Offshore Canning Basin

NW WESTERN AUSTRALIA, OFFSHORE

Reservoir:

Depuch Formation

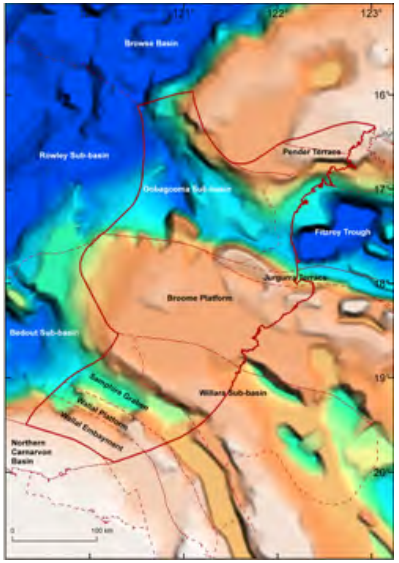
Seal:

Mermaid Formation

HYDROCARBON POTENTIAL

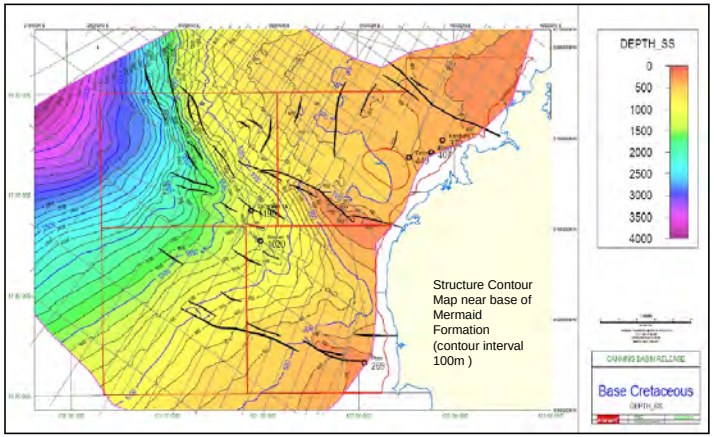
Insufficient data

STRUCTURAL ELEMENTS



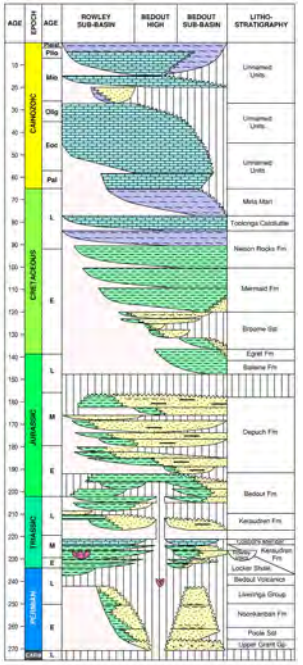
Modified OZ SEE-BASE™ (2005) image

REGIONAL SEAL AREA



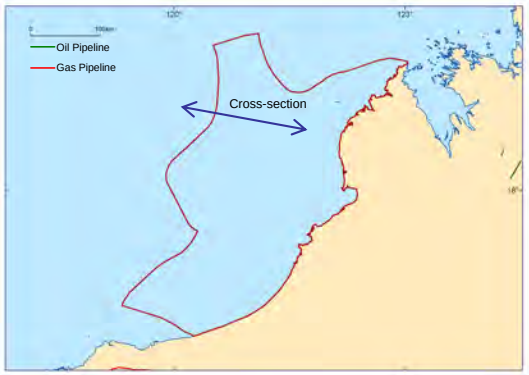
(After Foss et al., 2008)

STRATIGRAPHY



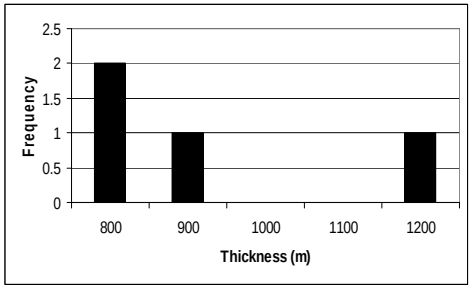
(After Smith, 1999 and Smith et al., 1999)

OIL AND GAS FIELDS

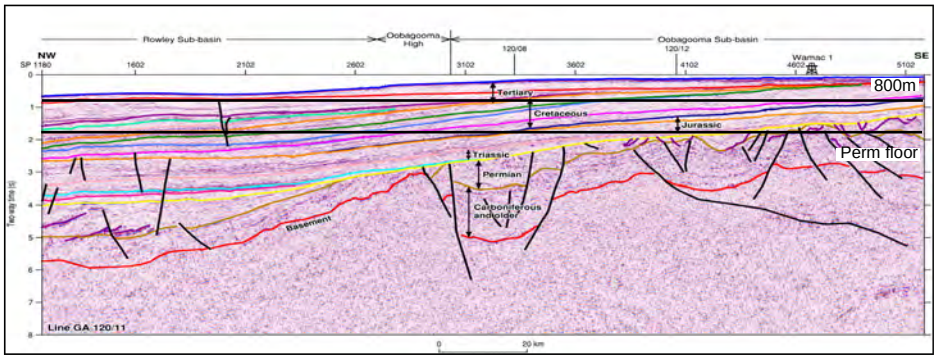


WELLS AND SEISMIC COVERAGE

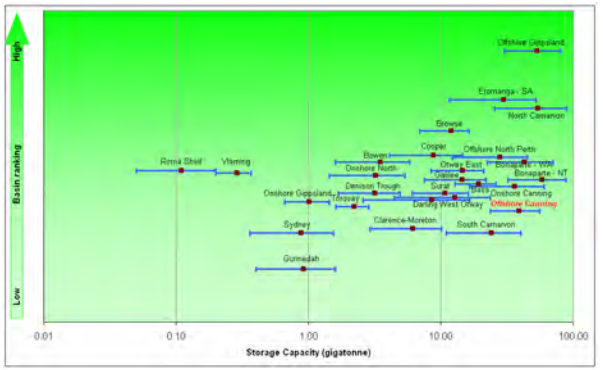
RESERVOIR THICKNESS



REGIONAL CROSS SECTION (LOCATION IN OIL AND GAS FIELDS MAP)

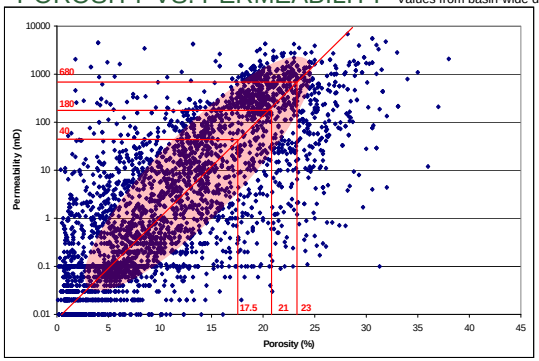


BASIN RANKING VS. CAPACITY



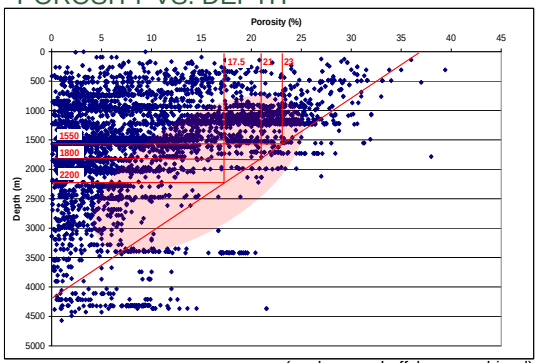
Offshore Canning Basin

POROSITY VS. PERMEABILITY *Values from basin-wide dataset



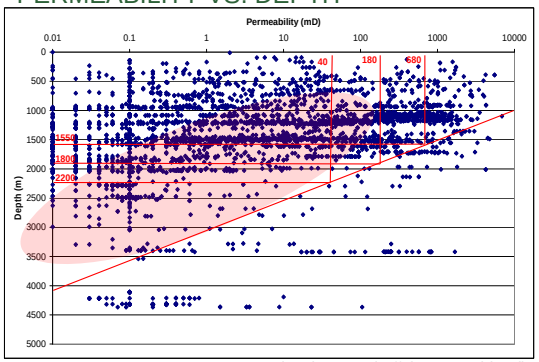
(onshore and offshore combined)

POROSITY VS. DEPTH



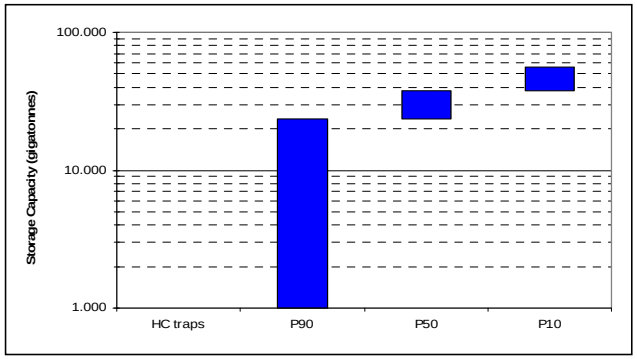
(onshore and offshore combined)

PERMEABILITY VS. DEPTH

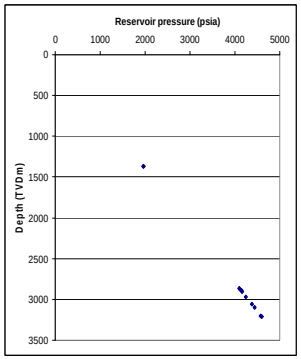


(onshore and offshore combined)

STORAGE CAPACITY

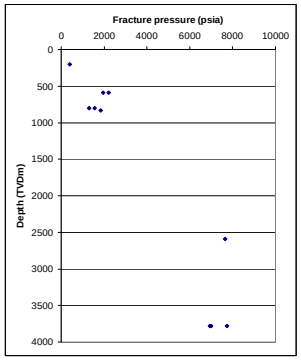


RESERVOIR PRESSURE VS. DEPTH *CSIRO PressurePlot



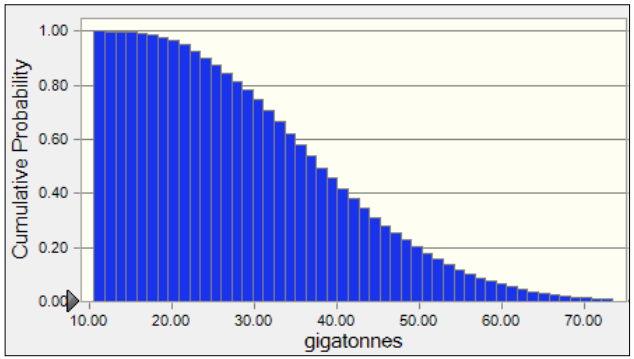
*based on entire basin

FRACTURE PRESSURE VS. DEPTH *CSIRO PressurePlot



*based on entire basin

STORAGE CAPACITY CURVE



BASIN RANKING

Category	Description	Score	Weighting
Tectonics (Seismicity)	Low	5	0.00
Size	Very Large	4	0.06
Depth	Intermediate	3	0.10
Type	Non-marine and Marine	2	0.04
Faulting intensity	Extensive	1	0.14
Hydrogeology	Good	3	0.04
Geothermal	Cold Basin	3	0.05
Hydrocarbon potential	Small	2	0.05
Maturity	Exploration	2	0.05
Coal and CBM	None	1	0.00
Reservoir	Good	4	0.16
Seal	Good	4	0.18
Reservoir/Seal Pairs	Good	3	0.03
Onshore/Offshore	Shallow Offshore	2	0.00
Climate	Tropical	3	0.00
Accessibility	Difficult	2	0.00
Infrastructure	None	1	0.00
CO_2 sources	None	1	0.00
Knowledge level	Limited	1	0.05
Data availability	Moderate	2	0.05
Overall Ranking			**27**

STORAGE CAPACITY ESTIMATE

Parameter	Unit	Score (P90)	Score (P50)	Score (P10)	Distribution
Area of storage region	km^2	12200	19300	25100	Triangular
Gross thickness of saline formation	m	200	450	850	Triangular
Average porosity of saline formation over thickness interval	%	14	17	20	Triangular
Density of CO_2 at average reservoir conditions	$tonne/m^3$	0.5	0.6	0.7	Triangular
E-storage efficiency factor (% of total pore volume)	%	4	4	4	
Calculated storage potential	gigatonnes	23.5	37.7	56.0	

POTENTIAL INJECTION PARAMETERS

Parameter	Unit	Shallow	Mid-Depth	Deep
Depth base seal	m	850	1550	1500
Formation thickness	m	700	250	700
Injection depth	m	1550	1800	2200
Porosity	%	23	21	17.5
Absolute permeability	mD	680	180	40
Formation pressure	psia	2220	2575	3150
Fracture pressure	psia	3355	3900	4765

Insufficient data for the following item:
- Top Seal Potential

DISCLAIMER

The purpose of these montages is to aid a high level evaluation of the geological storage potential of Australia's sedimentary basins for future CO_2 emissions. The evaluations are based on core analysis and other data derived from Geoscience Australia and other sources. However due to time constraints, it has not been possible to carry out the detailed evaluation of the data, which will be required for the next phase of analysis.

In this exercise, we sought to recognise a range of characteristics within each basin by identifying three sets of parameters at different locations and depths in the basin. The intent is to generate an indication of a range of storage capacity and potential injection rates. These capacities and rates are being used in high level reservoir modelling work to generate injection tariffs* and capacity estimates. All of this work feeds into a process that provides indicative, conceptual transport and storage tariffs for CO_2 emissions captured in various parts of Australia.

This 'top down', simplistic approach seeks to describe the magnitude and range of potential costs for transport and storage in Australia, at a 'conceptual' level of accuracy. Clearly, any final investment decision would call on an increased understanding and level of accuracy through the usual project development process.

* Cost per tonne of CO_2 avoided, calculated using the net present value of cash flows over a 25 year asset life.

REFERENCES

Foss, C., Stasinowsky, W. and Ziolkowski, V., 2008. Aeromagnetic interpretation and petroleum prospectivity assessment - Offshore Canning Basin, Western Australia. Encom Technical Report – 80750, 71pp.

OZ SEEBASE™ STUDY, 2005. OZ SEEBASE™ structural GIS, version 2. FrOG Tech Pty Ltd, project code GA703.

Smith, S.A., Tingate, P.R., Griffiths, C.M. and Hull, J.N.F., 1999. The structural development and petroleum potential of the Roebuck Basin. The APPEA Journal, 39 (1), 364–385.

Smith, S.A., 1999. The Phanerozoic basin-fill history of the Roebuck Basin. PhD Thesis, University of Adelaide, unpublished.