DISCOVERY WELL: *Tuna A-5 (Esso, 1979)*
- latitude: *38º10'16"* - longitude: *148º25'06"*
- discovery: *oil and gas*
- date total depth reached: *December 1978*

FOURTH DISCOVERY WELL: *Tuna A-8 (Esso, 1979)*
- latitude: *38º10'16"* - longitude: *148º25'07"*
- discovery: *oil*
- date total depth reached: *February 1979*

FIFTH DISCOVERY WELL: *Tuna A-7 (Esso, 1979)*
- latitude: *38º10'16"* - longitude: *148º25'06"*
- discovery: *oil*
- date total depth reached: *October 1979*

SIXTH DISCOVERY WELL: *Tuna A-17 (Esso, 1981)*
- latitude: *38º10'16"* - longitude: *148º25'06"*
- discovery: *oil*
- date total depth reached: *September 1980*

SEVENTH DISCOVERY WELL: *Tuna A-6 (Esso, 1981)*
- latitude: *38º10'16"* - longitude: *148º25'60"*
- discovery: *oil*
- date total depth reached: *November 1981*

EIGHTH DISCOVERY WELL: *Tuna No.4 (Esso, 1984)*
- latitude: *38º10'16"* - longitude: *148º25'06"*
- discovery: *oil and gas*
- date total depth reached: *July 1984*

NUMBER OF WELLS DRILLED: *4* exploration
18 development

STRUCTURE: *Anticline: east-northeast trending; truncated along the northern flank; faulted along the southern flank by northwest-southeast trending faults (Structure map, Plate 3)*
- areal closure: > *7 sq.km*
- vertical closure: > *80 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
6 traps
17 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil	gas	*Nil*	gas/condensate
5	gas/oil	*Nil*	oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *May 1979*

PRODUCTION INFRASTRUCTURE: *18 well platform in 58.5 m of water; connected via two 19.3 km long pipelines (oil and gas) to marlin platform*

TRAP

TRAP 1: *Eocene (M)*

DISCOVERY WELL(S): *Tuna No.1 (M-1.1; M-1.2)*

Tuna No.3 (M-2)

Tuna A-17 (M-3)

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1.1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine to marginal marine; interbedded with siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1301.2 m BSL*
POROSITY: *Average 25%*
PERMEABILITY*: > 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.06 KPa/m*

PETROLEUM-BEARING UNIT 2: *M-1.2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in M-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1377.4 m BSL*
POROSITY: *Average 25%*
PERMEABILITY*: > 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.06 KPa/m*

PETROLEUM-BEARING UNIT 3: *M-2**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: non-marine; massive; poorly cemented; interbedded with thin lenses of siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1396.9 m BSL*
POROSITY: *Average 24%*
PERMEABILITY*: Up to 2 darcies*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *11.08 KPa/m*

PETROLEUM-BEARING UNIT 4: *M-3**

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in M-2*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1476.8 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Paleocene (L)*

DISCOVERY WELL(S): *Tuna A-7 (A-7)*

Tuna A-6 (A-6)

Tuna A-5 (L-110)

Tuna A-8 (L-95/100; L-150/160; L-1.3; L-350/400)

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *1-6**

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: non-marine; interbedded with siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1601.5 m BSL*
POROSITY: *Up to 15%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *A-7**

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: as above in A-6*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1615.9 m BSL*
POROSITY: *Up to 15%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *L-95/100*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: non-marine; massive and poorly cemented; interbedded with siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1631.1 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: > 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.28 KPa/m*

PETROLEUM-BEARING UNIT 4: *L-110*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: as above in L-95/100*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1684.4 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Up to 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.28 KPa/m*

PETROLEUM-BEARING UNIT 5: *L-150/160*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: as above in L-95/100*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1672.5 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: Up to 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.28 KPa/m*

PETROLEUM-BEARING UNIT 6: *L-1.3*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: non-marine; massive; interbedded with marine and marginal marine, carbonaceous siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1735.4 m BSL*
POROSITY: *Up to 24%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 7: *L-350/400*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: as above in L-1.3*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1747.9 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 3: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Tuna No.1 (T-1)*

Tuna A-5 (T-0.5)

Tuna A-8 (T-2)

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-0.5**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: non-marine; massive; carbonaceous in parts; minor siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1879.0 m BSL*
POROSITY: *Up to 17%*
PERMEABILITY*: Up to 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.28 KPa/m*

PETROLEUM-BEARING UNIT 2: *T-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: non-marine; massive and poorly cemented; interbedded with siltstone, shale and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1916.3 m BSL*
POROSITY: *Up to 21%*
PERMEABILITY*: Up to 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.28 KPa/m*

PETROLEUM-BEARING UNIT 3: *T-2**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: as above in T-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2030.1 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Up to 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.28 KPa/m*

TRAP

TRAP 4: *Late Cretaceous West Tuna (R)*

DISCOVERY WELL(S): *Tuna No.4*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *R**

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with carbonaceous siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2367.0 m BSL*
POROSITY: *Up to 18%*
PERMEABILITY*: Up to 50 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 5: *Late Cretaceous West Tuna (S)*

DISCOVERY WELL(S): *Tuna No.4*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *S-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (N.senectus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in R*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2631.0 m BSL*
POROSITY: *Up to 15%*
PERMEABILITY*: Up to 50 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 6: *Late Cretaceous West Tuna (C)*

DISCOVERY WELL(S): *Tuna No.4*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *C**

PETROLEUM CONTENTS: *Gas and oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (C.triplex)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous; interbedded with minor siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3041.0 m BSL*
POROSITY: *Up to 12%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Bream*

COMPILATION DATE: *24/04/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Economic under development*

LOCATION: *Approximately 73 km south-southwest of Lakes Entrance, offshore Victoria; and 26 km south of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

FIRST DISCOVERY WELL: *Bream No.2 (Esso, 1969)*
- latitude: *38º31'21"* - longitude: *147º47'53"*
- discovery: *gas and oil*
- date total depth reached: *April 1969*

SECOND DISCOVERY WELL: *Bream No.3 (Esso, 1970)*
- latitude: *38º30'47"* - longitude: *147º46'15"*
- discovery: *gas and oil*
- date total depth reached: *January 1970*

NUMBER OF WELLS DRILLED: *3* exploration
Nil development

STRUCTURE: *Anticline: northeast-southwest trending; faulted by parallel faults (Structure map, Plate 3)*
- areal closure: *> 28 sq.km*
- vertical closure: *> 60 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
4 traps
10 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *27 well platform under construction in 58 m of water; the platform is to be connected via a 30 km long oil pipeline to West Kingfish platform*

TRAP

TRAP 1: *Oligocene (P)*

DISCOVERY WELL(S): *Bream No.2*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P-1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Lakes Entrance Formation*
AGE: *Oligocene (P.tuberculatus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine; friable and carbonaceous*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1806.2 m BSL*
POROSITY: *Up to 21%*
PERMEABILITY*: > 100 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.99 KPa/m*

TRAP

TRAP 2: *Eocene (N)*

DISCOVERY WELL(S): *Bream No.2*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1*

PETROLEUM CONTENTS: *Gas and oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; glauconitic and pyritic; interbedded with minor siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1865.4 m BSL*
POROSITY: *Up to 21%*
PERMEABILITY*: > 200 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *N-2*

PETROLEUM CONTENTS: *Gas and oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous, micaceous and pyritic in places; interbedded with siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1868.4 m BSL*
POROSITY: *Up to 21%*
PERMEABILITY*: > 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.54 KPa/m*

PETROLEUM-BEARING UNIT 3: *N-3*

PETROLEUM CONTENTS: *Gas and oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-2*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1925.1 m BSL*
POROSITY: *Up to 24%*
PERMEABILITY*: > 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.11 KPa/m*

TRAP

TRAP 3: *Eocene (M)*

DISCOVERY WELL(S): *Bream No.3*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and micaceous; in parts glauconitic and pyritic*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2209.3 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.70 KPa/m*

TRAP

TRAP 4: *Paleocene (L)*

DISCOVERY WELL(S): *Bream No.2*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1*

PETROLEUM CONTENTS: *Gas-oil show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and calcareous; interbedded with siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2484.7 m BSL*
POROSITY: *Up to 21%*
PERMEABILITY*: > 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.02 KPa/m*

PETROLEUM-BEARING UNIT 2: *L-2*

PETROLEUM CONTENTS: *Gas-oil show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; as above in L-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2562.1 m BSL*
POROSITY: *Up to 21%*
PERMEABILITY*: > 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.97 KPa/m*

PETROLEUM-BEARING UNIT 3: *L-3*

PETROLEUM CONTENTS: *Gas-oil show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2622.2 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: > 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.22 KPa/m*

PETROLEUM-BEARING UNIT 4: *L-4*

PETROLEUM CONTENTS: *Gas-oil show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2643.5 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: > 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.64 KPa/m*

PETROLEUM-BEARING UNIT 5: *L-5*

PETROLEUM CONTENTS: *Gas-oil show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and micaceous; interbedded with siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2726.1 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Up to 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.88 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Batfish*

COMPILATION DATE: *06/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 54 km southeast of Lakes Entrance, offshore Victoria; and 48 km south of Tuna accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L4*

DISCOVERY WELL: *Batfish No.1 (Esso, 1970)*
- latitude: *38º13'34"* - longitude: *148º24'13"*
- discovery: *gas*
- date total depth reached: *May 1970*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Domal feature; faulted to the north by a major northwest-southeast trending fault (Structure map, Plate 3)*
- areal closure: *> 7 sq.km*
- vertical closure: *> 60 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Paleocene (L)*

DISCOVERY WELL(S): *Batfish No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1**

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Middle Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: non-marine; interbedded with siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1901.0 m BSL*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Batfish No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-2**

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: as above in L-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2645.3 m BSL*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Dolphin*

COMPILATION DATE: *06/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 86 km southwest of Lakes Entrance, offshore Victoria; and 37 km southwest of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

DISCOVERY WELL: *Dolphin No.1 (Esso, 1967)*
- latitude: *38°29'32"* - longitude: *147°22'43"*
- discovery: *oil*
- date total depth reached: *November 1967*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: northeast-southwest trending; dissected by a northwest-southeast trending major fault (Structure map, Plate 3)*
- areal closure: *> 4 sq.km*
- vertical closure: *> 20 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): *Dolphin No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1**

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; unconsolidated; in parts interbedded with thin siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1209.1 m BSL*
POROSITY: *Average 26%*
PERMEABILITY*: Up to 1 darcy*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Emperor*

COMPILATION DATE: *06/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Gas and oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 25 km south of Lakes Entrance, offshore Victoria; and 11 km north of Snapper accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

DISCOVERY WELL: *Emperor No.1 (Esso, 1970)*
- latitude: *38º05'54"* - longitude: *148º00'20"*
- discovery: *gas*
- date total depth reached: *June 1970*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: east-west trending; closure fault dependent (Structure map, Plate 3)*
- areal closure: > *7 sq.km*
- vertical closure: > *40 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
3 traps
5 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (M)*

DISCOVERY WELL(S): *Emperor No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1.1*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; partly glauconitic*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1514.55 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *M-1.2*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in M-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1539.24 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Paleocene (L)*

DISCOVERY WELL(S): *Emperor No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1.1*

PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1612.69 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *L-1.2*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1757.17 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 3: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Emperor No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1*

PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1804.11 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Golden Beach*

COMPILATION DATE: *09/03/87*

OPERATOR: *B.O.C. of Australia Ltd*

TYPE: *Gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 4 km from Victoria coast; and 35 km southeast of Sale, Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P8*

DISCOVERY WELL: *Golden Beach No.1A (Beddoes, 1973)*
- latitude: *38º15'32"* - longitude: *147º25'20"*
- discovery: *gas*
- date total depth reached: *July 1967*

NUMBER OF WELLS DRILLED: *2* exploration
Nil development

STRUCTURE: *Anticline: east-west trending (Structure map, Plate 3)*
- areal closure: *> 41 sq.km*
- vertical closure: *> 40 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: Gas expansion / ?*Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): *Golden Beach No.1A*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with minor siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *633.0 m BSL*
POROSITY: *Up to 35%*
PERMEABILITY*: Average 266 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Early Cretaceous*

DISCOVERY WELL(S): *Golden Beach No.1A*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Strzelecki Gp*

PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Strzelecki Group*
AGE: *Early Cretaceous (C.triplex)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with siltstone, shale and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2730.4 m BSL*
POROSITY: *Up to 35%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Grunter*

COMPILATION DATE: *08/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Gas and oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 63 km southeast of Lakes Entrance, offshore Victoria; and 7 km northeast of the Flounder accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L11*

DISCOVERY WELL: *Grunter No.1 (Esso, 1985)*
- latitude: *36°16'21"* - longitude: *148°30'56"*
- discovery: *gas*
- date total depth reached: *November 1984*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: north-northeast trending; faulted by two parallel northwest-southeast trending faults, which provide closure to the structure*
- areal closure: *> 4 sq.km*
- vertical closure: *> 25 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
7 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Grunter No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1.2*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and pyritic in parts; interbedded with carbonaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2654.0 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *T-1.3*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in T-1.2*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2681.0 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *T-2.1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *T-1.2*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2824.0 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 4: *T-2.2**

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in T-1.2*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3019.0 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3ºC/100 m*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 5: *T-2.3*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in T-1.2*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3159.0 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 6: *T-2.4**

PETROLEUM CONTENTS: *Oil-gas show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and calcareous; interbedded with carbonaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3289.0 m BSL*
POROSITY: *Up to 17%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 7: *T-2.5**

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in T-2.4*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3401.0 m BSL*
POROSITY: *Up to 17%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Hapuku*

COMPILATION DATE: *08/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 89 km south-southeast of Lakes Entrance, offshore Victoria; and 18 km southeast of Mackerel accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

DISCOVERY WELL: *Hapuku No.1 (Esso, 1975)*
- latitude: *38º33'21"* - longitude: *148º32'56"*
- discovery: *oil*
- date total depth reached: *September 1975*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: northeast-southwest trending (Structure map, Plate 3)*
- areal closure: *> 18 sq.km*
- vertical closure: *> 60 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Paleocene (L)*

DISCOVERY WELL(S): *Hapuku No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1**

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; glauconitic and pyritic; interbedded with carbonaceous siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2811.5 m BSL*
POROSITY: *Up to 16%*
PERMEABILITY*: Up to 750 md*
TEMPERATURE GRADIENT: *2.9ºC/100 m*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Hapuku No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-2**

PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3002.3 m BSL*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Kipper*

COMPILATION DATE: *30/06/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 63 km southeast of Lakes Entrance, offshore Victoria; and 14 km east of Tuna accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P19*

DISCOVERY WELL: *Kipper No.1 (Esso, 1986)*
- latitude: *38°10'35"* - longitude: *148°35'47"*
- discovery: *oil and gas*
- date total depth reached: *March 1986*

NUMBER OF WELLS DRILLED: *1* exploration
1 development

STRUCTURE: *Anticline: a fault-dependent closure located on the lowside of a northwest-southeast trending normal fault (Esso, 1987)*
- areal closure: *Not available*
- vertical closure: *Not available*

SUBDIVISION OF PETROLEUM ACCUMULATION:
3 traps
5 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (P)*

DISCOVERY WELL(S): *Kipper No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Gurnard Formation & Latrobe Group*
AGE: *Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine to marginal marine; glauconitic and pyritic; argillaceous in parts*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *Not available*
POROSITY: *Average 21%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.3ºC/100 m*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Kipper No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine to non-marine; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *Not available*
POROSITY: *Average 21%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.8ºC/100 m*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *T-2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in T-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *Not available*
POROSITY: *Average 22%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *T-3*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in T-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *Not available*
POROSITY: *Average 21%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 3: *Late Cretaceous (S)*

DISCOVERY WELL(S): *Kipper No.1 (S-1)*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *S-1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (N.senectus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine to marginal marine; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *Not available*
POROSITY: *Average 18%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Seahorse*

COMPILATION DATE: *13/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 50 km southwest of Lakes Entrance, offshore Victoria; and 11 km north-northwest of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

DISCOVERY WELL: *Seahorse No.1 (Esso, 1979)*
- latitude: *38°11'47"* - longitude: *147°40'22"*
- discovery: *oil and gas*
- date total depth reached: *September 1978*

NUMBER OF WELLS DRILLED: *2* exploration
Nil development

STRUCTURE: *Anticline: south-southwest trending; faulted to the north by an east-west trending fault (Structure map, Plate 4)*
- areal closure: *> 6 sq.km*
- vertical closure: *> 58 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
4 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): *Seahorse No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1.1*

PETROLEUM CONTENTS: *Oil-gas show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous; interbedded with carbonaceous mudstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1406.0 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: Up to 90 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.95 KPa/m*

PETROLEUM-BEARING UNIT 2: *N-1.2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1417.0 m BSL*
POROSITY: *Up to 29%*
PERMEABILITY*: Up to 310 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *N-2.6*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in N-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1485.0 m BSL*
POROSITY: *Up to 29%*
PERMEABILITY*: Up to 125 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Eocene (P)*

DISCOVERY WELL(S): *Seahorse No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P-1*

PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with carbonaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1580.0 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Sunfish*

COMPILATION DATE: *08/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 37 km southeast of Lakes Entrance, offshore Victoria; and 11 km north of Marlin accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

FIRST DISCOVERY WELL: *Sunfish No.1 (Esso, 1974)*
- latitude: *38º08'25"* - longitude: *148º13'37"*
- discovery: *oil and gas*
- date total depth reached: *March 1974*

SECOND DISCOVERY WELL: *Sunfish No.2 (Esso, 1984)*
- latitude: *38º08'25"* - longitude: *148º13'37"*
- discovery: *oil*
- date total depth reached: *October 1983*

NUMBER OF WELLS DRILLED: *2* exploration
Nil development

STRUCTURE: *Anticline: faulted by high angle reverse faults (Structure map, Plate 4)*
- areal closure: *> 22 sq.km*
- vertical closure: *< 100 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
5 traps
7 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (P)*

DISCOVERY WELL(S): *Sunfish No.2*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early-Middle Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; massive; calcareous and pyritic; interbedded with minor siltstone, shale and limestone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1595.8 m BSL*
POROSITY: *Up to 24%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.95 KPa/m*

TRAP

TRAP 2: *Eocene (M)*

DISCOVERY WELL(S): *Sunfish No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; glauconitic and calcareous; interbedded with siltstone shale and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1696.5 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.94 KPa/m*

TRAP

TRAP 3: *Paleocene (L)*

DISCOVERY WELL(S): *Sunfish No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-2**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (Lower L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous; interbedded with siltstone, shale and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1758.0 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.93 KPa/m*

TRAP

TRAP 4: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Sunfish No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous; interbedded with siltstone and shale; minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1953.76 m BSL*
POROSITY: *Up to 17%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.96 KPa/m*

TRAP

TRAP 5: *Late Cretaceous (S)*

DISCOVERY WELL(S): *Sunfish No.1 (S-1, gas)*

Sunfish No.2 (s-1.1, oil)

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *S-1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (N.senectus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; calcareous and carbonaceous; interbedded with carbonaceous siltstone, shale and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2358.5 m BSL*
POROSITY: *Up to 17%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *S-1.1*

PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (N.senectus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as in S-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2514.0 m BSL*
POROSITY: *Up to 17%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *4.25ºC/100 m*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Tarwhine*

COMPILATION DATE: *08/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 72 km southwest of Lakes Entrance, offshore Victoria; and 18 km southeast of Golden Beach accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L1*

DISCOVERY WELL: *Tarwhine No.1 (Esso, 1982)*
- latitude: *38°24'17"* - longitude: *147°31'04"*
- discovery: *oil and gas*
- date total depth reached: *December 1981*

NUMBER OF WELLS DRILLED: 1*2* exploration
Nil development

STRUCTURE: *Anticline: northeast-southwest trending (Structure map, Plate 4)*
- areal closure: *> 5 sq.km*
- vertical closure: *> 30 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): *Tarwhine No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1**

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Middle Eocene (Middle N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; coarse in parts; interbedded with carbonaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1365.0 m BSL*
POROSITY: *Average 23%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.05 KPa/m*

TRAP

TRAP 2: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Tarwhine No.1*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1**

PETROLEUM CONTENTS: *Gas and oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; carbonaceous in parts; minor siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2635.0 m BSL*
POROSITY: *> 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.91 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *West Seahorse*

COMPILATION DATE: *14/07/87*

OPERATOR: *Lasmo Energy Australia Ltd (formerly Hudbay Oil Aust. Ltd)*

TYPE: *Oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 43 km southwest of Lakes Entrance, offshore Victoria; and 16 km east-northeast of Golden Beach accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P11*

DISCOVERY WELL: *West Seahorse No.1 (Hudbay, 1982)*
- latitude: *38°12'17"* - longitude: *147°37'21"*
- discovery: *oil*
- date total depth reached: *October 1981*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: east-northeast trending; faulted by a major east-west trending high angle reverse fault on the northern side of the anticline (Structure map, Plate 4)*
- areal closure: *> 6 sq.km*
- vertical closure: *> 40 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Subsea production well head installed*

TRAP

TRAP 1: *Eocene (M)*

DISCOVERY WELL(S): *West Seahorse No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Middle Eocene (middle N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with siltstone, shale, coal and minor dolomite*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1401.0 m BSL*
POROSITY: *Up to 31%*
PERMEABILITY*: Up to 175 md*
TEMPERATURE GRADIENT: *4.0ºC/100 m*
PRESSURE GRADIENT: *9.93 KPa/m*

PETROLEUM-BEARING UNIT 2: *M-1.1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Middle Eocene (Lower N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in M-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1490.5 m BSL*
POROSITY: *Up to 31%*
PERMEABILITY*: Up to 175 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.95 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Whiptail*

COMPILATION DATE: *17/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 18 km offshore from the Victoria coast; and 7.5 km east of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L1*

DISCOVERY WELL: *Whiptail No.1A (Esso, 1986)*
- latitude: *38°19'30"* - longitude: *147°31'09"*
- discovery: *oil*
- date total depth reached: *August 1985*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: east-west trending; faulted by northeast-southwest trending faults along the eastern part of the anticline (Structure map, Plate 4)*
- areal closure: > *1.4 sq.km*
- vertical closure: > *30 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): *Whiptail No.1A*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with stringers of siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1359.0 m BSL*
POROSITY: *Average 28%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.98 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Sperm Whale*

COMPILATION DATE: *14/07/87*

OPERATOR: *Lasmo Energy Australia Ltd (formerly Hudbay Oil Aust. Ltd)*

TYPE: *Gas and oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 38 km south-southwest of Lakes Entrance, offshore Victoria; and 13 km north-northwest of Tuna accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P11*

DISCOVERY WELL: *Sperm Whale No.1 (Hudbay, 1982)*
- latitude: *38º03'25"* - longitude: *148º21'51"*
- discovery: *gas and oil*
- date total depth reached: *January 1982*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: northeast-southwest trending; faulted along the northern flank by a major high angle reverse fault (Structure map, Plate 4)*
- areal closure: < *4 sq.km*
- vertical closure: < *60 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
3 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Early Eocene (M)*

DISCOVERY WELL(S): *Sperm Whale No.1*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1.1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; pebbly and pyritic in parts; interbedded with carbonaceous siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *795.6 m BSL*
POROSITY: *Up to 28%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *M-1.2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in M-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *822.1 m BSL*
POROSITY: *Up to 28%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *M-1.3*

PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in M-1.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *824.1 m BSL*
POROSITY: *Up to 28%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Wirrah*

COMPILATION DATE: *10/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 37 km south-southwest of Lakes Entrance, offshore Victoria; and 13 km northeast of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L2*

FIRST DISCOVERY WELL: *Wirrah No.1 (Esso, 1984)*
- latitude: *38°11'22"* - longitude: *147°48'57"*
- discovery: *oil and gas*
- date total depth reached: *November 1982*

SECOND DISCOVERY WELL: *Wirrah No.3 (Esso, 1985)*
- latitude: *38°11'49"* - longitude: *147°47'27"*
- discovery: *oil and gas*
- date total depth reached: *February 1984*

NUMBER OF WELLS DRILLED: *3* exploration
Nil development

STRUCTURE: *Anticline: north-south trending; faulted by high angle faults within the Latrobe Group*
- areal closure: *> 7 sq.km*
- vertical closure: *> 50 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
3 traps
4 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): *Wirrah No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and calcareous; interbedded with calcareous siltstone; minor shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1468.5 m BSL*
POROSITY: *Up to 24%*
PERMEABILITY*: > 100 md*
TEMPERATURE GRADIENT: *4.1ºC/100 m*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Paleocene (L)*

DISCOVERY WELL(S): *Wirrah No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; interbedded with minor siltstone and claystone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2004.0 m BSL*
POROSITY: *Up to 18%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.9ºC/100 m*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 3: *Late Cretaceous (T & R)*

DISCOVERY WELL(S): *Wirrah No.1 (T-1)*

Wirrah No.3 (R-1)

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and pyritic; interbedded with siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2553.0 m BSL*
POROSITY: *Up to 15%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.9ºC/100 m*
PRESSURE GRADIENT: *9.5 KPa/m*

PETROLEUM-BEARING UNIT 2: *R-1*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; pebbly with stringers of siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2915.0 m BSL*
POROSITY: *Up to 11%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.6ºC/100 m*
PRESSURE GRADIENT: *10.13 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Yellowtail*

COMPILATION DATE: *17/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 75 km south-southeast of Lakes Entrance, offshore Victoria; and 55 km south-southwest of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L5*

DISCOVERY WELL: *Yellowtail No.1 (Esso, 1982)*
- latitude: *38º31'34"* - longitude: *148º16'26"*
- discovery: *oil*
- date total depth reached: *November 1981*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: low relief closure on top of Latrobe Group (Structure map, Plate 5)*
- areal closure: *> 3 sq.km*
- vertical closure: *> 20 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Paleocene (L)*

DISCOVERY WELL(S): *Yellowtail No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1**

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; interbedded with calcareous siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2395.0 m BSL*
POROSITY: *Up to 18%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.8ºC/100 m*
PRESSURE GRADIENT: *9.6 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Angelfish*

COMPILATION DATE: *17/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 52 km southeast of Lakes Entrance, offshore Victoria; and 6 km southwest of Tuna accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L4*

DISCOVERY WELL: *Angelfish No.1 (Esso, 1987)*
- latitude: *38°14'42"* - longitude: *148°22'48"*
- discovery: *oil and gas*
- date total depth reached: *December 1985*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Fault-dependent closure; located on the downside of the Angelfish fault (Esso, 1987)*
- areal closure: *Not available*
- vertical closure: *Not available*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Angelfish No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; overall massive; carbonaceous and calcareous; interbedded with siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3027.3 m BSL*
POROSITY: *Average 17%*
PERMEABILITY*: Average 10 md*
TEMPERATURE GRADIENT: *3.5ºC/100 m*
PRESSURE GRADIENT: *10.1 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Baleen*

COMPILATION DATE: *14/07/87*

OPERATOR: *Lasmo Energy Australia Ltd (formerly Hudbay Oil Aust. Ltd)*

TYPE: *Gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 40 km east-southeast of Lakes Entrance, offshore Victoria; and 17 km north of the Tuna accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P11*

DISCOVERY WELL: *Baleen No.1 (Hudbay, 1982)*
- latitude: *38º00'36"* - longitude: *148º26'08"*
- discovery: *gas*
- date total depth reached: *November 1981*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: east-west trending; faulted by a high angle reverse fault (Structure map, Plate 5)*
- areal closure: > *5 sq.km*
- vertical closure: > *40 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not available*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *?Oligocene/Late Eocene (P/N)*

DISCOVERY WELL(S): *Baleen No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P/N* (* denotes multiple sands)*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *?Oligocene/Late Eocene (P.tuberculatus/N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; unconsolidated; glauconitic and limonitic; interbedded with calcareous claystone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *651.0 m BSL*
POROSITY: *Up to 30%*
PERMEABILITY*: Up to 747 md*
TEMPERATURE GRADIENT: *4.8ºC/100 m*
PRESSURE GRADIENT: *11.10 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Basker*

COMPILATION DATE: *10/03/87*

OPERATOR: *Shell Development (Australia) Pty Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 78 km southeast of Lakes Entrance, offshore Victoria; and 20 km east of Flounder accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P19*

DISCOVERY WELL: *Basker No.1 (Shell, 1983)*
- latitude: *38º18'26"* - longitude: *148º41'53"*
- discovery: *oil and gas*
- date total depth reached: *June 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: faulted; south-west trending (Structure map, Plate 5)*
- areal closure: *> 8 sq.km*
- vertical closure: *> 60 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Basker No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and calcareous; interbedded with siltstone, shale and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2962.3 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *2.4ºC/100 m*
PRESSURE GRADIENT: *9.88 KPa/m*

PETROLEUM-BEARING UNIT 2: *T-2*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with carbonaceous and calcareous siltstone, shale and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3197.0 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *2.4ºC/100 m*
PRESSURE GRADIENT: *9.9 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Flathead*

COMPILATION DATE: *17/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 56 km southeast of Lakes Entrance, offshore Victoria; and 19 km north of Tuna accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

DISCOVERY WELL: *Flathead No.1 (Esso, 1969)*
- latitude: *38º01'21"* - longitude: *148º32'04"*
- discovery: *oil*
- date total depth reached: *May 1969*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: east-west trending; faulted; closure on the upthrown side of an east-west striking wrench fault (Esso, 1969)*
- areal closure: *> 30 sq.km*
- vertical closure: *> 150 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
3 traps
3 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Oligocene (P)*

DISCOVERY WELL(S): *Flathead No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Nil*
FORMATION: *Lakes Entrance Formation*
AGE: *Oligocene (P.tuberculatus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine; unconsolidated; glauconitic; interbedded with glauconitic and calcareous siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *438.0 m BSL*
POROSITY: *Up to 35%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Eocene/Paleocene (M/L)*

DISCOVERY WELL(S): *Flathead No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M/L*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Eocene/Paleocene (M.diversus/L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; unconsolidated*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *460.0 m BSL*
POROSITY: *Up to 36%*
PERMEABILITY*: Up to 1200 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 3: *Early Cretaceous (Strzelecki Group)*

DISCOVERY WELL(S): *Flathead No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Strzelecki Gp*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Strzelecki Group*
AGE: *Early Cretaceous*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and silty; interbedded with carbonaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *467.3 m BSL*
POROSITY: *Up to 37%*
PERMEABILITY*: > 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Lakes Entrance*

COMPILATION DATE: *17/03/87*

OPERATOR: *Woodside (Lakes Entrance) Oil Co.*

TYPE: *Oil*

COMMERCIAL STATUS: *Subeconomic and suspended*

LOCATION: *Approximately 298 km east of Melbourne; and less than 2 km north of Lakes Entrance township, Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P44*

DISCOVERY WELL: *Lake Bunga No.1 (Beddoes, 1973)*
- latitude: *37°51'22"* - longitude: *148°02'24"*
- discovery: *oil*
- date total depth reached: *July 1924*

NUMBER OF WELLS DRILLED: *1* exploration
54 development

STRUCTURE: *Stratigraphic trap; basal sandy facies of the Lakes Entrance Formation is draped over a southward-plunging paleotopographic nose (Beddoes, 1973)*
- areal closure: *12.9 sq.km*
- vertical closure: *Not determined*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *None*

PRODUCTION COMMENCED: *1930*

PRODUCTION INFRASTRUCTURE: *Between 1930 and 1941 some 487 kls of heavy oil (15.7°API) was produced by pumping and bailing (no flow). This scheme was abandoned by the Victoria government in May 1946. Since then no further production took place.*

TRAP

TRAP 1: *Oligocene (P)*

DISCOVERY WELL(S): *Lake Bunga No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Suspended*
FORMATION: *Lakes Entrance Formation*
AGE: *Oligocene (P.tuberculatus)*
TRAPPING MECHANISM: *Stratigraphic*
LITHOLOGY: *Sandstone: marine; poorly cemented; calcareous, glauconitic and oolithic*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *385.8 m below ground level*
POROSITY: *Up to 36%*
PERMEABILITY*: Average < 10 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Leatherjacket*

COMPILATION DATE: *19/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 79 km east south-east of Lakes Entrance, offshore Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P19*

DISCOVERY WELL: *Leatherjacket No.1 (Esso, 1986)*
- latitude: *38º05'17"* - longitude: *148º46'42"*
- discovery: *oil*
- date total depth reached: *March 1986*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: northeast-southwest trending; faulted along the northern flank (Esso, 1987)*
- areal closure: *Not available*
- vertical closure: *Not available*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
3 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Paleocene (L)*

DISCOVERY WELL(S): *Leatherjacket No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; glauconitic and calcareous*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *743.0 m BSL*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *4.9ºC/100 m*
PRESSURE GRADIENT: *10.07 KPa/m*

PETROLEUM-BEARING UNIT 2: *L-2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *759.5 m BSL*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *4.9ºC/100 m*
PRESSURE GRADIENT: *10.4 KPa/m*

PETROLEUM-BEARING UNIT 3: *L-3*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *791.5 m BSL*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *4.9ºC/100 m*
PRESSURE GRADIENT: *10.04 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Luderick*

COMPILATION DATE: *20/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Gas and oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 65 km southwest of Lakes Entrance, offshore Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

DISCOVERY WELL: *Luderick No.1 (Esso, 1983)*
- latitude: *38°26'20"* - longitude: *147°42'57"*
- discovery: *gas and oil*
- date total depth reached: *June 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: northwest-southeast trending (Structure map, Plate 5)*
- areal closure: > *5 sq.km*
- vertical closure: > *26 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
3 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): *Luderick No.1*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-3.1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; bioturbated; interbedded with shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1811.0 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.2ºC/100 m*
PRESSURE GRADIENT: *9.8 KPa/m*

PETROLEUM-BEARING UNIT 2: *N-3.2*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene j(N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in 3.1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1821.0 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.2ºC/100 m*
PRESSURE GRADIENT: *9.7 KPa/m*

TRAP

TRAP 2: *Eocene (M)*

DISCOVERY WELL(S): *Luderick No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; calcareous and carbonaceous; interbedded with siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1997.0 m BSL*
POROSITY: *Up to 23%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.2ºC/100 m*
PRESSURE GRADIENT: *9.78 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Manta*

COMPILATION DATE: *18/06/87*

OPERATOR: *Shell Development (Australia) Pty Ltd*

TYPE: *Oil and gas; gas condensate*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 78 km southeast of Lakes Entrance, offshore Victoria; and 22 km south-southwest of Leatherjacket accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P19*

DISCOVERY WELL: *Manta No.1 (Shell, 1984)*
- latitude: *38º16'27"* - longitude: *148º43'19"*
- discovery: *oil and gas; gas/condensate*
- date total depth reached: *February 1984*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: southward trending closure; faulted by a major east-west trending fault (Structure map, Plate 5)*
- areal closure: *> 10 sq.km*
- vertical closure: *> 70 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Cretaceous (T)*

DISCOVERY WELL(S): *Manta No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-2**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: continental; interbedded with siltstone, claystone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2585.0 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Late Cretaceous (S)*

DISCOVERY WELL(S): *Manta No.1*

CONTENTS: *Gas/condensate*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *S-1*

PETROLEUM CONTENTS: *Gas/condensate*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (N.senectus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: continental; interbedded with siltstone, claystone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3245.0 m BSL*
POROSITY: *Up to 13%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Omeo*

COMPILATION DATE: *20/03/87*

OPERATOR: *Australian Aquitaine Petroleum Pty Ltd*

TYPE: *Gas-oil show*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 86 km south-southwest of Lakes Entrance, offshore Victoria; and 14 km south-southwest of Bream accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P17*

DISCOVERY WELL: *Omeo No.1 (Australian Aquitaine Petroleum, 1983)*
- latitude: *38°36'45"* - longitude: *147°43'02"*
- discovery: *gas and oil*
- date total depth reached: *January 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: northwest-southeast trending; faulted along the southern flank (Structure map, Plate 5)*
- areal closure: *> 3 sq.km*
- vertical closure: *> 40 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
5 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not determined*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Omeo No.1*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1.1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with shale, siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2814.5 m BSL*
POROSITY: *Up to 19%*
PERMEABILITY*: Average 10 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.9 KPa/m*

PETROLEUM-BEARING UNIT 2: *T-1.2*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; pyritic in parts; interbedded with shale, siltstone, coal and minor conglomerate*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3042.5 m BSL*
POROSITY: *Average 15%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.9 KPa/m*

PETROLEUM-BEARING UNIT 3: *T-1.3*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous; interbedded with shale, siltstone, coal and minor conglomerate*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3059.5 m BSL*
POROSITY: *Average 12%*
PERMEABILITY*: Average 5 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.9 KPa/m*

PETROLEUM-BEARING UNIT 4: *T-1.4*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; pebbly; silica cemented; interbedded with minor shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3090.5 m BSL*
POROSITY: *Average 13%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *9.9 KPa/m*

PETROLEUM-BEARING UNIT 5: *T-1.5*

PETROLEUM CONTENTS: *Gas and oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in T-1.4*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3099.5 m BSL*
POROSITY: *Average 13%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.06 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Perch*

COMPILATION DATE: *10/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 96 km south-southwest of Lakes Entrance, offshore Victoria; and 47 km southwest of Barracouta accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

DISCOVERY WELL: *Perch No.1 (Esso, 1968)*
- latitude: *38°34'37"* - longitude: *147°19'24"*
- discovery: *oil*
- date total depth reached: *May 1968*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: southwest plunging; faulted by a major northwest-southeast trending fault (Structure map, Plate 6)*
- areal closure: *> 2 sq.km*
- vertical closure: *> 40 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (N)*

DISCOVERY WELL(S): *Perch No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; massive; glauconitic and pyritic in parts*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1228 m BSL*
POROSITY: *Average 26%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Sole*

COMPILATION DATE: *10/03/87*

OPERATOR: *Shell Development (Australia) Pty Ltd*

TYPE: *Gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 94 km southeast of Lakes Entrance, offshore Victoria; and 54 km east of Tuna accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1, Vic/P9*

DISCOVERY WELL: *Sole No.1 (Shell, 1973)*
- latitude: *38º07'01"* - longitude: *149º02'04"*
- discovery: *gas*
- date total depth reached: *February 1973*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: east-west trending; faulted by west-northwest trending faults along the northern flank (Structure map, Plate 6)*
- areal closure: > *36.0 sq.km*
- vertical closure: > *59.0 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *? Gas expansion*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (M)*

DISCOVERY WELL(S): *Sole No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; pyritic; interbedded with micaceous siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *800.8 m BSL*
POROSITY: *Up to 33%*
PERMEABILITY*: Up to 500 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *11.05 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Whiting*

COMPILATION DATE: *13/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Oil and gas*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 37 km southeast of Lakes Entrance, offshore Victoria; and 12 km north of Tuna accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/L2*

FIRST DISCOVERY WELL: *Whiting No.1 (Esso, 1983)*
- latitude: *38°14'11"* - longitude: *147°53'03"*
- discovery: *oil and gas*
- date total depth reached: *April 1983*

SECOND DISCOVERY WELL: *Whiting No.2 (Esso, 1985)*
- latitude: *38°15'05"* - longitude: *147°51'15"*
- discovery: *oil and gas*
- date total depth reached: *June 1985*

NUMBER OF WELLS DRILLED: *2* exploration
Nil development

STRUCTURE: *Anticline: northeast-southwest trending; comprising two independent anticlinal domes: Whiting "East" and Whiting "West" (Structure map, Plate 6)*
- areal closure: > *5 sq.km*
- vertical closure: > *20 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
9 traps
15 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Water drive*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Eocene (N) West*

DISCOVERY WELL(S): *Whiting No.2 (Whiting 'West')*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *N-1*

PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (N.asperus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; massive; glauconitic, calcareous and carbonaceous*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1255.0 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Eocene (P)*

DISCOVERY WELL(S): *Whiting No.2 (Whiting 'West')*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P-240*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; highly porous; interbedded with carbonaceous siltstone and coal; traces of dolomite*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1429.0 m BSL*
POROSITY: *Up to 30%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *P-250*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in P-240*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1466.5 m BSL*
POROSITY: *Up to 27%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *P-260*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in P-240*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1516.0 m BSL*
POROSITY: *Up to 30%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 3: *Eocene (M)*

DISCOVERY WELL(S): *Whiting No.2 (Whiting 'West')*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-100*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and calcareous; interbedded with carbonaceous siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1711.0 m BSL*
POROSITY: *Up to 25%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 4: *Paleocene (L)*

DISCOVERY WELL(S): *Whiting No.2 (Whiting 'West')*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-500*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous and calcareous; interbedded with carbonaceous siltstone; minor dolomite*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2607.0 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *L-500.1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-500*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2933.0 m BSL*
POROSITY: *Up to 17%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 5: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Whiting No.2 (Whiting 'West')*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1**

PETROLEUM CONTENTS: *Gas and oil*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; silty; interbedded with carbonaceous siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3029.0 m BSL*
POROSITY: *Up to 12%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 6: *Eocene (P)*

DISCOVERY WELL(S): *Whiting No.1 (Whiting 'East')*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P-250*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Eocene (P.asperopolus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; partly calcareous and carbonaceous; interbedded with minor siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1460.5 m BSL*
POROSITY: *Average 23.0%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 7: *Eocene (M)*

DISCOVERY WELL(S): *Whiting No.1 (Whiting 'East')*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *M-100*

PETROLEUM CONTENTS: *Gas and oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Early Eocene (M.diversus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; dolomitic; partly carbonaceous; interbedded with calcareous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1714.5 m BSL*
POROSITY: *Average 23.0%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 8: *Paleocene (L)*

DISCOVERY WELL(S): *Whiting No.1 (Whiting 'East')*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *L-410*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in M-100*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1858.5 m BSL*
POROSITY: *20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *L-450*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous; interbedded with siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2272.0 m BSL*
POROSITY: *19%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 3: *L-455*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-450*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2320.0 m BSL*
POROSITY: *10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 4: *L-460**

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Paleocene (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous; interbedded with siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2382.5 m BSL*
POROSITY: *Average 13%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 9: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Whiting No.1 (Whiting 'East')*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-510*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (L.balmei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in L-460*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2745.0 m BSL*
POROSITY: *Up to 17%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Bignose*

COMPILATION DATE: *10/03/87*

OPERATOR: *Shell Development (Australia) Pty Ltd*

TYPE: *Gas show*

COMMERCIAL STATUS: *Subeconomic and undeveloped*

LOCATION: *Approximately 60 km south-southeast of Lakes Entrance, offshore Victoria; and 12 km east of Flounder accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P19*

DISCOVERY WELL: *Bignose No.1 (Shell, 1983)*
- latitude: *38º21'21"* - longitude: *148º36'05"*
- discovery: *gas*
- date total depth reached: *October 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: elongated closure; breached by northwest-southeast trending faults (Shell, 1984)*
- areal closure: < *14 sq.km*
- vertical closure: *Not available*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not available*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Bignose No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with carbonaceous siltstone, claystone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3554.0 m BSL*
POROSITY: *Up to 22%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.0ºC/100 m*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Hermes*

COMPILATION DATE: *10/03/87*

OPERATOR: *Phillips Australian Oil Company*

TYPE: *Gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 83 km south-southeast of Lakes Entrance, offshore Victoria; and 7 km east of Kingfish accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P18*

DISCOVERY WELL: *Hermes No.1 (Phillips, 1983)*
- latitude: *38°35'52"* - longitude: *148°17'11"*
- discovery: *gas*
- date total depth reached: *April 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: northwest-southeast trending; faulted along the northern flank by a major northwest-southeast trending fault (Structure map, Plate 6)*
- areal closure: < *6 sq.km*
- vertical closure: > *20 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not available*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous (S)*

DISCOVERY WELL(S): *Hermes No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *S-1*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (N.senectus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous; interbedded with siltstone and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3545.9 m BSL*
POROSITY: *Up to 13%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.6ºC/100 m*
PRESSURE GRADIENT: *Not available*

PETROLEUM-BEARING UNIT 2: *S-2**

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (N.senectus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: as above in S-1*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *4352.0 m BSL*
POROSITY: *Up to 10%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *North Seaspray*

COMPILATION DATE: *10/03/87*

OPERATOR: *ARCO Ltd / Woodside (Lakes Entrance) Oil Company*

TYPE: *Gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 23 km south-southeast of Sale, Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/PEP 109*

DISCOVERY WELL: *North Seaspray No.1 (Arco / Woodside, 1963)*
- latitude: *38º17'38"* - longitude: *147º12'13"*
- discovery: *gas*
- date total depth reached: *February 1963*

NUMBER OF WELLS DRILLED: *2* exploration
Nil development

STRUCTURE: *Anticline: east-west trending; faulted along the northern flank (ARCO/Woodside, 1963)*
- areal closure: *Not available*
- vertical closure: *> 100 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not determined*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Early Cretaceous*

DISCOVERY WELL(S): *North Seaspray No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Strzelecki Gp*

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Nil*
FORMATION: *Strzelecki Group*
AGE: *Early Cretaceous*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; friable; interbedded with carbonaceous siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1148.5 m BKB*
POROSITY: *Up to 30%*
PERMEABILITY*: Up to 5 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Pelican Point*

COMPILATION DATE: *13/03/87*

OPERATOR: *Valve Oil Wells Company*

TYPE: *Oil and gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 35 km southwest of Lakes Entrance, Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *PEP/107*

DISCOVERY WELL: *Pelican Point No. 1 (Valve Oil, 1933)*
- latitude: *38º00'51"* - longitude: *147º37'30"*
- discovery: *oil and gas*
- date total depth reached: *1933*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Not available*
- areal closure: *Not available*
- vertical closure: *Not available*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not known*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Miocene*

DISCOVERY WELL(S): *Pelican Point No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Gippsland Limestone*

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Nil*
FORMATION: *Gippsland Limestone*
AGE: *Late Miocene (T.bellus)*
TRAPPING MECHANISM: *Not known*
LITHOLOGY: *Limestone: sandy and glauconitic*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *Not known*
POROSITY: *Not known*
PERMEABILITY*: Not known*
TEMPERATURE GRADIENT: *Not known*
PRESSURE GRADIENT: *Not known*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Selene*

COMPILATION DATE: *20/03/87*

OPERATOR: *Phillips Australian Petroleum Oil Company*

TYPE: *? Oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 93 km south-southeast of Lakes Entrance, offshore Victoria; and 20 km east of Kingfish accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P18*

DISCOVERY WELL: *Selene No. 1 (Phillips, 1983)*
- latitude: *38º37'25"* - longitude: *148º26'11"*
- discovery: *gas*
- date total depth reached: *February 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: northwest-southeast trending; structural-stratigraphic anomaly defined mainly within the Latrobe Group (Structure map, Plate 7)*
- areal closure: > *15 sq.km*
- vertical closure: > *80 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not determined*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Selene No.1*

CONTENTS: *? Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1*

PETROLEUM CONTENTS: *? Oil*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural/stratigraphic*
LITHOLOGY: *Sandstone: non-marine; calcareous and carbonaceous; interbedded with siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3121.0 m BSL*
POROSITY: *Up to 28%*
PERMEABILITY*: Up to 600 md*
TEMPERATURE GRADIENT: *2.86ºC/100 m*
PRESSURE GRADIENT: *9.92 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Stonefish*

COMPILATION DATE: *28/04/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Gas and oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 65 km southeast of Lakes Entrance, offshore Victoria; and 8 km northeast of Flounder accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

DISCOVERY WELL: *Stonefish No. 1 (Esso, 1973)*
- latitude: *38°15'02"* - longitude: *148°33'34"*
- discovery: *gas and oil*
- date total depth reached: *August 1973*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: faulted; part of the northeastern extension of the Halibut-Flounder anticlinal trend (Esso, 1973)*
- areal closure: *Not available*
- vertical closure: *Not available*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not determined*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Stonefish No.1*

CONTENTS: *Oil and gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1**

PETROLEUM CONTENTS: *Oil and gas*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; poorly cemented; carbonaceous; pyritic in parts; interbedded with carbonaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2661.0 m BSL*
POROSITY: *Up to 20%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Sunday Island*

COMPILATION DATE: *20/03/87*

OPERATOR: *Woodside (Lakes Entrance) Oil Company*

TYPE: *Oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 20 km southeast of Welshpool, onshore Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/PEP42*

DISCOVERY WELL: *Sunday Island No. 1 (Woodside, 1966)*
- latitude: *38º42'19"* - longitude: *146º40'11"*
- discovery: *oil*
- date total depth reached: *January 1966*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *None. The well was drilled as a stratigraphic test; targeting the possible pinch out of the Eocene and the Lower Cretaceous and Jurassic sands (Woodside, 1966)*
- areal closure: *Not available*
- vertical closure: *Not available*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not determined*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Paleocene (? M/L)*

DISCOVERY WELL(S): *Sunday Island No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *? M/L*

PETROLEUM CONTENTS: *Oil*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Paleocene (? M.diversus/L.balmei)*
TRAPPING MECHANISM: *? Stratigraphic*
LITHOLOGY: *Sandstone: non-marine; interbedded with siltstone, shale and coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *454.4 m BRT*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *10.53 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Veilfin*

COMPILATION DATE: *20/03/87*

OPERATOR: *Esso Australia Ltd*

TYPE: *Gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 60 km south-southeast of Lakes Entrance, offshore Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P1*

DISCOVERY WELL: *Veilfin No. 1 (Esso, 1984)*
- latitude: *38º25'02"* - longitude: *148º00'08"*
- discovery: *gas*
- date total depth reached: *March 1984*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: faulted; northeast-southeast trending; primary closure at the top of Latrobe Group; a secondary closure within the Latrobe Group (Esso, 1984)*
- areal closure: *Not available*
- vertical closure: *Not available*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not determined*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Veilfin No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-1**

PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.longus)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; interbedded with carbonaceous siltstone and minor coal*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3164.0 m BSL*
POROSITY: *Up to 13.5%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *3.2ºC/100m*
PRESSURE GRADIENT: *10.03 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Volador*

COMPILATION DATE: *10/03/87*

OPERATOR: *Shell Development (Australia) Pty Ltd*

TYPE: *Gas and oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 76 km southeast of Lakes Entrance, offshore Victoria; and 14 km southeast of Flounder accumulation*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/P19*

DISCOVERY WELL: *Valador No. 1 (Shell, 1983)*
- latitude: *38º25'28"* - longitude: *148º32'36"*
- discovery: *gas and oil*
- date total depth reached: *April 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: southwest-northeast trending (Structure map, Plate 7)*
- areal closure: > *13 sq.km*
- vertical closure: > *60 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not determined*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous (T)*

DISCOVERY WELL(S): *Volador No.1*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *T-2**

PETROLEUM CONTENTS: *Gas and oil*
PRODUCTION STATUS: *Nil*
FORMATION: *Latrobe Group*
AGE: *Late Cretaceous (T.lilliei)*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: continental; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3725.0 m BSL*
POROSITY: *Up to 15%*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *12.55 KPa/m*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Wellington Park*

COMPILATION DATE: *20/03/87*

OPERATOR: *Woodside (Lakes Entrance) Oil Company*

TYPE: *Oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 40 km southwest of Bairnsdale, onshore Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *Vic/PEP/44*

DISCOVERY WELL: *Wellington Park No.1 (Woodside, 1962)*
- latitude: *38º08'25"* - longitude: *147º22'30"*
- discovery: *oil*
- date total depth reached: *April 1962*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: east-west trending; closure against a fault on the north flank (Woodside, 1962)*
- areal closure: *Not available*
- vertical closure: *Not available*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not determined*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Late Cretaceous*

DISCOVERY WELL(S): *Wellington Park No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *? Strzelecki Gp*

PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *? Strzelecki Group*
AGE: *Early Cretaceous*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: non-marine; carbonaceous; partly calcareous; interbedded with carbonaceous siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2249.0 m BKB*
POROSITY: *Up to 5.8%*
PERMEABILITY*: < 1 md*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Woodside-1*

COMPILATION DATE: *23/03/85*

OPERATOR: *Woodside (Lakes Entrance) Oil Company*

TYPE: *? Gas and oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 22.5 km southeast of Yarram, onshore Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *PEP/103*

DISCOVERY WELL: *Woodside No.1 (Woodside, 1955)*
- latitude: *38°35'34"* - longitude: *146°56'10"*
- discovery: *? gas and oil*
- date total depth reached: *1955*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Not known*
- areal closure: *Not known*
- vertical closure: *Not known*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not determined*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Early Cretaceous*

DISCOVERY WELL(S): *Woodside No.1*

CONTENTS: *? Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *? Latrobe Gp*

PETROLEUM CONTENTS: *? Gas and oil*
PRODUCTION STATUS: *Nil*
FORMATION: *? Latrobe Group*
AGE: *Early Cretaceous*
TRAPPING MECHANISM: *Not known*
LITHOLOGY: *Not known*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1350.2 m BKB*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Early Cretaceous*

DISCOVERY WELL(S): *Woodside No.1*

CONTENTS: *? Gas and oil show*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *? Strzelecki Gp*

PETROLEUM CONTENTS: *? Gas and oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *? Strzelecki Group*
AGE: *Early Cretaceous*
TRAPPING MECHANISM: *Not known*
LITHOLOGY: *Not known*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1530.7 m BKB*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Woodside-2*

COMPILATION DATE: *23/03/87*

OPERATOR: *Woodside (Lakes Entrance) Oil Company*

TYPE: *? Gas and oil*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 20 km southeast of Yarram, onshore Victoria*

STATE: *Victoria*

PETROLEUM TITLE(S): *PEP/103*

DISCOVERY WELL: *Woodside-2 (Woodside, 1957)*
- latitude: *38º37'32"* - longitude: *146º53'52"*
- discovery: *? gas and oil*
- date total depth reached: *1957*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Not known*
- areal closure: *Not available*
- vertical closure: *Not available*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:

Nil gas	*Nil* gas/condensate
Nil gas/oil	*Nil* oil

DRIVE MECHANISM: *Not determined*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

TRAP

TRAP 1: *Early Cretaceous*

DISCOVERY WELL(S): *Woodside No.2*

CONTENTS: *Gas and oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *? Latrobe Gp*

PETROLEUM CONTENTS: *Nil*
PRODUCTION STATUS: *? Gas and oil*
FORMATION: *? Latrobe Group*
AGE: *Early Cretaceous*
TRAPPING MECHANISM: *Not known*
LITHOLOGY: *Not known*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1544.1 m BKB*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

TRAP

TRAP 2: *Early Cretaceous*

DISCOVERY WELL(S): *Woodside No.2*

CONTENTS: *? Gas and oil show*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *? Strzelecki Gp*

PETROLEUM CONTENTS: *? Gas and oil*
PRODUCTION STATUS: *Nil*
FORMATION: *? Strzelecki Group*
AGE: *Early Cretaceous*
TRAPPING MECHANISM: *Not known*
LITHOLOGY: *Not known*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1717.5 m BKB*
POROSITY: *Not available*
PERMEABILITY*: Not available*
TEMPERATURE GRADIENT: *Not available*
PRESSURE GRADIENT: *Not available*

ACKNOWLEDGEMENTS

We acknowledge the co-operation and assistance provided by the Department of Industry, Technology and Resources, Victoria and the operators within the Gippsland Basin permits: Esso Australia Ltd; BHP Petroleum Pty Ltd; Shell Development (Aust.) Pty Ltd; Phillips Australian Oil Company; Lasmo Energy Australia Ltd; and Australian Aquitaine Petroleum Pty Ltd.

In particular we would like to thank Mssrs Greg Short, Mike Horden, Mark Sloane, Rod Limbert and Brian Burns (Esso); Mr Bruce Thomas and Dr Keith Jackson (Shell); Mssrs Dave McDonald and Matthew Buttrick (Lasmo); Mr F.W. Vollenweider (Phillips); Mr Rene Vernet (Aquitaine); Mr Barry Hocking (BHP); Professor Allan Cook (University of Wollongong); and Dr John Saxby (CSIRO), for their part in providing us with proprietary and other data.

Special acknowledgement is due to BMR's Drs Ian Lavering and Trevor Powell for their review of the manuscript.

We would also like to acknowledge the assistance of our BMR colleagues - Brian McKay, John White, Paul Winchester, Shige Miyazaki, Rob de Nardi, Mitch Ellis, Graeme Morrison, Denis Wright and Tun U Maung.

The Figures and Plates were drawn by Joanne Jenkins, Richard Carson, Ken Barrett and Rex Bates. The graphic design by Mary Silver, the manuscript was typed by Elizabeth Walker and Felicity Evans, and re-typed by Annette Barker.

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ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC., 1970 - Bream No. 3 well completion report (unpublished).

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Accumulation: a general term representing all petroleum finds irrespective of their commercial potential. An accumulation may comprise single or multiple petroleum traps all grouped on, or related to, the same individual geological structure and/or stratigraphic position.

Condensate: a liquid mixture consisting of pentanes and heavier hydrocarbons that are recoverable from a gas well through a surface-separating facility.

Crude oil: a mixture of hydrocarbons that existed in the liquid phase in underground rock formations, and remains liquid at atmospheric pressure after passing through a surface-separating facility.

Economic accumulation: a petroleum accumulation which has been declared commercial by the operator.

Liquid petroleum gas (LPG): a liquid mixture consisting of all the propane and butane that are recoverable from a gas well through a surface-separating facility.

Natural gas: a mixture of hydrocarbons and non-hydrocarbons which exist as a gas in underground rock formations.

Natural-gas liquids: a liquid mixture of LPG and condensate.

Petroleum: a gaseous and/or liquid mixture of a great many hydrocarbons and hydrocarbon compounds occurring naturally in rocks.

Petroleum-bearing unit: an interval, containing petroleum, that can be distinguished on one or more characters (e.g. lithology, stratigraphic zone, etc).

Sales gas: a mixture of methane and ethane and up to 3 per cent of carbon dioxide.

Subeconomic accumulation: a petroleum accumulation that is deemed by the operator to have significant petroleum reserves, but which has not yet been declared economically viable.

Trap: any geological condition (structural or stratigraphic, or both) which prevents the vertical or lateral movements of gaseous or liquid petroleum.

Uneconomic accumulation: a petroleum accumulation (generally a show only) that is deemed by the operator to be volumetrically insignificant and most probably non-recoverable.

DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

COMPILED BY S. OZIMIC, E. NICHOLAS & L. PAIN IN CO-OPERATION WITH ESSO (AUST) LTD., SHELL DEVELOPMENT (AUST) PTY LTD, PHILLIPS AUSTRALIAN OIL COMPANY CO, LASMO ENERGY AUSTRALIA LTD, AUSTRALIAN AQUITAINE PETROLEUM PTY LTD AND DEPARTMENT OF INDUSTRY, TECHNOLOGY AND RESOURCES, VICTORIA.

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AUSTRALIAN PETROLEUM ACCUMULATIONS

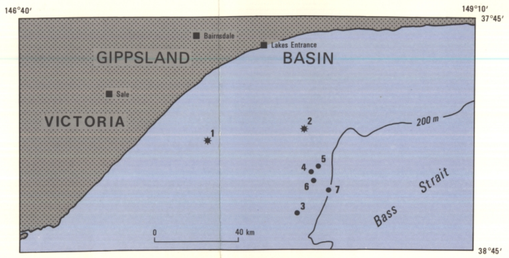
GIPPSLAND BASIN

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

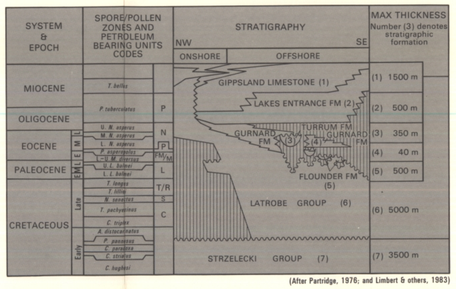
STATUS: ECONOMIC AND DEVELOPED

LOCALITY MAP NUMBER	1	2	3	4	5	6	7
ACCUMULATION	BARRACOUTA	MARLIN	KINGFISH	FORTESCUE	HALIBUT —	COBIA	MACKEREL
TRAP	Eocene (N); Eocene (M); Paleocene (L); L. Cret (T); L. Cret (S)	Eocene (N); Eocene (M); Marlin/Turrum Paleocene (L)	Intra-Gurnard (P); West Kingfish (M); Kingfish (M)	Fortescue 'West' (FM); Fortescue 'Central' (FM); Fortescue 'East' (FM)	M-1.0 (M); Halibut (M)		Cobia (M); Mackerel (L)
PETROLEUM-BEARING UNIT	N-1; N-4; N-5; N-6; M-1; L-1*; T-1*; S-1*	N-1.1*; N-1.2; N-1.3; N-1.4; N-1.5; M-1; L-0; L-1*; L-2*	P-1.1; M-1.2; M-1.3; M-1.4; M-1.5; M-1.6; M-1.7	FM-1.0; FM-1.1; FM-1.2U; FM-1.2L; FM-1.3; FM-1.4	M-1.0.1; M-1.0.2; M-1.1.1; M-1.3.1; M-1.3.2; M-1.4.1; M-1.5.1; M-1.6.1; M-1.7.1; M-1.8.1		M-1.1.1; M-1.3.1; M-1.4.1; M-1.5.1; L-1*
PETROLEUM CONTENT	* Multiple sands; Oil; Gas-oil show; Gas; Oil/Gas; Oil show						

LOCALITY MAP

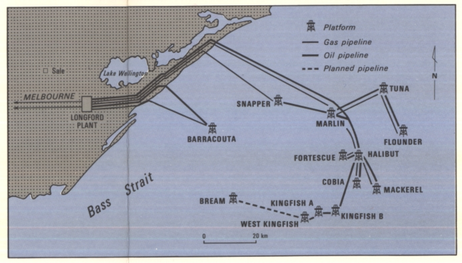


STRATIGRAPHY



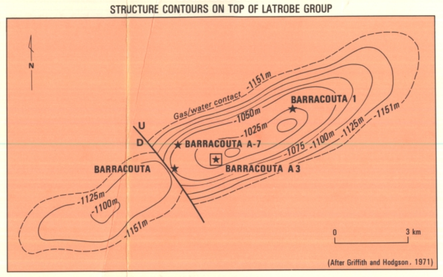
(After Partridge, 1976; and Limbert & others, 1983)

PETROLEUM PRODUCING SYSTEMS



BARRACOUTA

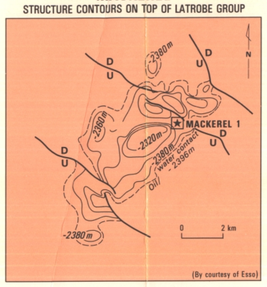
STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



(After Griffith and Hodgson, 1971)

MACKEREL

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



(By courtesy of Esso)

STRUCTURES

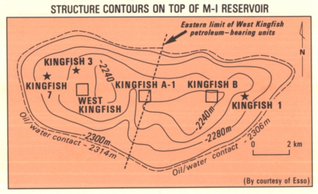
★ *Discovery well*

□ *Platform*

— *Fault*

KINGFISH

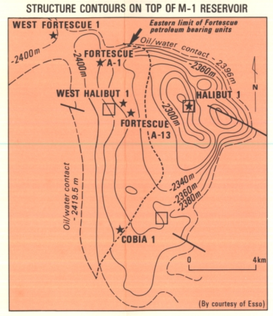
STRUCTURE CONTOURS ON TOP OF M-I RESERVOIR



(By courtesy of Esso)

FORTESCUE-HALIBUT-COBIA

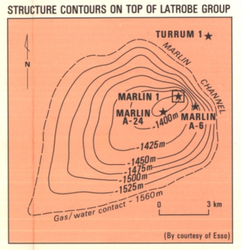
STRUCTURE CONTOURS ON TOP OF M-1 RESERVOIR



(By courtesy of Esso)

MARLIN

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



(By courtesy of Esso)

PETROLEUM RESERVES AND PRODUCTION

(The estimates listed below are for the whole of the basin and not for the accumulations shown on this Plate)

REMAINING RECOVERABLE RESERVES	as of	31	12	86
Gas (Sales)		206.39 x $10^9 m^3$		
LPG		44.89 x $10^6 m^3$		
Condensate		22.44 x $10^6 m^3$		
Oil		202.44 x $10^6 m^3$		
CUMULATIVE PRODUCTION	**as of**	**31**	**12**	**86**
Gas (Sales)		66.14 x $10^9 m^3$		
LPG		41.75 x $10^6 m^3$		
Condensate		9.68 x $10^6 m^3$		
Oil		344.66 x $10^6 m^3$		

Comments

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AUSTRALIAN PETROLEUM ACCUMULATIONS

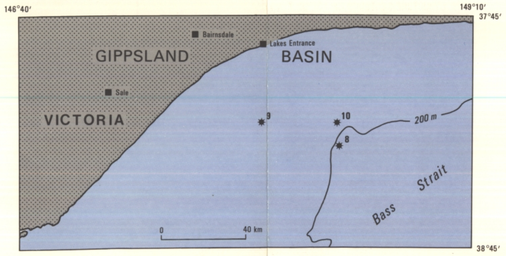
GIPPSLAND BASIN

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

STATUS: ECONOMIC AND DEVELOPED

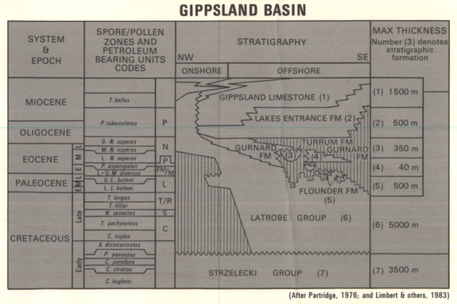
	8 — FLOUNDER	9 — SNAPPER	10 — TUNA
TRAP	L. Cretaceous 'Block C' (T); Eocene (P); Paleocene 'Block B' (L); L. Cretaceous 'Block B' (T); L. Cretaceous 'Block A' (T)	Eocene (N); Eocene (N); Eocene (M); Paleocene (L); L. Cretaceous (T)	L. Cretaceous 'West Tuna' (R); L. Cretaceous 'West Tuna' (S); L. Cretaceous 'West Tuna' (C); Eocene (M); Paleocene (L); L. Cretaceous (T)
PETROLEUM-BEARING UNIT	P-2.1, P-2.2, P-3.1, P-3.2; T-1.1; L-1, L-2; T-1.1, T-1.2, T-4, T-8; T-1.1	N-1.0, N-1.1, N-1.2, N-1.3, N-1.4, N-1.5, N-1.6, N-1.7, N-1.8, N-1.9; M-1*, M-2*; L-1*, L-2*, L-3*; T-1*	R-1*; S-1*; C*; M-1.1, M-1.2, M-2*, M-3*; A-6*, A-7*; L-95/100, L-110, L-150/160, L-1.3, L-350/400; T-0.5*, T-1*, T-2*
PETROLEUM CONTENT	Oil and gas show	Oil/Gas; Oil; Gas	Multiple sands

LOCALITY MAP



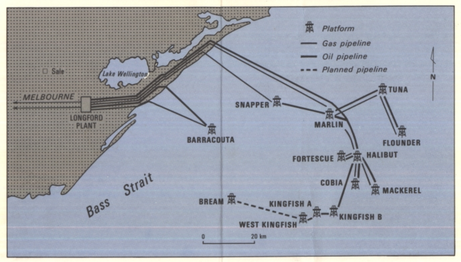
STRATIGRAPHY

GIPPSLAND BASIN



(After Partridge, 1976; and Limbert & others, 1983)

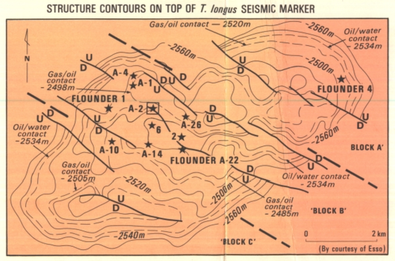
PETROLEUM PRODUCING SYSTEMS



STRUCTURES

FLOUNDER

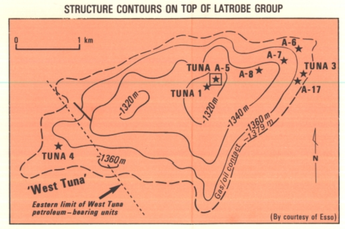
STRUCTURE CONTOURS ON TOP OF *T. longus* SEISMIC MARKER



★ *Discovery well*
□ *Platform*
— *Fault*

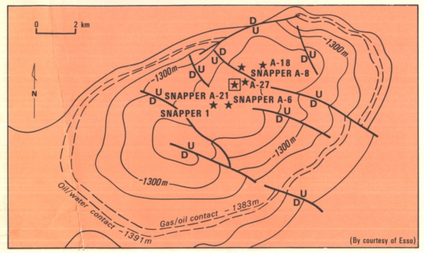
TUNA

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



SNAPPER

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



PETROLEUM RESERVES AND PRODUCTION

(The estimates listed below are for the whole of the basin and not for the accumulations shown on this Plate)

REMAINING RECOVERABLE RESERVES	as of	31	12	86
Gas (Sales)		206.39 x $10^9 m^3$		
LPG		44.89 x $10^6 m^3$		
Condensate		22.44 x $10^6 m^3$		
Oil		202.44 x $10^6 m^3$		
CUMULATIVE PRODUCTION	**as of**	**31**	**12**	**86**
Gas (Sales)		66.14 x $10^9 m^3$		
LPG		41.75 x $10^6 m^3$		
Condensate		9.68 x $10^6 m^3$		
Oil		344.66 x $10^6 m^3$		

Comments

DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

COMPILED BY S. OZIMIC, E. NICHOLAS & L. PAIN IN CO-OPERATION WITH ESSO (AUST) LTD., SHELL DEVELOPMENT (AUST) PTY LTD, PHILLIPS AUSTRALIAN OIL COMPANY CO, LASMO ENERGY AUSTRALIA LTD, AUSTRALIAN AQUITAINE PETROLEUM PTY LTD AND DEPARTMENT OF INDUSTRY, TECHNOLOGY AND RESOURCES, VICTORIA.

BIBLIOGRAPHIC CITATION: OZIMIC, S., NICHOLAS, E., PAIN, L. AND VUCKOVIC, V., 1987 — Gippsland Basin, Victoria. *Bureau of Mineral Resources, Australia, Australian Petroleum Accumulations Report 3.*

AUSTRALIAN PETROLEUM ACCUMULATIONS

GIPPSLAND BASIN

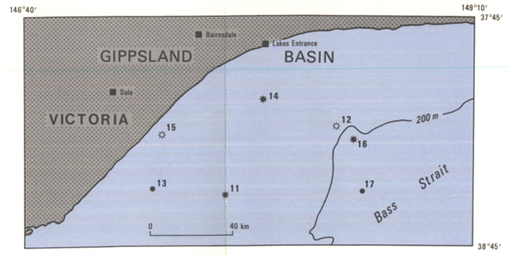
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

STATUS: ECONOMIC UNDER DEVELOPMENT | SUBECONOMIC AND UNDEVELOPED

LOCALITY MAP NUMBER	ACCUMULATION	TRAP	PETROLEUM-BEARING UNIT
11	BREAM	Oligocene (P)	P-1
		Eocene (N)	N-1, N-2, N-3
		Eocene (M)	M-1
		Paleocene (L)	L-1, L-2, L-3, L-4, L-5
12	BATFISH	Paleocene (L)	L-1*
		L. Cretaceous (T)	T-2*
13	DOLPHIN	Eocene (N)	N-1*
14	EMPEROR	Eocene (M)	M-1.1, M-1.2
		Paleocene (L)	L-1.1, L-1.2
		L. Cretaceous (T)	T-1
15	GOLDEN BEACH 1A	Eocene (N)	N-1
		E. Cretaceous	Strzelecki Gp
16	*GRUNTER	L. Cretaceous (T)	T-1.2*, T-1.3*, T-2.1, T-2.2*, T-2.3, T-2.4*, T-2.5*
17	HAPUKU	Paleocene (L)	L-1*
		L. Cretaceous (T)	T-2

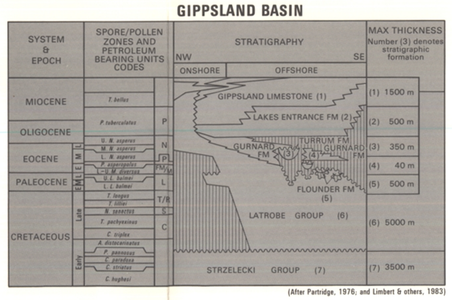
PETROLEUM CONTENT: * Multiple sands; Gas; Oil/gas; Gas-oil show; Gas show; Oil; Oil-gas show; Oil show

LOCALITY MAP



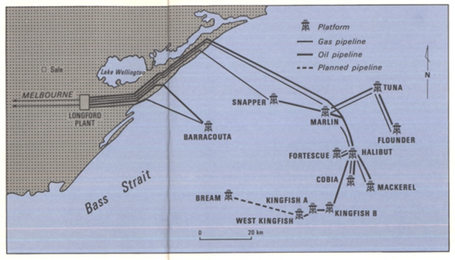
STRATIGRAPHY

GIPPSLAND BASIN

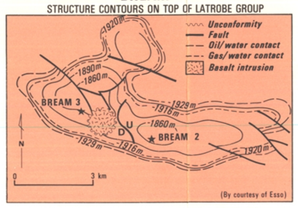


(After Partridge, 1976; and Limbert & others, 1983)

PETROLEUM PRODUCING SYSTEMS

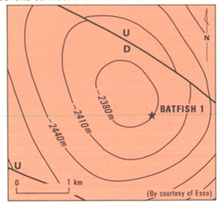


BREAM
STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



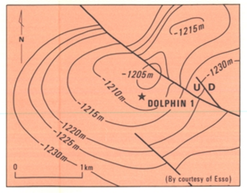
(By courtesy of Esso)

BATFISH
STRUCTURE CONTOURS ON TOP OF MID-PALEOCENE MARKER



(By courtesy of Esso)

DOLPHIN
STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



(By courtesy of Esso)

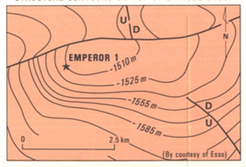
STRUCTURES

* (STRUCTURE MAP NOT AVAILABLE)

★ *Discovery well*

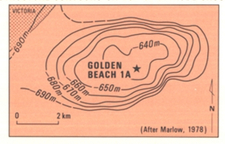
Fault

EMPEROR
STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



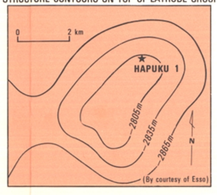
(By courtesy of Esso)

GOLDEN BEACH
STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



(After Marlow, 1978)

HAPUKU
STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



(By courtesy of Esso)

PETROLEUM RESERVES AND PRODUCTION

(The estimates listed below are for the whole of the basin and not for the accumulations shown on this Plate)

REMAINING RECOVERABLE RESERVES	as of	31	12	86
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CUMULATIVE PRODUCTION	**as of**	**31**	**12**	**86**
Gas (Sales)		66.14 x $10^9 m^3$		
LPG		41.75 x $10^6 m^3$		
Condensate		9.68 x $10^6 m^3$		
Oil		344.66 x $10^6 m^3$		

Comments

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COMPILED BY S. OZIMIC, E. NICHOLAS & L. PAIN IN CO-OPERATION WITH ESSO (AUST) LTD., SHELL DEVELOPMENT (AUST) PTY LTD, PHILLIPS AUSTRALIAN OIL COMPANY CO, LASMO ENERGY AUSTRALIA LTD, AUSTRALIAN AQUITAINE PETROLEUM PTY LTD AND DEPARTMENT OF INDUSTRY, TECHNOLOGY AND RESOURCES, VICTORIA.

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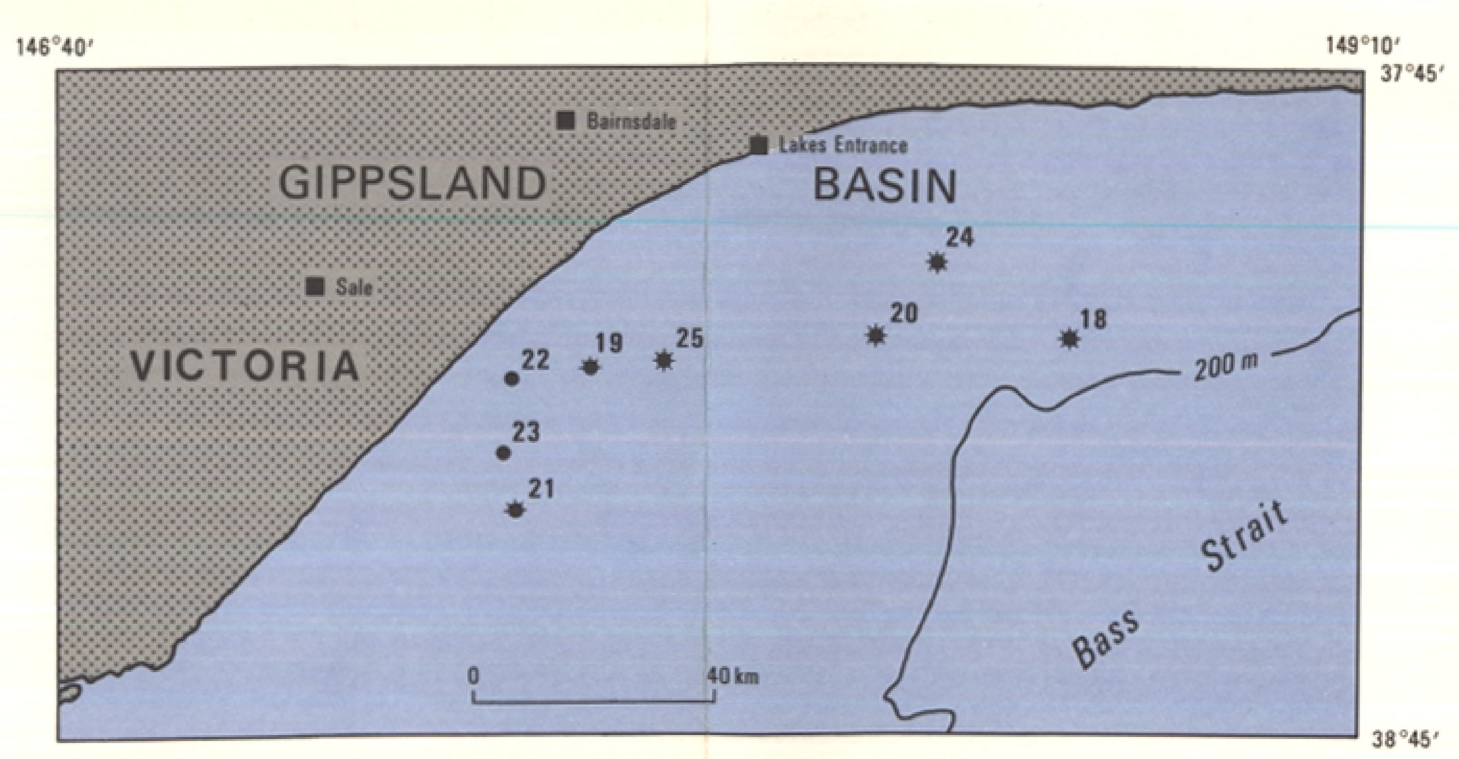
AUSTRALIAN PETROLEUM ACCUMULATIONS

GIPPSLAND BASIN

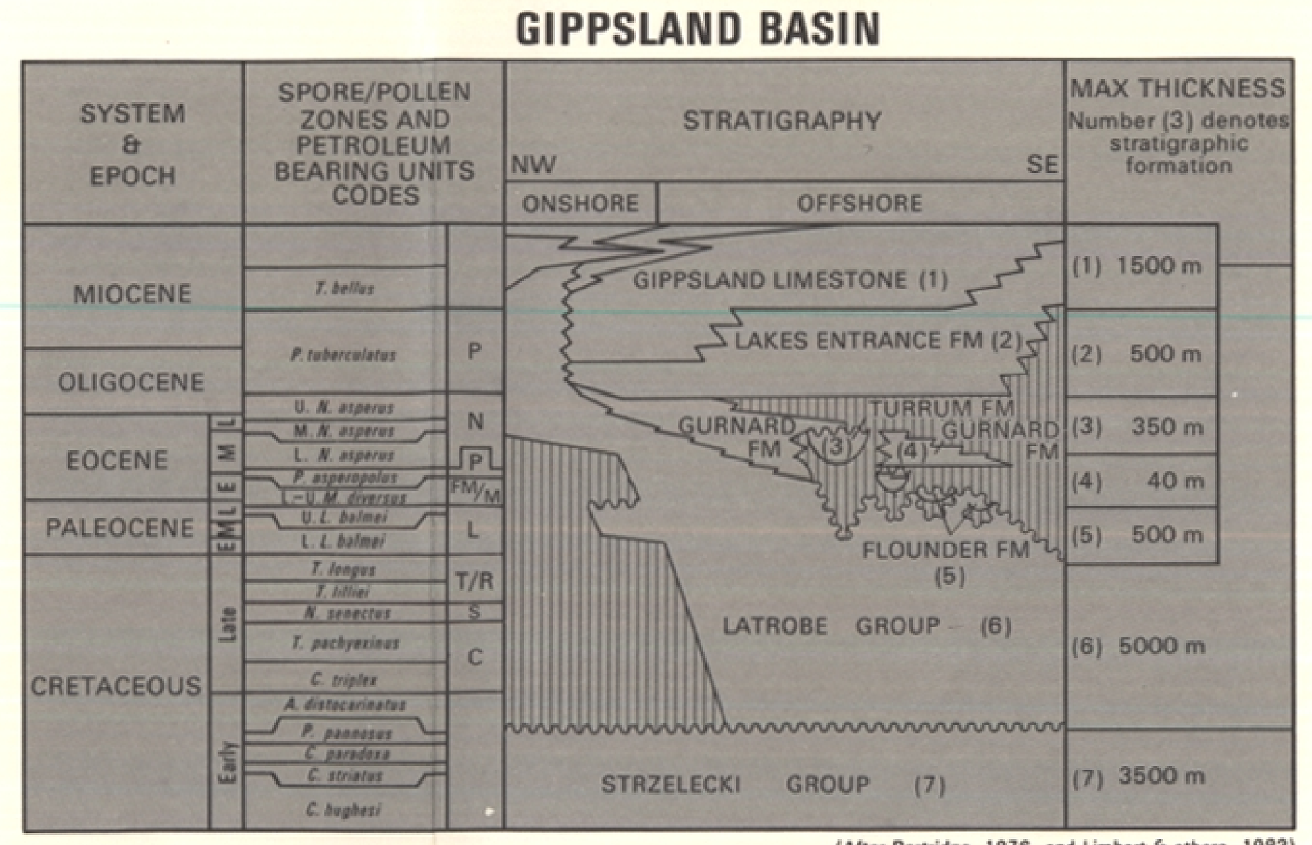
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

LOCALITY MAP



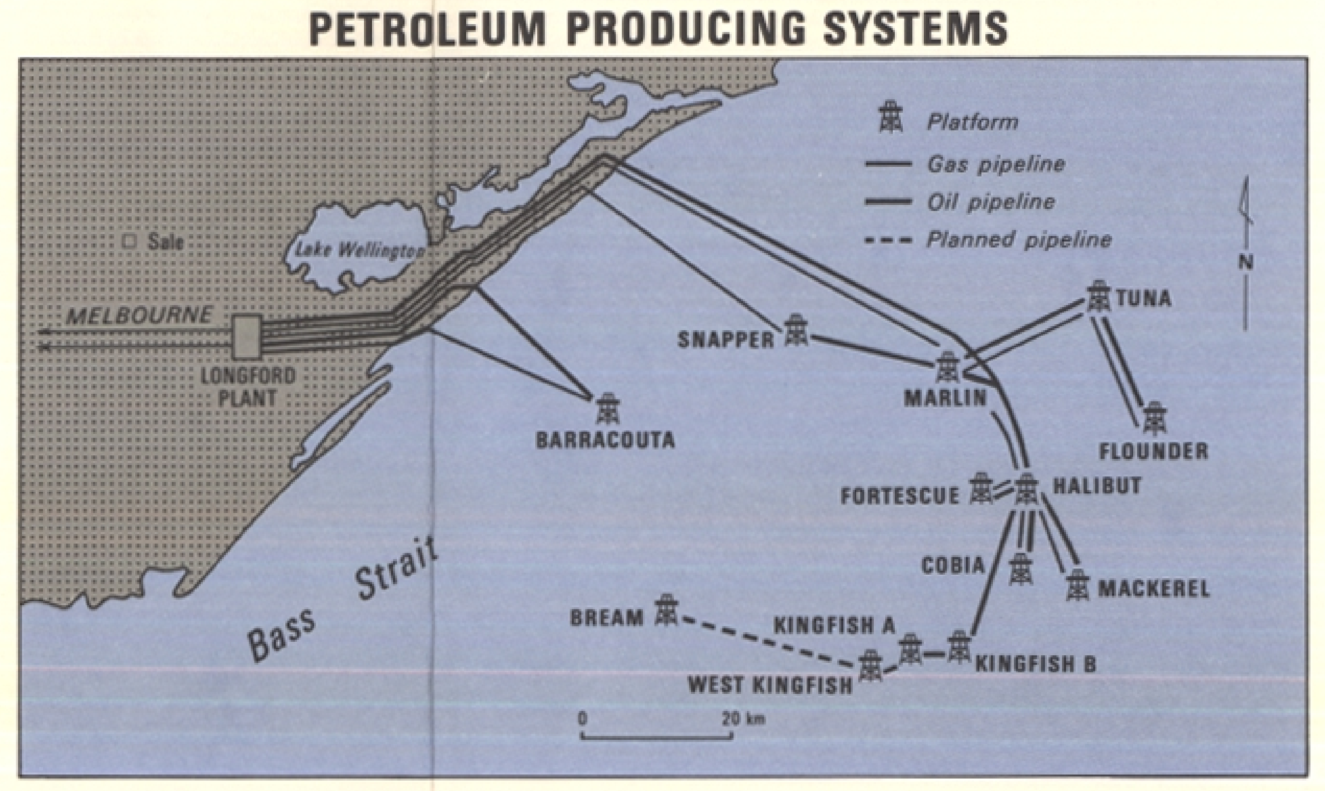
STRATIGRAPHY

GIPPSLAND BASIN



(After Partridge, 1976; and Lindbert & others, 1983)

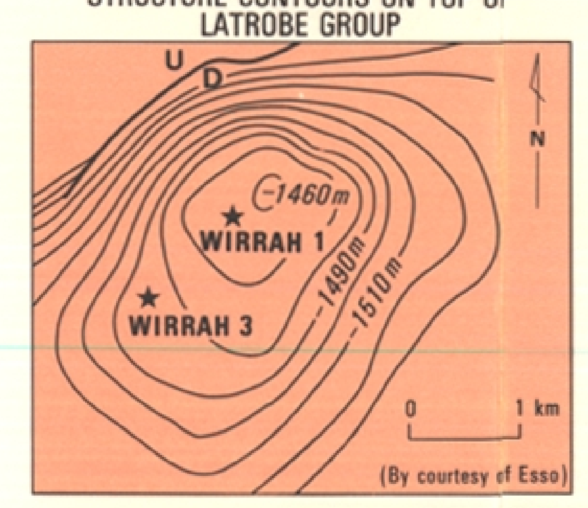
PETROLEUM PRODUCING SYSTEMS



STRUCTURES

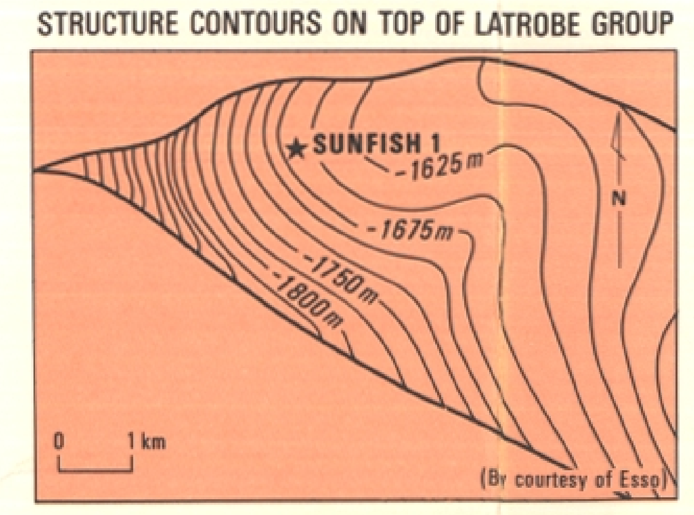
WIRRAH

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



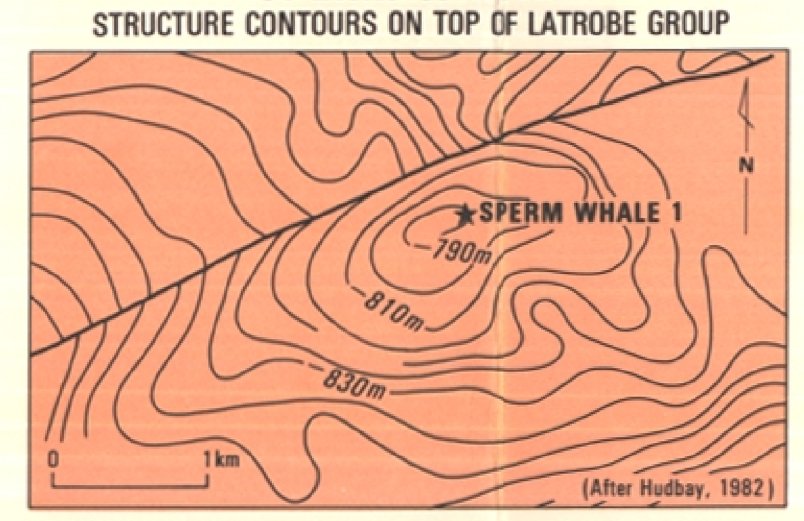
SUNFISH

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



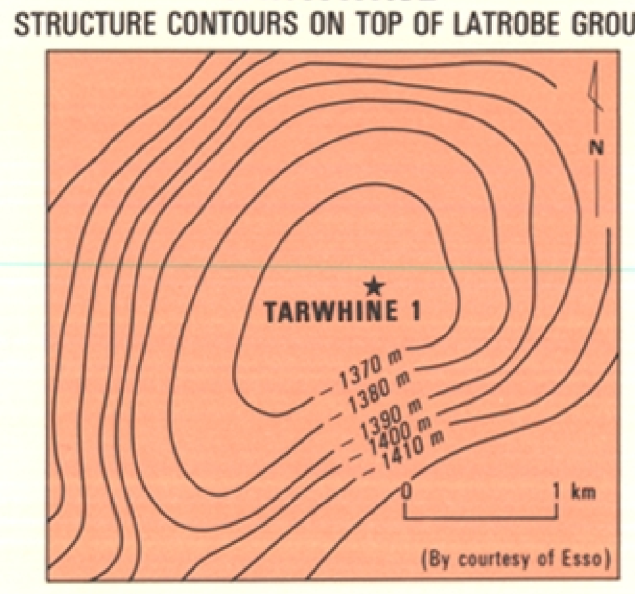
SPERM WHALE

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



TARWHINE

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



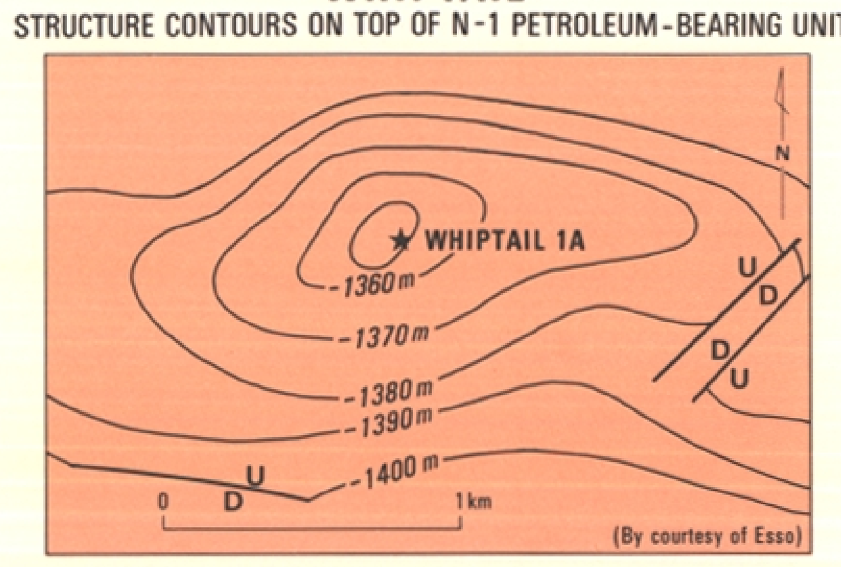
★ Discovery well

— Fault

* Structure map not available

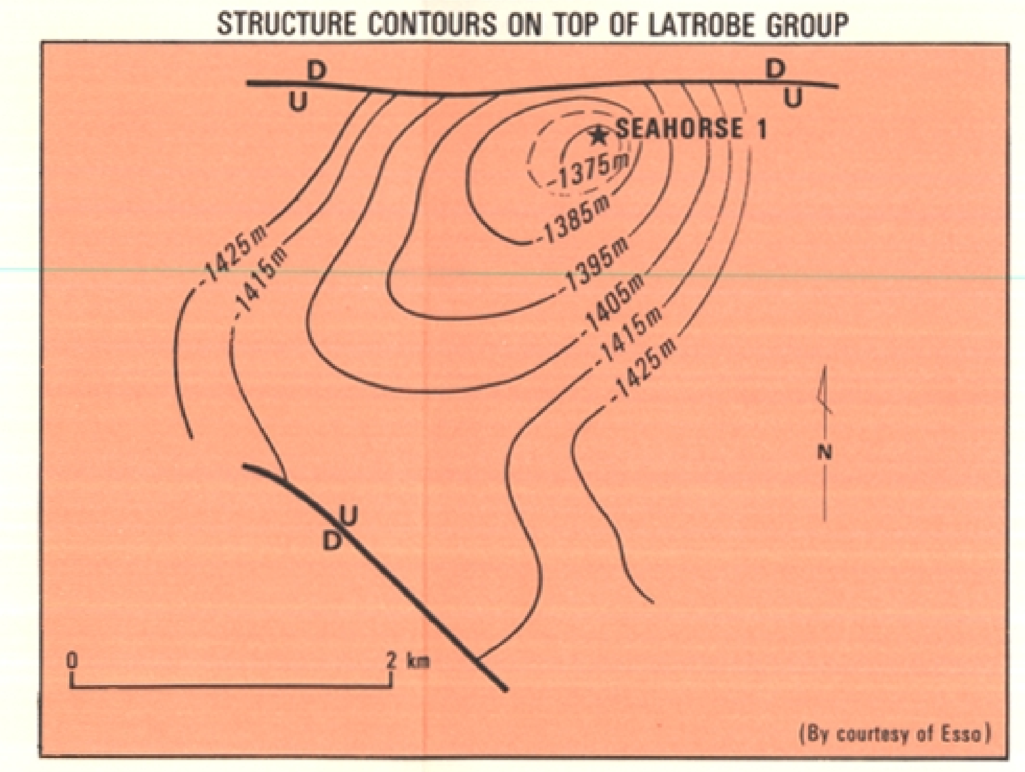
WHIPTAIL

STRUCTURE CONTOURS ON TOP OF N-1 PETROLEUM-BEARING UNIT



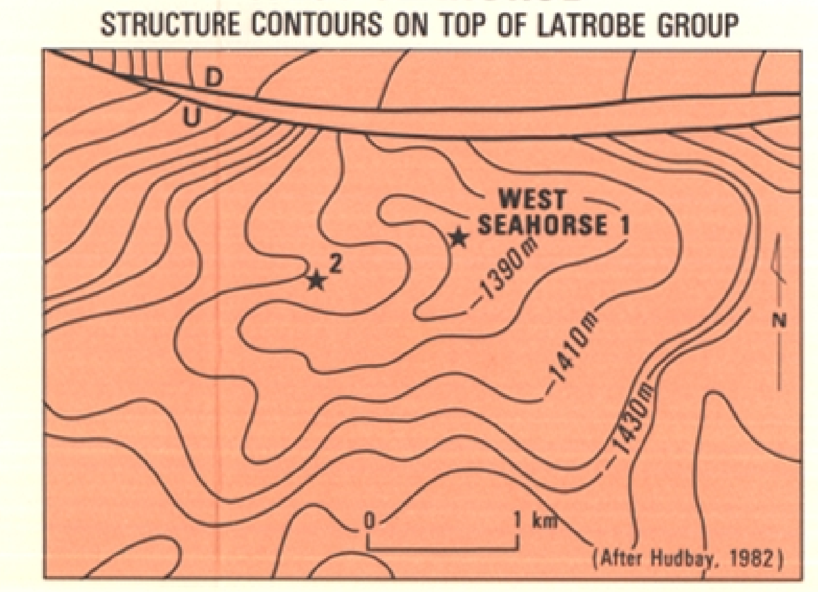
SEAHORSE

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



WEST SEAHORSE

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



PETROLEUM RESERVES AND PRODUCTION

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Comments			

DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

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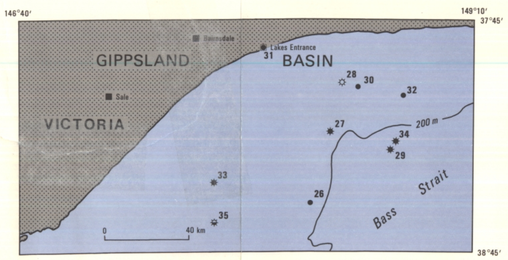
AUSTRALIAN PETROLEUM ACCUMULATIONS

GIPPSLAND BASIN

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

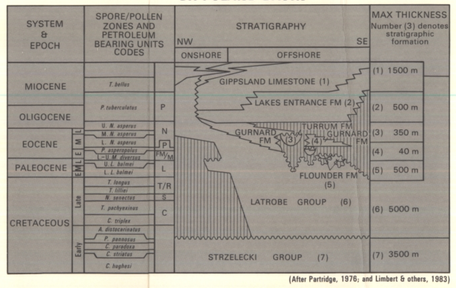
STATUS	SUBECONOMIC AND UNDEVELOPED					SUBECONOMIC & SUSPENDED	SUBECONOMIC AND UNDEVELOPED				
LOCALITY MAP NUMBER	26	27	28	29	30	31	32	33		34	35
ACCUMULATION	YELLOWTAIL	*ANGELFISH	BALEEN	BASKER	*FLATHEAD	LAKES ENTRANCE	*LEATHER-JACKET	LUDERICK		MANTA	OMEO
TRAP	Paleocene (L)	L. Cretaceous (T)	Oligocene / Eocene (P/N)	L. Cretaceous (T)	Oligocene (P)	Eocene / Paleocene (M/L)	E. Cretaceous	Oligocene (P)	Paleocene (L)	Eocene (N)	Eocene (M)	L. Cretaceous (T)	L. Cretaceous (S)	L. Cretaceous (T)
PETROLEUM-BEARING UNIT	L-1	T-1*	P/N*	T-1	P-1	M/L	Strzelecki Gp	P-1	L-1	L-2	L-3	N-3.1	N-3.2	M-1	T-2*	S-1	T-1.1	T-1.2	T-1.3	T-1.4	T-1.5
PETROLEUM CONTENT	* Multiple sands		Oil show	Oil / Gas	Gas and oil show	Gas / Condensate	Oil	Gas													

LOCALITY MAP



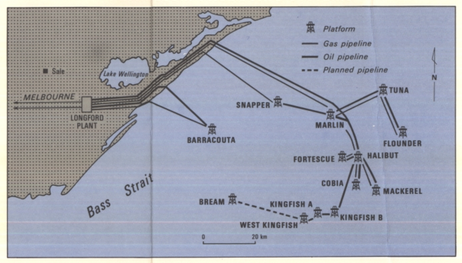
STRATIGRAPHY

GIPPSLAND BASIN

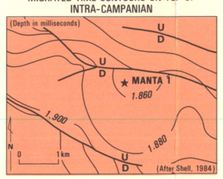


(After Partridge, 1976; and Limbert & others, 1983)

PETROLEUM PRODUCING SYSTEMS

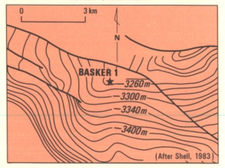


MANTA
MIGRATED TIME CONTOURS ON TOP OF INTRA-CAMPANIAN

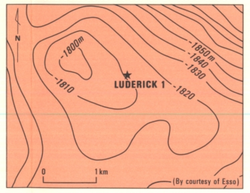


YELLOWTAIL
STRUCTURE CONTOURS ON TOP OF LATROBE GROUP

BASKER
STRUCTURE CONTOURS ON TOP OF LOWER INTRA-CAMPANIAN



LUDERICK
STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



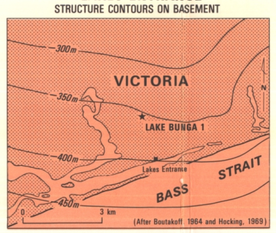
STRUCTURES

* (STRUCTURE MAPS NOT AVAILABLE)

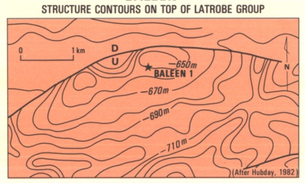
★ *Discovery well*

Fault

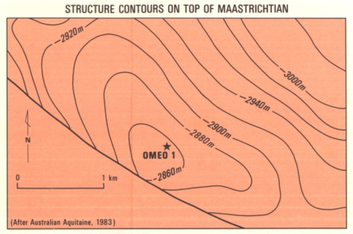
LAKES ENTRANCE
STRUCTURE CONTOURS ON BASEMENT



BALEEN
STRUCTURE CONTOURS ON TOP OF LATROBE GROUP



OMEO
STRUCTURE CONTOURS ON TOP OF MAASTRICHTIAN



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Comments

DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

COMPILED BY S. OZIMIC, E. NICHOLAS & L. PAIN IN CO-OPERATION WITH ESSO (AUST) LTD., SHELL DEVELOPMENT (AUST) PTY LTD, PHILLIPS AUSTRALIAN OIL COMPANY CO, LASMO ENERGY AUSTRALIA LTD, AUSTRALIAN AQUITAINE PETROLEUM PTY LTD AND DEPARTMENT OF INDUSTRY, TECHNOLOGY AND RESOURCES, VICTORIA.

BIBLIOGRAPHIC CITATION: OZIMIC, S., NICHOLAS, E., PAIN, L. AND VUCKOVIC, V., 1987 — Gippsland Basin, Victoria. *Bureau of Mineral Resources, Australia, Australian Petroleum Accumulations Report 3.*

AUSTRALIAN PETROLEUM ACCUMULATIONS

GIPPSLAND BASIN

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

STATUS	LOCALITY MAP NUMBER	ACCUMULATION	TRAP	PETROLEUM-BEARING UNIT
SUBECONOMIC AND UNDEVELOPED	36	PERCH	Eocene (N)	N-1
	37	SOLE	Eocene (M)	M-1
	38	WHITING 'WEST'	Eocene (N)	N-1
			Eocene (P)	P-240 P-250 P-260
			Eocene (M)	M-100
			Paleocene (L)	L-500 L-500.1
			L. Cretaceous (T)	T-1*
		WHITING 'EAST'	Eocene (P)	P-250
			Eocene (M)	M-100
			Paleocene (L)	L-410 L-450 L-455 L-460*
			L. Cretaceous (T)	T-510*
UNECONOMIC AND UNDEVELOPED	39	*BIG NOSE	L. Cretaceous (T)	T-1
	40	HERMES	L. Cretaceous (S)	S-1 S-2*
	41	*NORTH SEASPRAY-1	E. Cretaceous	Strzelecki Gp
	42	*PELICAN POINT	Late Miocene	Gippsland Limestone

PETROLEUM CONTENT

● Oil
☼ Gas
◒ Oil show
* Multiple sands
Gas and oil show
Gas-oil show
Oil/gas
Gas show

LOCALITY MAP

STRATIGRAPHY

GIPPSLAND BASIN

(After Partridge, 1976; and Limbert & others, 1983)

PETROLEUM PRODUCING SYSTEMS

STRUCTURES *(STRUCTURE MAPS NOT AVAILABLE)

★ Discovery well
—— Fault

WHITING

STRUCTURE CONTOURS ON TOP OF *P. asperopolus* MARKER (P-250 PETROLEUM-BEARING UNIT)

(By courtesy of Esso)

SOLE

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP

(After Esso 1974; and Shell 1975)

PERCH

STRUCTURE CONTOURS ON TOP OF LATROBE GROUP

(By courtesy of Esso)

HERMES

STRUCTURE CONTOURS ON TOP OF MAASTRICHTIAN

(After Phillips, 1983)

PETROLEUM RESERVES AND PRODUCTION

(The estimates listed below are for the whole of the basin and not for the accumulations shown on this Plate)

REMAINING RECOVERABLE RESERVES	as of	31 12 86
	Gas (Sales)	206.39 x $10^9 m^3$
	LPG	44.89 x $10^6 m^3$
	Condensate	22.44 x $10^6 m^3$
	Oil	202.44 x $10^6 m^3$
CUMULATIVE PRODUCTION	as of	31 12 86
	Gas (Sales)	66.14 x $10^9 m^3$
	LPG	41.75 x $10^6 m^3$
	Condensate	9.68 x $10^6 m^3$
	Oil	344.66 x $10^6 m^3$
Comments		

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AUSTRALIAN PETROLEUM ACCUMULATIONS

GIPPSLAND BASIN

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

STATUS: UNECONOMIC AND UNDEVELOPED

LOCALITY MAP NUMBER	ACCUMULATION	TRAP	PETROLEUM-BEARING UNIT	PETROLEUM CONTENT
43	SELENE	L. Cretaceous (T)	T-1	?
44	*STONEFISH	L. Cretaceous (T)	T-1*	Gas show
45	*SUNDAY ISLAND	Paleocene ?M/L	? M/L	Oil show
46	*VEILFIN	L. Cretaceous (T)	T-1*	Gas show
47	VOLADOR	L. Cretaceous (T)	T-2*	Gas show
48	*WELLINGTON PARK	E. Cretaceous	? Strzelecki Gp	Oil show
49	*WOODSIDE-1	E. Cretaceous	? Latrobe Gp	?
49	*WOODSIDE-1	E. Cretaceous	? Strzelecki Gp	?
50	*WOODSIDE-2	E. Cretaceous	? Latrobe Gp	?
50	*WOODSIDE-2	E. Cretaceous	? Strzelecki Gp	?

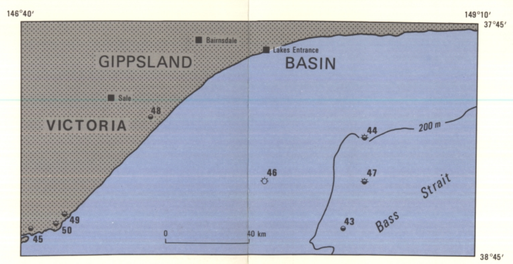
* Multiple sands

Gas show

Oil show

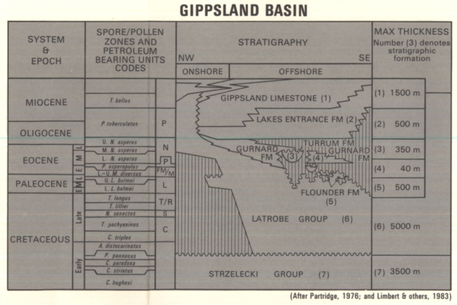
Gas and oil show

LOCALITY MAP



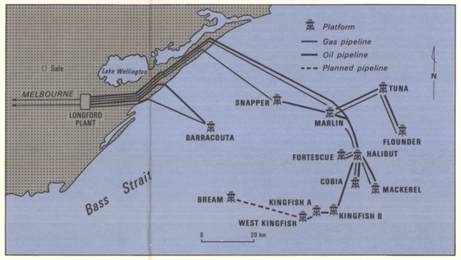
STRATIGRAPHY

GIPPSLAND BASIN



(After Partridge, 1976; and Limbert & others, 1983)

PETROLEUM PRODUCING SYSTEMS



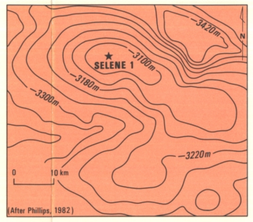
STRUCTURES

* (STRUCTURE MAPS NOT AVAILABLE)

★ *Discovery well*

SELENE

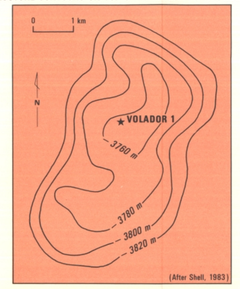
STRUCTURE CONTOURS ON TOP OF MAASTRICHTIAN



(After Phillips, 1982)

VOLADOR

STRUCTURE CONTOURS ON TOP OF INTRA-CAMPANIAN MARKER



(After Shell, 1983)

PETROLEUM RESERVES AND PRODUCTION

(The estimates listed below are for the whole of the basin and not for the accumulations shown on this Plate)

REMAINING RECOVERABLE RESERVES	as of	31	12	86
Gas (Sales)			206.39 x $10^6 m^3$	
LPG			44.89 x $10^6 m^3$	
Condensate			22.44 x $10^6 m^3$	
Oil			202.44 x $10^6 m^3$	
CUMULATIVE PRODUCTION	**as of**	**31**	**12**	**86**
Gas (Sales)			66.14 x $10^6 m^3$	
LPG			41.75 x $10^6 m^3$	
Condensate			9.68 x $10^6 m^3$	
Oil			344.66 x $10^6 m^3$	

Comments