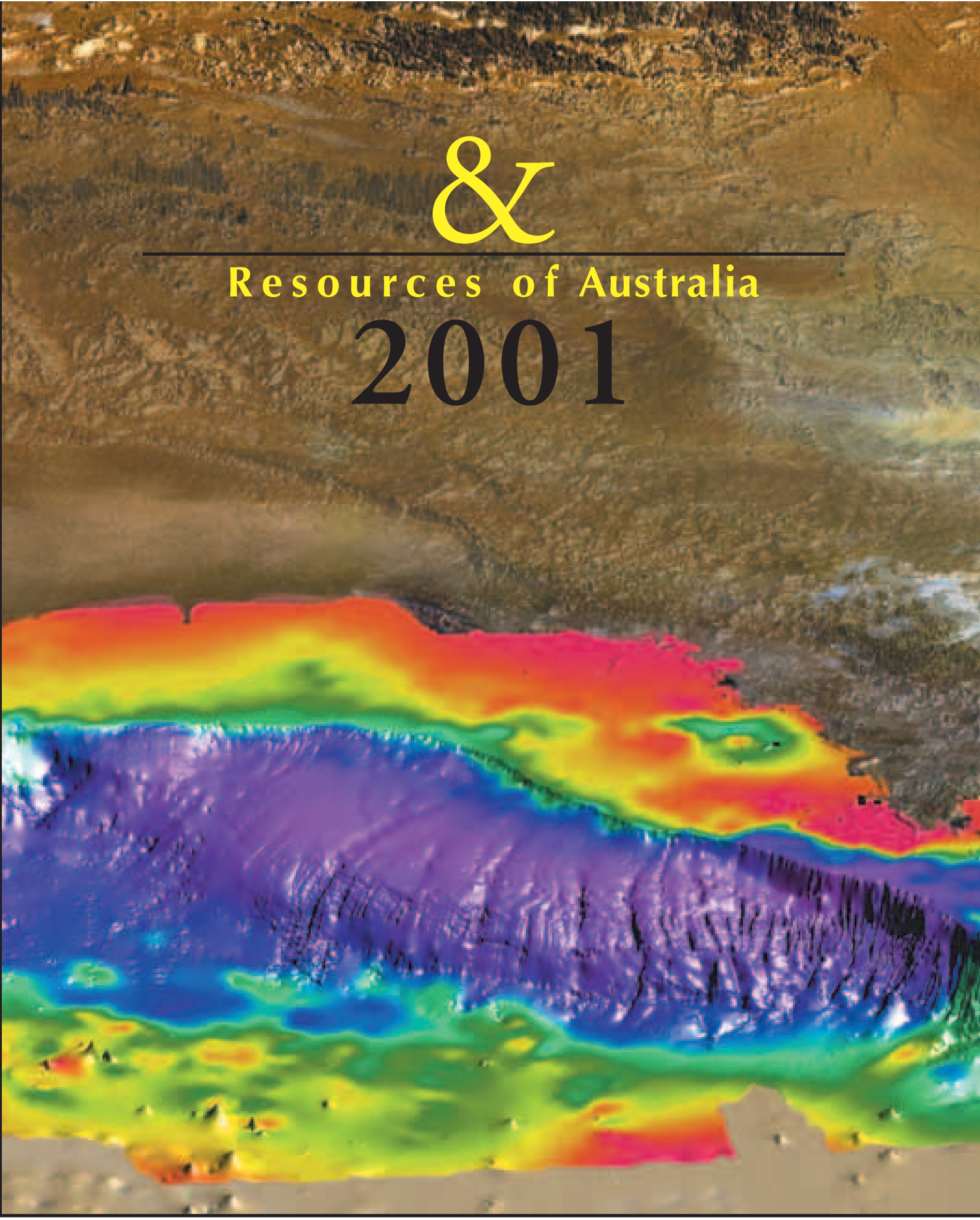

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Resources of Australia

2001

GEOSCIENCE AUSTRALIA

Geoscience Australia

Department of Industry, Tourism and Resources

Oil and Gas Resources of Australia 2001

Geoscience Australia

DEPARTMENT OF INDUSTRY, TOURISM & RESOURCES

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Secretary Mark Paterson
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Cover: Cover image shows the total resolvable sediment thickness grid for the Bight Basin in seconds (two-way time), draped over the 1 km Bathymetry Grid of Australia and clipped at the coastline. The onshore image is a LANDSAT TM image draped over the 9 s digital elevation model of Australia. The thickness grid is based on the seismic identification of top basement. In areas where the base of the basin-fill could not be seismically imaged, the deepest resolvable reflections were used to estimate total thickness.

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Glossary

AGSO	Australian Geological Survey Organisation (now Geoscience Australia)
°API	Degrees American Petroleum Institute—a measure of oil density. $\text{API gravity} = \frac{141.5}{\text{specific gravity at } 60°\text{F}} - 1315$
Basin	A geological depression filled with sediments. Several basins of different ages overlying each other are referred to as stacked basins (e.g. Cooper/Eromanga Basins).
Completion	The process by which a finished well is either sealed off or prepared for production.
Condensate	A liquid mixture of pentane and heavier hydrocarbons that is recoverable from a gas well through a separation system.
Crude oil	A mixture of hydrocarbons that existed in the liquid phase in natural under ground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities.
Demonstrated resources	The amount of petroleum that can be recovered from the part of identified resources whose existence is established and whose quantity is considered probable, based on well data and geological projection. In this publication, demonstrated resources are taken to be equal to remaining, proved plus probable, commercial and non-commercial reserves of petroleum as maintained at Geoscience Australia.
Development	Phase of the petroleum industry in which a proven oil or gas field is brought into production by drilling production wells.
Discovery	The first well (in a new field) from which any measurable amount of oil or gas has been recovered. A well that makes a discovery is classified as a new field discovery (NFD).
Exploration	The phase of operations in which a company searches for oil or gas by carrying out detailed geological and geophysical surveys, followed up where appropriate by exploratory drilling in the most promising places.
Extension/appraisal wells	Wells drilled to determine the physical extent, reserves and likely production rate of a field.
Gross	Including both permeable and non-permeable intervals.
Identified resources	The total amount of petroleum that can be recovered from specific accumulations that have been identified by drilling.
Initial resources	Resources before subtraction of cumulative production.
LNG	Liquefied natural gas, gaseous at normal temperature and pressures, but held in the liquid state at very low temperatures to facilitate storage and transport.
LPG	Liquefied petroleum gas, a liquid mixture of all the propane and butane that are recoverable from a well through a separating facility.
Natural gas	A mixture of methane and ethane and up to 3% carbon dioxide.
New-field wildcat well	A petroleum exploration well drilled on a structural or stratigraphic trap that has not previously been shown to contain petroleum.

Petroleum	A naturally occurring hydrocarbon or mixture of hydrocarbons. As oil or gas or in solution, it is widespread in Australian sedimentary rocks, but major concentrations are generally rare.
Petroleum resources	The part of Australia's petroleum endowment that may be produced profitably by currently feasible or near-feasible technology and for specified product prices. Petroleum resources are defined to include only those natural concentrations from which economic extraction of a part is feasible within the range of technology and prices likely to be seen within the next 20 to 25 years. Hence, petroleum resources are a subset of petroleum endowment that can change according to the assumed technological and economic conditions.
Play	A continuous portion of sedimentary volume, which contains pools, showing the following characteristics: (1) reservoirs within the same productive sequence occurring throughout the zone; (2) hydrocarbons of similar chemical composition; and (3) traps of the same type.
Production	The phase of bringing well fluids to the surface and separating them and storing, gauging and otherwise preparing the product for transportation.
Production test	A test on a cased well whereby the nature and quantity of the formation fluids in a possible oil- or gas-bearing stratum are determined by allowing them to flow to the surface through the drill string under carefully controlled conditions.
Prospective	Likely to contain producible petroleum.
Proved and probable reserves	Reserves established at the median value—that is with a 50% cumulative probability of existence.
Remaining resources	Resources after subtraction of cumulative production from the initial amount of resources.
Repeat formation test	Test run on a wireline in a well, to measure the pressure and temperature of the specific depths and to take small fluid samples from the reservoir.
Risked	Amount multiplied by the probability of existence.
Success rate	A ratio obtained by dividing the number of new-field discoveries by the number of new-field wildcat wells drilled.
Trap	Any barrier to the upward movement of oil or gas, allowing either or both to accumulate.
Undiscovered accumulation	A general term representing all undiscovered petroleum deposits irrespective of economic potential.
Undiscovered field	All the petroleum accumulations that may occur in multiple reservoirs within the same structural or stratigraphic trap.
Undiscovered resources	The amount of conventional petroleum that can be recovered from unspecified accumulations that have not been identified by drilling but may exist within a specific reservoir sequence, wherever it lies within a structural or stratigraphic trap.

Abbreviations

°API	degrees American Petroleum Institute
bbl	barrel
BCF	billion cubic feet
BCM	billion cubic metres
BRS	Bureau of Resource Sciences
cc	cubic centimetre(s)
d	day
DST	drill stem test
EOR	enhanced oil recovery
EUR	estimated ultimate recovery
EXT	extension to previously discovered petroleum fields
FPSO	floating production, storage and offloading
ft	feet
GL	gigalitre, equivalent to 10^6 cubic metres
kL	kilolitre
km	kilometre
km^2	square kilometre(s)
LPG	liquefied petroleum gas
m	metre(s)
m^3	cubic metres
MCF	million cubic feet
MCM	million cubic metres
MNbbl	million barrels
mm	millimetre(s)
na	not applicable
NFD	new-field discovery
NPD	new-pool discovery
pJ	petajoule = 10^{15} joules
RFT	repeat formation test
s	second(s)
scf	standard cubic feet (cubic feet at standard atmospheric temperature and pressure)
SECWA	State Electricity Commission of Western Australia
SPD	shallow pool discovery
SRV	service
TCF	trillion cubic feet = 10^{12} cubic feet
t	tonnes
tJ	terajoule = 10^{12} joules
y	year
ZOCA	Australia–Indonesia Zone of Cooperation Area A

Conversion factors (approximate)

1 kilolitre = 6.2898 barrels
1 cubic metre = 1 kilolitre = 35.315 cubic feet
Throughout the text one thousand million (10^9) is referred to as one billion, and one million million (10^{12}) as one trillion.

Summary

Exploration 2001

In total, 59 offshore exploration wells were drilled in 2001, three wells fewer than in 2000 and fewer than the record 74 wells drilled in 1998. Offshore, 49 new-field wildcat wells and 10 extension/appraisal wells drilled resulted in 12 new-field discoveries, including those discoveries inferred from well logs and repeat formation tests. In 2001, discoveries occurred in the:

- Bonaparte Basin at Audacious and Kuda Tasi (oil) and Blacktip (gas);
- Carnarvon Basin at Corowa, Gibson, Gudron and South Plato (oil) and Errol (gas);
- Gippsland Basin at East Pilchard (gas);
- Otway Basin at Geographe and Thylacine (gas);
- Perth Basin at Cliff Head (oil).

Onshore, 67 exploration wells were drilled in 2001—well above last year's level of 37 wells drilled. There were 49 new-field wildcat wells drilled and 18 extension/appraisal wells drilled, resulting in 26 new-field discoveries. Most of the success and activity occurred in the Cooper and Eromanga Basins of South Australia and Queensland where exploration drilling continued to be driven by the relinquishment in 1999 of Petroleum Exploration Licences 5 and 6 in South Australia. There is a focus on exploration drilling throughout the numerous production licences held in the South Australian part of the Cooper and Eromanga Basins. There were 14 gas discoveries and one oil discovery in the Cooper and Eromanga Basins, two gas discoveries in the Surat and Bowen/Surat Basins, one gas discovery in the Gippsland Basin, six gas discoveries in the Otway Basin and two oil discoveries in the Perth Basin.

In 2001, a total of 64 078 line km of 2D seismic and 21 779 km^2 of 3D seismic were recorded in Australia. Offshore, 37 seismic surveys were carried out that collected 62 780 line km of 2D data and 18 529 km^2 of 3D data. Onshore, there were 22 separate seismic surveys carried out which acquired 1298 line-km of 2D data and 3250 km^2 of 3D data.

Petroleum exploration expenditure in 2001 was A$874 330 500, of which A$736 858 500 was expended offshore and A$137 472 000 onshore. Expenditure on development and production in 2001 was A$1 812 936 000, of which A$1 085 262 000 was offshore and A$727 674 000 onshore.

Timor Gap Joint Petroleum Development Area (JPDA)

On 20 May 2002, the date of East Timor's independence, Australia and East Timor signed the Timor Sea Treaty. This Treaty now governs petroleum exploration and development in that part of the Timor Sea subject to overlapping jurisdictional claims.

The Treaty has been submitted for ratification by both countries and is expected to come into force in late 2002.

The key elements of the Treaty include:

- a revenue split of 90% for East Timor and 10% for Australia from petroleum activities in the Joint Petroleum Development Area (JPDA);
- deferral of permanent delimitation of the seabed boundary without prejudice to Australia's and East Timor's rights and entitlements;
- maintenance of the contractual terms of the existing petroleum projects (Bayu-Undan, Greater Sunrise and Elang-Kakatua);
- Australian jurisdiction over pipelines from the JPDA to Australia;
- unitisation of the Greater Sunrise field (which straddles the JPDA and an area under Australian jurisdiction) on the basis that 20.1% of the field lies within the JPDA and 79.9% within Australian jurisdiction.

The new Treaty will have a duration of 30 years.

Reserves and resources

Most (614 of 919 GL) of Australia's initial commercial crude oil reserves have been discovered in offshore Tertiary reservoirs in the Gippsland Basin. Additional major oil reserves have been discovered in the Carnarvon and Bonaparte Basins. The most significant gas reserves are located in the Carnarvon, Gippsland, Browse, Bonaparte and Cooper Basins.

Remaining commercial reserves at 1 January 2001 are:

Crude oil	Condensate	Liquid petroleum gas	Sales gas
(GL)	(GL)	(GL)	(BCM)
162.2	112.5	128.9	859.5
(MNbbl)	(MNbbl)	(MNbbl)	(TCF)
1020	708	810	30

Estimates of reserves that have not yet been declared commercially viable (non-commercial reserves) are:

Crude oil	Condensate	Liquid petroleum gas	Sales gas
(GL)	(GL)	(GL)	(BCM)
90.1	284.5	230.8	3136
(MNbbl)	(MNbbl)	(MNbbl)	(TCF)
567	1790	1451	111

Development

Development and production expenditure onshore and offshore decreased from A$2 245 million in 1999 to A$1 540 million in 2000.

Major new developments during 2001 and planned for 2002 were offshore from Western Australia, Northern Territory and Victoria. In the Bonaparte Basin, Woodside's Laminaria Phase 2 Project started oil production in June 2002. The project was designed to accelerate production and gain access to incremental reserves from the field. Phillips's Bayu-Undan gas condensate development in the JPDA is proceeding on schedule and first production is planned to commence in late 2003.

In the Carnarvon Basin, Woodside's Echo Yodel gas-condensate field started production in December 2001 from the two subsea production wells tied back to the Goodwyn platform. Apache's Simpson and Gibson/South Plato oil fields commenced production from five wells that are connected by pipeline to the field processing equipment at Varanus Island.

BHP Billiton has applied for a production licence over the Minerva gas condensate field in the offshore Otway Basin. Development of the field will commence during 2002, and the first gas is expected to be produced in the first quarter of 2004.

In the offshore Gippsland Basin, OMV is proceeding with the development of the Patricia Baleen gas field; gas production is scheduled to commence in late 2002.

Production

Daily petroleum production rates in 2000 were:

Crude oil plus condensate		Gas	
ML/d	113.8	MCM/d	99.1
bbl/d	716 000	BCF/d	3.5

Estimates by Geoscience Australia of future crude oil plus condensate production suggest production in 2002 at between about 529 000 bbl/d and 738 000 bbl/d and a decline to between about 215 000 bbl/d and 475 000 bbl/d in 2015.

Sufficiency

Reserves of crude oil and condensate remaining in 2000 could sustain production of 32.3 GL/y for 14.1 years. This average production level was calculated for the period 1990–2000. The consumption of crude oil and condensate in 2001 could be sustained by remaining economic reserves for only 11.1 years.

1: Exploration 2001

1.1 Exploration drilling and seismic surveys

In 2001, 127 exploration wells were drilled (99 in 2000). These consisted of:

		2001
Onshore	New-field wildcats	49
	Extension/appraisal	18
Offshore	New-field wildcats	49
	Extension/appraisal	10

In total, there was 305 650 m of exploration drilling in 2001 (241 059 m in 2000); details are given in Appendices A, D, F, G.

Seismic surveys

In 2001, 64 078 line km of 2D seismic data were recorded (27 477 in 2000) and 21 779 km^2 of 3D data were also acquired (15 887 km^2 in 2000). Onshore, 1298 line km of 2D data were collected and 3250 km^2 of 3D data were acquired. The level of seismic survey acquisition in Australia in 2001 is significantly more than the 2000 level. The largest rise in acquisition occurred offshore where 62 780 line km of 2D data were collected in 2001 compared with 25 185 line km of 2D data collected in 2000. Also offshore, 18 529 km^2 of 3D data were collected in 2001 compared with 14 305 km^2 of data collected in 2000 (Table 1.1, Appendix B).

Offshore, 37 surveys were conducted during 2001. This was an increase from 2000 when 33 surveys were conducted, and a decrease from 1999 when 39 surveys were conducted, and short of the record 41 surveys in 1998. Of these 37 surveys 12 were 3D surveys and 25 were 2D surveys. In 2001 most of the offshore seismic survey acquisition was on the North West Shelf of Australia including the Timor Sea, in the Great Australian Bight Basin and to a lesser extent in the Otway, Gippsland, Bass and Perth Basins.

Onshore, 22 separate seismic surveys were carried out in 2001, a slight decrease from the 23 carried out in 2000. Of these 22 seismic surveys there were thirteen 2D surveys and nine 3D surveys. During 2001, Western Geco was the main onshore contractor, carrying out 10 surveys in total. Trace Terracorp carried out a total of nine surveys and Geco Prakla a total of three surveys.

Several operating companies acquired data onshore during 2001, with Santos in the Otway, Bowen/Surat and Cooper/Eromanga Basins being the most active, followed by Origin Energy in the Otway and Perth Basins and Eastern Star Gas in the Gunnedah and Surat Basins. Other onshore surveys were carried out by Bass Petroleum in the Gippsland Basin, Great Southland Minerals in the Tasmania Basin and Tri-Star Petroleum in the Bowen Basin.

Expenditure

Petroleum exploration expenditure in 2000 was A$874 330 500, of which A$137 472 000 was onshore and A$736 858 500 was offshore. Exploration expenditure incurred in the Joint Petroleum Development Area (JPDA; previously known as Zone of Cooperation Area A (ZOCA)) is included in the above figures and in Appendix E which summarises petroleum exploration and development expenditure in 2000.

Note that the Northern Territory administers the Commonwealth Territory of Ashmore and Cartier Islands, for petroleum purposes, under an agency agreement with the Commonwealth.

Table 1.1 Seismic survey acquisition 2000-2001

	Onshore		Offshore		Total	
Year	2D line km	3D sq km	2D line km	3D sq km	Line km	Square km
2000	2 291	1 581	25 064	14 305	27 356	15 887
2001	1 298	3 250	70 159	18 529	71 457	21 779

Offshore drilling 2001

The level of offshore exploration drilling activity in 2001 (59 wells drilled) was high, but less than the record 74 wells drilled in 1998, and three fewer than the wells drilled in 2000 (Figure 1.1). Offshore drilling in 2001 accounted for 49 new-field wildcat wells and 10 extension/appraisal wells (Appendices A, G). Drilling was undertaken in 2001 in the Bonaparte (16 wells), Browse (4 wells), Carnarvon (31 wells), Gippsland (3 wells), Otway (4 wells) and Perth (1 well) Basins.

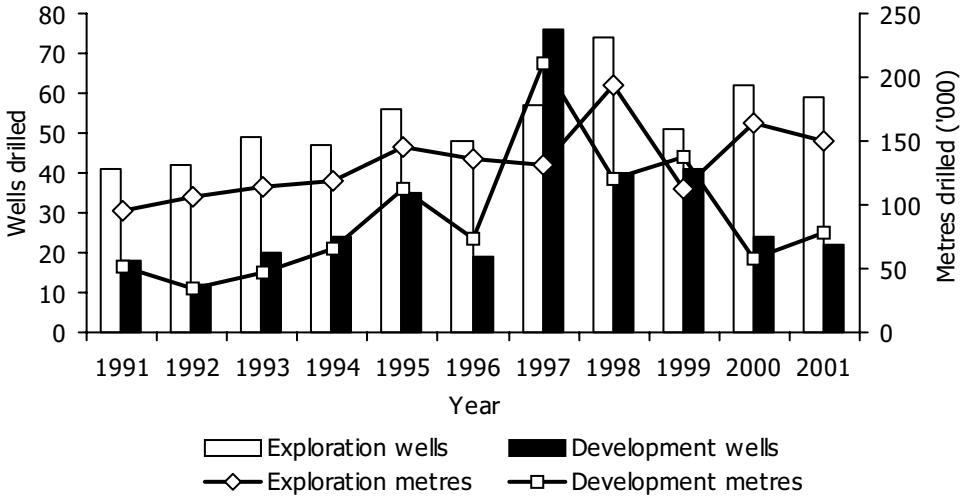

Figure 1.1 Wells and metres drilled offshore 1991–2001

Offshore discoveries 2001

Following the record level of 23 offshore discoveries in 2000, there were 12 new-field wildcat discoveries in 2001 (Figure 1.2) of which four discoveries were outside north-western Australia in the Gippsland, Otway and Perth Basins. During the year there were seven oil and five gas discoveries, including those discoveries inferred from well logs and Repeat Formation Testing (RFT). A number of oil and gas finds in the Carnarvon Basin contributed to the upgrading of existing fields but are not considered to be new-field wildcat discoveries. Discoveries occurred in the:

- Bonaparte Basin at Audacious and Kuda Tasi (oil) and Blacktip (gas);
- Carnarvon Basin at Corowa, Gibson, Gudron and South Plato (oil) and Errol (gas);
- Gippsland Basin at East Pilchard (gas);
- Otway Basin at Geographe and Thylacine (gas);
- Perth Basin at Cliff Head (oil).

Bonaparte Basin

Audacious 1 was drilled in 170 m of water in the Vulcan Sub-basin of the Bonaparte Basin. The well encountered an oil column of 11.5 m gross thickness confirmed by wireline formation sampling, and following production testing it flowed at a rate of 1446.8 kL/d (9100 bbl/d) of 55 °API oil from the Plover Formation.

Blacktip 1 was drilled in 55 m of water in the Bonaparte Gulf Petrel Sub-basin close to the shore. The well encountered gas in five reservoir intervals of Triassic and Permian age. On test the well flowed at 974 099 m^3/d (34.4 million scf/d) gas through a 25.4 mm (1") choke over the interval 2767–2785 m.

Kuda-Tasi 1 was drilled in Permit 91-01 in the JPDA in 428 m of water. Wireline logging over the primary objective (mid Jurassic Elang Formation) indicated a gross oil column of 17.5 m over the interval 3428.5–3446 m. Present indications suggest that the well is unlikely to be commercial in the near future on a stand-alone basis. The well was plugged and abandoned.

Carnarvon Basin

Corowa 1 was drilled in 85 m of water in the Barrow-Dampier Sub-basin with the objective of testing the sands in the Barrow Group. The well intersected an 11 m oil column and on test flowed 839 kL/d (5277 bbl/d) and 64 565 m^3/d (2.28 million scf/d) of gas. The well is a significant oil and gas discovery and was plugged and abandoned.

Errol 1 was drilled in 14 m of water and targeted both the Upper Barrow Group and the Jurassic Biggada Sandstone. Logging of the Upper Barrow Group indicated an interpreted 26 m gross hydrocarbon column accompanied by oil and gas shows from cuttings. The well was deepened to evaluate the secondary objective. However, no sandstones were encountered at the Biggada Formation level. The well was plugged and abandoned.

Gibson 1 was drilled in 8 m of water as a follow-up to the Simpson 1 well and in tandem with the South Plato 1 well in the Barrow-Dampier Sub-basin. It is one of several look-alike prospects at the top of the Barrow Sandstone Member in the area. Logging within the Flag Sandstone reservoir confirmed a 12.5 m oil column. The well was subsequently suspended as a future oil producer.

Gudrun 1 was drilled in 24 m of water in the Barrow-Dampier Sub-basin, 1.3 km south of the Harriet A Platform. The well penetrated a 5 m oil column within the Flag Sand Unit, 8 m high to prognosis. The well was subsequently plugged and abandoned.

South Plato 1 was a deviated exploration well drilled in 8 m of water in tandem with Gibson 1 from the same surface location in the Barrow-Dampier Sub-basin. It is one of the several look-alike prospects at the top of the Barrow Sandstone Member. The well encountered a 27.4 m gross oil column at the top of the Flag Sandstone. The well was subsequently suspended as a future oil producer.

Gippsland Basin

East Pilchard 1 was drilled in 90 m of water close to the Kipper Field. The primary objective was to test the sandstones in the Latrobe Group and the sandstones in the Golden Beach Group. Logging recovered four sets of gas samples from 2695.5 m to 3122 m. The well was subsequently suspended as a future gas producer.

Otway Basin

Geographe 1 was drilled in 80 m of water in the Victorian part of the Otway Basin. The well encountered a 240 m gross gas column in interbedded sandstones and shales of the Flaxman/Waarre Formations. Logging and formation sampling were conducted over the reservoir section. The operator reported that the well identified a significant gas resource. The well was subsequently plugged and abandoned.

Thylacine 1 was drilled in 101 m of water in the Tasmanian part of the Otway Basin. Logging and sampling of the objective Waarre Formation indicated the presence of a 281 m gross gas column. At the time the discovery was thought to comprise the largest gas discovery in the Otway Basin. The well was cased and suspended as a potential gas producer.

Perth Basin

Cliff Head 1 was drilled in 16 m of water, 11 km offshore from Dongara. The well was drilled to test the Permian reservoirs, sealed by the Early Triassic Kockatea Shale. The well intersected a 5 m oil column over the interval 1253.3–1258.3 m. The well is of particular interest because it confirms the presence of oil in this area of the offshore Perth Basin. The oil is relatively shallow and there are multiple structures still to be tested. A sidetrack, Cliff Head 2, was drilled at an angle of 60° and intersected a 28.5 m gross vertical oil column. Both wells have been plugged and abandoned as oil discoveries.

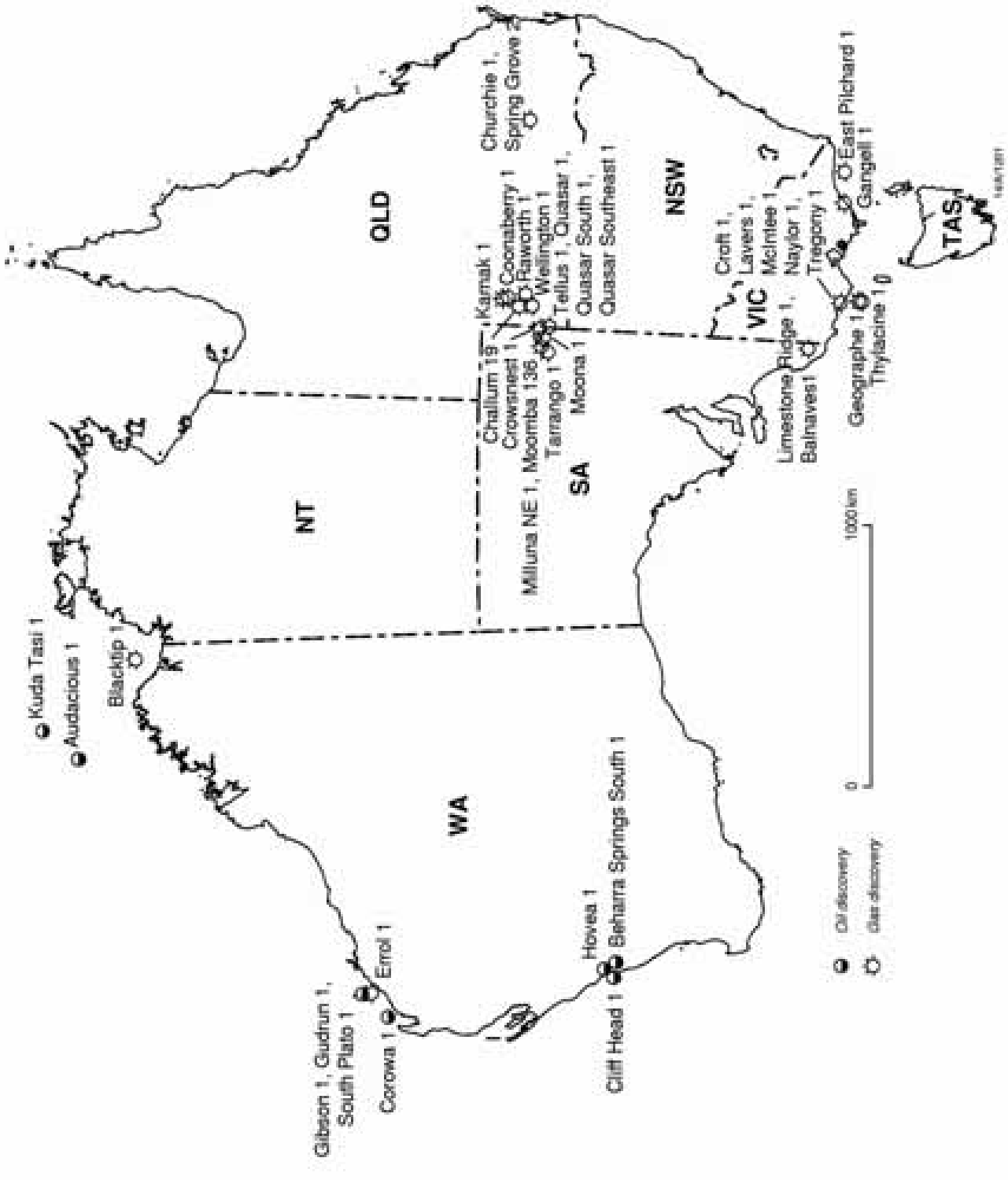

Figure 1.2 Location of discoveries in 2001 (listed in Appendix C)

Onshore drilling 2001

In 2001, 68 onshore exploration wells were drilled (Figure 1.3). Of these, 51 were new-field wildcat wells and 17 were extension/appraisal wells (Appendices A, G). Drilling was undertaken in the Bowen (1 well), Bowen/Surat (5 wells), Canning (3 wells), Carnarvon (2 wells), Cooper/Eromanga (34 wells), Gippsland (1 well), Murray (1 well), Otway (11 wells), Perth (5 wells) and Surat (6 wells) Basins.

Onshore exploration drilling accounted for 26 new-field discoveries (NFD) (Appendix C, Figure 1.2). Most of the success can be attributed to the activity and continuing discoveries in the Cooper and Eromanga Basins of South Australia and Queensland. A list of discoveries made during the year and other relevant information appears in Appendix C.

As happened in 2000, exploration drilling in the Cooper/Eromanga Basin continued to be driven by the relinquishment in 1999 of Petroleum Exploration Licences (PELs) 5 and 6 in South Australia. The focus has also been on development drilling throughout the numerous production licences held in the basin. However, the 13 gas discoveries and one oil discovery in the Cooper/Eromanga Basin are a substantial increase over the five gas discoveries made in 2000. The Wellington 1 and Crowsnest 1 wells were new-play stratigraphic-trap gas discoveries.

There was one Bowen/Surat Basin gas discovery at Churchie 1, which was suspended for further evaluation, and a small gas discovery at Spring Grove 2 in the Surat Basin. The Gangell 1 gas discovery in the Gippsland Basin flowed at 24 000 m^3/d (847 552 scf/d) and the well was suspended for possible future re-entry. In the Otway Basin, five of the six gas discoveries were cased and suspended for future production. These gas discoveries have added to the potential for the Otway Basin to be a future gas supplier to the Melbourne and Adelaide markets.

In the Perth Basin there were two oil discoveries, at Beharra Springs South 1 and at Hovea 1. The Beharra Springs South 1 well recovered a small amount of oil and the well was plugged and abandoned. The Hovea 1 oil discovery was drilled 8 km south of the Dongara gasfield and is considered a major new oil find, flowing at 151 kL/d (950 bbl/d). The well was cased and suspended for future oil production.

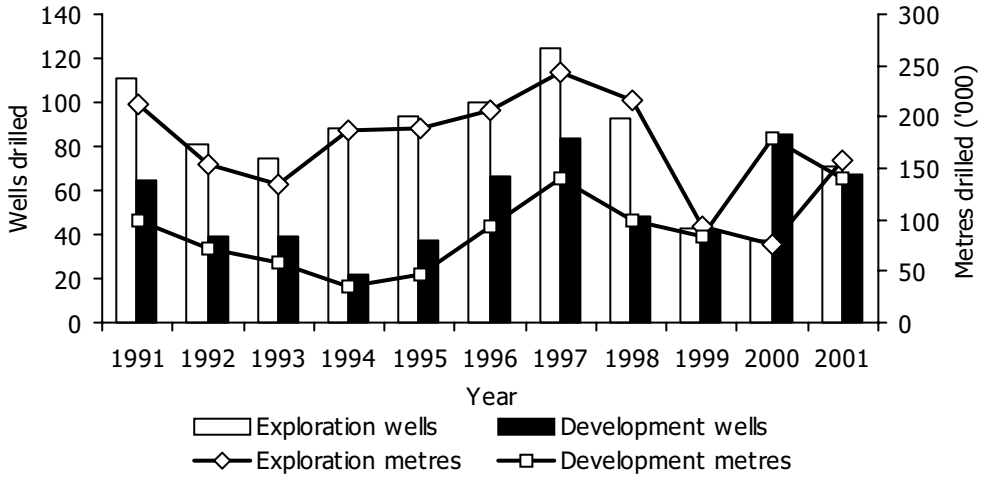

Figure 1.3 Wells and metres drilled onshore 1991–2001

1.2 Rig activity 2001

At the end of December 2001 there were 16 active rigs onshore and offshore (Figures 1.4, 1.5), four fewer than at the end of 2000. Ten of the available onshore rigs were active and six of the 10 offshore rigs were engaged in or in the process of mobilising.

Onshore, the number of active rigs varied between 10 and 14 throughout 2001. The year commenced with 13 rigs active, predominantly in the Cooper and Eromanga Basins (10 rigs) and also one rig each in the Otway and Canning Basins. By the end of the year rig activity had fallen to 10 rigs active from a high of 14 rigs active in November. At the end of the December quarter, the 10 active rigs were engaged in drilling in the Cooper and Eromanga (5 rigs), Otway (1 rig), Perth (1 rig) and Canning (1 rig) Basins and carrying out workovers in the Cooper and Eromanga Basins (2 rigs).

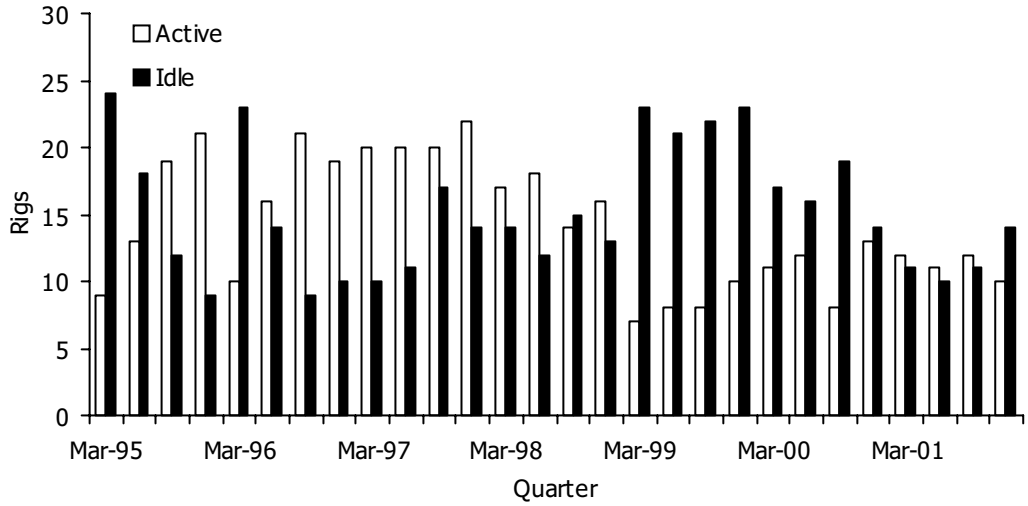

Figure 1.4 Onshore drilling rig activity 1995–2001

Offshore, rig activity varied between six and seven rigs active throughout 2001. The year commenced with six rigs active: three in the Carnarvon Basin and one each in the Bonaparte and Browse Basins and another mobilising in the Tuna field in the Gippsland Basin. In the December quarter six rigs were also active; development drilling occurred in the Gippsland and Carnarvon Basins and exploration drilling was undertaken in the Gippsland, Otway, Perth, Carnarvon, Browse and Bonaparte Basins. Workovers were carried out in the Gippsland Basin in the last quarter of the year.

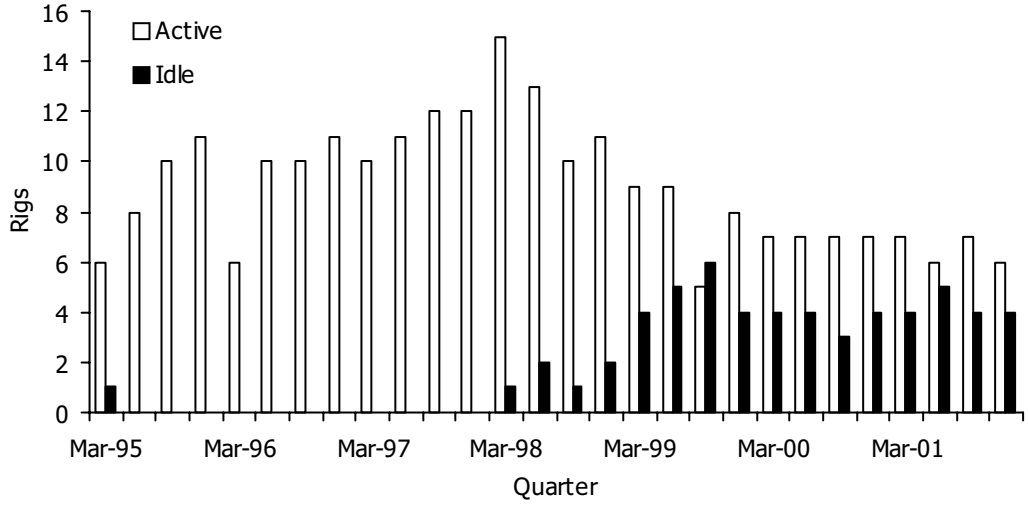

Figure 1.5 Offshore drilling rig activity 1995–2001

1.3 Petroleum permits, leases and licences

In 2001, petroleum permits, leases and licences in force or pending renewal both onshore and offshore in Australia covered about 3 080 591 km^2, including the Joint Petroleum Development Area (JPDA). The onshore titles comprised about 1 408 217 km^2 and the offshore titles comprised about 1 672 374 km^2.

Onshore, exploration permits covered an area of 1 241 863 km^2, production licences were in force over an area of 162 136 km^2 and retention leases covered an area of 4218 km^2.

Offshore, exploration permits covered an area of 1 575 786 km^2, production licences were in force over an area of 61 669 km^2 and retention leases covered an area of 35 078 km^2.

1.4 Success rates

The success rates shown (Table 1.2) are based on the number of new-field wildcat petroleum discoveries and new-field wildcat wells drilled in Australia onshore and offshore for each year from 1988 to 2001. No assumptions have been made as to whether a "discovery" has proved or will prove to be commercial. Geoscience Australia (GA) defines a discovery for success rate purposes as a well from which any measurable amount of oil or gas has been recovered or inferred from well logs. A summary of exploration and development drilling is presented in Appendix A.

Table 1.2 New–field wildcat success rates 1989–2001

	Success rate			Percentage success rate		
Year	Onshore	Offshore	Combined	Onshore	Offshore	Combined
1989	1:2.8	1:3.4	1:3.0	36.4	29.0	33.7
1990	1:2.8	1:4.2	1:3.3	35.5	23.9	30.6
1991	1:2.4	1:8.0	1:3.1	41.8	12.5	32.3
1992	1:3.3	1:4.7	1:3.7	30.0	21.4	26.9
1993	1:2.6	1:3.3	1:2.8	39.1	30.6	35.4
1994	1:1.8	1:3.3	1:2.1	57.1	30.8	48.8
1995	1:2.5	1:3.8	1:2.8	40.7	26.5	35.5
1996	1:2.8	1:2.7	1:2.8	35.3	36.7	35.7
1997	1:1.9	1:4.6	1:2.3	53.0	21.9	44.3
1998	1:2.1	1:4.1	1:2.7	47.2	24.6	37.2
1999	1:2.5	1:3.5	1:3.0	39.3	28.6	32.9
2000	1:3.1	1:2.2	1:2.4	31.8	45.5	41.6
2001	1:1.8	1:3.6	1:2.4	56.5	27.7	41.9

1.5 Release of offshore exploration areas

Offshore petroleum exploration in Australia operates under a work program bidding system. Vacant offshore acreage is released annually by the Commonwealth in two tranches, with closing dates for bids approximately six and 12 months after the date of release. The first closing generally includes mature to sub-mature acreage together with other areas requested by stakeholders for early release. Immature to frontier acreage is generally included in the second tranche as these areas require a greater lead-time for explorers to develop a pre-bid assessment.

The processes and requirements when applying for and being granted an exploration permit are detailed in three administrative guidelines: Applications for Exploration Areas; Bid Assessment Criteria; Permit Conditions and Administration. These guidelines are published by the Department of Industry, Tourism and Resources (DITR) in *Guidance Notes for Applicants* and *An Overview for Investors*, and accompany the promotional material associated with the annual release of acreage.

In April 1999, the then Department of Industry, Science and Resources (DISR) published its *Australian Offshore Petroleum Strategy* document, detailing a new guide for the size of release-area exploration permits (see http://www.industry.gov.au/resources/petr_exploration/releases-2000/strategy.html).

This new guide was applied to the 2000 and subsequent acreage release programs and provided a framework for a more focussed approach to offshore petroleum exploration. In the heavily explored areas (mature areas), release areas are restricted to a maximum of eight

graticular blocks (approximately 640 km^2), while in frontier regions, areas of up to 80 graticular blocks (approximately 6400 km^2) are released. The maximum recommended size of immature release areas is 40 graticular blocks while sub-mature areas generally do not exceed 20 graticular blocks in size.

During 1999, an Acreage Re-release Program was initiated by the Joint Authority to allow exploration companies to maintain "good standing" in the event of default in their work program conditions. These arrangements allow defaulting companies to spend the full amount of any outstanding commitments on new-fieldwork in the minimum guaranteed period of new permits awarded from the re-release program. Although the re-release of any area is at the discretion of the Joint Authority, it is generally intended that any area that does not attract a successful bid in the annual Acreage Release Program will be included in the re-release program. The re-released areas are open to all interested bidders under the work program bidding system, with closing dates for bids coinciding with the next closing date under the normal acreage release process.

2000 Offshore acreage release program

In early 2000, 86 offshore areas were released to petroleum explorers under the Commonwealth Offshore Acreage Release Program. The acreage was released in two tranches, with bids closing in November 2000 (36 areas) and in May 2001 (50 areas). The 2000 release program focussed on the North West Shelf, with 73 of the areas (85%) located in the offshore Bonaparte, Browse, Roebuck and Carnarvon Basins. This acreage covered a wide range of water depths and spanned a variety of geologic settings. A further 13 areas were released in the offshore Perth, Carpentaria, Otway and Gippsland Basins.

In total, 16 of the 86 areas offered in the 2000 Offshore Acreage Release Program were awarded as exploration permits, giving an overall take-up rate of 19%. Take-up of acreage in the frontier areas was around 6%, in the immature areas around 18% (11 areas, most in the Bonaparte Basin) and in the sub-mature and mature exploration acreage around 50% (eight areas in the Barrow, Dampier and Vulcan Sub-basins).

The 1999, the DISR released the *Australian Offshore Petroleum Strategy* document which recommended the promotion of exploration in frontier areas. Of the16 frontier areas included in the release on the Ashmore Platform and in the Roebuck and Carpentaria Basins, only one was subsequently awarded as an exploration permit (Q23/P, Carpentaria Basin).

Although offshore exploration acreage is released under a work program bidding system, indicative expenditure for each permit year of the proposed work program is included in the bid documentation submitted by the applicant(s). The work program committed to the initial three years of the permit term cannot be varied. As such, indicative expenditures associated with the initial three years of the permit term (referred to as the "primary work program" or "guaranteed work program") are guaranteed. Indicative expenditures committed to primary work programs in exploration permits awarded from the 2000 Acreage Release Program are shown in Table 1.3.

In 2000, indicative expenditure committed to primary work programs in successful bids for acreage totalled A$90 695 000. This indicative expenditure showed a significant decrease from that committed in the previous year's acreage release program (A$236 430 000) and was substantially below the maximum historical expenditure of A$598 210 000 committed to acreage released in 1996. Over the preceding decade (1986 to 1995), indicative expenditure committed to primary work programs averaged around A$113 800 000 per annum in non-inflation adjusted dollars.

Table 1.3 Offshore exploration permits awarded from the 2000 Acreage Release Program

Release Area	Basin / Sub-basin	Awarded as Exploration Permit	Operator	Indicative Expenditure in the Initial 3 Year (guaranteed) Work Program ($A)
W00-30	Bonaparte Basin / Petrel Sub-basin	WA-319-P	DrillSearch Energy Ltd	$1 980 000
W00-27	Bonaparte Basin / Petrel Sub-basin	WA-318-P	DrillSearch Energy Ltd	$1 980 000
W00-26	Bonaparte Basin / Petrel Sub-basin	WA-317-P	DrillSearch Energy Ltd	$1 980 000
W00-1	Bonaparte Basin / Londonderry High	WA-316-P	West Oil NL	$6 350 000
W00-32	Browse Basin	WA-315-P	Liberty Petroleum Corporation	$23 730 000
W00-31	Browse Basin	WA-314-P	Liberty Petroleum Corporation	$23 730 000
W00-28	Bonaparte Basin / Petrel Sub-basin	WA-313-P	Woodside Energy Ltd	$3 200 000
W00-57	Carnarvon Basin / Dampier Sub-basin	WA-312-P	Victoria Petroleum Pty Ltd	$400 000
W00-20	Bonaparte Basin / Londonderry High	WA-311-P	Magellan Petroleum (WA) Pty Ltd	$720 000
W00-56	Carnarvon Basin / Dampier Sub-basin	WA-310-P	West Oil NL	$800 000
V00-4	Gippsland Basin	VIC/P49	PanCanadian Petroleum Ltd	$1 250 000
V00-3	Gippsland Basin	VIC/P48	PanCanadian Petroleum Ltd	$625 000
V00-5	Gippsland Basin	VIC/P47	Eagle Bay Resources NL	$11 200 000
V00-1	Otway Basin	VIC/P46	Essential Petroleum Resources Ltd	$650 000
Q00-1	Carpentaria Basin	Q/23P	Gulf Energy Pty Ltd	$1 500 000
AC00-4	Bonaparte Basin / Vulcan Sub-basin	AC/P32	Daytona Energy Corporation	$10 600 000

2001 Offshore acreage release program

In 2001, a reduced number (42) of exploration areas were offered to the petroleum industry. Released in two tranches with closing dates for bids in October 2001 (13 areas) and April 2002 (29 areas), the 2001 Offshore Acreage Release Program was less focussed on the North West Shelf than the previous year's program. Only 19 release areas (45%) were located on the North West Shelf, with the remainder offered in the offshore Perth, Money Shoal, Sorell and Duntroon Basins. As in 2000, the acreage made available in 2001 spanned a wide range of water depths and geologic settings and offered exploration opportunities for large and small explorers alike.

As with the previous year's acreage release program, frontier acreage in several sedimentary basins was offered to the industry. Eleven areas in the offshore Perth Basin, three areas in the Sorell Basin and three areas in the Duntroon Basin were made available to explorers (approximately 40% of the areas offered). As in previous years, acreage recently made available by relinquishment, surrender or cancellation from current permits in the more mature areas was included in the release program.

Of the 13 release areas offered in the first tranche of offshore acreage in 2001, four were awarded as exploration permits (Table 1.4). This tranche included the mature and sub-mature areas offered in the Dampier, Barrow, Exmouth and Vulcan Sub-basins. Take-up rates of the mature and sub-mature acreage in 2001 were similar to those experienced in 2000 (around 50%).

Bids for the second tranche of acreage offered in 2001 closed in April 2002. At date of writing, results from this round of bidding had not been finalised.

Table 1.4 Offshore exploration permits awarded from the first closing of the 2001 Acreage Release Program

Release Area	Basin / Sub-basin	Awarded as Exploration Permit	Operator	Indicative Expenditure in the Initial 3 Year (guaranteed) Work Program ($A)
W01-13	Carnarvon Basin / Exmouth Sub-basin	WA-322-P	Octanex NL	$1 900 000
W01-12	Carnarvon Basin / Dampier Sub-basin	WA-321-P	Octanex NL	$1 400 000
W01-15	Carnarvon Basin / Barrow Sub-basin	WA-320-P	OMV Petroleum Pty Ltd	$1 400 000
NT01-1	Bonaparte/Money Shoal Basin	NT/P61	Santos Offshore Pty Ltd	$17 000 000

2002 Offshore acreage release program

In early 2002, a further 41 offshore areas were offered to petroleum explorers. Twenty-one of these areas (51%) are located on the North West Shelf. As with the previous year's Acreage Release Program, a significant proportion of the acreage made available to the petroleum industry was located in frontier regions (36%). This included six areas in the Roebuck Basin, five in the Bight Basin and four in the Arafura/Money Shoal Basin.

Closing dates for bids on the 2002 release areas are 24 October 2002 (seven areas) and 10 April 2003 (36 areas).

Offshore acreage re-release program 1999–2001

The re-release of areas that did not attract a bid during the course of the normal acreage release process commenced in 1999. Since that time, there have been seven re-releases, including three areas that were re-released for a second time at the request of a stakeholder. Of the 111 areas offered in the five Re-release Programs that had closed for bids as at 1 April 2002, five have subsequently been awarded as exploration permits. Results from the Acreage Re-release Program are shown in Table 1.5.

Table 1.5 Offshore Acreage Re-release Program, 1999 to 2001

Re-release	Areas Re-released	Number of Areas	Bids Close	Areas Awarded as Permits
1st Closing of 1999	NT99-1 to 6; W99-30 to 34; S99-7 and 8; V99-1; T99-1 to 3. AC99-1(a) and (b).	19	06/04/2000	W99-33 awarded as WA-300-P; W99-34 awarded as WA-299-P.
Second Re-release, 1st Closing of 1999	W99-30 to 32.	3	23/06/2000	W99-31 awarded as WA-308-P; W99-32 awarded as WA-309-P.
2nd Closing of 1999	W99-6,8,10,12,13, 16 to 20,22 to 28,35 to 37; S99-1,3 and 6.	23	02/11/2000	None.
1st Closing of 2000	NT00-1 to 4; W00-33 to 50,54, 55, 62 to 68. Q00-2 and 3; AC00-1,2,3 and 6; V00-2.	38	03/05/2001	None.
2nd Closing of 2000	W00-2,4 to 12,14 to 19,21,22,23,25,29, 51, 52,58 to 61. T00-1.	28	11/10/2001	W00-52 awarded as WA-323-P.
1st Closing of 2001	W01-1,10,11,14. NT01-2 to 5; AC01-1; W00-24*, and 53*.	11	11/04/2002	To be Announced.
2nd Closing of 2001	W01-2 to 6,16 to 21 and 26; S01-2 and 3; T01-2.	15	24/10/2002	Currently Open for Bidding.

* Delayed re-release.

1.6 Recent trends in deepwater exploration

Release of deepwater acreage 1996 to 2000

During the last decade, there has been increasing worldwide interest in deepwater exploration and production. The conditions that currently constitute deepwater exploration and development are poorly defined. The deepwater boundary for exploration drilling is commonly taken as 800 m, because dynamically positioned drilling rigs are usually required for drilling in deeper waters (Wright et al., 1997). For the purposes of this discussion, however, the 400 m bathymetric contour (which defines the limit of conventional steel jacket platform development), is used to delineate the shallow limit of deepwater drilling.

Since 1996, increasing numbers of deepwater permits have been awarded to explorers in the Browse, Carnarvon and Gippsland Basins (Table 1.6). These deepwater areas have typically been awarded to large Australian and foreign companies. Despite the increasing take-up of deep water acreage, however, the average indicative expenditure committed to minimum guaranteed work programs in these deepwater permits has shown a significant decline over the period 1996 to 2000 (Table 1.6).

In 1996, the average indicative expenditure committed to the initial three-years work program in a deepwater permit was approximately A$29 000 000. By 1999/2000, this figure had fallen to around A$12 000 000. This decrease is due in part to the increasing reluctance of explorers to include an exploration well in the guaranteed component (first three years) of the six years work program in deepwater immature to frontier exploration areas.

Deep water drilling 1991 to 2001

Between 1991 and 2001, a total of 36 wells were drilled offshore Australia in water depths greater than 400 m (Figure 1.6, Table 1.7). No wells were drilled in 1991 or 1993. Of the wells drilled, most were located either in the Exmouth Sub-basin or on the Exmouth Plateau (Figure 1.7). This deepwater drilling has resulted in the discovery of nine gas and four oil accumulations and one oil and gas accumulation. One of these (Corallina) is currently in commercial production. Discoveries resulting from the deepwater drilling program undertaken on the Exmouth Plateau between 1999 and 2001 by Mobil and Chevron have added significantly to North West Shelf gas reserves.

The success rate for deepwater exploration wells drilled during over the last decade is around 36%. This is significantly higher than the success rate recorded for new-field wildcat drilling in shallower waters during that time and compares favourably with the current global deep water exploration success rate of around 30% (Pettingill & Weimer, 2001). The high success rates currently associated with deep water drilling may be a result of the creaming effect (Wright et al., 1997). In immature and frontier areas, the larger, lower risked prospects are drilled first, leading to significant additions to reserves and high success rates. As exploration advances and without validation of further new play types, both the size of discovery and success rates in these deep water areas are expected to decline.

Table 1.6 Deepwater exploration permits awarded, 1996 to 2000

Exploration Permit	Approximate Water Depth (metres)	Basin / Sub-basin	Operator	Indicative Expenditure in MGWP (A$)
1996				
WA-269-P	500-1500	Carnarvon Basin / Exmouth Plateau	Woodside	$43 400 000 (4 wells)
WA-271-P	200-2000	Carnarvon Basin / Exmouth Plateau	Woodside	$21 200 000 (3 wells)
WA-268-P	1000-1500	Carnarvon Basin / Exmouth Plateau	Mobil	$21 500 000 (1 well)
1997				
WA-275-P	200-2000	Browse Basin	Woodside	$5 215 000
AC/P30	500-1000	Browse Basin	BHPP	$49 540 000 (2 wells)
1998				
WA-294-P	500-2000	Carnarvon Basin / Exmouth Plateau	Woodside	$13 050 000
WA-295-P	300-2000	Carnarvon Basin / Beagle Sub-basin	Kerr McGee	$39 860 000 (2 wells)
WA-297-P	300-2000	Roebuck Basin	Woodside	$9 500 000
WA-296-P	300-4000	Roebuck Basin	Woodside	$32 075 000 (1 well)
1999				
WA-302-P	1000-2500	Browse Basin	BHPP	$35 550 000 (1 well)
WA-300-P*	<200-1500	Carnarvon Basin / Exmouth Sub-basin	Woodside	$10 000 000
WA-301-P	2000-3000	Browse Basin	BHPP	$5 700 000
WA-303-P	1000-3000	Browse Basin	BHPP	$8 670 000
WA-304-P	500-2000	Browse Basin	BHPP	$7 460 000
WA-305-P	750-2000	Browse Basin	BHPP	$4 090 000
WA-306-P	300-1500	Browse Basin	Antrim	$2 000 000
EPP28	<200-1500	Great Australian Bight Basin	Woodside	$5 000 000
EPP29	1000-4000	Great Australian Bight Basin	Woodside	$22 990 000 (1 well)
EPP30	200-4000	Great Australian Bight Basin	Woodside	$6 400 000
WA-299-P*	200-2000	Carnarvon Basin / Exmouth Sub-basin	Woodside	$20 000 000 (1 well)
2000				
VIC/P49	500-3000	Gippsland Basin	PanCanadian	$1 250 000
WA-314-P	500-1500	Browse Basin	Liberty	$23 730 000 (1 well)
WA-315-P	500-1500	Browse Basin	Liberty	$23 730 000 (1 well)
VIC/P48	500-3000	Gippsland Basin	PanCanadian	$625 000
2001	Results not Available at Date of Publication			
2002	Acreage Open for Bidding at Date of Publication			

* Re-released acreage
MGWP = Minimum Guaranteed (initial 3 Year) Work Program

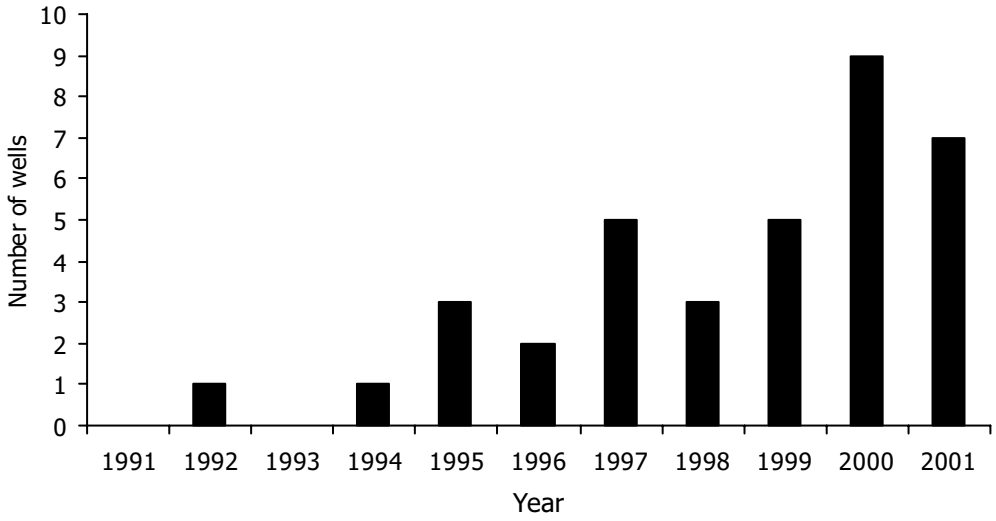

Figure 1.6 Deepwater (>400 m) wells drilled offshore Australia 1991 to 2001

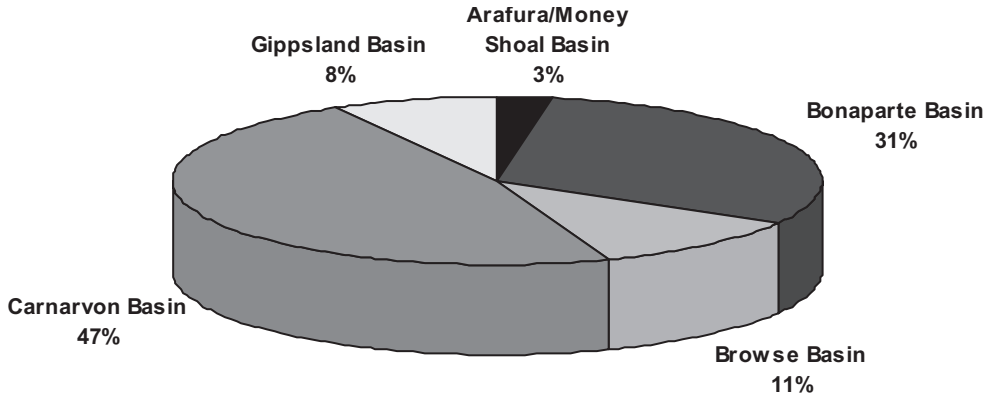

Figure 1.7 Location of deepwater drilling offshore Australia 1991 to 2001

Bonaparte Basin

In the early to mid-1990s, five wells were drilled on the Sahul Platform *sensu lato* targeting the Elang and Plover Formations. Of these, two discovered oil (Jahal-1 and Corallina-1).

Corallina lies in water depths of around 400 m and in close proximity to the Laminaria oil field. Commercial oil production from the joint development of Laminaria and Corallina commenced in 1999 via sub-sea wellheads linked to flowlines and risers connected to a common FPSO facility. The FPSO vessel is moored in water depths of around 385 m making it Australia's deepest water oil production facility.

Table 1.7 Deepwater (>400 m) exploration wells drilled offshore Australia, 1991 to 2001

Well Name	Operator	Permit*	Basin / Sub-basin	Water Depth (metres)	Drilling Rig
1992					
Whaleshark 1	none	vacant	Gippsland Basin	-717	Falcon
1994					
Chrysaor 1[1]	Chevron	WA-14-R	Carnarvon Basin / Exmouth Plateau	-806	Glomar Robert F Bauer*
1995					
Altair 1	BHP	WA-289-P	Carnarvon Basin / Exmouth Sub-basin	-605	Glomar Robert F Bauer*
Barnacle 1	Woodside	ZOCA 91-01	Bonaparte Basin / Sahul Platform	-535	Eagle
Corallina 1[2]	Woodside	AC/L5	Bonaparte Basin / Sahul Platform	-411	Ocean General
1996					
Leyden 1B	none	vacant	Carnarvon Basin / Exmouth Plateau	-1026	Peregrine III**
Jahal 1[3]	Woodside	ZOCA 91-01	Bonaparte Basin / Sahul Platform	-402	Ocean Bounty
1997					
Great White 1	none	vacant	Gippsland Basin	-659	Sedco 703
Vidalia 1	BHP	AC/P8	Bonaparte Basin / Sahul Platform	-503	Sedco 703
Alaria 1	Woodside	AC/L5	Bonaparte Basin	-402	Sedco 703
Thornton 1	Shell	ZOCA 91-02	Bonaparte Basin / Sahul Platform	-457	Ocean Epoch
Billfish 1	none	vacant	Gippsland Basin	-499	Sedco 703
1998					
Banka Banka 1	Santos	AC/P15	Bonaparte Basin / Vulcan Sub-basin	-439	Southern Cross
Claudea 1	BHP	AC/P8	Bonaparte Basin / Sahul Platform	-476	Sedco 703
Fish River 1	Santos	AC/P15	Bonaparte Basin / Vulcan Sub-basin	-476	Southern Cross
1999					
Orthrus 1[1]	Chevron	WA-267-P	Carnarvon Basin / Exmouth Plateau	-1203	Marine 500
Euryale 1 (WAPET)	Chevron	WA-205-P R2	Carnarvon Basin	-700	Marine 500
Ermine 1	Woodside	WA-270-P	Carnarvon Basin / Beagle Sub-basin	-526	Sedco 703
Enfield 1[2]	Woodside	WA-271-P	Carnarvon Basin / Exmouth Sub-basin	-544	Sedco 703
Geryon 1[1]	Chevron	WA-267-P	Carnarvon Basin / Exmouth Plateau	-1231	Marine 500
2000					
Urania 1[1]	Chevron	WA-267-P	Carnarvon Basin / Exmouth Plateau	-1200	Marine 500
Tyche 1	Shell	NT/P49	Arafura/Money Shoal Basin	-403	Ocean Bounty
Laverda 1[2]	Woodside	WA-271-P	Carnarvon Basin / Exmouth Sub-basin	-840	Marine 500
Abalone 1	Japex	AC/P29	Browse Basin	-410	Ocean Bounty
Maenad 1A[1]	Chevron	WA-267-P	Carnarvon Basin / Exmouth Plateau	-1221	Marine 500
Jansz 1[1]	Mobil	WA-268-P	Carnarvon Basin / Exmouth Plateau	-1321	Marine 500
Argus 1	BHP	AC/P30	Browse Basin	-575	Ocean General
Brecknock South 1[1]	Woodside	WA-33-P R3	Browse Basin	-423	Sedco 703
Titania 1 (Woodside)	Woodside	WA-269-P	Carnarvon Basin	-1000	Marine 500
2001					
Atlas 1	Woodside	WA-269-P	Carnarvon Basin / Exmouth Plateau	-1395	Marine 500
Phrixus 1	BHP	AC/P30	Browse Basin	-411	Sedco 702
Pandorina 1	BHP	AC/P8	Bonaparte Basin / Sahul Platform	-475	Ocean General
Montesa 1	Woodside	WA-271-P	Carnarvon Basin / Exmouth Sub-basin	-903	Marine 500
Kuda Tasi 1[2]	Woodside	ZOCA 91-01	Bonaparte Basin / Sahul Platform	-428	Ocean Bounty
Io 1[1]	Chevron	WA-267-P	Carnarvon Basin / Exmouth Plateau	-1352	Marine 500
Callirhoe 1[1]	Chevron	WA-267-P	Carnarvon Basin / Exmouth Plateau	-1221	Marine 500

*Operators and Permits as at April 2001. Whaleshark 1 is now in VIC/P48, Great White 1 is in VIC/P49,
** Drill ship, [1] Gas Discovery, [2] Oil Discovery, [3] Oil and Gas Discovery.

Carnarvon Basin

Between 1991 and 2001, exploration drilling on the Exmouth Plateau accelerated. During this period, Mobil and Chevron drilled seven deepwater wells targeting Jurassic/Triassic gas plays within exploration permits WA-267-P and WA-268-P. Of these, six encountered significant hydrocarbon columns (Callirhoe-1, Io-1, Jansz-1, Maenad-1A, Orthrus-1 and Geryon-1).

After the initial encouragement provided by the discovery of oil in the Exmouth Sub-basin by Vincent-1 in 1998, between 1999 and 2001 Woodside drilled three wells in the deepwater portion of the Exmouth Sub-basin within exploration permit WA-271-P. Two of these (Enfield-1 and Laverda-1) discovered oil in the Lower Cretaceous section.

Gippsland Basin

Between 1991 and 1997, three deepwater wells were drilled in the offshore Gippsland Basin targeting the Top Latrobe Group. All of these wells were plugged and abandoned as dry holes. Although the most recent deepwater Gippsland Basin wells failed to encounter hydrocarbons, in 1999 oil production commenced from the Blackback field. Lying in water depths of 300–600 m, Blackback is Australia's deepest water field under commercial production. Discovered in 1975 by the Hapuku-1 well, sub-sea completed wells on the Blackback field are connected via a 23.2 km pipeline to production facilities on the Mackerel platform located in 93 m of water.

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2: Identified resources

2.1 Basin geology and petroleum potential

Sedimentary rocks ranging in age from Proterozoic to Tertiary underlie about 4.3 million km^2 or about half of the land area of Australia (Figure 2.1), and about 2 million km^2 of the continental shelf. Forty-eight sedimentary basins are now recognised, of which 20 lie partly or wholly offshore.

Petroleum systems active in Australian sedimentary basins and the history of Australian petroleum discovery to date have recently been reviewed by Bradshaw et al. (1999) and Longley et al. (2002).

Australia's petroleum reservoirs range in age from Proterozoic to Early Tertiary. Locally, relationships are complex (e.g. the Galilee Basin overlies the Adavale Basin and underlies the Eromanga Basin). Basement denotes regions generally unprospective for petroleum—mainly areas underlain by crystalline rocks or by tightly folded or metamorphosed strata.

Most of the oil resources discovered so far are in offshore Tertiary reservoirs in the Gippsland Basin, while major oil and gas resources are present on the North West Shelf (Carnarvon, Browse and Bonaparte Basins) and in the Cooper and Eromanga Basins. The petroleum reservoirs in the Carnarvon, Browse and Otway Basins are Mesozoic. Both Mesozoic and Permian reservoirs exist in the Bonaparte Basin. Onshore, petroleum occurs in Jurassic and Cretaceous reservoirs in the Eromanga Basin, and Jurassic reservoirs in the Surat Basin. The reservoirs are Permian and Triassic in the Perth, Bowen and Cooper Basins. In Adavale Basin, the reservoirs are Devonian, while Canning Basin reservoirs are Permian and Devonian. Late Precambrian and Late Ordovician reservoirs occur in the Amadeus Basin.

The early to mid-Palaeozoic reservoirs in the Amadeus, Canning and Adavale Basins are in shallow marine sedimentary sequences. The Canning Basin contains Australia's only petroleum producing carbonate reservoir—a Devonian reef. However, most of Australia's petroleum resources have been discovered in Tertiary, Mesozoic and Late Palaeozoic clastic sequences.

Significant new petroleum discoveries of oil and gas during 2001

Oil

The most significant oil discovery of 2001 was Cliff Head, located approximately 11 km from Dongara, within exploration permit WA-286-P, in the offshore Perth Basin. The discovery well (Cliff Head 1), drilled by a Joint Venture led by Roc Oil (WA) Pty Ltd, intersected an oil pool within the Permian section. The Cliff Head oil field represents the first potentially commercial oil discovery in the offshore Perth Basin and confirms the presence of a working petroleum system capable of generating and trapping commercial quantities of oil in this area. Further drilling is planned both on satellite structures adjacent to Cliff Head and on the Cliff Head feature itself. The potential for a commercial

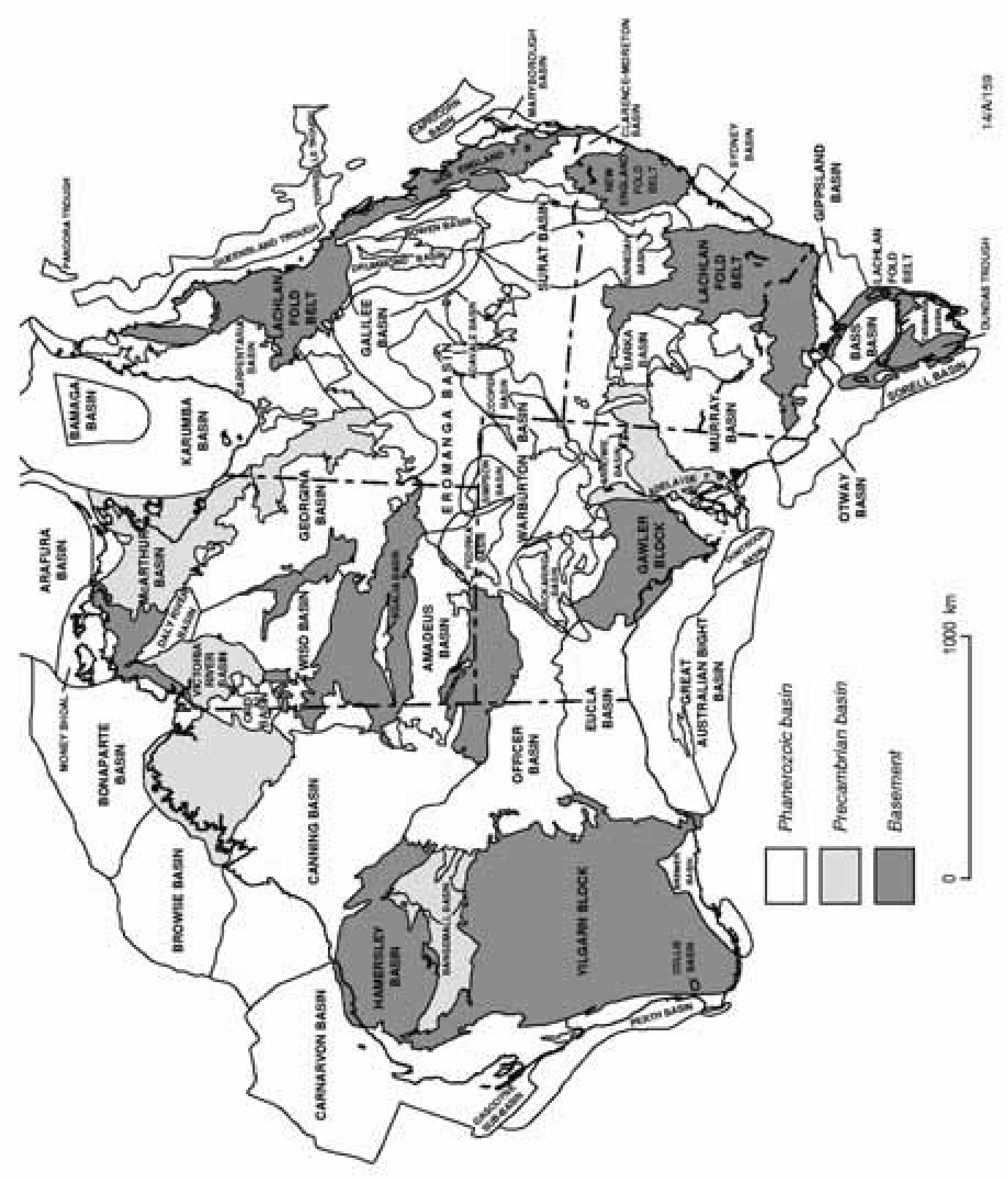

Figure 2.1 Australia's sedimentary basins

development at Cliff Head is enhanced by its proximity to onshore infrastructure, shallow water depths and shallow reservoir depth. Reports indicate Cliff Head could contain in excess of 70 million barrels of oil in place.

During 2001, exploration drilling by Apache Northwest Pty Ltd in the Carnarvon Basin in the vicinity of the Harriet oil field continued. In production license TL/1, Gudrun 1 encountered oil in the Flag Sandstone. Two wells located in production license TL/6 (Gibson 1 and South Plato 1) also intersected oil pools in the Flag Sandstone. These discoveries have provided further additions to the reserves base accessible to the Harriet field production facilities located on Varanus Island.

In the Bonaparte Basin to the north, the AC/P17 joint venture led by OMV Timor Sea Pty Ltd made the Audacious 1 oil discovery. The discovery well flowed oil on production test from the Plover Formation. A subsequent appraisal well (Audacious 2) drilled 2.3 km to the southwest, was not tested. A joint commercial oil development with the nearby Tenacious oil discovery is currently under consideration.

Gas

The most significant gas discoveries made in 2001 were Geographe and Thylacine, located approximately 60 km south of Port Campbell in the offshore Otway Basin. The Geographe and Thylacine features are separate culminations lying on the same structural trend. Geographe lies in Victorian State Waters within exploration permit VIC/P43 while Thylacine lies in Tasmanian State Waters within exploration permit T/30P. Thylacine 1 was drilled by a joint venture led by Origin Energy Resources Ltd. Subsequent drilling by the Woodside Energy Ltd led joint venture in VIC/P43 to the north led to the discovery of gas at Geographe.

Geographe North 1 tested a separate culmination adjacent to the main Thylacine and Geographe features but was plugged and abandoned with only minor gas shows. A further appraisal well (Thylacine 2) flowed gas on production test but was plugged and abandoned as it was not optimally located as a development well.

The gas/condensate resource at Geographe and Thylacine has been reported as 1 TCF gas in place at both Geographe and Thylacine. Recently, Woodside Energy Ltd negotiated the sale of gas from Geographe and Thylacine with TXU Electricity Ltd. Onshore delivery of gas is scheduled to commence in 2006.

Blacktip 1, located in the southern Bonaparte Basin within exploration permit WA-279-P, was the only other significant gas discovery made during 2001. The well flowed gas on test from multiple reservoirs within the Permo-Triassic section. Reports indicate that up to 1 trillion cubic feet of gas-in-place may be present at Blacktip. The Operator of exploration permit WA-279-P (Woodside Petroleum Ltd) is currently exploring development options for Blacktip. Although the gas at Blacktip could be commercialised on a stand-alone basis, a combined commercial gas development in the area is possible if other gas discoveries are subsequently made in the Southern Bonaparte Gulf near the basin margin.

2.2 Identified resources

Australia's identified resources are compiled from Geoscience Australia's in-house data and data provided by companies and State and Northern Territory mines departments. Information on individual accumulations is provided in the Geoscience Australia series *Australian Petroleum Accumulations*. The reserves estimates at 1 January 2001 are presented in Table 2.1 categorised by basin. The corresponding estimates according to the McKelvey reporting system are listed in Table 2.2. Bonaparte Basin estimates include the total reserves in the JPDA with East Timor.

Initial and remaining crude oil, condensate and gas reserves, together with production, for the period 1960–2000 are shown in Figure 2.2. Remaining crude oil reserves are now showing signs of a slow decline after having remained approximately unchanged since 1970. Most (385 of 725 GL) of the increase in initial crude oil reserves since 1970 remains due to growth in reserves in fields discovered before 1970. During the same period, remaining gas reserves have increased by 10 times, mainly due to discoveries of major gas resources off northwestern Australia. Reduction in crude oil reserves through production have not been matched by discoveries and reassessment of identified fields in the year to 1 January 2001, but increases in condensate reserves have more than offset this decline. Discoveries of gas have greatly exceeded production over the same period.

Changes to the Category 1 figures for the period are due to oil and gas production. Category 2 crude oil and gas volumes have increased due to assessment of recent discoveries in the Carnarvon Basin while further additions were made due to discoveries and reassessments of gas accumulations in the Browse and onshore Perth Basins.

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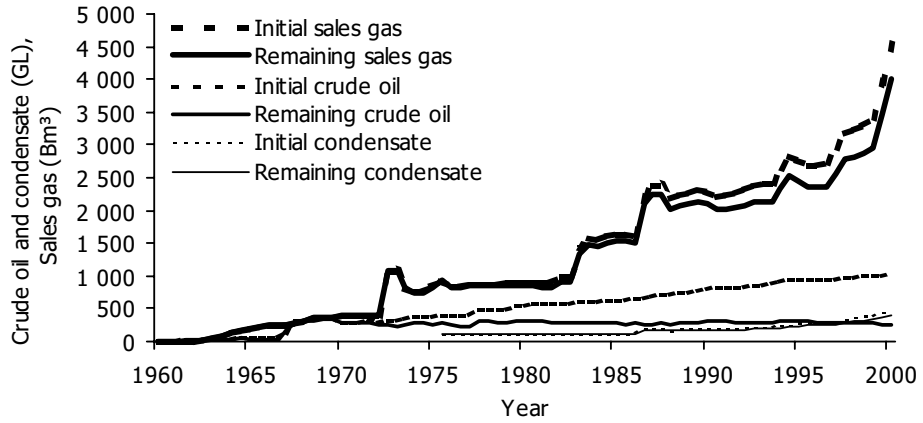

Figure 2.2 Australia's initial and remaining commercial plus non-commercial reserves of oil, condensate and gas

Table 2.1: Petroleum reserves estimates by basin as at 1 January 2001

Category / Basin	Crude oil		Condensate		LPG		Sales gas	
	GL	million barrels	GL	million barrels	GL	million barrels	Bcm	Tcf
Category 1								
Adavale	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.01
Amadeus	0.72	4.50	0.42	2.65	0.22	1.38	8.26	0.29
Bonaparte	22.65	142.48	0.00	0.00	0.00	0.00	0.24	0.01
Bowen	0.05	0.32	0.11	0.70	0.15	0.96	2.15	0.08
Canning	0.06	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Carnarvon	69.30	435.88	86.62	544.82	87.77	552.05	600.45	21.20
Cooper	1.05	6.59	7.73	48.63	9.68	60.90	88.29	3.12
Eromanga	6.15	38.69	0.18	1.10	0.11	0.70	1.76	0.06
Gippsland	61.77	388.49	17.40	109.44	30.90	194.35	153.96	5.44
Otway	0.00	0.00	0.07	0.41	0.00	0.00	0.77	0.03
Perth	0.19	1.20	0.01	0.06	0.00	0.00	2.63	0.09
Surat	0.23	1.47	0.00	0.03	0.01	0.09	0.64	0.02
TOTAL	**162.17**	**1 019.99**	**112.54**	**707.84**	**128.85**	**810.44**	**859.50**	**30.35**
PREVIOUS	**201.87**	**1 269.72**	**120.46**	**757.67**	**134.54**	**846.25**	**890.58**	**31.45**
Category 2								
Amadeus	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.02
Bass	2.45	15.41	5.51	34.66	8.14	51.20	9.70	0.34
Bonaparte	10.77	67.75	92.42	581.31	64.84	407.82	668.31	23.60
Bowen	0.00	0.01	0.01	0.08	0.02	0.12	3.11	0.11
Browse	0.48	3.00	94.30	593.13	70.59	444.02	858.96	30.33
Canning	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.01
Carnarvon	61.33	385.73	85.52	537.90	84.20	529.59	1 483.18	52.38
Cooper	0.05	0.30	1.86	11.67	2.32	14.57	22.64	0.80
Eromanga	0.31	1.92	0.03	0.20	0.03	0.20	0.84	0.03
Gippsland	14.75	92.77	4.51	28.40	0.60	3.77	52.96	1.87
Gunnedah	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Otway	0.00	0.00	0.34	2.14	0.00	0.00	12.67	0.45
Perth	0.00	0.00	0.00	0.00	0.00	0.00	22.50	0.79
Surat	0.00	0.00	0.00	0.02	0.01	0.04	0.05	0.00
TOTAL	**90.13**	**566.90**	**284.51**	**1 789.50**	**230.75**	**1 451.35**	**3 135.65**	**110.74**
PREVIOUS	**72.45**	**455.67**	**223.71**	**1 407.07**	**215.12**	**1 353.09**	**2 391.91**	**84.47**
GRAND TOTAL	**252.30**	**1 586.89**	**397.05**	**2 497.34**	**359.60**	**2 261.78**	**3 995.15**	**141.09**
PREVIOUS TOTAL	**274.32**	**1 725.40**	**344.17**	**2 164.75**	**349.67**	**2 199.34**	**3 282.49**	**115.92**

NOTES
Category 1 comprises current reserves of those fields which have been declared commercial. It includes both proved and probable reserves.
Category 2 comprises estimates of recoverable reserves which have not yet been declared commercially viable; they may be either geologically proved or are awaiting further appraisal.
For McKelvey resource classification see Table 2.2.
"Previous" totals refer to revised estimates of remaining reserves for the previous year.

Table 2.2: McKelvey classification estimates by basin as at 1 January 2001

Category	Crude oil		Condensate		LPG		Sales gas	
Basin	GL	million barrels	GL	million barrels	GL	million barrels	Bcm	Tcf
Economic Demonstrated Resources								
Adavale	0	0	0	0	0	0	0	0
Amadeus	1	5	0	3	0	1	8	0
Bass	2	9	1	5	1	5	3	0
Bonaparte	25	155	82	518	65	408	332	12
Bowen	0	0	0	1	0	1	2	0
Canning	0	0	0	0	0	0	0	0
Carnarvon	77	484	168	1058	169	1061	1649	58
Cooper	1	6	6	38	8	53	73	3
Eromanga	6	40	0	1	0	1	2	0
Gippsland	68	426	18	110	31	195	175	6
Otway	0	0	0	1	0	0	9	0
Perth	0	1	0	0	0	0	3	0
Surat	0	1	0	0	0	0	1	0
TOTAL	**180**	**1129**	**276**	**1735**	**274**	**1725**	**2256**	**80**
PREVIOUS	**219**	**1378**	**283**	**1780**	**274**	**1726**	**2105**	**74**
Subeconomic Demonstrated Resources								
Amadeus	0	0	0	0	0	0	1	0
Bass	1	6	5	30	7	47	7	0
Bonaparte	9	55	10	63	0	0	324	11
Bowen	0	0	0	0	0	0	3	0
Browse	0	3	81	506	59	369	750	26
Canning	0	0	0	0	0	0	0	0
Carnarvon	42	265	4	25	3	20	432	15
Cooper	0	0	3	20	3	20	35	1
Eromanga	0	1	0	0	0	0	1	0
Gippsland	9	55	4	28	1	3	32	1
Gunnedah	0	0	0	0	0	0	0	0
Otway	0	0	0	1	0	0	4	0
Perth	0	0	0	0	0	0	23	1
Surat	0	0	0	0	0	0	0	0
TOTAL	**61**	**386**	**107**	**673**	**73**	**460**	**1610**	**57**
PREVIOUS	**55**	**345**	**61**	**384**	**75**	**471**	**1173**	**41**
GRAND TOTAL	**252**	**1587**	**397**	**2497**	**360**	**2262**	**3995**	**141**
PREVIOUS TOTAL	**274**	**1725**	**344**	**2165**	**350**	**2199**	**3282**	**116**

NOTES
Economic Demonstrated Resources are resources judged to be economically extractable and for which the quantity and quality are computed partly from specific measurements, and partly from extrapolation for a reasonable distance on geological evidence.
Subeconomic Demonstrated Resources are similar to Economic Demonstrated Resources in terms of certainty of occurrence and, although considered to be potentially economic in the foreseeable future, these resources are judged to be subeconomic at present.
For traditional petroleum industry classification see Table 2.1.
"Previous" totals refer to revised estimates of remaining reserves for the previous year.

3: Undiscovered resources

3.1 Medium term potential of the Bonaparte Basin

During 2001–2002, the assessment of undiscovered resources of the Bonaparte Basin has been updated. The results reveal that, at the mean expectation, there remains the potential for:

- 335 MNbbl oil,
- 2.96 TCF gas, and
- 116 MNbbl condensate

to be discovered.

The last assessment of the Bonaparte Basin was undertaken in 1998 where the result was 567 MNbbl oil and 2.27 TCF gas. The new assessment shows a decrease of 41% for oil and an increase of 30% for gas and reflects the exploration history since the last assessment. Condensate was not assessed in 1998 for the Bonaparte Basin.

Table 3.1 shows in more detail the results of the Bonaparte Basin assessment.

Table 3.1 Assessment of undiscovered hydrocarbon resources in the Bonaparte Basin

		P95	Mean	P05
Oil	MNbbl	74.5	334.7	683.4
	GL	11.8	53.2	108.7
Gas	TCF	0.6	2.96	7.2
	BCM	16.2	83.8	203.1
Condensate	MNbbl	17.2	116.1	321.2
	GL	2.7	18.4	51.1

Figures 3.1 and 3.2 show the cumulative distribution plots for the oil and gas assessments respectively.

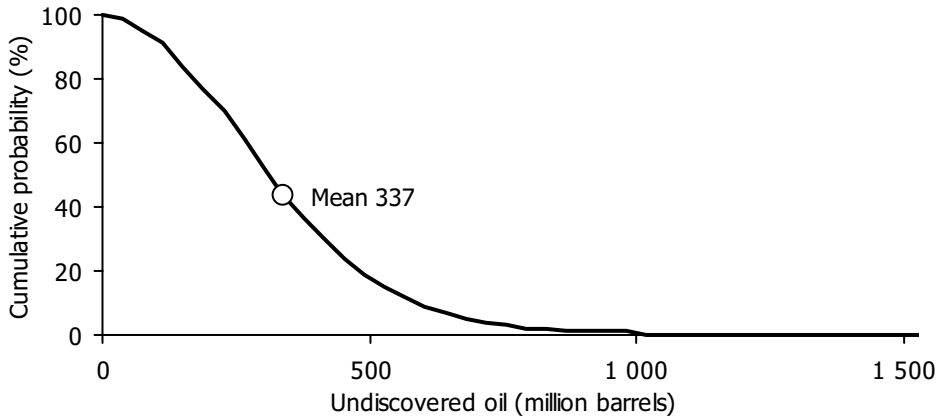

Figure 3.1 Undiscovered oil resources in the Bonaparte Basin

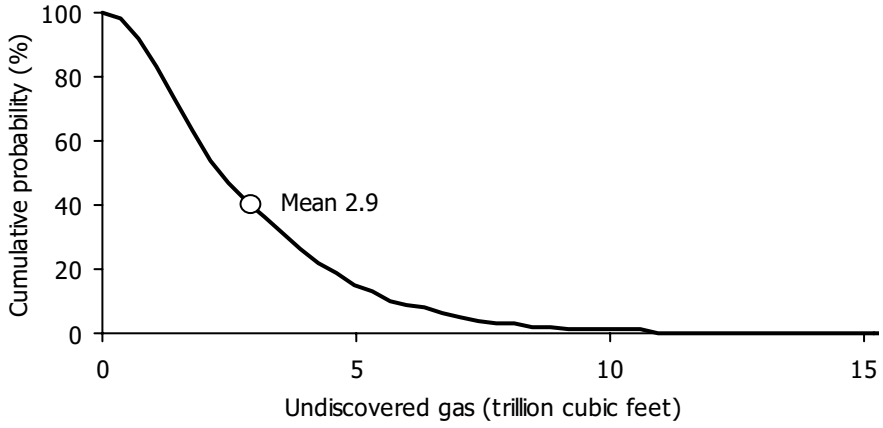

Figure 3.2 Undiscovered gas resources in the Bonaparte Basin

3.2 Discussion

The AUSTPLAY methodology described in a previous version of this publication (*Oil and Gas Resources of Australia 1995*) was used to generate this assessment, although some fundamental differences were made in the way in which it was applied.

The major difference related to the definition of the basic units of assessment. In previous assessments, the basic unit was a petroleum migration fairway. It is possible to have more than one migration fairway branching from a single active source pod. This year, the basic unit of assessment has been the petroleum system, as defined by Magoon and Dow (1994). A petroleum system contains all the migration fairways emanating from a single source pod.

A consequence of moving to assessment based on a petroleum system is that the reservoir in which the hydrocarbon is found is no longer an issue. The petroleum system approach allows more than one age of reservoir to be filled with hydrocarbons from a single source.

The previous assessment, undertaken in 1998, contained 22 different migration fairways whereas this year's assessment contains seven petroleum systems.

Another major difference is that this year's assessment has been designed to try to estimate the amount of hydrocarbons expected to be discovered in the next 10–15 years. This difference is part of the explanation of the lower oil volume this year compared to 1998, but it does not explain the higher gas volume.

Other differences from previous assessments include the effective removal of the trap order parameter and the trap type parameter. The trap order parameter was previously used to divide the complexity of a trap into several sub-traps. This level of detail is not required in a petroleum-system-based assessment. The lower level of detail used is not expected to affect the assessment outcome adversely.

3.3 Petroleum systems

Seven petroleum systems have been defined for the Bonaparte Basin. Details of the definition of the petroleum systems will be released at a later date. The results for the Petrel Petroleum System were given at the Western Australian Basins Symposium in October 2002 (Kennard et al., 2002).

Three of the petroleum systems contain predominantly Jurassic-aged source rocks; three contain predominantly Permian-aged source rocks; and the last contains predominantly Carboniferous-aged source rocks. All the petroleum systems contain at least one hydrocarbon discovery with two of the petroleum systems being oil systems and the other five being gas systems.

3.4 Ultimate potential of the Bonaparte Basin

In the last edition of OGRA (Petrie et al., 2001), a detailed discussion was presented on the USGS World Petroleum Assessment results for the four basins assessed (USGS, 2000). The mean expectation for the Bonaparte Basin was:

- 1286 MNbbl oil
- 24 TCF gas
- 1079 MNbbl condensate.

These volumes are significantly higher than the assessment conducted by Geoscience Australia (3.8 times the oil, 7.9 times the gas and 9.3 times the condensate), but it is important to understand the reasons for the differences.

The main matter to be addressed here is the timeframe of the assessments. The AUSTPLAY assessment is attempting to model the materials that will be discovered in the next 10 to 15 years, whereas the USGS assessment is attempting this for a 30 year period. The USGS assessment is thus aimed at estimating an ultimate resource potential.

Another fundamental difference is the methodology: AUSTPLAY is a "discovery process" model while the USGS methodology is a geology-based assessment.

There are also other differences.

- The USGS assessment models more wells to be drilled.
- The field-size distributions differ, partly because of the treatment of reserve growth in fields over time.
- The USGS assessment incorporates reserves growth based on statistics relevant to North America whereas AUSTPLAY does not model this phenomenon.
- The assessments differ in their approach to success rates.

References

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4: Developments

4.1 Major new developments

Offshore

Woodside's Laminaria Phase 2 Project in the Timor Sea started production in June 2002, on schedule. The project is designed to accelerate production and access incremental reserves from the Laminaria and Corallina oil fields. It has involved the drilling of two new wells, Laminaria 7 and 8, with subsea completions and tie-ins to the floating production, storage and offloading facility, Northern Endeavour. The capital cost of the Phase 2 project was A$127.5 million.

Initial production from Phase 2 (two new wells) was about 70 000 bbl oil/d. Daily production from the Laminaria and Corallina fields immediately before starting the hook up of the two wells was about 73 000 bbl oil/d. Drilling difficulties made it necessary to re-design the Phase 2 wells as vertical rather than horizontal producers. As a result, ultimate oil recovery from Phase 2 is likely to be lower than previously planned.

The Echo Yodel gas-condensate field started production in December 2001. The field is about 120 km north-west of Dampier and 23 km south-west of the Goodwyn A platform in 140 m of water and is being developed using two subsea production wells tied back to the Goodwyn platform, where the product will be mixed with the existing production for processing and transport to shore via the existing trunkline system. The project is expected to produce about 37 MNbbl condensate and 0.4 TCF gas over four or five years. Plateau flow rates of 300 MCF/d of gas and up to 30 kbbl/d condensate are expected.

Phillips's Bayu-Undan gas condensate development is proceeding as planned. At the end of May 2002, the installation of the Wellhead Platform was completed offshore and development drilling commenced. The production and processing platform jackets arrived at the Bayu-Undan field and were installed in June 2002. The infield pipeline installation was completed at the end of May 2002. In July 2002, the floating storage and offloading facility was launched at Samsung Heavy Industry's yard in Koje, Korea.

The Bayu-Undan field is located in the Bonaparte Basin, approximately 500 km north-west of Darwin in the Joint Petroleum Development Area (JPDA, previously known as Area A of the Zone of Cooperation) in the Timor Sea. The reserves are estimated at approximately 400 MNbbl liquids (condensate and LPG) and 3.4 TCF gas. The field is being developed in two phases. The first phase is a US$1.8 billion gas-recycle project, which will remove gas liquids and reinject the dry gas. The second phase is a proposed gas project.

The surface facilities selected consist of a remote wellhead platform, a central production and processing complex and a floating storage and offloading facility. Both the wellhead platform and central production and processing complex are to serve as drilling centres for up to 16 wells (11 producers and five injectors) during the first gas-recycling phase for both

wet gas production and lean gas reinjection. Approximately 26 wells will be required over the field life to produce the reserves. The final well numbers, type and locations are subject to future field evaluation and reservoir studies. The wells will be drilled from the two fixed platform drilling centres using a cantilever jack-up drilling rig. The central production and processing complex comprises two platforms: the drilling, production and processing platform and the compression, utilities and quarters platform. The sales products are pumped via subsea pipelines to the floating storage and offloading facility for storage and export via chartered tankers. The production facilities are designed to allow the future export of up to 14.7 MCM sales gas/d (520 million scf/d). The first commercial liquids production from the field is planned to commence in late 2003, and the commercial life of the field is expected to be approximately 25 years.

In 2000 Phillips completed a successful well intervention program at the Elang/Kakatua/Kakatua North field which extended the estimated field life to late 2002.

In December 2001 Apache's Simpson oil field started production at 21 000 bbl/d from three wells. The wells are connected by pipeline to the field processing equipment at Varanus Island. The field was discovered in June 2000 during drilling of the Tanami 4 well which intersected a 19 m gross oil interval in the Flag sandstone. In June 2002 Apache's Gibson/South Plato field in the Carnarvon Basin, offshore Western Australia, was put on production flowing 22 000 bbl/d from two wells. Each well is suported by a minipod platform. The Gibson/South Plato wells are producing into existing production infrastructure on Varanus Island. The field was discovered in 2001.

In May 2002, BHP Billiton applied for a production licence over the Minerva gas field. The field is in the offshore Otway Basin, approximately 10 km offshore from the township of Port Campbell in Victoria, in 60 m of water. The Minerva development involves the drilling and completion of two subsea wells and installation of a single flowline which will transport the gas to the gas processing plant. At the plant, which will be constructed onshore, gas liquids will be removed before the gas is exported to market. The gas plant will have a gross design production capacity of 150 tJ gas/d. Approximately 600 bbl condensate/d will be produced at the initial gas sales rates.

Most of the Minerva gas will be sold under contract into South Australia via a new pipeline which will connect the Victorian and South Australian principal gas transmission systems. The field has an expected life of 10 years and contains estimated proven and probable gas reserves of 301 BCF gas and 1.24 MNbbl condensate. Capital expenditure for the development is estimated at US$137 million. Construction will commence during 2002, with first gas expected in the first quarter of 2004.

OMV is proceeding with the development of the Patricia Baleen gas field. The field is located in the Gippsland basin, some 23 km offshore to the west of the town of Orbost in Eastern Victoria, in approximately 50 m of water. In May 2001 OMV finalised a gas sales agreement with Energex allowing the project to move into the development phase. The development consists of two sub-sea well completions connected via a 23 km offshore gas pipeline to an onshore dedicated gas treatment plant for processing and compression. From the plant, the gas will be piped via a 10 km onshore pipeline to enter the Eastern Gas

Pipeline at Orbost. The currently estimated reserves are about 77 BCF while a plateau production rate of 50 MCF/d is expected. Field life is estimated at 7 years. Gas production is targeted to commence in late 2002.

Onshore

During 2001, Chevron completed an eight-well infill drilling program on the Barrow Island field in the Carnarvon Basin, targeting the primary Lower Cretaceous Windalia reservoir.

In the Cooper Basin during 2001 Santos development activity was mainly focussed on increasing gas deliverability to meet strong gas demand. Santos drilled 51 development wells, completed seven gas compression projects and executed 89 fracture stimulations. In the South Australian section of the Cooper Basin, activity was focussed on the Moomba North and Dullingari gas fields and the Moomba/Big Lake oil fields. In South-west Queensland, Santos development activity centred on Challum, Baryulah and Barrolka gas fields. During 2002 Santos plans to spend A$159 million on Cooper Basin gas fields development and A$93 million on construction, including a second dew point control unit at Ballera, upgrade of the Moomba plant controls and Scotia coalbed methane project compression and separation facilities.

Gas-To-Liquids

Several processes have been developed in the past decades to synthesise liquid hydrocarbons from natural gas and to produce most liquid petrochemical products. Conversion of natural gas to liquid fuels is normally referred to as "Gas-To-Liquids" or GTL processes. The liquid fuels can be transport fuels (diesel and gasoline) or alternative fuels such as methanol. These are cheaper to transport and distribute to markets than natural gas. Petroleum liquids can be transported in existing pipelines or products tankers or blended with existing crude oil or product streams.

GTL projects are scalable and can be applied to small gas fields. The key parameters which influence their economic viability are capital costs, operating costs of the plant, scale, feedstock costs and ability to achieve high utilisation rates in production. However, as a general rule GTL is not competitive against conventional gas production unless the gas has a low market opportunity and can not be readily transported. The GTL technology should therefore ideally suit Australian conditions when large gas reserves are in remote offshore locations (stranded gas), necessitating local conversion of the gas to transportable products.

The Syntroleum Corporation of the USA is marketing a natural-gas-to-diesel technology based on the F-T process which they claim has a lower capital cost due to the redesign of the reactor. The technology uses an air-based autothermal reforming process instead of oxygen for synthesis gas preparation, to eliminate the significant capital expense of an air separation plant. Using their catalyst they claim to be able to produce synthetic crude at around US$20/bbl. The syncrude can be further subjected to hydro-cracking and fractionation to produce a diesel/naphtha/kerosene range at the user's discretion.

The company indicates its process has a capital cost of around US$13 000 per daily barrel of produced diesel for a 20 000 to 25 000 bbl/d facility and an operating cost of between

US$3.50/bbl to US$5.70/bbl. The thermal efficiency of the Syntroleum process is reported to be about 60%, implying a requirement for about 90 MCF/d of dry gas for a US$300 to US$350 million, 25 000 bbl/d capacity facility. These figures therefore suggest a unit cost of less than US$20/bbl diesel fuel.

Syntroleum Corporation now also licenses its proprietary process. In February 2000, Syntroleum Corporation announced its intention to construct a 10 000 bbl/d natural gas-to-liquids plant in Western Australia, to become the first location in the world to acquire full access to Syntroleum technology. The project plans to produce synthetic specialty hydrocarbons (polyalphaolefins lubricating oils), naphtha, normal paraffins and drilling fluids. It is estimated to cost US$500 million generating sales of around US$200 million/y at constant prices.

The process is designed for application in plant sizes ranging from 2000 bbl/d to more than 100 000 bbl/d. The Syntroleum Corporation has advised that it is "working on development plans" for gas-to-liquids specialty chemicals plant and is working with DaimlerChrysler to develop super-clean synthetic transportation fuels.

Several other GTL projects are being considered. These include Methanex (using North West Shelf gas to produce methanol), Sasol-Chevron (Gorgon gas), Coogee Chemicals (Montara oil and gas field), Methanol Australia (Evans Shoal gas field), GTL Resources, Japan DME and DME International Corporation, and Conoco.

4.2 Overview of present and past offshore developments

Offshore production facilities in Australia consist of conventional fixed steel jacket production platforms, concrete gravity platforms, various types of fixed mini-platforms, floating production facilities and subsea completions. Conventional steel jacketed platforms are generally large complex structures weighing up to 50 000 t, installed in water depths of between 45 m and 125 m, with four or more "legs" fixed to the seabed by piles and catering for wellheads. The platforms accommodate a drilling rig when necessary, and processing and transportation equipment, utilities, a helipad and living quarters, and, sometimes, storage facilities.

Conventional platforms operating in Australia can be conveniently divided into two generations depending on their type of construction. The first-generation platforms were constructed between 1967 and 1969 on the earliest discovered fields in Bass Strait, and consisted of tubular steel jackets with steel superstructures built onto them. Later platforms in Bass Strait and those on the North West Shelf were constructed with modular decks, integral modular support frames, and drilled and grouted pile foundations. Remotely operated satellite platforms, generally of a different construction (e.g. single leg monotower or mini-platforms), floating production, storage and offloading systems and, more recently, subsea completions have resulted from the need to develop smaller offshore fields economically.

A description of current and planned offshore production facilities in Australia is given below and summarised in Appendices H and I. Locations are given in Figure 4.1.

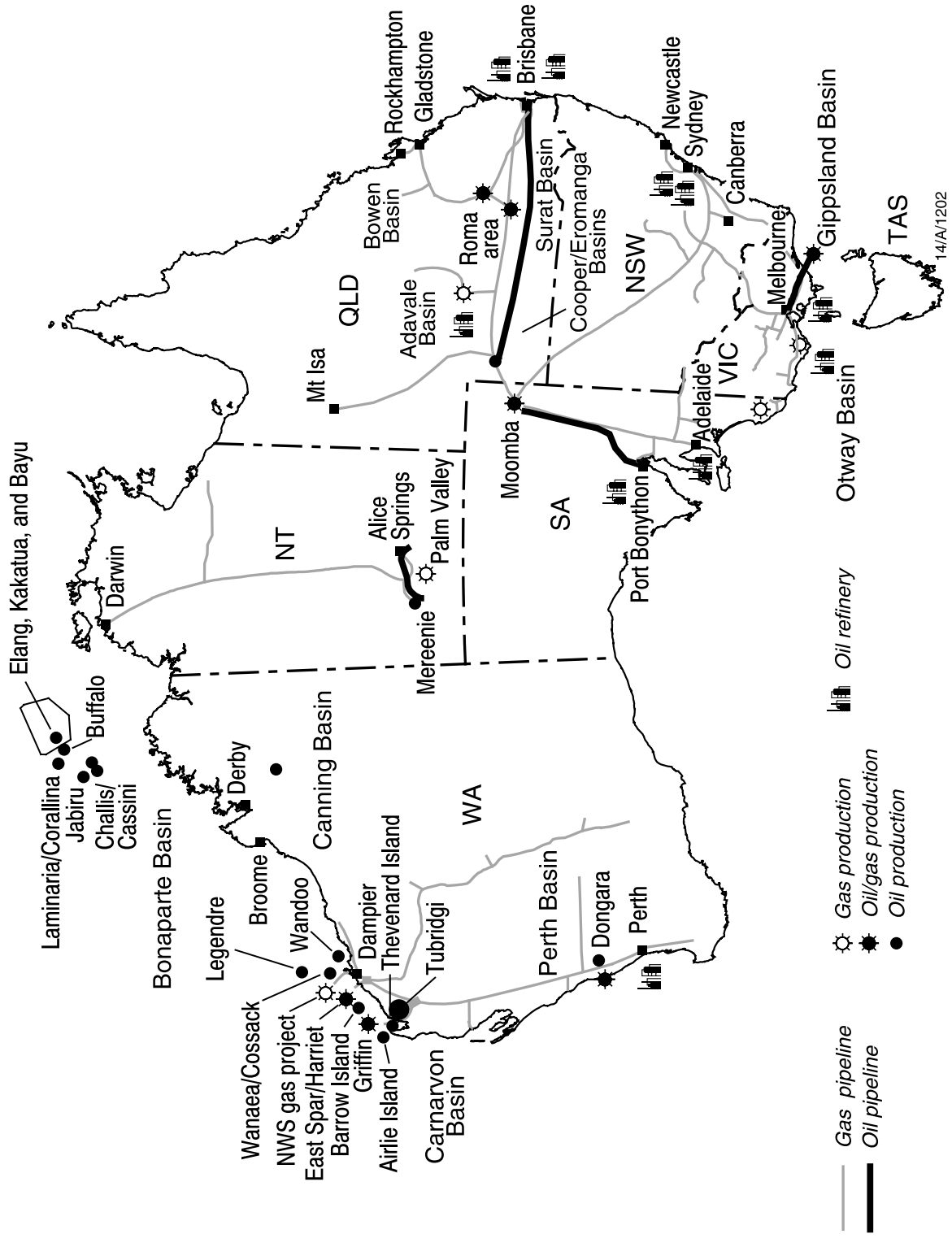

Figure 4.1 Locations of oil and gas production and pipelines

Bonaparte Basin

Buffalo

The Buffalo oil field was discovered in 1996 in the Bonaparte Basin, 7 km south-east of the Laminaria East 1 well in permit WA-260-P. Field production commenced in December 1999, with peak production rates between 6360 and 7950 kL/d (40 000 and 50 000 bbl/d). The Buffalo field is estimated to have reserves of 3.5 GL (22 MNbbl). The field development consists of an unmanned wellhead platform supporting three vertical wells producing to a nearby floating platform storage and offloading facility (FPSO).

Challis and Cassini

The Challis and Cassini oil fields are located on the Australian continental shelf in 106 m water depth, approximately 280 km from the nearest mainland and 600 km west of Darwin. The field was discovered in October 1984 and production started in December 1989. The production facilities at the Challis field consist of an FPSO vessel, a single anchor leg rigid arm mooring (SALRAM) system comprising a mooring base on the sea floor and a mooring column connected to the FPSO by a steel yoke, a total of 80 km of flowlines and control umbilicals connecting the eleven subsea wells with the FPSO. The FPSO is a moored barge, purpose-built for the Challis field, without seagoing capabilities.

The mooring column is a cylindrical, welded steel structure reinforced with internal stiffeners. Its weight is 2850 t and it is ballasted with 2500 t of iron ore. It is 10.5 m in diameter and 121 m long. It has an upper, watertight section comprising nine separate compartments, and a lower section, which is flooded and ballasted with iron ore. None of the compartments in the column has ever contained hydrocarbons or any liquids other than water.

The gravity base is an all-welded steel fabricated structure ballasted with iron ore and designed to penetrate the seabed to prevent any lateral movement of the mooring column. With ballast, the base weighs more than 15 000 t, has outside dimensions of 33 m x 33 m, and a height of 24 m.

Elang/Kakatua

The Elang/Kakatua oil fields started production in July 1998. The fields are located in the Bonaparte Basin, approximately 450 km north-west of Darwin in the JPDA in the Timor Sea. The development is by subsea completion of the existing vertical Elang 1 and 2 and Kakatua 1 wells connected to an FPSO vessel called the Modec Venture 1 (formerly the Skua Venture), moored over the Elang field. Export of crude is via shuttle tankers. The reserves are estimated at 2.7 GL (17 MNbbl), while peak production is expected to reach 5250 kL/d (33 000 bbl/d). The Kakatua North development involved subsea completion of the Kakatua North 1 discovery well and a tie-in to the Elang/Kakatua development through a 12 km pipeline. The Kakatua North field reserves have been estimated at 1.9 MCM (12 MNbbl). Production from the Kakatua North field started in December 1998.

Jabiru

The Jabiru oil field was bought on stream in August 1986 following installation of the FPSO using a converted tanker, the Jabiru Venture, of approximately 140 000 t, moored on a single point system of catenary design. Oil and associated gas is produced from subsea completed wells via flowlines to the mooring system and hence to the tanker where the oil is stabilised and stored. A connect/disconnect system is incorporated into the facility to allow the tanker, and elements of the mooring system, to disengage in the event that the system loads exceed preset criteria, or upon warning of an approaching cyclone. Rapid reconnection is possible. The FPSO is located in approximately 119 m of water and 900 m from the Jabiru 1A subsea wellhead. Crude oil is transferred from the FPSO to a shuttle tanker moored in tandem.

Laminaria/Corallina

The Laminaria oil field is located offshore in permit AC/P8, in the Territory of Ashmore and Cartier Islands area, in the Timor Sea just outside the JPDA, approximately 550 km west-north-west of Darwin. The field was discovered in October 1994 when the Laminaria 1 exploration well encountered a 52 m hydrocarbon column in a water depth of 361 m. Further drilling and wireline logging extended the depth of the oil column to 102 m.

The Corallina oil field is located offshore 10 km north-west of Laminaria 1 within permit AC/P8. The field was discovered in December 1995 when the Corallina 1 exploration well encountered a 77 m oil column.

Due to the close proximity of the Laminaria and Corallina fields, the operator undertook a joint development of the fields using a system of subsea wellheads linked through flowlines and risers to a common FPSO facility, permanently moored to an internal turret mooring system. Production from the Laminaria field and the adjacent Corallina field commenced in November 1999. The FPSO vessel, Northern Endeavour, is moored in a water depth of about 385 m, making it Australia's deepest offshore site for an oil production facility. This water depth required the development of diverless subsea systems. The internal turret system includes provision for future risers and riser tubes, as well as future piping arrangements, thereby allowing other fields to be linked to the development at a later stage. The FPSO has a production capacity of 27 000 kL/d (170 000 bbl/d) and a storage capacity of 0.22 GL (1.4 MNbbl).

The combined reserves have been estimated at 39.7 GL (250 MNbbl). The peak production rates from the two fields is expected to be up to 27 000 kL/d (170 000 bbl/d). A production life of about 14 years is expected. The combined development is estimated to cost between A$1.275 billion and A$1.325 billion.

Skua

Skua oil and gas field, located in the Vulcan Sub-basin of the Timor Sea, was discovered in 1985. The field was developed by the FPSO facility. Oil production commenced in December 1991 and continued for a little over five years until production ceased in January

1997 after recovering 3.2 GL (20.2 MNbbl) of oil from the three producing wells. The field was still producing at 300 kL/d (1900 bbl/d) when production was shut-in on 30 January 1997.

Carnarvon Basin

Agincourt

The Agincourt oil field is within the Harriet production licence area, 10 km south-west of the Harriet field and 4 km west of Rosette field. The field was developed by one subsea completed horizontal well and an unmanned offshore monopod which is tied back to the existing processing facilities on Varanus Island through a 150 mm diameter pipeline, 6.5 km long.

Bambra

The Bambra gas and oil field is in close proximity to Varanus Island. A seapole has been installed at the Bambra 3 gas well, but this has not yet been connected for production because sufficient gas reserves were available from the Sinbad, Rosette and Campbell gas fields.

Campbell

The Campbell gas field is situated 40 km north-east of Barrow Island in 39 m of water. The field is connected via a monopod facility to the Harriet gas-gathering facilities on Varanus Island, and from there to the Dampier–Perth gas pipeline.

Chervil

The Chervil oil field is in close proximity to Airlie Island (7 km) and was developed by using the existing North Herald/South Pepper storage and loading facilities on the island and setting a small caisson-type platform next to the existing Chervil 4 well. The platform supports two production wells, header manifolds, remotely operated well control equipment, gas lift lines, flowline risers and helideck. The produced fluids from the wells are commingled on the platform and shipped to the Airlie Island processing facilities through a 200 mm diameter pipeline.

Cowle

The Cowle oil field is situated 70 km south-west of Barrow Island in 12 m water depth. The Cowle accumulation was developed by two production wells and a monopod unmanned offshore structure for well support and protection. The discovery well, Cowle 1, was re-entered and completed as a vertical production well. The production well, Cowle 2, was drilled 1054 m horizontally into the reservoir in a south-west direction. The installation method for the structure was similar to that used for the Yammaderry monopod. Cowle wells are producing directly to the Thevenard Island processing facilities through a single 203 mm diameter product line.

East Spar

The East Spar gas condensate field is located 40 km west-north-west of Barrow Island in 98 m of water. The field was discovered on 7 April 1993 and commenced production in November 1996.

The East Spar development comprises Australia's first fully-automated subsea gas-gathering system operated via an unmanned navigation control and communication (NCC) buoy. The concept of controlling an entire subsea facility via an unmanned buoy is a world first. The buoy controls the operation of the subsea facility via electrohydraulic umbilicals which connect it to all control and monitoring devices on the subsea components. The buoy also provides:

- electrical and hydraulic power to activate the control devices;
- a telemetry communication system allowing remote control of the offshore facilities from a computerised master control system on Varanus Island via radio and satellite links; and
- chemical storage for corrosion and hydrate inhibitors which are injected via subsea umbilicals into the wellheads.

The submerged main body of the buoy is a 7.5 m diameter tube split into five deck levels.

- Level 1 (uppermost) contains control system electronics and communications equipment;
- Level 2 contains diesel power generation;
- Level 3 contains a battery system and hydraulic power units for subsea control;
- Level 4 is entirely sealed as chemical and diesel storage tanks; and
- Level 5 contains a pump room for chemical injection.

The buoy is attached to a gravity base on the seabed by tensioned tethers and is secured using a fabricated steel box filled with 2220 t of iron ore ballast. Gas and condensate from the East Spar field are produced from two subsea wells (East Spar 1 and 3) and conveyed to a subsea manifold through 1.8 km, 150 mm flexible flowlines after cooling in subsea heat exchangers. Provision for the tie-in of up to two further East Spar subsea wells and a future pipeline from another field is included in the manifold design. The combined wet gas production fluid is transported from the subsea manifold through a 356 mm, 62.5 km carbon steel pipeline to new processing facilities on Varanus Island.

In November 1996, two 3.14 MCM/d (110 million scf/d) gas processing trains were commissioned immediately adjacent to the two existing 1.57 MCM/d (55 million scf/d) trains used by the Harriet Joint Venture on Varanus Island. The two trains provide significant back-up capabilities for gas supply contracts held by the two joint ventures. The processing trains remove condensate, water and other minor impurities from the East Spar gas, conditioning it to Alinta Gas' transmission pipeline specifications. The treated gas is then transported to the mainland through the existing 324 mm, 100 km sales gas pipeline and sold to customers on both the Dampier to Bunbury pipeline and the Goldfields Gas Transmission pipeline. The condensate is exported from Varanus Island by tanker.

Goodwyn

The Goodwyn gas field is situated 145 km north-west of Dampier and 23 km south-west of the North Rankin platform in 126 m water depth. The Goodwyn field is being developed by a conventional fixed steel offshore platform and production wells drilled directionally into the reservoir from the platform. The platform has been built with a capacity for 26 wells. The Goodwyn A platform is connected by a subsea pipeline with the North Rankin A platform. The produced gas and condensate are shipped from the Goodwyn A platform to the onshore processing and storage facilities at Burrup Peninsula, via the North Rankin A platform.

The 18 000 t eight-leg platform jacket was launched in October 1992. The Goodwyn A platform installation and commissioning was completed on 4 February 1995.

Griffin/Chinook/Scindian

Griffin and Chinook/Scindian oil and gas fields are located about 68 km north-west of Onslow. The Chinook/Scindian field was discovered in August 1989, while the Griffin field was discovered in March 1990.

The development of the Griffin area fields uses a 100 000 t double-hulled FPSO (Griffin Venture) and a disconnectable mooring and production system. The Griffin Venture and its mooring riser are configured to accommodate a total of 11 wells with initial production from nine wells. The field development features subsea completions for horizontally drilled wells, designed to achieve improved reservoir drainage, and permanent downhole pressure gauges to monitor reservoir pressure during production. All production from the Griffin area fields uses subsea well completions at the seabed, which are linked back by flowlines to the centrally located FPSO facility. Oil from the FPSO vessel is pumped to moored offtake tankers through a floating hose system. Associated gas is exported via a subsea pipeline to the Griffin gas plant.

First oil production from the Griffin field commenced on 16 January 1994, with production from Scindian commencing in March 1994 and Chinook coming on-stream in January 1995. Peak production capacity is 12 700 kL/d (80 000 bbl/d) of oil.

The Griffin area fields contain an estimated 2.14 BCM (76 BCF) of natural gas reserves, associated with the oil. This gas is either sold into the domestic gas pipeline system, injected into the Tubridgi field or used as fuel on the Griffin Venture, except when safety dictates that flaring is necessary. The Griffin Venture was the first FPSO vessel in Australia to export gas to shore via a pipeline, to onshore processing facilities. Located about 30 km south-west of Onslow, the Griffin Gas Plant commenced full processing operations in November 1994. Up to 1 MCM/d (37 million scf) of gas is produced from the Griffin Venture. This gas is transported to shore through a 200 mm, 68 km pipeline and is processed at the plant to meet sales gas specification standards. Unwanted inert gases such as nitrogen and carbon dioxide and other contaminants are removed and the LPG component of up to 68 t/d (824 bbl/d) is separated and piped 24 km to a loading terminal. The LPG is sold into the domestic market. Sales gas is metered and sold to the Tubridgi joint venture participants, who deliver it into the Dampier–Bunbury natural gas pipeline,

through a 250 mm diameter feed pipeline that is approximately 90 km long. In 1997, the Griffin gas plant began processing third-party gas sourced from the Thevenard and Tubridgi permit areas.

Harriet

The Harriet oil and gas field is situated 20 km north-east of Barrow Island and 120 km west of Dampier in 23 m water depth. The Harriet field was developed by one conventional eight-leg platform with the processing plant on deck (Harriet A) and two satellite monopods (Harriet B and C) feeding back via the A platform to storage facilities on nearby Varanus Island. The Harriet A platform is totally self contained, with all power generation, production facilities, oil shipping facilities, helideck and emergency personnel amenities on board. The production facilities on the Harriet A platform consist of well manifolds, a three-stage production separation train and a three-phase test separator.

While the Harriet A platform and Varanus Island facilities were under construction, further drilling proved a northern extension to the field. Two satellite unmanned monopods (B and C), supporting three production wells each, were subsequently constructed and installed. The monopods were originally equipped with two-phase separation facilities. Separated liquid and gas are transported through separate lines to the Harriet A platform. Each monopod is also connected to the Harriet A platform with a 168 mm line in gas lift service. In 1991 the separator on Harriet B platform was converted to three-phase service and a hydrocyclone was installed to increase water handling capacity. Produced water from Harriet B is released into the ocean after processing.

Lambert/Hermes

Production from the Lambert/Hermes oil field commenced in October 1997. The field was discovered in November 1973 by Lambert 1 well but was considered uneconomic at that time. In 1994 a 3D seismic survey, carried out over the Lambert discovery, identified that the field has two culminations separated by a saddle. Lambert 1 well is located on the southern lobe. The existence of oil in the northern lobe, which was later named Hermes, had to be proved by drilling. The Lambert 2 well, which was spudded in January 1996, confirmed the existence of oil in the northern lobe and, consequently, sufficient reserves to make development economic. The development consists of three subsea wells tied back to the Cossack Pioneer FPSO via the subsea manifold and a 15 km flexible flowline.

North Herald/South Pepper

The North Herald and South Pepper fields are situated 53 km north of Onslow and 30 km south of Barrow Island. The fields were abandoned in November 1997.

The North Herald field is in 16 m water depth. The field was developed by a single well monopod and one production well drilled horizontally into the reservoir. The well was connected by a 150 mm diameter flowline and 75 mm diameter gas lift line via the South Pepper platform to the production facility on board the jack-up rig Vicksburg located over the South Pepper structure. The drilling rig Vicksburg is a slotted type jack up, which could

be positioned above the North Herald and South Pepper jacket structures, as these structures were specifically designed to accommodate the rig slot configuration. The rig was used to install the North Herald monopod and to drill the production well. The North Herald structure supported only one conductor and wellhead. The 80 t jacket supported the 5 m x 4 m wellhead access deck. The upper level of the deck structure allowed wireline equipment to be delivered by helicopter sling drop.

The South Pepper field is in 17 m water depth. The field was developed jointly with North Herald as a single project. The development concept was similar to that of North Herald, using a small unmanned offshore structure which supported four production wells and four subsea completed wells, producing to facilities on board the jack-up rig Vicksburg. The 115 t South Pepper jacket consisted of a tripod structure containing a central column which extended below the mudline to act as a pile.

Three external pin piles were attached to the jacket through grouted sleeve connections. One conductor and all pipeline risers were contained within the central pile. A deck structure provided access to the wellheads from the Vicksburg. South Pepper crude oil was commingled on the platform with North Herald crude oil and was then piped to the processing facilities on the Vicksburg for separation and shipment to Airlie Island for storage and distribution to refineries.

North Rankin

The North Rankin gas field is situated 134 km north-west of Dampier in 125 m of water. The North Rankin field was developed by a conventional fixed steel offshore platform and production wells drilled directionally into the reservoir from the platform. On the platform, streams from the producing wells are gathered, condensate and gas are separated, gas is dehydrated and both phases are shipped to shore in a two-phase, 1016 mm diameter, 134 km long pipeline for further processing and distribution of sales products in the onshore gas plant and shipping facilities at Burrup Peninsula, 30 km from the town of Karratha. Produced gas was formerly partly reinjected into the reservoir for accelerated condensate recovery.

The North Rankin A platform jacket has an eight-leg, 32-pile design, with a separate three-leg, six-pile flare support jacket, and a bridge between platform and flare. The platform weight, including piles, is 54 000 t. The flare support weighs 3130 t. Piles are driven 120 m into the sea bed. Twenty modules were installed on the platform. The average weight of each module is 800 t. The platform is equipped with a drilling rig which allows concurrent production and drilling or workover. The top of the derrick is 90 m above sea level. The platform dimensions are 83 m x 67 m at the sea bed and 60 m x 38 m at the top. The accommodation has capacity for 118 permanent and 96 temporary personnel. The two-phase pipeline to shore has a maximum capacity of 46.7 MCM/d (1.65 billion scf/d). The pipeline maximum design pressure is 13 100 kpa (1900 psi).

Roller/Skate

The Roller/Skate oil development incorporates six horizontal production wells linked to three unmanned steel monopods over the Roller field, and two horizontal wells producing through a single unmanned steel monopod at Skate. A gas injection well is also operated from the Skate monopod.

The Roller field is located offshore 20 km north-west of Onslow and 20 km south-west of Thevenard Island. The field was discovered in January 1990. Oil production first commenced from the Roller A, B and C monopods in the first half of 1994. The Skate field is located 2 km north-east of the Roller field and 13 km south of Thevenard Island. The field was discovered in October 1991 and commenced oil production in mid-1994.

A 508 mm, 27 km three-phase production pipeline transports commingled oil from the Roller and Skate fields, together with associated gas and water, to existing separation, storage and load-out facilities located on Thevenard Island, where it is blended with oil from the Saladin/Yammaderry, Crest and Cowle fields.

The existing facilities on Thevenard Island were originally capable of processing up to 14 300 kL/d (90 000 bbl/d) of fluid. To handle the increased production from the Roller/Skate fields, a third gas turbine generator, a gas treatment plant, a 55 kL (346 bbl) capacity slug catcher/separator vessel and two additional gas compression units were integrated with existing facilities. The upgraded Thevenard facilities are capable of handling up to 19 078 kL/d (120 000 bbl/d) of mixed oil/water fluid production.

Associated gas from the Roller/Skate fields is conditioned and compressed at Thevenard Island. The Roller/Skate associated gas reserves were sufficient to justify development of a gas-gathering project involving associated gas from the Saladin, Crest, Yammaderry and Cowle oil fields. Gas from the six fields is transported through a 150 mm, 44 km gas export line extending from Thevenard Island to the mainland via each of the Roller and Skate monopods, and then overland to the Tubridgi gas field facilities.

Commissioning of the gas-gathering system was completed in November 1994 and gas from Thevenard Island is being delivered into Tubridgi at a maximum rate of 0.52 MCM/d (18.5 million scf/d). The bulk of the gas is transported via the onshore Tubridgi pipeline lateral and the Dampier–Bunbury pipeline to the Dongara and Mondarra fields in the Perth Basin. The gas is then transferred into the Parmelia pipeline for direct sale or injection into the Dongara and Mondarra reservoirs for storage.

Saladin/Yammaderry

The Saladin/Yammaderry oil field is situated 70 km south-west of Barrow Island in 16 m water depth. The Saladin area has been developed by three unmanned platforms: A, B and C. Each of the platforms is a three-leg, three-well-slots steel structure with a double deck topside. Bi-level boat landings and a helicopter deck are installed on each platform. The platforms were positioned over the previously drilled Saladin 1, 2 and 7 wells. In addition, one directional well, Saladin 8, was drilled from the Saladin A platform. Three wells, Saladin 4, 5 and 6, were drilled from Thevenard Island and deviated into the reservoir area

that lay beneath the environmentally sensitive Thevenard Island shoal. Production from each offshore platform and onshore well is transported by pipeline to separation and stabilisation facilities on Thevenard Island.

The Yammaderry area was developed by a single horizontal well (Yammaderry 2) drilled to a horizontal length of 704 m to the south-west. The well was completed with a wellhead above the water level by an unmanned offshore monopod which protects and supports the well. A jack-up drilling rig was used to drill the caisson hole, lift the monopod substructure from the transportation vessel and grout the monopod substructure in place. The production well was then drilled and completed through the substructure. The monopod topside was then installed over the completed well. Yammaderry well is producing through a 2 km, 152 mm line to Saladin C platform, where the product is mixed with that of the Saladin 7 well and fed into the 203 mm diameter product line running to the Thevenard Island processing facility.

Sinbad

The Sinbad gas field is situated 30 km north-east of Barrow Island in 37 m water depth. The Sinbad field is produced via monopod facility to the Harriet gas-gathering facilities on Varanus Island.

Stag

The Stag field is located in 46 m of water, 30 km north-west of Dampier. The field's oil reserves have been estimated at 7 GL (44 MNbbl). The field was developed by a fixed production platform consisting of a six-leg piled jacket, topsides and full production facilities. Oil is exported from the production platform through a subsea flow line connected via a mooring buoy to a dedicated storage tanker about 2 km away and offloaded to export tankers. The platform oil-processing capacity is 7950 kL/d (50 000 bbl/d). The platform is equipped with a workover rig and has accommodation for 50 people. The reservoir was developed by eight horizontal production wells and four water injection wells. The production wells are equipped with subsurface electric pumps.

Talisman

The Talisman oil field is situated 127 km north of Dampier in 89 m water depth. Initially the Talisman field was developed by one subsea well (the discovery well Talisman 1) producing into a FPSO. In 1990, a second well, Talisman 7, was connected and put into production. Bluewater Offshore Production Systems NV was contracted to provide the FPSO, the Acqua Blu, a 70 000 t tanker which had been converted to FPSO service in 1985. A 152 mm diameter flexible flowline and an eight-path hydraulic control umbilical were laid from the buoy across a buoyancy tank/clump weight arrangement to the Talisman wellheads. Production was terminated in August 1992 and the facilities were later decommissioned.

Wanaea/Cossack

The Wanaea/Cossack oil discoveries lie in 80 m of water, approximately 130 km north of Dampier. They were discovered in June 1989 and January 1990, respectively. The two fields have a production life of about 25 years based on combined oil ultimate recovery of 39.7 GL (250 MNbbl) of which 29.2 GL (184 MNbbl) is at Wanaea and 10.5 GL (66 MNbbl) at Cossack.

First oil production from the Wanaea/Cossack development commenced on 17 November 1995, and was the first oil production from the North West Shelf Project. The two fields reached full production capacity of 18 280 kL/d (115 000 bbl/d) a week after start-up.

Development of Wanaea/Cossack uses the 150 000 t Cossack Pioneer, a former crude oil tanker converted for use as an FPSO facility. The conversion involved a total overhaul of all onboard systems, installation of both steam-driven and gas-fired turbine generators to a total of 28 MW, a helideck, flare tower, rigid arm for connection to the mooring system, central control room, refurbishment of the accommodation area and repainting of the ship. In addition, six process modules, and two structural support modules, weighing 1600 t, were installed on the upper deck of the FPSO vessel. The process facilities separate the produced fluids from Wanaea/Cossack into oil, water and gas, and the stabilised oil is stored in the FPSO vessel's tanks, which are capable of holding up to 183 000 kL (1.15 MNbbl) of oil. The oil is then offloaded by a flexible hose to shuttle tankers moored astern of the FPSO vessel. The Cossack Pioneer is moored over Wanaea field by its bow to a disconnectable riser turret mooring (RTM). The RTM consists of a 1900 t riser column which is held in position by eight 108 mm chain anchors connected to a gravity box. In the event of a cyclone or severe storm, production is closed in and the FPSO vessel disconnects and leaves the area. It reconnects when the storm has passed. Five subsea completion production wells on Wanaea and one horizontal production well on Cossack are connected through 40 km of flexible flowlines to four subsea manifolds from which the crude oil flows to the RTM for processing onboard the Cossack Pioneer. At a later stage, additional Wanaea and/or Cossack wells may be added to increase production. In August 1997 the Lambert 3 well in the Lambert/Hermes oil field was tied back to the FPSO through a 15 km flowline connected to the Wanaea 3 manifold. Production commenced at a rate of 1270 kL/d (8000 bbl/d), and has since been increased to around 2540 kL/d (16 000 bbl/d). Further development of neighbouring fields would extend the life of the FPSO and/or delay the natural decline in production levels as the Wanaea/Cossack reserves are drained.

Wandoo

The Wandoo oil field is located 75 km offshore northwest of Karratha. The field was discovered in June 1991 and commenced production under an extended production test from Wandoo A platform on 17 October 1993 at initial rates of up to 1270 m^3/d (8000 bbl/d) from one well. First oil from the Wandoo B platform flowed on 10 March 1997.

The Wandoo A platform now makes up part of the Wandoo full field development. The platform consists of a single column monopod wellhead platform supporting a deck and five production wells.

The Wandoo B platform was installed to the north-east of the Wandoo A platform. A concrete gravity structure (CGS), capable of holding 63 600 m^3 (400 000 bbl) of crude oil, was positioned on the seabed in October 1996. The Wandoo B platform is the first seabed-based oil storage system to be used in Australia. The platform consists of 10 horizontal oil production wells, and one gas injection well and processing facilities. The processing facilities are capable of handling up to 19 000 m^3 (120 000 bbl/d) of total fluid. This fluid handling capacity is required as it is expected that a significant amount of water will be produced from the field.

The fluid produced from the Wandoo A monopod platform is piped to the topside processing facilities where it is processed along with the fluid produced from the Wandoo B platform. The oil is stored in the CGS and then offloaded through two 348 mm flexible pipelines to a loading buoy located 1.2 km north of Wandoo B. A floating hose is used in transferring the oil from the loading buoy to export tankers at a mooring facility.

Wonnich

The Wonnich gas and oil field, discovered in August 1995, started production on 3 July 1999. The field is located 25 km north-west of Varanus Island in 30 m water depth. The field was developed with a simple tripod structure from which the untreated well stream is transferred to Varanus island via twin 200 mm pipelines. The pipelines and new facilities on the island were completed in February 1999.

Gippsland Basin

Early platforms in the Gippsland Basin were conventional fixed steel jackets as described above. The later platforms of Mackerel through to Whiting were constructed using modular decks, module support frames and grouted pile foundations. All the modules were constructed onshore, and transported to the platforms on crane barges. Total weights range from 3387 t for Whiting to 7919 t for Mackerel. Whiting was the first unmanned platform installed in Bass Strait, standing in 54 m water depth, halfway between Barracouta and Snapper, and housing only basic production equipment and a helideck. Operations were remotely controlled from the Snapper platform. Two subsea completions, Tarwhine and Seahorse are produced via the Barracouta platform. The Blackback subsea production facility is produced via the Mackerel platform.

Dolphin and Perch were Australia's first steel gravity-based monotowers. They were installed in 1989. Each monotower supports a deck that accommodates a single well, a separator with minimal control facilities and a helideck. Each weighs 2160 t. They stand on 1500 mm diameter steel columns, and the bulk of the weight is made up of iron ore and cement ballast fed into three feet on the tripod base section.

Two concrete gravity-based platforms, Bream B and West Tuna were installed in late 1996. The total weight of the Bream B facility is estimated at 45 000 t, and West Tuna at 95 000 t.

Barracouta

Barracouta oil and gas field was discovered in January 1965 and production started in March 1969. The field was developed by one manned jacket-steel platform, 24.1 km from shore, piled into the seabed in 46 m of water depth. Sixteen piles were used and maximum pile penetration is 44 m. Platform main deck dimension is 37 m x 20 m and the deck is 20 m above sea level. The total weight of platform structural steel is 2042 t. The platform has 10 well conductors and accommodation for 28 people. Production is exported through one 450 mm nominal diameter pipeline, 49 km long, in gas service and one 150 mm nominal diameter pipeline, 54.2 km long, in oil service to onshore plant at Longford.

Blackback

The Blackback oil field is located about 18 km south-east of the Mackerel platform and 90 km offshore in the Gippsland Basin. Water depth over the field varies from approximately 300 m to 600 m. Because of significant reserve uncertainty, a phased field development was planned, where the extent of Phase 2 development would be determined on the basis of data gathered from the Phase 1 development. The completed Phase 1 production facilities consist of three subsea completed wells (two conventional and one horizontal) connected using a single-well daisy chain configuration and a 23.2 km pipeline to production facilities on the Mackerel platform. Export to shore and onshore processing is through the existing infrastructure. Phase 1 production commenced on 12 June 1999 at a combined oil rate of 1590 kL/d (10 000 bbl/d).

Bream

The Bream oil and gas field was discovered in April 1969 and production started in the first half of 1988. The field was developed by one manned jacket-steel platform, 45 km from shore, piled into the seabed in 59 m of water depth. Twelve piles were used and maximum pile penetration is 107 m. The platform main deck dimensions are 65 m x 44 m and the deck is 25 m above sea level. The total weight of platform structural steel is 7074 t. The platform has 27 well conductors and accommodation for 84 people. Production is exported through one 400 mm nominal diameter pipeline, 30 km long, in oil service to West Kingfish A platform.

Production from the Bream B platform started in December 1996. The field was developed by one remote controlled concrete gravity platform, 51 km from shore, in 61 m water depth. The dimensions of the concrete base are 55 m x 55 m x 15 m and the concrete volume is 12 000 m^3. The total structure weighs 45 000 t. The weight of steel reinforcement is 4000 t, while solid ballast weighs 10 000 t. The platform has one leg and three buoyancy tanks. The diameter of the leg and buoyancy tanks is 12 m. Topside weight is 800 t. The platform main deck dimensions are 17 m x 16.5 m and the deck is 24 m above sea level. Production is exported through one 6-km-long pipeline in oil service to the Bream platform.

Cobia

Production from the Cobia platform started in April 1983. The field was developed by one manned jacket-steel platform, 66 km from shore, piled into the seabed in 78 m water depth. Sixteen piles were used and maximum pile penetration is 102 m. The platform main deck dimensions are 29 m x 58 m and the deck is 24 m above sea level. The total weight of platform structural steel is 8178 t. The platform has 21 well conductors and accommodation for 70 people. Production is exported through one 300 mm nominal diameter pipeline in oil service to Halibut platform.

Dolphin

The Dolphin oil field was discovered in October 1967 and production started in January 1990. Dolphin oil accumulation was developed by a single-well uncrewed monotower producing to the onshore plant at Longford. The platform main deck dimensions are 10 m x 10 m and the deck is 17 m above sea level. The total weight of platform structural steel is 2187 t. The platform has two well conductors. Production is exported through one 300 mm nominal diameter pipeline.

Flounder

The Flounder oil and gas field was discovered in August 1968 and production started in late 1984. The field was developed by one manned jacket-steel platform, 58 km from shore, piled into the seabed in 93 m water depth. Sixteen piles were used and maximum pile penetration is 122 m. The platform main deck dimensions are 58 m x 29 m and the deck is 25 m above sea level. The total weight of platform structural steel is 8000 t. The platform has 27 well conductors and accommodation for 70 people. Production is exported through one 250 mm nominal diameter pipeline, 16 km long, in oil service and one 250 mm nominal diameter pipeline, 16 km long, in gas service to Tuna platform.

Halibut

Halibut oil field was discovered in August 1967 and production started in March 1970. The Halibut oil accumulation was developed by one manned jacket-steel platform, 64.4 km from shore, piled into the seabed in 72.5 m of water depth. Twenty-four piles were used and maximum pile penetration is 145 m. Platform main deck dimensions are 43 m x 36 m and the deck is 21 m above sea level. The total weight of platform structural steel is 4761 t. The platform has 24 well conductors and accommodation for 40 people. Production is exported through 600 mm nominal diameter pipeline oil service to onshore plant at Longford.

The Fortescue oil pool was discovered on the western flank of Halibut in September 1978 and production commenced in September 1983. Fortescue was developed by one manned jacket-steel platform, 65 km from shore, piled into the seabed in 69 m water depth. Sixteen piles were used and maximum pile penetration is 102 m. The platform main deck dimensions are 58 m x 29 m and the deck is 24 m above sea level. The total weight of

platform structural steel is 6334 t. The platform has 21 well conductors and accommodation for 70 people. Production is exported through one 300 mm nominal diameter pipeline in oil service to Halibut platform.

Kingfish

The Kingfish oil field was discovered in May 1967 and production started in April 1971. The Kingfish A area was developed by one manned jacket-steel platform, 75.6 km from shore, piled into the seabed in 77.1 m water depth. Twelve piles were used and maximum pile penetration is 155.5 m. The platform main deck dimensions are 52 m x 20 m and the deck is 22 m above sea level. The total weight of platform structural steel is 4309 t. The platform has 21 well conductors and accommodation for 40 people. A 300 mm nominal diameter pipeline, 4 km long, connects West Kingfish to Kingfish A platform, and a 400 mm nominal diameter pipeline, 3.9 km long, connects Kingfish A and Kingfish B platform. Commingled Kingfish A, Kingfish B, West Kingfish and Bream production is transported through a 500 mm nominal diameter pipeline, 25.3 km long, to Halibut platform.

Kingfish B oil production started in November 1971. The Kingfish B area was developed by one manned jacket-steel platform, 77.2 km from shore, piled into the seabed in 77.7 m water depth. Twelve piles were used and maximum pile penetration is 155.5 m. The platform main deck dimensions are 52 m x 20 m and the deck is 22 m above sea level. The total weight of platform structural steel is 4309 t. The platform has 21 well conductors and accommodation for 40 people.

West Kingfish oil production started in December 1982. The area was developed by one manned jacket-steel platform, 73 km from shore, piled into the seabed in 76.2 m water depth. Sixteen piles were used and maximum pile penetration is 103 m. The platform main deck dimensions are 29 m x 58 m and the deck is 24 m above sea level. The total weight of platform structural steel is 8371 t. The platform has 31 well conductors and accommodation for 60 people.

Mackerel

The Mackerel oil field was discovered in April 1969 and production started in December 1977. The field was developed by one manned jacket-steel platform, 72.4 km from shore, piled into the seabed in 92.7 m water depth. Sixteen piles were used and maximum pile penetration is 102 m. The platform main deck dimensions are 59 m x 29 m and the deck is 24 m above sea level. The total weight of platform structural steel is 7917 t. The platform has 25 well conductors and accommodation for 54 people. Production is exported through one 300 mm nominal diameter pipeline, 8 km long, in oil service to the Halibut platform.

Marlin

The Marlin gas and oil field was discovered in February 1966 and production started in late 1969. The field was developed by one manned jacket-steel platform, 52.5 km from shore, piled into the seabed in 58.5 m water depth. Thirty-two piles were used and maximum pile

penetration is 60 m. The platform main deck dimensions are 43 m x 36 m and the deck is 20 m above sea level. The total weight of platform structural steel is 4127 t. The platform has 24 well conductors and accommodation for 56 people. Production is exported through one 500 mm nominal diameter pipeline, 108.3 km long, in gas service to onshore plant at Longford. A 300 mm nominal diameter pipeline, 1 km long, in oil service, carries Marlin, Tuna, Flounder and Snapper oil to join the Halibut to shore 600 mm pipeline.

Moonfish

The Moonfish oil field was put in production in 1997. The field is located about 4 km north of the Snapper field in the Gippsland Basin. The field was developed by two directional long reach wells drilled from the Snapper platform. The Moonfish oil field reserves are estimated at 1.99 GL (12.5 MNbbl). Peak production rates reached 795 kL/d (5000 bbl/d).

Perch

The Perch oil field was discovered in March 1968 and production started in January 1990. Perch oil accumulation was developed by a single-well uncrewed monotower producing to shore plant at Longford. The platform main deck dimensions are 10 m x 10 m (33 ft x 33 ft) and the deck is 17 m (56 ft) above the sea level. The total weight of platform structural steel is 2204 t (4.8 million lb). The platform has 2 well conductors. The platform is currently shut in. Production export was via one 300 mm nominal diameter pipeline to Dolphin platform.

Seahorse

The Seahorse oil field was discovered in August 1978 and production started in September 1990. The field is located 15 km from shore in 42 m water depth. The Seahorse oil accumulations were developed by a single well subsea completion producing to Longford plant via the Barracouta platform.

Snapper

The Snapper gas and oil field was discovered in June 1968 and production started in July 1981. Snapper gas and oil accumulation was developed by one manned jacket-steel platform, 32 km from shore, piled into the seabed in 54.96 m water depth. Twelve piles were used and maximum pile penetration is 103 m. The platform main deck dimensions are 29 m x 59 m and the deck is 24 m above sea level. The total weight of platform structural steel is 6783 t. The platform has 27 well conductors and accommodation for 55 people. Production is exported through one 250 mm nominal diameter pipeline, 15 km long, to Marlin platform in oil service and one 600 mm nominal diameter pipeline, 38.8 km long, in gas service to onshore gas pipeline and plant at Longford.

Tarwhine

The Tarwhine oil field was discovered in December 1981 and production started in May 1990. The field is located 23 km from shore in 43 m water depth. The field was developed by a single well subsea completion producing to Longford plant via the Barracouta platform. The export pipeline to Barracouta is 200 mm nominal diameter, 17 km long.

Tuna

The Tuna oil and gas field was discovered in June 1968 and production started in May 1979. The field was developed by one manned jacket-steel platform, 56.3 km from shore, piled into the seabed in 58.5 m water depth. Twelve piles were used and maximum pile penetration is 105 m. The platform main deck dimensions are 59 m x 20 m and the deck is 24 m above sea level. The total weight of platform structural steel is 6245 t. The platform has 30 well conductors and accommodation for 55 people. Production is exported through one 300 mm nominal diameter pipeline, 19.3 km long, to Marlin platform in gas service and one 200 mm nominal diameter pipeline, 19.3 km long, to Marlin platform in oil service.

West Tuna oil production started in January 1996. The area was developed by one manned concrete gravity platform, 56 km from shore, in 61 m water depth. The dimensions of concrete base are 92 m x 76 m x 15 m and the concrete volume is 26 000 kL (164 000 bbl). The total structure weighs 80 000 t. The weight of steel reinforcement is 9000 t and solid ballast is 17 000 t. The platform has three legs and four buoyancy tanks. Diameter of legs and buoyancy tanks is 16 m. Topside weight is 7000 t and there is accommodation for 84 people. The platform main deck dimensions are 80 m x 69 m and the deck is 27 m above sea level. Production is exported through two 3 km long pipelines (250 mm nominal diameter in oil service and 100 mm nominal diameter in gas service) to Tuna platform.

Whiting

The Whiting oil and gas field was developed by one unmanned jacket-steel platform, 34 km from shore, piled into the seabed in 54 m water depth. The field was discovered in March 1983, and production started in October 1989. The platform main deck dimensions are 33 m x 26 m and the deck is 25 m above sea level. The total weight of platform structural steel is 3387 t. The platform has six well conductors. Production was exported through one 250 mm nominal diameter pipeline in oil service and one 200 mm nominal diameter pipeline in gas service to Snapper platform. The platform is currently shut in.

4.3 Pipelines

A list of Australia's major petroleum pipelines is included as Appendix J. The pipelines listed are high pressure, large diameter (>100 mm) natural gas and crude oil pipelines that have been constructed since the mid 1960s. Pipelines transporting refined and partly refined products have been excluded, except major lines transporting LPG (propane and

butane), ethane and fuel gas in Victoria. The map of Australia's petroleum exploration and development titles (included with this publication) shows the major pipelines (see also Figure 4.1).

The three basic functions of pipelines in the Australian oil and gas industry are to:

(i) transport crude oil from onshore and offshore fields to stabilisation plants, refineries and export terminals;

(ii) transport natural gas from onshore and offshore fields to processing plants, distribution centres or consumers; and

(iii) carry refined products from refineries or tanker terminals to local distribution centres or consumers.

From 1964 to 1970 there were significant discoveries of oil and gas in Queensland, Victoria, South Australia and Western Australia. This led to the supply of oil and natural gas to refineries and consumers in the capital cities, industrial centres and certain country areas.

Major liquids pipelines

Australia's first long distance crude oil pipeline was constructed in 1964 between Moonie in the Bowen/Surat Basin and Brisbane (306 km). By the end of the decade an oil pipeline was constructed from the offshore Bass Strait to Westernport (185 km), later extended to Melbourne and Geelong (135 km). In 1984 the Jackson to Moonie pipeline (800 km) was linked to the Moonie to Brisbane pipeline, and in 1985 the Mereenie to Alice Springs pipeline (270 km) was completed. The Moomba to Stony Point liquids pipeline (659 km) was completed in 1982. This transports Cooper Basin natural gas liquids and crude oil to a fractionation plant on the Spencer Gulf.

Major gas pipelines

Queensland

The first major gas pipeline (397 km) connected Roma (Bowen/Surat Basin) fields and Brisbane in 1969. It was connected from Roma to Silver Springs (102 km) in 1978. In 1990, the Queensland State Gas Pipeline Unit completed the Wallumbilla to Gladstone gas pipeline through the Denison Trough gas fields (530 km). An extension to Rockhampton (100 km) was completed in 1991.

In 1993 the south-west Queensland gas/condensate pipeline from the Queensland Gas Centre (near the Ballera field) to Moomba in South Australia (180 km) was completed, linking the Queensland Cooper/Eromanga gas fields to South Australia. The natural gas pipeline from Ballera to Wallumbilla (750 km) was completed in 1996 providing a continuous link between the Cooper/Eromanga and Bowen/Surat basins and the Brisbane gas market. A second natural gas pipeline link (480 km) from north of Roma to the northern outskirts of Brisbane was completed in 1999. The Ballera to Mt Isa (841 km) pipeline, supplying the Mica Creek Power Station and a major fertiliser project planned for

Phosphate Hill located about 150 km south of Mt Isa, was completed in 1997. A lateral pipeline linking the Cannington mine to the Mount Isa trunk line was completed in 1998 and the Bunya/Vernon/Cocos gas fields were connected to the Cental Treatment Plant at Ballera in 1998.

In 1994, a pipeline (247 km) from the Gilmore Gas field in the Adavale Basin to Barcaldine was completed. This was connected to the Ballera to Wallumbilla pipeline in 1997, thus connecting the Adavale basin fields to the pipeline network. A pipeline project connecting coal seam methane in the Fairview area of the Bowen Basin, 150 km north of Roma, to the Queensland Gas Pipeline was completed in 1998. This methane development is a small but important alternative energy source in supply diversity and competition. A pipeline to connect gas reserves from the central highlands of Papua New Guinea with markets in Queensland is under consideration for possible commencement of construction in the near future.

Projects completed in 2001 included the conversion to gas of the Jackson to Moonie oil pipeline, the connection of a number of new gas fields in the Ballera–Jackson region, gas pipelines from Injune to Petrie north of Brisbane and from Gladstone to Bundaberg. Also a new gas-fired power station at Roma was connected to the Ballera–Brisbane gas pipeline.

South Australia

A gas pipeline was completed between the Moomba gas fields and Adelaide (781 km) in 1969, and was later connected to other centres including Angaston, Port Pirie and Whyalla. A liquids pipeline (659 km) from Moomba to Stony Point was completed in 1982. A gas pipeline linking Katnook gas field to Sasfries and a separate line to Mount Gambier and Snuggery were completed in the early 1990s. A gas pipeline from Angaston to Murray Bridge, including laterals to Berri in South Australia (231 km), was constructed in 1994 and an extension from Berri to Mildura in Victoria was completed in 1999.

Victoria

An LPG pipeline was built from Longford to Westernport (185 km) in 1968. An ethane pipeline was built from Westernport to Altona (78 km) in 1970. The 174 km gas pipeline from the Gippsland gas plant at Longford to Melbourne (1971) was later extended to Geelong, Ballarat, Bendigo, Shepparton, Kyabram and Albury. A 181 km pipeline from Carisbrook to Ararat, Stawell and Horsham was completed in 1997. The onshore Otway Basin field North Paaratte was connected by pipeline to Warrnambool in 1986 and later to Portland (1992). A gas pipeline linking the depleted Iona gas field (developed as a major underground storage facility) to Geelong was constructed in 2000.

In December 2001 work began on the 735-km-long Tasmanian Gas Pipeline (TGP). The TGP starts at Longford gas facility in Victoria, crosses Bass Strait and comes ashore at Five Mile Bluff, north-east of George Town on the north coast of Tasmania. Two onshore Tasmanian sections travel from Bell Bay to Port Latta in the north-west and from Bell Bay to Bridgewater in the south of the State.

New South Wales

Since the construction of the natural gas pipeline linking the Moomba gas fields to Wilton near Sydney in 1976, laterals have been constructed linking Wagga Wagga, Canberra, Lithgow, Oberon, Orange, Bathurst, Griffith, Leeton, Wollongong, Plumpton, Hexham and Walsh Point. In 1998 a 255 km natural gas pipeline was completed from Marsden near West Wyalong to Dubbo, including an extension to Wellington. This pipeline will be extended to Tamworth, Mudgee, Muswellbrook and Gunnedah. An ethane pipeline following the same easement as the main natural gas pipeline from Moomba to Sydney was completed in 1996. The 157 km gas pipeline link between Barnawatha in Victoria and Wagga Wagga in NSW was completed in 1998 and it supplied gas to Melbourne during the emergency shortage of 1998.

The construction of the 457 mm diameter, 795 km long Eastern Gas Pipeline from Longford to Sydney started in August 1999. The pipeline passes through the towns and regions of Bairnsdale, Orbost, Cann River, Bombala, Cooma, Nowra, Port Kembla, Wollongong and Wilton. The pipeline final capacity is 110 pJ gas/y and it has cost $495 million. The pipeline was completed in August 2000 and delivered gas to Sydney and the Olympic facility in September 2000. A lateral from Hoskinstown to Queanbeyan and Canberra was completed during 2001.

Construction of a 200 mm pipeline linking Illabo (near Junee), Tumut and Wagga Wagga in the southern part of New South Wales was completed during 2001.

Western Australia

The Dongara to Perth pipeline (445 km) established the Perth Basin natural gas market in 1972. The Carnarvon Basin gas fields were first developed by the North Rankin–Withnell Bay (Dampier) gas/condensate pipeline (134 km) and the Dampier–Wagerup pipeline (1482 km) gas pipeline which connected the North Rankin gas field to Perth, Wagerup and Bunbury in 1984. Enhancement of the pipeline was completed in December 1997, increasing capacity through additional compression. In 1995 the Wanaea/Cossack FPSO was connected by gas pipeline to the North Rankin platform. During 1994 the Karratha to Port Hedland (213 km) natural gas pipeline began supplying a 105 MW gas-fired power station. Since 1992, natural gas pipelines linking Varanus Island to shore, Griffin FPSO to Tubridgi (onshore) and the Roller oil platform to shore have been completed. These offshore facilities serve as focal points for shorter pipelines from a number of offshore producing fields. A second parallel gas pipeline (100 km) was commissioned in 1999 linking Varanus Island and Compressor Station 1 to cater for increasing gas production in adjoining fields.

In 1996 the Yaraloola–Kalgoorlie (1400 km) natural gas pipeline was completed. This pipeline carries Carnarvon Basin natural gas to the iron ore fields in the Pilbara area, various mine sites and the goldfields of Kalgoorlie and Boulder. A 353 km long pipeline to deliver gas from the main Dampier–Bunbury gas pipeline to the Windimurra Vanadium Project was completed in 2000. The gas is used directly and fires a 12 MW power station at the mine.

Northern Territory

The Palm Valley–Alice Springs gas pipeline (145 km) developed the Amadeus Basin gas fields and connected to the Amadeus Basin–Darwin gas link (1512 km) in 1986. The connection to the Macarthur River Mine (333 km) was completed in 1995. A gas pipeline has been proposed to link the Undan/Bayu gas field in the Timor Sea with Darwin, and feasibility studies have been completed for alternative gas supply to Eastern Australian markets.

5: Coalbed methane resources, developments and production

The coalbed methane industry is still in its infancy but is becoming a substantial part of the Australian gas industry.

5.1 Coalbed methane and coalmine methane

Coalbed methane (CBM) is methane gas that occurs naturally in coal seams; it is also known as coal seam methane and coal seam gas. The coalbed methane that is associated with coalmining operations is traditionally called coalmine methane.

Coalmine methane has long been regarded as the most hazardous (explosive) gas in underground coalmines. A total of 100 000 to 300 000 m of directional in-seam drilling is carried out every year for degasification purposes to enhance mine-site safety at underground and highwall open-cut collieries in the Bowen Basin in Queensland and the Sydney Basin in New South Wales. For comparison, about 58 000 m were drilled for stand-alone coalbed methane exploration and production in 2001 in Queensland, New South Wales and Victoria (Table 5.1).

Drained coalmine methane is sometimes utilised as either pipeline gas or fuel for on-site electric power generation, and surplus electricity is supplied to regional distributors. These practices help to reduce greenhouse gas emissions from collieries and may in future be eligible to gain greenhouse gas emission carbon credits. In recent years, coalbed methane has also become the subject of stand-alone energy resource development enterprises.

Chemically, coalbed methane is a mixture of methane, other hydrocarbon gases and inert gases (such as carbon dioxide). The gas composition is variable within the same coal seam. For instance, the Bulli coal seam at the Westcliff colliery in the Sydney Basin gives more than 90% methane in some parts and 90% carbon dioxide within a distance of 2 km. This example indicates the presence of a clear distinction of gas trapping mechanism between conventional natural gas and coalbed methane.

Methane was generated in coal seams and adsorbed onto the grain faces or micro-pores of the coal during the geological thermal maturation process of coalification. Its concentration generally increases with coal seam depth. Thus, the amount of coalmine methane released from coal mining would increase as underground mines get deeper. Without the use of an appropriate methane drainage system, many underground mines would become unsafe.

Coalmine methane drainage and coalbed methane resources are separately administered: the former by mineral resources legislation and the latter by petroleum resources legislation in Queensland and New South Wales. In Victoria, however, coalbed methane resources are administered under the legislation for mineral resources development.

As coalbed methane is contained within coal seams, the potential for conflict between the production of coal and coalmine methane and the production of coalbed methane can

occur in an area where the coalbed methane resource is located within a potentially economically mineable coal deposit. The Queensland government announced in February 2002 a proposed administrative and legislative tenure regime for coalbed methane development and its interaction with coal exploration and mining. Its aim is to provide a fair balance between the interests of the mining and petroleum industries. It can be said, however, the views of the coal mining and petroleum industries remain polarised on several fundamental issues. Some coalmining companies hold not only mining titles but also petroleum titles over their collieries to mitigate operational and ownership uncertainties.

5.2 Coalbed methane resources

When the amounts of resources are calculated, the geological uncertainty factor and the economic (and technological) feasibility factor are independently considered. In general, coalbed methane resources are only assessed in areas where identified sub-surface "black coal" resources have already been assessed. For this reason, all coalbed methane resources could be automatically categorised as "identified" when methane sorption (or gas contents analysis) data for the coal are available. "Undiscovered" coalbed methane may exist in "undiscovered" coal seams, but this does not merit resource assessment. Economic (and technological) feasibility remains one of the most critical issues for coalbed methane resource development and assessment.

In conventional estimation of natural gas reserves, the term "gas initially in place" refers to the total volume of gas contained in a reservoir, at or above a certain minimum level of concentration, before production commences. However, not all the gas initially in place is considered to be "gas resources". The "recovery factor" must be considered, to make allowance for producing the conventional gas. The terms "identified gas resources" or "proven, probable plus possible gas resources" are used to refer to a certain proportion of the gas initially in place. The identified gas resources are assessed as extractable from the reservoir to the surface with the use of existing and emerging technology. The term "gas reserves" is usually used to refer to the "demonstrated (or proven plus probable) gas resources" that are assessed as economically extractable.

In the case of coalbed methane, it is not always clear whether reported figures are of coalbed methane initially in place or coalbed methane resources. The latter should mean recoverable (or drainable) to the surface at or above a certain cut-off flow rate per well for a certain minimum period. Deliverability to the surface remains the most crucial factor for the commercial operations of a coalbed methane project. Further, it is not at all well understood what percentage (1, 5 or 20%) of the coalbed methane initially in place can reasonably be considered as recoverable. The ultimate recovery and flow rates depend, to a great extent, on both the spacing of production wells and the technology for completing coalbed methane wells, which is still emerging and developing. A combination of semantic

confusion and these technological uncertainties has resulted in inconsistent and conflicting estimates of coalbed methane volumes by various workers and companies. As a matter of practicality, proven reserves can only be calculated in the close vicinity of each coalbed methane production well after a long-term production test.

Regardless of coalbed methane exploration and development activities in coal-bearing basins in Queensland and New South Wales in the last 26 years, it is reasonable to assume that the overwhelming majority of the coalbed methane resources remain as sub-economic. Although some coalbed methane operators make the volumes of their coalbed methane resources publicly available, it is not meaningful to collate these figures.

5.3 Coalbed methane exploration

Traditional petroleum exploration theories and drilling practices are not necessarily applicable to coalbed methane exploration and drilling. Conventional natural gas is mainly contained in structurally defined closures. In contrast, exploration for coalbed methane targets geologically-defined "fairways", which are delineated using the petrophysical, petrological and geochemical parameters, depths and thicknesses of coal seams. Permeability and gas content are the most important parameters of a coal for coalbed methane exploration and development.

Finding coalbed methane resources is not necessarily the primary objective of exploration. Locating highly productive areas, known as "sweet spots", is the major task of coalbed methane exploration. The concept of a sweet spot is based on geological knowledge but is vague and often subjective. For this reason, it is not possible to outline the precise area of a coalbed methane field. The term "coalbed methane field" is used in this report to refer to a commercial production project area for coalbed methane, although the term is not used often in the coalbed methane industry.

Exploration began in Australia in 1976, when the Carra-1 and Kinma-1 wells were drilled in the Bowen Basin to search for coalbed methane. In addition, two older petroleum exploration wells (Moura-1 and Shotover-1) were re-entered and completed as coalbed methane wells. Since then, coalbed methane has mainly been sought within coal seams of Permian age in the Bowen Basin in Queensland and the Sydney Basin in New South Wales.

Coalbed methane resources are located fairly close to large potential markets in eastern Australia. Capital cost has decreased significantly in the last six years with fit-for-purpose drilling technologies developed on-site in Australia.

The Bowen Basin was the most actively explored basin in years 2000 and 2001. Wells are typically about 750 m deep in this basin (Table 5.1). Drilling activity in the Surat Basin in Queensland, where well depths are shallow (typically about 400 m), increased significantly in 2001. Coalbed methane exploration wells were drilled for the first time in the Otway Basin in Victoria in 2001. (See Figure 2.1 for the locations of these basins.)

Recently, exploration for coalbed methane resources has been at fairly shallow depths in low-rank (low thermal maturity) coal seams of Jurassic age in the Surat Basin in Queensland and in the Clarence–Moreton Basin in Queensland and New South Wales. "Brown coal" (lignite) of Tertiary age has also become the target for coalbed methane exploration in the Otway Basin in Victoria. This new trend is based on the theory that, in spite of a smaller amount of coalbed methane in place per unit volume of coal, low-rank coal at shallow depths (200–500 m) is more permeable than high-rank coal of Permian age at intermediate depths. Thus, coalbed methane could be more easily desorbed from the low-rank coal than from the high-rank coal, resulting in a higher recovery factor.

In the Gunnedah Basin in New South Wales, coal seams of Permian age are being explored for coalbed methane. This exploration activity occurs concurrently with appraisal programs for three separate conventional gas discoveries, near Narrabri, at Wilga Park (discovered in 1985), Coonarah (1993) and Bohena (1998). The Bohena conventional gas accumulation was discovered in the course of coalbed methane drilling program. However, no coalbed methane well was drilled in the basin in 2001.

Table 5.1 Coalbed methane drilling in 2000 and 2001

Year	State	Basin	CBM wells	Suspended or producing wells	Plugged & abandoned wells	Metres drilled	Average total depth (m)
2000			**54**	**49**	**5**	**40 083***	**743**
	Qld		**41**	**39**	**2**	**30 052***	**733**
		Bowen	31	31	0	23 901*	771
		Clarence-Morton	2	0	2	456	228
		Galilee	4	4	0	4 536	1 134
		Surat	4	4	0	1 159	290
	NSW		**13**	**10**	**3**	**10 031**	**772**
		Gunnedah	4	3	1	3 574	894
		Sydney	9	7	2	6 456	717
2001			**92**	**73**	**19**	**57 750***	**628**
	Qld		**81**	**70**	**11**	**50 321***	**621**
		Bowen	51	42	9	37 485*	735
		Surat	30	28	2	12 836	428
	NSW		**7**	**0**	**7**	**6 354**	**908**
		Clarence-Morton	5	0	5	4 725	945
		Sydney	2	0	2	1 629	815
	Vic		**4**	**3**	**1**	**1 075**	**269**
		Otway (lignite)	4	3	1	1 075	269

*Estimates only. Totals in bold type. Compiled from information provided by State governments and from information available at the web sites of APPEA and various companies. Some data entries are provisional. Information on the total depths of six Bowen Basin wells was not available for this statistical summary. Coalmine methane drainage wells are not included.

5.4 Coalbed methane production and development

Commercial production of coalbed methane (including use of coalmine methane) in both Queensland and New South Wales was about 0.3 MCM/d (9 MCF/d) in 1998. This has increased substantially to over 0.9 MCM/d (32 MCF/d) at year-end 2001 and is estimated to reach over 1.9 MCM/d (67 MCF/d) by end 2002.

Queensland

Coalbed methane is now produced commercially at several separate fields and is connected to the Statewide pipeline network in Queensland. All the production is from the high-rank (high thermal maturity) Baralaba Coal Measures of Late Permian age in the Bowen Basin. Total coalbed methane production, including coalmine methane utilisation, in Queensland was zero in 1995, about 2 pJ/y (about 5 MCF/d) in 1998 and 11 pJ/y (about 27 MCF/d) in 2001. In 2002, production is anticipated to be about 25 pJ/y (about 62 MCF/d), which equates to almost 25% of Queensland's gas demand.

Moura

A 21 km lateral pipeline from the Moura colliery to the Roma–Gladstone pipeline was commissioned in December 1995, and the commercial production of coalmine methane started in February 1996. Coalmine methane is drained from exposed highwalls with a series of horizontal wells into both highwall and underground seams in advance of coalmining. Each well is about 1000 m in length. About 2 pJ of coalmine methane per year (about 5 MCF/d as of early 2002) are supplied from this colliery to the regional transmission line. The infrastructure of the colliery has a capacity to process 27 tJ (about 25 MCF) of gas per day.

Pre-drained coalmine methane is either vented or flared at the following underground collieries in the Bowen Basin: North Goonyella, Central Goonyella, South Goonyella, German Creek Grasstrees, Kestrel, Moranbah North, Oaky North and Newlands. These collieries are located remote from a pipeline network. The mitigation and utilisation of coalmine methane are the subjects of various research projects carried out by commercial and public sectors. Four 3-MW gas turbine engines will be installed later in 2002 at the German Creek Grasstrees colliery to generate electricity from coalmine methane.

Dawson Valley

The first stand-alone commercial production of coalbed methane in Australia commenced in December 1996 from the Dawson Valley project, which adjoins the Moura coalmine area. The produced coalbed methane is connected through a 47 km lateral pipeline with the Roma–Gladstone pipeline. This project consists of the Dawson, Dawson River, Moura and Nipan coalbed methane fields. Nearly 100 coalbed-methane production wells have been drilled at these fields. This project produces 3 pJ gas/y (about 7 MCF/d as of early 2002).

The Moura coalmine methane and Dawson Valley coalbed methane projects are separately operated for different objectives by different operators under different legislative regimes.

Mungi

A seasonal gas sales agreement associated with the Mungi coalbed methane field, near Moura, was exchanged in August 2002. The gas will be used as a fuel stock for cotton drying facilities near the field. Commercial gas production is expected to commence in January 2003. The Dawson Valley lateral pipeline passes through the middle of the Mungi field.

Fairview and Durham

Gas has also been supplied to the Roma–Gladstone pipeline from the Fairview coalbed methane field, north of Roma, through a 26 km lateral pipeline since February 1998. This field produces coalbed methane at a rate of 20 MCF/d from 44 active production wells (as of April 2002), giving an average of 0.5 MCF/d per well. The Durham coalbed methane project area, near the Fairview field, could be linked to the existing infrastructure facilities. These two development projects are collectively known as the Comet Ridge project.

Peat and Scotia

During year 2000, a 115 km lateral pipeline was constructed to link the Peat coalbed methane field, near Wandoan, to the Roma–Brisbane transmission line. Gas production commenced in February 2001, and this field produces 6 pJ gas/y (about 15 MCF/d as of early 2002). The pipeline was scheduled to link the Scotia coalbed methane project to fire a 385 MW combined-cycle gas turbine at the Swanbank power station in Ipswich from July 2002.

Grosvenor

The Queensland government announced in June 2002 that a 220 MW combined-cycle base-load gas-fired power station will be re-built at Yabulu, near Townsville. This project will have gas demand in the order of 20 pJ/y (about 50 MCF/d) from January 2005. A new 391 km pipeline will connect the power station with the undeveloped Grosvenor coalbed methane project area near Moranbah in the northern Bowen Basin. An unspecified number of wells has been producing coalbed methane at a rate of more than 1.5 MCF/d at the Grosvenor pilot project area (as of mid-2002) since April 2001.

Other projects

Three pilot development projects (Aberdeen, Berwyndale South and Andrew) are underway near Condamine in southern Queensland, targeting the Walloon Coal Measures of Middle Jurassic age. These project sites are located within 35 km of the Roma–Brisbane pipeline. Should there be a successful outcome to the pilot development phase, the

commercial supply of coalbed methane to the transmission pipeline is expected to start in 2003.

A new supply contract was exchanged in July 2002, using coalbed methane sourced from unspecified fields close to the Roma–Gladstone pipeline. This project will supply 5.4 pJ of gas per year (about 13 MCF/d) from September 2004 to magnesium production facilities in Rockhampton and in Stanwell, which is located 30 km to the west of Rockhampton. A lateral pipeline will be built to connect the existing pipeline with the new Stanwell plant.

New South Wales

Appin, Tower and Westcliff

The Appin, Tower and Westcliff collieries in the Southern Coalfield of the Sydney Basin have been using coalmine methane on a commercial basis since 1997. The gas is drained from the Illawarra Coal Measures of Late Permian age by horizontal wells at the mine workings prior to coal mining. The in-seam drainage gas is piped to two nearby power stations with a combined capacity of 97 MW. Here it is used to generate electricity, which is sold into the Statewide electricity grid. Gas with variable methane contents (40–100%) can be utilised as a fuel source at these power plants. Some 20 MCF gas/d is required for the generation capacity. The operator of this power generation project has estimated that coalmining-related greenhouse gas emissions can be reduced by 50%.

In addition to these projects, a pilot reactor plant was installed at the Appin colliery as a demonstration trial to burn mine ventilation air, which contains 0.3–0.8% methane, as combustion air. This plant utilises fumigant methane before it is emitted to the atmosphere while simultaneously capturing its energy value. The potential utilisation of mine ventilation air is largely restricted to on-site power generation, as its methane content is not high enough for pipeline transmission.

Tahmoor

A 5 MW coalmine methane power plant was commissioned in February 2001 at the Tahmoor colliery in the Southern Coalfield. In other areas of the Sydney Basin, coalmine methane is either vented or flared at the following underground or highwall open-cut collieries: Bellambi West, South Bulga, Dartbrook and Metropolitan.

Johndilo

A petroleum assessment lease was granted in November 2000 for the Johndilo coalbed methane pilot production project, which is the first phase of the Camden gas project. Later, a production lease was granted in September 2001. This is the first time that any petroleum project in New South Wales has been granted a production lease. The project area is located 50 km south-west of Sydney. Coalbed methane is produced from the Illawarra Coal Measures from 18 wells. The produced gas has been piped through a 5 km

lateral to a regional pipeline network since May 2001. The gas composition is 95–98% methane. Gas sales volume reached 1.5 tJ (about 1.4 MCF) per day in November 2001. A Petroleum Production Lease application was made in December 2001 for the Camden project, proposing a production scheme with 300 wells to be drilled by the end of 2006. A large-scale drilling program will commence in September 2002 as part of the second phase of this project.

6: Current production

6.1 Crude oil and condensate production in 2000

Crude oil and condensate production in 2000 was 41.6 GL or 114.0 ML/d (717 000 bbl/d)—an increase from the revised figure of 31.6 GL or 86.7 ML/d (545 000 bbl/d) for 1999. Preliminary estimates of crude oil and condensate production for 2001 show a slight decline to 38.2 GL or 104.7 ML/d (658 000 bbl/d). Crude oil production data include all production from the current JPDA with East Timor in the Bonaparte Basin. For the period covered, Australia's share was 50% of 0.6 GL (3.9 MNbbl) in 1998, 1.5 GL (9.2 MNbbl) in 1999 and 1.0 GL (6.5 MNbbl) in 2000. There was only minor gas production. Under the current arrangement, Australia's revised share will be 10% of production.

Crude oil production by basin is listed in Appendix I. Production relative to reserves is shown in Figure 2.2.

6.2 Gas production in 2000

Gas production, inclusive of on-site fuel use and flaring, decreased slightly from a revised estimate of 37.1 BCM or 101.6 MCM/d (3.6 BCF/d) in 1999 to 36.2 BCM or 99.2 MCM/d (3.5 BCF/d) in 2000. Preliminary estimates of gas production for 2001 show an increase to 37.5 BCM or 102.7 MCM/d (3.6 BCF/d). Annual production by basin is listed in Appendix I.

7: Crude oil and condensate forecasts

7.1 Crude oil and condensate forecast for 2002–2015

The forecast of production given in this chapter is based on current estimates of production from identified and undiscovered resources. Geoscience Australia estimates are provided at various probability levels to reflect the uncertainty surrounding the development of discovered accumulations (e.g. a production estimate at the 90% probability level means that there is a 90% chance of production being at least as high as the figure shown).

The figures for production from identified resources incorporate estimates of production from individual developed fields, as well as estimates of reserves and timing of development of identified but undeveloped fields. The major factors affecting the accuracy of oil production estimates for identified fields are reserves growth in offshore fields and delays in the startup and interruptions to production from offshore fields. As a result the low probabilities reflect the scope for increases in the reserves estimates on which the forecasts are based.

The accuracy of the production estimates is also dependent on the timing of future gas developments with their associated condensate production. In some cases, the cycling of dry gas allows accelerated production of condensate.

Figure 7.1 shows the production of crude oil and condensate from 1975 to 2001, and Figure 7.1 and Table 7.1 show forecast production from 2002 to 2015. The forecast includes production of crude oil and condensate from accumulations that had been discovered by the end of June 2002, plus production of crude oil and condensate from undiscovered accumulations. The 2002 forecast includes 10% of production from the JPDA.

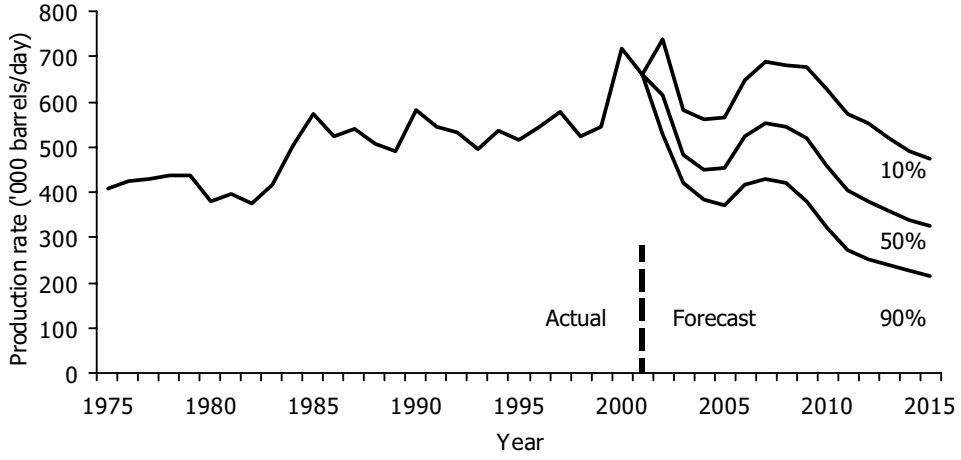

Figure 7.1 Australia's annual production of crude oil and condensate, 1975–2001, and forecast annual production at 90%, 50% and 10% cumulative probability, 2002–2015

Table 7.1 Forecast for 2002–2015 of crude oil and condensate production from Australia's identified accumulations, and crude oil production from undiscovered accumulations, in the Bonaparte, Carnarvon, Eromanga, Cooper, Gippsland, Browse, Bass, offshore Otway and offshore Perth Basins, as at July 2002 (thousands of barrels per day)

	Identified			Undiscovered			Both		
Year	P90	P50	P10	P90	P50	P10	P90	P50	P10
2002	528	614	737	0	0	1	529	615	738
2003	423	481	577	0	1	2	422	483	580
2004	379	442	553	0	1	10	382	448	560
2005	363	438	548	1	5	32	372	452	564
2006	396	500	625	2	14	58	416	524	649
2007	396	515	643	6	30	89	430	551	689
2008	370	490	614	13	46	123	420	545	679
2009	317	444	593	21	63	155	380	518	678
2010	244	364	526	30	81	173	320	458	628
2011	189	298	456	37	92	192	274	406	572
2012	163	266	422	45	100	205	250	380	552
2013	145	238	385	50	109	212	239	360	520
2014	128	209	341	57	118	223	225	340	490
2015	114	188	305	64	127	233	215	325	475

7.2 Crude oil forecast for 2002–2015

Figure 7.2 shows crude oil production from 1975 to 2001, and Figure 7.2 and Table 7.2 show forecast crude oil production from 2002 to 2015. The forecast is based partly on Geoscience Australia estimates and company estimates of crude oil production from accumulations that had been discovered by end of June 2002 (identified accumulations), and partly on estimates of crude oil production from undiscovered accumulations. The forecast includes 10% of production from the JPDA.

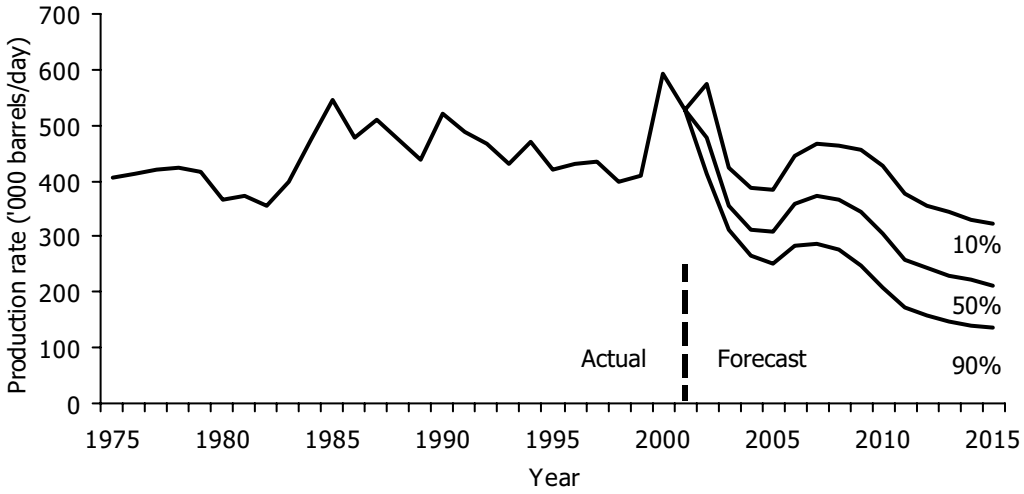

Figure 7.2 Australia's annual production of crude oil 1975–2001 and forecast annual production at 90%, 50% and 10% cumulative probability from 2002 to 2015

Table 7.2 Forecast for 2002–2015 of crude oil production from Australia's identified accumulations, and from undiscovered accumulations, in the Bonaparte, Carnarvon, Eromanga, Cooper, Gippsland, Browse, Bass, offshore Otway and offshore Perth Basins, as at July 2002 (thousands of barrels per day)

	Identified			Undiscovered			Both		
Year	P90	P50	P10	P90	P50	P10	P90	P50	P10
2002	411	479	574	0	0	1	412	479	574
2003	311	354	425	0	1	2	311	355	425
2004	264	308	385	0	1	10	265	312	389
2005	246	296	371	1	5	32	252	308	383
2006	266	336	420	2	14	58	283	358	445
2007	259	336	420	6	30	89	288	373	467
2008	235	312	391	13	46	123	278	367	462
2009	196	274	366	21	63	155	249	345	457
2010	146	218	315	30	81	173	210	305	426
2011	101	158	243	37	92	192	174	260	376
2012	80	131	209	45	100	205	157	245	355
2013	69	113	183	50	109	212	148	231	343
2014	57	94	152	57	118	223	140	221	330
2015	48	79	128	64	127	233	135	212	322

7.3 Condensate forecast for 2002–2015

Figure 7.3 shows production of condensate from 1975 to 2001, and Figure 7.3 and Table 7.3 show a forecast of condensate production from 2002 to 2015. The forecast is based on company estimates and Geoscience Australia estimates of production from accumulations that had been discovered by June 2002 and for which some production planning has been carried out. The forecast includes 10% of production from the JPDA.

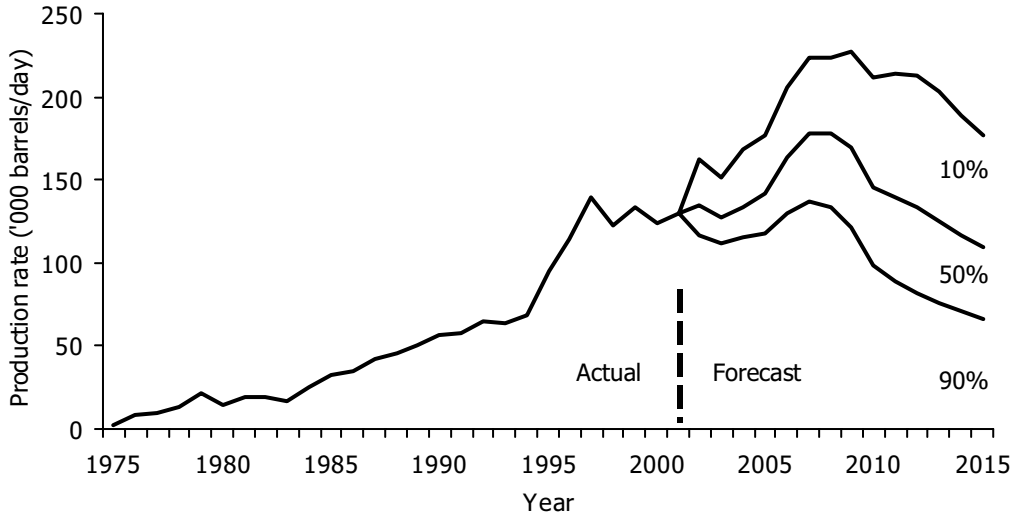

Figure 7.3 Australia's annual production of condensate, 1975–2001 and forecast annual production at 90%, 50% and 10% cumulative probability, 2002–2015

Table 7.3 Forecast for 2002–2015 of condensate production from Australia's identified accumulations, as at July 2002 (thousands of barrels per day)

	Identified		
Year	P90	P50	P10
2002	116	135	162
2003	112	127	152
2004	115	134	168
2005	118	142	177
2006	130	164	205
2007	137	178	223
2008	134	178	223
2009	121	170	227
2010	98	146	211
2011	89	139	214
2012	82	134	213
2013	76	125	203
2014	71	116	189
2015	66	109	177

8: Sufficiency of crude oil and condensate resources

8.1 Introduction

This chapter discusses the quantity of Australia's petroleum resources, the amounts that have already been produced and the sufficiency of the amounts that remain for future consumption. Sufficiency refers to the amounts of discovered and undiscovered resources relative to current and future extraction rates. The word "sufficiency" is used rather than "sustainability", since petroleum resources are consumed much faster than they are generated, and the production of petroleum is not strictly sustainable.

Since the 1960s, when oil and gas were first produced, petroleum has played an increasingly important part in Australia's economy. Nevertheless, Australia's resources of crude oil are limited and there is concern about how much longer they can last.

Australian production of natural gas meets domestic consumption. Significant additional amounts are exported. There are prospects for significantly increased production for both domestic and export markets. Condensate resources are substantial but cannot be brought into production rapidly.

8.2 Ratio of economic demonstrated resources to annual production

Australia's remaining economic demonstrated resources of petroleum, as estimated at the end of each year, and the production for that year, are set out in Table 8.1. The ratios of economic demonstrated resources to production are shown in Figure 8.1.

The resources to production (R/P) ratio indicates how many years of production the resource would support assuming present production rates could be maintained (Figure 8.1). For example, the ratio for crude oil indicates an estimated "life" which has remained fairly steady at about 10 years since 1982 but is currently five years. This has decreased rapidly since 1998. Natural gas has a current "life" estimated at 62 years, but past estimates have been as low as 39 years (in 1993) and as high as 66 years (in 1987). These estimates include all resources and production in the JPDA with East Timor.

The fairly constant R/P ratio of about 10 years for crude oil over 1983–1999 shows that economic demonstrated resource to production ratios cannot be relied on as an indicator of resource life. The estimated life did not reduce year by year (despite considerable production), because estimates of remaining economic demonstrated resources stayed at a near constant level, mainly as a result of revisions (additions) to the estimates of the demonstrated resources within the producing fields, and partly as a result of new discoveries (while the rate of production remained steady). The rapid decrease in R/P ratio recently is due to record production levels while resource additions have been small.

The average crude oil and condensate production from 1990 to 2000 was 32.3 GL/y, while remaining economic demonstrated resources in 2000 were 456 GL. This means that in 2000 average crude oil and condensate production could be sustained for 14.1 years.

A better indicator of sustainability might be the ratio of crude oil and condensate production to consumption. The consumption figures are projected by ABARE (Outlook 2002, p. 93). The ratios of forecast crude oil and condensate production to consumption from 2002 to 2006 are given in Table 8.2. It can be seen that the capability of domestic crude oil and condensate production at the median probability level to sustain consumption decreases dramatically from 87% in 2002 to 67% in 2006. The consumption of crude oil and condensate in 2001 of 41.0 GL could be sustained by remaining economic demonstrated resources at end of 2000 of 456 GL for only 11.1 years.

Table 8.1 Australia's economic demonstrated resources and production of crude oil, condensate, naturally–occurring LPG and natural gas 1982 to 2000 (gigalitres and billions of cubic metres).

	Crude oil			Condensate			LPG			Gas		
End of Year	EDR	Annual Production	R/P	EDR	Annual Production	R/P	EDR	Annual Production	R/P	EDR	Annual Production	R/P
1982	260	20.6	13	83	1.1	75	123	3.3	37	641	11.9	54
1983	235	23.2	10	74	1.0	74	87	3.3	26	629	10.3	61
1984	240	27.7	9	81	1.4	58	86	3.8	23	689	12.8	54
1985	217	31.5	7	86	1.9	45	88	4.1	21	709	13.6	52
1986	242	28.3	9	116	2.1	55	99	4.0	25	902	15.0	60
1987	246	28.9	9	119	2.5	48	97	4.3	23	1069	16.3	66
1988	255	27.5	9	122	2.7	45	130	3.7	35	1033	16.6	62
1989	260	24.9	10	119	2.8	43	114	3.7	31	955	16.7	57
1990	270	30.4	9	118	3.5	34	114	4.8	24	927	22.1	42
1991	258	28.3	9	124	3.5	35	131	4.3	30	950	22.0	43
1992	244	27.2	9	133	3.8	35	135	4.9	28	1006	24.3	41
1993	249	25.0	10	136	3.7	37	133	5.0	27	992	25.6	39
1994	297	27.2	11	156	3.9	40	154	5.5	28	1292	31.9	41
1995	277	24.3	11	183	5.5	33	144	5.6	26	1264	29.4	43
1996	240	24.9	10	193	6.6	29	174	4.9	36	1360	28.1	48
1997	266	25.3	11	192	8.1	24	184	5.1	36	1494	32.7	46
1998	243	23.2	10	273	7.2	38	243	6.6	37	1989	38.8	51
1999	227	23.9	9	282	7.8	36	262	6.3	42	2219	37.1	60
2000	180	34.4	5	276	7.2	38	274	5.6	49	2256	36.2	62

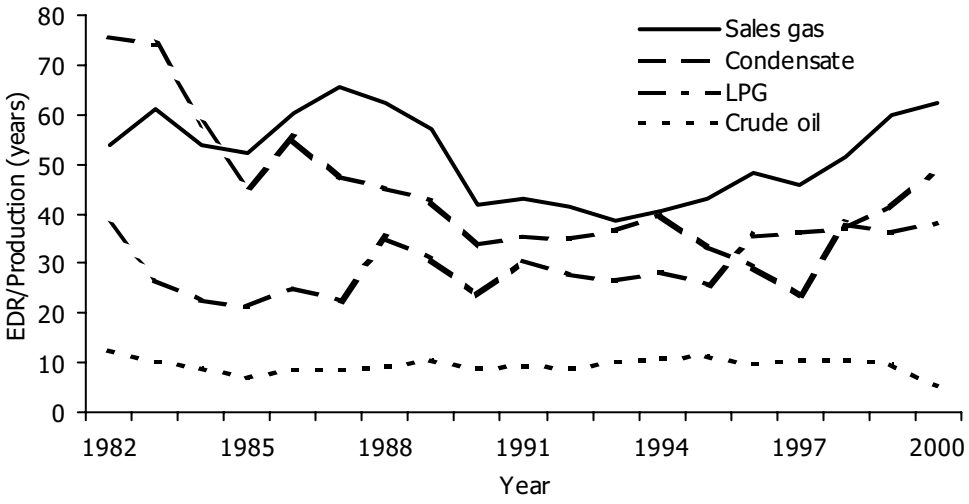

Figure 8.1 Annual R/P ratios for crude oil, condensate, LPG and sales gas

Table 8.2 Australia's production and demand for crude oil and condensate (thousands of barrels per day)

Year	Production	Consumption	Ratio
2002	615	708	87%
2003	483	725	67%
2004	448	744	60%
2005	452	763	59%
2006	524	785	67%

8.3 Trends in crude oil production

Clearly the resource about which there is most concern is crude oil. Production profiles and the longevity of fields vary widely with the size of the field, the quality of the host reservoir and the means of development. The Barrow Island field is a giant field hosted in a poor quality reservoir with low recovery rates, but is accessible from land. It has produced consistently over a long period of time because of the ability to implement improved recovery practices relatively easily and economically. However, maintenance of and/or additional production depends on profitability, which in turn is related to the price of oil and the capacity for technological innovation.

In the past, the giant fields in the Gippsland Basin have underpinned Australian oil production. These fields have high-performing reservoirs and associated fixed infrastructure. Growth in reserves in these fields, plus the ability to economically tie-in small fields to the infrastructure, has meant that these assets have sustained production for

a long period of time. Similarly, production of condensate from the large gas developments on the North West Shelf and Timor Sea is expected to have a relatively long life, but with very even production profiles reflecting constraints on the associated gas production. In the very long term, they will underpin the Australian production that the Bass Strait fields have traditionally supplied, but obviously not at the same level.

Production of oil from the Gippsland fields peaked in 1985 and has subsequently declined steadily. The industry has been successful in replacing this production by the development of the gas/condensate fields on the North West Shelf and in the discovery and development of many smaller oilfields on the north-west margin. In contrast to the Gippsland Basin oilfields, the remote and relatively small oilfields of the North West Shelf and Timor Sea have much shorter lives. They have been discovered and developed in a period of very uncertain oil prices and their location and size have required physical facilities with lower capital costs, constraining their flexibility for secondary developments in some cases. The year-by-year production performance of these developments has been harder to predict. However, it is evident that the recent spurt in oil production is superimposed on a decline from a peak in production in the mid-1980s. While overall liquids production has increased due to the contribution from condensate, production in the long term can only be sustained at current levels from new reserves in new oil fields, as the Laminaria-Corallina example clearly illustrates.

8.4 Estimated self-sufficiency

An indicator of resource sufficiency is percentage self-sufficiency, last published by the Department of Primary Industries and Energy (DPIE 1987). Self-sufficiency was defined as:

$$\text{Self-sufficiency} = \frac{\text{Crude oil and condensate production + domestic demand for naturally occurring LPG}}{\text{Net domestic demand for petroleum products}} .$$

Since 1970, self-sufficiency has fluctuated between 60% and 90%, with levels above 70% since mid-1984. The indicator shows how well domestic production meets demand and is simple to understand. The 2000–2001 figure was 84%. Heavy crude oil suitable for fuel oil, lubricant and bitumen production is imported, and light crude oil is exported.

9: Shale oil development

9.1 Introduction

Organic rich shale that yields substantial quantities of oil by heating and distillation is commonly referred to as oil shale. One tonne of oil shale may contain over 200 L of oil. The organic material in oil shale is kerogen, which can be a precursor to conventional oil reservoirs given sufficient heat in the crust. Australian oil shale deposits of commercial interest are predominantly in a series of narrow and deep extensional-basins near Gladstone and Mackay (Qld). These are thick Tertiary lacrustine (lake-formed) deposits that are relatively easy to mine. They contrast with generally harder carbonate bearing oil shales (marls) found elsewhere in the world that are more difficult to mine and process.

9.2 Resources

Southern Pacific Petroleum and Central Pacific Minerals (SPP/CPM) systematically reviewed in-situ mineralisation to accord with the Joint Ore Reserve Committee of the Australian Institute of Mining and Metallurgy Code (JORC) during 2000 in all 10 oil shale deposits held by them (solely or with joint venture partners) in the Gladstone–Mackay region. The reserve and resource estimates reported by the companies remain unchanged for 2001 and are incorporated in this assessment (see Table 9.1). Australia has 4.6 GL (29 MNbbl) of shale oil economic demonstrated resources. However, this could increase significantly if the research and development demonstration-scale processing of shale oil advances to a proposed commercial plant at SPP/CPM's Stuart deposit. Paramarginal and submarginal demonstrated resources are 202.1 GL (1300 MNbbl) and 3719 GL (23 400 MNbbl) respectively.

9.3 Production

Oil production at the Stuart demonstration plant for the 2001 calendar year was 37 ML (233 000 bbl), increasing total production since the start of operations to 42.6 ML (268 000 bbl). The oil products are Ultra Low Sulphur Naphtha (ULSN) 55–60% and Light Fuel Oil (LFO) 40–45%. The ULSN, which can be used to make petrol, diesel and jet fuel, has a sulphur content of less than 1 ppm. To put this into perspective, petrol in Australia currently contains about 500 ppm sulphur. Regulatory guidelines are in place to reduce this to 150 ppm for petrol by 2005 and to 50 ppm for diesel by 2006.

9.4 World resources and production

According to the World Energy Council's 2001 survey of energy resources, Jordan, Australia and Morocco have the largest estimates of "proved oil shale in place". In the same survey, the Council reported that production of oil from shale in 1999 was recorded in Brazil (239 ML), Estonia (185 ML) and Australia (6 ML).

9.5 Industry developments

Trials at the A$300 million demonstration plant (Stage 1) commenced in August 1999 and continued throughout 2000 and 2001 with increasing production. In November 2001 the Stage 1 plant achieved operating cash flow break even. Such breakeven requires monthly oil production of around 50 000 bbl (35% of plant capacity) and monthly operating costs of around A$3 million. Work is underway on a A$15–35 million improvement program at the Stage 1 plant which should increase annual oil production from around 750 000 bbl in 2002 to over 1 MNbbl in 2003.

Results from research and development at the Stage 1 plant are being incorporated into the design for a 4:1 commercial scale-up (Stage 2). An investment of up to A$25 million will be required to advance Stage 2 to project decision readiness by early 2003. If Stage 2 proceeds it is expected to cost A$500 million and SPP/CPM are actively seeking joint venture partners.

SPP/CPM has committed to restricting net greenhouse gas emissions to less than those produced by conventional oil extraction methods over the full cycle of production and end use. SPP/CPM's long-term goal is to achieve, through progressive plant expansion, production of 200 000 bbl/d.

Table 9.1 Australian shale oil resources as at 31 Dec 2001

State	Demonstrated Economic		Demonstrated Subeconomic			
			Paramarginal		Submarginal	
Deposit	GL	million barrels	GL	million barrels	GL	million barrels
Queensland						
Alpha	0	0	0	0	14	90
Condor	0	0	0	0	1 908	12 000
Duaringa	0	0	0	0	477	3 000
Julia Creek	0	0	0	0	238	1 500
Lowmead	0	0	0	0	32	200
Nagoorin	0	0	0	0	191	1 200
Nagoorin Sth	0	0	0	0	16	100
Rundle	0	0	0	0	413	2 600
Stuart	5	29	202	1 271	64	400
Yaamba	0	0	0	0	270	1 700
Block Creek	0	0	0	0	32	200
Boundary Flat	0	0	0	0	48	300
Queensland Total	**5**	**29**	**202**	**1 271**	**3 703**	**23 290**
New South Wales						
Baerami	0	0	0	0	3	19
Newnes	0	0	0	0	4	25
New South Wales Total	**0**	**0**	**0**	**0**	**7**	**44**
Tasmania						
Beulah	0	0	0	0	1	3
Chudleigh	0	0	0	0	1	6
Railton	0	0	0	0	6	38
Nook	0	0	0	0	1	3
Quamby Bluff	0	0	0	0	1	6
Tasmanian Total	**0**	**0**	**0**	**0**	**9**	**57**
AUSTRALIA	**5**	**29**	**202**	**1 271**	**3 719**	**23 390**

Categories of resources based on economic considerations

Economic: this term implies that, at the time of determination, profitable extraction or production under defined investment assumptions has been established, analytically demonstrated, or assumed with reasonable certainty.

Subeconomic: this term refers to those resources which do not meet the criteria of economic. Subeconomic resources include paramarginal and submarginal categories.

Paramarginal: that part of subeconomic resources which, at the time of determination, almost satisfies the criteria for economic. The main characteristics of this category are economic uncertainty and/or failure (albeit just) to meet the criteria which define economic. Included are resources which would be producible given postulated changes in economic or technologic factors.

Submarginal: that part of subeconomic resources that would require a substantially higher commodity price or some major cost-reducing advance in technology to render them economic.

10: Data availability

10.1 Digital seismic exploration and well log data

Geoscience Australia's collection is made up of over 570 000 digital magnetic tapes, some analogue data, and associated paper data from over 700 seismic surveys. The digital magnetic tapes contain field seismic survey data and well log, processed seismic and navigation data.

The tape media include 21 track tapes, 9 track tapes, 3480 tapes, 3590 tapes, 8 mm and DAT tapes. Some older data tapes have been remastered. Where the original media are deemed to be obsolete, there is a requirement to remaster data on access. Remastered data are subsequently available to all users.

Drilling and geophysical survey reports

Geoscience Australia's repository houses more than 3500 drilling reports, geophysical reports and support data, including:

- operations, positioning, processing and acquisition reports, shotpoint location and water depth maps, velocity data and seismic sections;
- interpretative data comprising various reports and maps;
- drilling data comprising well completion reports, logs, maps, and other data generated during operations and;
- prints and transparencies for logs, maps and seismic sections.

While most of the reports are printed documents, more recent reports are submitted on CD, with processed seismic data being lodged on tapes. Data on open file can be viewed at the Symonston repository or can be scanned to CD on request.

Cores, cuttings and fluid samples

The following physical data are available:

- samples from over 5600 petroleum wells and stratigraphic holes;
- over 150 000 m of down-hole core samples;
- over 3 000 000 m of down-hill drill cuttings;
- over 3000 onshore sidewall cores;
- 14 000 thin sections and 9000 reservoir plugs;
- assorted prepared samples from previous analyses;
- over 1200 open file destructive analyses reports; and
- documented duplicate and unwashed samples.

10.2 Metadata databases

The Petroleum Exploration Data Index (PEDIN) contains data for over 10 000 wells and 4500 geophysical surveys. Basic drilling data are recorded for all wells drilled in Australia. More detailed data, such as formation tops, down-hole temperature and seismic horizon intersections, are recorded for wells drilled under the Petroleum Search Subsidy Act (PSSA) and the Petroleum (Submerged Lands) Act (P(SL)A) legislation. Index data are recorded for onshore and offshore geophysical surveys including operator, titles, basins and survey specifications. Surveys conducted under the PSSA and P(SL)A legislation have more details such as summaries from data acquisition, navigation and interpretation reports, line numbers and other line information. PEDIN interfaces with other Geoscience Australia databases.

The Petroleum Information Management System (PIMS) manages data lodged under the Commonwealth legislation. This database is accessible through the Geoscience Australia website.

10.3 Contacts

All Geoscience Australia's data collections are located in the Geoscience Australia Data Repository at Symonston, ACT, Australia. Inquiries regarding lodgement of and access to data in the repositories, including charges for access, may be made through the Designated Authorities or directly with Geoscience Australia Data Repositories, or through the Geoscience Australia web page.

Geoscience Australia Data Repository

Postal address:	GPO Box 378, Canberra, ACT 2601, Australia
Street address:	Cnr Jerrabomberra Ave and Hindmarsh Drive, Symonston, ACT 2609
Phone:	+61 2 6249 9222
Fax:	+61 2 6249 9903
Email:	ausgeodata@ga.gov.au
Web page:	www.ga.gov.au

Appendices

Appendix A
2001

Wells drilled for petroleum exploration, development and production by State, 2001

APPENDIX A: WELLS DRILLED FOR EXPLORATION, DEVELOPMENT AND PRODUCTION BY STATE, 2001

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
QUEENSLAND							
IOR Inland 10 PL98	Cooper/Eromanga	-25° 33' 9" 141° 37' 38"	RT 159.1 GL 154.8	02-Feb-01 13-Feb-01	1 875 1 875	Completed as a future oil producer.	DEV DEV
IOR Inland 11 PL98	Cooper/Eromanga	-25° 33' 12" 141° 37' 26"	RT 169.2 GL 164.9	19-Feb-01 27-Feb-01	1 661 1 661	Completed as a future oil producer.	DEV DEV
MOSAIC Churchie 1 ATP471P	Bowen/Surat	-27° 5' 53" 149° 12' 55"	RT 258.7 GL 254.4	12-Jul-01 25-Jul-01	2 205 2 205	Cased and suspended pending further evaluation and completion as a Triassic/Permian gas producer.	NFW NFD
MOSAIC Churchie 2 ATP471P	Bowen/Surat	-27° 6' 13" 149° 12' 8"	RT 260.3 GL 256	20-Aug-01 02-Sep-01	2 269 2 269	Cased and suspended pending completion as a future Permian gas producer.	EXT EXT
MOSAIC Downlands East 1 PL119	Bowen/Surat	-27° 6' 27" 149° 4' 30"	RT* 243.7 GL 240	06-Jan-01 19-Jan-01	1 890 1 890	Cased and suspended as a gas well after intersecting a gas bearing interval (1842.	NFW NFD
MOSAIC Lacombe 1 PL16	Bowen/Surat	-27° 35' 41" 149° 9' 14"	RT 296.8 GL 292.5	07-Aug-01 14-Aug-01	1 958 1 958	Plugged and abandoned, dry.	NFW NFW
MOSAIC Spring Grove 2 ATP471P	Surat	-27° 7' 42" 149° 5' 51"	RT 243.8 GL 239.5	24-Jun-01 10-Jul-01	1 977 1 977	Cased and suspended as a future gas producer.	NFW NFD
OCA Brekkie Creek 1 PL 22	Surat	-27° 6' 44" 148° 53' 7"	RT 5.1 GL 262.8	02-Oct-01 08-Oct-01	1 552 1 552	Cased and suspended as a future Mid Triassic - Early Jurassic gas producer.	EXT EXT
OCA Ettamogah 1 PL14	Surat	-27° 10' 53" 148° 55' 55"	RT 236.9 GL 233	14-Oct-01 18-Oct-01	1 520 1 520	Plugged and abandoned, dry.	NFW NFW
OCA Maid of Auckland 1 PL22	Surat	-27° 6' 50" 148° 52' 48"	RT 265.3 GL 261.4	18-Sep-01 26-Sep-01	1 543 1 543	Cased and suspended as a future gas producer.	EXT EXT
OCA Springton 7 PPL41	Bowen	-23° 57' 20" 148° 24' 8"	RT 193.6 GL 189	06-Nov-01 25-Nov-01	1 860 1 860	Completed and suspended as a future Permian gas producer.	DEV DEV
OCA Springton 8 PPL41	Bowen	-23° 56' 40" 148° 23' 13"	RT 183.2 GL 178.6	22-Oct-01 02-Nov-01	1 041 1 041	Cased and suspended as a future gas producer.	DEV DEV
QGAS Ridgewood 1 ATP621P	Bowen/Surat	-27° 17' 38" 150° 41' 5"	NA GL 373.5	14-Feb-01 11-Mar-01	756 756	Completed as a potential gas producer.	NFW NFD
SANTOS Barrolka 5 PL112	Cooper/Eromanga	-26° 54' 42" 141° 42' 41"	RT 117 GL 109	02-Nov-00 29-Jan-01	2 943 3 376	Completed as a Permian gas producer.	DEV DEV
SANTOS Barrolka 6 PL112	Cooper/Eromanga	-26° 54' 34" 141° 42' 36"	RT 118 GL 112.7	19-Nov-01 09-Dec-01	2 626 2 626	Plugged and abandoned, dry.	EXT EXT
SANTOS Barrolka 7 PL112	Cooper/Eromanga	-26° 54' 3" 141° 43' 32"	RT 112 GL 104	02-May-01 07-Jun-01	3 180 3 274	Cased and suspended as a future gas producer.	DEV DEV

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
QUEENSLAND							
SANTOS Barrolka 8 PL112	Cooper/Eromanga	-26° 53' 18" 141° 41' 44"	RT 109 GL 104	16-Dec-01 -	- -	Drilling ahead	EXT –
SANTOS Baryulah 4 PL131	Cooper/Eromanga	-27° 45' 12" 141° 52' 20"	RT 75 GL 67.9	19-May-01 05-Jun-01	2 673 2 673	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Baryulah 5 PL131	Cooper/Eromanga	-27° 45' 23" 141° 51' 50"	RT 75 GL 68	09-Jul-01 28-Jul-01	2 667 2 667	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Bootes Creek 1 ATP337P	Bowen	-24° 18' 37" 148° 21' 40"	RT 266.8 GL 262.8	07-Oct-01 18-Oct-01	1 260 1 260	Plugged and abandoned, dry.	NFW NFW
SANTOS Challum 19 PL58	Cooper/Eromanga	-27° 23' 25" 141° 34' 43"	RT 83 GL 78	13-Jan-01 27-Jan-01	2 608 2 608	Cased and suspended as a future Permian gas producer.	DEV NPD
SANTOS Challum 20 PL59	Cooper/Eromanga	-27° 23' 54" 141° 36' 17"	RT 84.9 GL 76.4	17-Mar-01 05-Apr-01	2 570 2 570	Completed as a pilot hole for Challum 20 DW1 and Challum 20 DW2.	DEV DEV
SANTOS Challum 20 DW1 PL59	Cooper/Eromanga	-27° 23' 54" 141° 36' 17"	RT 84.9 GL 76.4	11-Apr-01 19-Apr-01	2 749 239	Completed as a Permian gas producer.	DEV DEV
SANTOS Challum 20 DW2 PL59	Cooper/Eromanga	-27° 23' 54" 141° 36' 17"	RT 84.9 GL 76.4	19-Apr-01 25-Apr-01	2 634 117	Completed as a Permain gas producer.	DEV DEV
SANTOS Challum 21 PPL58	Cooper/Eromanga	-27° 23' 17" 141° 33' 5"	RT 90 GL 81.9	15-Feb-01 09-Mar-01	2 239 2 239	Plugged and abandoned.	DEV DEV
SANTOS Challum 21 DW1 PPL58	Cooper/Eromanga	-27° 23' 17" 141° 33' 5"	RT 90 GL 81.9	07-Mar-01 09-Mar-01	2 339 178	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Challum 22 PL59	Cooper/Eromanga	-27° 24' 36" 141° 38' 55"	RT 81 GL 76.2	02-Mar-01 13-Mar-01	2 534 2 534	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Challum 23 PL59	Cooper/Eromanga	-27° 24' 17" 141° 35' 15"	RT 80.4 GL 75	09-Apr-01 19-Apr-01	2 524 2 524	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Challum 24 PL59	Cooper/Eromanga	-27° 22' 58" 141° 35' 47"	RT 84 GL 78	07-Feb-01 20-Feb-01	2 493 2 493	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Challum 25 PL58	Cooper/Eromanga	-27° 23' 21" 141° 37' 10"	RT 84 GL 79	21-Mar-01 05-Apr-01	2 527 2 527	Cased and suspended as a Permian gas producer.	DEV DEV
SANTOS Coonaberry 1 ATP259P	Cooper/Eromanga	-26° 51' 9" 142° 6' 10"	RT 95 GL 87	11-Dec-00 01-Jan-01	2 850 2 850	Cased and suspended as a future gas producer.	NFW NFD
SANTOS Hera 2 PL131	Cooper/Eromanga	-27° 41' 3" 141° 51' 24"	RT 76.8 GL 68.8	24-Aug-01 17-Sep-01	2 994 2 994	Cased and suspended as a Permian gas producer.	DEV DEV

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
QUEENSLAND							
SANTOS Juno 3 PL131	Cooper/Eromanga	-27° 41' 46" 141° 50' 6"	RT 73.6 GL 68	21-Sep-01 17-Oct-01	2 928 2 928	Cased and suspended pending completion as a future Permian Gas Producer.	DEV DEV
SANTOS Karnak 1 ATP259P	Cooper/Eromanga	-26° 39' 49" 142° 1' 28"	RT 94.7 GL 86	02-Jul-01 31-Jul-01	3 171 3 171	Cased and suspended pending completion as a Permian gas producer.	NFW NFD
SANTOS Moonie 39 PL 1	Surat	-27° 45' 18" 150° 14' 56"	RT 270 GL 266	26-Oct-01 04-Nov-01	1 834 1 834	Cased and suspended as a future oil producer.	EXT EXT
SANTOS Quasar 1 ATP259P	Cooper/Eromanga	-28° 22' 18" 141° 2' 12"	RT 100 GL 94	06-Mar-01 22-Mar-01	2 525 2 525	Cased and suspended as a future Permian gas producer.	NFW NFD
SANTOS Quasar South 1 ATP259P	Cooper/Eromanga	-28° 25' 15" 141° 2' 29"	RT 102 GL 97	30-Mar-01 11-Apr-01	2 446 2 446	Cased and suspended as a future Permian gas producer.	NFW NFD
SANTOS Quasar Southeast 1 ATP259P	Cooper/Eromanga	-28° 25' 30" 141° 3' 7"	RT 105 GL 100	02-Dec-01 12-Dec-01	2 520 2 520	Cased and suspended as a future Permian gas producer.	NFW NFD
SANTOS Ranger South 1 ATP259P	Cooper/Eromanga	-28° 24' 6" 141° 4' 32"	RT 108 GL 103	06-May-01 15-May-01	2 439 2 439	Plugged and abandoned, dry.	NFW NFW
SANTOS Raworth 1 ATP259P	Cooper/Eromanga	-27° 28' 4" 142° 16' 39"	RT 137 GL 131.9	14-Jan-01 24-Jan-01	2 206 2 206	Cased and suspended as a future Permian gas producer.	NFW NFD
SANTOS Roti 2 ATP259P	Cooper/Eromanga	-27° 23' 4" 142° 10' 42"	RT 101.3 GL 96	08-Feb-01 25-Feb-01	2 402 2 402	Cased and suspended as a future gas producer.	NFW NPD
SANTOS Roti 3 ATP259P	Cooper/Eromanga	-27° 23' 26" 142° 10' 46"	RT 106 GL 101	28-Apr-01 10-May-01	2 388 2 388	Cased and suspended as a future Permian gas producer.	EXT EXT
SANTOS Stokes 10 PL84	Cooper/Eromanga	-28° 20' 16" 141° 1' 25"	RT* 88.4 GL 83.6	24-May-01 07-Jun-01	2 458 2 458	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Tellus 1 ATP259P	Cooper/Eromanga	-28° 21' 57" 141° 3' 7"	RT 69 GL 64	18-Apr-01 29-Apr-01	2 488 2 488	Cased and suspended as a future gas producer.	NFW NFD
SANTOS Tellus South 1 ATP259P	Cooper/Eromanga	-28° 22' 37" 141° 3' 36"	RT 98.5 GL 93	25-Dec-01 -	- -	Drilling ahead	NFW –
SANTOS Vega 2 PL131	Cooper/Eromanga	-27° 43' 19" 141° 52' 53"	RT 75.8 GL 67.9	12-Jun-01 02-Jul-01	2 890 2 890	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Vega North 1 ATP259P	Cooper/Eromanga	-27° 42' 5" 141° 52' 59"	RT 73.6 GL 68.5	21-Oct-01 09-Nov-01	2 794 2 794	Cased and suspended as a Permian gas producer.	NFW NFD
SANTOS Warrinilla 8 ATP337P	Surat	-25° 5' 29" 148° 33' 20"	RT 297.5 GL 293.5	18-Sep-01 30-Sep-01	1 189 1 189	Plugged and abandoned, dry.	NFW NFW

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
QUEENSLAND							
SANTOS Wellington 1 PL131	Cooper/Eromanga	-27° 43' 18" 141° 49' 55"	RT 71.3 GL 65.8	01-Aug-01 18-Aug-01	2 765 2 765	Cased and suspended as a future Permian Toolachee gas producer.	NFW NFD
SANTOS Wippo East 2 ATP259P	Cooper/Eromanga	-27° 16' 15" 142° 7' 46"	RT 84 GL 79	17-Dec-00 08-Jan-01	2 251 2 251	Cased and suspended as a future gas producer.	DEV DEV
TAMARK Cashmere 1 ATP541P	Cooper/Eromanga	-24° 45' 22" 142° 30' 31"	RT 184.6 GL 180	08-Jan-01 18-Jan-01	1 706 1 706	Plugged and abandoned, dry.	NFW NFW
TAMARK Sable 1 (Tamark) ATP541P	Cooper/Eromanga	-25° 2' 11" 142° 31' 11"	RT 184.6 GL 180	25-Jan-01 08-Feb-01	2 203 2 203	Plugged and abandoned, dry.	NFW NFW

METRES DRILLED - QUEENSLAND

Wells	Onshore	Offshore	Total
Exploration	57 482	-	57 482
Development	49 977	-	49 977
Total	107 458	-	107 458

VICTORIA							
BASS STRAIT Melville 1 (Bass Strait) VIC/P42	Gippsland	-38° 41' 0" 147° 59' 0"	RT 25 WD -75	17-Oct-01 13-Nov-01	3 345 3 345	Plugged and abandoned, dry.	NFW NFW
EAGLE BAY Northright 1 VIC/P41	Gippsland	-37° 55' 58" 149° 8' 59"	RT 25 WD -105	26-Apr-01 29-Apr-01	391 391	Plugged and abandoned, dry.	NFW NFW
ESSO East Pilchard 1 VIC/L 9	Gippsland	-38° 11' 54" 148° 33' 43"	RT 25 WD -90	03-Jul-01 02-Aug-01	3 138 3 138	Cased and suspended as a future gas producer.	NFW NFD
ESSO West Tuna W 3 VIC/L 4	Gippsland	-38° 11' 36" 148° 23' 14"	RT 34.69 WD -60	25-Sep-01 08-Oct-01	2 565 2 565	Completed as an oil producer.	DEV DEV
ESSO West Tuna W 4A VIC/L 4	Gippsland	-38° 11' 36" 148° 23' 14"	RT 34.69 WD -61.1	25-Jul-01 01-Aug-01	2 833 421	Completed as an oil producer.	DEV DEV
ESSO West Tuna W 9 VIC/L 4	Gippsland	-38° 10' 26" 148° 22' 53"	RT 34.69 WD -59	05-Sep-01 16-Sep-01	3 015 3 015	Completed as an oil producer.	DEV DEV
ESSO West Tuna W 15 VIC/L 4	Gippsland	-38° 11' 36" 148° 23' 14"	RT 34.69 WD -61.1	10-Aug-01 23-Aug-01	3 030 3 030	Completed as an oil producer.	DEV DEV
ESSO West Tuna W 16 VIC/L 4	Gippsland	-38° 11' 36" 148° 23' 14"	RT 34.69 WD -61.1	20-Nov-01 23-Nov-01	140	Plugged and abandoned, dry.	DEV DEV
ESSO West Tuna W 20 VIC/L 4	Gippsland	-38° 11' 37" 148° 23' 14"	RT 34.69 WD -61.1	15-Oct-01 10-Nov-01	3 663 3 663	Completed as an oil producer.	DEV DEV

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
VICTORIA							
ESSO West Tuna W 21 VIC/L 4	Gippsland	-38° 11' 37" 148° 23' 14"	KB 34.69 WD -60	01-Jul-01 14-Jul-01	3 261 3 261	Completed as an oil producer.	DEV DEV
ESSO West Tuna W 22 VIC/L 4	Gippsland	-38° 11' 37" 148° 23' 15"	RT 34.69 WD -59	06-Jun-01 22-Jun-01	2 552 2 552	Completed as an oil Producer.	DEV DEV
ESSO West Tuna W 27 VIC/L 4	Gippsland	-38° 11' 37" 148° 23' 16"	RT 34.69 WD -61.1	03-Dec-01 28-Dec-01	3 564 3 564	Completed as an oil producer.	DEV DEV
KNIGHT Kelly 1 PEP161	Murray	-36° 16' 22" 145° 53' 48"	KB 137 GL 135.5	07-Oct-01 29-Oct-01	862 862	Plugged and abandoned, dry.	NFW NFW
LAKES Gangell 1 PEP137	Gippsland	-38° 18' 54" 147° 11' 49"	RT 40 GL 35	05-Jan-01 26-Jan-01	2 350 2 350	Suspended for possible future re-entry.	NFW NFD
ORIGIN Dunbar 1 DW1 PPL1	Otway	-38° 32' 51" 142° 54' 20"	RT 82.7 GL 77.2	19-Mar-01 26-Mar-01	1 507 1 507	Cased and suspended as a future gas producer.	EXT EXT
ORIGIN Geographe North 1 VIC/P43	Otway	-39° 4' 32" 142° 55' 15"	RT 25 WD -82	28-Sep-01 09-Oct-01	2 156 2 156	Plugged and abandoned, dry.	EXT EXT
SANTOS Croft 1 PEP154	Otway	-38° 32' 26" 142° 46' 24"	RT 57.4 GL 52.4	01-Apr-01 12-Apr-01	2 529 2 529	Cased and suspended as a future gas producer.	NFW NFD
SANTOS Lavers 1 PEP154	Otway	-38° 28' 45" 142° 48' 13"	RT 68.2 GL 63.5	26-Apr-01 03-May-01	1 627 1 627	Cased and suspended as a future gas producer.	NFW NFD
SANTOS McIntee 1 PEP154	Otway	-38° 29' 21" 142° 49' 21"	RT 64.2 GL 59.5	10-Feb-01 22-Feb-01	1 803 1 803	Cased and suspended as a future gas producer.	NFW NFD
SANTOS Naylor 1 PEP154	Otway	-38° 31' 53" 142° 48' 26"	RT 50.7 GL 46	09-May-01 17-May-01	2 157 2 157	Cased and suspended as a future gas producer.	NFW NFD
SANTOS Naylor South 1 PEP154	Otway	-38° 32' 16" 142° 48' 44"	RT 52.2 GL 47.5	15-Dec-01 26-Dec-01	2 243 2 243	Plugged and abandoned, dry.	NFW NFW
SANTOS Penryn 2 PPL5	Otway	-38° 31' 20" 142° 58' 43"	RT 132.7 GL 128	07-Aug-01 16-Aug-01	1 811 1 811	Cased and suspended as a future Late Cretacious Waarre Sst gas producer.	EXT EXT
SANTOS Tregony 1 PEP153	Otway	-38° 30' 56" 142° 55' 24"	RT 98.6 GL 70	28-Feb-01 15-Mar-01	1 819 1 819	Cased and suspended as a future gas producer.	NFW NFD
WOODSIDE Geographe 1 VIC/P43	Otway	-39° 6' 47" 142° 55' 39"	RT 25 WD -85	30-May-01 16-Jun-01	2 430 2 430	Plugged and abandoned, dry.	NFW NFD

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication

VICTORIA

METRES DRILLED - VICTORIA

Wells	Onshore	Offshore	Total
Exploration	18 708	11 460	30 168
Development	-	22 211	22 211
Total	18 708	33 671	52 379

TASMANIA

ORIGIN Thylacine 1 T/30P	Otway	-39° 14' 28" 142° 54' 44"	RT 25 WD -101.4	05-May-01 18-May-01	2 710 2 710	Cased and suspended as a potential gas producer.	NFW NFD
WOODSIDE Thylacine 2 T/30P	Otway	-39° 13' 43" 142° 50' 55"	RT 25 WD -101	28-Aug-01 08-Sep-01	2 525 2 525	Plugged and abandoned.	EXT EXT

METRES DRILLED - TASMANIA

Wells	Onshore	Offshore	Total
Exploration	-	5 235	5 235
Development	-	-	-
Total	-	5 235	5 235

SOUTH AUSTRALIA

ORIGIN Balnaves 1 PEL32	Otway	-37° 26' 56" 140° 42' 12"	RT 66.3 GL 61.7	10-Jun-01 28-Jun-01	2 874 2 874	Plugged and abandoned.	NFW NFD
ORIGIN Limestone Ridge 1 PEL32	Otway	-37° 26' 7" 140° 42' 7"	RT 65.8 GL 61.2	12-Jul-01 26-Jul-01	2 850 2 850	Cased and suspended pending further testing.	NFW NFD
ORIGIN McNamara Park 1 PEL72	Otway	-37° 49' 49" 140° 37' 6"	RT 33.55 GL 28.95	25-May-01 04-Jun-01	2 062 2 062	Plugged and abandoned, dry.	NFW NFW
SANTOS Beckler 4 PPL141	Cooper/Eromanga	-28° 2' 20" 140° 56' 48"	RT 84 GL 78	17-Nov-01 05-Dec-01	3 146 3 146	Cased and suspended as a future Permian gas producer.	EXT EXT
SANTOS Beckler 5 PPL141	Cooper/Eromanga	-28° 4' 9" 140° 58' 8"	RT 92 GL 86	13-Dec-01 29-Dec-01	3 049 3 049	Cased and suspended as a future Permian gas producer.	EXT EXT
SANTOS Big Lake 68 PPL11	Cooper/Eromanga	-28° 15' 23" 140° 15' 5"	RT 38 GL 33	07-Mar-01 20-Mar-01	2 623 2 623	Cased and suspended as a Permian gas producer.	DEV SPD
SANTOS Big Lake 69 PPL11	Cooper/Eromanga	-28° 13' 52" 140° 17' 23"	RT 37 GL 32	18-Jun-01 12-Jul-01	3 035 3 035	Cased and suspended as a Jurassic oil producer, and plugged and suspended over the Permian gas zones pending a later completion.	DEV DEV

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
SOUTH AUSTRALIA							
SANTOS Big Lake 70 PPL11	Cooper/Eromanga	-28° 12' 34" 140° 19' 17"	RT 39 GL 33.2	14-Sep-01 04-Oct-01	3 066 3 066	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Bow 2 PPL141	Cooper/Eromanga	-28° 1' 39" 140° 58' 22"	RT 85.1 GL 79	24-Oct-01 09-Nov-01	3 035 3 035	Cased and suspended as a Permian gas producer.	EXT EXT
SANTOS Cabernet 4 PPL138	Cooper/Eromanga	-28° 30' 48" 140° 9' 59"	RT 41 GL 36	03-Nov-01 14-Nov-01	2 471 2 471	Plugged and abandoned, dry.	EXT EXT
SANTOS Castalia 1 PPL 8	Cooper/Eromanga	-28° 9' 13" 140° 5' 34"	RT 34.7 GL 28.9	04-May-01 24-May-01	2 837 2 837	Plugged and abandoned, dry.	NFW NFW
SANTOS Crowsnest 1 PPL141	Cooper/Eromanga	-28° 1' 26" 140° 55' 26"	RT 89.8 GL 83.8	27-Sep-01 10-Oct-01	2 859 2 859	Cased and suspended pending completion as a future Permian gas producer.	NFW NFD
SANTOS Dullingari 52 PPL12	Cooper/Eromanga	-28° 6' 20" 140° 53' 57"	RT 86.5 GL 81.6	01-May-01 17-May-01	2 686 2 686	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Dullingari 53 PPL12	Cooper/Eromanga	-28° 7' 33" 140° 53' 28"	RT 90 GL 85	24-May-01 07-Jun-01	2 733 2 733	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Dullingari 54 PPL12	Cooper/Eromanga	-28° 7' 49" 140° 52' 1"	RT 86.3 GL 80.4	13-Jun-01 26-Jun-01	2 633 2 633	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Dullingari North 10 PPL112	Cooper/Eromanga	-28° 3' 31" 140° 52' 22"	RT 88 GL 83	21-Jan-01 03-Feb-01	2 822 2 822	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Dullingari North 11 PPL112	Cooper/Eromanga	-28° 4' 7" 140° 51' 21"	RT 79 GL 74	12-Feb-01 27-Feb-01	2 829 2 829	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Dullingari North 12 PPL112	Cooper/Eromanga	-28° 5' 2" 140° 51' 37"	RT 82 GL 77	05-Mar-01 20-Mar-01	2 852 2 852	Cased and suspended as a gas producer.	DEV DEV
SANTOS Dullingari North 13 PPL112	Cooper/Eromanga	-28° 4' 38" 140° 52' 47"	RT 86 GL 81.1	29-Mar-01 23-Apr-01	2 776 3 358	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Meranji North 1 PPL35	Cooper/Eromanga	-27° 50' 11" 140° 4' 58"	RT 38.4 GL 33	14-Dec-01 -	- -	Drilling ahead	EXT –
SANTOS Merrimelia 42 PPL17	Cooper/Eromanga	-27° 45' 35" 140° 8' 58"	RT 44 GL 38.5	24-Jul-01 03-Aug-01	2 348 2 348	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Milluna NE 1 PPL139	Cooper/Eromanga	-28° 19' 40" 140° 29' 13"	RT 39.3 GL 34	20-Mar-01 05-Apr-01	2 539 2 539	Cased and suspended as a future Permian gas producer.	NFW NFD
SANTOS Moomba 119 DW2 PPL 9	Cooper/Eromanga	-28° 10' 53" 140° 13' 24"	RT 35 GL 30.4	10-Jan-01 10-Jan-01	2 219 55	Completed as an oil producer.	DEV DEV

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
SOUTH AUSTRALIA							
SANTOS Moomba 125 PPL7	Cooper/Eromanga	-28° 1' 19" 140° 8' 45"	RT 42.6 GL 36	11-Jan-01 22-Jan-01	2 772 2 772	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 127 PPL7	Cooper/Eromanga	-28° 1' 6" 140° 9' 15"	RT 40 GL 34	29-Jan-01 09-Feb-01	2 839 2 839	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 128 PPL 7	Cooper/Eromanga	-28° 1' 39" 140° 8' 2"	RT 37 GL 32	26-Dec-00 06-Jan-01	2 764 2 764	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 129 PPL7	Cooper/Eromanga	-28° 1' 6" 140° 9' 56"	RT 37 GL 32	16-Feb-01 01-Mar-01	2 837 2 837	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Moomba 130 PPL 7	Cooper/Eromanga	-28° 2' 10" 140° 12' 32"	RT 40.5 GL 34.9	03-Jan-01 06-Jan-01	2 618 2 618	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 131 PPL7	Cooper/Eromanga	-28° 3' 32" 140° 13' 40"	RT 51 GL 46	21-Jan-01 02-Feb-01	2 641 2 641	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 132 PPL7	Cooper/Eromanga	-28° 2' 5" 140° 12' 30"	RT 41 GL 35	10-Feb-01 25-Feb-01	2 630 2 630	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Moomba 133 PPL113	Cooper/Eromanga	-28° 4' 6" 140° 21' 25"	RT 44 GL 38.1	11-Mar-01 29-Mar-01	2 992 2 992	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 136 PPL 9	Cooper/Eromanga	-28° 13' 14" 140° 12' 25"	RT 35.7 GL 30.4	20-Feb-01 01-Mar-01	2 719 2 179	Cased and suspended as a future oil producer.	NFW NPD
SANTOS Moomba 137 PPL 9	Cooper/Eromanga	-28° 11' 22" 140° 12' 38"	RT 40.6 GL 35	29-Jan-01 11-Feb-01	2 430 2 430	Plugged and abandoned, dry.	NFW NFW
SANTOS Moomba 138 PPL 9	Cooper/Eromanga	-28° 9' 12" 140° 15' 42"	RT 39.1 GL 33	21-Apr-01 17-May-01	2 522 2 522	Cased and suspended as a future gas producer.	EXT EXT
SANTOS Moomba 139 PPL 7	Cooper/Eromanga	-28° 6' 37" 140° 19' 26"	RT 40.7 GL 35.6	05-Jul-01 19-Jul-01	2 774 2 774	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 140 PPL 7	Cooper/Eromanga	-28° 3' 44" 140° 14' 55"	RT 46.7 GL 40.8	01-Apr-01 17-Apr-01	2 771 2 771	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Moomba 141 PPL 7	Cooper/Eromanga	-28° 4' 27" 140° 15' 44"	RT 51.8 GL 46	21-Apr-01 09-May-01	2 805 2 805	Cased and suspended as a future gas producer.	DEV DEV
SANTOS Moomba 142 PPL7	Cooper/Eromanga	-28° 3' 24" 140° 15' 56"	RT 49.7 GL 43.9	27-Jul-01 08-Aug-01	2 789 2 789	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 143 PPL 7	Cooper/Eromanga	-28° 7' 54" 140° 14' 35"	RT 40.7 GL 35	26-May-01 12-Jun-01	2 761 2 761	Cased and suspended as a future Permian gas producer.	DEV DEV

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
SOUTH AUSTRALIA							
SANTOS Moomba 144 PPL 7	Cooper/Eromanga	-28° 2' 19" 140° 14' 41"	RT 36.7 GL 31	22-Jun-01 03-Jul-01	2 744 2 744	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 145 PPL7	Cooper/Eromanga	-28° 1' 24" 140° 14' 49"	RT 43.7 GL 38	08-Jul-01 23-Jul-01	2 774 2 774	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 146 PPL 7	Cooper/Eromanga	-28° 2' 18" 140° 13' 37"	RT 43.8 GL 38	31-Aug-01 09-Sep-01	2 628 2 628	Cased and suspended as a Permian gas producer.	DEV DEV
SANTOS Moomba 147 PPL 7	Cooper/Eromanga	-28° 1' 15" 140° 13' 40"	RT 41.7 GL 35.9	13-Aug-01 25-Aug-01	2 781 2 781	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 148 PPL 9	Cooper/Eromanga	-28° 10' 37" 140° 13' 24"	RT 36.9 GL 32	27-Mar-01 19-Apr-01	2 204 2 204	Cased and suspended as a future oil producer.	DEV DEV
SANTOS Moomba 149 PPL 7	Cooper/Eromanga	-28° 5' 8" 140° 18' 12"	RT 50.7 GL 44.9	13-Nov-01 24-Nov-01	2 801 2 801	Cased and suspended pending completion as a Permian gas producer.	DEV DEV
SANTOS Moomba 151 PPL 7	Cooper/Eromanga	-28° 5' 11" 140° 19' 8"	RT 47 GL 41	30-Nov-01 09-Dec-01	2 790 2 790	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Moomba 153 PPL 9	Cooper/Eromanga	-28° 13' 47" 140° 11' 7"	RT 41.4 GL 35.6	08-Oct-01 06-Nov-01	2 277 3 566	Cased and suspended as a future oil producer.	EXT EXT
SANTOS Moomba 167 PPL 9	Cooper/Eromanga	-28° 11' 2" 140° 13' 26"	RT 37.8 GL 32	18-Dec-01 30-Dec-01	2 216 2 216	Cased and suspended as a future Jurassic oil producer.	DEV DEV
SANTOS Moona 1 PPL22	Cooper/Eromanga	-28° 10' 57" 140° 34' 47"	RT 53 GL 47.5	04-Mar-01 15-Mar-01	2 339 2 339	Cased and suspended as a future Permian gas producer.	NFW NFD
SANTOS Mootanna 1 PPL114	Cooper/Eromanga	-27° 55' 7" 140° 26' 46"	RT 47 GL 41	13-May-01 14-Jun-01	3 051 3 051	Plugged and suspended.	NFW NFW
SANTOS Pelican 7 PPL 7	Cooper/Eromanga	-27° 47' 57" 140° 5' 40"	RT 39.4 GL 34.4	22-Nov-01 06-Dec-01	2 708 2 708	Cased and suspended as a future Permian gas producer.	EXT EXT
SANTOS Reg Sprigg 2 PPL194	Cooper/Eromanga	-27° 14' 16" 140° 57' 20"	RT 126.8 GL 121.6	04-Sep-01 14-Sep-01	2 420 2 420	Plugged and abandoned, dry.	EXT EXT
SANTOS Swan Lake 5 PPL101	Cooper/Eromanga	-27° 51' 5" 140° 8' 8"	RT 40.3 GL 34.5	09-Aug-01 25-Aug-01	3 086 3 086	Cased and suspended as a future Permian gas producer.	DEV DEV
SANTOS Tarrango 1 PPL10	Cooper/Eromanga	-28° 21' 43" 140° 0' 54"	RT 29.9 GL 24.9	03-Jan-01 15-Jan-01	2 470 2 470	Cased and suspended as a future Permian gas producer.	NFW NFD
SANTOS Tirrawarra 71 PPL20	Cooper/Eromanga	-27° 42' 31" 140° 4' 15"	RT 36.5 GL 31.3	08-Apr-01 24-Apr-01	3 085 3 085	Cased and suspended as a future gas producer.	EXT EXT

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
SOUTH AUSTRALIA							
SANTOS	Cooper/Eromanga	-28° 22' 7"	RT 42	20-Dec-00	2 743	Cased and suspended as a	DEV
Waukatanna 2		140° 5' 5"	GL 37	05-Jan-01	2 743	future Permian gas producer.	DEV
PPL82							

METRES DRILLED - SOUTH AUSTRALIA

Wells	Onshore	Offshore	Total
Exploration	54 492	-	54 492
Development	93 800	-	93 800
Total	148 292	-	148 292

WESTERN AUSTRALIA							
APACHE	Carnarvon	-20° 40' 8"	RT 26.7	17-Jul-01	2 542	Completed as a pilot hole for	DEV
Agincourt 5H		115° 30' 52"	WD -8.1	23-Jul-01	2 943	Agincourt 5H DW1.	DEV
TL/6							
APACHE	Carnarvon	-20° 40' 8"	RT 26.7	25-Jul-01	3 535	.	DEV
Agincourt 6		115° 30' 0"	WD -8.1	02-Aug-01	1 083		DEV
TL/6							
APACHE	Carnarvon	-21° 37' 5"	RT 32.2	17-Sep-01	1 120	Plugged and abandoned, dry.	NFW
Bessieres 1		114° 47' 19"	WD -11	21-Sep-01	1 120		NFW
TP/6							
APACHE	Carnarvon	-20° 45' 43"	RT 31.4	27-Oct-01	3 417	Plugged and abandoned.	NFW
Denver 1		115° 35' 38"	WD -10	13-Nov-01	3 417		NFW
TP/8							
APACHE	Carnarvon	-21° 2' 31"	RT 27.1	24-Sep-01	2 038	Plugged and abandoned.	NFW
Errol 1		115° 33' 2"	WD -14	02-Oct-01	2 034		NFD
TR/1							
APACHE	Carnarvon	-20° 41' 58"	RT 25.2	14-Feb-01	2 356	Suspended as a future oil	NFW
Gibson 1		115° 33' 52"	WD -8	27-Feb-01	2 356	producer.	NFD
TL/6							
APACHE	Carnarvon	-20° 46' 52"	RT 25.1	04-Dec-01	2 633	Plugged and abandoned, dry.	NFW
Great Victoria 1		115° 33' 10"	-	14-Dec-01	2 633		NFW
TP/8							
APACHE	Carnarvon	-20° 37' 54"	RT 31.4	05-Oct-01	1 984	Plugged and abandoned as an	NFW
Gudrun 1		115° 37' 0"	WD -24	08-Oct-01	1 984	oil discovery.	NFD
TL/6							
APACHE	Carnarvon	-21° 9' 6"	RT 31.6	27-Aug-01	3 039	Plugged and abandoned, dry.	NFW
Leaf 1		115° 2' 26"	WD -58	12-Sep-01	3 039		NFW
WA-215-P							
APACHE	Carnarvon	-19° 42' 14"	RT 44	17-Jan-01	5 510	Completed as an oil producer.	DEV
Legendre North 1H		116° 42' 31"	WD -52	25-May-01	5 940		DEV
WA-20-L							
APACHE	Carnarvon	-19° 42' 14"	RT 44.36	22-Jan-01	4 300	Completed as an oil producer.	DEV
Legendre North 2H		116° 42' 31"	WD -52	02-Jun-01	4 300		DEV
WA-20-L							
APACHE	Carnarvon	-19° 42' 14"	RT 41	23-Jan-01	3 415	Completed as an oil producer.	DEV
Legendre North 3H		116° 42' 31"	WD -52	06-May-01	4 108		DEV
WA-20-L							

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
WESTERN AUSTRALIA							
APACHE Legendre South 2H WA-20-L	Carnarvon	-19° 42' 14" 116° 42' 31"	RT 44 WD -52	22-Jan-01 15-Jun-01	4 484 4 484	Completed as an oil producer.	DEV DEV
APACHE Legendre West 1 WA-20-L	Carnarvon	-19° 42' 14" 116° 42' 31"	RT 44 WD -52	22-Jan-01 26-Jun-01	4 863 4 863	Completed as an oil producer.	DEV SRV
APACHE Linda 2 TL/1	Carnarvon	-20° 32' 45" 115° 41' 37"	RT 32 WD -32	27-Mar-01 17-Apr-01	2 927 2 927	Plugged and abandoned, dry.	EXT EXT
APACHE Priscilla 1 TL/1	Carnarvon	-20° 41' 58" 115° 33' 52"	NA WD -6	12-Oct-01 20-Oct-01	3 281 3 281	Plugged and abandoned, dry.	NFW NFW
APACHE Simpson 1 TL/1	Carnarvon	-20° 40' 24" 115° 35' 5"	RT 25 -	30-Jan-01 07-Feb-01	2 148 2 148	Plugged and abandoned as a future oil producer.	EXT EXT
APACHE Simpson 2 TL/1	Carnarvon	-20° 41' 10" 115° 35' 13"	RT 32.3 -	18-Mar-01 22-Mar-01	2 038 2 038	Plugged and abandoned, dry.	EXT EXT
APACHE Simpson 3H TL/1	Carnarvon	-20° 40' 24" 115° 35' 6"	RT 24.2 WD -6	09-Aug-01 22-Aug-01	2 848 2 848	Completed as an oil producer.	DEV DEV
APACHE South Plato 1 TL/6	Carnarvon	-20° 41' 58" 115° 33' 52"	RT 25.2 WD -8	14-Feb-01 27-Feb-01	2 337 2 337	Suspended as a future oil producer.	NFW NFD
APACHE South Plato 2 TL/6	Carnarvon	-20° 42' 2" 115° 33' 47"	NA WD -6	12-Oct-01 23-Oct-01	1 925 1 925	Plugged and abandoned, dry.	EXT EXT
APACHE Stag 22 WA-15-L	Carnarvon	-20° 17' 57" 116° 15' 17"	RT 32.5 WD -4.8	12-Mar-01 15-Mar-01	850 850	Plugged and abandoned, dry.	EXT EXT
APACHE Stag 23H WA-15-L	Carnarvon	-20° 17' 28" 116° 16' 26"	RT 32 WD -102	24-Apr-01 06-May-01	3 125 3 125	Cased and suspended as a future oil producer.	DEV DEV
APACHE Tusk 2 WA-246-P	Carnarvon	-20° 14' 12" 116° 8' 24"	RT 33.12 WD -53.84	10-Jan-01 16-Jan-01	1 377 1 377	Plugged and abandoned, dry.	EXT EXT
ARC ENERGY Yardarino 5 L 2	Perth	-29° 13' 15" 115° 3' 33"	RT 75.5 GL 67.7	03-Jun-01 18-Jun-01	2 560 2 560	Suspended for possible re-entry and sidetrack following technical evaluation.	DEV DEV
AUSAM Walyering 4 EP 414	Perth	-30° 42' 55" 115° 28' 14"	RT 103 GL 95	18-Nov-01 15-Dec-01	3 350 3 350	Plugged and abandoned, dry.	EXT EXT
AWE Arradale 1 EP 368	Perth	-29° 5' 31" 115° 18' 44"	RT 278 GL 270	28-Oct-01 08-Nov-01	2 245 2 245	Plugged and abandoned, dry.	NFW NFW
BHP Griffin 9 WA-10-L	Carnarvon	-21° 12' 33" 114° 38' 14"	RT 26 WD -142	28-Nov-01 16-Dec-01	3 825 5 311	Completed as future oil producer.	DEV DEV

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
WESTERN AUSTRALIA							
BHP Xanthe 1 WA-290-P	Carnarvon	-20° 52' 12" 114° 41' 2"	RT 27 WD -394	13-Mar-01 21-Mar-01	3 220 3 220	Plugged and abandoned, dry.	NFW NFW
CHEVRON Barrow Island E 22A L 1H	Carnarvon	-20° 50' 2" 115° 24' 23"	NA -	11-Sep-01 14-Sep-01	739 739	Cased and suspended pending completion as a Windalia Sst oil producer.	DEV DEV
CHEVRON Barrow Island G 27A L 1H	Carnarvon	-20° 50' 5" 115° 21' 51"	NA -	01-Oct-01 03-Oct-01	735 735	Cased and suspended pending completion as an Early Cretaceous Windalia Sst oil producer.	DEV DEV
CHEVRON Barrow Island K 44A TL/3	Carnarvon	-20° 48' 43" 115° 21' 8"	NA -	21-Sep-01 23-Sep-01	766 766	Cased and suspended pending completion as an Early Cretaceous Windalia Sst oil producer.	DEV DEV
CHEVRON Barrow Island K 66A L 1H	Carnarvon	-20° 49' 12" 115° 21' 36"	NA -	14-Sep-01 18-Sep-01	762 762	Cased and suspended pending completion as an Early Cretaceous Windalia Sst Oil Producer.	DEV DEV
CHEVRON Barrow Island K 84A L 1H	Carnarvon	-20° 49' 37" 115° 21' 8"	NA -	26-Sep-01 28-Sep-01	766 766	Cased and suspended pending completion as an Early Cretaceous Windalia Sandstone oil producer.	DEV DEV
CHEVRON Barrow Island M 25A L 1H	Carnarvon	-20° 48' 21" 115° 25' 5"	NA -	16-Oct-01 19-Oct-01	800 800	Cased and suspended pending completion as a Windalia Sst oil producer.	DEV DEV
CHEVRON Barrow Island P 64A L 1H	Carnarvon	-20° 47' 24" 115° 24' 51"	NA -	20-Oct-01 22-Oct-01	792 792	Cased and suspended pending completion as an Early Cretaceous Windalia Sst oil producer.	DEV DEV
CHEVRON Callirhoe 1 WA-267-P	Carnarvon	-19° 56' 38" 114° 53' 12"	RT 28.3 WD -1221	25-Jan-01 06-Feb-01	4 128 4 128	Plugged and abandoned, dry; part of the Geryon field.	NFW EXT
CHEVRON Io 1 WA-267-P	Carnarvon	-19° 47' 13" 114° 38' 10"	RT 26.3 WD -1352	06-Jan-01 14-Jan-01	3 030 3 030	Plugged and abandoned, dry; part of Jansz field.	NFW EXT
COVEYORK Kaleidoscope 1 WA-274-P	Browse	-13° 44' 27" 123° 19' 24"	RT 26 WD -259	03-Apr-01 08-May-01	4 437 4 437	Plugged and abandoned, dry.	NFW NFW
EMPIRE Brooke 1 EP 41	Carnarvon	-22° 26' 31" 114° 4' 9"	RT 89.9 GL 86	01-Jun-01 28-Jun-01	1 168 1 168	Plugged and abandoned, dry.	NFW NFW
EMPIRE Carlston 1 EP 410	Carnarvon	-23° 49' 51" 114° 11' 49"	KB 38.2 GL 35.3	30-Dec-01 -	- -	Drilling ahead	NFW –
EMPIRE Tess 1 EP 41	Carnarvon	-22° 22' 3" 114° 8' 13"	RT 22.1 GL 18.9	20-Aug-01 19-Sep-01	1 394 1 394	Plugged and abandoned, dry.	NFW NFW
HARDMAN Woodada 17 L 5	Perth	-29° 51' 43" 115° 8' 48"	RT 44.05 GL 35.95	27-Dec-01 -	- -	Drilling ahead	DEV –

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
WESTERN AUSTRALIA							
HUGHES AND HUGHES Fruitcake 1 EP 353	Canning	-19° 28' 25" 124° 28' 47"	RT 144.2 GL 140	15-Nov-01 14-Dec-01	1 696 1 696	Plugged and abandoned, dry.	NFW NFW
HUGHES AND HUGHES Missing 1 EP 353	Canning	-19° 33' 18" 124° 36' 36"	RT 165.4 GL 161	14-Oct-01 07-Nov-01	1 810 1 810	Plugged and abandoned, dry.	NFW NFW
HUGHES AND HUGHES Robert 1 EP 353	Canning	-19° 9' 22" 124° 19' 48"	RT 206.4 GL 203	15-Aug-01 26-Sep-01	1 628 1 827	Plugged and abandoned, dry.	NFW NFW
IB RES. Manaslu 1 WA-292-P	Carnarvon	-18° 37' 2" 117° 21' 56"	RT 26 WD -397	24-May-01 03-Jun-01	2 531 2 531	Plugged and abandoned, dry.	NFW NFW
KERR-MCGEE Defiant 1 WA-278-P	Bonaparte	-12° 57' 36" 126° 8' 34"	RT 26 WD -63	04-Aug-01 12-Aug-01	1 627 1 627	Plugged and abandoned, dry.	NFW NFW
KERR-MCGEE Endeavor 1 WA-278-P	Bonaparte	-12° 51' 18" 126° 22' 19"	RT 26 WD -71	07-Jul-01 29-Jul-01	2 938 2 938	Plugged and abandoned, dry.	NFW NFW
NEWFIELD Backpacker 1 WA-273-P	Bonaparte	-11° 46' 27" 126° 14' 6"	RT 26 WD -72	16-Aug-01 26-Aug-01	2 276 2 276	Plugged and abandoned, dry.	NFW NFW
OMV Capricious 1 AC/P24	Bonaparte	-11° 43' 16" 125° 17' 40"	RT 22 WD -112.9	27-Nov-01 02-Dec-01	1 627 1 627	Plugged and abandoned, dry.	NFW NFW
ORIGIN Beharra Springs North 1 L 11	Perth	-29° 26' 7" 115° 8' 38"	RT 58.7 GL 50.7	12-Jul-01 09-Aug-01	3 450 3 450	Cased and suspended as a new-pool gas discovery.	NFW NPD
ORIGIN Beharra Springs South 1 EP 320	Perth	-29° 30' 17" 115° 9' 5"	RT 59.9 GL 47.5	24-Aug-01 20-Sep-01	3 471 3 471	Plugged and abandoned.	NFW NFD
ORIGIN Hovea 1 L 1	Perth	-29° 19' 7" 115° 2' 25"	RT 73.4 GL 61	03-Oct-01 13-Oct-01	2 134 2 134	Cased and suspended as an oil producer.	NFW NFD
ROC OIL Cliff Head 1 WA-286-P	Perth	-29° 27' 53" 114° 52' 11"	RT 25.21 WD -16.39	25-Dec-01 29-Dec-01	1 499 1 499	Plugged and abandoned.	NFW NFD
ROC OIL Cliff Head 2 WA-286-P	Perth	-29° 27' 53" 114° 52' 11"	RT 25.21 WD -16.39	31-Dec-01 -	- -	Drilling ahead	EXT –
SANTOS Carbine 1 WA-283-P	Browse	-15° 11' 13" 122° 10' 40"	RT 27.7 WD -80.8	06-Nov-01 17-Nov-01	1 561 1 561	Plugged and abandoned, dry.	NFW NFW
SANTOS Corowa 1 WA-264-P	Carnarvon	-21° 29' 10" 114° 34' 10"	RT 28.33 WD -85.27	04-Jun-01 07-Jun-01	1 651 1 651	Cased and suspended as a future oil producer.	NFW NFD
SANTOS Harpy 1 WA-264-P	Carnarvon	-21° 28' 39" 114° 39' 25"	RT 26.65 WD -70.9	25-May-01 30-May-01	1 665 1 665	Plugged and abandoned, dry.	NFW NFW

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication
WESTERN AUSTRALIA							
SANTOS Marabou 1 WA-281-P	Browse	-14° 9' 59" 122° 33' 28"	RT 26.4 WD -361	23-Nov-01 31-Dec-01	3 729 4 878	Plugged and abandoned, dry.	NFW NFW
TAP Lindsay 1 EP 364	Carnarvon	-21° 22' 50" 115° 18' 8"	NA WD -14	02-Jan-01 06-Jan-01	525 525	Plugged and abandoned, dry.	NFW NFD
WOODSIDE Atlas 1 WA-269-P	Carnarvon	-19° 25' 60" 115° 1' 0"	RT 28.3 WD -1395	20-Feb-01 28-Feb-01	4 211 4 211	Plugged and abandoned, dry.	NFW NFW
WOODSIDE Blacktip 1 WA-279-P	Bonaparte	-13° 54' 15" 128° 29' 5"	RT 31.5 WD -55.2	25-Jul-01 10-Aug-01	3 181 3 181	Plugged and abandoned as a gas discovery.	NFW NFD
WOODSIDE Delilah 1 WA-208-P	Carnarvon	-19° 43' 48" 116° 39' 32"	RT 22 WD -53.6	15-Mar-01 26-Mar-01	2 857 2 857	Plugged and abandoned, dry.	NFW NFW
WOODSIDE Goodwyn A 18 WA-5-L	Carnarvon	-19° 36' 38" 115° 57' 49"	RT 54.7 WD -130.1	06-Feb-01 04-May-01	9 278 9 278	Completed as a gas producer.	DEV DEV
WOODSIDE Grey Rabbit 1 WA-270-P	Carnarvon	-18° 47' 11" 117° 18' 2"	RT 22 WD -301.5	01-Apr-01 07-Apr-01	2 518 2 518	Plugged and abandoned, dry.	NFW NFW
WOODSIDE Maia 1 WA-4-L	Carnarvon	-19° 23' 42" 116° 30' 12"	RT 22 WD -134	22-May-01 04-Jun-01	3 179 3 179	Plugged and abandoned, dry.	NFW NFW
WOODSIDE Montesa 1 WA-271-P	Carnarvon	-21° 31' 23" 113° 49' 26"	RT 23 WD -902.5	07-Mar-01 15-Mar-01	2 302 2 302	Plugged and abandoned, dry.	NFW NFW
WOODSIDE Patriot 1 WA-1-P	Carnarvon	-19° 32' 39" 116° 48' 25"	RT 32 WD -42.8	05-Jul-01 12-Jul-01	2 390 2 390	Plugged and abandoned, dry.	NFW NFW
WOODSIDE Planaire 1 WA-28-P	Carnarvon	-19° 42' 18" 116° 18' 48"	RT 22 WD -71.4	22-Apr-01 15-May-01	3 872 3 872	Plugged and abandoned, dry.	NFW NFW
WOODSIDE Sandbar 1 WA-280-P	Bonaparte	-14° 35' 52" 128° 44' 51"	RT 31 WD -16	05-Sep-01 30-Sep-01	2 950 2 950	Plugged and abandoned, dry.	NFW NFW
WOODSIDE Tayra 1 WA-270-P	Carnarvon	-19° 3' 48" 117° 9' 54"	RT 22 WD -198	10-Apr-01 17-Apr-01	2 907 2 907	Plugged and abandoned, dry.	NFW NFW
WOODSIDE Yodel 3 WA-28-P	Carnarvon	-19° 44' 22" 115° 44' 49"	RT 22 WD -136.3	09-Jun-01 26-Jun-01	3 390 3 390	Cased and suspended as a future gas producer.	DEV DEV
WOODSIDE Yodel 4 WA-28-P	Carnarvon	-19° 44' 43" 115° 44' 11"	RT 22 WD -133.5	30-Jul-01 22-Aug-01	4 574 4 574	Cased and suspended as a future gas producer.	DEV DEV

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi-fication

WESTERN AUSTRALIA

METRES DRILLED - WESTERN AUSTRALIA

Wells	Onshore	Offshore	Total
Exploration	22 545	101 426	123 971
Development	7 920	56 247	64 167
Total	30 465	157 673	188 138

NORTHERN TERRITORY

AEC Puffin 6 AC/P22	Bonaparte	-12° 19' 20" 124° 18' 7"	RT 25.5 WD -93.6	10-Feb-01 27-Feb-01	2 326 2 326	Plugged and abandoned.	EXT EXT
BHP Phrixus 1 AC/P30	Browse	-13° 12' 54" 122° 53' 19"	RT 26.4 WD -411	22-Oct-01 14-Nov-01	3 874 3 874	Plugged and abandoned, dry.	NFW NFW
COASTAL Elasmosaurus 1 AC/P21	Bonaparte	-12° 14' 3" 124° 40' 43"	RT 22 WD -109	02-Dec-00 09-Jan-01	2 920 3 563	Plugged and abandoned, dry.	NFW NFW
COASTAL Hadrosaurus 1 AC/P21	Bonaparte	-12° 14' 48" 124° 34' 17"	NA WD -106	13-Sep-01 13-Oct-01	3 567 3 567	Plugged and abandoned, dry.	NFW NFW
NIPPON Saucepan 1 AC/P23	Browse	-12° 53' 47" 124° 35' 34"	RT 25 WD -114.5	25-Dec-00 02-Jan-01	2 600 2 600	Plugged and abandoned, dry.	NFW NFW
OMV Audacious 1 AC/P17	Bonaparte	-11° 43' 14" 125° 6' 4"	RT 22 WD -170	18-Jan-01 31-Jan-01	2 055 2 055	Plugged and abandoned as an oil discovery.	NFW NFD
OMV Audacious 2 AC/P17	Bonaparte	-11° 44' 4" 125° 5' 8"	RT 22 WD -172	05-Nov-01 20-Nov-01	2 235 2 235	Plugged and abandoned due to technical difficulties.	EXT EXT
OMV Bodacious 1 AC/P17	Bonaparte	-11° 51' 50" 124° 54' 31"	RT 22 WD -159.6	07-Dec-01 17-Dec-01	1 475 2 017	Plugged and abandoned, dry.	NFW NFW
OMV Bodacious 1A AC/P17	Bonaparte	-11° 51' 48" 124° 54' 30"	RT 22 WD -159	18-Dec-01 -	- -	Drilling ahead	NFW –
OMV Cromwell 1 AC/P18	Bonaparte	-11° 16' 38" 124° 46' 53"	RT 22 WD -362	13-Oct-01 17-Oct-01	396 396	Hole abandoned and moved to Cromwell 1A.	NFW NFW
OMV Cromwell 1A AC/P18	Bonaparte	-11° 16' 36" 124° 46' 48"	RT 22 WD -340.5	17-Oct-01 30-Oct-01	2 032 2 032	Plugged and abandonded, dry.	NFW NFW
WOODSIDE Pandorina 1 AC/P8	Bonaparte	-10° 33' 57" 125° 53' 60"	RT 22 WD -475	21-Feb-01 04-Mar-01	3 480 3 480	Plugged and abandoned, dry.	NFW NFW

APPENDIX A (cont'd)

Operator Well Permit	Basin	Location	Elevation	Spudded TD reached	Final TD Metres drilled	Well remark	Classi- fication

NORTHERN TERRITORY

METRES DRILLED - NORTHERN TERRITORY

Wells	Onshore	Offshore	Total
Exploration	-	28 145	28 145
Development	-	-	-
Total	-	28 145	28 145

JOINT PETROLEUM DEVELOPMENT AREA

WOODSIDE	Bonaparte	-10° 32' 17"	RT 25	07-Mar-01	3 535	Plugged and abandoned, dry.	NFW
Kuda Tasi 1		126° 9' 26"	WD -428	16-Mar-01	3 535		NFD
ZOCA 91-01							

METRES DRILLED - JOINT PETROLEUM DEVELOPMENT AREA

Wells	Onshore	Offshore	Total
Exploration	-	3 535	3 535
Development	-	-	-
Total	-	3 535	3 535

* Assumed reference point

Abbreviations (Amercian Petroleum Institute standard definitions for petroleum statistics)

DEV	Development	NPD	New-pool discovery
DF	Drill floor	SPD	Shallower pool discovery
DRY	Not completed	RT	Rotary table
EXT	Extension	STR	Stratigraphic
GL	Ground level	SRV	Service
KB	Kelly bushing	TD	Total depth
NFD	New-field discovery	WD	Water depth
NFW	New-field wildcat		

Appendix B
2001

Seismic survey activity by State, 2001

APPENDIX B: SEISMIC SURVEY ACTIVITY BY STATE, 2001

Operator	Contractor	Basin	Survey name	Type	Title	Km shot (sq. km)	Status
			OFFSHORE				
VICTORIA							
Eagle Bay Resources NL	Fugro	Gippsland	SCORPION	2D	VIC/P41, VIC/P41, VIC/RL3, V004	449	Completed
Esso Australia Resources Ltd	WesternGeco	Gippsland	NORTHERN FIELDS 3D	3D	VIC/L 9 R1, VIC/L10, VIC/L11, VIC/L15, VIC/L16, VIC/L17, VIC/L18, VIC/L19, VIC/L20, VIC/RL2, VIC/RL4, VIC/RL5, VIC/P36, VIC/P40	(1 260)	Continuing
Fugro Geoteam/Seismic Aus	Fugro Geoteam	Otway	OTWAY SORELL 2D (VICTORIA)	2D	V01-1, V01-2, V01-3	484	Completed
Pan Canadian Petroleum Ltd	Fugro Geoteam	Gippsland	2001 MIDAS 2D	2D	VIC/P48, VIC/P49	477	Continuing
Santos Ltd	WesternGeco	Otway	ONH-01	3D	PEP153, PEP154	(188)	Completed
Strike Oil	(unknown)	Otway	OSTR-01	3D	VIC/P44	(545)	Completed
Strike Oil NL	WesternGeco	Otway	CASINO 3D	3D	VIC/P44	(470)	Completed
TASMANIA							
Fugro Geoteam/Seismic Aus	Fugro Geoteam	Otway	OTWAY SORELL 2D (TASMANIA)	2D	T/30P, T01-1, T01-2, T01-3	3 151	Completed
Origin Energy Resources Ltd	Fugro Geoteam	Bass	SHELDUCT	2D	T/18P R3	425	Completed
SOUTH AUSTRALIA							
Woodside	Geco Prakla	Great Australian Bight	FLINDERS DEEPWATER (SOUTH AUSTRALIA)	2D	EPP29, EPP30, EPP28	14 058	Completed
WESTERN AUSTRALIA							
Apache Northwest Pty Ltd	WesternGeco	Carnarvon	MARLOW 2D	2D	TL/1, TL/5, TL/6	418	Completed
Apache Oil Australia Pty Ltd	Veritas DGC Asia Pacific	Carnarvon	LIZ 2D	2D	TP/ 6 R2	134	Completed
BHP	Veritas	Browse	HBR 2000A 2D	2D	WA-305-P, WA-303-P, WA-304-P, WA-301-P, WA-302-P	14 648	Completed
BHP Petroleum (Australia) Pty Ltd	Schlumberger Oilfield Australia Pty Ltd	Carnarvon	HCA 2000A 3D	3D	WA-255-P R1	(1 297)	Completed
Fugro Survey Pty Ltd	Fugro Geoteam	Perth	HOUTMAN BASIN 2001 NON-EXCLUSIVE 2D	2D	WA-226-P R1	2 600	Completed

APPENDIX B (cont'd)

Operator	Contractor	Basin	Survey name	Type	Title	Km shot (sq. km)	Status
Kerr-McGee NW Shelf Australia Energy Pty Ltd	WesternGeco	Carnarvon	MOOR 2D	2D	WA-295-P, WA-295-P	4 876	Completed
Petroleum Geoservices Asia Pacific Pte Ltd	PGS Exploration Pty Ltd	Carnarvon	PANAEUS 2000 WEST MC3D	3D	SPA 2SL/99-0	(330)	Completed
Santos Offshore Pty Ltd	Veritas DGC Australia Pty Ltd	Carnarvon	COROWA	2D	WA-264-P	97	Completed
Santos Offshore Pty Ltd	Veritas DGC Australia Pty Ltd	Carnarvon	LADON	2D	WA-264-P	140	Completed
Schlumberger	Schlumberger	Browse	ADELE TREND TQ 2D	2D	SPA 1SL/00-1, WA-285-P	198	Completed
Schlumberger	Schlumberger	Browse	ADELE TREND TQ 3D	3D	SPA 1SL/00-1, WA-285-P	(11 019)	Completed
TGS-NOPEC Geophysical Company	Veritas DGC Australia Pty Ltd	Carnarvon	FLINDERS NON EXCLUSIVE 3D	3D	SPA 1T/00-1,	(1 948)	Completed
Veritas DGC Australia Pty Ltd	Swire Pacific Offshore	Browse	BROWSE 2001	2D	SPA 4SL/01-2	5 956	Continuing
Veritas DGC Australia Pty Ltd	Veritas DGC Australia Pty Ltd	Carnarvon	ODIN MULTI-CLIENT SPEC	2D	SPA 5SL/01-2	1 258	Completed
WesternGeco (A) Pty Ltd	WesternGeco (A) Pty Ltd	Carnarvon	SKORPION/COVER ACK WG2D	2D	WA-271-P, WA-299-P, WA-300-P, SPA 7SL/01-2, SPA6SL/01-2	4 380	Continuing
Woodside Energy Ltd	Western Geophysical	Carnarvon	ARANEUS 2D	2D	WA-293-P	1 718	Completed
Woodside Energy Ltd	WesternGeco	Carnarvon	COVERACK 3D	3D	WA-299-P, WA-300-P	(493)	Completed
Woodside Energy Ltd	Schlumberger Oilfield Australia Pty Ltd	Carnarvon	HUNTSMAN 3D	3D	WA-297-P	(255)	Completed
Woodside Energy Ltd	WesternGeco	Carnarvon	LYCOS	2D	WA-294-P	800	Completed
Woodside Energy Ltd	Geco Prakla	Carnarvon	WHITETAIL 3D	3D	WA-296-P,	(553)	Completed
Woodside Energy Ltd	WesternGeco	Browse	WYLA	2D	WA-242-P R1	1 025	Completed
NORTHERN TERRITORY							
BHP Petroleum (Australia) Pty Ltd	Veritas DGC Australia Pty Ltd	Bonaparte	HBR 2001A	2D	AC/P30, AC/P29	78	Completed
Inpex Masela Ltd	PGS Asia Pacific Pte Ltd	Bonaparte	MASELA	3D	NT/P49	(171)	Completed
Multiwave Geophysical Company AS	TGS-NOPEC Geophysical Company	Bonaparte	MATAHARI	2D	NT/RL2, NT/P48, NT/P49, NT/P58, NT/P56, NT/P59	1 021	Completed
Nexen Petroleum Australia Pty Ltd	WesternGeco	Money Shoal	NT/P58-60	2D	NT/P58, NT/P59, NT/P60	3 709	Completed

APPENDIX B (cont'd)

Operator	Contractor	Basin	Survey name	Type	Title	Km shot (sq. km)	Status
Nippon Oil Exploration (Vulcan) Pty Ltd	Veritas DGC Australia Pty Ltd	Bonaparte	TELESCOPE	2D	AC/P23	461	Completed
West Oil NL	WesternGeco	Bonaparte	ROSSINI	2D	AC/P26	219	Completed
			ONSHORE				
QUEENSLAND							
Santos Exploration Pty Ltd	WesternGeco	Surat	SAWPIT 2D	2D		45	Completed
Santos Ltd	WesternGeco	Surat	BLYTHE CREEK	2D	ATP336P	44	Completed
Santos Ltd	WesternGeco	Surat	MOONIE	3D	PL 1	(98)	Completed
Santos Ltd	WesternGeco	Cooper	NORTH NACCOWLAH 3D	3D	ATP259P	(713)	Completed
Santos Ltd	WesternGeco	Cooper	WINDORAH	2D		71	Completed
Tri-Star Petroleum Company	Trace Terracorp	Bowen	SOUTHERN CROSS	2D	ATP333P	12	Completed
NEW SOUTH WALES							
Eastern Star Gas Ltd	Trace Terracorp	Gunnedah	BUNDOCK CREEK	2D	PEL238	11	Completed
Eastern Star Gas Ltd	Trace Terracorp	Gunnedah	CASTLEREIGH	2D	PEL433	119	Completed
Eastern Star Gas Ltd	Trace Terracorp	Surat	WHALAN CREEK PHASE 1	2D	PEL6	47	Continuing
VICTORIA							
Bass Petroleum Pty Ltd	Trace Terracorp	Gippsland	WARRAGUL	2D	PEP131	68	Completed
Origin Energy Resources Ltd	Trace Terracorp	Otway	GIPSYS CREEK	2D	PEP152, PEP159	63	Completed
Santos Ltd	WesternGeco	Otway	HEYTESBURY NORANDA 3D	3D	PEP153	(195)	Completed
TASMANIA							
Great South Land Minerals Pty Ltd	Trace Terracorp	Tasmania	NORTHERN MIDLANDS 2001	2D	EL13/98	659	Completed
SOUTH AUSTRALIA							
Origin Energy Resources Ltd	Trace Terracorp	Otway	NAMPARA	2D	PEL 27	55	Completed
Origin Energy Resources Ltd	Western Geophysical	Otway	SAINT GEORGE	3D	PEL 83	(65)	Completed
Origin Energy Resources Ltd	Trace Terracorp	Otway	SUMMER HILL	2D	PEL 57	45	Completed

APPENDIX B (cont'd)

Operator	Contractor	Basin	Survey name	Type	Title	Km shot (sq. km)	Status
Santos Ltd	WesternGeco	Cooper	CALADAN DARALINGIE	3D	PPL 6, PPL 7, PPL 8, PPL48, PPL107, PPL140, PPL143, PPL185	(801)	Completed
Santos Ltd	Geco Prakla	Cooper	COONATIE	3D	PPL131	(38)	Completed
Santos Ltd	Geco Prakla	Cooper	GREATER STRZELECKI	3D	PPL11, PPL12, PPL16, PPL 9, PPL22, PPL24, PPL40, PPL58, PPL71, PPL72, PPL73, PPL74, PPL78, PPL79, PPL85, PPL92, PPL93, PPL113, PPL114, PPL117	(1 034)	Completed
Santos Ltd	Geco Prakla	Cooper	MURTEREE HORST	3D	PPL30, PPL39, PPL36, PPL86, PPL149	(126)	Completed
WESTERN AUSTRALIA							
Origin Energy Developments Pty Ltd	WesternGeco	Perth	HIBBERTIA	3D	L 1 R1	(180)	Continuing
Origin Energy Developments Pty Ltd	WesternGeco	Perth	ULARINO	2D	EP 413 R1	60	Completed

APPENDIX B (cont'd)

SEISMIC SURVEY ACTIVITY 1998–2001 (line kilometres)

	Onshore		Offshore		Onshore Total	Offshore Total	Total
	2D	3D	2D	3D			
1998							
Queensland	1 419	603	-	-	2 022	-	2 022
New South Wales	564	-	-	-	564	-	564
Victoria	238	-	-	-	238	-	238
South Australia	803	1 670	4 812	-	2 473	4 812	7 285
Western Australia	2 513	179	73 358	554 687	2 692	628 045	630 737
Northern Territory	-	-	20 944	399 098	-	420 042	420 042
JPDA	-	-	3 655	47 268	-	50 923	50 923
Total	**5 537**	**2 452**	**102 770**	**1 001 052**	**7 989**	**1 103 822**	**1 111 811**
1999							
Queensland	2 903	1 931	-	-	4 834	-	4 834
New South Wales	476	-	-	-	476	-	476
Victoria	40	-	960	13 733	40	14 693	14 733
Tasmania	-	-		454	-		
South Australia	216	93	3 688	-	309	3 688	3 997
Western Australia	365	5 137	58 976	200 595	5 502	259 571	265 073
Northern Territory	99	-	18 201	-	99	18 201	18 300
JPDA	-	-	1 452	-	-	1 452	1 452
Total	**4 098**	**7 161**	**83 277**	**214 782**	**11 260**	**298 059**	**309 318**
2000							
Queensland	1 759	182	-	-	1 941	-	1 941
Victoria	202	479	-	9 291	681	9 291	9 972
Tasmania	-	-		4 570	-		
South Australia	188	12 822	2 142	-	13 010	2 142	15 152
Western Australia	142	-	21 272	40 369	142	61 641	61 783
Northern Territory	-	-	1 771	16 642	-	18 413	18 413
JPDA	-	-		5 900	-		
Total	**2 291**	**13 483**	**25 185**	**76 772**	**15 774**	**101 957**	**117 731**
2001							
Queensland	171	-	-	-	171	-	171
New South Wales	176	-	-	-	176	-	176
Victoria	131	-	1 409	-	131	1 409	1 540
Tasmania	659	-	3 576	-	659	3 576	4 235
South Australia	100	-	14 058	0	100	14 058	14 157
Western Australia	60	-	38 248	0	60	38 248	38 308
Northern Territory	-	-	5 489	-	-	5 489	5 489
Total	**1 298**	**-**	**62 780**	**0**	**1 298**	**62 780**	**64 078**

Appendix C
2001

Discoveries of petroleum in 2001

APPENDIX C: DISCOVERIES OF PETROLEUM IN 2001

Basin and well name	Operator	State	Producing formation	Discovery	Classification
	Recovery			Remarks	
			OFFSHORE		
BONAPARTE					
AUDACIOUS 1	OMV	NT	Plover Fm	Oil	NFD
	Flowed 1 446.8 kL/d (9 100 bbl/d) oil from 3 m perforated interval during production tests.			Plugged and abandoned as an oil discovery.	
BLACKTIP 1	Woodside	WA	Keeling Fm and Treachery Shale	Gas	NFD
	Flowed 974 099 cu m/d (34.4 million scf/d) gas through a 25.4 mm (1") choke over the interval 2 767 to 2 785 m. Less than 2% carbon dioxide and less than 2 ppm hydrogen sulphide.			Plugged and abandoned as a gas discovery.	
KUDA TASI 1*	Woodside	ZOCA	Elang Fm	Oil	NFD
	Wireline logs indicate a 17.5 m gross oil column between 3 428.5 and 3 446 m.			Plugged and abandoned, dry.	
CARNARVON					
COROWA 1	Santos	WA	Barrow Gp	Oil	NFD
	Flowed 839 kL/d (5 277 bbl/d) oil and 64 565 cu m/d (2.28 million scf/d) gas.			Cased and suspended as a future oil producer.	
ERROL 1*	Apache	WA	Flag Sst	Gas	NFD
	Intersected interpreted 26 m gross gas column.			Plugged and abandoned.	
GIBSON 1*	Apache	WA	Flag Sst	Oil	NFD
	Intersected a 12.6 m gross oil column.			Suspended as a future oil producer.	
GUDRUN 1*	Apache	WA	Flag Sst	Oil	NFD
	Intersected a 5 m oil column at 1 924 m.			Plugged and abandoned as an oil discovery.	
SOUTH PLATO 1*	Apache	WA	Flag Sst	Oil	NFD
	Intersected a 27.4 m oil column.			Suspended as a future oil producer.	
GIPPSLAND					
EAST PILCHARD 1	Esso	Vic	Latrobe Gp	Gas	NFD
	Took 4 sets of gas samples from 2695.5 to 3122 m.			Cased and suspended as a future gas producer.	
OTWAY					
GEOGRAPHE 1*	Woodside	Vic	Flaxmans and Waarre Fms	Gas	NFD
	Intersected a 240 m gross gas column.			Plugged and abandoned, dry.	
THYLACINE 1	Origin	Tas	Waarre Fm	Gas	NFD
	Wireline logs indicate a 281 m gross gas column. Wireline sampling recovered gas.			Cased and suspended as a potential gas producer.	

APPENDIX C (cont'd)

Basin and well name	Operator	State	Producing formation	Discovery	Classification
	Recovery			Remarks	
PERTH					
CLIFF HEAD 1*	Roc Oil	WA	Dongara/Wagina Fm	Oil	NFD
	Intersected an interpreted 5 m gross oil column.			Plugged and abandoned.	
			ONSHORE		
BOWEN/SURAT					
CHURCHIE 1*	Mosaic	Qld	Rewan, Tinowon and Wallabella Fms	Gas	NFD
	Wireline logs indicated 3 potential gas zones through the Rewan Gp (31 m at 1 916.5 to 1 985.7 m), the Tinowon Fm (25.2 m at 2 096.5 to 2 135 m) and the Wallabella Fm (8.6 m at 2 156.3 to 2 168 m).			Cased and suspended pending further evaluation and completion as a Triassic/Permian gas producer.	
COOPER/EROMANGA					
CHALLUM 19	Santos	Qld	Pre-Permian carbonate	Gas	NPD
	Flowed 212 380 cu m/d (7.5 million scf/d) gas through 13 mm (1/2") choke from a pre-Permian carbonate reservoir over the interval 2 339 to 2 367 m.			Cased and suspended as a future Permian gas producer.	
COONABERRY 1	Santos	Qld	Toolachee Fm	Gas	NFD
	Flowed 206 700 cu m/d (7.3 million scf/d) gas through a 13 mm (1/2") choke over the interval 2 722 to 2 730 m.			Cased and suspended as a future gas producer.	
CROWSNEST 1	Santos	SA	Patchawarra Fm	Gas	NFD
	Encountered 57 m (186 ft) of net pay and flowed 0.159 cu m/d (5.6 million scf/d) gas.			Cased and suspended pending completion as a future Permian gas producer.	
KARNAK 1*	Santos	Qld	Nappamerri Fm	Gas	NFD
	Inferred accumulation.			Cased and suspended pending completion as a Permian gas producer.	
MILLUNA NE 1	Santos	SA	Patchawarra Fm	Gas	NFD
	Discovered gas in the Patchawarra Fm.			Cased and suspended as a future Permian gas producer.	
MOOMBA 136	Santos	SA	Hutton Sst	Oil	NPD
	Flowed 611.3 kL/d (3 845 bbl/d) oil through 13 mm (1/2") choke over the interval 1 997 to 2 007 m.			Cased and suspended as a future oil producer.	
MOONA 1*	Santos	SA	Toolachee Fm	Gas	NFD
	Wireline logs indicate a gas discovery.			Cased and suspended as a future Permian gas producer.	
QUASAR 1	Santos	Qld	Patchawarra Fm	Gas	NFD
	Flowed 306 105 cu m/d (10.8 million scf/d) gas and 7.9 kL/d (50 bbl/d) condensate through a 13 mm (1/2") choke over the interval 2 317 to 2 334 m.			Cased and suspended as a future Permian gas producer.	
QUASAR SOUTH 1	Santos	Qld	Patchawarra Fm	Gas	NFD
	Flowed 172 200 cu m/d (6.1 million scf/d) gas over the interval 2 312 to 2 329 m. The indicative net pay for the well is 31 m.			Cased and suspended as a future Permian gas producer.	

APPENDIX C (cont'd)

Basin and well name	Operator	State	Producing formation	Discovery	Classification
	Recovery			Remarks	
QUASAR SOUTHEAST 1	Santos	Qld	Patchawarra Fm	Gas	NFD
	Flowed 109 560 cu m/d (3.9 million scf/d) gas with 3.2 kL/d (20 bbl/d) of 44.6 degree API condensate through a 13 mm (1/2") choke over the interval 2 289 to 2 310 m.			Cased and suspended as a future Permian gas producer.	
RAWORTH 1	Santos	Qld	Patchawarra Fm	Gas	NFD
	Flowed 145 000 cu m/d (5.12 million scf/d) gas through a 13 mm (1/2") choke over the interval 2 046 to 2 065 m.			Cased and suspended as a future Permian gas producer.	
ROTI 2	Santos	Qld	Toolachee Fm	Gas	NPD
	Flowed 189 700 cu m/d (6.7 million scf/d) gas and 76 kL/d (480 bbl/d) condensate through a 13 mm (1/2") choke over the interval 2 231 to 2 246 m.			Cased and suspended as a future gas producer.	
TARRANGO 1*	Santos	SA	Patchawarra Fm	Gas	NFD
	Inferred accumulation.			Cased and suspended as a future Permian gas producer.	
TELLUS 1*	Santos	Qld	Patchawarra Fm	Gas	NFD
	Wireline logs were run. Inferred accumulation.			Cased and suspended as a future gas producer.	
WELLINGTON 1	Santos	Qld	Toolachee Fm	Gas	NFD
	Flowed 257 700 cu m/d (9.1 million scf/d) gas through a 12.5 mm (1/2") choke.			Cased and suspended as a future Permian Toolachee gas producer.	
GIPPSLAND					
GANGELL 1	Lakes	Vic	Strzelecki Gp	Gas	NFD
	Flowed 24 000 cu m/d (847 552 scf/d) gas.			Suspended for possible future re-entry.	
OTWAY					
BALNAVES 1	Origin	SA	Pretty Hill Sst	Gas	NFD
	Flowed 39 360 cu m/d (1.39 million scf/d) gas and 78.4 kL/d (493 bbl/d) water.			Plugged and abandoned.	
CROFT 1*	Santos	Vic	Waarre Sst	Gas	NFD
	Intersected a 60 m gross gas column over the interval 2 025 to 2 529 m.			Cased and suspended as a future gas producer.	
LAVERS 1*	Santos	Vic	Waarre Sst	Gas	NFD
	Wireline logs indicate an 11 m gross (10 m net) gas column between 1 542 to 1 553 m.			Cased and suspended as a future gas producer.	
MCINTEE 1*	Santos	Vic	Waarre Sst	Gas	NFD
	Intersected a 16.5 m net gas column.			Cased and suspended as a future gas producer.	
NAYLOR 1*	Santos	Vic	Waarre Sst	Gas	NFD
	Intersected a potential 84 m gross gas column over the interval 2 028 to 2 112 m. Wireline logs indicate at least 30 m net of gas pay.			Cased and suspended as a future gas producer.	
TREGONY 1*	Santos	Vic	Waarre Sst	Gas	NFD
	Wireline logs indicate 42 m of net gas pay over the interval 1 652 to 1 708 m.			Cased and suspended as a future gas producer.	

APPENDIX C (cont'd)

Basin and well name	Operator	State	Producing formation	Discovery	Classification
	Recovery			Remarks	
PERTH					
BEHARRA SPRINGS SOUTH 1	Origin	WA	Kockatea Sh	Oil	NFD
	Recovered a total calculated flow of approximately 2 barrels of oil over a two hour period where the cleaner oil sample displayed an API of 53.3 at 66 degrees F.			Plugged and abandoned.	
HOVEA 1	Origin	WA	Dongara Sst	Oil	NFD
	Flowed 151 kL/d (950 bbl/d) of 41.6 degree API oil and 2 832 cu m/d (0.1 million scf/d) gas over the interval 1 995 to 2 002 m.			Cased and suspended as an oil producer.	
SURAT					
SPRING GROVE 2*	Mosaic	Qld	Unknown	Gas	NFD
	Wireline logs indicate a gross hydrocarbon column of 24 m with net pay of 8 to 9 m. Hydrocarbons appear to be gas with the possibility of light oil lower in the section.			Cased and suspended as a future gas producer.	

* Accumulation inferred from logs.

Appendix D
2001

Summary of wells drilled

APPENDIX D : SUMMARY OF WELLS DRILLED

SUMMARY OF ONSHORE AND OFFSHORE WELLS DRILLED IN 2001

Status at 31 December 2001

State or Territory	Spudded		Completed or C&S					Abandoned or Secured					DA
	*	**	Oil	Gas	O&G	Unsp	Serv	Dry	Oil	Gas	O&G	Unsp	
Exploration													
Queensland	1	26	1	17	0	0	0	9	0	0	0	0	2
Victoria	0	15	0	9	0	0	0	5	0	1	0	0	0
Tasmania	0	2	0	1	0	0	0	0	0	1	0	0	0
South Australia	0	20	2	12	0	0	0	6	0	0	0	0	1
Western Australia	0	50	5	2	0	0	0	31	7	4	1	0	2
Northern Territory	2	9	0	0	0	0	0	9	2	0	0	0	1
Joint Petroleum Development Area	0	1	0	0	0	0	0	0	1	0	0	0	0
TOTAL	**3**	**123**	**8**	**41**	**0**	**0**	**0**	**60**	**10**	**6**	**1**	**0**	**6**
Development													
Queensland	2	21	2	19	0	0	0	2	0	0	0	0	0
Victoria	0	9	8	0	0	0	0	1	0	0	0	0	0
South Australia	2	33	3	32	0	0	0	0	0	0	0	0	0
Western Australia	0	21	17	3	0	0	0	0	0	1	0	0	1
TOTAL	**4**	**84**	**30**	**54**	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**1**

*	Other than this period
**	This period
C&S	Cased and Suspended
Serv	Service well, classification applicable only to development wells
Unsp	Unspecified
DA	Drilling ahead
Sus	Suspended temporarily; to resume drilling at a future date

APPENDIX D (cont'd)

SUMMARY OF ONSHORE WELLS DRILLED 2001

Status at 31 December 2001

State or Territory	Spudded		Completed or C&S					Abandoned or Secured					DA
	*	**	Oil	Gas	O&G	Unsp	Serv	Dry	Oil	Gas	O&G	Unsp	
Exploration													
Queensland	1	26	1	17	0	0	0	9	0	0	0	0	2
Victoria	0	10	0	8	0	0	0	2	0	0	0	0	0
South Australia	0	20	2	12	0	0	0	6	0	0	0	0	1
Western Australia	0	10	1	1	0	0	0	7	1	0	0	0	1
TOTAL	**1**	**66**	**4**	**38**	**0**	**0**	**0**	**24**	**1**	**0**	**0**	**0**	**4**
Development													
Queensland	2	21	2	19	0	0	0	2	0	0	0	0	0
South Australia	2	33	3	32	0	0	0	0	0	0	0	0	0
Western Australia	0	8	7	0	0	0	0	0	0	1	0	0	1
TOTAL	**4**	**62**	**12**	**51**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**1**

*	Other than this period
**	This period
C&S	Cased and Suspended
Serv	Service well, classification applicable only to development wells
Unsp	Unspecified
DA	Drilling ahead
Sus	Suspended temporarily; to resume drilling at a future date

APPENDIX D (cont'd)

SUMMARY OF OFFSHORE WELLS DRILLED 2001

Status at 31 December 2001

State or Territory	Spudded		Completed or C&S					Abandoned or Secured					DA
	*	**	Oil	Gas	O&G	Unsp	Serv	Dry	Oil	Gas	O&G	Unsp	
Exploration													
Victoria	0	5	0	1	0	0	0	3	0	1	0	0	0
Tasmania	0	2	0	1	0	0	0	0	0	1	0	0	0
Western Australia	0	40	4	1	0	0	0	24	6	4	1	0	1
Northern Territory	2	9	0	0	0	0	0	9	2	0	0	0	1
Joint Petroleum Development Area	0	1	0	0	0	0	0	0	1	0	0	0	0
TOTAL	**2**	**57**	**4**	**3**	**0**	**0**	**0**	**36**	**9**	**6**	**1**	**0**	**2**
Development													
Victoria	0	9	8	0	0	0	0	1	0	0	0	0	0
Western Australia	0	13	10	3	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**22**	**18**	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

*	Other than this period
**	This period
C&S	Cased and Suspended
Serv	Service well, classification applicable only to development wells
Unsp	Unspecified
DA	Drilling ahead
Sus	Suspended temporarily; to resume drilling at a future date

Appendix E
2001

Petroleum expenditure and activity

APPENDIX E: PETROLEUM EXPENDITURE AND ACTIVITY

PETROLEUM EXPLORATION EXPENDITURE ($A) - OPERATORS, 2000

State	Exploration Drilling	Geological	Seismic Regional	Seismic 2D	Seismic 3D	Other	Total
Onshore							
Queensland	38 924 000	6 919 000	200 000	5 264 000	2 180 000	22 255 000	75 742 000
New South Wales	355 000	393 000	0	0	0	50 000	798 000
Victoria	3 819 000	250 000	0	1 071 000	2 031 000	595 000	7 766 000
Tasmania	0	0	0	0	0	119 000	119 000
South Australia	15 877 000	362 000	0	591 000	4 854 000	9 189 000	30 873 000
Western Australia	11 318 000	7 313 000	255 000	534 000	371 000	2 262 000	22 053 000
Northern Territory	0	121 000	0	0	0	0	121 000
TOTAL	**70 293 000**	**15 358 000**	**455 000**	**7 460 000**	**9 436 000**	**34 470 000**	**137 472 000**
Offshore							
Queensland	0	0	0	0	0	0	0
New South Wales	0	0	0	0	0	0	0
Victoria	977 000	12 732 000	0	0	33 950 000	2 329 000	49 988 000
Tasmania	0	3 392 000	0	209 000	8 542 000	1 813 000	13 956 000
South Australia	0	2 638 000	0	0	0	1 549 000	4 187 000
Western Australia	452 918 000	34 584 000	1 170 000	14 212 500	6 001 000	40 911 000	549 796 500
Northern Territory	85 452 000	8 067 000	0	774 000	1 071 000	5 972 000	101 336 000
JPDA	14 741 000	1 194 000	0	0	0	1 660 000	17 595 000
TOTAL	**554 088 000**	**62 607 000**	**1 170 000**	**15 195 500**	**49 564 000**	**54 234 000**	**736 858 500**
TOTAL EXPLORATION	**624 381 000**	**77 965 000**	**1 625 000**	**22 655 500**	**59 000 000**	**88 704 000**	**874 330 500**

Northern Territory includes Territory of Ashmore and Cartier Islands
JPDA is the Joint Petroleum Development Area (formerly Zone of Cooperation Area A)
Some company expenditure data is estimated

APPENDIX E cont'd

PETROLEUM DEVELOPMENT AND PRODUCTION EXPENDITURE ($A) - OPERATORS, 2000

State	Development Drilling	Production	Other	Total
Onshore				
Queensland	76 820 000	176 653 000	14 129 000	267 602 000
New South Wales	0	0	0	0
Victoria	718 000	2 440 000	0	3 158 000
Tasmania	0	0	0	0
South Australia	68 881 000	304 890 000	0	373 771 000
Western Australia	2 728 000	41 883 000	0	44 611 000
Northern Territory	6 808 000	30 971 000	753 000	38 532 000
TOTAL	**155 955 000**	**556 837 000**	**14 882 000**	**727 674 000**
Offshore				
Queensland	0	0	0	0
New South Wales	0	0	0	0
Victoria	40 000 000	580 000 000	0	620 000 000
Tasmania	0	0	0	0
South Australia	0	0	0	0
Western Australia	75 200 000	297 582 000	20 000 000	392 782 000
Northern Territory	14 341 000	39 740 000	1 899 000	55 980 000
JPDA	4 500 000	10 000 000	2 000 000	16 500 000
TOTAL	**134 041 000**	**927 322 000**	**23 899 000**	**1 085 262 000**
TOTAL DEVELOPMENT AND PRODUCTION	**289 996 000**	**1 484 159 000**	**38 781 000**	**1 812 936 000**

Northern Territory includes Territory of Ashmore and Cartier Islands
JPDA is the Joint Petroleum Development Area (formerly Zone of Cooperation Area A)

APPENDIX E cont'd

PETROLEUM EXPLORATION, DEVELOPMENT AND PRODUCTION EXPENDITURE ($A) - OPERATORS, 2000

	Drilling				Seismic				
State	Exploration	Development	Production	Geological	Regional	2D	3D	Other	Total
Queensland	38 924 000	76 820 000	176 653 000	6 919 000	200 000	5 264 000	2 180 000	36 384 000	343 344 000
New South Wales	355 000	0	0	393 000	0	0	0	50 000	798 000
Victoria	4 796 000	40 718 000	582 440 000	12 982 000	0	1 071 000	35 981 000	2 924 000	680 912 000
Tasmania	0	0	0	3 392 000	0	209 000	8 542 000	1 932 000	14 075 000
South Australia	15 877 000	68 881 000	304 890 000	3 000 000	0	591 000	4 854 000	10 738 000	408 831 000
Western Australia	464 236 000	77 928 000	339 465 000	41 897 000	1 425 000	14 746 500	6 372 000	63 173 000	1 009 242 500
Northern Territory	85 452 000	21 149 000	70 711 000	8 188 000	0	774 000	1 071 000	8 624 000	195 969 000
JPDA	14 741 000	4 500 000	10 000 000	1 194 000	0	0	0	3 660 000	34 095 000
TOTAL	**624 381 000**	**289 996 000**	**1 484 159 000**	**77 965 000**	**1 625 000**	**22 655 500**	**59 000 000**	**127 485 000**	**2 687 266 500**

Northern Territory includes Territory of Ashmore and Cartier Islands
JPDA is the Joint Petroleum Development Area (formerly Zone of Cooperation Area A)

ORIGIN OF PRIVATE ENTERPRISE EXPENDITURE ON EXPLORATION, DEVELOPMENT AND PRODUCTION ($A), 2000

	Onshore operations	Offshore operations	Total
Australian funds	39 272 000	214 733 000	254 005 000
Reinvestment	812 160 000	1 025 570 000	1 837 730 000
North American funds	6 017 000	272 697 500	278 714 500
Other	7 697 000	309 120 000	316 817 000
Total	**865 146 000**	**1 822 120 500**	**2 687 266 500**

APPENDIX E cont'd

SUMMARY OF PRIVATE ENTERPRISE PETROLEUM EXPLORATION AND DEVELOPMENT EXPENDITURE AND ACTIVITY 1979-2001

Year	Exploration Expenditure ($ million)	Development Expenditure (including production) ($ million)	Seismic Surveys (line km)	Seismic Surveys (sq km)	Exploration Wells Drilled	Development Wells Drilled
1979	223	236	41 539		52	57
1980	290	358	55 445		94	33
1981	459	944	74 438		158	55
1982	948	1 263	95 253		221	107
1983	723	1 022	38 761		211	64
1984	740	734	61 941		264	109
1985	774	1 065	90 169		270	94
1986	424	936	47 353		138	37
1987	346	2 068	42 527		225	57
1988	503	1 049	51 492		237	54
1989	521	1 378	70 750		148	76
1990	589	1 467	89 933		177	75
1991	424	776	163 642		154	86
1992	530	947	359 523		120	51
1993	441	1 207	174 469		122	55
1994	650	1 437	161 352		128	44
1995	782	1 464	161 174		148	65
1996	758	2 262	389 163		143	89
1997	772	2 063	529 529		176	155
1998	1 008	1 926	1 062 810		168	95
1999	699	2 245	523 410		95	81
2000	874	1 813	135 828	15 178	97	105
2001	NA	NA	65 024	21 779	144	102

APPENDIX E cont'd

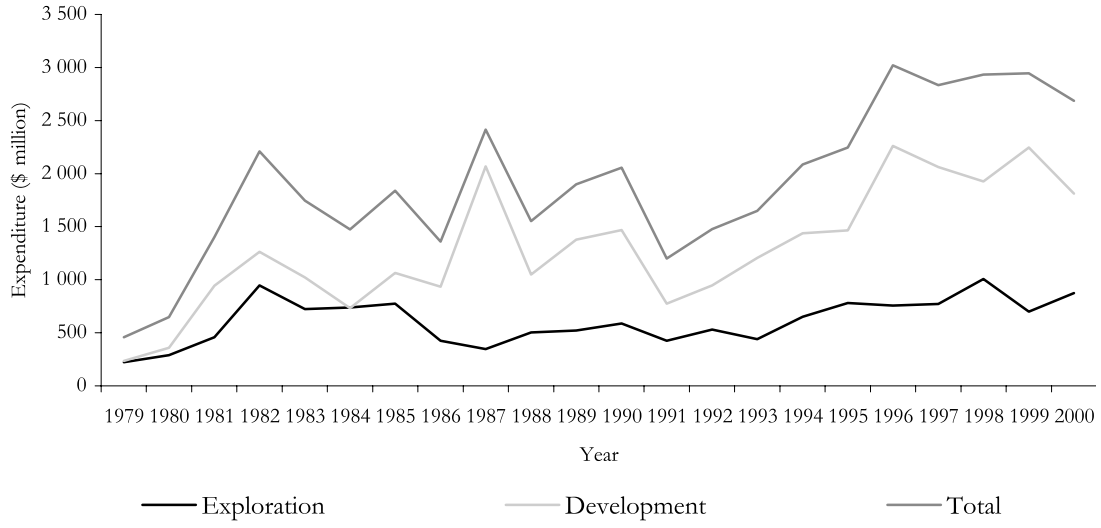

Figure E.1 Total petroleum expenditure by private enterprise, 1979-2000

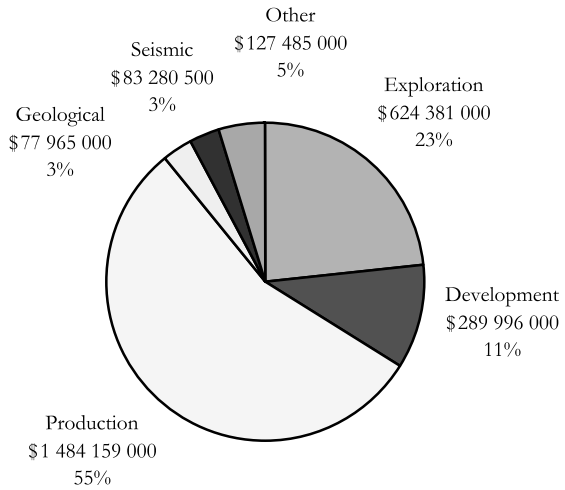

Figure E.2 Total petroleum expenditure by industry in 2000

Appendix F
2001

Wells and metres drilled, 1982–2001

APPENDIX F: WELLS AND METRES DRILLED 1982-2001

WELLS DRILLED

Year	Exploration		Development		Total		Total
	Onshore	Offshore	Onshore	Offshore	Exploration	Development	
1982	177	45	92	13	222	105	327
1983	127	51	49	26	178	75	253
1984	192	42	80	42	234	122	356
1985	227	41	75	20	268	95	363
1986	110	28	17	21	138	38	176
1987	210	15	37	20	225	57	282
1988	201	36	32	15	237	47	284
1989	121	47	32	27	168	59	227
1990	105	71	57	18	176	75	251
1991	111	41	65	18	152	83	235
1992	76	42	39	12	118	51	169
1993	74	49	35	20	123	55	178
1994	83	47	19	24	130	43	173
1995	94	56	30	35	150	65	215
1996	97	48	65	19	145	84	229
1997	120	57	79	76	177	155	332
1998	90	74	48	40	164	88	252
1999	43	51	40	41	94	81	175
2000	37	62	79	24	99	103	202
2001	67	59	66	22	126	88	214

METRES DRILLED

Year	Exploration		Development		Total		Total
	Onshore	Offshore	Onshore	Offshore	Exploration	Development	
1982	334 156	124 654	152 952	29 817	458 810	182 769	641 579
1983	234 463	146 801	95 196	70 262	381 264	165 458	546 722
1984	370 628	111 068	160 800	130 036	481 696	290 836	772 532
1985	405 693	101 783	121 559	63 241	507 476	184 800	692 276
1986	207 056	63 987	31 162	73 809	271 043	104 971	376 014
1987	396 354	34 233	65 491	58 715	430 587	124 206	554 793
1988	376 944	90 518	58 591	40 848	467 462	99 439	566 901
1989	229 739	128 945	58 932	69 894	358 684	128 826	487 510
1990	210 796	162 466	91 060	45 820	373 262	136 880	510 142
1991	212 747	94 942	99 927	51 705	307 689	151 632	459 321
1992	154 847	106 853	72 773	35 011	261 700	107 784	369 483
1993	134 010	114 191	59 309	47 439	248 201	106 747	354 948
1994	187 077	119 464	35 234	65 333	306 540	100 567	407 107
1995	188 537	145 370	46 293	112 099	333 907	158 392	492 299
1996	207 213	135 639	93 673	73 152	342 852	166 825	509 677
1997	243 350	130 718	140 459	211 353	374 068	351 812	725 880
1998	216 174	194 218	99 143	120 478	410 392	219 621	630 012
1999	93 832	112 975	83 468	137 930	206 807	221 398	428 205
2000	76 449	164 610	179 730	57 247	241 059	236 977	478 035
2001	153 226	149 801	151 697	78 458	303 027	230 155	533 181

Appendix G
2001

Offshore and onshore drilling activity by State, 1991–2001

APPENDIX G: OFFSHORE AND ONSHORE DRILLING ACTIVITY BY STATE, 1991-2001

OFFSHORE

New-field wildcat wells drilled

State	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Qld	-	-	-	-	-	-	-	-	-	-	-
Vic	-	3	5	-	6	-	2	2	2	-	4
Tas	-	2	-	-	-	-	-	1	1	-	1
SA	-	-	4	-	1	-	-	2	-	-	-
WA	19	17	19	11	20	26	24	40	35	47	34
NT	13	5	5	5	4	2	3	9	5	7	9
JPDA	-	1	3	10	3	2	4	3	1	1	1
TOTAL	**32**	**28**	**36**	**26**	**34**	**30**	**33**	**57**	**44**	**55**	**49**

Extension/Appraisal wells drilled

State	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Vic	-	4	2	2	3	-	-	-	1	-	1
Tas	-	-	-	-	-	-	-	1	-	-	1
WA	5	10	11	17	9	11	18	12	6	7	6
NT	4	-	-	1	4	1	1	3	-	-	2
JPDA	-	-	-	1	6	6	5	1	-	-	-
TOTAL	**9**	**14**	**13**	**21**	**22**	**18**	**24**	**17**	**7**	**7**	**10**

Development wells drilled

State	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Vic	7	10	11	9	20	12	51	32	26	6	9
WA	7	1	9	12	15	7	22	4	14	14	13
NT	4	1	-	3	-	-	2	4	1	3	-
JPDA	-	-	-	-	-	-	1	-	-	1	-
TOTAL	**18**	**12**	**20**	**24**	**35**	**19**	**76**	**40**	**41**	**24**	**22**

APPENDIX G (cont'd)

ONSHORE

New-field wildcat wells drilled

State	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Qld	41	27	29	27	41	32	41	29	13	12	21
NSW	1	1	2	-	-	1	1	-	1	1	-
Vic	1	2	1	5	3	3	7	2	3	2	8
TAS	-	-	-	-	-	-	5	-	-	-	-
SA	18	16	8	11	14	30	27	34	9	5	11
WA	8	5	6	17	5	6	4	7	2	6	9
NT	1	2	3	-	-	1	-	1	-	-	-
TOTAL	**70**	**53**	**49**	**60**	**63**	**73**	**85**	**73**	**28**	**26**	**49**

Extension/Appraisal wells drilled

State	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Qld	12	11	12	9	19	11	25	8	10	6	6
NSW	-	-	-	-	1	-	-	-	-	-	-
Vic	1	-	-	-	1	-	-	-	-	1	2
SA	25	9	11	10	7	9	8	9	5	4	9
WA	3	2	2	2	3	4	1	-	-	-	1
NT	-	1	-	2	-	-	1	-	-	-	-
TOTAL	**41**	**23**	**25**	**23**	**31**	**24**	**35**	**17**	**15**	**11**	**18**

Development wells drilled

State	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Qld	17	19	12	7	9	28	28	18	18	22	23
Vic	-	-	-	1	-	-	-	-	2	-	-
SA	26	16	6	4	4	12	29	23	10	48	35
WA	22	2	8	5	13	22	19	7	8	6	8
NT	-	2	9	2	4	3	3	-	2	3	-
TOTAL	**65**	**39**	**35**	**19**	**30**	**65**	**79**	**48**	**40**	**79**	**66**

Appendix H
2001

Australia's offshore production facilities

Appendix H: AUSTRALIA'S OFFSHORE PRODUCTION FACILITIES

Basin/Facility	Accumulation(s)	Operator	Platform type	Product	Producing to	Start-up date
BONAPARTE						
Challis Venture	Challis*, Cassini*	Newfield	Floating facility	Oil	Offtake tanker	December-89
Jabiru Venture	Jabiru	Newfield	Floating facility	Oil	Offtake tanker	August-86
Modec Venture 1	Elang*, Kakatua*	BHP	Floating facility	Oil	Offtake tanker	July-98
Northern Endeavour	Corallina*, Laminaria*	Woodside	Floating facility	Oil	Offtake tanker	November-99
Skua Venture (ab. Jan-97)	Skua	BHP	Floating facility	Oil	Offtake tanker	December-91
Buffalo	Buffalo	BHP	Mini platform	Oil	FPSO	December-99
Buffalo FPSO		BHP	Floating facility	Oil	Offtake tanker	December-99
CARNARVON						
Acqua Blu (ab. Jul-92)	Talisman	Marathon	Floating facility	Oil	Offtake tanker	January-89
Griffin Venture	Griffin*, Chinook/Scindian*	BHP	Floating facility	Oil and Gas	Offtake tanker (oil); Onslow plant (gas)	January-94
South Plato	South Plato	Apache	minipod	Oil	Varanus Island	June-02
Stag	Stag	Apache	Conventional steel	Oil	Storage tanker	May-98
North Herald (ab. Nov-97)	North Herald	WMC	Monopod	Oil	South Pepper	December-87
South Pepper (ab. Nov-97)	South Pepper	WMC	Tripod	Oil	Vicksburg jackup rig to Airlie Island	January-88
Chervil	Chervil	Apache	Monopod	Oil	Airlie Island	August-89
Ocean Legend	Legendre	Woodside	Conventional steel	Oil	Karratha Spirit	May-01
Karratha Spirit		Woodside	FSO	Oil	Offtake tanker	May-01
Cossack Pioneer	Wanaea*, Lambert*, Cossack*	Woodside	Floating facility	Oil	Offtake tanker (oil); North Rankin (solution gas)	November-95
Goodwyn A	Rankin*, Goodwyn	Woodside	Conventional steel	Gas	North Rankin	February-95
North Rankin A	North Rankin	Woodside	Conventional steel	Gas	Withnell Bay	July-84
Cowle A	Cowle	Chevron	Monopod	Oil	Thevenard Island	April-91
Roller A	Roller	Chevron	Monopod	Oil	Roller B	March-94
Roller B	Roller	Chevron	Monopod	Oil	Roller C	March-94
Roller C	Roller	Chevron	Monopod	Oil	Skate	March-94
Skate	Skate	Chevron	Monopod	Oil	Thevenard Island	March-94
Saladin A	Saladin	Chevron	Mini-platform	Oil	Thevenard Island	November-89
Saladin B	Saladin	Chevron	Mini-platform	Oil	Thevenard Island	November-89
Yammaderry A	Saladin	Chevron	Monopod	Oil	Saladin C	April-91
Saladin C	Saladin	Chevron	Mini-platform	Oil	Thevenard Island	November-89
Agincourt	Agincourt	Apache	Minipod	Oil and Gas	Varanus Island	August-97
Campbell A	Campbell	Apache	Monopod	Gas	Sinbad A	October-92
Sinbad A	Sinbad	Apache	Monopod	Gas	Varanus Island	October-92
Harriet B	Harriet	Apache	Monopod	Oil	Harriet C	January-86
Harriet C	Harriet	Apache	Monopod	Oil	Harriet A	January-86
Harriet A	Harriet	Apache	Conventional steel	Oil and Gas	Varanus Island	January-86
Simpson A	Simpson	Apache	Minipod	Gas	Varanus Island	December-01
Simpson B	Simpson	Apache	Minipod	Gas	Varanus Island	December-01
Wonnich	Wonnich	Apache	Tripod	Oil and Gas	Varanus Island	July-99

* = Subsea wells

APPENDIX H (cont'd)

Basin/Facility	Accumulation(s)	Operator	Platform type	Product	Producing to	Start-up date
Wandoo A	Wandoo	Mobil	Monopod	Oil	Initially Hakuryu VII jackup rig; now Wandoo B	October-93
Wandoo B	Wandoo	Mobil	Concrete gravity	Oil	Offtake tanker	March-97
GIPPSLAND						
Bream B	Bream	Esso	Concrete gravity	Oil and Gas	Bream	January-97
Bream	Bream	Esso	Conventional steel	Oil and Gas	West Kingfish	March-88
West Kingfish	Kingfish	Esso	Conventional steel	Oil	Kingfish A	December-82
Kingfish A	Kingfish	Esso	Conventional steel	Oil	Kingfish B	April-71
Kingfish B	Kingfish	Esso	Conventional steel	Oil	Halibut	November-71
Cobia	Halibut	Esso	Conventional steel	Oil	Halibut	April-83
Fortescue	Halibut	Esso	Conventional steel	Oil	Halibut	September-83
Mackerel	Mackerel, Blackback*	Esso	Conventional steel	Oil	Halibut	December-77
Whiting	Whiting	Esso	Mini-platform	Oil and Gas	Snapper	October-89
Snapper	Snapper, Moonfish	Esso	Conventional steel	Oil and Gas	Longford (gas); Marlin (oil)	July-81
Flounder	Flounder	Esso	Conventional steel	Oil and Gas	Tuna	December-84
West Tuna	Tuna	Esso	Concrete gravity	Oil and Gas	Tuna	December-96
Tuna	Tuna	Esso	Conventional steel	Oil and Gas	Marlin	May-79
Marlin	Marlin	Esso	Conventional steel	Oil and Gas	Longford (gas); Halibut (oil)	November-69
Halibut	Halibut	Esso	Conventional steel	Oil	Longford	March-70
Perch	Perch	Esso	Monotower	Oil	Dolphin	January-90
Dolphin	Dolphin	Esso	Monotower	Oil	Longford	January-90
Barracouta	Barracouta, Seahorse*, Tarwhine*	Esso	Conventional steel	Oil and Gas	Longford	March-69

* = Subsea wells

Appendix I
2001

Crude oil and gas production by basin, pre-1991 and 1991 to 2000

APPENDIX I: CRUDE OIL AND GAS PRODUCTION BY BASIN, pre–1991 and 1991 to 2000 (GL and BCM)

Basin	pre-1991	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
CRUDE OIL												
Adavale	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Amadeus	0.812	0.082	0.107	0.099	0.140	0.143	0.143	0.141	0.133	0.092	0.079	1.971
Bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bonaparte	10.678	3.495	3.918	2.348	1.835	1.486	1.165	0.988	1.256	3.018	11.028	41.215
Bowen/Surat	4.383	0.095	0.080	0.071	0.019	0.091	0.007	0.102	0.079	0.050	0.020	4.996
Browse	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Canning	0.292	0.018	0.015	0.021	0.041	0.000	0.012	0.005	0.007	0.008	0.004	0.423
Carnarvon	46.490	5.176	4.828	4.001	8.722	8.656	11.246	10.136	11.101	8.229	12.902	131.487
Cooper/Eromanga	19.834	2.596	2.208	1.959	1.622	1.633	1.441	1.300	1.241	1.266	1.025	36.127
Gippsland	422.500	16.800	16.000	16.500	14.800	12.300	10.900	12.600	9.400	11.200	9.300	552.300
Gunnedah	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Otway	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Perth	0.275	0.034	0.030	0.045	0.035	0.025	0.021	0.016	0.010	0.008	0.003	0.502
Total	**505.264**	**28.296**	**27.186**	**25.045**	**27.214**	**24.334**	**24.935**	**25.288**	**23.227**	**23.871**	**34.361**	**769.021**
GAS												
Adavale	0.010	0.000	0.000	0.000	0.000	0.034	0.009	0.096	0.034	0.023	0.023	0.229
Amadeus	1.212	0.328	0.465	0.720	0.431	0.398	0.507	0.639	0.426	0.418	0.391	5.935
Bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bonaparte	0.681	0.222	0.459	0.245	0.191	0.149	0.096	0.067	0.095	0.180	0.115	2.500
Bowen/Surat	8.286	0.959	1.027	1.058	1.091	1.213	1.009	0.768	0.647	0.720	0.564	17.342
Browse	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Canning	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Carnarvon	29.672	9.921	10.797	12.365	15.020	15.919	16.862	18.592	21.185	18.792	19.586	188.711
Cooper/Eromanga	66.142	4.515	4.811	4.935	7.657	4.684	3.322	5.900	8.808	9.231	7.250	127.256
Gippsland	90.000	5.900	6.500	5.900	7.000	6.600	5.800	6.300	7.000	7.300	7.700	156.000
Gunnedah	0.010	-0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Otway	0.036	0.033	0.041	0.069	0.117	0.131	0.138	0.141	0.155	0.238	0.402	1.501
Perth	13.285	0.139	0.245	0.350	0.424	0.314	0.386	0.152	0.487	0.215	0.307	16.304
Total	**209.334**	**22.007**	**24.345**	**25.642**	**31.932**	**29.442**	**28.129**	**32.655**	**38.837**	**37.117**	**36.338**	**515.778**

APPENDIX I (cont'd)

(million barrels and billion cubic feet)

Basin	pre-1991	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
CRUDE OIL												
Adavale	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Amadeus	5.107	0.516	0.673	0.625	0.878	0.899	0.899	0.887	0.837	0.579	0.497	12.397
Bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bonaparte	67.162	21.983	24.643	14.768	11.542	9.347	7.328	6.214	7.900	18.983	69.364	259.234
Bowen/Surat	27.566	0.600	0.503	0.448	0.118	0.572	0.044	0.639	0.497	0.312	0.126	31.425
Browse	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Canning	1.837	0.113	0.094	0.132	0.258	0.000	0.075	0.031	0.044	0.050	0.025	2.661
Carnarvon	292.413	32.555	30.367	25.165	54.860	54.445	70.735	63.753	69.823	51.759	81.151	827.027
Cooper/Eromanga	124.754	16.326	13.890	12.324	10.205	10.271	9.066	8.178	7.806	7.963	6.450	227.232
Gippsland	2 657.440	105.669	100.637	103.782	93.089	77.365	68.559	79.251	59.124	70.446	58.495	3 473.857
Gunnedah	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Otway	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Perth	1.731	0.213	0.189	0.283	0.220	0.157	0.132	0.101	0.063	0.050	0.019	3.157
Total	**3 178.011**	**177.974**	**170.997**	**157.527**	**171.170**	**153.056**	**156.839**	**159.055**	**146.093**	**150.142**	**216.126**	**4 836.990**
GAS												
Adavale	0.353	0.000	0.000	0.000	0.000	1.201	0.318	3.390	1.201	0.812	0.812	8.087
Amadeus	42.793	11.592	16.421	25.424	15.223	14.055	17.905	22.566	15.044	14.762	13.808	209.595
Bass	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bonaparte	24.050	7.840	16.210	8.652	6.745	5.262	3.390	2.366	3.355	6.357	4.061	88.287
Bowen/Surat	292.620	33.867	36.269	37.363	38.533	42.851	35.615	27.122	22.849	25.422	19.918	612.428
Browse	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Canning	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Carnarvon	1 047.867	350.360	381.296	436.670	530.431	562.179	595.482	656.576	748.148	663.639	685.323	6 657.972
Cooper/Eromanga	2 335.804	159.441	169.911	174.295	270.423	165.415	117.316	208.359	311.055	325.993	256.034	4 494.046
Gippsland	3 178.350	208.358	229.548	208.359	247.205	233.079	204.827	222.484	247.205	257.800	271.926	5 509.140
Gunnedah	0.353	-0.353	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Otway	1.271	1.165	1.448	2.437	4.132	4.626	4.873	4.979	5.474	8.405	14.197	53.008
Perth	469.155	4.914	8.652	12.360	14.974	11.089	13.632	5.368	17.198	7.593	10.842	575.776
Total	**7 392.616**	**777.184**	**859.755**	**905.559**	**1 127.666**	**1 039.758**	**993.358**	**1 153.211**	**1 371.529**	**1 310.782**	**1 276.920**	**18 208.338**

Appendix J
2001

Australian petroleum pipelines, 2001

APPENDIX J: AUSTRALIAN PETROLEUM PIPELINES, 2001

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
		QUEENSLAND				
ONSHORE						
1	Moonie to Brisbane	Moonie Pipeline Co Pty Ltd	Oil	306	273	1964
2	Wallumbilla (Roma) to Brisbane	AGL Pipelines Ltd	Gas	397, 37	273, 324	1969
3	Kincora to Wallumbilla	Oil Co of Aust Ltd	Gas	53	219	1977
4	Silver Springs to Wallumbilla	Petroz NL	Gas	102	219	1978
6	Jackson to Moonie	Santos Ltd	Oil	800	324	1983-84
7	MLIA to Wallumbilla	Elgas Ltd	Propane and Butane	14	60	1984
8	Tickalara to Cooroo	Santos Ltd	Oil	115	114	1989
9	Kenmore to Eromanga	Inland Oil Refiners (Qld) Pty Ltd	Oil	18	89	1989
10	Arcturus Separation Plant to PPL30	Oil Co of Aust Ltd	Gas	107	168	1990
11	Central Treatment Plant to PPL30	Oil Co of Aust Ltd	Gas	41	168	1989
12	Epsilon to SA Border	Santos Ltd	Gas	18	273	1992
13	Qld. Gas Centre (Ballera) to Moomba (See PL5 South Australia)	Santos Ltd	Gas and Condensate	90	400	1993
14	Patroclus to Tickalara/Cooroo Line	Santos Ltd	Oil	15	80	1993
15	PPL24 to Barcaldine	Australian Gasfields Ltd	Gas	420	168	1994-97
16	Judga to Munkah	Santos Ltd	Gas	13	219	1993
17	Munkah to QGC	Santos Ltd	Gas	13.5	356	1993
18	Yanda to QGC	Santos Ltd	Gas	8	324	1993
19	Dinmore lateral	Gas Corp of Qld	Gas	1.2	168	1993
20	Namarah to Yarrabend	Oil Co of Aust	Gas	45	168	1994
21	SA border to NSW border	East Australian Pipeline Ltd	Gas	56	864	1974
22	Major to Boxleigh	Angari Pty Ltd	Gas	16	89	1994
23	SA border to NSW border	Gorodok Pty Ltd	Ethane	38	219	1974-76
24	Ballera to Wallumbilla	Tenneco Energy Queensland Pty Ltd	Gas	750	406	1996
30	Gladstone to Rockhampton	Duke Queensland Pipeline Pty Ltd	Gas	100	219	1991
30	Wallumbilla to Gladstone	Duke Queensland Pipeline Pty Ltd	Gas	530	324	1989-90
31	Roti to Judga	Santos Ltd	Gas	-	-	1996
32	Gatton to Gympie	Allgas Pipeline Operations Pty Ltd	Gas	239	150	Under construct.
34	Stokes to SA Border	Santos Ltd	Gas	7	300	1996
35	Challum to Ballera Gas Centre	Santos Ltd	Gas	15	400	1996
36	Karmona to Ballera Gas Centre	Santos Ltd	Gas	15	300	1996
37	Wackett to Ballera Gas Centre	Santos Ltd	Gas	15	200	1996
38	Okotoko to Karmona	Santos Ltd	Gas	10	200	1996
39	Wippo to Okotoko	Santos Ltd	Gas	10	200	1996
40	Yawa to Munkah	Santos Ltd	Gas	5	150	1996
41	Ballera to Mt Isa	Roverton Pty Ltd	Gas	841	324	1997

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
42	PPL41 to Carrington	AGL Pipelines (Qld) Pty Ltd	Gas	100	100, 150	1998
45	Bunya/Vernon/Cocos to Central Treatment Plant	Australian Gasfields Ltd	Gas	130	–	1998
47	Mt Howitt to Wippo	Santos Limited	Gas	75	200	Under Construct.
48	Wolgolla to Epsilon	Santos Limited	Gas	16	250	Under Construct.
49	Mica Creek Meter Station to Power Station	Mount Isa Mines Ltd	Gas	1	508, 114	1998
50	Mica Creek Meter Station	Roverton Pty Ltd	Gas	–	324	1998
51	Mica Creek to Mt Isa	Roverton Pty Ltd	Gas	6.2	168, 89	1998
53	Central Treatment Plant to PPL41	Australian Gasfields Ltd	Gas	42.6	168	Under construction
54	PPL41 to Phosphate Hill	WMC Fertilisers	Gas	4.5	323	Under construction
55	PPL24 to Roma Power Station	Boral Energy Electric Ltd	Gas	14.1	114.3	Operational
58	Downlands to PPL 4	Mosaic Oil NL	Gas	8.5	114.3	Under Construct
62	Karri to Wackett	Santos Ltd	Gas	17.3	150	Under Construct
68	Wackett South manifold to Wackett pipeline riser	Santos Ltd	Gas	7.9	150 to 200	Under Construct
69	Okotoko East No. 1 wellhead to Okotoko pipeline riser	Santos Ltd	Gas	3.3	100 to 150	Under Construct
70	Wippo South No. 1 wellhead to Judga North No. 1 wellhead	Santos Ltd	Gas	6.5	100 to 200	Under Construct
71	Chiron Field manifold to Stokes Field manifold	Santos Ltd	Gas	10.5	150 to 250	Under Construct
		NEW SOUTH WALES				
ONSHORE						
na	Moomba to MW10 (loopline)	East Australian Pipeline Ltd	Gas	10	660	1984
1	Wilton to Horsley Park	The Australian Gas Light Co Ltd	Gas	52	864	1976
2	Wilton to Wollongong	The Australian Gas Light Co Ltd	Gas	32	508	1978
3	Horsley Park to Plumpton	AGL Gas Networks Ltd	Gas	10	168	1976
4, 5, 6	Botany Bay to Rosehill	Shell Oil Australia, SMP Company	Petroleum	28	na	1977
7	Plumpton to Killingworth	The Australian Gas Light Co Ltd	Gas	141	508	1982
8	Killingworth to Walsh Point	Newcastle Gas Co Pty Ltd (AGL)	Gas	32.9	508, 355	1982
15	Moomba to Wilton	East Australian Pipeline Ltd	Ethane	1 375	219	1997
16	Moomba (Qld border) to Wilton (Sydney)	East Australian Pipeline Ltd	Gas	1 142	864	1974-76
17	Young to Lithgow	East Australian Pipeline Ltd	Gas	212	168	1986-87
17	Young to Bathurst Spur	East Australian Pipeline Ltd	Gas	2	114	1986-87
18	Young to Oberon Spur	East Australian Pipeline Ltd	Gas	21	168	1987-88
19	Young to Wagga Wagga	East Australian Pipeline Ltd	Gas	131	324, 89	1980-81
20	Junee to Griffith/Leeton	East Australian Pipeline Ltd	Gas	180	168, 114	1993
21	Dalton to Canberra	East Australian Pipeline Ltd	Gas	52	273	1981
22	Young to Orange Spur	East Australian Pipeline Ltd	Gas	24	114	1986-87

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
23	Culcairn to Wagga Wagga	East Australian Pipeline Ltd	Gas	88	457	1998
24	Vic/NSW border to Culcairn (from Barnawatha)	Transmission Pipelines Australia	Gas	57	457	Under construction
25	Marsden to Dubbo	AGL Pipelines (NSW) Pty Ltd	Gas	255	168, 219	Under construction
26	Vic/NSW to Wilton	Duke Energy	Gas	467	450	Under construction
		VICTORIA				
OFFSHORE						
PL 1	Barracouta A to shore (Vic/PL and Vic/PL(V))	Esso Australia Resources Ltd	Oil and Gas	18.5	450	1967
PL 2	Marlin A to shore (Vic/PL and Vic/PL(V))	Esso Australia Resources Ltd	Gas	46.3	500	1967
PL 4	Barracouta A to shore (Vic/PL and Vic/PL(V))	Esso Australia Resources Ltd	Oil and Gas	18.9	150	1969
PL 5	Halibut to shore (Vic/PL and Vic/PL(V))	Esso Australia Resources Ltd	Oil	71	600	1969
PL 6	Kingfish A to Kingfish B	Esso Australia Resources Ltd	Oil	4.5	400	1969
PL 7	Kingfish B to Halibut A	Esso Australia Resources Ltd	Oil	26.9	500	1969
PL 8	Mackerel A to Halibut A	Esso Australia Resources Ltd	Oil	9.2	300	1975
PL 9	Tuna A to Marlin A	Esso Australia Resources Ltd	Gas	18.7	300	1975
PL10	Tuna A to Marlin A	Esso Australia Resources Ltd	Oil	18.7	200	1975
PL11	Marlin to Halibut to shore pipeline (Vic/PL5)	Esso Australia Resources Ltd	Oil	1.6	300	1975
PL13	Snapper A to shore (Vic/PL and Vic/PL(V))	Esso Australia Resources Ltd	Gas	31	600	1979
PL14	West Kingfish to Kingfish A	Esso Australia Resources Ltd	Oil	3.5	300	1981
PL15	Cobia to Halibut A	Esso Australia Resources Ltd	Oil	5.5	300	1982
PL16	Fortescue to Halibut A	Esso Australia Resources Ltd	Oil	4.1	300	1982
PL17	Flounder to Tuna A	Esso Australia Resources Ltd	Oil and Gas	16.7	250	1983
PL18	Flounder to Tuna A	Esso Australia Resources Ltd	Oil and Gas	16.7	250	1983
PL19	Snapper A to Marlin A	Esso Australia Resources Ltd	Oil	17.8	250	1983
PL20	Bream to West Kingfish	Esso Australia Resources Ltd	Oil	32	400	1987
PL21	Perch to Dolphin to shore (Vic/PL and Vic/PL(V))	Esso Australia Resources Ltd	Oil	26.4	300	1989
PL22	Seahorse to Barracouta A	Esso Australia Resources Ltd	Oil	11.3	150	1989
PL23	Tarwhine to Barracouta A	Esso Australia Resources Ltd	Oil	17.4	200	1989
PL24	Whiting to Snapper A	Esso Australia Resources Ltd	Oil	14.6	250	1989
PL25	Whiting to Snapper A	Esso Australia Resources Ltd	Gas	14.6	200	1989
PL26	Bream B to Bream A	Esso Australia Resources Ltd	Oil and Gas	6.2	250	1996
PL27	West Tuna to Tuna A	Esso Australia Resources Ltd	Oil and Gas	3.5	100	1996
PL28	West Tuna to Tuna A	Esso Australia Resources Ltd	Oil and Gas	3.5	250	1996
PL29	Blackback Termination to Mackerel	Esso Australia Resources Ltd	Oil and Gas	22.7	200	1999
SL 1	Cobia Sub-sea to Mackerel A	Esso Australia Resources Ltd	Oil	-	-	Revoked Sep 1984
SL 2	Marlin A to Halibut A to Mackerel A	Esso Australia Resources Ltd	Fuel gas	31.5	100	1979

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
SL 5	Perch to Dolphin to shore	Esso Australia Resources Ltd	Fuel gas	27.1	100	1989
SL 3	Cobia to Halibut A	Esso Australia Resources Ltd	Fuel gas	5.6	100	1982
SL 4	Fortescue to Halibut A	Esso Australia Resources Ltd	Fuel gas	4.1	100	1982
SL 5 & SL 5(v)	Perch to Dolphin to shore	Esso Australia Resources Ltd	Gas	32.6	100	1989
SL 6	Seahorse to Barracouta A	Esso Australia Resources Ltd	Gas	11.3	65	1989
SL 7	Tarwhine to Barracouta A	Esso Australia Resources Ltd	Gas	17.4	65	1989
SL 8	Blackback Termination to Mackerel	Esso Australia Resources Ltd	Fuel gas	22.7	65	1999
SL 9	Marlin to West Kingfish	Esso Australia Resources Ltd	Fuel gas	53	150	1999
ONSHORE						
1	Beach to Longford (Barracouta)	Esso Australia Resources Ltd	Liquids or Gas	24.7	450	1969
2	Beach to Longford (Marlin)	Esso Australia Resources Ltd	Liquids or Gas	55.1	500	1969-70
5	Shell Newport to South Dynon Railway Yards	The Shell Company of Australia Limited	Liquids	7.4	100	1968
7, 8	Shell Geelong to Shell Newport	The Shell Company of Australia Limited	Liquids	56.4	200	1968
11	Crib Point to Dandenong (see PL172)	Stratus Pty Ltd	Gas	39.1	300	1969
13	Dandenong to Highett	Multinet Pty Ltd	Gas	17.8	300	1969
14	Highett to Spencer St Bridge	Multinet Pty Ltd	Gas	19.7	300	1969
15	Altona to West Melbourne	Westar Pty Ltd	Gas	13.9	300	1969
16	Altona to Derrimut	Westar Pty Ltd	Gas	6.4	100	1969
17	Derrimut to West Melbourne	Westar Pty Ltd	Gas	15.7	150	1969
18	Footscray to Sunshine	Westar Pty Ltd	Gas	12.4	200, 300, 400	1968
19	West Footscray to Williamstown	Westar Pty Ltd	Gas	8.9	400, 300, 200	1968
23, 25, 26	Spotswood to Newport	Caltex Oil (Australia) Pty Ltd	Liquids	0.45	300, 150	1969
27	Gippsland Gas Processing Plant to Cranbourne/ Hastings	Esso Australia Resources Ltd	Liquids	173.1	250	1968
27, 34	Longford to Cranbourne/ Hastings/Long Island Point	Esso Australia Resources Ltd	LPG	185.5	250	1968
28	Ringwood to Vermont	Multinet Pty Ltd	Gas	3.5	200	1968
33	Dandenong to Edithvale	Multinet Pty Ltd	Gas	11.6	150	1969
35	Dutson to Hastings	Esso Australia Resources Ltd	Liquids	185.2	700	1969
36	Dandenong to West Melbourne	Transmission Pipelines Australia Pty Ltd	Gas	35.6	200, 750	1969
37, 38	Altona, Yarraville, Spotswood	Mobil Refining (Aust) Pty Ltd	Liquids	8.1	150	1969
39	Beach to Longford (Halibut)	Esso Australia Resources Ltd	Oil	55.2	650	1969
40	Dandenong to Templestowe	Multinet Pty Ltd	Gas	37	450	1969
42	Beach to Longford (Barracouta)	Esso Australia Resources Ltd	Liquids or Gas	32	150	1969
43	Longford to Sale	Vic Gas Distribution Pty Ltd	Gas	15	100	1969
43,44	Longford/Sale/Maffra	Stratus Pty Ltd	Gas	31.5	100	1969
44	Sale to Maffra	Vic Gas Distribution Pty Ltd	Gas	16.5	100	1969
46	Long Island Point to Crib Point	Esso Australia Resources Ltd	Liquids	10.8	1050	1969

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
47	Dandenong	Multinet Gas Pty Ltd	Gas	3	150, 80	1969
49	Dandenong to Frankston	Stratus Pty Ltd	Gas	29.5	200	1970
50	Dandenong to Morwell with branch lines	Transmission Pipelines Australia Pty Ltd	Gas	128.8	450, 100, 75	1970
51	Ringwood to Lilydale	Multinet Pty Ltd	Gas	16.5	250	1970
53	Hastings to Altona	Esso Australia Resources Ltd	Ethane	78.3	250	1970
55	Altona to Spotswood	Mobil Refining (Aust) Pty Ltd	Liquids	6.9	250, 150	1970
56	Dandenong to West Melbourne with branch lines	Multinet Pty Ltd	Gas	44.5	450, 300, 200, 150	1970
57	Corio/Belmont/Point Henry	Westar Pty Ltd	Gas	24.8	350, 250, 200	1970
58, 59, 60	Yarraville to Spotswood	BP Australia Ltd	Liquids	1.58	300, 200	1970
61,62	Hastings/Tyabb/Mornington	Stratus Pty Ltd	Gas	17.7	250, 150, 100	1970-71
61	Hastings to Tyabb	Vic Gas Distribution Pty Ltd	Gas	3.44	250, 150, 100	1970
62	Tyabb to Mornington	Vic Gas Distribution Pty Ltd	Gas	12.66	150	1971
63	Golden Beach to Longford (Loopline)	Esso Australia Resources Ltd	Liquids or Gas	28.5	750	1971
64	Fawkner to Craigieburn	Westar Pty Ltd	Gas	10.8	250	1971
65	Tyabb/Altona/Corio	WAG Pipeline Pty Ltd	Liquids	135.9	600, 450	1971
66	North Melbourne to Fairfield	Stratus Pty Ltd	Gas	11.3	250	1971
67	Tyers to Maryvale	Transmission Pipelines Australia Pty Ltd	Gas	5.6	150	1971
68	Pakenham	GPU Gas Net Pty Ltd	Gas	1.2	80	1971
69 - 74	Altona	Mobil Refining (Aust) Pty Ltd	Liquids	11.24	150, 200, 250, 300, 450	1972
75	Longford to Dandenong	Transmission Pipelines Australia Pty Ltd	Gas	173.8	750	1971
76	Maidstone to Braybrook	TXU Networks (Gas) Pty Ltd	Gas	4.1	300	1971
77	Croydon to Mooroolbark	Multinet Gas Pty Ltd	Gas	3.4	250	1972
78	Brooklyn/Ballarat/Bendigo	Transmission Pipelines Australia Pty Ltd	Gas	196.3	200, 150	1972
80	North Geelong to Fyansford	TXU Networks (Gas) Pty Ltd	Gas	4.93	350	1972
81	Brooklyn to Corio	Transmission Pipelines Australia Pty Ltd	Gas	52.5	350, 400	1973
82	Sunshine to Sunshine North	TXU Networks (Gas) Pty Ltd	Gas	1.2	300	1972
84	Yarraville	TXU Networks (Gas) Pty Ltd	Gas	2.78	100, 150, 200	1973
85	Bangholme	Vic Gas Distribution Pty Ltd	Gas	2.1	150	1973
90	Exford to Melton	TXU Networks (Gas) Pty Ltd	Gas	8	150	1974
91	Lardner to Warragul	GPU Gas Net Pty Ltd	Gas	4.8	100	1974
92 - 95	Yarraville to Spotswood	Mobil Oil Australia Ltd	Liquids	1.5	250, 150	1974
96	Longford	Esso Australia Resources Ltd	Gas	1.4	600	1975
97	Corio	TXU Networks (Gas) Pty Ltd	Gas	0.57	200	1975
98	Lake Reeve	Esso Australia Resources Ltd	Gas	1.4	600	1975
99	Fyansford to Waurn Ponds	Westar Pty Ltd	Gas	12.8	250	1975
100	Mooroolbark to Lilydale	Multinet Pty Ltd	Gas	4.9	250	1975

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
101,	Keon Park/ Wodonga/ Shepparton	Transmission Pipelines Australia Pty Ltd	Gas	318	300, 600	1975
101	Keon Park/Wodonga/ Shepparton	GPU Gas Net Pty Ltd	Gas	318	300, 200, 600	1975
102	Wodonga	Stratus Pty Ltd	Gas	5	200	1975
103	Shepparton to Mooroopna Shepparton	Stratus Pty Ltd	Gas	10.5	200	1975
107	Clyde North	Transmission Pipelines Australia Pty Ltd	Gas	2	100	1975
108	South Melbourne to Brooklyn	Transmission Pipelines Australia Pty Ltd	Gas	12.8	750	1976
112	Altona to West Footscray	Huntsman Chemical Company Australia Ltd	Ethane	6.5	250	1976
113	Brooklyn to Altona	Westar Pty Ltd	Gas	4.9	500, 300	1976
115	John Lysaght, Hastings	Vic Gas Distribution Pty Ltd	Gas	1.58	250	1977
116	Snapper to Valve Site 1	Esso Australia Resources Ltd	Gas	1.3	600	1979
117, 120	Longford to Tyers	Transmission Pipelines Australia Pty Ltd	Gas	65.1	750	1978
117	Rosedale to Tyers	GPU Gas Net Pty Ltd	Gas	34.3	750	1978
118	Altona to Somerton	Mobil Oil Australia Ltd	Liquids	34	350	1978
119	Somerton to Tullamarine	Mobil Oil Australia Ltd	Liquids	11	150	1978
120	Longford to Rosedale	GPU Gas Net Pty Ltd	Gas	30.5	750	1978
121	Tyers to Morwell	Transmission Pipelines Australia Pty Ltd	Gas	15.7	500	1978
122	Derrimut to Sunbury	Transmission Pipelines Australia Pty Ltd	Gas	24	150	1979
124	Newport	GPU Gas Net Pty Ltd	Gas	1	450	1979
125	Guildford to Maryborough	Transmission Pipelines Australia Pty Ltd	Gas	33	150	1980
126	Longford to Westbury	Esso Australia Resources Ltd	Liquids	87	700	1980
128	Mt Franklin to Kyneton	Transmission Pipelines Australia Pty Ltd	Gas	24	300	1980
129	Dandenong to Princes Highway	Transmission Pipelines Australia Pty Ltd	Gas	5	750, 500	1980
130, 138, 144, 151	Altona	Kemcor Olefins Ltd	Gas/ Liquids/ LPG	10.7	300, 250, 200, 150, 80	1990
131	Mt Franklin to Bendigo	Transmission Pipelines Australia Pty Ltd	Gas	53	300	1980
132	Shepparton to Tatura	Transmission Pipelines Australia Pty Ltd	Gas	16	200	1981
133	Longford Plant to Metering Station	Esso Australia Resources Ltd	Gas	1.1	600, 350	1981
134	Ballan to Ballarat	Transmission Pipelines Australia Pty Ltd	Gas	23	300	1981
135	Bunyip to Pakenham	Transmission Pipelines Australia Pty Ltd	Gas	19	750	1981
136	Tatura to Kyabram	Transmission Pipelines Australia Pty Ltd	Gas	22	200	1982
137	Bittern to Dromana	Stratus Pty Ltd	Gas	19	200	1982
139	Langwarrin to Frankston	Stratus Pty Ltd	Gas	8	200	1982

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
141	Pakenham to Woolert	Transmission Pipelines Australia Pty Ltd	Gas	91	750	1982
142	Knox to Shire of Sherbrooke	Multinet Pty Ltd	Gas	6	150	1983
143	Wandong to Kyneton	Transmission Pipelines Australia Pty Ltd	Gas	59	300	1984
145	Paaratte to Allansford	Transmission Pipelines Australia Pty Ltd	Gas	34	150	1985-86
149	Seaspray to Longford (Perch/Dolphin)	Esso Australia Resources Ltd	Oil and Gas	19.4	300	1989
150	Longford to Seaspray (Perch/Dolphin)	Esso Australia Resources Ltd	Oil and Gas	17.8	100	1989
152	Kyabram to Echuca	Transmission Pipelines Australia Pty Ltd	Gas	30.5	150	1990
153	Crib Pt to Hastings	Van Ommeren Tank Terminals Aust Pty Ltd	Liquids	9.4	300	1992
155	Allansford to Portland	Transmission Pipelines Australia Pty Ltd	Gas	115	150	1992
162	Laverton North to BHP	GPU Gas Net Pty Ltd	Gas	1.6	150	1993
164	Port Melbourne to Boundary Road	GPU Gas Net Pty Ltd	Gas	0.4	150	1993
167	Dromana to Rye	Transmission Pipelines Australia Pty Ltd	Gas	17.3	200	1993
168	Curdievale to Cobden	Transmission Pipelines Australia Pty Ltd	Gas	27.7	150	1993
171	Codrington to Hamilton	Transmission Pipelines Australia Pty Ltd	Gas	54.5	150	1994
172	Crib Pt to Long Island Pt to Dandenong (previously licensed under PL11 & 12)	Elgas Reticulation Pty Ltd	LPG	43	100	1969
175	Longford to Vic/NSW border	Duke Energy	Gas	277	450	Under construction
176	Chiltern to Rutherglen	Transmission Pipelines Australia Pty Ltd	Gas	14.3	200	1998
177	Drouin to Bunyip	Transmission Pipelines Australia Pty Ltd	Gas	13.6	750	1998
178	Barnawatha to Murray River	Transmission Pipelines Australia Pty Ltd	Gas	5.5	450	1998
179	Carisbrook to Horsham	Coastal Gas Pipelines Victoria Pty Ltd	Gas	182	200, 100	1998
182	Rutherglen to Koonoomoo	Transmission Pipelines Australia Pty Ltd	Gas	104.3	200	1998
183	Colac to Lara	Transmission Pipelines Australia Pty Ltd	Gas	94.8	500	–
184	Ararat, Stawell, Horsham City Gates	TXU Networks (Gas) Pty Ltd	Gas	1	80	1997
186	Rutherglen City Gate	Stratus Pty Ltd	Gas	1	100	1998
187	Yarrawonga, Cobram and Koonoomoo City Gates	Stratus Pty Ltd	Gas	1	100	1998
188	Ballarat City Gate to Dana St	Westar Pty Ltd	Gas	7.1	200	1998
189	Bendigo City Gate to Able St	Westar Pty Ltd	Gas	9.2	200	1998

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
190	Derrimut, Bacchus Marsh, Ballan, Wallace, Daylesford, Rockbank and Castlemaine City Gates	TXU Networks (Gas) Pty Ltd	Gas	1	100, 80, 50	1998
191	Sydenham, Diggers Rest and Sunbury City Gates	TXU Networks (Gas) Pty Ltd	Gas	1	80, 50	1998
192	Kyneton City Gate	TXU Networks (Gas) Pty Ltd	Gas	1	80	1998
193	Maryborough City Gate	TXU Networks (Gas) Pty Ltd	Gas	1	80	1998
194	Allansford City Gate	TXU Networks (Gas) Pty Ltd	Gas	1	100	1998
195	Koroit City Gate	TXU Networks (Gas) Pty Ltd	Gas	1	50	1998
196	Portland City Gate to Portland Smelter	Westar Pty Ltd	Gas	15.8	200	1998
197	Brooklyn City Gate to Somerville Rd	Westar Pty Ltd	Gas	1.7	400	1998
198	Hoppers Crossing, Werribee, Laverton North, Kerbrook, Lara and Avalon City Gate	TXU Networks (Gas) Pty Ltd	Gas	1	100, 80	1998
199	Cobden City Gate	TXU Networks (Gas) Pty Ltd	Gas	1	80	1998
200	Hamilton City Gate	TXU Networks (Gas) Pty Ltd	Gas	1	80	1998
201	Templestowe to Keon Park East	Stratus Pty Ltd	Gas	16.5	450	1998
202	Keon Park East to Keon Park West	GPU Gas Net Pty Ltd	Gas	0.6	450	1998
203	Keon Park West to North Melbourne	Westar Pty Ltd	Gas	25	450	1998
204	Cecil St to Pickles St	Multinet Pty Ltd	Gas	1.4	200	1998
205	Oakleigh, Clayton, Noble Park, Malvern and St Kilda East City Gates and Yarra Bank Road Spurline	Multinet Gas Pty Ltd	Gas	1	300, 150, 100, 80	1998
206	Pakenham City Gate	Vic Gas Distribution Pty Ltd	Gas	1	80	1998
207	Queens Wharf Road City Gate	Vic Gas Distribution Pty Ltd	Gas	1	150	1998
208	North Melbourne to West Melbourne	Stratus Pty Ltd	Gas	3.5	450	1998
209	Howe Parade and Lorimer St Port Melbourne City Gate	Multinet Gas Pty Ltd	Gas	1	100	1998
210	Gembrook City Gate	Multinet Gas Pty Ltd	Gas	1	80	1998
211	Healesville City Gate	Vic Gas Distribution Pty Ltd	Gas	1	80	1998
212	Warragul City Gate	Vic Gas Distribution Pty Ltd	Gas	1	100	1998
213	Clyde North City Gate	Vic Gas Distribution Pty Ltd	Gas	1	100	1998
214	Firmans Lane City Gate Morwell	Vic Gas Distribution Pty Ltd	Gas	1	80	1998
215	Tramway Rd Morwell	Stratus Pty Ltd	Gas	4.85	80	1998
216	Moe, Churchill, Yarragon, Trafalgar, Drouin South, Darnum, Longwarry, Lyndhurst, Huon Park Road, Cranbourne Road and Cranbourne North City Gates	Vic Gas Distribution Pty Ltd	Gas	1	100, 80, 75, 25	1998
217	Hampton Park, Narre Warren, Berwick, Traralgon and Rosedale City Gates	Vic Gas Distribution Pty Ltd	Gas	1	80	1998
218	Kyabram and Merrigum City Gates	Vic Gas Distribution Pty Ltd	Gas	1	80	1998

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
219	Wodonga City Gate to Murray River	Stratus Pty Ltd	Gas	8.4	300, 200	1998
220	Chiltern, Wallan, Broadford, Puckapunyal, Seymour, Euroa, Benalla, Monsbent, Wangaratta, Wangaratta East and Epping City Gates	Vic Gas Distribution Pty Ltd	Gas	1	100, 80, 60	1998
221	Craigieburn City Gates	TXU Networks (Gas) Pty Ltd	Gas	1	100	1998
222	Tatura City Gate	Vic Gas Distribution Pty Ltd	Gas	1	80	1998
223	Kilmore City Gate	Vic Gas Distribution Pty Ltd	Gas	1	50	1998
224	Echuca and Tongala City Gates	Vic Gas Distribution Pty Ltd	Gas	1	100, 80	1998
226	SA/Vic border to Mildura	Envestra Ltd	Gas	105.2	100	1999
227	Iona to North Paaratte	GPU Gas Net Pty Ltd	Gas	7.8	150	1999
231	Iona to Lara	GPU Gas Net Pty Ltd	Gas	143.9	500	2000
232	Longford to NSW Border and East Coast Power Plant Bairnsdale	Duke Eastern Gas Pipeline Pty Ltd	Gas	280.57	168, 450, 610	2000
234	Traralgon to Loy Yang Power Station	Edison Mission Energy	Gas	13	300	2001
235	Colac City Gate	TXU Networks (Gas) Pty Ltd	Gas	1	80	2001
		SOUTH AUSTRALIA				
ONSHORE						
na	Leleptian to Fly Lake	Epic Energy SA Pty Ltd	Gas	16.5	200	1989
na	Kurunda to Gidgealpa satellite	Epic Energy SA Pty Ltd	Gas	16.5	219	1988
na	Kidman to Dullingari	Epic Energy SA Pty Ltd	Gas	15.5	300	1984
PL1	Nuriootpa lateral	Epic Energy SA Pty Ltd	Gas	1.6	114	1969
PL1	Port Bonython lateral	Epic Energy SA Pty Ltd	Gas	5.5	168	1988-89
PL1	Whyalla lateral	Epic Energy SA Pty Ltd	Gas	87.7	200	1988-89
PL1	Wasleys to Torrens Is loop	Epic Energy SA Pty Ltd	Gas	41.5	508	1969
PL1	Mintaro lateral	Epic Energy SA Pty Ltd	Gas	0.3	220	1969
PL1	Burra lateral	Epic Energy SA Pty Ltd	Gas	15	90	1969
PL1	Peterborough lateral	Epic Energy SA Pty Ltd	Gas	1.9	90	1969
PL1	Dry Creek lateral	Epic Energy SA Pty Ltd	Gas	1.3	324	1969
PL1	Taperoo lateral	Epic Energy SA Pty Ltd	Gas	1.2	324	1969
PL1	Angaston lateral	Epic Energy SA Pty Ltd	Gas	38.7	220	1969
PL1	Moomba to Adelaide	Epic Energy SA Pty Ltd	Gas	781	560	1969
PL1	Port Pirie lateral	Epic Energy SA Pty Ltd	Gas	77.8	170	1969
na	Strzelecki tee to Moomba	Epic Energy SA Pty Ltd	Liquids	48	219	1983
na	Daralingie to Moomba	Epic Energy SA Pty Ltd	Gas	44	500	1984
na	Dullingari to Strzelecki tee	Epic Energy SA Pty Ltd	Liquids	21	168	1982
PL2	Moomba to Point Bonython	Epic Energy SA Pty Ltd	Liquids	659	355	1982
na	Strzelecki to Strzelecki tee	Epic Energy SA Pty Ltd	Liquids	12	168	1983
na	Fly Lake to Tirrawarra	Epic Energy SA Pty Ltd	Gas	15	400	1983
na	Fly Lake to Tirrawarra	Epic Energy SA Pty Ltd	Oil	15	250	1983
na	Moorari to Tirrawarra	Epic Energy SA Pty Ltd	Gas	13.5	200	1983
na	Tirrawarra to Moomba	Epic Energy SA Pty Ltd	Gas	49.2	500	1982

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
na	Tirrawarra to Moomba	Epic Energy SA Pty Ltd	Oil	49.2	250	1982
na	Toolachee to Della	Epic Energy SA Pty Ltd	Gas	37	750	1984
na	Moomba South Central to Moomba	Epic Energy SA Pty Ltd	Gas	11	450	1975
na	Mudrangie to Tirrawarra (abandoned)	Epic Energy SA Pty Ltd	Gas/condensate	20.3	150	1982
na	Big Lake to Moomba	Epic Energy SA Pty Ltd	Gas	10	450	1976
na	Gidgealpa to Moomba	Epic Energy SA Pty Ltd	Gas	25.6	400	1970
na	Kidman to Dullingari	Epic Energy SA Pty Ltd	Gas	15.5	300	1984
na	Big Lake satellite (new to old)	Epic Energy SA Pty Ltd	Gas	10.4	500	1976
na	Dullingari to Della	Epic Energy SA Pty Ltd	Gas	24.8	750	1981
na	Leleptian to Fly Lake	Epic Energy SA Pty Ltd	Gas	16.5	200	1989
na	Della to Moomba	Epic Energy SA Pty Ltd	Gas	42.6	750	1980
na	Epsilon to Moomba	Epic Energy SA Pty Ltd	Gas	90	250	1992
na	Kurunda to Gidgealpa satellite	Epic Energy SA Pty Ltd	Gas	16.5	219	1988
na	Bookabourdie to Tirrawarra	Epic Energy SA Pty Ltd	Gas/condensate	43.8	324	1988
na	Moomba to Moomba SC	Epic Energy SA Pty Ltd	Ethane (reinjection)	9.1, 41.4	273, 323.85	1984, 1988
na	Munkarie 4 to Toolachee	Epic Energy SA Pty Ltd	Gas	3.6, 14.9	300 406	1984
na	Bourke to Dullingari	Epic Energy SA Pty Ltd	Gas	5.7	406	1982
na	Strzelecki to Dullingari / Moomba tie-in	Epic Energy SA Pty Ltd	Oil	12.3	168	1984
na	Dullingari to Della to Moomba	Epic Energy SA Pty Ltd	Oil	48.2, 20.6	168, 219	1984
na	Wancoocha to Moomba	Epic Energy SA Pty Ltd	Oil	58.3	100	1985
na	Gidgealpa to Moomba	Epic Energy SA Pty Ltd	Oil	20.6	150	1985
na	Merrimelia Satellite to Tirrawarra/Moomba tie-in	Epic Energy SA Pty Ltd	Oil	16.5	168	1982
PL3	Katnook to SAFRIES	Epic Energy SA Pty Ltd	Gas	4.5	60	1990
na	Meranji to Merrimelia Satellite	Epic Energy SA Pty Ltd	Oil	16.5	100	1986
PL4	Katnook/Glencoe to Mount Gambier & Snuggery	Epic Energy SA Pty Ltd	Gas	67	168	1991
PL5	Ballera to Moomba (See PL13 Queensland)	Santos Ltd	Gas and Condensate	92	400	1993
PL6	Angaston to Berri lateral Sedan Junction to Murray Bridge	Epic Energy SA Pty Ltd	Gas	231	114	1994
PL7	Moomba to Qld border (Moomba-Sydney Gas Pipeline)	East Aust. Pipeline Gas Ltd	Gas	111 (10km loop incl.)	660, 864	1974
PL8	Moomba- Sydney	ICI Aust Engineering P/L	Ethane	101	219	1996
PL9	SW Queensland-Mettika	Santos Ltd	Gas and Condensate	3.5	324	1996
PL10	Moomba Interconnection	Boral Energy Pipelines Pty Ltd	Gas	0.087	250	1999
PL11	Berri-Mildura	Envestra Ltd	Gas	42.3	114	1999

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
		WESTERN AUSTRALIA				
OFFSHORE						
TPL1	Harriet 'A' to Varanus Island	Apache Northwest Pty Ltd	Oil	6.5	219	1984
WA-1-PL	North Rankin 'A' to Withnell Bay	Woodside Petroleum Development Ltd	Gas	134	1 016	1983
TPL2	Varanus Island Export	Apache Northwest Pty Ltd	Oil	3.5	762	1985
WA-2-PL	Goodwyn to North Rankin 'A'	Woodside Petroleum Development Ltd	Gas and Condensate	25	762	1993
TPL3	South Pepper to Airlie Is; South Pepper to North Herald	WMC Resources Ltd	Oil	1.2	219	1987
TPL3	Varanus Island Export	WMC Resources Ltd	Oil	23.7	168	1987
WA-3-PL	Griffin FPSO to shore	BHP Petroleum (Aust) Pty Ltd	Gas	29.2	219	1993
TPL4	Airlie Island to mooring terminal	WMC Resources Ltd	Oil	1.94	508	1987
WA-4-PL	Wanaea FPSO to North Rankin 'A'	Woodside Petroleum Development Ltd	Gas	32.3	324	1995
TPL5	Harriet 'A' to Varanus Island	Apache Northwest Pty Ltd	Gas	6.3	168	1989
WA-5-PL	East Spar to Varanus Island	Western Mining Corp	Gas	41	356	1996
TPL6	Harriet 'A' to Varanus Island	West Australian Petroleum Pty Ltd	Oil and Gas	2.8	219	1989
TPL6	Harriet 'A' to Varanus Island	West Australian Petroleum Pty Ltd	Oil	6.4	610	1989
TPL6	Harriet 'A' to Varanus Island	West Australian Petroleum Pty Ltd	Gas	1.5	89	1989
TPL6	Saladin to Thevenard Island to mooring terminal	West Australian Petroleum Pty Ltd	Gas	5	114	1989
WA-6-PL	Stag oilfield production facility	Apache Dampier Pty Ltd	Oil	2	219	1997
TPL6	Harriet 'A' to Varanus Island	West Australian Petroleum Pty Ltd	Oil and Gas	7.5	168	1989
TPL7	Chervil to Airlie Island	WMC Resources Ltd	Oil	6.4	210	1989
TPL8	Varanus Island to shore	Apache Northwest Pty Ltd	Gas	70	300	1992
TPL9	Barrow Island to mooring terminal	West Australian Petroleum Pty Ltd	Oil	10.4	508	1967
TPL10	Griffin FPSO to shore	BHP Petroleum (Australia) Pty Ltd	Gas	32.5	219	1994
TPL11	Roller 'A' platform to shore	West Australian Petroleum Pty Ltd	Gas	8.5	168	1993
na	Roller 'A' platform to Thevenard Island	West Australian Petroleum Pty Ltd	Oil/Gas	27	500	1994
TPL 12	East Spar to Varanus Island	WMC Resources Ltd	Gas	21.8	356	1996
TPL13	Varanus Island to mainland	Apache Energy Ltd	Gas	70	406	1998-99
na	Thevenard Island to Roller 'A' platform	West Australian Petroleum Pty Ltd	Gas	27	150	1994
TPL14	Wonnich platform to Varanus Island	Apache Energy Ltd	Gas	31	219	1998-99
ONSHORE						
na	Geraldton lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	68	150	1985
na	Hamersley lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	3.7	200	1985

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
na	Kwinana / Russell Rd	Epic Energy (WA) Transmission Pty Ltd	Gas	7.5	300	1986
na	Withnell Bay to Wagerup	Epic Energy (WA) Transmission Pty Ltd	Gas	1 482	660, 508	1984
na	Wagerup to Bunbury	Epic Energy (WA) Transmission Pty Ltd	Gas	59	250, 200, 150	1984
na	Gascoyne Junction to Carnarvon	Epic Energy (WA) Transmission Pty Ltd	Gas	170	150	1987
na	Worsley lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	33	250	1984
PL1 R1	Dongara to Pinjarra (including Fremantle & Rockingham laterals)	CMS Gas Transmission of Australia Pty Ltd	Gas	445	356, 168, 114	1972
PL2 R1	Dongara to Pinjarra (including Fremantle & Rockingham laterals)	CMS Gas Transmission of Australia Pty Ltd	Gas	2.0	356, 168, 114	1972
PL3 R1	Dongara to Pinjarra (including Fremantle & Rockingham laterals)	CMS Gas Transmission of Australia Pty Ltd	Gas	445	356, 168, 114	1972
PL5 R1	Dongara to Pinjarra (including Fremantle & Rockingham laterals)	CMS Gas Transmission of Australia Pty Ltd	Gas	445	356, 168, 114	1972
PL6 R2	Woodada to Eneabba	Consolidated Gas Pty Ltd	Gas	12	219	1982
PL7	Blina to Great Northern Highway	Capital Energy NL	Oil	29	114	1983
PL8	Karratha to Pt Lambert	Robe River Mining Co Pty Ltd	Gas	57	273	1984
PL9	Dampier (loading)	Woodside Petroleum Development Pty Ltd	Condensate	1	762	1984
PL12	Varanus Island	Apache Northwest Pty Ltd	Oil	0.26	762, 219	1985
PL14	Airlie Island	Novus Airlie Pty Ltd	Oil	0.64	508, 219	1987
PL15	Thevenard Island	WAPET	Oil	2.7	600, 168	1988
PL16	Tubridgi to Compressor Station No 2	Sagasco South East Inc	Gas	87.5	168	1992
PL17	Shore (Varanus Is) to Compressor Station No 1	Apache Northwest Pty Ltd	Gas	30	300	1992
PL18	Beharra Springs to WANG Pipeline	Boral Energy Developments Ltd	Gas	1.6	168	1992
PL19	Tubridgi Gas Plant to Compressor Station No 2	Sagasco South East Inc	Gas	88	273	1993
PL20	Shore to Griffin Gas Plant	BHP Petroleum Pty Ltd	Gas	6	219	1994
PL21	Shore to Tubridgi Gas Plant	West Australian Petroleum Pty Ltd	Gas	8	168	1990
PL22	Karratha to Port Hedland	Epic Energy (Pilbara Pipeline) Pty Ltd	Gas	213	450	1994
PL23	Wang Pipeline to SECWA Pipeline (Dongara area)	CMS Gas Transmission of Australia	Gas	0.5	-	1994
PL24	Yaraloola to Kalgoorlie	Southern Cross Pipelines Aust Pty Ltd	Gas	1 400	400, 350	1996
PL25	Mt Keith lateral	Southern Cross Pipelines (NPL) Aust Pty Ltd	Gas	8.1	219	1996
PL26	Leinster lateral	Southern Cross Pipelines Aust Pty Ltd	Gas	5.2	219	1996

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
PL27	Kambalda Nickel lateral	Southern Cross Pipelines Aust Pty Ltd	Gas	44.3	219	1996
PL28	Parkerston Power Station	Southern Cross Pipelines (NPL) Aust Pty Ltd	Gas	8.2	219	1996
PL29	Lowendal Island	Apache East Spar Pty Ltd	Gas	0.6	356	1996
PL30	Varanus Island	Apache Oil Aust Pty Ltd	Gas	0.6	356	1996
PL31	Port Hedland	Epic Energy Pty Ltd	Gas	5	-	1996
na	Worsley lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	33	273	1984
na	South Caversham lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	0.5	100	1984
na	Withnell Bay to Wagerup	Epic Energy (WA) Transmission Pty Ltd	Gas	1,488	650, 508	na
na	Viveash lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	2.5	150	1985
na	Western Mining lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	7	300, 150	1986
na	Eneabba lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	7	100	1986
PL32	Dongara area	AGL Pipelines (WA) Pty Ltd	Gas	10	-	1996
na	Mungarra lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	2.5	168	na
na	Wagerup to Bunbury	Epic Energy (WA) Transmission Pty Ltd	Gas	42	273, 219	na
na	Pinjar lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	14	355	na
na	East Perth lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	17.5	250	1986
na	Hamersley lateral	Epic Energy (WA) Transmission Pty Ltd	Gas	0.5	219	1985
na	Kwinana / Russell Rd	Epic Energy (WA) Transmission Pty Ltd	Gas	7.5	323	1986
PL33	GGT pipeline's Wiluna Scraper Station to Wiluna Gold Pty Ltd plant site	AGL Pipelines (WA) Pty Ltd	Gas	8	89	1997
na	Gascoyne Junction to Carnarvon	Epic Energy (WA) Transmission Pty Ltd	Gas	171	168	1987
PL34	GGT pipeline's Wiluna Scraper Station to Jundee Gold Mine Plant site	AGL Pipelines (WA) Pty Ltd	Gas	45	114	1997
PL35	GGT Pipeline at Three Rivers to the Plutonic Gold Mine site	AGL Pipelines (WA) Pty Ltd	Gas	19.2	114	1997
PL36	Offtake tee in GGT Pipeline 16km W of Leonora to the Murrin Murrin plant site	Boral Energy Pipelines Pty Ltd	Gas	85	219	1997
PL37	Flange on GGT Pipeline East of Broad Arrow to Cawse Nickel plant site	AGL Pipelines (WA) Pty Ltd	Gas	35	168	1997-98
PL38	Burrup Gas Plant to Inlet station on Karratha to Port Hedland Pipeline	Epic Energy (WA) Transmission Pty Ltd	Gas	24	610	1998
PL39	Offtake tee in DBNGP to Cockburn Cement Plant near Dongara	Boral Energy Pipelines Pty Ltd	Gas	18	114	1998

APPENDIX J (cont'd)

Pipeline licence	Location/Route	Operator	Product	Length (km)	Pipe diameter (mm)	Period constructed
PL40	Dampier to Bunbury (DBNGP)	Epic Energy (WA) Transmission Pty Ltd	Gas	1 789	660	1984
PL41	Thomas Rd valve station to Tiwest Cogeneration Plant	Epic Energy (WA) Transmission Pty Ltd	Gas	580	168	1998
PL42	PL17 end flange to GGT Pipeline	Apache Energy Ltd	Gas	1	-	1998-99
PL43	Geraldton to Windimurra	AGL Pipelines (WA) Pty Ltd	Gas	365	219, 168	Under construction
PL44	Parmelia Pipelines to Canning Vale Gardens Industrial Estate	CMS Gas Transmission of Australia	Gas	1	200	Under construction
PL45	Parmelia Pipeline to Jandakot Wool Scourers in East Rockingham	CMS Gas Transmission of Australia	Gas	400	200	Under construction
PL47	Compressor Station No. 10 (Kwinana) to Rockingham lateral.	Epic Energy (WA) Transmission Pty Ltd	Gas	1	-	1999
PL48	GGT offtake, (approx 16km West of Leonora), to Leonora Power Station.	Statewest Power Pty Ltd	Gas	17	-	1999
PL49	Geraldton to Mt Magnet	Anaconda Nickel Ltd	na	na	na	Imminent either PL49 or PL50
PL50	Geraldton to Mt Magnet	Anaconda Nickel Ltd	na	na	na	Imminent either PL49 or PL50
		NORTHERN TERRITORY				
ONSHORE						
1	Palm Valley to Alice Springs	Holyman Limited/NT Gas Pty Ltd	Gas	145	200	1983
2	Mereenie to Alice Springs	Santos Ltd	Oil	270	200	1985
4	Mereenie to Tylers Pass	NT Gas Pty Ltd	Gas	116	324	1986
4	Tennant Creek lateral	NT Gas Pty Ltd	Gas	23	273	1986
4	Katherine lateral	NT Gas Pty Ltd	Gas	6.8	114	1986
4	Palm Valley to Darwin	NT Gas Pty Ltd	Gas	1512	356	1986
5	Alice Springs	Envestra Ltd	Gas	0.52	50, 40	1988
7	Brewer Estate	Energy Equity Co Ltd	Gas	10	114	1989
8	Cosmo Howley lateral	International Oil Pty Ltd/NT Gas Pty Ltd	Gas	25	90	1988
10	Elliot lateral	NT Gas Pty Ltd	Gas	4	60	1990
17	Daly Waters to McArthur River Mine	PAWA/NT Gas Pty Ltd	Gas	333	168	1995
18	Darwin City Gate to Berrimah	NT Gas Pty Ltd	Gas	19	168	1996
19	Mt Todd Mine lateral	NT Gas Pty Ltd	Gas	10	219	1996

Appendix K
2001

Key to petroleum exploration and development titles, 2001

APPENDIX K: KEY TO PETROLEUM EXPLORATION AND DEVELOPMENT TITLES, 2001

Title	Area and Title holder	Expiry date
QUEENSLAND		
ONSHORE		
EXPLORATION PERMIT		
ATP212P	371 km²	31-Jul-01
	OCA* (20.00)	
	Bridge (7.50)	
	Mosaic (16.00)	
	Santos (7.50)	
	Angari (49.00)	
ATP244P	332 km²	31-Jul-01 (R.P.)
	Anulka* (100.00)	
ATP259P	28 106 km²	31-Dec-02
	Santos* (50.00)	
	Delhi (50.00)	
ATP267P	740 km²	30-Nov-03 (R.P.)
	Transoil* (17.47)	
	Chimelle (40.94)	
	Moonie (33.83)	
	Santos (7.77)	
ATP269P	2 404 km²	31-Dec-03
	OCA* (69.59)	
	Australian Gasfields (19.60)	
	Inland Oil (5.00)	
	Petromin (5.81)	
ATP299P	1 858 km²	31-Dec-00 (R.P.)
	Transoil* (62.00)	
	Moonie (5.00)	
	Santos (22.00)	
	CPC (1.00)	
	OCA (10.00)	
ATP333P	415 km²	31-May-01 (R.P.)
	Tri-Star Energy* (80.00)	
	Victoria International (12.80)	
	Victoria Oil (7.20)	
ATP336P	2 318 km²	30-Sep-03
	Interstate Pipelines (15.00)	
ATP337P	7 744 km²	30-Sep-03
	Santos* (50.00)	
	OCA (50.00)	
ATP364P	8 467 km²	28-Feb-02 (R.P.)
	BHP* (100.00)	
ATP375P	249 km²	30-Sep-02
	OCA* (100.00)	
ATP378P	310 km²	30-Sep-00
	Moonie* (84.38)	
	Vamgas (15.63)	
ATP379P	83 km²	30-Sep-99
	Kingston* (100.00)	
ATP465P	155 km²	31-Aug-00 (R.P.)
	Roma* (80.00)	
	Victoria Petroleum (20.00)	
ATP470P	892 km²	28-Feb-03
	OCA* (100.00)	
ATP471P	1 633 km²	28-Feb-03
	Mosaic* (100.00)	
ATP525P	225 km²	30-Sep-04
	OCA* (100.00)	
ATP526P	3 177 km²	31-Oct-00 (R.P.)
	Tri-Star Pet.* (100.00)	
ATP529P	30 051 km²	30-Nov-00 (R.P.)
	Capricorn* (50.00)	
	Beaconsfield (50.00)	
ATP530P	2 407 km²	31-Dec-00 (R.P.)
	Roma* (100.00)	
ATP538P	2 158 km²	31-Jan-01 (R.P.)
	Dyad* (85.00)	
	Golden Triangle (7.50)	
	Kamon K (7.50)	
ATP539P	6 392 km²	31-Jan-01 (R.P.)
	Tyers Investments* (100.00)	
ATP541P	2 408 km²	31-Jan-01
	Maple* (100.00)	
ATP543P	5 562 km²	31-Jan-01
	Faulconer* (100.00)	
ATP544P	2 833 km²	30-Apr-01 (R.P.)
	API* (100.00)	
ATP545P	4 151 km²	31-Jan-01 (R.P.)
	Roma* (100.00)	
ATP548P	2 906 km²	31-Mar-01
	IOR* (62.00)	
	APS (15.00)	
	Mawson (2.06)	
	Midland (20.94)	
ATP549P	9 464 km²	30-Apr-01 (R.P.)
	Australian Gasfields* (100.00)	
ATP550P	1 245 km²	30-Jun-01 (R.P.)
	Discovery* (100.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
ATP552P	515 km²	30-Jun-01
	Brisbane Pet.* (15.00)	
	Hyland (2.00)	
	Interstate Energy (39.00)	
	Olympus (4.00)	
	Peedamullah (20.00)	
	Tyers Petroleum (20.00)	
ATP553P	1 162 km²	30-Nov-01 (R.P.)
	Santos* (50.00)	
	OCA (50.00)	
ATP554P	498 km²	30-Nov-00 (R.P.)
	Dyad* (100.00)	
ATP556P	3 404 km²	30-Nov-01 (R.P.)
	Maneroo* (100.00)	
ATP560P	2 633 km²	30-Nov-01 (R.P.)
	First Sourcenergy* (42.50)	
	Forcenergy (42.50)	
	Oil Wells of Kentucky (15.00)	
ATP564P	3 778 km²	30-Apr-02
	OCA* (100.00)	
ATP566P	542 km²	31-May-98 (R.P.)
	Maneroo* (100.00)	
ATP567P	17 888 km²	30-Apr-02
	Pagehurst* (100.00)	
ATP573P	1 316 km²	30-Apr-98 (R.P.)
	Tyers Investments* (100.00)	
ATP574P	429 km²	30-Apr-02
	Victoria Petroleum* (100.00)	
ATP578P	5 033 km²	30-Jun-98 (R.P.)
	Shogoil* (100.00)	
ATP582P	28 264 km²	31-Jul-98 (R.P.)
	Cooper-Eromanga* (100.00)	
ATP584P	915 km²	31-Jul-02
	Tri-Star Pet.* (100.00)	
ATP587P	996 km²	31-Jul-98 (R.P.)
	Millennium* (45.00)	
	Cobrex (45.00)	
	Maple (10.00)	
ATP589P	14 945 km²	31-Aug-98 (R.P.)
	Victoria Oil* (60.00)	
	Seqoil (40.00)	
ATP590P	6 272 km²	30-Sep-98 (R.P.)
	Tyers Investments* (100.00)	
ATP592P	3 520 km²	31-Aug-02
	Tri-Star Pet.* (100.00)	
ATP593P	2 232 km²	30-Sep-02 (R.P.)
	Azeeza* (60.00)	
	Seqoil (40.00)	
ATP594P	1 549 km²	30-Sep-98 (R.P.)
	Triple J* (50.00)	
	Icon (50.00)	
ATP595P	2 400 km²	31-Oct-98 (R.P.)
	Tyers Investments* (100.00)	
ATP596P	310 km²	31-Oct-02
	Rincon (100.00)	
ATP598P	1 239 km²	30-Nov-02
	Amity* (100.00)	
ATP602P	1 030 km²	31-Dec-02
	OCA* (100.00)	
ATP603P	310 km²	31-Oct-98 (R.P.)
	Tyers Investments* (100.00)	
ATP606P	3 263 km²	31-Oct-02
	Tri-Star Pet.* (100.00)	
ATP608P	4 551 km²	30-Nov-02
	Victoria Petroleum* (60.00)	
	Seqoil (40.00)	
ATP610P	387 km²	31-Dec-02
	Icon* (100.00)	
ATP613P	1 546 km²	31-Mar-03
	Magellan* (98.00)	
	Qgas (2.00)	
ATP616P	619 km²	07-Jan-00 (R.P.)
	Liberty* (100.00)	
ATP618P	11 693 km²	07-Jan-00 (R.P.)
	Tyers Investments* (100.00)	
ATP619P	2 633 km²	29-Feb-04
	Bonnerwell* (100.00)	
ATP620P	515 km²	28-Feb-04
	Pangaea* (100.00)	
ATP621P	601 km²	29-Feb-04
	Bobwyns* (100.00)	
ATP623P	172 km²	28-Feb-02 (R.P.)
	Tri-Star Pet.* (100.00)	
ATP626P	2 323 km²	31-Aug-99 (R.P.)
	Jakabar* (100.00)	
ATP641P	9 447 km²	31-Mar-02
	BNG* (100.00)	
ATP643P	3 177 km²	31-Oct-03
	BNG* (100.00)	
ATP644P	3 177 km²	31-Oct-03
	BNG* (100.00)	
ATP645P	2 400 km²	31-Dec-03
	BNG* (100.00)	
ATP648P	2 710 km²	31-Oct-04
	Icon* (100.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
ATP649P	619 km²	30-Nov-04
	Icon* (100.00)	
ATP650P	1 471 km²	28-Feb-05
	Mathews, J S* (100.00)	
ATP651P	1 936 km²	31-Oct-04
	Mathews, J S* (100.00)	
ATP654P	929 km²	31-Dec-04
	Victoria Petroleum* (60.00)	
	Seqoil (40.00)	
ATP655P	1 549 km²	31-Oct-03
	Tipperary* (100.00)	
ATP675P	3 562 km²	29-Feb-04
	Tipperary* (100.00)	
ATP676P	5 343 km²	30-Sep-04
	Seqoil* (50.00)	
ATP678P	1 162 km²	28-Feb-05
	Arrow* (100.00)	
ATP679P	852 km²	28-Feb-05
	Arrow* (100.00)	
ATP680P	2 323 km²	30-Nov-04
	Tri-Star Energy* (100.00)	
ATP682P	77 km²	29-Feb-04
	Kingston* (100.00)	
ATP683P	8 307 km²	29-Feb-04
	Arrow* (100.00)	
ATP685P	1 162 km²	30-Apr-04
	Santos* (100.00)	
ATP689P	4 374 km²	30-Nov-04
	Seqoil* (50.00)	
	Falcon (50.00)	
ATP690P	1 084 km²	30-Nov-04
	Tipperary* (100.00)	
ATP691P	2 091 km²	30-Nov-04
	Icon* (100.00)	
ATP692P	1 549 km²	30-Nov-04
	OCA* (50.00)	
	Sunoco (50.00)	
PRODUCTION LICENCE		
PL 1	258 km² Cabawin, Moonie	31-Dec-06
	Santos* (100.00)	
PL 2	258 km² Alton	31-Dec-08
	Santos* (100.00)	
PL 3	257 km² Timbury Hills	28-Feb-11
	Interstate Pipelines (15.00)	
PL 4	257 km² Pine Ridge	28-Feb-11
	Interstate Pipelines (15.00)	
PL 5	257 km² Raslie, Yanalah	28-Feb-11
	Interstate Pipelines (15.00)	
PL 6	257 km² Pringle Downs, Roma	28-Feb-11
	Interstate Pipelines (15.00)	
PL 7	26 km² Blyth Creek, Richmond	28-Feb-11
	Interstate Pipelines (15.00)	
PL 8	257 km² Wallumbilla South	28-Feb-11
	Interstate Pipelines (15.00)	
PL 9	257 km² Anabranch, Maffra	28-Feb-11
	Interstate Pipelines (15.00)	
PL10	26 km² Bony Creek, Tarrawonga	28-Feb-11
	Interstate Pipelines (15.00)	
PL11	257 km² Back Creek, Tarrawonga	28-Feb-11
	Interstate Pipelines (15.00)	
PL12	257 km² Oberina, Trinidad	28-Feb-11
	Interstate Pipelines (15.00)	
PL13	26 km² Pleasant Hills	31-Oct-92 (R.P.)
	Interstate Pipelines (15.00)	
PL14	252 km² Kincora	31-May-07
	OCA* (100.00)	
PL15	259 km² Boxleigh	29-Apr-19
	Mosaic* (66.67)	
	Petroz (33.33)	
PL16	259 km² Silver Springs	29-Apr-19
	Mosaic* (50.00)	
	Petroz (50.00)	
PL17	104 km² Bennett	28-Feb-99 (R.P.)
	Santos* (60.00)	
	Petromin (10.00)	
	Timor Oil (26.70)	
	Golden West (3.30)	
PL18	184 km² Yellowbank Creek	31-Aug-03
	Brisbane Pet.* (50.00)	
	Delbaere (50.00)	
PL21	260 km² Beldene, Royston	18-Apr-04
	OCA* (64.00)	
	Alliance (12.50)	
	Angari (4.50)	
	Oil Investments (19.00)	
PL22	230 km² Waratah	31-May-04
	OCA* (64.00)	
	Angari (4.50)	
	Alliance (12.50)	
	Oil Investments (19.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PL23	234 km² Jackson	31-Aug-04
	Santos* (40.00)	
	Australian Gasfields (2.00)	
	Delhi (32.00)	
	Inland Oil (2.00)	
	Mawson (6.00)	
	OCA (2.50)	
	Vamgas (15.50)	
PL24	200 km² Jackson South	14-Dec-03
	Santos* (40.00)	
	OCA (2.50)	
	Australian Gasfields (2.00)	
	Delhi (32.00)	
	Vamgas (15.50)	
	Mawson (6.00)	
	Inland Oil (2.00)	
PL25	257 km² Naccowlah South	28-Feb-05
	Santos* (40.00)	
	Australian Gasfields (2.00)	
	Delhi (32.00)	
	Inland Oil (2.00)	
	Mawson (6.00)	
	OCA (2.50)	
	Vamgas (15.50)	
PL26	257 km² Chookoo	28-Feb-05
	Santos* (40.00)	
	Delhi (32.00)	
	Vamgas (15.50)	
	OCA (2.50)	
	Inland Oil (2.00)	
	Australian Gasfields (2.00)	
	Mawson (6.00)	
PL27	255 km² Newstead, Yarrabend	31-Aug-05
	OCA* (64.00)	
	Alliance (12.50)	
	Angari (4.50)	
	Oil Investments (19.00)	
PL28	251 km² Avondale	30-Nov-05
	OCA (10.74)	
	Interstate Pipelines (7.50)	
	Oil Investments (35.51)	
PL29	12 km² Tintaburra	19-Dec-05
	Transoil* (62.00)	
	OCA (10.00)	
	Santos (22.00)	
	CPC (1.00)	
	Moonie (5.00)	
PL30	37 km² Riverslea, Yapunyah	08-Jul-06
	Angari* (55.00)	
	Bridge (7.50)	
	Mosaic (10.00)	
	OCA (20.00)	
	Santos (7.50)	
PL31	260 km² Bodalla South	26-May-06
	OCA* (72.75)	
	Beach (22.00)	
	Petromin (5.25)	
PL32	260 km² Kenmore	31-Dec-06
	OCA* (72.75)	
	Beach (22.00)	
	Petromin (5.25)	
PL33	257 km² Koora, Nockatunga, Winna	14-Apr-07
	Chimelle* (40.94)	
	Moonie (33.83)	
	Santos (7.77)	
	Transoil (17.47)	
PL34	238 km² Sigma, Tickalara	10-Jul-07
	Santos* (37.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
	Total (25.00)	
PL35	136 km² Watson, Watson South	10-Jul-07
	Santos* (40.00)	
	Australian Gasfields (2.00)	
	Inland Oil (2.00)	
	Mawson (6.00)	
	OCA (2.50)	
	Vamgas (15.50)	
	Delhi (32.00)	
PL36	61 km² Naccowlah	07-Apr-08
	Santos* (40.00)	
	Vamgas (15.50)	
	OCA (2.50)	
	Mawson (6.00)	
	Inland Oil (2.00)	
	Delhi (32.00)	
	Australian Gasfields (2.00)	
PL37	12 km² Brumby	18-Sep-07
	Santos* (62.50)	
	Delhi (30.00)	
	Vamgas (7.50)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PL38	134 km² Toobunyah	16-Jun-08
	Transoil* (62.00)	
	OCA (10.00)	
	Moonie (5.00)	
	CPC (1.00)	
	Santos (22.00)	
PL39	107 km² Talgeberry	13-Aug-08
	Transoil* (62.00)	
	CPC (1.00)	
	Santos (22.00)	
	OCA (10.00)	
	Moonie (5.00)	
PL40	76 km² Louise	13-Sep-08
	Brisbane Pet.* (50.00)	
	Delbaere (50.00)	
PL41	157 km² Arcturus	25-May-10
	Santos* (50.00)	
	OCA (50.00)	
PL42	150 km² Rolleston	25-May-10
	Santos* (50.00)	
	OCA (50.00)	
PL43	179 km² Yellowbank	25-May-10
	Santos* (50.00)	
	OCA (50.00)	
PL44	201 km² Merivale	25-May-10
	Santos* (50.00)	
	OCA (50.00)	
PL45	108 km² Glentulloch	25-May-10
	Santos* (50.00)	
	OCA (50.00)	
PL46	34 km² Fairymount	23-Feb-10
	Mosaic* (100.00)	
PL47	28 km² Blackstump	22-Aug-10
	OCA* (72.75)	
	Petromin (5.25)	
	Beach (22.00)	
PL48	7 km² Noona Block	31-Jan-11
	Santos* (50.00)	
	Petroz (50.00)	
PL49	22 km² Taylor	31-Jan-11
	Petroz* (40.00)	
	Interstate Energy (10.00)	
	Santos (50.00)	
PL50	49 km² Maxwell, Maxwell South	27-Jun-11
	Transoil* (17.47)	
	Moonie (33.83)	
	Chimelle (40.94)	
	Santos (7.77)	
PL51	55 km² Dilkera, Muthero, Thungo	27-Jun-11
	Transoil* (17.47)	
	Chimelle (40.94)	
	Moonie (33.83)	
	Santos (7.77)	
PL52	70 km² Ipundu, Ipundu North, Tarbut	27-Jun-11
	Transoil* (62.00)	
	OCA (10.00)	
	Moonie (5.00)	
	CPC (1.00)	
	Santos (22.00)	
PL53	46 km² Yambugle	10-Sep-11
	OCA* (100.00)	
PL54	34 km² Moorooloo	27-Mar-12
	Santos* (50.00)	
	OCA (50.00)	
PL55	19 km² Munro	12-Jun-12
	Santos* (52.00)	
	Vamgas (8.00)	
	Delhi (40.00)	
PL56	19 km² Broadway	29-Jan-11
	Angari* (49.00)	
	Bridge (7.50)	
	Mosaic (16.00)	
	OCA (20.00)	
	Santos (7.50)	
PL57	19 km² Endeavour	15-Apr-13
	Transoil* (62.00)	
	Moonie (5.00)	
	Santos (22.00)	
	CPC (1.00)	
	OCA (10.00)	
PL58	62 km² Challum	15-Apr-2034
	Santos* (62.50)	
	Delhi (30.00)	
	Vamgas (7.50)	
PL59	96 km² Challum	15-Apr-2034
	Santos* (50.00)	
	Origin (25.00)	
	Delhi (20.00)	
	Vamgas (5.00)	
PL60	70 km² Munkah	15-Apr-19
	Santos* (50.00)	
	Vamgas (5.00)	
	Delhi (20.00)	
	Origin (25.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PL61	158 km² Ballera, Ballera West, Yanda	15-Apr-19
	Santos* (50.00)	
	Vamgas (5.00)	
	Origin (25.00)	
	Delhi (20.00)	
PL62	65 km² Judga	01-Mar-04
	Santos* (40.00)	
	Mawson (6.00)	
	Australian Gasfields (2.00)	
	Inland Oil (2.00)	
	OCA (2.50)	
	Vamgas (15.50)	
	Delhi (32.00)	
PL63	145 km² Epsilon	24-Jun-17
	Santos* (62.50)	
	Delhi (30.00)	
	Vamgas (7.50)	
PL64	49 km² Cogoon	19-Aug-13
	OCA* (83.00)	
	Alliance (12.50)	
	Angari (4.50)	
PL65	59 km² Gilmore	15-Dec-14
	Australian Gasfields* (100.00)	
PL66	125 km² Roswin	23-Feb-07
	Mosaic* (50.00)	
	Petroz (50.00)	
PL67	113 km² Turkey Creek	23-Jun-11
	OCA* (50.00)	
	Santos (50.00)	
PL68	24 km² Coopers Creek	08-Dec-01 (R.P.)
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL69	303 km²	08-Dec-99
	Interstate Pipelines (7.50)	
	OCA (10.74)	
	Oil Investments (35.51)	
PL70	3 km² Berwick	06-Jul-00 (R.P.)
	OCA* (100.00)	
PL71	134 km² Namarah, Parknook	15-Dec-14
	Angari* (67.50)	
	OCA (22.50)	
	Santos (10.00)	
PL72	18 km² Xyloleum	26-Apr-00 (R.P.)
	Sykes I G* (100.00)	
PL73	3 km² Xylex	26-Apr-00 (R.P.)
	Sykes I G* (100.00)	
PL74	18 km² Major	14-Dec-04
	OCA* (20.00)	
	Santos (7.50)	
	Mosaic (16.00)	
	Bridge (7.50)	
	Angari (49.00)	
PL75	12 km² Orientos	23-Nov-08
	Santos* (62.50)	
	Delhi (30.00)	
	Vamgas (7.50)	
PL76	39 km² Bolan, Corella, Echuburra, Natan	23-Nov-08
	Santos* (40.00)	
	Mawson (6.00)	
	Delhi (32.00)	
	OCA (2.50)	
	Vamgas (15.50)	
	Australian Gasfields (2.00)	
	Inland Oil (2.00)	
PL77	12 km² Jarrar	23-Nov-04
	Santos* (40.00)	
	Vamgas (15.50)	
	OCA (2.50)	
	Inland Oil (2.00)	
	Mawson (6.00)	
	Delhi (32.00)	
	Australian Gasfields (2.00)	
PL78	12 km² Bowen	23-Nov-08
	Santos* (40.00)	
	Vamgas (15.50)	
	Delhi (32.00)	
	Mawson (6.00)	
	OCA (2.50)	
	Australian Gasfields (2.00)	
	Inland Oil (2.00)	
PL79	7 km² Costa	06-Sep-20
	Santos* (40.00)	
	Australian Gasfields (2.00)	
	Delhi (32.00)	
	Inland Oil (2.00)	
	Mawson (6.00)	
	OCA (2.50)	
	Vamgas (15.50)	
PL80	92 km² Durham Downs	06-Sep-2032
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PL81	40 km² Karmona	06-Sep-20
	Santos* (50.00)	
	Delhi (20.00)	
	Origin (25.00)	
	Vamgas (5.00)	
PL82	10 km² Okotoko East	06-Sep-20
	Santos* (40.00)	
	Delhi (32.00)	
	Inland Oil (2.00)	
	Mawson (6.00)	
	OCA (2.50)	
	Vamgas (15.50)	
	Australian Gasfields (2.00)	
PL83	6 km² Okotoko West	06-Sep-20
	Santos* (50.00)	
	Delhi (20.00)	
	Origin (25.00)	
	Vamgas (5.00)	
PL84	48 km² Stokes	06-Sep-20
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL85	17 km² Wackett	06-Sep-2032
	Santos* (50.00)	
	Origin (25.00)	
	Vamgas (5.00)	
	Delhi (20.00)	
PL86	11 km² Wackett	06-Sep-2032
	Santos* (46.88)	
	Delhi (22.50)	
	Vamgas (5.63)	
	Origin (25.00)	
PL87	27 km² Wippo	06-Sep-20
	Santos* (40.00)	
	Australian Gasfields (2.00)	
	Delhi (32.00)	
	Inland Oil (2.00)	
	Mawson (6.00)	
	OCA (2.50)	
	Vamgas (15.50)	
PL88	45 km² Wolgolla	06-Sep-20
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL89	59 km² Blackbutt, Bloodwood	06-Dec-02
	Interstate Pipelines (7.50)	
	OCA (10.74)	
	Oil Investments (35.51)	
PL90	232 km² Fairview	29-Nov-29
	Tri-Star Pet.* (100.00)	
PL91	232 km² Fairview	29-Nov-29
	Tri-Star Pet.* (100.00)	
PL92	232 km² Fairview	29-Nov-29
	Tri-Star Pet.* (100.00)	
PL93	6 km² Stakeyard	06-Dec-02
	Interstate Pipelines (15.00)	
PL94	237 km² Moura	17-Apr-2032
	OCA* (100.00)	
PL95	12 km² Monler	25-Aug-19
	Transoil* (62.00)	
	Santos (22.00)	
	Moonie (5.00)	
	CPC (1.00)	
	OCA (10.00)	
PL97	28 km² Cook	25-Aug-14
	Santos* (50.00)	
	Delhi (20.00)	
	Vamgas (5.00)	
	Origin (25.00)	
PL98	40 km² Inland	23-Oct-21
	IOR* (29.38)	
	Inland Oil (20.00)	
	Moroil (22.40)	
PL99	232 km² Fairview	15-Dec-2033
	Tri-Star Pet.* (100.00)	
PL100	232 km² Fairview	15-Dec-2033
	Tri-Star Pet.* (100.00)	
PL101	240 km² Peat	20-Nov-2031
	OCA* (100.00)	
PL105	13 km² Roti	28-Oct-08
	Santos* (40.00)	
	Inland Oil (2.00)	
	Australian Gasfields (2.00)	
	Delhi (32.00)	
	OCA (2.50)	
	Mawson (6.00)	
	Vamgas (15.50)	
PL106	6 km² Okotoko West	28-Oct-06
	Santos* (50.00)	
	Vamgas (5.00)	
	Origin (25.00)	
	Delhi (20.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PL107	13 km² Okotoko East	28-Oct-08
	Santos* (40.00)	
	Vamgas (15.50)	
	Australian Gasfields (2.00)	
	Inland Oil (2.00)	
	Mawson (6.00)	
	OCA (2.50)	
	Delhi (32.00)	
PL108	6 km² Costa South	28-Oct-28
	Santos* (50.00)	
	Origin (25.00)	
	Vamgas (5.00)	
	Delhi (20.00)	
PL109	10 km² Judga North	29-Oct-13
	Santos* (40.00)	
	Delhi (32.00)	
	Australian Gasfields (2.00)	
	Inland Oil (2.00)	
	OCA (2.50)	
	Vamgas (15.50)	
	Mawson (6.00)	
PL110	18 km² Stokes North	29-Oct-13
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL111	18 km² Yawa	28-Oct-16
	Santos* (50.00)	
	Origin (25.00)	
	Delhi (20.00)	
	Vamgas (5.00)	
PL112	92 km² Barrolka	10-Mar-2047
	Santos* (50.00)	
	Vamgas (5.00)	
	Delhi (20.00)	
	Origin (25.00)	
PL113	73 km² Tartulla	10-Mar-2047
	Santos* (54.00)	
	Origin (10.00)	
	Vamgas (7.20)	
	Delhi (28.80)	
PL114	55 km² Wareena	28-Oct-18
	Santos* (54.00)	
	Delhi (28.80)	
	Origin (10.00)	
	Vamgas (7.20)	
PL115	52 km² Bunya	28-Sep-19
	Australian Gasfields* (100.00)	
PL116	34 km² Cocos	28-Sep-19
	Australian Gasfields* (100.00)	
PL117	49 km² Vernon	28-Sep-19
	Faulconer* (100.00)	
PL119	21 km² Downlands	11-Nov-10
	Santos* (16.67)	
	Interstate Energy (42.22)	
	Mosaic (28.89)	
	Petroz (12.22)	
PL129	45 km² Ashby, Ashby North	15-Dec-2037
	Santos* (62.50)	
	Delhi (30.00)	
	Vamgas (7.50)	
PL130	30 km² Chiron	23-Jun-24
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL131	225 km² Baryulah, Baryulah East, Hera, Juno, Vega	23-Jun-2050
	Santos* (46.88)	
	Origin (25.00)	
	Vamgas (5.63)	
	Delhi (22.50)	
PL132	15 km² Costa Central	23-Jun-21
	Santos* (50.00)	
	Vamgas (5.00)	
	Origin (25.00)	
	Delhi (20.00)	
PL133	12 km² Goora	12-Dec-19
	Santos* (40.00)	
	Delhi (32.00)	
	Vamgas (15.50)	
	OCA (2.50)	
	Mawson (8.00)	
	Inland Oil (2.00)	
PL134	27 km² Kappa	20-Dec-2058
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL135	20 km² Keilor	23-Jun-2053
	Santos* (50.00)	
	Delhi (20.00)	
	Origin (25.00)	
	Vamgas (5.00)	
PL136	53 km² Keilor	23-Jun-2052
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL137	88 km² Macadama	15-Dec-2052
	Santos* (62.50)	
	Delhi (30.00)	
	Vamgas (7.50)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PL138	77 km² Marengo	15-Dec-2030
	Santos* (31.50)	
	Delhi (25.20)	
	Alliance (10.00)	
	Vamgas (6.30)	
	Origin (27.00)	
PL139	25 km² Monte	23-Jun-17
	Santos* (50.00)	
	Delhi (20.00)	
	Vamgas (5.00)	
	Origin (25.00)	
PL140	36 km² Moon	15-Dec-2053
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL141	46 km² Mount Howitt	15-Dec-25
	Santos* (54.00)	
	Delhi (28.80)	
	Origin (10.00)	
	Vamgas (7.20)	
PL142	12 km² Raffle	15-Dec-24
	Santos* (62.50)	
	Delhi (30.00)	
	Vamgas (7.50)	
PL143	27 km² Ruby	15-Dec-18
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL144	33 km² Thoar	15-Dec-2039
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL145	28 km² Toby	15-Dec-2048
	Santos* (54.00)	
	Delhi (28.80)	
	Origin (10.00)	
	Vamgas (7.20)	
PL146	60 km² Wackett	23-Jun-25
	Santos* (46.88)	
	Vamgas (5.63)	
	Delhi (22.50)	
	Origin (25.00)	
PL147	58 km² Wackett	23-Jun-19
	Santos* (50.00)	
	Origin (25.00)	
	Vamgas (5.00)	
	Delhi (20.00)	

Title	Area and Title holder	Expiry date
PL148	37 km² Whanto	15-Dec-29
	Santos* (54.00)	
	Delhi (28.80)	
	Origin (10.00)	
	Vamgas (7.20)	
PL149	12 km² Wippo South	23-Jun-2049
	Santos* (40.00)	
	Australian Gasfields (2.00)	
	Vamgas (15.50)	
	OCA (2.50)	
	Mawson (6.00)	
	Delhi (32.00)	
	Inland Oil (2.00)	
PL150	158 km² Dingera, Psyche, Winninia	23-Jun-2042
	Santos* (62.50)	
	Delhi (30.00)	
	Vamgas (7.50)	
PL153	103 km² Clinton	15-Dec-2046
	Santos* (54.00)	
	Vamgas (7.20)	
	Origin (10.00)	
	Delhi (28.80)	
PL154	17 km² Clinton	15-Dec-2046
	Santos* (31.50)	
	Alliance (10.00)	
	Delhi (25.20)	
	Origin (27.00)	
	Vamgas (6.30)	
PL157	40 km² Ghina	15-Dec-20
	Santos* (54.00)	
	Origin (10.00)	
	Delhi (28.80)	
	Vamgas (7.20)	
PL158	188 km² Marama	15-Dec-20
	Santos* (54.00)	
	Delhi (28.80)	
	Origin (10.00)	
	Vamgas (7.20)	
PL159	27 km² Tallalia	15-Dec-2052
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	
PL168	12 km² Tennaperra	12-Feb-14
	Santos* (62.50)	
	Vamgas (7.50)	
	Delhi (30.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PL169	18 km² Gimboola	12-Apr-17
	Transoil* (62.00)	
	CPC (1.00)	
	Moonie (5.00)	
	OCA (10.00)	
	Santos (22.00)	
PL170	92 km² Kooroopa	12-Apr-17
	Transoil* (62.00)	
	CPC (1.00)	
	Santos (22.00)	
	Moonie (5.00)	
	OCA (10.00)	
PL173	84 km² Yandina	15-Dec-19
	Santos* (50.00)	
	OCA (50.00)	
PL174	43 km² Myall Creek	15-Dec-14
	OCA* (100.00)	
PL175	27 km² Windigo	19-Apr-25
	Santos* (40.00)	
	Vamgas (15.50)	
	OCA (2.50)	
	Mawson (6.00)	
	Inland Oil (2.00)	
	Delhi (32.00)	
	Australian Gasfields (2.00)	
PL176	213 km² Scotia	07-Jun-21
	Moonie* (84.38)	
	Vamgas (15.63)	
NEW SOUTH WALES		
OFFSHORE		
EXPLORATION PERMIT		
PEP 11	8 289 km²	23-Jun-06
	Flare* (100.00)	
ONSHORE		
EXPLORATION PERMIT		
PML1	29 km²	12-May-01
	BHP* (100.00)	
PML2	40 km²	12-May-01
	BHP* (100.00)	
PEL1	7 043 km²	10-Feb-05
	Australian Coalbed Methane* (100.00)	
PEL2	8 100 km²	28-Mar-05
	Sydney Gas* (100.00)	
PEL4	6 955 km²	10-Nov-99 (R.P.)
	Sydney Gas* (n/a)	
	Pacific Power (n/a)	

Title	Area and Title holder	Expiry date
PEL5	2 026 km²	10-Nov-99 (R.P.)
	Pacific Power* (100.00)	
PEL6	5 867 km²	08-Dec-05
	Eastern Energy* (100.00)	
PEL8	9 112 km²	13-Dec-99 (R.P.)
	Maple* (100.00)	
PEL10	436 km²	10-Feb-05
	Australian Coalbed Methane* (100.00)	
PEL12	2 274 km²	26-Sep-01
	Australian Coalbed Methane* (100.00)	
PEL13	2 174 km²	26-Nov-01
	OCA* (n/a)	
	St. Barbara Mines (n/a)	
	Pacific Power (n/a)	
	Claremont (n/a)	
PEL16	826 km²	12-Nov-05
	Metgasco* (100.00)	
PEL238	9 093 km²	02-Aug-07 (R.P.)
	Eastern Energy* (n/a)	
PEL267	6 138 km²	19-Jan-04
	Sydney Gas* (n/a)	
	GIO (n/a)	
PEL283	4 725 km²	09-Apr-99 (R.P.)
	Capital Energy* (n/a)	
	Tyers Investments (n/a)	
PEL285	1 306 km²	15-Apr-05
	Pacific Power* (100.00)	
PEL286	1 749 km²	10-Feb-05
	Australian Coalbed Methane* (100.00)	
PEL419	9 450 km²	19-Dec-03
	Go Resources* (100.00)	
PEL420	8 864 km²	19-Dec-03
	Go Resources* (100.00)	
PEL421	9 180 km²	01-Feb-04
	First Sourcenergy* (100.00)	
PEL422	4 335 km²	01-Feb-04
	First Sourcenergy* (100.00)	
PEL423	5 805 km²	01-Feb-04
	First Sourcenergy* (100.00)	
PEL424	8 302 km²	01-Feb-04
	First Sourcenergy* (100.00)	
PEL425	9 450 km²	26-Feb-04
	Otto* (100.00)	
PEL426	5 998 km²	20-Apr-04
	OCA* (n/a)	
	Claremont (n/a)	
	Pacific Power (n/a)	
	St. Barbara Mines (n/a)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PEL427	8 728 km²	20-May-04
	Strike Oil* (100.00)	
PEL428	10 342 km²	14-Sep-04
	Strike Oil* (100.00)	
PEL429	3 527 km²	25-Oct-05
	Sunoco* (100.00)	
PEL430	150 km²	25-Oct-05
	Sunoco* (100.00)	
PEL431	75 km²	25-Oct-05
	Sunoco* (100.00)	
PEL432	2 120 km²	21-Dec-06
	Arrow* (100.00)	
VICTORIA		
OFFSHORE		
EXPLORATION PERMIT		
VIC/P19 R2	1 012 km² Basker, Bignose, Chimaera, Gummy, Leatherjacket, Manta, Veilfin	11-Aug-98 (R.P.)
	Woodside* (76.47)	
	News Corp (23.53)	
VIC/P34	2 160 km² Angler, Selene	26-Jul-01
	BHP* (100.00)	
VIC/P36	3 105 km²	26-Jul-01
	Amity* (65.00)	
	Pan Pacific (15.00)	
	Latrobe (20.00)	
VIC/P38	742 km²	30-Jul-03
	Amity* (80.00)	
	Latrobe (20.00)	
VIC/P40	1 147 km²	13-May-04
	Amity* (10.00)	
	Latrobe (10.00)	
	Pan Pacific (10.00)	
	Tri-C (70.00)	
VIC/P41	2 160 km²	13-Feb-05
	Eagle Bay* (100.00)	
VIC/P42	1 890 km² Omeo	13-May-04
	Bass Strait* (100.00)	
VIC/P43	3 645 km²	10-Aug-05
	Origin* (25.00)	
	Woodside (50.00)	
	CalEnergy Gas (25.00)	
VIC/P44	3 037 km²	10-Aug-05
	Strike Oil* (100.00)	
VIC/P45	877 km²	15-May-06
	BHP* (100.00)	

Title	Area and Title holder	Expiry date
PRODUCTION LICENCE		
VIC/L 1	260 km² Barracouta, Tarwhine, Whiptail	24-Aug-09
	Esso* (50.00)	
	BHP (50.00)	
VIC/L 2	325 km² Barracouta, Whiting, Wirrah	24-Aug-09
	Esso* (50.00)	
	BHP (50.00)	
VIC/L 3	325 km² Marlin	24-Aug-09
	Esso* (50.00)	
	BHP (50.00)	
VIC/L 4	260 km² Angelfish, Batfish, Marlin	24-Aug-09
	Esso* (50.00)	
	BHP (50.00)	
VIC/L 5	325 km² Halibut, Mackerel, Trumpeter, Yellowtail	19-Sep-10
	Esso* (50.00)	
	BHP (50.00)	
VIC/L 6	260 km² Gudgeon, Halibut	19-Sep-10
	Esso* (50.00)	
	BHP (50.00)	
VIC/L 7	325 km² Kingfish	19-Sep-10
	Esso* (50.00)	
	BHP (50.00)	
VIC/L 8	260 km² Kingfish	19-Sep-10
	Esso* (50.00)	
	BHP (50.00)	
VIC/L 9 R1	260 km² Tuna	12-Jul-16
	Esso* (50.00)	
	BHP (50.00)	
VIC/L10	260 km² Emperor, Moonfish, Snapper, Sweetlips	28-May-18
	Esso* (50.00)	
	BHP (50.00)	
VIC/L11	130 km² Flounder, Grunter, Stonefish	28-May-18
	Esso* (50.00)	
	BHP (50.00)	
VIC/L13	202 km² Bream, Luderick	15-Dec-06
	Esso* (50.00)	
	BHP (50.00)	
VIC/L14	202 km² Bream	15-Dec-06
	Esso* (50.00)	
	BHP (50.00)	
VIC/L15	130 km² Dolphin	13-Jun-10
	Esso* (50.00)	
	BHP (50.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
VIC/L16	130 km² Torsk	13-Jun-10
	Esso* (50.00)	
	BHP (50.00)	
VIC/L17	65 km² Perch	13-Jun-10
	Esso* (50.00)	
	BHP (50.00)	
VIC/L18	130 km² Seahorse	13-Jun-10
	Esso* (50.00)	
	BHP (50.00)	
VIC/L19	65 km² Halibut	12-Jul-16
	Esso* (50.00)	
	BHP (50.00)	
VIC/L20	195 km² Blackback, Volador	01-Jan-19
	Esso* (50.00)	
	BHP (50.00)	
RETENTION LEASE		
VIC/RL1	67 km² Mulloway	13-Apr-05
	Esso* (50.00)	
	BHP (50.00)	
VIC/RL2	67 km² Kipper	14-Dec-03
	Esso* (25.00)	
	Woodside (30.00)	
	Crusader (12.95)	
	BHP (25.00)	
	Santos (7.05)	
VIC/RL3	202 km² Sole	13-Apr-05
	Shell* (45.00)	
	Mobil (30.00)	
	Santos (25.00)	
VIC/RL4	67 km² Remora, Sunfish	27-Feb-06
	Esso* (50.00)	
	BHP (50.00)	
VIC/RL5	135 km² Baleen, Patricia, Sperm Whale	13-Nov-01
	Basin* (100.00)	
VIC/RL6	67 km² Basker, Manta	29-Oct-05
	Woodside* (76.47)	
	News Corp (23.53)	
VIC/RL7	202 km² La Bella	27-Feb-03
	BHP* (90.00)	
	Santos (10.00)	
VIC/RL8	67 km² Minerva	29-Nov-02
	BHP* (90.00)	
	Santos (10.00)	
VIC/RL1(V)	90 km² Golden Beach	24-Jul-02
	Bridge* (66.67)	
	Basin (33.33)	

Title	Area and Title holder	Expiry date
ONSHORE		
EXPLORATION PERMIT		
PEP131	2 950 km²	21-May-00 (R.P.)
	Bass* (100.00)	
PEP152	755 km²	03-Feb-05
	Origin* (50.51)	
	Essential (33.90)	
	Lakes (15.59)	
PEP153	1 062 km²	28-Feb-05
	Santos* (100.00)	
PEP154	828 km²	30-Mar-05
	Santos* (90.00)	
	Beach (10.00)	
PEP155	1 578 km²	28-Aug-05
	Petrotech* (100.00)	
PEP156	3 207 km²	16-Jun-05
	Petrotech* (100.00)	
PEP157	1 889 km²	16-Jun-05
	Petrotech* (100.00)	
PEP158	799 km²	16-Mar-05
	Petrotech* (100.00)	
PEP159	2 280 km²	16-Jun-05
	Origin* (60.00)	
	Essential (40.00)	
PEP160	3 660 km²	13-Nov-05
	TMOC* (60.00)	
	Origin (40.00)	
PEP161	2 923 km²	18-Feb-05
	Knight* (100.00)	
PRODUCTION LICENCE		
PPL1	76 km² Dunbar, Grumby, Langley, North Paaratte, Port Campbell 1, Port Campbell 3, Port Campbell 4, Skull Creek, Vaughan, Wallaby Creek	01-Mar-00
	Origin* (100.00)	
PPL2	8 km² Iona	31-Dec-05
	Western Underground* (100.00)	
PPL3	2 km² Boggy Creek	09-May-08
	Boggy Creek* (100.00)	
PPL4	6 km² Fenton Creek, Tregony	06-Apr-14
	Santos* (100.00)	
PPL5	6 km² Penryn	
	Santos* (100.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
TASMANIA		
OFFSHORE		
EXPLORATION PERMIT		
T/18P R3	1 080 km²	22-Sep-04
	Origin* (41.40)	
	AWE (35.10)	
	CalEnergy Gas (23.50)	
T/25P	1 485 km² Pelican (Esso), Poonboon	09-Oct-03
	Origin* (44.00)	
	CalEnergy Gas (20.00)	
	Premier (36.00)	
T/30P	6 817 km²	09-Jul-03
	Benaris* (20.00)	
	Origin (30.00)	
	Woodside (50.00)	
T/31P	6 277 km²	24-Mar-05
	Roma* (50.00)	
	Guinness Peat (50.00)	
RETENTION LEASE		
T/RL1	607 km² Yolla	14-Oct-06
	Origin* (30.50)	
	AWE (30.50)	
	Santos (5.00)	
	CalEnergy Gas (20.00)	
	Galveston Mining (14.00)	
SOUTH AUSTRALIA		
OFFSHORE		
EXPLORATION PERMIT		
EPP24	1 935 km² Crayfish, Troas	29-May-02
	Origin* (74.00)	
	Durum (6.00)	
	Otway (8.33)	
	Pan Pacific (5.00)	
	Victoria Diamond (6.67)	
EPP27	3 962 km²	24-Feb-06
	Tyers Investments* (100.00)	
EPP28	15 896 km²	11-Jul-06
	Woodside* (40.00)	
	Pan Canadian (30.00)	
	Anadarko (30.00)	
EPP29	18 763 km²	11-Jul-06
	Woodside* (40.00)	
	Pan Canadian (30.00)	
	Anadarko (30.00)	
EPP30	22 225 km²	11-Jul-06
	Woodside* (40.00)	
	Anadarko (30.00)	
	Pan Canadian (30.00)	
ONSHORE		
EXPLORATION PERMIT		
PEL 27	240 km² Sawpit	30-Jul-04
	OCA* (66.67)	
	Origin (33.33)	
PEL 32	530 km² Wynn	18-Feb-05
	Sagasco* (55.71)	
	Omega (24.29)	
	Origin (20.00)	
PEL 49	2 064 km²	30-Jun-01 (R.P.)
	Felstea* (100.00)	
PEL 50	4 847 km²	30-Jun-01 (R.P.)
	Felstea* (100.00)	
PEL 53	7 198 km²	03-Dec-95 (R.P.)
	Wagner* (35.00)	
	BET (5.00)	
	Brown (35.00)	
	Forcenergy (25.00)	
PEL 57	772 km²	17-Nov-01
	Lakes* (30.00)	
	Mirboo (10.00)	
	Origin (50.00)	
	Victoria Petroleum (10.00)	
PEL 59	4 129 km²	30-Mar-98
	Wagner* (35.00)	
	BET (5.00)	
	Forcenergy (25.00)	
	Brown (35.00)	
PEL 61	6 258 km²	22-May-01
	Hemley* (100.00)	
PEL 63	10 930 km²	22-May-01
	Hemley* (100.00)	
PEL 66	376 km² Kalangadoo	17-Jun-06
	Origin* (70.00)	
	Beach (30.00)	
PEL 72	686 km²	25-Mar-02
	Origin* (75.00)	
	Essential (25.00)	
PEL 75	937 km²	22-Dec-02
	Strike Oil* (100.00)	
PEL 85	151 km²	19-Apr-04
	Eoil* (100.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PRODUCTION LICENCE		
PPL 6	257 km² Gidgealpa, Mawson Santos* (41.31) Vamgas (8.51) Reef Oil (1.97) Origin (13.19) Gulf (4.75) Delhi (20.21) Basin (2.10) Bridge (3.99)	31-Dec-05
PPL 7	254 km² Moomba Santos* (41.31) Vamgas (8.51) Origin (13.19) Delhi (20.21) Bridge (3.99) Basin (2.10) Reef Oil (1.97) Gulf (4.75)	31-Dec-05
PPL 8	254 km² Moomba Santos* (41.31) Vamgas (8.51) Reef Oil (1.97) Origin (13.19) Delhi (20.21) Bridge (3.99) Basin (2.10) Gulf (4.75)	31-Dec-05
PPL 9	133 km² Moomba Santos* (41.31) Gulf (4.75) Vamgas (8.51) Basin (2.10) Origin (13.19) Delhi (20.21) Bridge (3.99) Reef Oil (1.97)	31-Dec-05
PPL10	226 km² Cowan, Daralingie, Deina, Yapeni Santos* (41.31) Origin (13.19) Vamgas (8.51) Reef Oil (1.97) Delhi (20.21) Bridge (3.99) Basin (2.10) Gulf (4.75)	31-Dec-05
PPL11	160 km² Big Lake Santos* (41.31) Reef Oil (1.97) Origin (13.19) Gulf (4.75) Delhi (20.21) Bridge (3.99) Basin (2.10) Vamgas (8.51)	31-Dec-05
PPL12	157 km² Burke, Dullingari, Dullingari North Santos* (41.31) Bridge (3.99) Vamgas (8.51) Reef Oil (1.97) Basin (2.10) Delhi (20.21) Gulf (4.75) Origin (13.19)	31-Dec-05
PPL13	56 km² Amyema, Brumby, Marsilea Santos* (41.31) Gulf (4.75) Vamgas (8.51) Origin (13.19) Reef Oil (1.97) Basin (2.10) Bridge (3.99) Delhi (20.21)	31-Dec-05
PPL14	233 km² Toolachee Santos* (41.31) Reef Oil (1.97) Origin (13.19) Gulf (4.75) Delhi (20.21) Bridge (3.99) Basin (2.10) Vamgas (8.51)	31-Dec-05
PPL15	154 km² Della Santos* (41.31) Bridge (3.99) Vamgas (8.51) Reef Oil (1.97) Origin (13.19) Gulf (4.75) Delhi (20.21) Basin (2.10)	31-Dec-05

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL16	127 km² Big Lake, Namur Santos* (41.31) Basin (2.10) Bridge (3.99) Delhi (20.21) Gulf (4.75) Origin (13.19) Reef Oil (1.97) Vamgas (8.51)	31-Dec-05
PPL17	141 km² Merrimelia, Pelican (Santos) Santos* (41.31) Basin (2.10) Vamgas (8.51) Reef Oil (1.97) Origin (13.19) Gulf (4.75) Bridge (3.99) Delhi (20.21)	31-Dec-05
PPL18	109 km² Fly Lake/Brolga Santos* (41.31) Origin (13.19) Basin (2.10) Vamgas (8.51) Reef Oil (1.97) Bridge (3.99) Delhi (20.21) Gulf (4.75)	31-Dec-05
PPL19	37 km² Moorari Santos* (41.31) Gulf (4.75) Vamgas (8.51) Origin (13.19) Delhi (20.21) Bridge (3.99) Basin (2.10) Reef Oil (1.97)	31-Dec-05
PPL20	130 km² Gooranie, Tirrawarra Santos* (41.31) Basin (2.10) Origin (13.19) Vamgas (8.51) Reef Oil (1.97) Delhi (20.21) Bridge (3.99) Gulf (4.75)	31-Dec-05
PPL21	145 km² Caroline Air Liquide* (100.00)	30-Apr-21
PPL22	234 km² Marabooka, Mina, Mudera, Nanima, Strzelecki, Wanara Santos* (41.31) Delhi (20.21) Vamgas (8.51) Reef Oil (1.97) Gulf (4.75) Bridge (3.99) Basin (2.10) Origin (13.19)	31-Dec-06
PPL23	80 km² Munkarie Santos* (41.31) Delhi (20.21) Reef Oil (1.97) Vamgas (8.51) Bridge (3.99) Basin (2.10) Origin (13.19) Gulf (4.75)	31-Dec-06
PPL24	168 km² Boongala, Caraka, Coochilara, Dieri, Kidman, Marana Santos* (41.31) Delhi (20.21) Vamgas (8.51) Reef Oil (1.97) Gulf (4.75) Bridge (3.99) Basin (2.10) Origin (13.19)	31-Dec-06
PPL25	20 km² Narcoonowie Santos* (41.31) Origin (13.19) Vamgas (8.51) Reef Oil (1.97) Delhi (20.21) Bridge (3.99) Basin (2.10) Gulf (4.75)	31-Dec-06
PPL26	4 km² Cuttapirrie Santos* (25.60) Vamgas (43.75) Delhi (17.14) Gulf (2.97) Origin (10.54)	10-Jun-07

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL27	23 km² Mudrangie	31-Dec-06
	Santos* (41.31)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Basin (2.10)	
	Vamgas (8.51)	
	Bridge (3.99)	
PPL28	16 km² Kanowana	06-May-07
	Santos* (41.31)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Delhi (20.21)	
	Basin (2.10)	
	Bridge (3.99)	
	Gulf (4.75)	
PPL29	3 km² Rakoona	31-Dec-08
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL30	49 km² Limestone Creek/Biala	31-Dec-06
	Santos* (41.31)	
	Gulf (4.75)	
	Vamgas (8.51)	
	Origin (13.19)	
	Bridge (3.99)	
	Basin (2.10)	
	Reef Oil (1.97)	
	Delhi (20.21)	
PPL31	6 km² Wancoocha	06-May-07
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL32	6 km² Muteroo	06-May-07
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	
PPL33	15 km² Bookabourdie	31-Dec-06
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
PPL34	9 km² McKinlay	31-Dec-06
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL35	21 km² Meranji	31-Dec-06
	Santos* (41.31)	
	Gulf (4.75)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Bridge (3.99)	
	Vamgas (8.51)	
	Basin (2.10)	
	Delhi (20.21)	
PPL36	47 km² Alwyn, Jena, Ulandi	31-Dec-06
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL37	8 km² Spencer	06-Oct-07
	Santos* (41.31)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
	Gulf (4.75)	
PPL38	10 km² Dirkala, Dirkala South, Dirkala West	06-Oct-07
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL39	2 km² Nungeroo	31-Dec-06
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Gulf (4.75)	
	Basin (2.10)	
PPL40	11 km² Lepena	31-Dec-07
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL41	20 km² Kapinka, Mundi	31-Dec-11
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	

Title	Area and Title holder	Expiry date
PPL42	7 km² Bookabourdie	31-Dec-08
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
PPL43	3 km² Taylor South	31-Dec-08
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL44	5 km² Bimbaya	31-Dec-08
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	
PPL45	1 km² Taloola	29-Mar-10
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL46	2 km² Tantanna	20-Dec-09
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL47	4 km² Sturt, Sturt East	20-Dec-09
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
PPL48	2 km² Kurunda	31-Dec-10
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL49	8 km² Andree/Leleptian	31-Dec-10
	Santos* (41.31)	
	Delhi (20.21)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
	Gulf (4.75)	
PPL50	17 km² Andree/Leleptian	31-Dec-09
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL51	7 km² Kirralee	31-Dec-11
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	

Title	Area and Title holder	Expiry date
PPL52	2 km² Gooranie South	31-Dec-09
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
PPL53	2 km² Spencer West	04-Dec-10
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL54	1 km² Pintari North	15-Jun-10
	Santos* (41.31)	
	Gulf (4.75)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Bridge (3.99)	
	Vamgas (8.51)	
	Basin (2.10)	
	Delhi (20.21)	
PPL55	10 km² Varanus	31-Dec-11
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL56	4 km² Varanus	31-Dec-13
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL57	10 km² Thurakinna	16-Jul-11
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
PPL58	15 km² Mettika	31-Dec-10
	Santos* (41.31)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Basin (2.10)	
PPL59	10 km² Garanjanie	16-Jul-11
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	
PPL60	7 km² Wirrarie, Wirrarie North	25-May-14
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL61	12 km² Arrakis/Murta	17-Oct-11
	Santos* (41.31)	
	Gulf (4.75)	
	Vamgas (8.51)	
	Origin (13.19)	
	Bridge (3.99)	
	Basin (2.10)	
	Delhi (20.21)	
	Reef Oil (1.97)	
PPL62	29 km² Haselgrove, Katnook, Ladbroke Grove	26-Nov-11
	Origin* (20.00)	
	Omega (24.29)	
	Sagasco (55.71)	
PPL63	1 km² Malgoona	23-May-12
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Bridge (3.99)	
	Delhi (20.21)	
PPL64	2 km² Malgoona	23-May-12
	Santos* (41.31)	
	Gulf (4.75)	
	Vamgas (8.51)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Bridge (3.99)	
	Delhi (20.21)	
	Basin (2.10)	
PPL65	6 km² Kujani	17-Jul-12
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL66	11 km² Jack Lake	24-Nov-12
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	
PPL67	11 km² Keena	17-Jul-12
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL68	14 km² Cooba	31-Dec-11
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL69	12 km² Tarwonga	31-Dec-11
	Santos* (41.31)	
	Delhi (20.21)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
	Gulf (4.75)	
PPL70	6 km² Farina	25-May-14
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL71	16 km² Kerna	31-Dec-13
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	
PPL72	17 km² Dilchee, Pira	31-Dec-13
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
PPL73	1 km² Mudlalee	31-Dec-15
	Santos* (41.31)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Basin (2.10)	
PPL74	5 km² Allambi	31-Dec-15
	Santos* (41.31)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Delhi (20.21)	
	Basin (2.10)	
	Bridge (3.99)	
	Gulf (4.75)	
PPL75	6 km² Caladan	26-Oct-16
	Santos* (41.31)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
PPL76	3 km² Telopea	26-Oct-16
	Santos* (25.60)	
	Vamgas (43.75)	
	Origin (10.54)	
	Delhi (17.14)	
	Gulf (2.97)	
PPL77	10 km² Keleary	26-Oct-16
	Santos* (25.60)	
	Gulf (2.97)	
	Origin (10.54)	
	Vamgas (43.75)	
	Delhi (17.14)	
PPL78	6 km² Baratta	31-Dec-16
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Bridge (3.99)	
	Delhi (20.21)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL79	2 km² Gahnia	31-Dec-16
	Santos* (41.31)	
	Gulf (4.75)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Bridge (3.99)	
	Vamgas (8.51)	
	Basin (2.10)	
	Delhi (20.21)	
PPL80	3 km² Correa	31-Dec-16
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL81	4 km² Caladan	31-Oct-17
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	
PPL82	6 km² Waukatanna	31-Dec-16
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
PPL83	3 km² Pogona	31-Dec-16
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	

Title	Area and Title holder	Expiry date
PPL84	28 km² Barina	06-Jun-18
	Santos* (41.31)	
	Delhi (20.21)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
	Gulf (4.75)	
PPL85	3 km² Alisma	31-Dec-17
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL86	2 km² Carmina	31-Dec-17
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Gulf (4.75)	
PPL87	5 km² Boobook	31-Dec-17
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
PPL88	2 km² Lycosa	31-Dec-17
	Santos* (41.31)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Basin (2.10)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL89	6 km² Bobs Well	31-Dec-17
	Santos* (41.31)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Delhi (20.21)	
	Basin (2.10)	
	Bridge (3.99)	
	Gulf (4.75)	
PPL90	61 km² Packsaddle, Pondrinie	31-Dec-17
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL91	9 km² Cowralli	31-Dec-17
	Santos* (41.31)	
	Gulf (4.75)	
	Vamgas (8.51)	
	Origin (13.19)	
	Bridge (3.99)	
	Basin (2.10)	
	Reef Oil (1.97)	
	Delhi (20.21)	
PPL92	2 km² Plantago	31-Dec-17
	Santos* (41.31)	
	Gulf (4.75)	
	Vamgas (8.51)	
	Origin (13.19)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Reef Oil (1.97)	
PPL93	7 km² Wilpinnie	31-Dec-17
	Santos* (41.31)	
	Vamgas (8.51)	
	Gulf (4.75)	
	Basin (2.10)	
	Delhi (20.21)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Bridge (3.99)	
PPL94	7 km² Atreides	08-Jan-19
	Santos* (41.31)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Vamgas (8.51)	
PPL95	12 km² Nephrite	21-May-19
	Santos* (41.31)	
	Vamgas (8.51)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
PPL96	3 km² Beckler	31-Dec-17
	Santos* (41.31)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
PPL97	2 km² Beckler South	31-Dec-17
	Santos* (41.31)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
PPL98	7 km² Merupa	31-Dec-17
	Santos* (41.31)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Origin (13.19)	
	Gulf (4.75)	
	Basin (2.10)	
	Bridge (3.99)	
	Vamgas (8.51)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL99	7 km² Merindal	31-Dec-17
	Santos* (41.31)	
	Origin (13.19)	
	Bridge (3.99)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Basin (2.10)	
PPL100	5 km² Nappacoongee, Nappacoongee East	31-Dec-17
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL101	214 km² Swan Lake	02-Nov-18
	Santos* (41.31)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
PPL102	131 km² Wantana	02-Nov-18
	Santos* (41.31)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
PPL103	258 km² Wantana	02-Nov-18
	Santos* (41.31)	
	Vamgas (8.51)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Basin (2.10)	
	Bridge (3.99)	
	Reef Oil (1.97)	
PPL104	259 km²	02-Nov-18
	Santos* (41.31)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Basin (2.10)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
PPL105	256 km² Kirby	02-Nov-18
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL106	254 km²	02-Nov-18
	Santos* (41.31)	
	Gulf (4.75)	
	Origin (13.19)	
	Vamgas (8.51)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Reef Oil (1.97)	
PPL107	217 km² Davren	02-Nov-18
	Santos* (41.31)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Basin (2.10)	
	Vamgas (8.51)	
	Bridge (3.99)	
PPL108	254 km²	02-Nov-18
	Santos* (41.31)	
	Vamgas (8.51)	
	Basin (2.10)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Bridge (3.99)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL109	248 km² Bulyeroo	02-Nov-18
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL110	228 km² Burley	02-Nov-18
	Santos* (41.31)	
	Gulf (4.75)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
PPL111	254 km² McLeod	02-Nov-18
	Santos* (41.31)	
	Delhi (20.21)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL112	255 km²	02-Nov-18
	Santos* (41.31)	
	Origin (13.19)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Delhi (20.21)	
	Basin (2.10)	
	Bridge (3.99)	
PPL113	232 km² Moomba	02-Nov-18
	Santos* (41.31)	
	Reef Oil (1.97)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Vamgas (8.51)	

Title	Area and Title holder	Expiry date
PPL114	242 km²	02-Nov-18
	Santos* (41.31)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Delhi (20.21)	
	Vamgas (8.51)	
PPL115	251 km² Three Queens	02-Nov-18
	Santos* (41.31)	
	Origin (13.19)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
PPL116	249 km²	02-Nov-18
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL117	239 km² Wilpinnie	02-Nov-18
	Santos* (41.31)	
	Basin (2.10)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Bridge (3.99)	
PPL118	1 km² Kudrieke North	26-May-19
	Santos* (25.60)	
	Delhi (17.14)	
	Gulf (2.97)	
	Vamgas (43.75)	
	Origin (10.54)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL119	7 km² Kudrieke, Mitchie	31-Dec-17
	Santos* (41.31)	
	Delhi (20.21)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Bridge (3.99)	
PPL120	4 km² Lake MacMillan	31-Dec-17
	Santos* (41.31)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Basin (2.10)	
	Bridge (3.99)	
	Vamgas (8.51)	
PPL121	5 km² Tarragon	26-May-19
	Santos* (25.60)	
	Vamgas (43.75)	
	Origin (10.54)	
	Delhi (17.14)	
	Gulf (2.97)	
PPL122	6 km² Tallerangie	23-Sep-19
	Santos* (25.60)	
	Origin (10.54)	
	Vamgas (43.75)	
	Delhi (17.14)	
	Gulf (2.97)	
PPL123	5 km² Pennie	23-Sep-19
	Santos* (25.60)	
	Delhi (17.14)	
	Gulf (2.97)	
	Origin (10.54)	
	Vamgas (43.75)	
PPL124	5 km² Bindah	31-Dec-18
	Santos* (41.31)	
	Delhi (20.21)	
	Bridge (3.99)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	

Title	Area and Title holder	Expiry date
PPL125	9 km² Gudi	11-Feb-20
	Santos* (25.60)	
	Vamgas (43.75)	
	Origin (10.54)	
	Gulf (2.97)	
	Delhi (17.14)	
PPL126	1 km² Daralingie North	21-Feb-20
	Santos* (41.31)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Vamgas (8.51)	
PPL127	4 km² Nulla	21-Feb-20
	Santos* (41.31)	
	Reef Oil (1.97)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Vamgas (8.51)	
PPL128	1 km² Garanjanie	21-Feb-20
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL129	1 km² Thurakinna	20-Apr-20
	Santos* (41.31)	
	Basin (2.10)	
	Bridge (3.99)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Delhi (20.21)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL130	1 km² Thurakinna	20-Apr-20
	Santos* (41.31)	
	Gulf (4.75)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
PPL131	40 km² Coonatie	20-Apr-20
	Santos* (25.60)	
	Origin (10.54)	
	Delhi (17.14)	
	Gulf (2.97)	
	Vamgas (43.75)	
PPL132	1 km² Packsaddle, Pondrinie	31-Dec-19
	Santos* (41.31)	
	Bridge (3.99)	
	Vamgas (8.51)	
	Delhi (20.21)	
	Basin (2.10)	
	Origin (13.19)	
	Gulf (4.75)	
	Reef Oil (1.97)	
PPL133	1 km² Packsaddle, Pondrinie	31-Dec-19
	Santos* (41.31)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Basin (2.10)	
	Delhi (20.21)	
PPL134	1 km² Packsaddle, Pondrinie	31-Dec-19
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL135	11 km² Goyder	31-Dec-19
	Santos* (41.31)	
	Delhi (20.21)	
	Bridge (3.99)	
	Vamgas (8.51)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Basin (2.10)	
PPL136	33 km² Cuttapirrie	17-Jun-20
	Santos* (25.60)	
	Origin (10.54)	
	Gulf (2.97)	
	Delhi (17.14)	
	Vamgas (43.75)	
PPL137	7 km² Moonanga	25-May-20
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
PPL138	25 km² Cabernet	10-Aug-20
	Santos* (41.31)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Basin (2.10)	
	Bridge (3.99)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
PPL139	16 km² Milluna	31-Dec-19
	Santos* (41.31)	
	Bridge (3.99)	
	Vamgas (8.51)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Basin (2.10)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL140	161 km² Nephrite South	31-Dec-19
	Santos* (41.31)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Bridge (3.99)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL141	125 km² Beckler	31-Dec-19
	Santos* (41.31)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Gulf (4.75)	
	Origin (13.19)	
	Delhi (20.21)	
	Reef Oil (1.97)	
	Basin (2.10)	
PPL142	28 km² Moolion	10-Aug-20
	Santos* (25.60)	
	Delhi (17.14)	
	Gulf (2.97)	
	Origin (10.54)	
	Vamgas (43.75)	
PPL143	93 km² Dorodillo	31-Dec-19
	Santos* (41.31)	
	Vamgas (8.51)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Reef Oil (1.97)	
PPL144	7 km² Keena	10-Aug-20
	Santos* (41.31)	
	Vamgas (8.51)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Reef Oil (1.97)	
	Origin (13.19)	

Title	Area and Title holder	Expiry date
PPL145	18 km² Koree, Koree South	10-Aug-20
	Santos* (41.31)	
	Bridge (3.99)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Basin (2.10)	
PPL146	10 km² Balcaminga	31-Dec-19
	Santos* (41.31)	
	Basin (2.10)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
	Vamgas (8.51)	
PPL147	3 km² Balcaminga	10-Aug-20
	Santos* (25.60)	
	Origin (10.54)	
	Vamgas (43.75)	
	Delhi (17.14)	
	Gulf (2.97)	
PPL148	8 km² Welcome Lake East	10-Aug-20
	Santos* (41.31)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Vamgas (8.51)	
PPL149	33 km² Jalbu West	31-Dec-19
	Santos* (41.31)	
	Gulf (4.75)	
	Vamgas (8.51)	
	Origin (13.19)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Reef Oil (1.97)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL150	22 km² Raven	10-Aug-20
	Santos* (41.31)	
	Reef Oil (1.97)	
	Basin (2.10)	
	Vamgas (8.51)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
	Origin (13.19)	
PPL151	66 km² Napowie	31-Dec-19
	Santos* (41.31)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
PPL152	4 km² Napowie	10-Aug-20
	Santos* (25.60)	
	Vamgas (43.75)	
	Gulf (2.97)	
	Delhi (17.14)	
	Origin (10.54)	
PPL153	43 km² Shiraz	31-Dec-19
	Santos* (41.31)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
PPL154	4 km² Ficus	31-Dec-19
	Santos* (41.31)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Vamgas (8.51)	
	Gulf (4.75)	
PPL155	9 km² Bungee	10-Aug-20
	Santos* (41.31)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
PPL156	35 km² Beanbush	10-Aug-20
	Santos* (25.60)	
	Vamgas (43.75)	
	Gulf (2.97)	
	Delhi (17.14)	
	Origin (10.54)	
PPL157	3 km² Muscat	10-Aug-20
	Santos* (41.31)	
	Basin (2.10)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
PPL158	67 km² Verona	08-Aug-20
	Santos* (25.60)	
	Gulf (2.97)	
	Origin (10.54)	
	Vamgas (43.75)	
	Delhi (17.14)	
PPL159	4 km² Touriga	22-Jul-20
	Santos* (41.31)	
	Gulf (4.75)	
	Basin (2.10)	
	Bridge (3.99)	
	Delhi (20.21)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
PPL160	3 km² Mica	22-Jul-20
	Santos* (41.31)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Bridge (3.99)	
	Delhi (20.21)	
	Origin (13.19)	
	Basin (2.10)	
	Gulf (4.75)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
PPL161	7 km² Malgoona	08-Aug-20
	Santos* (41.31)	
	Gulf (4.75)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
PPL162	3 km² Sturt	08-Aug-20
	Santos* (41.31)	
	Delhi (20.21)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Bridge (3.99)	
	Basin (2.10)	
	Origin (13.19)	
	Gulf (4.75)	
PPL163	1 km² Brumby	31-Dec-19
	Santos* (41.31)	
	Gulf (4.75)	
	Vamgas (8.51)	
	Origin (13.19)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
	Reef Oil (1.97)	
PPL164	3 km² Packsaddle	31-Dec-19
	Santos* (41.31)	
	Reef Oil (1.97)	
	Bridge (3.99)	
	Vamgas (8.51)	
	Origin (13.19)	
	Delhi (20.21)	
	Basin (2.10)	
	Gulf (4.75)	
PPL165	4 km² Malgoona	26-Aug-20
	Santos* (41.31)	
	Vamgas (8.51)	
	Reef Oil (1.97)	
	Origin (13.19)	
	Gulf (4.75)	
	Delhi (20.21)	
	Bridge (3.99)	
	Basin (2.10)	
PPL166	1 km² Taylor South	31-Dec-19
	Santos* (41.31)	
	Bridge (3.99)	
	Delhi (20.21)	
	Gulf (4.75)	
	Origin (13.19)	
	Reef Oil (1.97)	
	Vamgas (8.51)	
	Basin (2.10)	
PPL167	7 km² Moolion	02-Sep-20
	Santos* (25.60)	
	Vamgas (43.75)	
	Delhi (17.14)	
	Gulf (2.97)	
	Origin (10.54)	
PPL168	9 km² Redman	25-Jun-20
	Origin* (20.00)	
	Omega (24.29)	
	Sagasco (55.71)	
WESTERN AUSTRALIA		
OFFSHORE		
EXPLORATION PERMIT		
WA-1-P R5	1 328 km² Hampton, Legendre, Rosemary, Saffron	16-Nov-02
	Santos* (22.56)	
	Woodside (45.94)	
	Apache (31.50)	
WA-18-P R5	664 km² Tern	01-Jun-04
	Santos* (70.00)	
	Bonaparte (30.00)	
WA-24-P R4 PART 1	166 km²	07-Mar-00
	Chevron* (25.71)	
	Mobil (12.86)	
	Shell (35.71)	
	Texaco Aus. (25.71)	
WA-24-P R4 PART 2&3	664 km²	07-Mar-00
	Chevron* (10.00)	
	Mobil (5.00)	
	Shell (75.00)	
	Texaco Aus. (10.00)	
WA-25-P R5	1 328 km² North Tryal Rocks	27-Jan-03 (R.P.)
	Shell* (28.57)	
	Chevron (28.57)	
	Mobil (14.29)	
	Texaco Aus. (28.57)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
WA-28-P R5	1 245 km² Eaglehawk, Haycock	04-Aug-01
	Woodside* (16.67)	
	BHP (16.67)	
	BP (16.67)	
	Chevron (16.67)	
	Japan Australia LNG (16.67)	
	Shell (16.67)	
WA-33-P R3	3 985 km² Brecknock, Scott Reef	26-Feb-03
	Woodside* (50.00)	
	Chevron (16.67)	
	BP (16.67)	
	BHP (8.33)	
	Shell (8.33)	
WA-35-P R5	1 328 km²	06-Sep-03
	Shell* (66.67)	
	Chevron (33.33)	
WA-149-P R3	703 km²	09-Nov-04
	Ampolex (12.47)	
	Apache (48.81)	
	Pan Pacific (10.00)	
	Petroz (10.00)	
	Santos (18.71)	
WA-155-P R3	1 162 km²	12-Jan-04
	BHP* (71.43)	
	Mobil (28.57)	
WA-191-P R3	1 328 km²	01-Jun-04
	Mobil* (33.40)	
	Nippon (25.00)	
	Santos (33.40)	
	Woodside (8.20)	
WA-192-P R3	996 km²	08-Jul-20
	Apache* (57.25)	
	New World (0.10)	
	Tap (12.22)	
	Kufpec (19.28)	
	Texaco Aus. (11.25)	
WA-202-P R2	1 079 km²	03-Aug-04
	Mobil* (40.00)	
	Premier (20.00)	
	Wandoo (40.00)	
WA-205-P R2	945 km²	03-Dec-05
	Chevron* (28.57)	
	Mobil (14.29)	
	Shell (28.57)	
	Texaco Aus. (28.57)	
WA-206-P R1	3 155 km²	09-Nov-99
	Santos* (100.00)	

Title	Area and Title holder	Expiry date
WA-208-P R1	1 328 km²	10-Apr-01
	Woodside* (24.50)	
	Mosaic (5.00)	
	Santos (30.00)	
	British Borneo (12.50)	
	Mobil (28.00)	
WA-209-P R2	810 km²	09-Nov-05
	Apache* (54.20)	
	Globex (12.50)	
	Santos (33.30)	
WA-214-P R1	1 079 km²	19-Aug-01
	Santos* (20.00)	
	AEC (25.00)	
	Apache (55.00)	
WA-215-P R1	498 km²	23-Jun-02
	Apache* (47.17)	
	Chevron (17.25)	
	Texaco Aus. (8.33)	
	Santos (10.00)	
	Shell (17.25)	
WA-217-P R1	2 905 km²	27-Apr-03
	Mobil* (100.00)	
WA-226-P R1	4 027 km²	23-Nov-02
	Dana E & P* (21.25)	
	Cadex (10.50)	
	Dana WA (21.00)	
	EDC (39.75)	
	Planet (7.50)	
WA-234-P	675 km²	13-Feb-98
	British Borneo* (30.00)	
	Tap West (10.00)	
	Mobil (20.00)	
	Pan Canadian (40.00)	
WA-239-P R1	4 732 km²	24-May-04
	Nexen* (30.00)	
	Santos (14.00)	
	Southern Diamond (14.00)	
	BHP (42.00)	
WA-242-P R1	7 886 km²	14-Nov-04
	Woodside* (66.66)	
	Santos (33.33)	
WA-246-P R1	270 km²	23-Oct-05
	Apache* (45.00)	
	Kufpec (20.00)	
	Globex (15.00)	
	Pan Pacific (10.00)	
	Tap (10.00)	
WA-248-P R1	3 071 km²	11-Jun-05
	Woodside* (100.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
WA-253-P	2 158 km²	17-Jan-00
	Chevron* (50.00)	
	Texaco Aus. (50.00)	
WA-254-P PARTS 1,3 & 4	249 km²	30-Aug-00
	Apache* (39.20)	
	First Australian (10.71)	
	Carnarvon (8.69)	
	Woodside (24.38)	
	Pan Pacific (2.99)	
	Victoria Petroleum (4.03)	
	Sun (7.85)	
	Kestrel (2.14)	
WA-254-P PART 2	83 km²	30-Aug-00
	Apache* (36.44)	
	Victoria Petroleum (4.03)	
	Carnarvon (11.46)	
	Kestrel (2.14)	
	Sun (9.25)	
	First Australian (11.25)	
	Woodside (24.38)	
	Pan Pacific (2.99)	
WA-255-P R1	3 105 km²	01-Aug-05
	BHP* (50.00)	
	Mobil (50.00)	
WA-256-P	664 km²	28-Dec-00
	Apache* (69.43)	
	Globex (15.00)	
	Origin (15.57)	
WA-257-P	498 km²	28-Jun-01
	Mobil* (30.00)	
	Origin (24.90)	
	Apache (45.10)	
WA-258-P	581 km²	18-Dec-00
	Santos* (45.44)	
	Amerada Hess (54.56)	
WA-259-P	830 km²	08-Dec-00
	Apache* (100.00)	
WA-260-P	3 985 km² Buller	21-Dec-01
	BHP* (50.00)	
	Nexen (50.00)	

Title	Area and Title holder	Expiry date
WA-261-P	415 km²	02-Jan-02
	Santos* (29.58)	
	Strike Oil (5.00)	
	Apache (26.67)	
	Globex (6.25)	
	Kestrel (2.50)	
	Petroz (22.50)	
	Sun (5.00)	
	Victoria Petroleum (2.50)	
WA-263-P	2 324 km²	07-Mar-02
	Novus* (27.50)	
	Woodside (22.50)	
	Mobil (22.50)	
	Idemitsu (27.50)	
WA-264-P	664 km²	07-Mar-02
	Santos* (66.70)	
	Idemitsu (33.30)	
WA-267-P	5 645 km²	19-May-03
	Chevron* (25.00)	
	Texaco Aus. (25.00)	
	Shell (12.50)	
	Mobil (25.00)	
	BP (12.50)	
WA-268-P	14 610 km²	04-Jun-03
	Mobil* (50.00)	
	Texaco Aus. (50.00)	
WA-269-P	10 460 km²	04-Jun-03
	Woodside* (60.00)	
	Phillips (40.00)	
WA-270-P	7 803 km²	04-Jun-03
	Woodside* (60.00)	
	Phillips (40.00)	
WA-271-P	6 309 km²	11-Aug-03
	Woodside* (100.00)	
WA-273-P	2 324 km²	
	Newfield* (70.00)	
	Novus (30.00)	
WA-274-P	5 728 km²	18-Aug-04
	International Frontier* (12.50)	
	Coveyork (87.50)	
WA-275-P	4 649 km²	18-Aug-04
	Woodside* (20.00)	
	BP (20.00)	
	Chevron (20.00)	
	BHP (20.00)	
	Shell (20.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
WA-276-P	2 324 km²	18-Aug-04
	Kerr-McGee* (39.00)	
	Pan Canadian (34.00)	
	Tap Oil (17.00)	
	SK (10.00)	
WA-277-P	2 490 km²	18-Aug-04
	Kerr-McGee* (39.00)	
	Tap Oil (17.00)	
	SK (10.00)	
	Pan Canadian (34.00)	
WA-278-P	2 490 km²	18-Aug-04
	Kerr-McGee* (39.00)	
	Tap Oil (17.00)	
	SK (10.00)	
	Pan Canadian (34.00)	
WA-279-P	3 238 km² Blacktip	18-Aug-04
	Woodside* (50.00)	
	Shell (50.00)	
WA-280-P	3 736 km²	18-Aug-04
	Woodside* (50.00)	
	Shell (50.00)	
WA-281-P	4 649 km²	18-Aug-04
	Santos* (27.50)	
	Oil Search (25.00)	
	Magellan (10.00)	
	Beach (20.00)	
	Petroz (17.50)	
WA-282-P	5 977 km²	18-Aug-04
	Santos* (42.50)	
	Petroz (17.50)	
	Magellan (10.00)	
	Beach (30.00)	
WA-283-P	4 317 km²	18-Aug-04
	Santos* (27.50)	
	Petroz (20.00)	
	Magellan (17.50)	
	Beach (7.50)	
	Coastal (27.50)	
WA-284-P	1 743 km²	18-Aug-04
	West Oil* (100.00)	
WA-285-P	5 147 km²	18-Aug-04
	Inpex* (100.00)	
WA-286-P	17 433 km²	21-Feb-05
	AWE* (40.00)	
	ROC (45.00)	
	Arc Energy (15.00)	
WA-287-P	2 075 km²	21-Feb-05
	Magellan* (100.00)	
WA-288-P	2 407 km²	21-Feb-05
	Magellan* (100.00)	
WA-289-P	581 km²	25-Mar-05
	BHP* (40.00)	
	OMV (20.00)	
	Nexen (40.00)	
WA-290-P	498 km²	25-Mar-05
	BHP* (40.00)	
	Nexen (40.00)	
	OMV (20.00)	
WA-291-P	9 214 km²	03-Aug-05
	Magellan* (100.00)	
WA-292-P	6 309 km² Nebo	03-Aug-05
	OMV* (33.33)	
	IB Res. (33.33)	
	AGIP (33.33)	
WA-293-P	17 018 km²	03-Aug-05
	Woodside* (100.00)	
WA-294-P	9 713 km²	16-Aug-05
	BP* (20.00)	
	Shell (20.00)	
	Japan Australia LNG (20.00)	
	Woodside (20.00)	
	Chevron (20.00)	
WA-295-P	14 361 km²	18-Aug-05
	Kerr-McGee* (50.00)	
	British Borneo (50.00)	
WA-296-P	12 286 km²	16-Aug-05
	Woodside* (16.66)	
	Japan Australia LNG (16.66)	
	Chevron (16.66)	
	BP (16.66)	
	BHP (16.66)	
	Shell (16.66)	
WA-297-P	10 875 km²	16-Aug-05
	Woodside* (20.00)	
	BP (20.00)	
	Chevron (20.00)	
	Japan Australia LNG (20.00)	
	Shell (20.00)	
WA-298-P	83 km²	16-Feb-06
	Mobil* (35.00)	
	Apache (20.00)	
	Santos (20.00)	
	AEC (25.00)	
WA-299-P	5 546 km²	24-Jul-06
	Shell* (100.00)	
WA-300-P	6 466 km²	24-Jul-06
	Shell* (100.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
WA-301-P	7 665 km²	24-Jul-06
	BHP* (50.00)	
	Kerr-McGee (50.00)	
WA-302-P	4 417 km²	24-Jul-06
	BHP* (33.33)	
	Texaco Aus. (33.33)	
	Kerr-McGee (33.33)	
WA-303-P	5 236 km²	24-Jul-06
	BHP* (33.33)	
	Kerr-McGee (33.33)	
	Texaco Aus. (33.33)	
WA-304-P	3 491 km²	24-Jul-06
	BHP* (50.00)	
	Kerr-McGee (50.00)	
WA-305-P	5 222 km²	24-Jul-06
	BHP* (33.33)	
	Kerr-McGee (33.33)	
	Texaco Aus. (33.33)	
WA-306-P	4 629 km²	24-Jul-06
	Antrim* (75.00)	
	Rawson Res. (25.00)	
WA-307-P	3 462 km²	22-Aug-06
	Antrim* (75.00)	
	Rawson Res. (25.00)	
TP/ 2 R2	310 km²	09-Nov-02
	Chevron* (n/a)	
	WAPET (n/a)	
	Texaco Aus. (n/a)	
	Shell (n/a)	
	Mobil (n/a)	
TP/ 3 R2	1 084 km²	21-Apr-04
	Chevron* (n/a)	
	WMC Res. (n/a)	
	WAPET (n/a)	
	Texaco Aus. (n/a)	
	Shell (n/a)	
	Mobil (n/a)	
TP/ 4	1 162 km²	26-Feb-03
	Woodside* (n/a)	
	Shell (n/a)	
	BHP (n/a)	
	Chevron (n/a)	
	BP (n/a)	
TP/ 6 R2	1 162 km²	12-Oct-03
	Apache* (100.00)	
TP/ 7 R2	1 247 km² Pepper, South Chervil	16-Apr-05
	Apache* (n/a)	
	Pan Pacific (n/a)	
	Ampolex (n/a)	
	Santos (n/a)	
TP/ 8 R2	1 239 km² Cycad	14-Nov-04
	Apache* (n/a)	
	Tap (n/a)	
	New World (n/a)	
	Kufpec (n/a)	
TP/ 9 R1	387 km²	31-May-00 (R.P.)
	Apache* (n/a)	
	Newfield (n/a)	
	Asamera (n/a)	
	AWE (n/a)	
	Southern Diamond (n/a)	
	Origin (n/a)	
	Gulf (n/a)	
	Carnarvon (n/a)	
TP/12	332 km²	18-Jan-02
	Santos* (100.00)	
TP/13	166 km²	10-Sep-02
	WAPET* (100.00)	
TP/14	83 km²	10-Sep-02
	WAPET (n/a)	
	Texaco Aus. (n/a)	
	Shell (n/a)	
	Mobil (n/a)	
	Chevron (n/a)	
TP/15	3 902 km²	21-Aug-03
	AWE* (n/a)	
	Arc Energy (n/a)	
	Phoenix (n/a)	
	ROC (n/a)	
TP/16	1 890 km²	26-Aug-04
	Empire* (n/a)	
	CalEnergy Gas (n/a)	
TP/17	498 km²	25-Jun-04
	Strike Oil* (n/a)	
	Australian Gasfields (n/a)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
EP 325 R2	1 626 km²	03-Aug-04
	Victoria Petroleum* (n/a)	
	Mobil (n/a)	
	Petroz (n/a)	
	Omega (n/a)	
	Rothschild (n/a)	
	Amity (n/a)	
	Tepstew (n/a)	
	Kestrel (n/a)	
	Sun (n/a)	
	Santos (n/a)	
EP 341 R1	1 239 km²	21-Sep-99 (R.P.)
	Tap Oil* (n/a)	
	Peedamullah (n/a)	
	Tap (n/a)	
EP 342 R2	1 084 km²	19-Jul-99
	Apache* (n/a)	
	Premier (n/a)	
	Origin (n/a)	
	Gulf (n/a)	
	Carnarvon (n/a)	
	Southern Diamond (n/a)	
EP 395	232 km²	13-Dec-01
	Apache* (n/a)	
	Tap Oil (n/a)	
	Carnarvon (n/a)	
	First Australian (n/a)	
	Goodrich (n/a)	
	Sun (n/a)	
EP 397	135 km²	13-Jun-02
	Tap Oil* (n/a)	
	Tap (n/a)	
	Goodrich (n/a)	
	First Australian (n/a)	
EP 399	405 km²	20-Jan-02
	Tap* (n/a)	
	Clyde (n/a)	
	Gulf (n/a)	
	Petroz (n/a)	
EP 400	405 km²	20-Jan-02
	Tap* (n/a)	
	Gulf (n/a)	
	Clyde (n/a)	
	Apache (n/a)	
	Tap Oil (n/a)	
	Petroz (n/a)	
EP 403	270 km²	12-Nov-02
	Apache* (n/a)	
	Tap Oil (n/a)	

Title	Area and Title holder	Expiry date
EP 406	5 111 km²	28-Nov-02
	Euro Pacific* (n/a)	
EP 409	155 km²	21-Sep-03
	Apache* (n/a)	
	OMV (n/a)	
	Arc Energy (n/a)	
	Omega (n/a)	
PRODUCTION LICENCE		
WA-1-L	415 km² North Rankin	29-Sep-01
	Woodside* (23.33)	
	Japan Australia LNG (13.34)	
	Shell (15.00)	
	BP (16.67)	
	Chevron (16.67)	
	BHP (15.00)	
WA-2-L	332 km² North Rankin	29-Sep-01
	Woodside* (23.33)	
	Japan Australia LNG (13.34)	
	Shell (15.00)	
	BP (16.67)	
	BHP (15.00)	
	Chevron (16.67)	
WA-3-L	415 km² Angel	29-Sep-01
	Woodside* (23.33)	
	Shell (15.00)	
	Japan Australia LNG (13.34)	
	Chevron (16.67)	
	BP (16.67)	
	BHP (15.00)	
WA-4-L	332 km² Angel	29-Sep-01
	Woodside* (23.33)	
	BHP (15.00)	
	BP (16.67)	
	Shell (15.00)	
	Japan Australia LNG (13.34)	
	Chevron (16.67)	
WA-5-L	415 km² Dockrell, Goodwyn, Tidepole	29-Sep-01
	Woodside* (23.33)	
	Japan Australia LNG (13.34)	
	Chevron (16.67)	
	BP (16.67)	
	Shell (15.00)	
	BHP (15.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
WA-6-L	332 km² Goodwyn, Keast	29-Sep-01
	Woodside* (23.33)	
	BHP (15.00)	
	Shell (15.00)	
	Japan Australia LNG (13.34)	
	Chevron (16.67)	
	BP (16.67)	
WA-7-L	155 km² Barrow Island	03-Feb-09
	Shell (28.57)	
	Texaco Aus. (28.57)	
	Chevron (28.57)	
	Mobil (14.29)	
WA-8-L	166 km² Talisman	16-Aug-09
	Santos* (27.37)	
	Mobil (42.63)	
	Texaco Aus. (20.00)	
	Origin (10.00)	
WA-9-L	83 km² Cossack	11-Apr-12
	Woodside* (16.66)	
	BP (16.67)	
	Shell (16.67)	
	BHP (16.67)	
	Chevron (16.67)	
	Japan Australia LNG (16.67)	
WA-10-L	310 km² Bowers, Chinook/Scindian, Griffin	18-Feb-14
	BHP* (45.00)	
	Mobil (35.00)	
	Inpex (20.00)	
WA-11-L	166 km² Wanaea	30-Sep-14
	Woodside* (16.66)	
	BHP (16.67)	
	BP (16.67)	
	Chevron (16.67)	
	Japan Australia LNG (16.67)	
	Shell (16.67)	
WA-12-L	77 km² Griffin, Ramilles	13-Feb-15
	BHP* (71.43)	
	Mobil (28.57)	
WA-13-L	232 km² East Spar	18-Feb-17
	Santos* (45.00)	
	Apache (55.00)	
WA-14-L	232 km² Wandoo	19-Mar-17
	Mobil* (60.00)	
	Wandoo (40.00)	
WA-15-L	155 km² Stag	25-Aug-18
	Santos* (54.17)	
	Apache (33.34)	
	Globex (12.50)	

Title	Area and Title holder	Expiry date
WA-16-L	83 km² Hermes, Lambert	11-Sep-18
	Woodside* (16.67)	
	Shell (16.67)	
	BHP (16.67)	
	BP (16.67)	
	Chevron (16.67)	
	Japan Australia LNG (16.67)	
WA-17-L	249 km² Athena, North Rankin	14-Jan-20
	Mobil* (50.00)	
	Phillips (50.00)	
WA-18-L	83 km² Laminaria	12-May-20
	BHP* (100.00)	
WA-19-L	166 km² Buffalo	05-Sep-20
	BHP* (50.00)	
	Nexen (50.00)	
WA-20-L	83 km² Legendre	15-Nov-20
	Woodside* (45.94)	
	Apache (31.50)	
	Santos (22.56)	
WA-21-L	83 km² Buffalo	25-Nov-20
	BHP* (50.00)	
	Nexen (50.00)	
WA-22-L	77 km² East Spar	28-Feb-21
	Pan Canadian* (40.00)	
	Tap West (10.00)	
	British Borneo (30.00)	
	Mobil (20.00)	
TL/1	387 km² Bambra, Harriet, Ulidia	06-Nov-06
	Apache* (n/a)	
	Tap (n/a)	
	Kufpec (n/a)	
	New World (n/a)	
TL/2	387 km² Chervil, North Herald, South Pepper	25-Nov-08
	Apache* (n/a)	
	Pan Pacific (n/a)	
	Santos (n/a)	
	Ampolex (n/a)	
TL/3	542 km² Barrow Island	03-Feb-09
	Chevron* (n/a)	
	Shell (n/a)	
	Texaco Aus. (n/a)	
	Mobil (n/a)	
	WAPET (n/a)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
TL/4	310 km² Cowle, Saladin	14-Nov-10
	Chevron* (n/a)	
	Texaco Aus. (n/a)	
	WAPET (n/a)	
	Shell (n/a)	
	Mobil (n/a)	
TL/5	232 km² Campbell, Orpheus, Sinbad	03-Nov-12
	Apache* (n/a)	
	Kufpec (n/a)	
	New World (n/a)	
	Tap (n/a)	
TL/6	321 km² Agincourt, Alkimos, Rosette	03-Nov-12
	Apache* (n/a)	
	Tap (n/a)	
	New World (n/a)	
	Kufpec (n/a)	
TL/7	155 km² Roller, Skate	15-Dec-14
	Chevron (n/a)	
	Mobil (n/a)	
	WAPET (n/a)	
	Texaco Aus. (n/a)	
	Shell (n/a)	
TL/8	310 km² Wonnich	20-Sep-19
	Apache* (n/a)	
	New World (n/a)	
	Tap (n/a)	
	Kufpec (n/a)	
RETENTION LEASE		
WA-1-R R2	727 km² Scarborough	03-Aug-04
	BHP* (50.00)	
	Esso (50.00)	
WA-2-R R1	830 km² Gorgon	08-Jun-02
	Chevron* (28.57)	
	Texaco Aus. (28.57)	
	Shell (28.57)	
	Mobil (14.29)	
WA-3-R R1	83 km² Gorgon	08-Jun-02
	Chevron* (28.57)	
	Texaco Aus. (28.57)	
	Shell (28.57)	
	Mobil (14.29)	
WA-4-R R1	166 km² Spar	08-Jun-02
	Chevron* (28.57)	
	Mobil (14.29)	
	Texaco Aus. (28.57)	
	Shell (28.57)	
WA-5-R R1	249 km² West Tryal Rocks	08-Jun-02
	Chevron* (28.57)	
	Shell (28.57)	
	Texaco Aus. (28.57)	
	Mobil (14.29)	
WA-6-R	830 km² Petrel	31-Jan-05
	Bonaparte* (44.51)	
	Santos (35.49)	
	Boral (5.00)	
	Alliance (15.00)	
WA-7-R	249 km² Wilcox	08-Nov-05
	Woodside* (16.66)	
	Shell (16.66)	
	Japan Australia LNG (16.66)	
	Chevron (16.66)	
	BP (16.66)	
	BHP (16.66)	
WA-9-R	83 km² Dixon	05-Dec-00
	Woodside* (16.66)	
	Japan Australia LNG (16.66)	
	Shell (16.66)	
	BP (16.66)	
	BHP (16.66)	
	Chevron (16.66)	
WA-10-R	166 km² Egret, Montague	05-Dec-00
	Woodside* (16.66)	
	BHP (16.66)	
	BP (16.66)	
	Chevron (16.66)	
	Japan Australia LNG (16.66)	
	Shell (16.67)	
WA-11-R	83 km² Rankin	30-Jan-01
	Woodside* (16.67)	
	BP (16.66)	
	Chevron (16.66)	
	Japan Australia LNG (16.66)	
	Shell (16.66)	
	BHP (16.66)	
WA-12-R	415 km² Macedon/Pyrenees	12-Oct-03
	BHP* (71.43)	
	Mobil (28.57)	
WA-13-R	134 km² Turtle	10-Oct-05
	Cultus* (52.90)	
	Basin (23.50)	
	Frontier (5.90)	
	OMV (17.70)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
WA-14-R	81 km²	08-Nov-05
	Chevron* (28.57)	
	Texaco Aus. (28.57)	
	Shell (28.57)	
	Mobil (14.29)	
TR/1	160 km²	31-Jan-04
	Apache* (n/a)	
	Kufpec (n/a)	
	New World (n/a)	
	Tap (n/a)	
TR/2	80 km²	31-Jan-04
	Apache* (n/a)	
	Tap (n/a)	
	New World (n/a)	
	Kufpec (n/a)	
ONSHORE		
EXPLORATION PERMIT		
EP 23 R5	697 km²	04-Jul-01
	Ausam* (n/a)	
	Carnarvon (n/a)	
	Phoenix (n/a)	
	Rothschild (n/a)	
	AWE (n/a)	
EP 36 R3	83 km²	26-Feb-03
	Woodside* (n/a)	
	BP (n/a)	
	Chevron (n/a)	
	Shell (n/a)	
	BHP (n/a)	
EP 41 R5	697 km²	27-Aug-02
	Lansvale* (n/a)	
	Rough Range (n/a)	
	Pace (n/a)	
EP 61 R5	310 km² Pasco	11-Sep-02
	Mobil (n/a)	
	Chevron (n/a)	
	Texaco Aus. (n/a)	
	WAPET (n/a)	
	Shell (n/a)	
EP 62 R5	77 km²	11-Sep-02
	Chevron (n/a)	
	Mobil (n/a)	
	Shell (n/a)	
	Texaco Aus. (n/a)	
	WAPET (n/a)	
EP 65 R5	155 km² Crest	11-Sep-02
	Chevron* (n/a)	
	WAPET (n/a)	
	Texaco Aus. (n/a)	
	Mobil (n/a)	
	Shell (n/a)	
EP 66 R5	83 km²	11-Sep-02
	Chevron* (n/a)	
	Mobil (n/a)	
	Shell (n/a)	
	Texaco Aus. (n/a)	
	WAPET (n/a)	
EP 104 R4	996 km²	09-Nov-04 (R.P.)
	Basin* (n/a)	
	Kimberley Oil (n/a)	
	Stirling (n/a)	
	Kiwi (n/a)	
	Indigo Oil (n/a)	
	Gulliver (n/a)	
	First Australian (n/a)	
	Arc Energy (n/a)	
	Pelsoil (n/a)	
EP 110 R4	691 km²	23-Jan-05
	Carnarvon* (n/a)	
	Rothschild (n/a)	
	Euro Pacific (n/a)	
	Hardman (n/a)	
	Kiwi (n/a)	
	Pan Pacific (n/a)	
	Radford R A (n/a)	
EP 111 R4	913 km²	22-Feb-05 (R.P.)
	Jervois* (100.00)	
EP 129 R3	1 328 km²	01-May-01 (R.P.)
	Terratek WA* (n/a)	
	Shebandowan (n/a)	
	Arc Energy (n/a)	
	Karimbla (n/a)	
	Capital Energy (n/a)	
EP 137 R4	1 360 km²	23-May-05
	Tap* (n/a)	
	JED NWS (n/a)	
EP 307 R3	161 km²	17-Sep-05
	Apache* (n/a)	
	Tap (n/a)	
	New World (n/a)	
	Kufpec (n/a)	
EP 320 R2	1 316 km²	16-Mar-02
	Origin* (n/a)	
	Phoenix (n/a)	
	AWE (n/a)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
EP 321 R2	1 755 km²	01-Jul-03
	Ausam* (n/a)	
	AWE (n/a)	
	Capital Consultant (n/a)	
	Carnarvon (n/a)	
	Phoenix (n/a)	
	Rothschild (n/a)	
EP 341 R2	1 239 km²	22-May-05
	Apache* (n/a)	
	Carnarvon (n/a)	
	Origin (n/a)	
	Tap Oil (n/a)	
	Peedamullah (n/a)	
	Phoenix (n/a)	
	Gulf (n/a)	
	Asamera (n/a)	
	Southern Diamond (n/a)	
	Newfield (n/a)	
	AWE (n/a)	
EP 353 R1	12 452 km²	20-Jul-03
	Shell* (n/a)	
EP 357 R1	232 km²	10-Oct-01
	Shell* (n/a)	
	WAPET (n/a)	
	Chevron (n/a)	
	Mobil (n/a)	
	Texaco Aus. (n/a)	
EP 358 R1	387 km²	14-Nov-04
	Apache* (n/a)	
	Tap (n/a)	
	New World (n/a)	
	Kufpec (n/a)	
EP 359 R1	1 626 km²	06-Apr-04
	Lansvale (n/a)	
	Pace (n/a)	
	Tap Oil (n/a)	
	Perthshire (n/a)	
	Sun (n/a)	
	Kestrel (n/a)	
	Petroz (n/a)	
	Phoenix (n/a)	
EP 363 R1	310 km²	11-Aug-02
	Apache* (n/a)	
	Tap (n/a)	
	Kufpec (n/a)	
	AWE (n/a)	
	Cue (n/a)	
EP 364 R1	77 km²	14-Nov-04
	Tap Oil* (n/a)	
	Westranch (n/a)	
	Omega (n/a)	
	Peedamullah (n/a)	
	Tap (n/a)	
EP 366 R1	3 981 km²	04-May-05
	Kimberley Oil* (n/a)	
	Stirling (n/a)	
	Socdet (n/a)	
EP 368 R1	619 km²	21-Sep-02
	AWE* (n/a)	
	Phoenix (n/a)	
EP 369 R1	2 400 km²	12-Oct-03
	Euro Pacific* (n/a)	
EP 371 R1	3 675 km²	04-May-05
	Kimberley Oil* (n/a)	
	Stirling (n/a)	
	Socdet (n/a)	
EP 372 R1	542 km²	12-Oct-03
	AWE* (n/a)	
	Phoenix (n/a)	
EP 373 R1	4 981 km²	23-Aug-03
	Black Rock* (n/a)	
	Union Texas (n/a)	
	Pasminco (n/a)	
EP 374 R1	7 744 km²	29-Sep-03
	Nerdlihc* (n/a)	
EP 375 R1	7 744 km²	29-Sep-03
	Nerdlihc* (n/a)	
EP 376 R1	7 744 km²	29-Sep-03
	Nerdlihc* (n/a)	
EP 380 R1	11 615 km²	13-Jul-03
	Amadeus* (n/a)	
	Jagen Nominees (n/a)	
EP 381 R1	1 417 km²	10-Dec-03
	Amity* (n/a)	
	Forcenergy (n/a)	
	Southern Amity (n/a)	
	Geopetro (n/a)	
	Empire (n/a)	
EP 386 R1	7 554 km² Bonaparte, Garimala, Ningbing, Waggon Creek	11-Jan-04
	Amity* (n/a)	
	Frontier (n/a)	
	Geopetro (n/a)	
	Bonaparte Gulf (n/a)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
EP 389 R1	2 052 km²	24-Sep-05
	CalEnergy Gas* (n/a)	
	Empire (n/a)	
EP 390	10 792 km²	18-Jan-01 (R.P.)
	Kimberley Oil* (n/a)	
	Stirling (n/a)	
EP 391	9 796 km²	18-Jan-01 (R.P.)
	Kimberley Oil* (n/a)	
	Stirling (n/a)	
EP 394	77 km²	18-Jan-01
	AWE* (n/a)	
	Phoenix (n/a)	
EP 398	472 km²	18-Jan-02
	Santos* (100.00)	
EP 405	8 750 km²	12-Nov-02
	Empire* (n/a)	
EP 407	1 755 km²	04-Mar-03
	Ausam* (n/a)	
	Phoenix (n/a)	
	Capital Consultant (n/a)	
	Carnarvon (n/a)	
	AWE (n/a)	
EP 408	1 755 km²	01-Jul-03
	Amity* (n/a)	
	Southern Amity (n/a)	
	Geopetro (n/a)	
	Forcenergy (n/a)	
EP 410	1 549 km²	29-Sep-03
	Gulliver* (n/a)	
	Indigo Oil (n/a)	
	Falcore (n/a)	
EP 411	1 147 km²	26-Aug-04
	Empire* (n/a)	
	CalEnergy Gas (n/a)	
EP 412	5 343 km²	18-Mar-04
	Flare* (100.00)	
	ESU (n/a)	
	Dick Cooper (n/a)	
	Zadar (n/a)	

Title	Area and Title holder	Expiry date
EP 413 R1	852 km²	25-Aug-04
	Origin* (n/a)	
	Rothschild (n/a)	
	Premier (n/a)	
	Phoenix (n/a)	
	Hughes, D J (n/a)	
	Hughes, D A (n/a)	
	Geary, J K (n/a)	
	Euro Pacific (n/a)	
	Empire (n/a)	
	Cladium (n/a)	
	Carnarvon (n/a)	
	Burns V W (n/a)	
	Ausam (n/a)	
	Burns A R (n/a)	
EP 414 R1	1 012 km²	25-Aug-04
	AWE* (n/a)	
	Burns V W (n/a)	
	Empire (n/a)	
	Ausam (n/a)	
	Boral (n/a)	
	Burns A R (n/a)	
	Carnarvon (n/a)	
	Euro Pacific (n/a)	
	Geary, J K (n/a)	
	Hughes, D A (n/a)	
	Phoenix (n/a)	
	Rothschild (n/a)	
	Cladium (n/a)	
	Hughes, D J (n/a)	
EP 415	1 417 km²	25-Aug-05
	Empire* (100.00)	
EP 416	3 847 km²	25-Aug-05
	Empire* (100.00)	
EP 417	6 475 km²	21-Feb-06
	New Standard* (100.00)	
EP 418	22 814 km²	19-Apr-06
	Jubilee* (100.00)	
EP 419	607 km²	18-Oct-06
	Black Rock* (100.00)	
PRODUCTION LICENCE		
L 1 R1	387 km² Dongara	17-May-14
	Arc Energy* (n/a)	
	CMS (n/a)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
L 1H R1	697 km² Barrow Island	09-Feb-09
	Chevron* (n/a)	
	WAPET (n/a)	
	Texaco Aus. (n/a)	
	Shell (n/a)	
	Mobil (n/a)	
L 2 R1	310 km² Dongara	17-May-14
	Arc Energy* (n/a)	
L 4	387 km² Woodada	24-Mar-04
	Phoenix* (n/a)	
L 5	310 km² Woodada	28-Dec-04
	Phoenix* (n/a)	
L 6	415 km² Blina	22-Sep-04
	Terratek* (n/a)	
	Arc Energy (n/a)	
	Capital Energy (n/a)	
	Karimbla (n/a)	
	Shebandowan (n/a)	
L 7	155 km² Mount Horner	13-May-05
	AWE* (n/a)	
	Phoenix (n/a)	
L 8	332 km² Sundown, West Terrace	21-Oct-05
	Terratek* (n/a)	
	Karimbla (n/a)	
	Capital Energy (n/a)	
	Arc Energy (n/a)	
	Shebandowan (n/a)	
L 9	232 km² Tubridgi	03-Jun-08
	Sagasco* (n/a)	
	Tubridgi (n/a)	
	Origin (n/a)	
	Pan Pacific (n/a)	
L 10	619 km² Barrow Island	03-Feb-09
	Chevron (n/a)	
	Mobil (n/a)	
	Shell (n/a)	
	Texaco Aus. (n/a)	
	WAPET (n/a)	
L 11	77 km² Beharra Springs	14-May-13
	Origin* (n/a)	
	AWE (n/a)	
NORTHERN TERRITORY		
OFFSHORE		
EXPLORATION PERMIT		
NT/P46	3 653 km²	04-Mar-02
	Cultus* (75.00)	
	Frontier (5.00)	
	Basin (20.00)	
NT/P47	11 456 km²	02-Jun-02
	Shell* (75.00)	
	NGA (15.00)	
	Osaka (10.00)	
NT/P48	12 369 km² Evans Shoal	02-Jun-02
	Shell* (75.00)	
	NGA (15.00)	
	Osaka (10.00)	
NT/P49	9 131 km² Lynedoch	14-May-03
	Shell* (66.67)	
	Woodside (33.33)	
NT/P55	7 720 km² Sunrise	18-Jan-05
	Woodside* (23.34)	
	Osaka (10.00)	
	Phillips (33.33)	
	Shell (33.33)	
NT/P56	4 649 km² Sunrise	18-Jan-05
	Roma* (50.00)	
	Guinness Peat (50.00)	
NT/P57	4 234 km²	18-Jan-05
	Woodside* (90.00)	
	Shell (10.00)	
NT/P58	8 467 km²	16-Aug-05
	Nexen* (100.00)	
NT/P59	8 301 km²	16-Aug-05
	Nexen* (100.00)	
NT/P60	9 298 km²	16-Aug-05
	TSP Arafura* (100.00)	
RETENTION LEASE		
NT/RL1	747 km² Petrel	31-Jan-05
	Santos* (35.49)	
	Alliance (15.00)	
	Bonaparte (44.51)	
	Boral (5.00)	
NT/RL2	1 826 km² Sunrise, Troubadour	04-Dec-01
	Woodside* (56.67)	
	Osaka (10.00)	
	Phillips (8.33)	
	Shell (25.00)	
ONSHORE		
EXPLORATION PERMIT		
EP 66	9 547 km² Spirit Hill	01-Aug-99
	Amity* (56.50)	
	Geopetro (8.50)	
	Frontier (15.00)	
	Bonaparte Gulf (20.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
EP 69	1 394 km²	
	IOR* (36.72)	
	Moroil (28.00)	
PRODUCTION LICENCE		
L3	616 km² Palm Valley	08-Nov-03
	Magellan* (50.78)	
	Canso (15.38)	
	Farmout (9.38)	
	Kufpec (1.25)	
	Santos (23.22)	
L4	123 km² Mereenie	17-Nov-02
	Santos* (6.25)	
	Farmout (6.25)	
	United Oil & Gas (15.00)	
	Transoil (9.00)	
	Petromin (7.50)	
	Magellan (20.00)	
	Canso (15.00)	
	Moonie (21.00)	
L5	158 km² Mereenie	17-Nov-02
	Santos* (6.25)	
	Transoil (9.00)	
	Petromin (7.50)	
	United Oil & Gas (15.00)	
	Magellan (20.00)	
	Farmout (6.25)	
	Canso (15.00)	
	Moonie (21.00)	
RETENTION LEASE		
RL 1	166 km² Weaber	09-Oct-00
	Amity* (76.50)	
	Frontier (15.00)	
RL 2	465 km² Dingo	26-Oct-03
	Santos* (49.88)	
	Transoil (1.53)	
	Moonie (3.56)	
	Magellan (34.34)	
	Farmout (5.50)	
	Canso (5.14)	
	Petromin (0.02)	
TERRITORY OF ASHMORE AND CARTIER ISLANDS ADJACENT AREA		
OFFSHORE		
EXPLORATION PERMIT		
AC/P4 R2	1 992 km²	04-May-02
	Woodside* (80.00)	
	Cultus (20.00)	

Title	Area and Title holder	Expiry date
AC/P8	996 km²	23-Jan-02 (R.P.)
	BHP* (25.00)	
	Shell (25.00)	
	Woodside (41.66)	
	Mid-Eastern (8.33)	
AC/P15	3 653 km² Dillon Shoals	17-Apr-02
	Santos* (33.33)	
	Yukong (10.00)	
	AEC (23.33)	
	Kerr-McGee (33.33)	
AC/P16	4 234 km²	17-Apr-02
	Woodside* (60.00)	
	Shell (40.00)	
AC/P17	581 km² Audacious, Tenacious	17-Apr-02
	Cultus* (35.00)	
	Woodside (30.00)	
	Cosmo (35.00)	
AC/P18	1 660 km²	29-May-03
	Cultus* (25.00)	
	Cosmo (25.00)	
	Newfield (25.00)	
	Pan Canadian (25.00)	
AC/P19	1 494 km² Sahul Shoals	29-May-03
	Indo-Pacific* (65.00)	
	Mosaic (35.00)	
AC/P20	1 494 km² Maple	29-May-03
	Coastal* (50.00)	
	Todd (10.00)	
	Newfield (40.00)	
AC/P21	1 577 km² East Swan, Eclipse, Swan	29-May-03
	Coastal* (40.00)	
	AGIP (30.00)	
	Newfield (30.00)	
AC/P22	1 826 km² Puffin	29-May-03
	Ashmore* (20.00)	
	Westranch (20.00)	
	AEC (60.00)	
AC/P23	4 649 km² Crux, Keeling, Maret	31-Aug-03
	Nippon* (75.00)	
	Timor Sea P/L (25.00)	
AC/P24	1 660 km²	25-Feb-04
	Cultus* (33.34)	
	AEC (33.33)	
	Newfield (33.33)	
AC/P25	1 162 km²	25-Feb-04
	Flare* (100.00)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date
AC/P26	415 km²	25-Feb-04
	Mosaic* (35.00)	
	West Oil (30.00)	
	Trans-Orient (35.00)	
AC/P27	1 162 km²	25-Feb-04
	Arc Energy* (50.00)	
	Flare (50.00)	
AC/P28	4 400 km²	16-Jun-04
	West Oil* (100.00)	
AC/P29	4 068 km²	16-Jun-04
	Japex* (100.00)	
AC/P30	4 068 km²	16-Jun-04
	BHP* (66.67)	
	AEC (33.33)	
AC/P31	83 km²	11-Sep-05
	Indo-Pacific* (65.00)	
	Mosaic (35.00)	
AC/P32	1 079 km²	27-Feb-07
	Daytona* (36.00)	
	Eagle Bay (30.00)	
	Westranch (34.00)	
PRODUCTION LICENCE		
AC/L1	332 km² Jabiru, Pengana	16-Jul-06
	Newfield* (50.00)	
	Santos (10.31)	
	Anadarko (14.69)	
	OMV (18.75)	
	Mobil (6.25)	
AC/L2	332 km² Challis	16-Jul-06
	Newfield* (50.00)	
	Anadarko (14.69)	
	Mobil (6.25)	
	OMV (18.75)	
	Santos (10.31)	
AC/L3	747 km² Cassini, Challis	28-Jan-09
	Newfield* (50.00)	
	Santos (10.31)	
	Mobil (6.25)	
	Anadarko (14.69)	
	OMV (18.75)	
AC/L4	332 km² Birch, Skua, Swift	11-Oct-11
	Newfield* (47.31)	
	Santos (33.63)	
	Anadarko (5.49)	
	AWE (3.44)	
	Mobil (10.13)	
AC/L5	166 km² Corallina, Laminaria	05-Feb-18
	Woodside* (58.33)	
	Shell (25.00)	
	Mid-Eastern (8.33)	
	BHP (8.33)	
RETENTION LEASE		
AC/RL1	83 km² Talbot	31-Jan-05
	West Oil* (100.00)	
AC/RL2	415 km²	02-Mar-02
	Santos* (100.00)	
AC/RL3	249 km² Bilyara, Montara, Tahbilk	22-Feb-02
	Nexen* (100.00)	
JOINT PETROLEUM DEVELOPMENT AREA		
OFFSHORE		
EXPLORATION PERMIT		
ZOCA 91-01	1 225 km² Jahal	08-Jan-02
	Woodside* (40.00)	
	Inpex (35.00)	
	Santos (25.00)	
ZOCA 91-02	1 344 km²	16-Dec-01
	Shell* (100.00)	
ZOCA 91-09	1 238 km²	08-Jan-02
	Shell* (60.00)	
	Enterprise (20.00)	
	Southern Diamond (20.00)	
ZOCA 91-12	1 470 km² Bayu, Bayu/Undan, Elang, Flamingo, Kakatua	06-Feb-02
	Phillips* (42.42)	
	Petroz (13.37)	
	Inpex (21.21)	
	Santos (21.43)	
	Emet (1.58)	
ZOCA 91-13	1 406 km² Bayu/Undan, Fohn	16-Dec-01
	Phillips* (60.00)	
	AGIP (15.00)	
	Kerr-McGee (25.00)	
ZOCA 94-07	2 401 km²	28-Mar-01
	Woodside* (10.00)	
	Shell (90.00)	
ZOCA 95-19	2 262 km² Sunrise, Troubadour	03-Oct-02
	Woodside* (24.33)	
	Osaka (10.00)	
	Phillips (33.33)	
	Shell (32.33)	

APPENDIX K (cont'd)

Title	Area and Title holder	Expiry date	Title	Area and Title holder	Expiry date
ZOCA 96-16	2 684 km²	15-Nov-02			
	Phillips* (66.00)				
	NWE (14.00)				
	ZOCA 96-16 (10.00)				
ZOCA 96-20	3 216 km² Sunrise	11-Nov-02			
	Woodside* (23.33)				
	Osaka (10.00)				
	Phillips (33.33)				
	Shell (33.33)				
ZOCA 00-21	3 071 km²				
	Phillips* (75.00)				
	AGIP (25.00)				

NOTE:
*: Denotes the operator for the title.
(R.P.): Renewal Pending
(n/a): Equity not available.
"Area" refers to 5' X 5' graticular blocks unless otherwise indicated.

APPENDIX K: PETROLEUM EXPLORATION AND DEVELOPMENT TITLES, 2001
PETROLEUM TITLES BY COMPANY

Listed below in an alphabetical order are all petroleum companies that hold interest, whole or in part, in the current petroleum titles.

AEC International (Australia) Pty Ltd

Western Australia	WA-214-P R1, WA-298-P
Ashmore-Cartier	AC/P15, AC/L1, AC/L2, AC/L3, AC/P24, AC/P22, AC/P30

AGIP

JPDA	ZOCA 00-21

AGIP Australia 91-13 Ltd

JPDA	ZOCA 91-13

AGIP Australia Ltd

Western Australia	WA-313-P
Ashmore-Cartier	AC/P21

AGIP Exploration BV

Western Australia	WA-292-P

AGIP ZOCA 95-18 B.V.

JPDA	ZOCA 95-18

Air Liquide Australia Ltd

South Australia	PPL21

Allender J F

South Australia	PEL 82

Alliance Minerals Australia NL

Queensland	PL21, PL22, PL27, PL64
Western Australia	WA-6-R

Alliance Petroleum Australia Pty Ltd

South Australia	PPL169, PPL170, PPL 6, PPL 7, PPL 8, PPL171, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL137, PPL138, PPL139, PPL140, PPL141, PPL143, PPL144, PPL145, PPL146, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL183, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181

Alvin Hosking

South Australia	PEL 82

Amadeus Petroleum NL

Western Australia	EP 380 R1

Amity Oil NL

Queensland	ATP598P
Western Australia	EP 325 R2, EP 381 R1, EP 386 R1, EP 408
Northern Territory	EP 66, RL 1

Ampolex (PPL) Pty Ltd

Western Australia	TL/2, WA-149-P R3, TP/ 7 R2

Anadarko Australia Company Pty Ltd

South Australia	EPP28, EPP29, EPP30

Angari Pty Ltd

Queensland	ATP212P, PL21, PL22, PL27, PL30, PL56, PL64, PL71, PL74

Anthony Barton Pty Ltd

Northern Territory	RL 1

Antrim Energy Inc.

Western Australia	WA-306-P, WA-307-P

APPENDIX K cont'd

Apache AE Pty Ltd

Western Australia	WA-214-P R1

Apache East Spar Pty Ltd

Western Australia	WA-13-L

Apache Harriet Pty Ltd

Western Australia	EP 358 R1, TL/6, TL/8, TR/1, TL/1, TL/5, TP/ 8 R2, TR/2, WA-192-P R3, EP 307 R3

Apache Kersail Pty Ltd

Western Australia	WA-13-L

Apache Lowendal Pty Ltd

Western Australia	TL/6, TL/8, TR/1, TR/2, WA-192-P R3, EP 358 R1, EP 307 R3, TL/1, TL/5, TP/ 8 R2

Apache Miladin Pty Ltd

Western Australia	TL/6, TL/8, TR/1, TR/2, WA-192-P R3, EP 358 R1, EP 307 R3, TL/1, TL/5, TP/ 8 R2

Apache Nasmah Pty Ltd

Western Australia	TL/6, TL/8, TR/1, TR/2, WA-192-P R3, EP 358 R1, EP 307 R3, TL/1, TL/5, TP/ 8 R2

Apache Northwest Pty Ltd

Western Australia	EP 358 R1, EP 363 R1, EP 395, TP/ 9 R2, TL/6, TL/8, TL/1, TL/5, TR/1, TP/ 8 R2, TP/ 9 R1, TR/2, WA-15-L, WA-192-P R3, WA-1-P R5, TR/3, WA-20-L, WA-215-P R1, WA-256-P, WA-257-P, WA-261-P, TP/ 6 R2, WA-254-P PARTS 1,3 & 4, WA-254-P PART 2, EP 342 R2, EP 307 R3, EP 403, WA-209-P R2, WA-246-P R1

Apache Oil Australia Pty Ltd

Western Australia	TL/2, WA-13-L, WA-149-P R3, WA-214-P R1, EP 409, TP/ 7 R2, WA-298-P

APS Oil Pty Ltd

Queensland	ATP548P

Arc Energy NL

Western Australia	L 1 R1, L 2 R1, WA-286-P
Ashmore-Cartier	AC/P27

Arrow Energy NL

Queensland	ATP689P, ATP686P, ATP683P, ATP678P, ATP679P
New South Wales	PEL432

Asamera Australia Ltd

Western Australia	TP/ 9 R1

Ashmore Oil Pty Ltd

Ashmore-Cartier	AC/P22

Associated Petroleum Pty Ltd

Queensland	ATP336P, PL 3, PL 4, PL 5, PL 6, PL 7, PL 8, PL 9, PL10, PL12, PL13, PL11, PL28, PL69, PL89, PL93

Ausam Resources NL

Western Australia	EP 321 R2, EP 23 R5, EP 407, EP 413 R1, EP 414 R1

Australian Coalbed Methane Pty Ltd

Queensland	ATP574P, ATP676P
New South Wales	PEL1, PEL10, PEL12, PEL286, PEL435, PEL436

Australian Gasfields Ltd

Queensland	PL24, PL25, PL26, PL36, ATP269P, ATP549P, PL105, PL107, PL115, PL116, PL23, PL77, PL35, PL78, PL62, PL65, PL76, PL79, PL82, PL87, PL175, PL181, PL182, PL184, PL109, PL133, PL149

Australian Petroleum Industries Pty Ltd

Queensland	ATP544P

AWE (Perth Basin) Ltd

Western Australia	EP 320 R2, EP 413 R1, L 11, TP/15, EP 23 R5

AWE Oil (WA) NL

Western Australia	WA-286-P

AWE Petroleum Ltd

Tasmania	T/RL1, T/18P R3
South Australia	PEL 84
Western Australia	EP 342 R2, EP 363 R1, EP 368 R1, TP/ 9 R2, TP/ 9 R1

Azeeza Pty Ltd

Queensland	ATP593P

Basin Oil NL

Victoria	VIC/RL1(V)
South Australia	PPL169, PPL170, PPL 6, PPL 7, PPL 8, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL137, PPL138, PPL139, PPL140, PPL141, PPL143, PPL144, PPL145, PPL146, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL183, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL171, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181
Western Australia	EP 104 R4, WA-13-R
Northern Territory	NT/RL3

APPENDIX K cont'd

Basin Oil Pty Ltd

Victoria	VIC/RL5, VIC/L21

Bass Petroleum (Victoria) Pty Ltd

Victoria	PEP162

Bass Petroleum Pty Ltd

Victoria	PEP131

Bass Strait Oil Company Pty Ltd

Victoria	VIC/P42

Beach Oil & Gas Pty Ltd

South Australia	PEL 82, PEL 83

Beach Petroleum NL

Queensland	PL31, PL32, PL47
Victoria	PEP154, PPL6, PPL9, PPL 10
South Australia	PEL 92, PEL 94, PEL 95, PEL 135, PEL 136, PEL 66
Western Australia	WA-281-P, WA-282-P, WA-283-P

Beaconsfield Energy Development Pty Ltd

Queensland	ATP529P

Benaris International NV

Tasmania	T/30P

BHP Billiton Petroleum (Bass Strait) Pty Ltd

Victoria	VIC/L 1, VIC/L 2, VIC/L 3, VIC/L 4, VIC/L 5, VIC/L 6, VIC/L 7, VIC/L 8, VIC/L 9 R1, VIC/L10, VIC/L11, VIC/L13, VIC/L14, VIC/L15, VIC/L16, VIC/L17, VIC/L18, VIC/L19, VIC/L20, VIC/RL4

BHP Billiton Petroleum (Victoria) Pty Ltd

Victoria	VIC/RL1, VIC/RL2, VIC/RL7, VIC/RL8

BHP Coal Pty Ltd

Queensland	ATP364P

BHP Petroleum (Australia) Pty Ltd

Victoria	VIC/P45
Western Australia	WA-10-L, WA-11-L, WA-12-L, WA-12-R, WA-155-P R3, WA-1-L, WA-239-P R1, WA-255-P R1, WA-289-P, WA-290-P
Ashmore-Cartier	AC/P30

BHP Petroleum (North West Shelf) Pty Ltd

Western Australia	EP 36 R3, WA-10-R, WA-11-R, WA-16-L, WA-18-L, WA-19-L, WA-1-R R2, WA-21-L, WA-260-P, WA-275-P, WA-28-P R5, WA-296-P, WA-2-L, WA-33-P R3, WA-3-L, WA-4-L, WA-5-L, WA-6-L, WA-7-R, WA-9-L, WA-9-R, WA-23-L, TP/ 4, WA-24-L, WA-301-P, WA-302-P, WA-303-P, WA-304-P, WA-305-P
Ashmore-Cartier	AC/L5, AC/P8

BHP Steel (AIS) Pty Ltd

New South Wales	PML1, PML2

Black Rock Petroleum NL

Western Australia	EP 373 R1

Black Rock Resources Australia NL

Western Australia	EP 419

BNG (Surat) Pty Ltd

Queensland	ATP684P, ATP693P, ATP645P

BNG Pty Ltd

Queensland	ATP641P, ATP643P, ATP644P

Bobwyns Pty Ltd

Queensland	ATP621P

Boggy Creek Pty Ltd

Victoria	PPL3

Bonaparte Gas & Oil Pty Ltd

Western Australia	WA-18-P R5, WA-6-R
Northern Territory	NT/RL1

Bonaparte Gulf Oil & Gas Pty Ltd

Western Australia	EP 386 R1
Northern Territory	EP 66

Bonnerwell Pty Ltd

Queensland	ATP619P

Boral Energy Bonaparte Pty Ltd

Western Australia	WA-6-R
Northern Territory	NT/RL1

Bounty Oil & Gas NL

New South Wales	PEP 11
Western Australia	WA-310-P

BP Developments Australia Pty Ltd

Western Australia	EP 36 R3, WA-10-R, WA-11-L, WA-11-R, WA-16-L, WA-1-L, WA-28-P R5, WA-2-L, WA-33-P R3, WA-3-L, WA-4-L, WA-5-L, WA-6-L, WA-7-R, WA-9-L, WA-9-R, WA-23-L, TP/ 4, WA-24-L

BP Exploration (Alpha) Ltd

Western Australia	WA-267-P

BP Petroleum Developments (NWS) Pty Ltd

Western Australia	WA-275-P, WA-294-P, WA-296-P, WA-297-P

APPENDIX K cont'd

Bridge Oil Developments Pty Ltd

South Australia	PPL169, PPL170, PPL 6, PPL 7, PPL 8, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL137, PPL138, PPL139, PPL140, PPL141, PPL143, PPL144, PPL145, PPL146, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL171, PPL183, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181

Bridge Oil Exploration Pty Ltd

Queensland	ATP212P, PL30, PL56, PL74
Victoria	VIC/RL1(V)

Brisbane Petroleum NL

Queensland	ATP552P, PL18, PL40

British Borneo Australia Ltd

Western Australia	WA-208-P R1, WA-234-P, WA-22-L

British Borneo Exploration Inc.

Western Australia	WA-295-P

Burns, Alan Robert

Western Australia	EP 413 R1, EP 414 R1

Cadex Petroleum Pty Ltd

Western Australia	WA-226-P R1

CalEnergy Gas (UK) Ltd

Victoria	VIC/P43
Tasmania	T/RL1, T/18P R3
Western Australia	EP 389 R1

Canso Resources Ltd

Northern Territory	L3, L4, L5, RL 2

Capital Consultant Services Pty Ltd

Western Australia	EP 321 R2, EP 407

Capital Energy NL

New South Wales	PEL283

Capricorn Energy Pty Ltd

Queensland	ATP529P

Carnarvon Oil and Gas NL

Western Australia	WA-254-P PART 2

Carnarvon Petroleum NL

Western Australia	EP 342 R2, TP/ 9 R2, TP/ 9 R1, WA-254-P PARTS 1,3 & 4, EP 414 R1, EP 110 R4

CH4 Pty Ltd

Queensland	ATP364P

Chevron Asiatic Ltd

Western Australia	EP 357 R1, EP 61 R5, EP 62 R5, EP 66 R5, L 10, L 1H R1, TL/3, TL/4, TL/7, TP/14, WA-10-R, WA-11-L, WA-11-R, WA-16-L, WA-1-L, WA-215-P R1, WA-253-P, WA-25-P R5, WA-267-P, WA-275-P, WA-28-P R5, WA-294-P, WA-296-P, WA-297-P, WA-2-L, WA-2-R R1, WA-33-P R3, WA-35-P R5, WA-3-L, WA-3-R R1, WA-4-L, WA-4-R R1, WA-5-L, WA-5-R R1, WA-6-L, WA-7-L, WA-7-R, WA-9-L, WA-9-R, WA-15-R, WA-23-L, TP/ 2 R2, TP/ 3 R2, WA-24-L, WA-14-R, WA-205-P R2

Chevron Australia Pty Ltd

Western Australia	EP 36 R3, TP/ 4, WA-1-L

Chevron Overseas Petroleum Ltd

Western Australia	EP 357 R1, EP 66 R5, TL/4, TL/7, TP/ 3 R2

Chimelle Petroleum Ltd

Queensland	ATP267P, PL33, PL50, PL51
Western Australia	EP 104 R4

CMS Gas Transmission of Australia

Western Australia	L 1 R1

Coastal Development III Ltd

Western Australia	WA-283-P

Coastal Oil & Gas Australia 20 Pty Ltd

Ashmore-Cartier	AC/P20

Coastal Oil & Gas Australia 21 Pty Ltd

Ashmore-Cartier	AC/P21

Cobrex Pty Ltd

Queensland	ATP587P

Coogee Resources Pty Ltd

Ashmore-Cartier	AC/RL3

Cooper-Eromanga Oil Inc.

Queensland	ATP582P

Cosmo Oil Ashmore Ltd

Ashmore-Cartier	AC/P17

Cosmo Oil Cartier Ltd

Ashmore-Cartier	AC/P18

Coveyork Pty Ltd

Western Australia	WA-274-P

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CPC Energy Pty Ltd

Queensland	ATP299P, PL29, PL38, PL39, PL52, PL57, PL95, PL169, PL170

Crusader (Victoria) Pty Ltd

Victoria	VIC/RL2

Cue Exploration Pty Ltd

Western Australia	EP 363 R1

Cultus Timor Sea Ltd

Western Australia	WA-13-R, WA-308-P, WA-309-P
Ashmore-Cartier	AC/P4 R3

Cultus Timor Sea Pty Ltd

Victoria	VIC/RL5

Dana Petroleum (E&P) Ltd

Western Australia	WA-226-P R1

Dana Petroleum (WA) LLC

Western Australia	WA-226-P R1

David M. Schuette

South Australia	PEL 73

Daytona Energy Corporation

Ashmore-Cartier	AC/P32

Delbaere Associates Pty Ltd

Queensland	PL18, PL40

Delhi Petroleum Pty Ltd

Queensland	PL178, PL24, PL25, PL26, PL36, PL105, PL106, PL107, PL108, PL110, PL111, PL112, PL113, PL109, PL114, PL129, PL130, PL131, PL23, PL186, PL77, PL78, PL34, PL35, PL79, PL37, PL55, PL58, PL59, PL60, PL61, PL62, PL63, PL68, PL75, PL76, PL80, PL81, PL83, PL84, PL85, PL82, PL87, PL86, PL88, PL97, ATP259P, PL132, PL134, PL135, PL136, PL139, PL133, PL137, PL138, PL140, PL141, PL142, PL143, PL144, PL145, PL146, PL147, PL148, PL150, PL153, PL154, PL157, PL149, PL158, PL159, PL168, PL175, PL181, PL182, PL177
South Australia	PPL169, PPL170, PPL 6, PPL 7, PPL 8, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL26, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL76, PPL77, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL118, PPL121, PPL122, PPL123, PPL125, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL136, PPL137, PPL138, PPL139, PPL140, PPL141, PPL142, PPL143, PPL144, PPL145, PPL146, PPL147, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL152, PPL156, PPL158, PPL167, PPL131, PPL183, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL187, PPL191, PPL194, PPL197, PPL171, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181, PPL182

Diamond Gas Resources Pty Ltd

Victoria	VIC/L21

Discovery Geo (Australia) Corporation

Queensland	ATP550P

Drillsearch Energy NL

Queensland	PL23, PL24, PL25, PL26, PL35, PL109, PL36, PL62, PL76, PL77, PL29, PL78, PL38, PL39, PL105, PL52, PL57, PL107, PL79, PL82, PL95, PL87, PL133, PL149, PL170, PL175, PL169
Western Australia	WA-317-P, WA-318-P, WA-319-P

Dyad-Australia Inc.

Queensland	ATP554P

Eagle Bay Resources NL

Victoria	VIC/P41, VIC/P47
Ashmore-Cartier	AC/P32

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Eastern Energy Australia Pty Ltd
New South Wales PEL238, PEL422, PEL6

Eastern Star Gas Ltd
New South Wales PEL433

EDC Australia Ltd
Western Australia WA-226-P R1

Emet Pty Ltd
JPDA ZOCA 91-12

Empire Oil Company (WA) Ltd
Western Australia EP 381 R1, EP 405, EP 411, EP 415, EP 416, EP 413 R1, EP 414 R1, EP 389 R1

EnCana Corporation
Victoria VIC/P48, VIC/P49

Enterprise Oil Timor Gap (9) Ltd
JPDA ZOCA 91-09

Eoil Pty Ltd
South Australia PEL 85

Essential Petroleum Resources Ltd
Victoria PEP159, PEP152, VIC/P46
South Australia PEL 72

Esso Australia Resources Ltd
Victoria VIC/L 1, VIC/L 2, VIC/L 3, VIC/L 4, VIC/L 5, VIC/L 6, VIC/L 7, VIC/L 8, VIC/L 9 R1, VIC/L10, VIC/L11, VIC/L13, VIC/L14, VIC/L15, VIC/L16, VIC/L17, VIC/L18, VIC/L19, VIC/L20, VIC/RL1, VIC/RL2, VIC/RL4
Western Australia WA-1-R R2

Euro Pacific Energy Pty Ltd
Western Australia EP 369 R1, EP 406, EP 413 R1, EP 414 R1, EP 110 R4

Falcore Pty Ltd
Western Australia EP 410

Farmout Drillers Pty Ltd
Northern Territory L3, L4, L5, RL 2

First Australian Resources Limited
Western Australia EP 395

First Australian Resources NL
Western Australia EP 104 R4, EP 397, WA-254-P PARTS 1,3 & 4, WA-254-P PART 2

First Sourcenergy Group Inc.
New South Wales PEL421, PEL423, PEL424

Flare Petroleum NL
New South Wales PEP 11
Western Australia EP 412
Ashmore-Cartier AC/P25, AC/P27

Forcenergy International Inc.
Western Australia EP 381 R1

Frontier Bonaparte Pty Ltd
Western Australia EP 386 R1
Northern Territory NT/RL3, EP 66, RL 1

Frontier Exploration Ltd
Western Australia WA-13-R

Galveston Mining Corporation Pty Ltd
Tasmania T/RL1

Geary, John Kevin
Western Australia EP 413 R1, EP 414 R1

Geopetro Resources Company
Western Australia EP 381 R1, EP 386 R1, EP 408
Northern Territory EP 66

Globex Far East
Western Australia WA-15-L, WA-256-P, WA-261-P, WA-209-P R2, WA-246-P R1

Go Resources (Aust) Pty Ltd
New South Wales PEL419, PEL420

Golden West Hydrocarbons Pty Ltd
Queensland PL17

Goodrich Petroleum Company
Western Australia EP 395, EP 397

Great Southland Minerals Pty Ltd
Tasmania EL13/98

Great Southland Petroleum Pty Ltd
New South Wales PEL238

Guinness Peat plc
Tasmania T/31P

Gulf (Aust) Resources NL
Western Australia TP/ 9 R1

Gulf Energy Pty Ltd
Queensland Q/23P

Gulliver Productions Pty Ltd
Western Australia EP 104 R4, EP 410

Hardman Oil and Gas Pty Ltd
Western Australia EP 110 R4

Harlow Australia Pty Ltd
Queensland ATP618P

Hughes and Hughes Oil and Gas
Western Australia EP 353 R1

Hughes, Dan Allen
Western Australia EP 413 R1, EP 414 R1

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Hughes, Dudley Joe

Western Australia	EP 413 R1, EP 414 R1

Hyland Bay Pty Ltd

Queensland	ATP552P

IB Resources Pty Ltd

Western Australia	WA-292-P

Icon Energy Ltd

Queensland	ATP632P, ATP594P, ATP648P, ATP649P, ATP610P

Idemitsu Oil Exploration (Barrow) Pty Ltd

Western Australia	WA-264-P

Indigo Oil Pty Ltd

Western Australia	EP 104 R4, EP 410

Inland Oil (Production) Pty Ltd

Queensland	PL24, PL25, PL26, PL36, ATP269P, PL105, PL107, PL23, PL77, PL78, PL35, PL62, PL109, PL76, PL79, PL82, PL87, PL98, PL175, PL149, PL181, PL182, PL184, PL133

Innovative Technological Geo-Exploration Pty Ltd

Queensland	PL98
Northern Territory	EP 69

Inpex Alpha Ltd

Victoria	VIC/P42, VIC/P45
Western Australia	WA-10-L

Inpex Browse Ltd

Western Australia	WA-285-P

Inpex Sahul Ltd

JPDA	ZOCA 91-12

Inpex Timor Sea Ltd

JPDA	ZOCA 91-01

International Frontier Resources Ltd

Western Australia	WA-274-P

Interstate Energy Pty Ltd

Queensland	ATP552P, PL119

Interstate Pipelines Pty Ltd

Queensland	ATP336P, PL 3, PL 4, PL 5, PL 6, PL 7, PL 8, PL 9, PL10, PL12, PL13, PL11, PL28, PL69, PL89, PL93

IOR Exploration (NT) Pty Ltd

Northern Territory	EP 69

IOR Exploration Pty Ltd

Queensland	ATP548P, PL98

Jagen Nominees Pty Ltd

Western Australia	EP 380 R1

Jakabar Pty Ltd

Queensland	ATP626P

Japan Australia LNG (MIMI) Pty Ltd

Western Australia	WA-10-R, WA-11-L, WA-11-R, WA-16-L, WA-1-L, WA-28-P R5, WA-294-P, WA-296-P, WA-297-P, WA-2-L, WA-3-L, WA-4-L, WA-5-L, WA-6-L, WA-7-R, WA-9-L, WA-9-R, WA-23-L, WA-24-L

Japex AC, Ltd

Ashmore-Cartier	AC/P29

JED North West Shelf Pty Ltd

Western Australia	EP 137 R4

Jervois Mining Ltd

Western Australia	EP 111 R4

Jubilee Oil NL

Western Australia	EP 418

Karimbla Oil Pty Ltd

Western Australia	L 6, L 8, EP 129 R4

Kerr-McGee (ZOC) Energy Pty Ltd

JPDA	ZOCA 91-13

Kerr-McGee NW Shelf Australia Energy Pty Ltd

Western Australia	WA-276-P, WA-277-P, WA-278-P, WA-295-P, WA-301-P, WA-302-P, WA-303-P, WA-304-P, WA-305-P
Ashmore-Cartier	AC/P15

Kestrel Energy Inc.

Western Australia	EP 325 R2, WA-261-P, WA-254-P PARTS 1,3 & 4, WA-254-P PART 2

Kimberley Oil NL

Western Australia	EP 104 R4, EP 390 R1, EP 391 R1, EP 366 R1, EP 371 R1

Kingston Petroleum Pty Ltd

Queensland	ATP682P

Knight Industries Pty Ltd

Victoria	PEP161

Kufpec Australia Pty Ltd

Western Australia	EP 358 R1, TL/6, TL/8, TL/1, TR/1, TL/5, TP/8 R2, TR/2, WA-192-P R3, EP 307 R3, EP 363 R1, WA-246-P R1
Northern Territory	L3

Lakes Oil NL

Victoria	PEP152
South Australia	PEL 57

Lansvale Oil and Gas Pty Ltd

Western Australia	EP 359 R1, EP 41 R5

Liberty Petroleum Corporation

Queensland	ATP616P
Western Australia	WA-314-P, WA-315-P

Lowell Petroleum NL

Queensland	ATP564P

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Magellan Petroleum (Eastern) Pty Ltd

Queensland	ATP613P

Magellan Petroleum (NT) Pty Ltd

South Australia	PEL 94, PEL 95
Northern Territory	L3, L4, L5, RL 2

Magellan Petroleum (WA) Pty Ltd

Western Australia	WA-311-P, WA-281-P, WA-282-P, WA-283-P, WA-287-P, WA-288-P, WA-291-P

Magnum Gold NL

New South Wales	PEL440, PEL439

Maneroo Oil Company Ltd

Queensland	ATP556P, ATP566P

Maple Oil and Exploration NL

New South Wales	PEL8

Mathews, J S

Queensland	ATP651P

Mawson Oil NL

Queensland	PL175

Mawson Petroleum NL

Queensland	PL24, PL25, PL26, PL36, ATP548P, PL105, PL107, PL109, PL23, PL77, PL78, PL35, PL79, PL62, PL76, PL82, PL87, PL133, PL149, PL181, PL182

Metgasco Pty Ltd

New South Wales	PEL16

Mid-Eastern Oil NL

Ashmore-Cartier	AC/L5

Midland Exploration Pty Ltd

Queensland	ATP548P

Millennium Resources Qld Pty Ltd

Queensland	ATP587P

Mirboo Ridge Pty Ltd

South Australia	PEL 57

Mobil (Legendre) Pty Ltd

Western Australia	WA-14-L, WA-202-P R2

Mobil Australia Resources Company Pty Ltd

Victoria	VIC/RL3
Western Australia	EP 357 R1, EP 61 R5, EP 62 R5, EP 66 R5, L 10, TL/3, TL/4, TL/7, TP/14, WA-12-L, WA-12-R, WA-155-P R3, WA-17-L, WA-191-P R3, WA-208-P R1, WA-234-P, WA-257-P, WA-25-P R5, WA-267-P, WA-2-R R1, WA-3-R R1, WA-4-R R1, WA-5-R R1, WA-7-L, WA-8-L, WA-22-L, TP/ 2 R2, TP/ 3 R2, L 1H R1, WA-205-P R2

Mobil Exploration and Producing Australia Pty Ltd

Western Australia	WA-10-L, WA-217-P R1, WA-255-P R1, WA-268-P, WA-14-R, WA-298-P

Moonie Oil NL

Queensland	PL169, PL170, PL176

Moonie Oil Pty Ltd

Queensland	ATP267P, ATP299P, ATP378P, PL29, PL33, PL38, PL39, PL50, PL51, PL52, PL57, PL95
Northern Territory	L4, L5, RL 2

Moroil Pty Ltd

Queensland	PL98
Northern Territory	EP 69

Mosaic Oil NL

Queensland	ATP212P, PL119, PL30, PL46, PL56, PL74
Western Australia	WA-208-P R1
Ashmore-Cartier	AC/P26

Mosaic Oil QLD Pty Ltd

Queensland	ATP709P, ATP212P, ATP244P, ATP471P, PL119, PL48, PL49, PL56, PL66, PL74, PL15, PL16

Natural Gas Australia Pty Ltd

Northern Territory	NT/P47, NT/P48

Nerdlihc Company Inc.

Western Australia	EP 374 R1, EP 375 R1, EP 376 R1

New Standard Exploration NL

Western Australia	EP 417

New World Oil & Developments Pty Ltd

Western Australia	WA-192-P R3

Newfield Australia (Ashmore Cartier) Pty Ltd

Western Australia	TP/ 9 R2
Ashmore-Cartier	AC/RL3, AC/P24, AC/P18

Newfield Australia (Cartier) Pty Ltd

Western Australia	WA-273-P
Ashmore-Cartier	AC/L1, AC/L2, AC/L3, AC/P20, AC/P21

Newfield Exploration Australia Ltd

Western Australia	TP/ 9 R1

News Corp Ltd

Victoria	VIC/RL10, VIC/RL9

Nexen Petroleum Australia Pty Ltd

Western Australia	WA-19-L, WA-21-L, WA-260-P, WA-289-P, WA-290-P, WA-239-P R1
Northern Territory	NT/P60, NT/P58, NT/P59

Nippon Oil Exploration (Dampier) Pty Ltd

Western Australia	WA-191-P R3

Nippon Oil Exploration (Vulcan) Pty Ltd

Ashmore-Cartier	AC/P23

Novus Australia Energy Company Pty Ltd

Western Australia	WA-273-P

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Novus Australia Resources NL

South Australia	PPL169, PPL170, PPL 6, PPL 7, PPL 8, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL26, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL76, PPL77, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL118, PPL121, PPL122, PPL123, PPL125, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL136, PPL137, PPL138, PPL139, PPL140, PPL141, PPL142, PPL143, PPL144, PPL145, PPL146, PPL147, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL152, PPL156, PPL158, PPL167, PPL131, PPL183, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL187, PPL191, PPL194, PPL197, PPL171, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181, PPL182

NWE (ZOCA 96-16) Pty Ltd

JPDA	ZOCA 96-16

Octanex NL

Western Australia	WA-321-P, WA-322-P, WA-323-P

Odyssey International Pty Ltd

Ashmore-Cartier	AC/P19, AC/P31

Oil Company of Australia (Moura) Pty Ltd

Queensland	ATP525P, ATP564P, ATP602P, PL101, PL94

Oil Company of Australia Ltd

Queensland	PL24, PL25, PL26, PL36, ATP212P, ATP269P, ATP299P, ATP337P, ATP375P, ATP470P, ATP525P, ATP553P, PL14, PL101, PL105, PL107, PL109, PL21, PL22, PL23, PL27, PL28, PL77, PL78, PL30, PL31, PL32, PL35, PL41, PL42, PL43, PL44, PL45, PL47, PL79, PL53, PL54, PL56, PL62, PL64, PL67, PL69, PL70, PL71, PL74, PL76, PL82, PL89, PL87, PL133, PL149, PL173, PL174, PL175, ATP692P, PL181, PL182, PL183, PL184
South Australia	PEL 27

Oil Investments Ltd

Queensland	PL21, PL22, PL27, PL28, PL69, PL89

Oil Search (Australia) Pty Ltd

Western Australia	WA-281-P

Oil Wells of Kentucky Inc.

Queensland	ATP560P

Olympus Resources Ltd

Queensland	ATP552P

Omega Oil NL

South Australia	PEL 32, PPL62, PPL168
Western Australia	EP 325 R2

OMV Australia Pty Ltd

Western Australia	WA-13-R

OMV Barrow Pty Ltd

Western Australia	WA-289-P, WA-290-P, EP 409

OMV Beagle Pty Ltd

Western Australia	WA-292-P

OMV Petroleum Pty Ltd

Western Australia	WA-320-P, WA-308-P, WA-309-P

OMV Timor Sea Pty Ltd

Victoria	VIC/L21
Western Australia	WA-320-P
Northern Territory	NT/RL3
Ashmore-Cartier	AC/L1, AC/L2, AC/L3, AC/P17, AC/P24, AC/P18

Origin Energy Amadeus NL

Western Australia	L 9

Origin Energy Developments Pty Ltd

Western Australia	EP 320 R2, L 1 R1, L 2 R1, EP 413 R1, L 11

Origin Energy Petroleum Pty Ltd

Victoria	PEP159, PEP152, PEP160, PPL8
Western Australia	L 9

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Origin Energy Resources Ltd

Queensland	PL177, PL106, PL108, PL111, PL112, PL113, PL114, PL131, PL59, PL60, PL61, PL81, PL83, PL85, PL86, PL97, PL132, PL135, PL139, PL138, PL141, PL145, PL146, PL147, PL148, PL153, PL154, PL157, PL158
Victoria	VIC/P43
Tasmania	T/RL1, T/18P R3, T/30P
South Australia	PEL 83, PPL169, PEL 27, PEL 32, PEL 57, PPL170, PEL 66, PEL 72, PPL 6, PPL 7, PPL 8, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL26, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL62, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL76, PPL77, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL118, PPL121, PPL122, PPL123, PPL125, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL136, PPL137, PPL138, PPL139, PPL140, PPL141, PPL142, PPL143, PPL144, PPL145, PPL146, PPL147, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL152, PPL156, PPL158, PPL167, PPL168, PPL131, PPL183, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL187, PPL191, PPL194, PPL197, PPL171, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181, PPL182
Western Australia	EP 342 R2, TP/ 9 R2, TP/ 9 R1, WA-256-P, WA-257-P, WA-8-L

Origin Northwest Ltd

Tasmania	T/RL1

ORS

New South Wales	PEL438

Osaka Gas Australia Pty Ltd

Northern Territory	NT/P47, NT/P48, NT/P55, NT/RL2
JPDA	ZOCA 95-19, ZOCA 96-20

Otto Oil Pty Ltd

New South Wales	PEL425

Otway Resources Pty Ltd

South Australia	EPP24

Oz-Exoil NL

Northern Territory	NT/P60

Pace Petroleum Pty Ltd

Western Australia	EP 359 R1, EP 41 R5

Pacific Power

New South Wales	PEL13, PEL285, PEL4, PEL426, PEL5

Pagehurst Pty Ltd

Queensland	ATP567P

Pan Canadian Petroleum Ltd

South Australia	EPP28, EPP29, EPP30
Ashmore-Cartier	AC/P18

Pan Continental Oil and Gas NL

Western Australia	EP 104 R4, WA-312-P

Pan Pacific Petroleum (South Aust) Pty Ltd

Western Australia	TL/2, WA-149-P R3, EP 110 R4, TP/ 7 R2, WA-246-P R1

Pan Pacific Petroleum NL

Western Australia	L 9, WA-254-P PARTS 1,3 & 4, WA-254-P PART 2

PanCanadian Petroleum Ltd

Western Australia	WA-234-P, WA-276-P, WA-277-P, WA-278-P, WA-22-L

Pangaea Oil And Gas Pty Ltd

Queensland	ATP620P
New South Wales	PEL 437

Pannonian International Ltd

New South Wales	PEL438

Pasminco Australia Ltd

Western Australia	EP 373 R1

Peedamullah Petroleum Pty Ltd

Queensland	ATP552P
Western Australia	EP 341 R1, EP 364 R1, EP 341 R2

Pelsoil NL

Western Australia	EP 104 R4

Petro Energy Pty Ltd

Western Australia	L 7

Petromin NL

Queensland	ATP269P, PL17
Northern Territory	L4, L5

Petromin Pty Ltd

Queensland	PL31, PL32, PL47, PL184
Northern Territory	RL 2

Petrotech Pty Ltd

Victoria	PEP155, PEP156, PEP157, PEP158

Petroz (Timor Sea) Pty Ltd

JPDA	ZOCA 91-12

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Petroz NL

Western Australia	EP 359 R1, EP 399, EP 400, WA-261-P, WA-281-P, WA-282-P, WA-283-P, WA-149-P R3

Phillips Oil Company Australia

Western Australia	WA-17-L, WA-269-P, WA-270-P

Phillips Petroleum (00-21) Pty Ltd

JPDA	ZOCA 00-21

Phillips Petroleum (91-12) Pty Ltd

JPDA	ZOCA 91-12

Phillips Petroleum (95-19) Pty Ltd

JPDA	ZOCA 95-19

Phillips Petroleum (96-16) Pty Ltd

JPDA	ZOCA 96-16

Phillips Petroleum (96-20) Pty Ltd

JPDA	ZOCA 96-20

Phillips Petroleum Company ZOC Ltd

JPDA	ZOCA 91-13

Phillips Petroleum Timor Sea Pty Ltd

JPDA	ZOCA 91-13

Phillips STH Pty Ltd

Northern Territory	NT/P55

Phillips STL Pty Ltd

Northern Territory	NT/RL2

Phoenix Energy Pty Ltd

Western Australia	EP 320 R2, EP 359 R1, EP 368 R1, EP 413 R1, L 4, L 5, TP/15, EP 23 R5

Planet Resources Pty Ltd

Western Australia	WA-226-P R1

Premier Petroleum (Australia) Ltd

Western Australia	WA-202-P R2

Qgas Pty Ltd

Queensland	ATP613P

Queensland Gas Pty Ltd

Queensland	ATP632P, ATP648P, ATP610P, ATP650P, ATP691P

Radford, Roy Antony

Western Australia	EP 110 R4

Rawson Resources NL

Western Australia	WA-306-P, WA-307-P
Northern Territory	EP 97

Reef Oil NL

South Australia	PPL169, PPL170, PPL 6, PPL 7, PPL 8, PPL171, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL137, PPL138, PPL139, PPL140, PPL141, PPL143, PPL144, PPL145, PPL146, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL183, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181

Rincon-Australia Pty Ltd

Queensland	ATP596P

ROC Oil WA Pty Ltd

Western Australia	WA-286-P

Roma Petroleum Company Pty Ltd

Queensland	ATP695P, ATP530P, ATP545P
Tasmania	T/31P

Roma Petroleum NL

Queensland	ATP465P

Rough Range Oil Pty Ltd

Western Australia	EP 41 R5

Sagasco South East Inc.

South Australia	PEL 32, PPL62, PPL168
Western Australia	L 9

Santos (299) Pty Ltd

Queensland	ATP299P, PL29, PL38, PL39, PL52, PL57, PL95, PL169, PL170
Victoria	VIC/P44

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Santos (BOL) Pty Ltd

Queensland	ATP212P, PL119, PL30, PL56, PL74
Victoria	PPL4, VIC/RL7, VIC/RL8, PPL5, PEP153, PEP154, PPL6, PPL7, PPL9, PPL 10
South Australia	PPL169, PPL170, PPL 6, PPL 7, PPL 8, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL137, PPL138, PPL139, PPL140, PPL141, PPL143, PPL144, PPL145, PPL146, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL171, PPL183, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181
Western Australia	TL/2, WA-13-L, WA-149-P R3, WA-214-P R1, WA-215-P R1, WA-239-P R1, WA-242-P R1, TP/ 7 R2, WA-298-P
Ashmore-Cartier	AC/P15

Santos (ZOCA 91-01) Pty Ltd

JPDA	ZOCA 91-01

Santos (ZOCA 91-12) Pty Ltd

JPDA	ZOCA 91-12

Santos Australian Hydrocarbons Pty Ltd

Queensland	PL113, PL114, PL58, PL80, PL136, PL137, PL141, PL145, PL148, PL153, PL157, PL158, PL159

Santos Exploration Pty Ltd

Queensland	PL 1, PL 2, PL17, PL71
Northern Territory	L3, L4, L5, RL 2

Santos Gnuco Pty Ltd

Queensland	ATP267P, ATP299P, PL29, PL33, PL38, PL39, PL50, PL51, PL52, PL57, PL95, PL169, PL170

Santos Ltd

Queensland	PL178, PL24, PL25, PL26, PL36, ATP259P, PL105, PL106, PL107, PL108, PL110, PL111, PL112, PL113, PL109, PL114, PL129, PL130, PL131, PL23, PL186, PL77, PL78, PL34, PL35, PL79, PL37, PL55, PL58, PL59, PL60, PL61, PL62, PL63, PL68, PL75, PL76, PL80, PL81, PL83, PL84, PL85, PL82, PL87, PL86, PL88, PL97, PL132, PL134, PL135, PL136, PL139, PL133, PL137, PL138, PL140, PL141, PL142, PL143, PL144, PL145, PL146, PL147, PL148, PL150, PL153, PL154, PL157, PL149, PL158, PL159, PL181, PL168, PL175, PL182, PL177
Victoria	VIC/RL3
Tasmania	T/RL1
South Australia	PPL169, PPL170, PPL171, PPL 6, PPL 7, PPL 8, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL26, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL76, PPL77, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL118, PPL121, PPL122, PPL123, PPL125, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL136, PPL137, PPL138, PPL139, PPL140, PPL141, PPL142, PPL143, PPL144, PPL145, PPL146, PPL147, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL152, PPL156, PPL158, PPL167, PPL131, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL187, PPL191, PPL194, PPL197, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181, PPL182, PPL183
Western Australia	WA-15-L, WA-18-P R5, WA-191-P R3, WA-1-P R5, WA-20-L, WA-6-R, WA-8-L, WA-209-P R2
Northern Territory	NT/RL1, L3, RL 2

Santos offshore Pty Ltd

Victoria	VIC/RL2
Western Australia	EP 325 R2, EP 357 R1, EP 61 R5, TP/ 2 R2, TP/ 3 R2, EP 62 R5, L 10, TL/3, TL/4, TL/7, TP/14, WA-18-P R5, WA-208-P R1, WA-261-P, WA-264-P, WA-281-P, WA-282-P, WA-283-P, EP 66 R5, L 1H R1
Northern Territory	NT/P61, NT/RL1

Santos Petroleum Operations Pty Ltd

Queensland	ATP337P, ATP553P, PL41, PL42, PL43, PL44, PL45, PL54, PL67, PL173, PL183

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Santos Petroleum Pty Ltd

Queensland	PL178, PL106, PL108, PL110, PL111, PL112, PL129, PL130, PL131, PL186, PL37, PL59, PL60, PL61, PL63, PL68, PL75, PL81, PL83, PL84, PL85, PL86, PL88, PL97, PL132, PL134, PL135, PL139, PL140, PL142, PL143, PL144, PL146, PL147, PL150, PL168, PL177
South Australia	PPL169, PPL170, PPL 6, PPL 7, PPL 8, PPL171, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL137, PPL138, PPL139, PPL140, PPL141, PPL143, PPL144, PPL145, PPL146, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL183, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181

Santos QNT Pty Ltd

Queensland	ATP685P

Seqoil Pty Ltd

Queensland	ATP589P, ATP593P, ATP608P, ATP574P, ATP654P

Shell Development (Australia) Pty Ltd

Western Australia	EP 353 R1, EP 36 R3, EP 65 R5, WA-10-R, WA-11-L, WA-11-R, WA-16-L, WA-1-L, WA-215-P R1, WA-25-P R5, WA-267-P, WA-275-P, WA-279-P, WA-280-P, WA-28-P R5, WA-294-P, WA-296-P, WA-297-P, WA-2-L, WA-2-R R1, WA-33-P R3, WA-35-P R5, WA-3-L, WA-3-R R1, WA-4-L, WA-4-R R1, WA-5-L, WA-5-R R1, WA-6-L, WA-7-L, WA-7-R, WA-9-L, WA-9-R, WA-23-L, TP/ 4, WA-24-L, WA-299-P, WA-300-P, WA-14-R, WA-205-P R2, WA-313-P
Northern Territory	NT/P47, NT/P48, NT/P49, NT/P55, NT/P57, NT/RL2
Ashmore-Cartier	AC/L5, AC/P8

Shell Development (PSC 19) Pty Ltd

JPDA	ZOCA 95-19

Shell Development (PSC 20) Pty Ltd

JPDA	ZOCA 96-20

Shell Development (PSC 7) Pty Ltd

JPDA	ZOCA 94-07

Shell Development (PSC 9) Pty Ltd

JPDA	ZOCA 91-09

Shogoil Australia Pty Ltd

Queensland	ATP578P

SK Corporation

Western Australia	WA-276-P, WA-277-P, WA-278-P

Southern Amity Inc.

Western Australia	EP 408, EP 381 R1

Southern Diamond Resources (EP342/TP9) Pty Ltd

Western Australia	TP/ 9 R1

Southern Diamond Resources (WA-239-P) Pty Ltd

Western Australia	WA-239-P R1

Southern Diamond Resources (ZOCA 91-09) Pty Ltd

JPDA	ZOCA 91-09

St. Barbara Mines Ltd

New South Wales	PEL13, PEL426

Starzap Pty Ltd

Queensland	ATP647P

Strata Resources NL

Western Australia	WA-321-P, WA-322-P, WA-323-P

Strike Oil NL

New South Wales	PEL427, PEL428
Victoria	VIC/P44
South Australia	PEL 75
Western Australia	EP 420, TP/18, TP/17, WA-261-P

Stuart Petroleum NL

South Australia	PEL 90, PEL 93

Sun Resources NL

Western Australia	EP 325 R2, EP 359 R1, WA-261-P, WA-254-P PARTS 1,3 & 4, WA-254-P PART 2, EP 395, WA-312-P

Sunoco Inc. of Australia

Queensland	ATP692P
New South Wales	PEL429, PEL430, PEL431

Sweetpea Corporation Pty Ltd

Northern Territory	EP 76

Sydney Gas Operations Pty Ltd

New South Wales	PEL2, PEL267, PEL4

Sykes Ian Grant

Queensland	PL73, PL72

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Tap (Harriet) Pty Ltd

Western Australia	EP 358 R1, EP 399, EP 400, TL/6, TL/8, TL/1, TR/1, TL/5, TP/ 8 R2, TR/2, WA-192-P R3, EP 307 R3, EP 363 R1, WA-246-P R1

TAP (SHELFAL) Pty Ltd

Western Australia	EP 341 R1, EP 364 R1, EP 403, EP 137 R4, EP 341 R2, EP 395, EP 397

TAP Oil Limited

Western Australia	TP/18

Tap Oil NL

Western Australia	EP 341 R1, WA-276-P, WA-277-P, WA-278-P

Tap West Pty Ltd

Western Australia	WA-234-P, WA-22-L

Terratek Drilling Tools Pty Ltd

Western Australia	L 6, L 8, EP 129 R4

Texaco Australia Pty Ltd

Western Australia	EP 357 R1, EP 61 R5, EP 66 R5, EP 62 R5, L 10, TL/3, TL/4, TL/7, TP/14, WA-192-P R3, WA-215-P R1, WA-25-P R5, WA-267-P, WA-268-P, WA-2-R R1, WA-3-R R1, WA-4-R R1, WA-5-R R1, WA-7-L, WA-8-L, WA-253-P, WA-15-R, TP/ 2 R2, WA-302-P, WA-303-P, WA-305-P, WA-14-R, L 1H R1, TP/ 3 R2, WA-205-P R2

Timor Oil Ltd

Queensland	PL17

Timor Sea Petroleum Pty Ltd

Ashmore-Cartier	AC/P23

Tipperary Oil & Gas (Australia) Pty Ltd

Queensland	ATP554P, ATP655P, ATP675P, ATP690P

TMOC Exploration Pty Ltd

Victoria	PEP160

Todd Petroleum Australia Ltd

Ashmore-Cartier	AC/P20

Total Exploration Australia Pty Ltd

Queensland	PL34

Trans-Orient Petroleum Ltd

Ashmore-Cartier	AC/P26

Transoil (NT) Pty Ltd

Northern Territory	L4, L5

Transoil Pty Ltd

Queensland	ATP267P, ATP299P, PL29, PL33, PL38, PL39, PL50, PL51, PL52, PL57, PL95, PL169, PL170
Northern Territory	RL 2

Tri-Star Energy Company

Queensland	ATP680P, ATP333P

Tri-Star Petroleum Company

Queensland	ATP631P, ATP526P, ATP584P, ATP592P, ATP606P, ATP623P, PL90, PL91, PL92, PL99, PL100

Trinity Gas Resources Pty Ltd

Victoria	VIC/RL5

Triple J Resources Pty Ltd

Queensland	ATP594P

TSP Arafura Petroleum Pty Ltd

Northern Territory	NT/P60

Tubridgi Petroleum Pty Ltd

Western Australia	L 9

TXU Gas Storage Pty Ltd

Victoria	PPL1, PPL2

Tyers Investments Pty Ltd

Queensland	ATP539P
New South Wales	PEL283
South Australia	EPP27

Tyers Petroleum Pty Ltd

Queensland	ATP552P

United Oil & Gas Company (NT) Pty Ltd

Northern Territory	L4, L5

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Vamgas Pty Ltd

Queensland	PL178, PL24, PL25, PL26, PL36, ATP378P, PL105, PL106, PL107, PL108, PL110, PL111, PL112, PL113, PL109, PL114, PL129, PL130, PL131, PL23, PL186, PL77, PL78, PL34, PL35, PL79, PL37, PL55, PL58, PL59, PL60, PL61, PL62, PL63, PL68, PL75, PL76, PL80, PL81, PL83, PL84, PL85, PL82, PL87, PL86, PL88, PL97, PL132, PL134, PL135, PL136, PL139, PL137, PL133, PL138, PL140, PL141, PL142, PL143, PL144, PL145, PL146, PL147, PL148, PL150, PL153, PL154, PL157, PL149, PL158, PL159, PL168, PL175, PL176, PL181, PL182, PL177
South Australia	PPL169, PPL170, PPL 6, PPL 7, PPL 8, PPL171, PPL 9, PPL10, PPL11, PPL12, PPL13, PPL14, PPL15, PPL16, PPL17, PPL18, PPL19, PPL20, PPL22, PPL23, PPL24, PPL25, PPL26, PPL27, PPL28, PPL29, PPL30, PPL31, PPL32, PPL33, PPL34, PPL35, PPL36, PPL37, PPL38, PPL39, PPL40, PPL41, PPL42, PPL43, PPL44, PPL45, PPL46, PPL47, PPL48, PPL49, PPL50, PPL51, PPL52, PPL53, PPL54, PPL55, PPL56, PPL57, PPL58, PPL59, PPL60, PPL61, PPL63, PPL64, PPL65, PPL66, PPL67, PPL68, PPL69, PPL70, PPL71, PPL72, PPL73, PPL74, PPL75, PPL76, PPL77, PPL78, PPL79, PPL80, PPL81, PPL82, PPL83, PPL84, PPL85, PPL86, PPL87, PPL88, PPL89, PPL90, PPL91, PPL92, PPL93, PPL94, PPL95, PPL96, PPL97, PPL98, PPL99, PPL100, PPL101, PPL102, PPL103, PPL104, PPL105, PPL106, PPL107, PPL108, PPL109, PPL110, PPL111, PPL112, PPL113, PPL114, PPL115, PPL116, PPL117, PPL119, PPL120, PPL118, PPL121, PPL122, PPL123, PPL125, PPL124, PPL126, PPL127, PPL128, PPL130, PPL129, PPL132, PPL133, PPL134, PPL135, PPL136, PPL137, PPL138, PPL139, PPL140, PPL141, PPL142, PPL143, PPL144, PPL145, PPL146, PPL147, PPL148, PPL149, PPL150, PPL151, PPL153, PPL154, PPL155, PPL157, PPL159, PPL160, PPL161, PPL162, PPL163, PPL164, PPL165, PPL166, PPL152, PPL156, PPL158, PPL167, PPL131, PPL184, PPL185, PPL186, PPL188, PPL189, PPL190, PPL192, PPL193, PPL195, PPL196, PPL198, PPL199, PPL187, PPL191, PPL194, PPL197, PPL172, PPL173, PPL174, PPL175, PPL176, PPL177, PPL178, PPL179, PPL180, PPL181, PPL182, PPL183

Vernon E Faulconer Australia Inc.

Queensland	ATP543P, PL117

Victoria International Petroleum NL

Queensland	ATP333P

Victoria Oil Exploration (1977) Pty Ltd

Queensland	ATP589P

Victoria Oil Pty Ltd

Queensland	ATP333P

Victoria Petroleum (WA-209-P) Pty Ltd

Western Australia	WA-312-P

Victoria Petroleum Ltd

Queensland	ATP654P
Western Australia	WA-254-P PART 2

Victoria Petroleum NL

Queensland	ATP695P, ATP465P, ATP574P, ATP608P
South Australia	PEL 57
Western Australia	EP 325 R2, WA-261-P, WA-254-P PARTS 1,3 & 4

Wandoo Petroleum Pty Ltd

Western Australia	WA-14-L, WA-202-P R2
Ashmore-Cartier	AC/L1, AC/L2, AC/L3, AC/P18, AC/P24

Wenk, Andrew

South Australia	PEL 82

West Australian Petroleum Pty Ltd

Western Australia	EP 65 R5, TP/13

West Oil NL

Western Australia	WA-284-P, WA-316-P, WA-310-P
Ashmore-Cartier	AC/RL1, AC/P26, AC/P28

Westranch Holdings Pty Ltd

Ashmore-Cartier	AC/P22, AC/P32

Woodside Eastern Energy Pty Ltd

Victoria	VIC/RL10, VIC/RL2, VIC/RL6, VIC/RL9
Western Australia	WA-23-L, WA-24-L

Woodside Energy Ltd

Victoria	VIC/RL10, VIC/P43, VIC/RL2, VIC/RL6, VIC/RL9
Tasmania	T/30P
South Australia	EPP28, EPP29, EPP30
Western Australia	EP 36 R3, WA-10-R, WA-11-L, WA-11-R, WA-16-L, WA-1-L, WA-1-P R5, WA-208-P R1, WA-20-L, WA-242-P R1, WA-313-P, WA-275-P, WA-279-P, WA-280-P, WA-28-P R5, WA-293-P, WA-296-P, WA-297-P, WA-2-L, WA-33-P R3, WA-3-L, WA-4-L, WA-5-L, WA-6-L, WA-7-R, WA-9-L, WA-9-R, TP/ 4, WA-294-P, WA-254-P PARTS 1,3 & 4, WA-254-P PART 2, WA-248-P R1
Northern Territory	NT/P55, NT/P57, NT/RL2, NT/P49
Ashmore-Cartier	AC/P4 R3, AC/P17, AC/P8

Woodside Oil Ltd

Western Australia	WA-191-P R3, WA-269-P, WA-271-P, WA-270-P
Ashmore-Cartier	AC/L5

Woodside Petroleum (Timor Sea 1) Pty Ltd

JPDA	ZOCA 91-01

Woodside Petroleum (Timor Sea 20) Pty Ltd

JPDA	ZOCA 95-19, ZOCA 96-20

Woodside Petroleum (Timor Sea 7) Pty Ltd

JPDA	ZOCA 94-07

Woodside Petroleum Development Pty Ltd

Ashmore-Cartier	AC/L5

Yukong Ltd

Ashmore-Cartier	AC/P15

APPENDIX K cont'd

ZOCA 96-16 Pty Ltd

JPDA	ZOCA 96-16

ZOCA Pty Ltd

JPDA	ZOCA 96-16

Ashmore-Cartier is the Territory of Ashmore and Cartier Islands Adjacent Area
JPDA is the Joint Petroleum Development Area

Appendix L
2001

Significant Australian offshore oil and gas discoveries up to the end of 2001

APPENDIX L: SIGNIFICANT AUSTRALIAN OFFSHORE OIL AND GAS DISCOVERIES UP TO THE END OF 2001

The listing of a 'discovery' in this Appendix is a reflection of company classification and should not be interpreted as a finalised Geoscience Australia classification. Current status is determined at the date of the last titles publication, usually in April.

CAPITALS denotes discoveries in production licences as at 31 December 2001 and abandoned producers;
Bold denotes discoveries in retention leases;
Italics denotes discoveries in vacant acreage and
Lower case denotes other discoveries.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
BARRACOUTA	Esso	31-May-65	Mar-69	Gippsland	Oil and Gas
MARLIN	Esso	03-Feb-66	Nov-69	Gippsland	Oil and Gas
Bass	Esso	29-Mar-67		Bass	Gas
Pecten	Shell	03-Apr-67		Otway	Gas
KINGFISH	Esso	29-May-67	Apr-71	Gippsland	Oil
Golden Beach	BOCAL	17-Jul-67		Gippsland	Gas
HALIBUT	Esso	29-Aug-67	Mar-70	Gippsland	Oil
DOLPHIN	Esso	21-Nov-67	Jan-90	Gippsland	Oil
PERCH	Esso	02-May-68	Jan-90	Gippsland	Oil
TUNA	Esso	07-May-68	May-79	Gippsland	Oil and Gas
FLOUNDER	Esso	28-Sep-68	Dec-84	Gippsland	Oil and Gas
LEGENDRE	BOCAL	31-Oct-68	May-01	Carnarvon	Oil
SNAPPER	Esso	09-Dec-68	Jul-81	Gippsland	Oil and Gas
Gage Roads	Wapet	24-Jan-69		Perth	Oil
BREAM	Esso	16-Apr-69	Mar-88	Gippsland	Oil and Gas
MACKEREL	Esso	23-Apr-69	Dec-77	Gippsland	Oil
Flathead	Esso	26-May-69		Gippsland	Oil
Flinders Shoal	Wapet	09-Jul-69		Carnarvon	Oil and Gas
Petrel	Arco	06-Aug-69		Bonaparte	Gas
Flag	Wapet	30-Jan-70		Carnarvon	Gas
Pelican (Esso)	Esso	24-Apr-70		Bass	Gas
Pepper	Wapet	03-May-70		Carnarvon	Gas
BATFISH	Esso	27-May-70	not producing	Gippsland	Gas
EMPEROR	Esso	29-Jun-70	not producing	Gippsland	Oil and Gas
Cormorant	Esso	27-Jul-70		Bass	Oil
Scott Reef	BOCAL	26-May-71		Browse	Gas
NORTH RANKIN	BOCAL	25-Jun-71	Jun-84	Carnarvon	Oil and Gas
Tern	Arco	04-Jul-71		Bonaparte	Gas
RANKIN	BOCAL	23-Sep-71	Dec-01	Carnarvon	Oil and Gas
GOODWYN	BOCAL	25-Nov-71	Feb-95	Carnarvon	Oil and Gas
Flamingo	Arco	30-Nov-71		Bonaparte	Gas
ANGEL	BOCAL	11-Jan-72	not producing	Carnarvon	Gas
Puffin	Arco	08-Jun-72		Bonaparte	Oil
Penguin	Arco	23-Jul-72		Bonaparte	Gas
Iago	Wapet	28-Jul-72		Carnarvon	Gas
Eider	Arco	16-Sep-72		Bonaparte	Gas

APPENDIX L (cont'd)

CAPITALS denotes discoveries in production licences as at 31 December 2001 and abandoned producers;
Bold denotes discoveries in retention leases;
Italics denotes discoveries in vacant acreage and
Lower case denotes other discoveries.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Eaglehawk	Woodside	13-Dec-72		Carnarvon	Oil
Swan	Arco	30-Jan-73		Bonaparte	Gas
Sole	Shell	05-Feb-73		Gippsland	Gas
West Tryal Rocks	Wapet	03-Mar-73		Carnarvon	Gas
Rosemary	Woodside	26-Mar-73		Carnarvon	Gas
Egret	Woodside	12-May-73		Carnarvon	Oil
DOCKRELL	Woodside	17-Aug-73	not producing	Carnarvon	Oil and Gas
LAMBERT	Woodside	23-Nov-73	Oct-97	Carnarvon	Oil and Gas
Sunfish	Esso	01-Mar-74		Gippsland	Oil and Gas
Hampton	Woodside	17-Apr-74		Carnarvon	Gas
Aroo	Hematite	19-Apr-74		Bass	Gas
Troubadour	Woodside	15-Aug-74		Bonaparte	Gas
GRIFFIN	Wapet	19-Sep-74	Jan-94	Carnarvon	Oil
Sunrise	Woodside	28-Jan-75		Bonaparte	Gas
BLACKBACK	Esso	11-Aug-75	Jun-99	Gippsland	Oil
TIDEPOLE	BOCAL	26-Nov-75	not producing	Carnarvon	Oil and Gas
Spar	Wapet	01-Sep-76		Carnarvon	Gas
Haycock	Woodside	07-Apr-77		Carnarvon	Gas
East Swan	Arco	19-Mar-78		Bonaparte	Oil and Gas
Koolinda	Wapet	31-Mar-78		Carnarvon	Gas
Houtman	Esso	01-May-78		Perth	Gas
SEAHORSE	Esso	02-Sep-78	Sep-90	Gippsland	Oil and Gas
Zeewulf	Esso	05-May-79		Carnarvon	Gas
Investigator	Esso	17-Jul-79		Carnarvon	Gas
Jupiter (Phillips)	Phillips	14-Oct-79		Carnarvon	Gas
Brecknock	Woodside	09-Nov-79		Browse	Gas
Resolution	Esso	10-Nov-79		Carnarvon	Gas
Scarborough	Esso	17-Dec-79		Carnarvon	Gas
Vinck	Esso	16-Mar-80		Carnarvon	Gas
Eendracht	Esso	29-May-80		Carnarvon	Gas
Lesueur	Aquitaine	22-Aug-80		Bonaparte	Gas
Zeepaard	Esso	16-Oct-80		Carnarvon	Gas
Sirius (Esso)	Esso	02-Dec-80		Carnarvon	Gas
Brewster	Woodside	08-Dec-80		Browse	Gas
Gorgon	Wapet	11-Jan-81		Carnarvon	Gas
YELLOWTAIL	Esso	02-Nov-81	not producing	Gippsland	Oil
Patricia/Baleen	Hudbay	17-Nov-81		Gippsland	Gas
Sperm Whale	Hudbay	07-Jan-82		Gippsland	Oil and Gas
TARWHINE	Esso	20-Jan-82	May-90	Gippsland	Oil and Gas
Rosily	Wapet	03-May-82		Carnarvon	Gas

APPENDIX L (cont'd)

CAPITALS denotes discoveries in production licences as at 31 December 2001 and abandoned producers;
Bold denotes discoveries in retention leases;
Italics denotes discoveries in vacant acreage and
Lower case denotes other discoveries.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
BOWERS	Wapet	14-Aug-82	not producing	Carnarvon	Gas
Novara	Esso	25-Oct-82		Carnarvon	Oil
WIRRAH	Esso	18-Nov-82	not producing	Gippsland	Oil and Gas
SOUTH PEPPER	Mesa	12-Dec-82	Jan-88	Carnarvon	Oil and Gas
Wilcox	Woodside	17-Feb-83		Carnarvon	Gas
VOLADOR	Shell	24-Mar-83	not producing	Gippsland	Oil and Gas
WHITING	Esso	05-Apr-83	Oct-89	Gippsland	Oil and Gas
Hermes	Phillips	20-Apr-83		Gippsland	Gas
Basker	Shell	12-Jun-83		Gippsland	Oil and Gas
NORTH HERALD	Mesa	20-Jun-83	Dec-87	Carnarvon	Oil
LUDERICK	Esso	23-Jun-83	not producing	Gippsland	Oil and Gas
CHERVIL	Mesa	02-Aug-83	Aug-89	Carnarvon	Oil and Gas
BAMBRA	Aust Occidental	27-Aug-83	not producing	Carnarvon	Oil and Gas
JABIRU	BHP	29-Sep-83	Aug-86	Bonaparte	Oil
Caswell	Woodside	28-Oct-83		Browse	Oil and Gas
Bignose	Shell	30-Oct-83		Gippsland	Gas
South Chervil	Wesminco	20-Nov-83		Carnarvon	Oil and Gas
HARRIET	Aust Occidental	22-Nov-83	Jan-86	Carnarvon	Oil and Gas
BASIL	Wesminco	23-Dec-83	not producing	Carnarvon	Oil and Gas
Turtle	Wesminco	10-Feb-84		Bonaparte	Oil
Manta	Shell	20-Mar-84		Gippsland	Oil and Gas
Veilfin	Esso	30-Mar-84		Gippsland	Gas
Dixon	Woodside	26-May-84		Carnarvon	Gas
Outtrim	Esso	02-Jul-84		Carnarvon	Oil
TALISMAN	Marathon	24-Aug-84	Jan-89	Carnarvon	Oil
CHALLIS	BHP	23-Oct-84	Dec-89	Bonaparte	Oil
GRUNTER	Esso	11-Nov-84	not producing	Gippsland	Oil and Gas
SWIFT	BHP	10-Jan-85	not producing	Bonaparte	Oil
Barnett	Aquitaine	06-Feb-85		Bonaparte	Oil
Montague	Woodside	07-Mar-85		Carnarvon	Gas
ELDER	Wesminco	29-May-85	not producing	Carnarvon	Gas
SALADIN	Wapet	19-Jun-85	Dec-89	Carnarvon	Oil and Gas
Yolla	Amoco	22-Aug-85		Bass	Oil and Gas
WHIPTAIL	Esso	28-Aug-85	not producing	Gippsland	Oil
ANGELFISH	Esso	16-Dec-85	not producing	Gippsland	Oil and Gas
SKUA	BHP	26-Dec-85	Dec-91	Bonaparte	Oil
CAMPBELL	Bond	16-Feb-86	Jul-92	Carnarvon	Oil and Gas
Leatherjacket	Esso	27-Feb-86		Gippsland	Oil
ORPHEUS	Bond	20-Mar-86	not producing	Carnarvon	Gas
Kipper	Esso	28-Mar-86		Gippsland	Oil and Gas

APPENDIX L (cont'd)

CAPITALS denotes discoveries in production licences as at 31 December 2001 and abandoned producers;
Bold denotes discoveries in retention leases;
Italics denotes discoveries in vacant acreage and
Lower case denotes other discoveries.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Eclipse	BHP	03-Jul-86		Bonaparte	Oil
Avocet	Bond	27-Aug-86		Bonaparte	Oil and Gas
Forestier	Woodside	14-Sep-86		Carnarvon	Gas
Remora	Esso	21-May-87		Gippsland	Oil and Gas
Oliver	BHP	02-Feb-88		Bonaparte	Oil and Gas
Montara	BHP	26-Apr-88		Bonaparte	Oil and Gas
PENGANA	BHP	06-May-88	not producing	Bonaparte	Oil and Gas
CASSINI	BHP	18-Jul-88	Dec-89	Bonaparte	Oil and Gas
Evans Shoal	BHP	18-Aug-88		Bonaparte	Gas
Lorikeet	BHP	28-Aug-88		Bonaparte	Gas
Bilyara	BHP	13-Sep-88		Bonaparte	Oil and Gas
TORSK	Esso	10-Nov-88	not producing	Gippsland	Oil and Gas
Mulloway	Esso	19-Feb-89		Gippsland	Oil
Angler	Petrofina	13-May-89		Gippsland	Gas
WANAEA	Woodside	26-May-89	Nov-95	Carnarvon	Oil
CHINOOK/SCINDIAN	BHP	27-Jun-89	Jan-94	Carnarvon	Oil and Gas
SWEETLIPS	Esso	18-Aug-89	not producing	Gippsland	Oil and Gas
Anemone	Petrofina	04-Sep-89		Gippsland	Gas
Rivoli	Minora	06-Sep-89		Carnarvon	Gas
Talbot	Santos	01-Dec-89		Bonaparte	Oil and Gas
COWLE	Wapet	22-Dec-89	Apr-91	Carnarvon	Oil and Gas
COSSACK	Woodside	08-Jan-90	Nov-95	Carnarvon	Oil
Maple	BHP	11-Jan-90		Bonaparte	Gas
Keeling	Norcen	11-Jan-90		Bonaparte	Gas
ROLLER	Wapet	19-Jan-90	Mar-94	Carnarvon	Oil and Gas
SINBAD	Hadson	25-Mar-90	Jul-92	Carnarvon	Gas
Archer (Petrofina)	Petrofina	28-Mar-90		Gippsland	Oil and Gas
Gummy	Shell	02-Jun-90		Gippsland	Gas
BIRCH	BHP	01-Aug-90	not producing	Bonaparte	Oil
Delamere	BHP	20-Aug-90		Bonaparte	Gas
Venture	Wapet	25-Oct-90		Carnarvon	Oil
Tahbilk	BHP	01-Dec-90		Bonaparte	Gas
Minden	BHP	17-May-91		Carnarvon	Gas
WANDOO	Ampolex	15-Jun-91	Oct-93	Carnarvon	Oil
Leatherback	Lasmo	21-Jun-91		Carnarvon	Oil
Halcyon	Lasmo	29-Jul-91		Bonaparte	Gas
SKATE	Wapet	18-Nov-91	Mar-94	Carnarvon	Oil and Gas
Maret	Norcen	23-Jan-92		Bonaparte	Gas
MOONFISH	Esso	13-Jul-92	Jul-97	Gippsland	Oil and Gas
Maitland	Wesminco	09-Sep-92		Carnarvon	Gas

APPENDIX L (cont'd)

CAPITALS denotes discoveries in production licences as at 31 December 2001 and abandoned producers;
Bold denotes discoveries in retention leases;
Italics denotes discoveries in vacant acreage and
Lower case denotes other discoveries.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Fishburn	BHP	22-Oct-92		Bonaparte	Gas
Macedon/Pyrenees	BHP	31-Oct-92		Carnarvon	Oil and Gas
ULIDIA	Hadson	26-Nov-92	not producing	Carnarvon	Gas
Troas	Boral	06-Jan-93		Otway	Gas
La Bella	BHP	08-Feb-93		Otway	Gas
EAST SPAR	Wesminco	29-Mar-93	Oct-96	Carnarvon	Gas
Minerva	BHP	07-Apr-93		Otway	Gas
Nebo	Kufpec	14-May-93		Carnarvon	Oil
STAG	Hadson	18-Jun-93	May-98	Carnarvon	Oil and Gas
Australind	Wapet	19-Sep-93		Carnarvon	Oil
Lightfoot	Wapet	05-Oct-93		Carnarvon	Oil and Gas
Santa Cruz	Command	08-Nov-93		Carnarvon	Oil and Gas
Rambler	SAGASCO	30-Dec-93		Bonaparte	Oil and Gas
ELANG	BHP	10-Feb-94	Jul-98	Bonaparte	Oil
Fohn	Phillips	06-Aug-94		Bonaparte	Gas
Saffron	Woodside	03-Oct-94		Carnarvon	Oil and Gas
LAMINARIA	Woodside	09-Oct-94	Nov-99	Bonaparte	Oil
KAKATUA	BHP	08-Dec-94	Jul-98	Bonaparte	Oil
Chrysaor	Wapet	13-Dec-94		Carnarvon	Gas
Bayu/Undan	Phillips	03-Feb-95		Bonaparte	Oil and Gas
Cycad	Ampolex	25-Mar-95		Carnarvon	Oil and Gas
GUDGEON	Esso	27-Apr-95	not producing	Gippsland	Oil
Longtom	BHP	24-May-95		Gippsland	Gas
Gwydion	BHP	08-Jun-95		Browse	Oil
WONNICH	Ampolex	31-Jul-95	Jul-99	Carnarvon	Oil and Gas
Ascalon	Mobil	01-Sep-95		Bonaparte	Gas
Blencathra	BHP	18-Sep-95		Carnarvon	Oil and Gas
CORALLINA	Woodside	21-Dec-95	Nov-99	Bonaparte	Oil
ANTLER	Apache	23-Apr-96	not producing	Carnarvon	Oil and Gas
Elk	Apache	01-May-96		Carnarvon	Gas
Jahal	BHP	06-May-96		Bonaparte	Oil
AGINCOURT	Apache	09-Jun-96	Aug-97	Carnarvon	Oil
Lynx	Woodside	27-Sep-96		Carnarvon	Gas
BUFFALO	BHP	27-Sep-96	Dec-99	Bonaparte	Oil
Ridley	Apache	28-Sep-96		Carnarvon	Oil
Nimrod	BHP	10-Oct-96		Carnarvon	Gas
Buller	BHP	13-Dec-96		Bonaparte	Oil
Cornea	Shell	07-Jan-97		Browse	Oil and Gas
KEAST	Woodside	21-Jan-97	not producing	Carnarvon	Gas
Woollybutt	Mobil	23-Apr-97		Carnarvon	Oil

APPENDIX L (cont'd)

CAPITALS denotes discoveries in production licences as at 31 December 2001 and abandoned producers;
Bold denotes discoveries in retention leases;
Italics denotes discoveries in vacant acreage and
Lower case denotes other discoveries.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Mutineer	Santos	18-Jun-97		Carnarvon	Oil
Tenacious	Cultus	21-Jun-97		Bonaparte	Oil and Gas
Krill	BHP	19-Jul-97		Bonaparte	Oil
Kelp Deep	Mobil	29-Jul-97		Bonaparte	Gas
Reindeer	Apache	28-Oct-97		Carnarvon	Gas
Psepotus	Woodside	28-Feb-98		Browse	Gas
GIPSY	Apache	02-Mar-98	Feb-01	Carnarvon	Oil
Peck	Apache	18-Mar-98		Carnarvon	Oil
Caspar	BHP	21-Jun-98		Browse	Gas
White Ibis	Premier	23-Jun-98		Bass	Gas
ROSE	Apache	20-Jul-98	not producing	Carnarvon	Oil and Gas
Bluff	BHP	21-Jul-98		Bonaparte	Oil
Sparkle	Shell	23-Jul-98		Browse	Oil
Adele	Shell	09-Oct-98		Browse	Gas
John Brookes	Mobil	17-Oct-98		Carnarvon	Gas
Chuditch	Shell	02-Nov-98		Bonaparte	Gas
Vincent	Woodside	26-Dec-98		Carnarvon	Oil
Webley	Woodside	18-Jan-99		Carnarvon	Gas
LEE	Apache	25-Jan-99	not producing	Carnarvon	Gas
WINDSOR	Apache	07-Mar-99	not producing	Carnarvon	Gas
BENNET	Apache	13-Mar-99	not producing	Carnarvon	Oil
Sage	Apache	25-Mar-99		Carnarvon	Oil
Enfield	Woodside	05-Apr-99		Carnarvon	Oil
North Marra	Apache	08-Jul-99		Carnarvon	Oil and Gas
Geryon	Wapet	15-Sep-99		Carnarvon	Gas
Moon (Mobil)	Mobil	04-Oct-99		Carnarvon	Oil
Orthrus	Wapet	15-Oct-99		Carnarvon	Gas
NORTH GIPSY	Apache	28-Oct-99	Feb-01	Carnarvon	Oil
Cuttlefish	Amity	29-Oct-99		Gippsland	Oil and Gas
Cadell	Apache	08-Nov-99		Carnarvon	Gas
Nasutus	Apache	18-Nov-99		Carnarvon	Oil and Gas
Narvik	Apache	28-Nov-99		Carnarvon	Gas
COASTER	Wapet	30-Dec-99	not producing	Carnarvon	Oil
Antiope	BHP	15-Jan-00		Carnarvon	Gas
BAKER	Apache	20-Jan-00	not producing	Carnarvon	Gas
Coniston	BHP	04-Feb-00		Carnarvon	Oil
Urania	Wapet	11-Feb-00		Carnarvon	Gas
Scafell	BHP	27-Feb-00		Carnarvon	Gas
Maenad	Chevron	28-Mar-00		Carnarvon	Gas
Corvus	Apache	07-Apr-00		Carnarvon	Gas

APPENDIX L (cont'd)

CAPITALS denotes discoveries in production licences as at 31 December 2001 and abandoned producers;
Bold denotes discoveries in retention leases;
Italics denotes discoveries in vacant acreage and
Lower case denotes other discoveries.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Padthaway	BHP	09-Apr-00		Bonaparte	Oil and Gas
Oryx	Apache	26-Apr-00		Carnarvon	Oil
Jansz	Mobil	27-Apr-00		Carnarvon	Gas
Crux	Nippon Oil	03-May-00		Bonaparte	Gas
NORTH ALKIMOS	Apache	02-Jun-00	not producing	Carnarvon	Oil and Gas
Prometheus/Rubicon	Kerr McGee	07-Jun-00		Bonaparte	Gas
Brecknock South	Woodside	18-Aug-00		Browse	Gas
LINDA	Apache	18-Aug-00	not producing	Carnarvon	Gas
Chamois	Apache	28-Aug-00		Carnarvon	Oil and Gas
Tusk	Apache	15-Sep-00		Carnarvon	Oil
Laverda	Woodside	27-Oct-00		Carnarvon	Oil and Gas
Coleraine	Phillips	21-Nov-00		Bonaparte	Oil
GAEA	Woodside	02-Dec-00	not producing	Carnarvon	Gas
Saratoga	Kerr McGee	18-Dec-00		Bonaparte	Gas
Cliff Head	Roc Oil	01-Jan-01		Perth	Oil
Lindsay	Tap Oil	06-Jan-01		Carnarvon	Gas
Audacious	OMV	31-Jan-01		Bonaparte	Oil
SOUTH PLATO	Apache	27-Feb-01	not producing	Carnarvon	Oil
Kuda Tasi	Woodside	22-Mar-01		Bonaparte	Oil
Kaleidoscope	Coveyork	08-May-01		Browse	Gas
Thylacine	Origin	18-May-01		Otway	Gas
Corowa	Santos	07-Jun-01		Carnarvon	Oil
Geographe	Woodside	16-Jun-01		Otway	Gas
EAST PILCHARD	Esso	02-Aug-01	not producing	Gippsland	Gas
Blacktip	Woodside	10-Aug-01		Bonaparte	Gas
Errol	Apache	02-Oct-01		Carnarvon	Gas
Gudrun	Apache	10-Oct-01		Carnarvon	Oil

* Total depth date of discovery well
** Approximate, where available

NOTES:
MARLIN includes Turrum and North Turrum
KINGFISH includes WEST KINGFISH (produced Dec-82)
HALIBUT includes COBIA (produced Jun-79) and FORTESCUE (produced Sep-83)
MACKEREL includes SOUTH MACKEREL
Rankin includes ECHO/YODEL, Dockerell, Sculptor and Keast
GRIFFIN field was discovered by the Hilda 1A well, includes Ramillies
BLACKBACK field was discovered by the Hapuku 1 well
SALADIN includes YAMMADERRY
Macedon/Pyrenees field was discovered by the West Muiron 3 well
NORTH RANKIN includes PERSEUS, ATHENA, Capella, Perseus South and Searipple
Brewster includes Dinichthys, Gorgonichthys and Titanichthys
TALISMAN was abandoned in 1992
NORTH HERALD, SKUA and SOUTH PEPPER were abandoned in 1997

Appendix M
2001

Australian producing onshore oil and gas discoveries up to the end of 2000

APPENDIX M: AUSTRALIAN PRODUCING ONSHORE OIL AND GAS DISCOVERIES UP TO THE END OF 2000

The listing of a 'discovery' in this Appendix is a reflection of company classification and should not be interpreted as a finalised Geoscience Australia classification.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Hospital Hill	Qld Government	30-Oct-11		Surat	Gas
Lakes Entrance	Petrotech	01-Jul-24		Gippsland	Oil
Rough Range	Wapet	08-May-55	May-55	Carnarvon	Oil
Timbury Hills	CSR	04-Apr-60	Apr-61	Surat	Gas
Pickanjinnie	AAO	12-Jul-60	May-69	Bowen/Surat	Gas
Cabawin	Union Oil	26-Mar-61	Aug-77	Bowen/Surat	Oil and Gas
Moonie	Union Oil	06-Dec-61	Feb-64	Surat	Oil
Sunnybank	AAO	01-Jan-63	Jan-63	Bowen	Oil and Gas
Bony Creek	AAO	27-Mar-63	Mar-69	Surat	Gas
Richmond	AAO	24-Aug-63	Mar-69	Bowen/Surat	Oil and Gas
Rolleston	Associated Freney Oil	25-Jan-64	Jun-90	Bowen	Gas
Gidgealpa	Delhi-Santos	10-Feb-64	Nov-69	Cooper/Eromanga	Oil and Gas
Mereenie	Exoil	11-Feb-64	Sep-84	Amadeus	Oil and Gas
Warooby South	AAO	27-Feb-64		Surat	Gas
Blyth Creek	AAO	12-Mar-64		Surat	Gas
Back Creek	Amalgamated	24-Mar-64	Aug-87	Bowen	Gas
Yardarino	Wapet	04-Jun-64	Jan-78	Perth	Oil and Gas
Snake Creek	Amalgamated	15-Jun-64	Jun-69	Bowen	Oil and Gas
Duarran	AAO	02-Jul-64	Mar-69	Surat	Oil and Gas
Beaufort	AAO	02-Jul-64	Jul-84	Bowen/Surat	Gas
Alton	Union Oil	17-Jul-64	Jan-66	Bowen/Surat	Oil
Yanalah	AAO	20-Jul-64	Feb-70	Surat	Gas
Barrow Island	Wapet	04-Aug-64	Jan-67	Carnarvon	Oil and Gas
Conloi	Union Oil	24-Aug-64	Jan-66	Surat	Oil
Raslie	AAO	27-Sep-64	Jun-69	Bowen/Surat	Gas
Gilmore	Phillips	24-Oct-64	Jun-95	Adavale	Gas
Arcturus	Associated Freney Oil	17-Nov-64	Jul-90	Bowen	Gas
Lamen	CSR	28-Nov-64	Apr-76	Surat	Gas
Pine Ridge	CSR	25-Jan-65	Jun-65	Bowen/Surat	Gas
Oberina	Amalgamated	04-Feb-65	Mar-96	Surat	Gas
Trinidad	Amalgamated	14-Feb-65	Feb-65	Surat	Oil
Mount Horner	Wapet	22-Mar-65	May-84	Perth	Oil
Anabranch	CSR	26-Mar-65	Mar-65	Surat	Oil and Gas
Gingin	Wapet	31-Mar-65	Jan-72	Perth	Gas
Hollyrood	CSR	08-Apr-65	Jul-91	Surat	Gas
Major	Union Oil	20-Apr-65	Mar-95	Bowen	Gas
Palm Valley	Magellan	01-May-65	Aug-83	Amadeus	Gas
Maffra	CSR	14-Jun-65	Jan-66	Surat	Oil and Gas
Bennett	Union Oil	18-Oct-65	Jan-66	Surat	Oil
Tarrawonga	Inter Petroleum Services	07-Dec-65	May-69	Bowen/Surat	Gas
Spencer	Delhi	30-Dec-65	Feb-86	Eromanga	Oil
Leichhardt	Union Oil	22-Feb-66	Nov-92	Surat	Oil and Gas
Moomba	Delhi	20-Apr-66	Nov-69	Cooper	Gas
Lyndon Caves	CSR	28-May-66	Mar-88	Surat	Gas
Dongara	Wapet	28-Jun-66	Oct-71	Perth	Oil and Gas
Tubridgi	Wapet	08-Nov-66	Sep-91	Carnarvon	Oil and Gas

APPENDIX M (cont'd)

The listing of a 'discovery' in this Appendix is a reflection of company classification and should not be interpreted as a finalised Geoscience Australia classification.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Caroline	Alliance	29-Jan-67	Nov-68	Otway	Gas
Pasco	Wapet	25-May-67		Carnarvon	Oil and Gas
Wallumbilla South	CSR	12-Jun-67	Sep-69	Bowen	Gas
Hope Creek	CSR	07-Oct-67	Feb-71	Surat	Gas
Pringle Downs	CSR	15-Oct-67	Feb-71	Bowen/Surat	Oil and Gas
Stakeyard	CSR	30-Nov-67		Bowen	Gas
Daralingie	Delhi	10-Dec-67	May-84	Cooper	Gas
Pleasant Hills	CSR	07-Nov-68	Sep-69	Bowen/Surat	Gas
Mondarra	Wapet	25-Nov-68	Apr-72	Perth	Gas
Grafton Range	CSR	22-Mar-69	Nov-81	Surat	Gas
Toolachee	Delhi	22-Mar-69	May-84	Cooper	Gas
Mooga	CSR	26-Jul-69	Jan-76	Surat	Gas
Kincora	Union Oil	12-Dec-69	Mar-77	Bowen/Surat	Oil and Gas
Boxleigh	Union Oil	03-Jun-70	Jan-79	Bowen	Gas
Tirrawarra	Bridge	11-Jun-70	Feb-83	Cooper	Oil and Gas
Packsaddle/Pondrinie	Alliance	12-Jun-70		Cooper	Oil and Gas
Westlands	CSR	02-Aug-70	Jul-93	Surat	Gas
Euthulla	CSR	10-Aug-70	Jan-76	Bowen/Surat	Gas
Della	Pursuit	16-Aug-70	Oct-71	Cooper/Eromanga	Gas
Merrimelia	Alliance	20-Aug-70	Feb-83	Cooper/Eromanga	Oil and Gas
Noorindoo	Union Oil	09-Oct-70	Nov-70	Bowen	Oil and Gas
Strzelecki	Pursuit	05-Dec-70	Dec-82	Cooper/Eromanga	Oil and Gas
Mudrangie	Alliance	01-Jan-71	Jun-85	Cooper	Gas
Moorari/Woolkina	Bridge	28-Feb-71	Oct-83	Cooper/Eromanga	Oil and Gas
Walyering	Wapet	10-Apr-71	Mar-72	Perth	Gas
Coonatie	Flinders	05-Jul-71		Cooper	Gas
Fly Lake	Delhi	15-Oct-71	Oct-83	Cooper	Oil and Gas
Big Lake	Delhi	29-Dec-71	Jul-72	Cooper/Eromanga	Gas
Epsilon	Delhi	03-Jan-72	Jan-89	Cooper/Eromanga	Oil and Gas
Brumby	Delhi	06-Apr-72	Feb-85	Cooper	Gas
Burke	Delhi	08-Aug-72	May-82	Cooper	Gas
Dullingari	Delhi	06-Oct-72	Mar-82	Cooper/Eromanga	Oil and Gas
Kanowana	Vamgas	08-Jan-73	Mar-90	Cooper	Oil and Gas
Durham Downs	Delhi	01-Oct-73		Cooper	Gas
Silver Springs/Renlim	Bridge	29-Jun-74	Oct-78	Bowen	Gas
Karmona	Aquitaine	28-Jul-76		Cooper	Oil and Gas
Barrolka	Aquitaine	05-Sep-76		Cooper	Gas
Namur	Delhi	05-Nov-76	Feb-79	Eromanga	Gas
Kidman	Delhi	15-Oct-77	Jun-84	Cooper	Gas
Munkarie	Delhi	16-Feb-78	Feb-85	Cooper	Gas
Mascotte	Jimbilly	17-May-78	Feb-82	Surat	Gas
Wackett	Delhi	29-Aug-78		Cooper/Eromanga	Gas
Boggo Creek	Bridge	02-Sep-78	Dec-78	Bowen	Oil
Parknook	BHP	27-Dec-78	May-94	Bowen	Gas
Warroon	BHP	31-Aug-79	May-94	Bowen	Oil and Gas
Dullingari North	Delhi	23-Sep-79	Sep-82	Cooper/Eromanga	Oil and Gas
Beldene	Hartogen	23-Oct-79	Jun-82	Bowen/Surat	Gas
Thomby Creek	Bridge	13-Nov-79	Nov-79	Bowen	Oil
North Paaratte	Beach	21-Nov-79	Apr-86	Otway	Gas

APPENDIX M (cont'd)

The listing of a 'discovery' in this Appendix is a reflection of company classification and should not be interpreted as a finalised Geoscience Australia classification.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Cuttapirrie	Santos	12-Apr-80	Jul-85	Cooper/Eromanga	Oil and Gas
Woodada	Hughes and Hughes	12-Jun-80	May-82	Perth	Gas
Glen Fosslyn	Bridge	09-Jul-80	May-94	Bowen	Oil and Gas
Newstead	Hartogen	14-Dec-80	Oct-83	Bowen/Surat	Gas
Marabooka	Delhi	30-Jan-81	Sep-82	Cooper/Eromanga	Oil and Gas
Mudera	Delhi	08-Mar-81	Feb-92	Cooper	Gas
Wallaby Creek	Beach	29-Mar-81		Otway	Gas
Yapeni	Delhi	25-Apr-81	Jun-84	Cooper	Gas
Kerna	Delhi	30-Apr-81	Apr-93	Cooper	Gas
McKinlay	Delhi	26-May-81	Mar-85	Eromanga	Oil
Blina	Home Energy	08-Jun-81	Sep-83	Canning	Oil
Royston	Hartogen	20-Jul-81	Jun-82	Surat	Gas
Riverslea	BHP	24-Aug-81	Oct-81	Surat	Oil
Namarah	Hematite	08-Oct-81	May-94	Bowen	Gas
Dilchee	Delhi	28-Oct-81	Apr-93	Cooper	Gas
Avondale	AAR	10-Nov-81	Jan-84	Surat	Oil and Gas
Wanara	Delhi	19-Nov-81	Jun-89	Cooper	Gas
Waggamba	Bridge	20-Nov-81	Mar-82	Bowen	Gas
Jackson	Delhi	14-Dec-81	Dec-83	Eromanga	Oil
Merivale	AAR	02-Jan-82	Jul-90	Bowen	Gas
Yellowbank	AAR	12-Feb-82	Jun-90	Bowen	Gas
Jackson South	Delhi	06-Apr-82	Feb-84	Eromanga	Oil
Jack Lake	Delhi	14-Apr-82		Cooper	Gas
Yellowbank Creek	Bridge	15-Apr-82	May-82	Bowen	Oil
Borah Creek	Hartogen	28-Apr-82	Aug-82	Bowen/Surat	Oil and Gas
Sandy Creek	Hartogen	27-May-82	Aug-82	Bowen/Surat	Oil and Gas
Sirrah	Bridge	08-Jun-82	Jun-85	Bowen	Gas
Waratah	Hartogen	15-Jun-82	Nov-83	Bowen	Oil and Gas
Yapunyah	Hematite	01-Jul-82	Aug-82	Bowen	Oil
Punchbowl Gully	AAR	04-Aug-82		Bowen	Gas
Cogoon River	Hartogen	16-Aug-82	Jan-93	Surat	Gas
Andree/Leleptian	Delhi	23-Sep-82	Dec-89	Cooper	Gas
Marana	Delhi	06-Oct-82	May-87	Cooper	Gas
Sundown	Home Energy	23-Nov-82	Nov-83	Canning	Oil
Rakoona	Delhi	08-Dec-82	Jan-88	Cooper	Gas
South Pepper	Mesa	12-Dec-82	Jan-88	Carnarvon	Oil and Gas
Springvale	CSR	23-Jan-83	Jul-90	Bowen	Gas
Broadway	BHP	29-Apr-83	Feb-92	Surat	Gas
North Herald	Mesa	20-Jun-83	Dec-87	Carnarvon	Oil
Gunna	Delhi	29-Jul-83	Mar-84	Eromanga	Oil
Chookoo	Delhi	30-Aug-83	Nov-85	Eromanga	Oil and Gas
Narcoonowie	Delhi	21-Sep-83	Mar-85	Eromanga	Oil
Nockatunga	Pancontinental	27-Sep-83	Jan-84	Eromanga	Oil
Yambugle	Hartogen	11-Oct-83	Jan-91	Bowen	Gas
Munkah	Delhi	27-Oct-83	Jan-94	Cooper	Gas
Naccowlah South	Delhi	01-Nov-83	Mar-84	Cooper/Eromanga	Oil and Gas
Wilson	Delhi	05-Nov-83	Mar-84	Eromanga	Oil
Yarrabend	Hartogen	15-Nov-83	May-85	Bowen/Surat	Gas
Tinpilla	Delhi	14-Dec-83	May-84	Eromanga	Oil

APPENDIX M (cont'd)

The listing of a 'discovery' in this Appendix is a reflection of company classification and should not be interpreted as a finalised Geoscience Australia classification.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Challum	Delhi	22-Dec-83	May-85	Cooper/Eromanga	Oil and Gas
Naccowlah West	Delhi	22-Dec-83	May-84	Eromanga	Oil
Sigma	Delhi	29-Dec-83	Apr-85	Eromanga	Oil
Tintaburra	Hartogen	31-Dec-83	Jan-84	Eromanga	Oil
Roswin	Bridge	07-Feb-84	Jul-93	Bowen	Gas
Myrtleville	CSR	26-Feb-84	Jul-90	Bowen	Gas
Yanda	Delhi	11-Mar-84	May-85	Cooper/Eromanga	Oil and Gas
Springton	CSR	08-May-84	Jun-90	Bowen	Gas
Moorooloo	CSR	23-Jun-84	May-91	Bowen	Gas
Bogala	Delhi	27-Jun-84	Jul-84	Cooper/Eromanga	Oil and Gas
Bodalla South	Lasmo	27-Jun-84	Nov-84	Eromanga	Oil
Bloodwood	Hartogen	28-Jun-84		Bowen	Gas
Kerinna	Delhi	08-Jul-84	Apr-85	Eromanga	Oil
Limestone Creek/Biala	Delhi	14-Aug-84	Feb-85	Eromanga	Oil
Talisman	Marathon	24-Aug-84	Jan-89	Carnarvon	Oil
West Kora	Esso	27-Aug-84	Sep-89	Canning	Oil
Naccowlah East	Delhi	28-Aug-84	Sep-88	Cooper/Eromanga	Oil and Gas
Carbean	Hartogen	26-Oct-84	May-85	Bowen/Surat	Gas
Berwick	Hartogen	11-Nov-84	Mar-94	Bowen/Surat	Gas
Wancoocha	Delhi	17-Nov-84	Feb-85	Cooper/Eromanga	Oil and Gas
Ballera	Delhi	27-Nov-84	Jan-94	Cooper	Gas
Bookabourdie	Delhi	27-Nov-84	Jul-85	Cooper/Eromanga	Oil and Gas
Tickalara	Delhi	24-Dec-84	Mar-85	Eromanga	Oil
Merrit	AAR	13-Jan-85	Jul-88	Surat	Gas
Mayfield	AAR	25-Jan-85	Jun-85	Surat	Gas
Ulandi	Delhi	03-Mar-85	Jul-85	Eromanga	Oil
Baratta	Delhi	09-Mar-85		Cooper	Gas
Alwyn	Delhi	22-Mar-85	Dec-85	Eromanga	Oil
Mooliampah	Delhi	07-Apr-85	Aug-85	Eromanga	Oil
Norwood	Sunland	14-Apr-85		Bowen	Gas
Muteroo	Delhi	21-Apr-85	May-85	Eromanga	Oil
Lepena	Delhi	15-May-85	Jun-87	Cooper	Gas
West Terrace	Home Energy	28-May-85	Jun-85	Canning	Oil
Kooroopa	Hartogen	01-Jun-85	Aug-85	Eromanga	Oil
Kooroopa North	Santos	01-Jun-85		Eromanga	Oil
Watson South	Delhi	22-Jun-85	Jul-85	Eromanga	Oil
Kenmore	Lasmo	26-Jun-85	Sep-85	Eromanga	Oil
Jena	Delhi	04-Jul-85	Oct-85	Eromanga	Oil
Talgeberry	Hartogen	08-Jul-85	Sep-85	Eromanga	Oil
Meranji	Delhi	12-Jul-85	Aug-85	Cooper/Eromanga	Oil and Gas
Gooranie	Delhi	31-Jul-85	Oct-87	Cooper	Gas
Wippo	Delhi	31-Jul-85		Cooper	Gas
Koora	Pancontinental	01-Sep-85	Sep-85	Eromanga	Oil
Washpool	Hartogen	07-Sep-85	Jul-87	Bowen	Oil
Cook	Delhi	09-Sep-85	Sep-85	Eromanga	Oil
Glenvale	Lasmo	16-Sep-85	Sep-85	Eromanga	Oil
Nulla	Delhi	04-Oct-85		Cooper	Gas
Fairymount	Sydoc	04-Oct-85	Nov-85	Bowen	Oil
Louise	Bridge	13-Oct-85	Jul-86	Bowen	Oil

APPENDIX M (cont'd)

The listing of a 'discovery' in this Appendix is a reflection of company classification and should not be interpreted as a finalised Geoscience Australia classification.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Winna	Pancontinental	17-Oct-85	Oct-85	Eromanga	Oil
Toobunyah	Hartogen	06-Nov-85	Dec-85	Eromanga	Oil
Takyah	Hartogen	28-Nov-85	Feb-86	Eromanga	Oil
McWhirter	Sunland	01-Dec-85	Dec-85	Bowen	Oil
Watson	Delhi	15-Dec-85	Feb-86	Eromanga	Oil
Skua	BHP	26-Dec-85	Dec-91	Bonaparte	Oil
Deepwater	AAR	27-Dec-85	Nov-88	Surat	Gas
Pira	Delhi	04-Jan-86		Cooper	Gas
Ipundu	Hartogen	07-Jan-86	Feb-86	Eromanga	Oil
Dirkala	Delhi	13-Feb-86	Mar-86	Cooper/Eromanga	Oil and Gas
Garanjanie	Delhi	09-Mar-86	Mar-90	Cooper	Gas
Black Stump	Lasmo	10-Mar-86	Mar-86	Eromanga	Oil
Thungo	Pancontinental	15-Mar-86	May-86	Eromanga	Oil
Cowralli	Delhi	30-Mar-86		Cooper	Gas
Kihee	Pancontinental	02-Apr-86	Nov-86	Eromanga	Oil
Nanima	Delhi	13-Apr-86	Aug-87	Eromanga	Gas
Taylor	Bridge	23-Apr-86	Jun-88	Bowen	Oil and Gas
Nungeroo	Delhi	26-Apr-86	May-86	Eromanga	Oil
Dilkera	Pancontinental	02-May-86	Sep-89	Eromanga	Oil
Goyder	Delhi	16-May-86		Cooper	Gas
Bimbaya	Santos	30-May-86	Jun-88	Cooper	Gas
Narrows	Bridge	13-Jul-86	Sep-86	Bowen	Oil
Okotoko	Delhi	04-Aug-86		Cooper	Gas
Tennaperra	Delhi	08-Sep-86		Eromanga	Oil
Tarwonga	Delhi	14-Oct-86	Sep-91	Cooper	Gas
Thurakinna	Delhi	04-Nov-86	Apr-90	Cooper	Gas
Merupa	Santos	04-Nov-86		Cooper/Eromanga	Oil and Gas
Cooroo	Delhi	29-Nov-86	Jan-87	Eromanga	Oil
Swan Lake	Santos	07-Dec-86		Cooper	Gas
Mundi	Delhi	14-Dec-86	Jul-91	Cooper	Gas
Cooroo North	Delhi	31-Dec-86	Mar-87	Eromanga	Oil
Kurunda	Delhi	15-Jan-87	Jul-89	Cooper	Gas
Toby	Delhi	31-Jan-87	Sep-87	Cooper/Eromanga	Oil and Gas
Taylor South	Santos	10-Feb-87	Jun-88	Cooper	Gas
Balcaminga	Santos	02-Apr-87		Cooper	Gas
Maxwell	Pancontinental	06-Apr-87	May-87	Eromanga	Oil
Wingnut	CSR	18-Apr-87	Mar-88	Bowen/Surat	Gas
Caneon	CSR	06-May-87	Feb-88	Surat	Gas
Dingera	Delhi	18-May-87	Jan-88	Cooper/Eromanga	Oil and Gas
Mawson	Delhi	22-May-87	Jul-87	Cooper/Eromanga	Oil and Gas
Keena	Delhi	20-Jun-87	Jul-91	Cooper	Gas
Lloyd	Home Energy	09-Jul-87	Aug-87	Canning	Oil
Monler	Hartogen	15-Jul-87	Sep-87	Eromanga	Oil
Waukatanna	Santos	17-Jul-87		Cooper	Gas
Kanaloo	Hartogen	19-Jul-87	Nov-87	Bowen/Surat	Gas
Deina	Santos	03-Aug-87	Aug-88	Cooper	Gas
Kungarri	Hartogen	20-Aug-87	Mar-89	Bowen	Gas
Pelican (Santos)	Santos	21-Sep-87	Dec-89	Cooper/Eromanga	Oil and Gas
Rosette	Bond	16-Oct-87	Apr-88	Carnarvon	Oil and Gas

APPENDIX M (cont'd)

The listing of a 'discovery' in this Appendix is a reflection of company classification and should not be interpreted as a finalised Geoscience Australia classification.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Cranstoun	Hartogen	02-Nov-87	Nov-87	Eromanga	Oil
Karri	Delhi	05-Nov-87	Nov-90	Cooper/Eromanga	Oil and Gas
Pintari North	Santos	10-Nov-87	Feb-88	Eromanga	Oil
Judga	Delhi	26-Nov-87		Cooper	Gas
McWhirter East	Sydoc	28-Nov-87		Bowen	Oil
Yuranigh	Hartogen	04-Dec-87	Jun-89	Bowen	Gas
North Colgoon	Hartogen	20-Dec-87	Sep-88	Surat	Gas
Katnook	Ultramar	31-Dec-87		Otway	Gas
Pitchery	Delhi	21-Jan-88	Mar-88	Eromanga	Oil
Walpanara	Hartogen	01-Feb-88	Jan-91	Bowen	Gas
Munro	Delhi	01-Mar-88	Aug-88	Cooper/Eromanga	Oil
Iona	Beach	17-Mar-88		Otway	Gas
Natan	Delhi	20-Mar-88	Dec-88	Eromanga	Oil
Massy	Santos	13-Apr-88		Cooper	Gas
Narie	Santos	09-May-88	May-90	Cooper	Oil and Gas
Kujani	Santos	09-May-88	Jul-91	Cooper	Gas
Taloola	Santos	29-May-88	Jul-88	Eromanga	Oil
Tarbat	Hartogen	15-Jun-88	Jun-88	Eromanga	Oil
Sturt	Santos	06-Jul-88	Jul-88	Cooper/Eromanga	Oil and Gas
Varanus	Santos	16-Jul-88	Apr-91	Cooper	Gas
Tantanna	Santos	23-Jul-88	Sep-89	Eromanga	Oil
James	Santos	07-Sep-88	Jan-89	Cooper	Oil
Kirralee	Santos	02-Nov-88	Apr-91	Cooper	Gas
Arrakis	Santos	06-Nov-88	Jun-92	Cooper/Eromanga	Gas
Beechwood	Bridge	09-Dec-88	Dec-92	Bowen	Gas
Tinker	Bridge	30-Dec-88	Jul-93	Bowen	Gas
Mettika	Santos	02-Feb-89	May-90	Cooper	Gas
Spencer West	Santos	10-Apr-89	May-89	Eromanga	Oil
Marsilea	Santos	04-May-89	Jun-90	Cooper	Gas
Amyema	Santos	27-May-89	Jun-90	Cooper	Gas
Naccowlah	Delhi	15-Jul-89	Sep-89	Eromanga	Oil
Gidgee	Delhi	31-Jul-89	Sep-89	Eromanga	Oil
Pinaroo	Delhi	24-Aug-89	Oct-89	Eromanga	Oil
Muthero	Command	25-Aug-89	Sep-89	Eromanga	Oil
Wandilo	Delhi	07-Sep-89	Oct-89	Eromanga	Oil
Maxwell South	Command	15-Sep-89	Jan-90	Eromanga	Oil
Corella	Delhi	22-Sep-89	Nov-89	Eromanga	Oil
Ipundu North	Ampolex	22-Sep-89	Nov-89	Eromanga	Oil
Endeavour	Ampolex	06-Oct-89	Nov-89	Eromanga	Oil
Orientos	Delhi	18-Dec-89	Mar-90	Eromanga	Oil
Bowen	Delhi	29-Dec-89	Feb-90	Eromanga	Oil
Pogona	Santos	23-Feb-90		Cooper	Gas
North Yardanogo	Barrack	02-Mar-90		Perth	Oil
Caraka	Santos	15-Apr-90	Nov-90	Cooper	Gas
Moolalla	Santos	15-Apr-90	Aug-90	Cooper	Gas
Beharra Springs	Barrack	05-May-90	Jun-90	Perth	Gas
Bottletree	OCA	06-Jul-90	Mar-91	Bowen	Gas
Alisma	Santos	26-Jul-90	Dec-94	Cooper	Gas
Boundary	Petroleum Securities	16-Aug-90	Dec-90	Canning	Oil

APPENDIX M (cont'd)

The listing of a 'discovery' in this Appendix is a reflection of company classification and should not be interpreted as a finalised Geoscience Australia classification.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Malgoona	Santos	17-Aug-90	Oct-90	Cooper	Oil and Gas
Rheims	Delhi	19-Aug-90	Nov-90	Eromanga	Oil
Beranga South	OCA	24-Aug-90	Jul-91	Bowen	Gas
Cogoon River West	OCA	10-Oct-90	Mar-91	Surat	Oil
Jarrar	Delhi	16-Dec-90	Dec-90	Eromanga	Oil
Bolan	Delhi	04-Jan-91	Feb-91	Eromanga	Oil
Cooba	Santos	26-Mar-91	Aug-91	Cooper	Gas
Echuburra	Delhi	01-Apr-91	May-91	Eromanga	Oil
North Boxleigh	Bridge	20-Apr-91	May-93	Bowen	Gas
Cowan	Santos	18-May-91		Cooper	Gas
East Glen	Bridge	23-May-91	Jul-93	Bowen	Gas
Wallawanny North	Delhi	06-Jun-91	Aug-91	Eromanga	Oil
Patroclus	Delhi	21-Jun-91	Jul-91	Cooper/Eromanga	Oil and Gas
Cooloon South	Santos	02-Jul-91	Dec-92	Cooper	Gas
Tanami	Hadson	08-Jul-91	Oct-91	Carnarvon	Oil
Wilga	OCA	15-Sep-91	Aug-92	Bowen	Oil and Gas
Keleary	Santos	13-Oct-91	Nov-91	Cooper	Oil
Martini	OCA	22-Nov-91	Aug-92	Bowen	Oil and Gas
Genoa	Delhi	03-Jan-92	Mar-92	Eromanga	Oil
Boongala	Santos	14-Jan-92	Apr-93	Cooper	Gas
Gimboola	Ampolex	10-Jul-92	Jul-92	Eromanga	Oil
Roswin North	Bridge	20-Jul-92	Jul-93	Bowen	Gas
Farina	Santos	14-Sep-92	Apr-93	Cooper	Gas
Wirrarie	Santos	01-Oct-92		Cooper	Gas
Coopers Creek	Santos	11-Nov-92		Cooper	Gas
Turkey Creek	AGL	16-Nov-92	Aug-93	Bowen	Gas
Genoa North	Santos	16-Dec-92	Feb-93	Eromanga	Oil
Glenloth	OCA	16-Jan-93		Bowen	Gas
Stokes	Santos	14-Jun-93		Cooper	Gas
Lark	Bridge	16-Jun-93	Jun-94	Bowen	Gas
Costa	Santos	06-Jul-93		Cooper	Gas
Mudlalee	Santos	30-Jul-93	Aug-93	Eromanga	Oil
Snake Creek East	Santos	02-Oct-93	Apr-94	Bowen/Surat	Gas
Bargie	OCA	11-Jan-94	Apr-94	Eromanga	Oil
Crest	Wapet	06-Feb-94		Carnarvon	Oil and Gas
Link	Bridge	17-Mar-94		Bowen	Gas
Haselgrove	SAGASCO	27-May-94		Otway	Gas
Inland	Inland	24-Jun-94		Eromanga	Oil
Mylor	Bridge	27-Jun-94		Otway	Oil and Gas
Caladan	Santos	30-Jul-94		Cooper/Eromanga	Gas
Iliad	Santos	10-Aug-94	Aug-94	Eromanga	Oil
Alkimos	Hadson	31-Aug-94		Carnarvon	Oil and Gas
Ballera West	Santos	01-Sep-94		Cooper	Gas
Telopea	Santos	13-Oct-94	Oct-94	Cooper	Oil
Allambi	Santos	20-Oct-94	Jun-95	Cooper	Gas
Caxton	OCA	24-Jan-95		Bowen/Surat	Gas
Dunbar	GFE	23-Mar-95		Otway	Gas
Tarrawonga North	Santos	04-May-95	Aug-95	Bowen/Surat	Gas
Gahnia	Santos	04-Aug-95	Nov-95	Cooper	Gas

APPENDIX M (cont'd)

The listing of a 'discovery' in this Appendix is a reflection of company classification and should not be interpreted as a finalised Geoscience Australia classification.

Discovery	Discovery operator	Discovered*	Produced**	Basin(s)	Type
Costa South	Santos	10-Aug-95		Cooper	Gas
Correa	Santos	06-Nov-95		Cooper	Gas
New Royal	OCA	09-Nov-95		Bowen	Oil and Gas
Pennie	Santos	01-Dec-95		Cooper	Gas
Plantago	Santos	05-Dec-95		Cooper	Gas
Yawa	Santos	21-Feb-96		Cooper	Gas
Reg Sprigg	Santos	10-Jun-96	Sep-96	Eromanga	Oil
Carmina	Santos	13-Sep-96	Sep-96	Eromanga	Oil
Gudi	Santos	23-Oct-96		Cooper	Gas
Stokes North	Santos	24-Oct-96		Cooper	Gas
Beckler	Santos	30-Nov-96		Cooper	Gas
Judga North	Santos	06-Jan-97	Jun-97	Cooper	Gas
Merindal	Santos	16-Jan-97	Apr-97	Cooper	Gas
Nephrite	Santos	18-Jan-97	Jun-97	Cooper	Gas
Tarragon	Santos	23-Jan-97	Jul-97	Eromanga	Oil
Koree South	Santos	10-Feb-97		Cooper	Gas
Weribone East	OCA	30-Mar-97	Apr-98	Surat	Gas
Fenton Creek	Santos	04-Apr-97		Otway	Gas
Nephrite South	Santos	19-Jun-97		Cooper	Gas
Dorodillo	Santos	17-Jul-97		Cooper	Gas
Regatta	OCA	05-Aug-97		Surat	Gas
Milluna	Santos	17-Aug-97		Cooper	Gas
Redman	Boral	14-Feb-98		Otway	Oil and Gas
Cabernet	Santos	06-May-98		Cooper	Gas
Welcome Lake East	Santos	09-Sep-98		Cooper	Gas
Moolion North	Santos	10-Sep-98		Cooper	Gas
Moonanga	Santos	05-Nov-98		Cooper	Gas
Verona	Santos	05-Nov-98		Cooper	Gas
Mica	Santos	22-Dec-98		Cooper	Gas
Raven	Santos	13-Jan-99		Cooper	Gas
Touriga	Santos	01-Feb-99		Cooper	Gas

* Total depth date of discovery well
** Approximate, where available