



**Australian Government**

**Department of Resources, Energy and Tourism**



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**Geoscience Australia**

## **2009 RELEASE OF OFFSHORE AREAS FOR GREENHOUSE GAS STORAGE ASSESSMENT**

**AREAS VLAM-01 AND VLAM-02**

**VLAMING SUB-BASIN, PERTH BASIN**

**WESTERN AUSTRALIA**

**BIDS CLOSE: The later of the 6 months after the release of the acreage or  
2 months after the regulations under the Act have been promulgated**

- Water depths less than 1000 m
- Several potential structural and stratigraphic storage sites and migration dissolution/residual trapping
- Moderate seismic and well coverage
- Close to existing infrastructure

Special Notices apply, refer to **Guidance notes for Applicants**.

## GREENHOUSE GAS (GHG) ACREAGE RELEASE –2009

### VLAMING SUB-BASIN, PERTH BASIN, WESTERN AUSTRALIA

The Vlaming Sub-basin is located along the southwestern coast of Australia and the major Middle Jurassic–Early Cretaceous depocentre of the offshore Perth Basin, located along the southwestern coast of Australia. Water depths range from approximately 20 to 200 m over much of the release areas. Close to existing Western Australian infrastructure, the sub-basin has extensive seismic coverage with moderate petroleum well distribution. The potential storage styles include fault bounded dry structures and stratigraphic traps within multiple stratigraphic levels, as well as, long distance dissolution/residual trapping in regional sand bodies.

Reservoir: Gage Sandstone, Charlotte Sandstone, Jervoise Sandstone and the upper part of the Yarragadee Formation.

Seal: Local, intra-formational seals including the South Perth Shale, Carnac Formation and Otorowiri Formation (Parmelia Group).

Trap: Multiple structural and stratigraphic traps and migration dissolution/residual trapping.

Refer to Causebrook et al., 2007 for stratigraphic information.

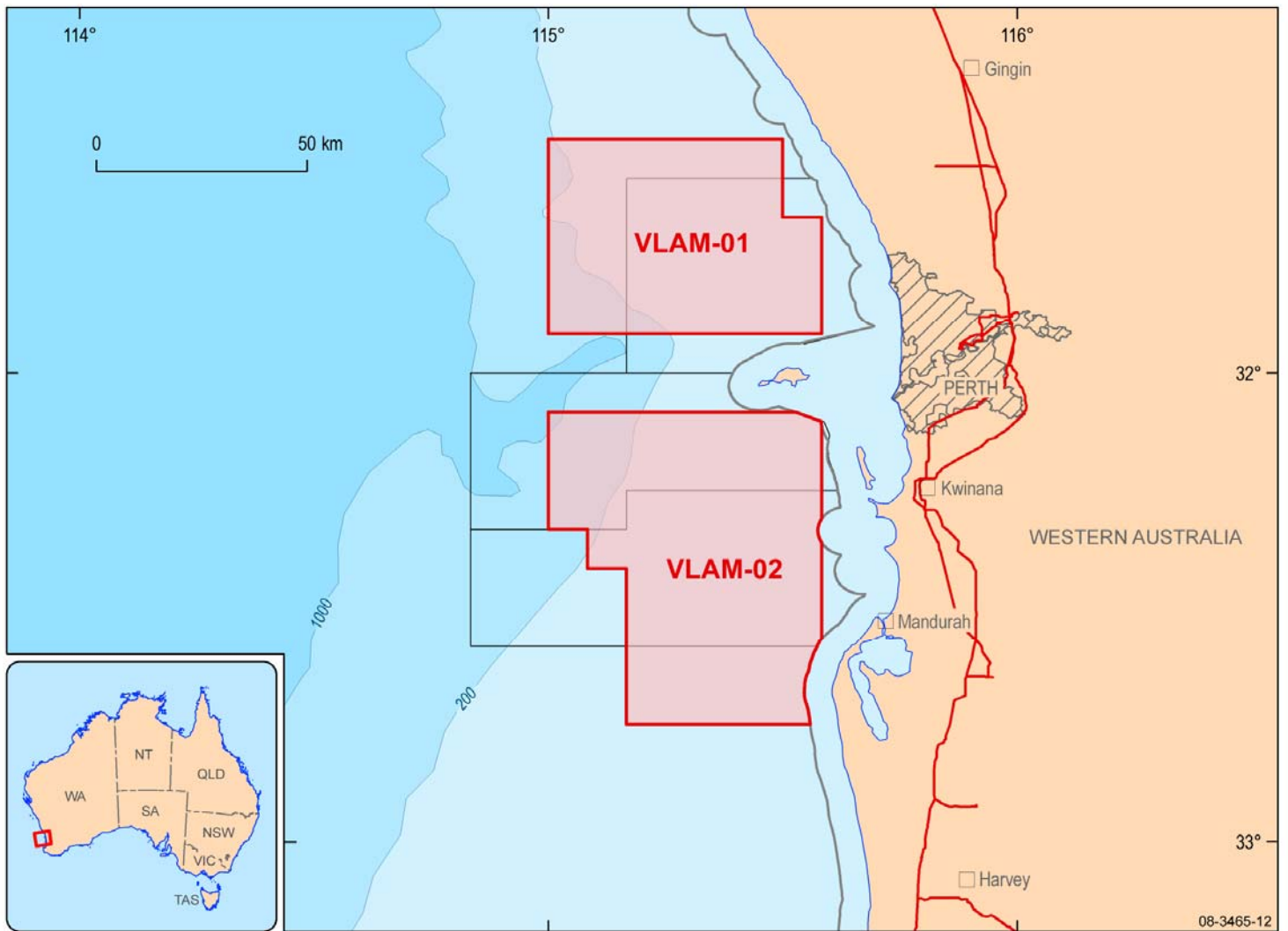
### VLAM-01 AND VLAM-02, Vlaming Sub-basin, Perth Basin

VLAM-01 and VLAM-02 are located in the central part of the Vlaming Sub-basin, between 6 km and 75 km offshore of Perth (Figure 1).

Release area VLAM-01 covers an area of about 2410 square kilometres and 33 graticular blocks (Figure 2). Release area VLAM-02 covers an area of approximately 3345 square kilometres and 47 graticular blocks, or parts thereof (Figure 2).

### Overlapping Petroleum Exploration Titles

Release Area	Overlapping Petroleum Titles	Petroleum Title Holders
VLAM-01	WA-368-P	Nexus Energy Ltd ( <b>Operator</b> ); Australian Worldwide Exploration Ltd
VLAM-02	WA-381-P	Roc Oil Company Ltd ( <b>Operator</b> ); Westralian Gas & Power Ltd; Cladium Ltd;
	WA-382-P	Roc Oil Company Ltd ( <b>Operator</b> ); Westralian Gas & Power Ltd; Cladium Ltd;



The Coastal Waters shown on this map are indicative only.  
 A precise determination of the Coastal Waters will be determined at the time of issue and included in the permit boundary as a Metes and Bounds determination.

- |   |                          |  |                                   |
|---|--------------------------|--|-----------------------------------|
|  | 2009 GHG release area    |  | Gas pipeline                      |
|  | Existing petroleum title |  | Coastal waters limit              |
|   |                          |  | -200- Bathymetry contour (metres) |

Figure 1. Location map of offshore Greenhouse Gas Storage release areas for Assessment VLAM-01 and VLAM-02, Vlaming Sub-basin, Perth Basin.

## GRATICULAR BLOCK LISTING

### *Area VLAM-01, Vlaming Sub-basin, Perth Basin*

Map Sheet SH 50 (Perth)

3037	3038	3039	3040	3041	3042	3109	3110	3111	3112
3113	3114	3181	3182	3183	3184	3185	3186	3187	3253
3254	3255	3256	3257	3258	3259	3325	3326	3327	3328
3329	3330	3331							

### *Area VLAM-02, Vlaming Sub-basin, Perth Basin*

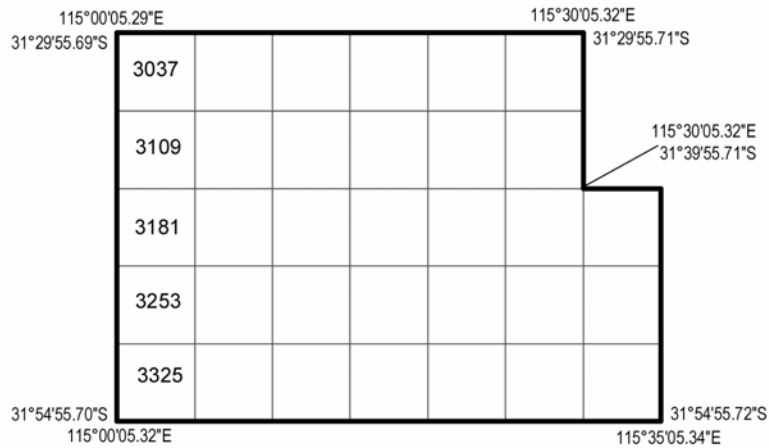
Map Sheet SI 50 (Albany)

85	86	87	88	89	90	91 PART	157	158	159
160	161	162	163	229	230	231	232	233	234
235 PART	302	303	304	305	306	307 PART	375	376	377
378	379	447	448	449	450	451 PART	519	520	521
522	523 PART	591	592	593	594	595 PART			

# 2009 Release Areas Perth Basin, Western Australia

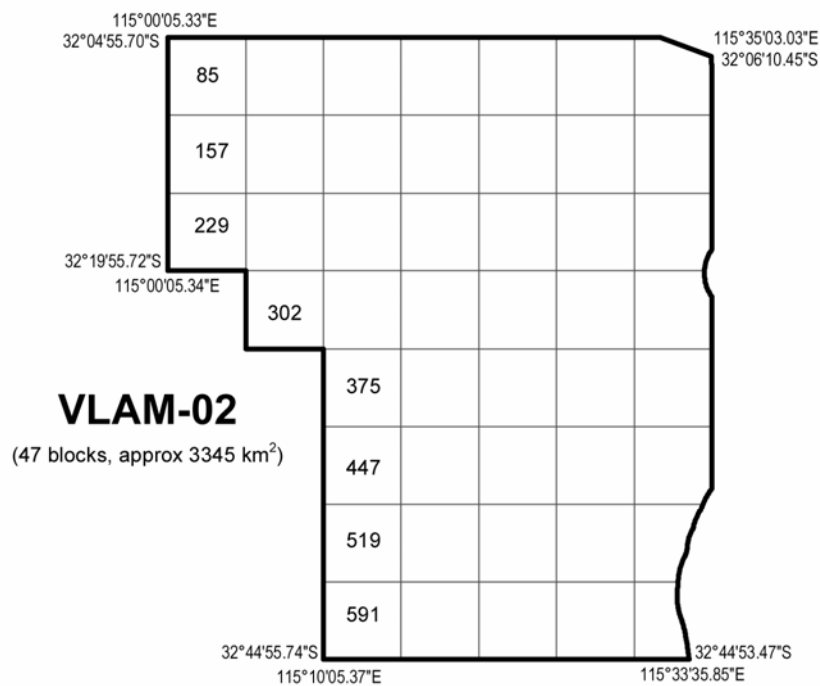
## VLAM-01

(33 blocks, approx 2410 km<sup>2</sup>)



MAP SHEET  
SH 50 (Perth)

MAP SHEET  
SI 50 (Albany)



## VLAM-02

(47 blocks, approx 3345 km<sup>2</sup>)

Geographic coordinates on this map are presented with reference to the Geocentric Datum of Australia (GDA94). Permit areas are based on the same grid, Australian Geodetic Datum (AGD66), that has defined areas since the Petroleum (Submerged Lands) Act was proclaimed in 1967. However, with the adoption of GDA94, the graticules are no longer referred to in whole multiples of 5 minutes as they were under AGD66. Parts of the outer limit of Release Area VLAM-02 are defined by the outer limit of the Coastal Waters. The Coastal Waters shown on this map are indicative only. A precise determination of the Coastal Waters will be determined at the time of issue and included in the permit boundary as a Metes and Bounds determination.

IDEAS 9016-3

Figure 2. Graticular block map of offshore Greenhouse Gas Storage release areas for Assessment VLAM-01 and VLAM-02, Vlaming Sub-basin, Perth Basin

## WELL DATA

### Well Completion reports – VLAM-01 and VLAM-02, Vlaming Sub-basin, Perth Basin

Well	Operator	Year	Total Depth (m)
Araucaria 1	Petrofina Exploration	1993	2218
Bouvard 1	WAPET	1975	1980
Challenger 1	WAPET	1975	2250
Charlotte 1	WAPET	1971	2435
Felix 1	Woodside Oil Ltd	1998	1013
Gage Roads 1	WAPET	1969	3660
Gage Roads 2	WAPET	1971	2972
Marri 1	Ampol Exploration Ltd	1993	2594
Minder Reef 1	Esso Exploration and Prod Aust Ltd	1984	1530
Mullaloo 1	Esso Exploration and Prod Aust Ltd	1984	2030
Parmelia 1	WAPET	1981	1770
Peel 1	Phillips Aust Oil Co	1977	3714
Quinns Rock 1	WAPET	1968	2209
Roe 1	WAPET	1970	2134
Sugarloaf 1	WAPET	1971	3658
Tuart 1	Ampol Exploration Ltd	1991	1600
Warnbro 1	WAPET	1971	3660

### Analysis reports – VLAM-01 and VLAM-02, Vlaming Sub-basin, Perth Basin

Well	State	Year	Test	Title
Bouvard 1	WA	1991	Palynology	Perth Basin Palynological review: Seven offshore wells.
Challenger 1	WA	1992	Palynology	Late Cret-Palaeogene Nannofossil Biostrat of Challenger 1, Perth basin.
Challenger 1	WA	1991	Palynology	Perth Basin Palynological review: Seven offshore wells.
Charlotte 1	WA	1991	Lithological descriptions	Perth Basin Core Descriptions
Charlotte 1	WA	1991	Palynological review	Palynological review of wells in the Vlaming Sub-Basin
Gage Roads 1	WA	1965	Stratigraphy	Sedimentary basins of Australia and P N G and hydrocarbon occurrence.
Gage Roads 1	WA	1991	Palynological review	Palynological review of wells in the Vlaming Sub-Basin
Gage Roads 2	WA	1991	Palynological review	Palynological review of wells in the Vlaming Sub-Basin
Minder Reef 1	WA	1991	Palynological review	Palynological review of wells in the Vlaming Sub-Basin
Mullaloo 1	WA	1987	Palynology (Mesozoic)	Studies in Australian Mesozoic Palynology
Mullaloo 1	WA	1991	Palynological review	Palynological review of wells in the Vlaming Sub-Basin
Parmelia 1	WA	1991	Palynology	Perth Basin Palynological review: Parmelia 1, well.

Parmelia 1	WA	1991	Palynology	Perth Basin Palynological review: Seven offshore wells.
Peel 1	WA	1991	Palynology	Perth Basin Palynological review: Seven offshore wells.
Peel 1	WA	1992	Petrology	Petrology report, Roe 1 and Peel 1 wells, Vlaming Sub-basin, WA
Quinns Rock 1	WA	1991	Palynological review	Palynological review of wells in the Vlaming Sub-Basin
Roe 1	WA	1992	Petrology	Petrology report, Roe 1 and Peel 1 wells, Vlaming Sub-basin, WA
Roe 1	WA	1991	Lithological descriptions	Perth Basin Core Descriptions
Roe 1	WA	1991	Palynological review	Palynological review of wells in the Vlaming Sub-Basin
Sugarloaf 1	WA	1980	Petrology	Preliminary petrological studies of cores of the Yarragadgee Fm Perth WA
Sugarloaf 1	WA	1991	Palynology	Perth Basin Palynological review: Seven offshore wells.
Sugarloaf 1	WA	1991	Lithological descriptions	Perth Basin Core Descriptions
Warnbro 1	WA	1980	Petrology	Preliminary petrological studies of cores of the Yarragadgee Fm Perth WA
Warnbro 1	WA	1991	Palynology	Perth Basin Palynological review: Seven offshore wells.
Warnbro 1	WA	1992	Seal capacity	High Pressure Mercury Capillary Pressure: Warnbro 1 well.
Warnbro 1	WA	1991	Lithology	Perth Basin Core Descriptions

Geoscience Australia's geological databases provide detailed biostratigraphic (STRATDAT), geochemical (ORGCHEM) and interpreted depositional environment information (RESFACS) from open file exploration wells.

<http://dbforms.ga.gov.au/www/npm.well.search>.

Contact Geoscience Australia's Repository for more information or to arrange access to open file exploration wells, phone 61 (0)2 6249 9222, e-mail

[ausgeodata@ga.gov.au](mailto:ausgeodata@ga.gov.au).

## PHYSICAL DATA

### Cores and Cuttings – VLAM-01 and VLAM-02, Vlaming Sub-basin, Perth Basin

Well	Type	Top (m)	Bottom (m)	Remark
Araucaria 1	Cuttings	760	2218	
Araucaria 1	Core	1807	1821.6	
Bouvard 1	Cuttings	103.63	603.5	
Challenger 1	Cuttings	460	2250	
Charlotte 1	Core	1571.03	2435.97	Continuous core.
Charlotte 1	Cuttings	335.36	2431.4	
Felix 1	Cuttings	550	1013	
Gage Roads 1	Cuttings	106.7	3658.53	
Gage Roads 1	Core	301.21	3661.28	100mm of every 600mm recovered.
Gage Roads 2	Core	1357.62	1362.5	Continuous core.
Gage Roads 2	Cuttings	371.95	2972.56	
Marri 1	Cuttings	100	2595	
Minder Reef 1	Cuttings	235	1530	Washed samples
Minder Reef 1	Cuttings	235	1525	Unwashed cuttings
Minder Reef 1	Cuttings	815	1525	Duplicate set
Minder Reef 1	Sidewall core	821	1512	
Mullaloo 1	Cuttings	905	2020	Washed samples.
Mullaloo 1	Cuttings	905	2020	Duplicate set
Mullaloo 1	Cuttings	905	2030	Unwashed cuttings
Mullaloo 1	Sidewall core	911.5	1997.3	
Parmelia 1	Cuttings	550	1720	Unwashed samples P610. Repacked samples from canned cuttings.
Parmelia 1	Cuttings	519	1770	Washed samples.
Peel 1	Cuttings	0	0	No samples were received.
Quinns Rock 1	Core	396.03	2207.77	100mm every 600mm recovered.
Quinns Rock 1	Cuttings	73.17	2210.36	
Roe 1	Core	1143.9	2134.45	Continuous core.
Roe 1	Cuttings	393.29	2125	
Sugarloaf 1	Core	2588.41	3267.37	Continuous core.
Sugarloaf 1	Cuttings	356.7	3658.53	
Tuart 1	Cuttings	372	1599	Washed and dried samples: average weight 95.0 gm
Warnbro 1	Core	1960.47	3582.31	Continuous core
Warnbro 1	Cuttings	505.97	3660.34	

Contact Geoscience Australia's Repository for more information or to arrange access to core and cuttings, phone 61 (0)2 6249 9222, e-mail [ausgeodata@ga.gov.au](mailto:ausgeodata@ga.gov.au).



## GEOPHYSICAL DATA

### Seismic Surveys – VLAM-01 and VLAM-02 Vlaming Sub-basin, Perth Basin

Survey Name	UNO	Year	Type	Processed	Field	Navigation
AGSO Survey 80;South Perth Basin I M.S.S.	S6880052	1988	2D	YES	YES	YES
AGSO Survey 81;South Perth Basin II M.S.S.	S6880053	1988	2D	YES	YES	YES
WA-174-P 1983 M.S.S.	S6830019	1983	2D	YES	YES	YES
Southwest Frontier	S6200412	2004	2D	YES	YES	YES
Pauline 1994 M.S.S.	S6940024	1994	2D	YES	YES	YES
Direction Bank M.S.S.	S6680047	1968	2D	NO	YES	YES
Koombana M.S.S.	S6690072	1969	2D	YES	YES	YES
Perth M.S.S.	S6650110	1965	2D	NO	YES	YES
Rottneest M.S.S.	S6660068	1966	2D	NO	YES	YES
Sugarloaf M.S.S.	S6680075	1968	2D	NO	YES	YES
V85A M.S.S.	S6850016	1985	2D	YES	YES	YES
Peel M.S.S.	S6740013	1974	2D	NO	YES	YES
Lancelin (SW) M.S.S.	S6710021	1971	2D	NO	YES	YES
Bouvard (DW) M.S.S.	S6720035	1972	2D	NO	YES	YES
Charlotte M.S.S.	S6670067	1967	2D	YES	YES	YES
Naturaliste 1993 M.S.S.	S6930019	1993	2D	YES	YES	YES
Kerrie M.S.S.	S6910013	1991	2D	YES	YES	YES
PV91 M.S.S.	S6910007	1991	2D	YES	YES	YES
V90A M.S.S.	S6900027	1990	2D	YES	YES	YES
V83A M.S.S.	S6830018	1983	2D	YES	YES	YES
Roe M.S.S.	S6820024	1982	2D	YES	YES	YES
V82A M.S.S.	S6820020	1982	2D	YES	YES	YES
WA-174-P 1982 M.S.S.	S6820037	1982	2D	YES	YES	YES
Bullsbrook Reconnaissance S.S.	S6660023	1966	2D	NO	YES	YES
Koombana Wedge Island M.S.S.	S6690102	1969	2D	NO	YES	YES
Perth South M.S.S.	not known	not known	2D	NO	NO	YES
Preston Detail (1971) M.S.S.	S6710022	1971	2D	NO	YES	YES
Koombana 3 M.S.S.	S6750002	1975	2D	YES	YES	YES
Preston Detail S.S.	S6700111	1970	2D	NO	YES	YES
Challenger Detail M.S.S.	not known	not known	2D	NO	NO	YES
Coventry M.S.S.	S6660109	1966	2D	NO	YES	YES
Yanchep S.S.	S6660024	1966	2D	NO	YES	YES

Contact Geoscience Australia's Repository for more information or to arrange access to the seismic data, phone 61 (0)2 6249 9222, e-mail [ausgeodata@ga.gov.au](mailto:ausgeodata@ga.gov.au).

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Refer to the CRC for Greenhouse Gas Technologies website [www.co2crc.com.au](http://www.co2crc.com.au) for further references associated with Greenhouse Gas Storage.