



New opportunities for offshore petroleum exploration

2008 acreage release focuses on North West Shelf

Marita Bradshaw

Each year the Australian Government releases new offshore opportunities for petroleum exploration. The 2008 release of offshore petroleum exploration areas was announced on 7 April by the Hon. Martin Ferguson AM MP, Minister for Resources and Energy, at the annual Australian Petroleum Production and Exploration Association conference held in Perth.

“They cover a wide range of sizes, water depths and exploration maturity, providing opportunities to a diversity of petroleum exploration companies.”

Thirty-five new exploration areas in five offshore sedimentary basins are offered in the 2008 release. All areas are available through a work program bidding system, with closing dates for bids at six and twelve months from the date of release. Acreage in the first round closes on 9 October 2008 and includes the more explored areas. The second closing round on 9 April 2009 comprises acreage located in less well explored and frontier regions.

The 2008 acreage release areas are in Commonwealth waters offshore of Western Australia and the Northern Territory, and in the Territory of the Ashmore and Cartier Islands Adjacent Area. They cover a wide range of sizes, water depths and exploration maturity, providing opportunities to a diversity of petroleum exploration companies. The release areas are selected from nominations from industry, the states, the Northern Territory, and Geoscience Australia.

The focus of the 2008 release is on the North West Shelf, where there is strong industry interest in the producing Carnarvon and Bonaparte basins and in the Browse Basin, the home of super-giant gas fields under active consideration for development.

Also included in the 2008 release is the Bedout Sub-basin of the Roebuck Basin, located on the central North West Shelf between the hotly contested Carnarvon and Browse basins. In addition, the release showcases the southern Vlaming Sub-basin, Perth Basin, where



recent studies by Geoscience Australia have provided a new understanding of petroleum potential (figure 1).

Bonaparte Basin

Fifteen of the release areas are in shallow water in the Bonaparte Basin, and represent a range of geological settings. The Bonaparte Basin is on Australia's northwest continental margin and contains up to 15 kilometres of Phanerozoic marine and fluvial siliciclastics, as well as marine carbonates. The basin is structurally complex and comprises Palaeozoic and Mesozoic sub-basins and platform areas with a number of proven petroleum systems for both oil and gas. The 2008 release areas on offer in the Bonaparte Basin (figure 2) include areas on the eastern (AC08-5 and AC08-6) and western (AC08-4) margins of the proven Mesozoic oil kitchen of the Vulcan Sub-basin and on the adjacent Ashmore Platform (AC08-1, AC08-2 and AC08-3).

Also available in the Bonaparte Basin are areas that have access to proven Palaeozoic petroleum

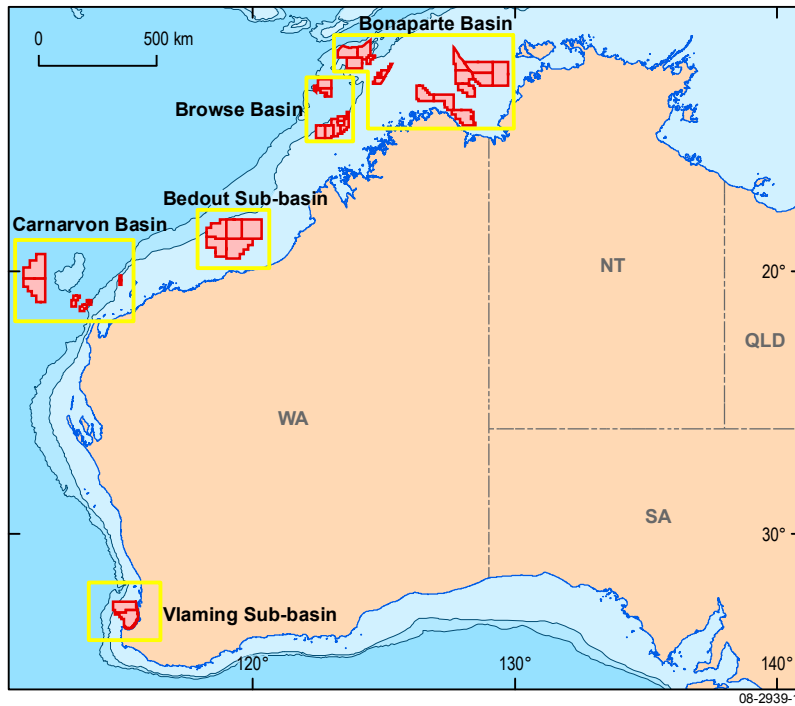


Figure 1. Location of Australia's 2008 offshore petroleum exploration areas.

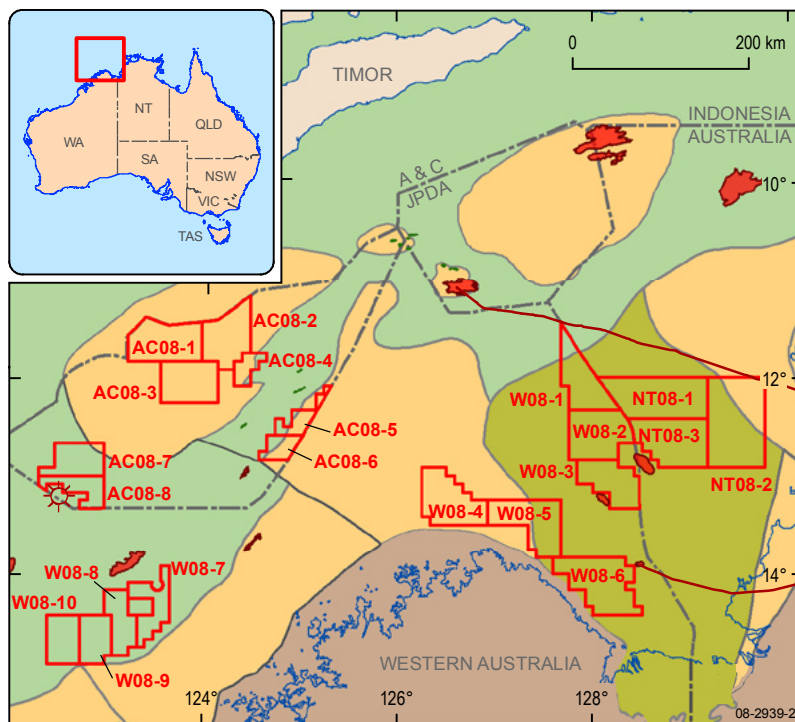
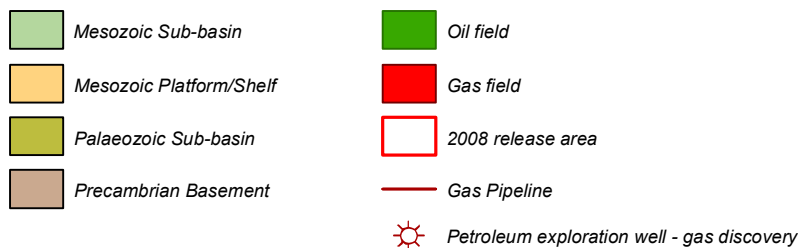
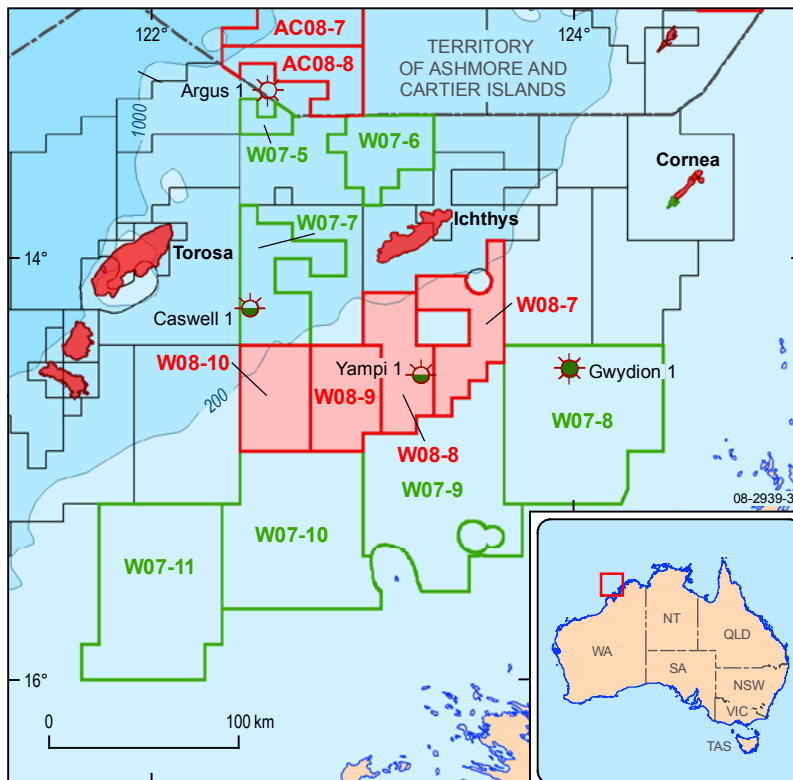


Figure 2. Regional setting of the Bonaparte and Browse basins, showing the location of the 2008 release areas, major fields and structural elements.

Field outlines supplied by Encom Petroleum Information Pty Ltd. Field outlines in GPInfo are sourced from the operators of the fields only. Outlines are updated at irregular intervals but with at least one major update per year. Field outlines for Comea and Ichthyus are sourced from IHS Energy, 2006.



systems. Release areas NT08-1, NT08-2 and NT08-3, and W08-1, W08-2 and W08-3 overlie the Petrel Sub-basin and are within the mapped extent of the proven Permian Hyland Bay/Keyling-Hyland Bay petroleum system, which has sourced the nearby major gas discoveries of Petrel, Tern and Blacktip. The Blacktip gas-condensate field is currently under development to supply gas to Darwin via pipeline (figure 2). On the underexplored and shallow water western margin of the Petrel Sub-basin, three release areas are available. Areas W08-4, W08-5 and W08-6 are on the Londonderry High – Berkley Platform and are adjacent to significant hydrocarbon discoveries and to proven Permian and Carboniferous petroleum systems.



Well symbols supplied by Geoscience Australia (basic data open file) and Encom Petroleum Information Pty Ltd (basic data confidential). These were generated from open file data as at 31 Jan 2008. Field outlines supplied by Encom Petroleum Information Pty Ltd. Field outlines in GPInfo are sourced from the operators of the fields only. Outlines are updated at irregular intervals but with at least one major update per year. Field outlines for Cornea and Ichthys are sourced from IHS Energy, 2006.

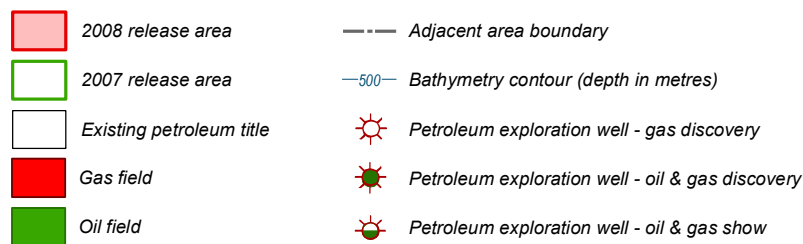


Figure 3. Release areas W08-7, W08-8, W08-9 and W08-10, Caswell Sub-basin, Browse Basin.

Browse Basin

Six areas are available for bidding in the Browse Basin, which is a northeast trending, Palaeozoic to Cenozoic depocentre up to 15 kilometres thick situated entirely offshore in the Timor Sea region of Australia's North West Shelf. The Browse Basin hosts significant, but as yet undeveloped, reserves of gas (~30 trillion cubic feet) and condensate (>400 million barrels) mostly in five large gas fields—Scott Reef (Torosa), Brecknock, Brecknock South (Calliance), Ichthys and Crux—together with a number of other smaller discoveries. Release areas AC08-7 and AC08-8 are on offer in the northern Caswell Sub-basin, directly adjacent to the Argus gas field in water depths between 400 and 1450 metres.

Four release areas are available in the central Caswell Sub-basin, nearby or adjacent to the giant Ichthys gas accumulation where aggressive appraisal drilling programs are underway. Thick, rich source rocks and excellent reservoir and competent seal facies have been demonstrated within the stratigraphic section of the Caswell Sub-basin. The release areas W08-7, W08-8, W08-9 and W08-10 lie within this Early Cretaceous petroleum system delimited by the Cornea and Gwydion oil fields to the east and the Caswell 2 oil accumulation to the west (figure 3).

Bedout Sub-basin

In the Bedout Sub-basin of the Roebuck Basin, six areas are on offer. The Roebuck Basin is the central part of the northeast–southwest trending Westralian Superbasin, which underlies the North West Shelf. On trend along the shelf, to the south and north respectively are the major Mesozoic petroleum provinces of the Carnarvon and Browse basins, while to the east is the offshore extension of the petroliferous Palaeozoic Canning Basin.

The release areas cover the Bedout Sub-basin, which is the inboard component of the Roebuck Basin (figure 4) and contains up to 7 kilometres of Mesozoic sediments overlying a Palaeozoic section. Only six wells have been drilled in the sub-basin, with the last drilling

occurring 25 years ago. Within release area W08–11 is the Phoenix tight gas accumulation reservoir in Triassic sandstones, and the Triassic Keraudren Formation is interpreted as the local source for the gas. Good reservoir characteristics occur in Middle Jurassic sandstones in a number of wells in the Bedout Sub-basin, and several undrilled prospects are recognised at both the top Triassic and base Cretaceous levels across the release areas.

Carnarvon Basin

Seven of the new release areas are in Australia's major hydrocarbon-producing province, the Carnarvon Basin. The offshore Northern Carnarvon Basin has a thick Mesozoic section that includes thousands of metres of Triassic, Jurassic and Cretaceous clastic sediments that are the source, reservoir and seal facies for a world-class gas and oil province. A number of different sub-basins and structural elements make up the Carnarvon Basin, and on offer in the 2008 release are areas in the Exmouth and Barrow sub-basins and on the Exmouth Plateau and Rankin Platform.

Two release areas are available in the heart of the Carnarvon Basin, surrounded by major gas and oil fields. W08–16 and W08–17 are in the western Barrow Sub-basin on the Tryal Rocks Terrace, with W08–16 extending up onto the Rankin Platform. There are proven

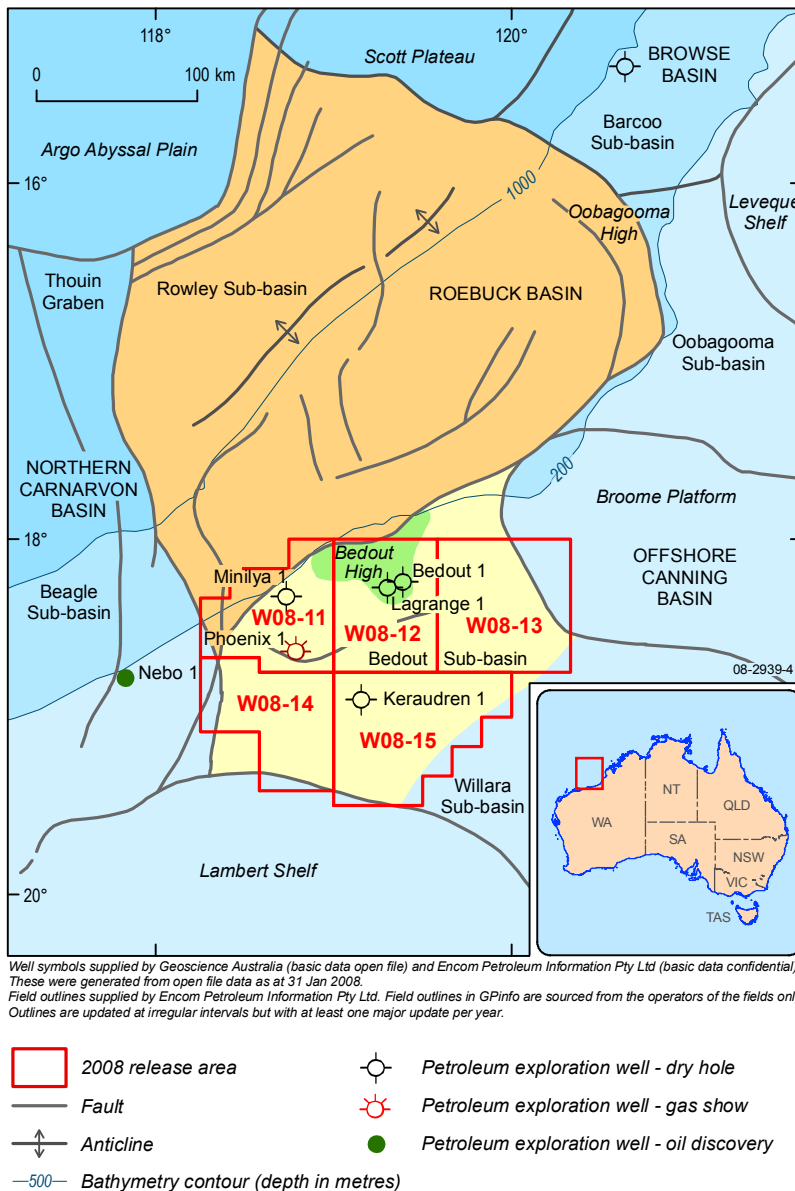


Figure 4. Regional setting of the Bedout Sub-basin showing the location of the 2008 Release areas, major fields and structural elements.

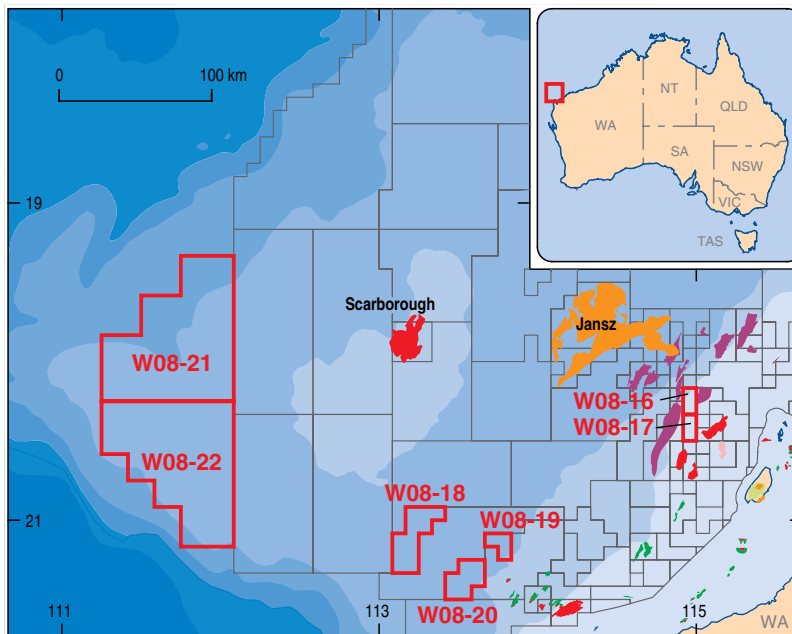
plays in the adjacent acreage at the Triassic, Early Cretaceous and Palaeocene levels (figure 5). Gas charge in these reservoirs has seismic expression, which has been successfully used to guide exploration.

Further south, three release areas are on offer in the Exmouth Sub-basin, the most southerly of a series of oil-bearing Jurassic depocentres that lie inboard of the Exmouth Plateau. Areas W08-18, W08-19 and W08-20 are in water depths of around 1000 metres along the western margin of Exmouth Sub-basin and on the Exmouth Plateau. Oil production from the sub-basin began in 2006; since 1993, 11 oil and gas fields have been discovered in the region immediately to the east of the release areas (figure 5).

The Exmouth Plateau is the deepwater frontier of the Carnarvon Basin. A subsided continental platform dominated by a thick fluviodeltaic Triassic sequence, it hosts several giant gas accumulations and is an area of active and successful exploration. W08-21 and W08-22 are large (each more than 6400 square kilometres) undrilled release areas across the southwestern corner of the Exmouth Plateau and upper

slope, with water depths in the range from 1000 to 2500 metres. The super-giant Jansz gas field and the giant Scarborough gas field, along with the recent discoveries at Chandon and Thebe, clearly demonstrate that the Exmouth Plateau is prospective for large gas discoveries.

Two release areas are offered in the Vlaming Sub-basin of the Perth Basin (figure 6). The Perth Basin is an elongate, north-to-northwest trending sedimentary basin extending about 1300 kilometres along the southwestern coast of Australia.



Field outlines supplied by Encom Petroleum Information Pty Ltd. Field outlines in GPinfo are sourced from the operators of the fields only. Outlines are updated at irregular intervals but with at least one major update per year.

2008 release area
 Existing petroleum permit

08-2939-5

Period (Formation)	Oil accumulation	Gas accumulation
Paleocene		
Barremian (Windalia Sandstone)		
Valanginian & Berriasian (Barrow Group)		
Tithonian, Oxfordian and Middle Jurassic		
Upper Triassic (Brigadier and Mungaroo Formations)		

Figure 5. Major oil and gas accumulations of the northern Carnarvon Basin indicating age of main reservoir and showing the location of the 2008 Release Areas.

There is onshore and offshore oil production from a Permo-Triassic petroleum system in the northern Perth Basin. In the offshore southern Perth Basin there are known accumulations of oil and gas in Early Cretaceous and Late Jurassic reservoirs in the Vlaming Sub-basin. Release areas W08-23 and W08-24 are in the sub-basin, and recent basin modelling studies indicate the potential for hydrocarbon accumulations to occur.

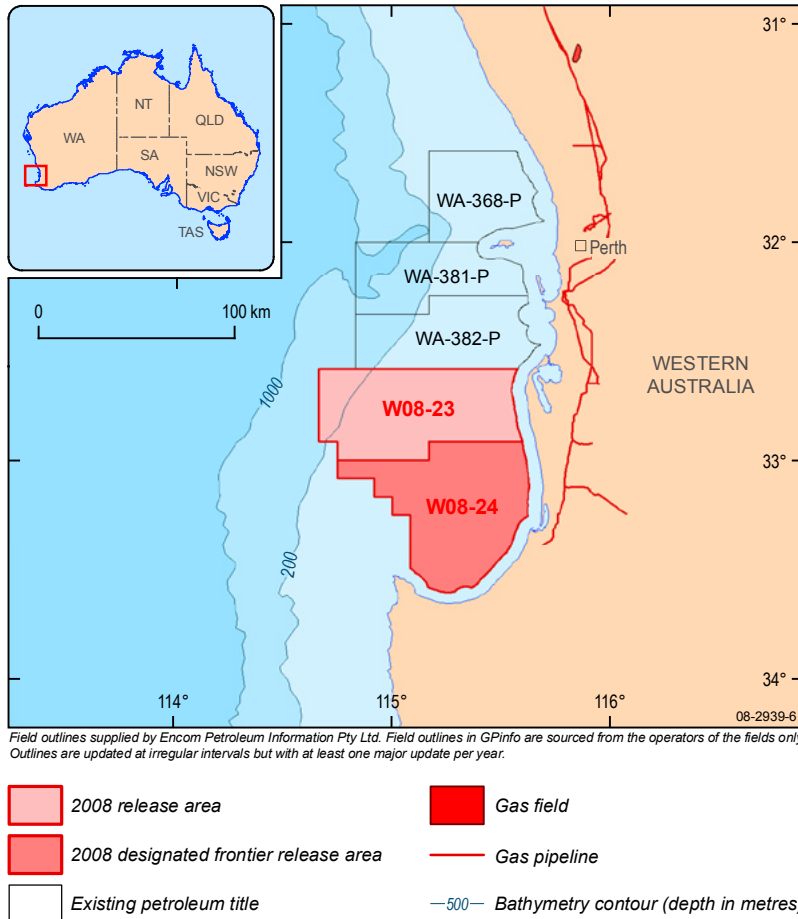


Figure 6. Release areas W08-23 and W08-24, Vlaming Sub-basin, Perth Basin.

For more information

For further information on the 2008 release areas or to book into the 2008 Acreage Release Data Room,

phone Megan Lech on +61 2 6249 9459

email megan.lech@ga.gov.au

visit www.ga.gov.au

For more information to assist prospective applicants in preparing an exploration area application,

phone +61 2 6249 9222

Related websites/links

2008 offshore petroleum exploration areas (Department of Resources, Energy and Tourism)

www.ret.gov.au/petexp

CD-ROM version

petroleum.exploration@ret.gov.au

Data supporting the 2008 acreage release (Seismic data is available in GeoFrame™, Kingdom and Landmark™ formats)

ausgeodata@ga.gov.au

Associated digital well data

biu@ga.gov.au