Clarence-Moreton Basin

SE QLD - NE NSW, EASTERN AUSTRALIA, ONSHORE

Reservoir:

Ripley Road Sandstone, Heifer Creek Sandstone: Member of the Koukandowie Formation

Seal:

Calamia Member of the Gatton Sst, intra-formational shales in Koukandowie Formation

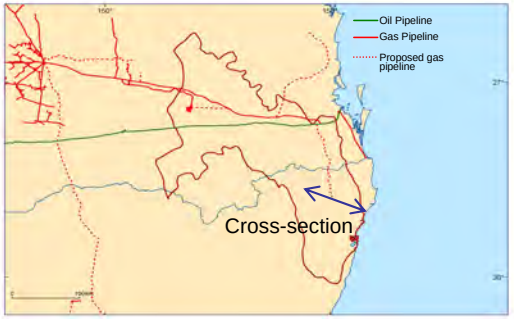
HYDROCARBON POTENTIAL

Although there are no commercial hydrocarbon discoveries, good reservoirs within the basin exist that have produced gas flows and some indications of oil. Coal seam methane exploration is still in its early stage.

STRUCTURAL ELEMENTS

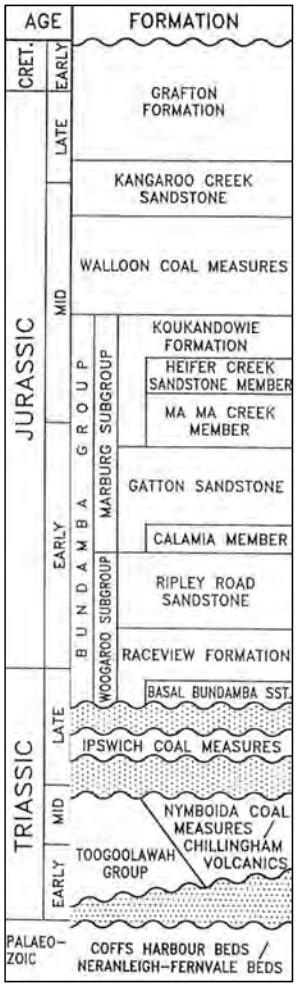
(After DPI, NSW)

OIL AND GAS FIELDS



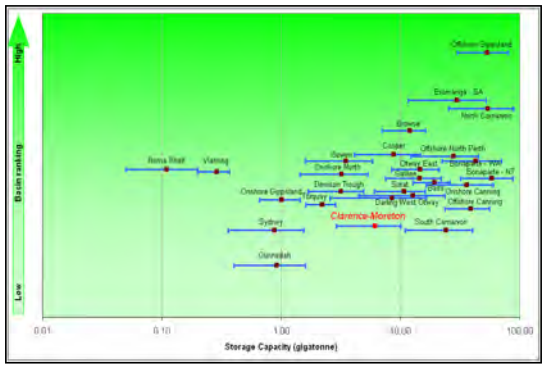
WELLS AND SEISMIC COVERAGE

STRATIGRAPHY

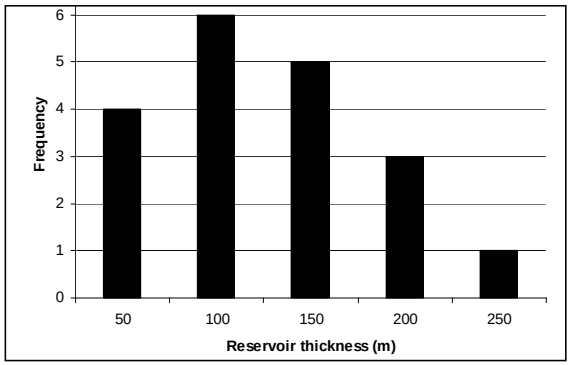


(After Ingram and Robinson, 1996)

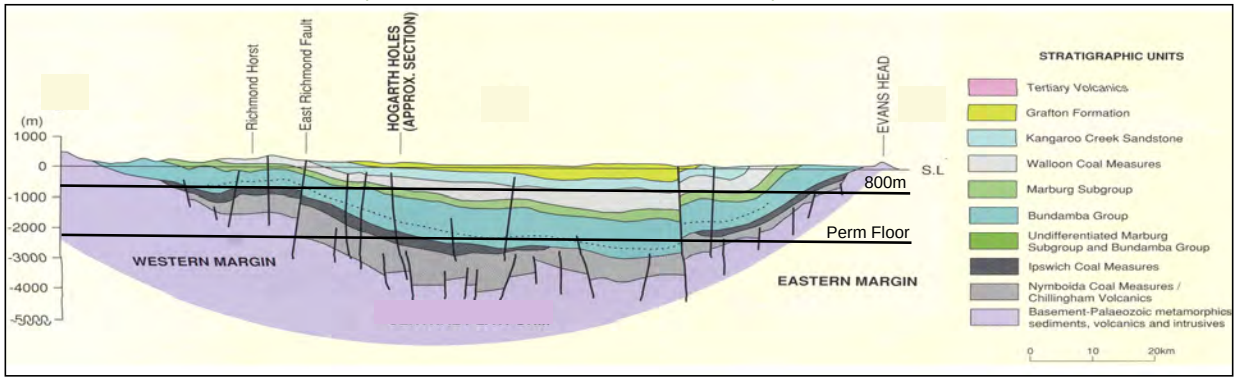
BASIN RANKING VS. CAPACITY



RESERVOIR THICKNESS



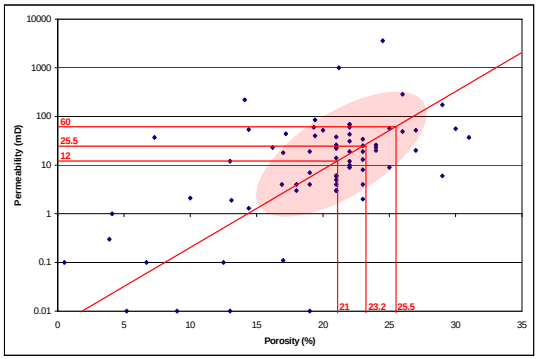
REGIONAL CROSS SECTION (LOCATION IN OIL AND GAS FIELDS MAP)



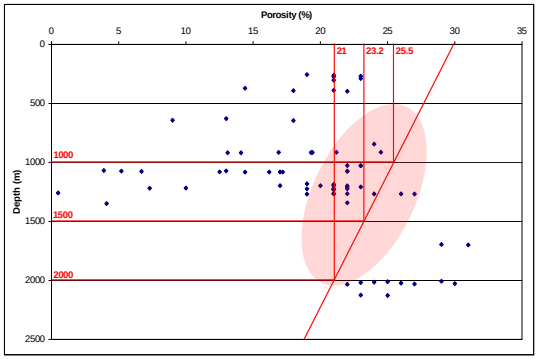
(After Stewart and Alder, 1995)

Clarence-Moreton Basin

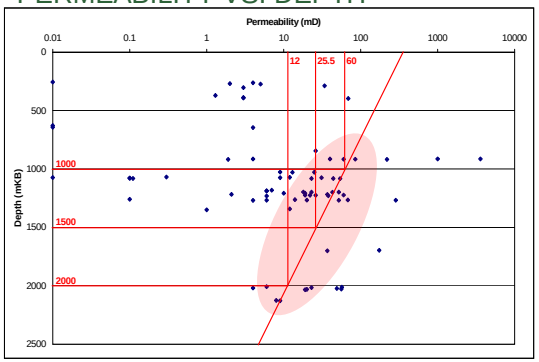
POROSITY VS. PERMEABILITY *Values from basin-wide dataset



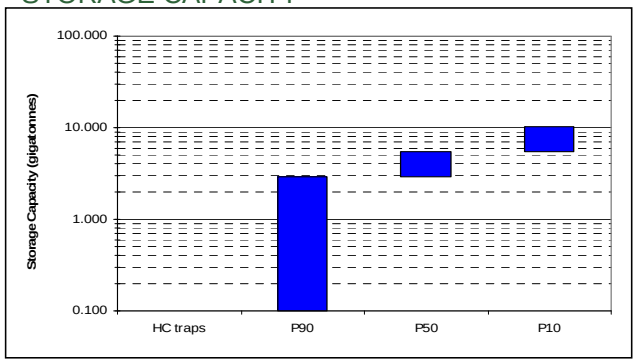
POROSITY VS. DEPTH



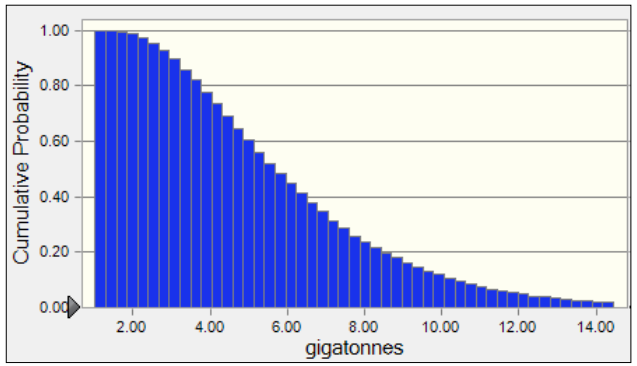
PERMEABILITY VS. DEPTH



STORAGE CAPACITY



STORAGE CAPACITY CURVE



Insufficient data for the following items:
- Fracture Pressure vs. Depth Graph
- Reservoir Pressure vs. Depth Graph
- Top seal Potential Graph
- Regional Seal Area Figure

BASIN RANKING

Category	Description	Score	Weighting
Tectonics (Seismicity)	Medium/Low	4	0.00
Size	Large	3	0.06
Depth	Intermediate	3	0.10
Type	Non-marine and Marine	2	0.04
Faulting intensity	Moderate	2	0.14
Hydrogeology	Intermediate	2	0.04
Geothermal	Cold Basin	3	0.05
Hydrocarbon potential	Medium	3	0.05
Maturity	Exploration	2	0.05
Coal and CBM	Shallow	2	0.00
Reservoir	Good	4	0.16
Seal	Poor	3	0.18
Reservoir/Seal Pairs	Good	3	0.03
Onshore/Offshore	Onshore	3	0.00
Climate	Subtropical	4	0.00
Accessibility	Easy	4	0.00
Infrastructure	Moderate	3	0.00
CO_2 sources	Major	4	0.00
Knowledge level	Moderate	2	0.05
Data availability	Moderate	2	0.05
Overall Ranking			**28**

STORAGE CAPACITY ESTIMATE

Parameter	Unit	Score (P90)	Score (P50)	Score (P10)	Distribution
Area of storage region	km^2	3000	6000	16000	Triangular
Gross thickness of saline formation	m	50	100	250	Triangular
Average porosity of saline formation over thickness interval	%	18	23	28	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	2.9	5.5	10.2	

POTENTIAL INJECTION PARAMETERS

Parameter	Unit	Shallow	Mid-Depth	Deep
Depth base seal	m	950	1400	1750
Formation thickness	m	50	100	250
Injection depth	m	1000	1500	2000
Porosity	%	25.5	23.2	21
Absolute permeability	mD	60	25.5	12
Formation pressure**	psia	1470	2200	2930
Fracture pressure**	psia	2390	3590	4790

** No data, estimated from adjacent Cooper Basin

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

Ingram, F.T. and Robinson, V.A., 1996. Petroleum Prospectivity of the Clarence-Moreton Basin in New South Wales, New South Wales Department of Mineral Resources, Petroleum Bulletin 3, 133pp.

Stewart, R. and Adler, D. (eds), 1995. New South Wales Petroleum Potential-Bulletin New South Wales. Department of Mineral Resources. Coal and Petroleum Geology Branch. Bulletin 1, 5-36.