

Projects

Ashmore Cartier

AUDACIOUS

Permit: AC-P17

Location: About 20 km NE of the Tenacious field, Vulcan Sub-basin, Timor Sea.
Ownership: COSMO OIL COMPANY LTD 35% through Cosmo Oil Ashmore Ltd; OMV AUSTRALIA PTY LTD 65% through OMV Timor Sea Pty Ltd.

Operator office: Graham Dwyer, operations manager, OMV Australia Pty Ltd, Level 28, 44 St Georges Tce, Perth, WA 6000. Ph: (08) 9223 5000. Fax: (08) 9223 5004.

Resources/Reserves: At December 2001, initial scope for recovery volume estimates were 20 mmbbl oil.

Comment: In January 2001, Audacious-1, a significant flank test of the Audacious structure and located more than 50m down dip from the mapped crest achieved a flow rate of 9,100 bopd during production testing from a 3m perforated interval. Gravity of the produced fluid was 55 degrees API and early data suggested an 11.5m continuous light oil column to be present. Audacious-1 was plugged and abandoned. The Audacious-2 well was spudded in November 2001, 2.3 km SW of Audacious-1, in a water depth of 172m. The well confirmed the presence of an oil accumulation but technical difficulties prevented any wireline logging and the well was plugged and abandoned. Nothing further was reported to September 2003.

CHALLIS-CASSINI (see also Jabiru)

Permit: AC-L3

Location: 20 km SW of Jabiru, Vulcan Sub-basin.

Ownership: ANADARKO PETROLEUM CORPORATION 14.7% through Anadarko Canada Corporation; COOGEE CHEMICALS PTY LTD 50%; EXXON MOBIL CORPORATION 6.25% through Ampolex Ltd; OMV AUSTRALIA PTY LTD 18.75% through Cultus Timor Sea Pty Ltd; SANTOS LTD 10.3%.

Operator office: Andy Jacob, managing director, Coogee Resources Pty Ltd, Level 1, 28-42 Ventnor Ave, West Perth, WA 6005. Ph: (08) 9483 9483. Fax: (08) 9226 2102.

Resources/Reserves: At September 2000, the remaining proven-probable recoverable oil reserves were 2.8 mmbbl.

Comment: The Challis and Cassini fields began production in December 1989 and produced via subsea wellheads and flexible flowlines to an FPSO where oil was stabilised and stored until sufficient quantities had been gathered for offloading to an export tanker. The ship was specially built to be permanently moored over the Challis and Cassini fields and was connected to a production riser by a 50m yoke-like structure protruding from the bow, allowing the vessel to move up and down and swivel around the riser like a weathervane. A heavy base on the seabed anchored the mooring and production riser, which had universal joints to allow for the vessel's surge, pitch and sway. The field reached peak production of about 43,000 bopd in 1990. During 1998/99, development work focused on minimising operating costs as the field moved closer towards its natural end of life, estimated to be within three to eight years. In July 1998, BHPP sold its subsidiary BHP Petroleum (Cartier) Pty Ltd, to Gulf Australia, a subsidiary of Gulf Canada Resources Ltd. In July 1999, Newfield Exploration Australia acquired Gulf's interest. Newfield said it would focus on maximising the assets through reducing operating expenses, increasing field life and further exploration. In May 2000, Challis-15, a deviated oil development well, reached a TD of 1,533m. The well was unsuccessful and was plugged and abandoned. A gas lift optimisation program had been implemented in early 2000 and production averaged about 4,300 bopd (for both Challis-Cassini and Jabiru oil fields) in the second half of 2000. In the September 2001 quarter, production from Challis-Cassini and fields was at 3,329 bopd. Sixteen wells had been drilled on the field, seven were being used for oil production and one well for water injection. Newfield had reduced operating costs, extended field life and increased expected ultimate recovery, with the remaining field life expected to be up to three years. In 2003 Newfield sold its Australian interests to Coogee Chemicals Pty Ltd and Coogee took over the operation of the project. (For production figures see Jabiru).

CORALLINA (see Laminaria-Corallina)

Permit: AC-P8

JABIRU (see also Challis-Cassini)

Permit: AC-L1

Location: 650 km west of Darwin, Vulcan Sub-basin.

Ownership: ANADARKO PETROLEUM CORPORATION 14.7% through Anadarko Canada Corporation; COOGEE CHEMICALS PTY LTD 50%; EXXON MOBIL CORPORATION 6.25% through Ampolex Ltd; OMV AUSTRALIA PTY LTD 18.75% through Cultus Timor Sea Pty Ltd; SANTOS LTD 10.3%.

Operator office: Andy Jacob, managing director, Coogee Resources Pty Ltd, Level 1, 28-42 Ventnor Ave, West Perth, WA 6005. Ph: (08) 9483 9483. Fax: (08) 9226 2102.

Geology: Fault-bounded anticline with production from Jurassic sand. Oil gravity is 41-42 degrees API and water depth 120m.

Resources/Reserves: At December 2000, remaining proven-probable recoverable oil reserves were 6.2 mmbbl.

Production history:

Period to	Amount	Comment
31/12/2000	2.03 mmbbl	oil
31/12/2001	2.80 mmbbl	oil
31/12/2002	2.63 mmbbl	oil

Comment: The Jabiru field was discovered in May 1983 and was held under the licences AC-L1 and AC-L2. Production began in 1986 through subsea wellheads and flexible flowlines to the "Jabiru Venture" FPSO, a converted oil tanker. The disconnectable FPSO was developed when it became apparent that a less costly alternative

to a conventional cyclone-proof production platform was required to economically develop the field. Shuttle tankers took on crude through a floating hose, with cargoes ranging from 200,000 - 500,000 bbls. Production peaked at almost 60,000 bopd in 1989/90. In 1996, the 145,000t vessel dry-docked in Singapore for a \$11 million refit and recertification to re-classify the vessel from a crude oil tanker to a mobile offshore unit. As a result, the "Jabiru Venture" was capable of remaining on location for at least another five years. The vessel resumed production in January 1997 at similar levels to pre-shutdown rates. In July 1998, BHPP sold its subsidiary BHP Petroleum (Cartier) Pty Ltd, to Gulf Australia, a subsidiary of Gulf Canada Resources Ltd. The sale involved production licences AC-L1, -2 and -3, containing the Jabiru and Challis-Cassini oil fields and AC-L4 covering the Skua field, which had ceased production in 1996/97. Gulf Australia became operator in January 1999. The company said it would focus on maximising the assets through reducing operating expenses, increasing field life and further exploration but, in mid-1999, it sold its interest to Newfield Australia. Jabiru-14, infill development well was drilled in April 2000 to a TD of 1,830m. The well did not find sufficient oil pay to warrant completion at that time and was temporarily abandoned. Downtime associated with the drilling of Jabiru-14 and annual maintenance on the field's production vessel reduced production for the first quarter of 2000. A gas lift optimisation program had been implemented in early 2000. In the September 2001 quarter, production from Jabiru and Challis-Cassini was at 4,875 bopd. A total of 14 wells had been drilled, of which 5 were producers. The remaining life of the field was expected to be up to five years. During 2003, Newfield Exploration withdrew from its Australian permits and sold its interests to Coogee Chemicals Pty Ltd. Coogee subsequently took over the operation of the project. (Production figures include Challis-Cassini).

LAMINARIA-CORALLINA

Permit: AC-L5

Location: 550 km NW of Darwin, Timor Sea.

Ownership: BHP BILLITON PETROLEUM PTY LTD 25% and 32.6125% of Laminaria through BHP Billiton Petroleum (North West Shelf) Pty Ltd; SHELL AUSTRALIA PTY LTD 25% and 22.4625% of Laminaria; WOODSIDE PETROLEUM LTD 50% and 44.9250% of Laminaria through Woodside Energy Ltd.

Operator office: Agu Kantsler, general manager new ventures, Woodside Energy Ltd, 1 Adelaide Tce, Perth, WA 6000. Ph: (08) 9348 4000. Fax: (08) 9348 5539.

Geology: Laminaria is part of a small drowned platform area and is an E-W orientated horst, internally divided into ENE-WSW tilted fault blocks. Oxfordian shales seal the Collovian to lowest Oxfordian Laminaria Formation, which forms the main reservoir section, with the deeper Collovian Plover Formation being the main aquifer. The low GOR and high API of the oil was typical of other fields in the Timor Sea. The Collovian stratigraphy exhibits a substantial change from the fluvio-deltaic, dominantly lowstand sandstone units of the Plover Formation, to the backstepping progrades of the Laminaria Formation, which represents a transgressive, estuarine-dominated delta. The best quality reservoir lithofacies comprise distributary channels and stream mouth bars, vertically separated by estuarine, interdistributary and extensive shallow marine bay sediments. The development of secondary interconnected porosity has produced reservoirs with excellent permeabilities, even though burial to about 3,300m has decreased the original porosities to an average 15%.

Resources/Reserves: At December 2002, Laminaria's ultimate recovery of oil decreased by 19 mmbbl at the proved and 20.8 mmbbl at the probable levels. Corallina's ultimate recovery was increased by 3.5 mmbbl at the proved level and 1.3 mmbbl at the probable level. Total AC-L5 proved oil reserves were estimated at 28.7 mmbbl and total probable oil reserves were estimated at 66.8 mmbbl.

Production history:

Period to	Amount	Comment
30/6/2002	29.83 mmbbl	oil and condensate
30/6/2003	22.58 mmbbl	oil and condensate

Comment: The Laminaria-Corallina fields began producing in November 1999. The fields had cost \$1.37 billion to bring on line, and were about \$300 million over budget and almost a year behind schedule. Water depth was expected to create technical challenges in the development of both fields, with the Laminaria FPSO to be moored in a depth of about 385m, necessitating the development of diver-less subsea systems. Other challenges involved tying in the required number of risers from the Laminaria and Corallina fields and creating flexibility for the tying in of future fields. The development was to make provisions in the internal turret in terms of space for future risers and riser tubes, as well as provisions for future piping arrangements. The Laminaria FPSO was to utilise an internal turret, around which the vessel weathervaned. Fabrication of the FPSO hull, turret and topsides began in early 1997 following the issuing of a production licence. Drilling of Laminaria-4, the first production well, was successfully completed in 1997, encountering a 99m oil column. In April 1998, drilling of Corallina-2 development well was suspended while Corallina-3 was completed. Later in the year, Corallina-2 recorded a flow rate of 25,000 bopd but production was limited by rig equipment. A cost blow-out in early 1998 saw construction delayed several months with sailaway taking place in July. Woodside, Shell and BHP Petroleum concluded a unitisation agreement over the oil fields which straddled both AC-L5 and WA-260P. In November 1999, oil production began with production planned to increase steadily as commissioning was completed. The project was expected to produce 140,000 bopd of light low-sulphur crude with an API gravity of 58-59 degrees. The Northern Endeavour FPSO had a maximum production capacity of 170,000 bopd. In the first half of 2000, average production rates varied between 129,889 bopd and 152,692 bopd, averaging 141,291 bopd. In the June 2000 quarter, production of 180,000 bopd was achieved during high-rate testing, demonstrating that the facility was capable of producing at higher rates than its nameplate capacity of 170,000 bopd. The Laminaria and Corallina reservoirs continued to perform to expectation. Analysis of pressure data indicated strong aquifer support and good reservoir connectivity, significantly reducing the likelihood of a low-side reserves outcome for both fields. The interpretation of reprocessed 3D seismic was completed and reserves estimates were updated in the second half 2000, based on revised reservoir modelling. In late 2000, Woodside finalised an agreement with BHP Petroleum on the timing of payment and arrangements for receipt of a production entitlement to be paid by BHPP to Woodside. The entitlement was part of the 1994 farm-in agree-