Gunnedah Basin

CENTRAL NEW SOUTH WALES, ONSHORE

Reservoir:
Black Jack and Digby formations

Seal:
Napperby Formation

HYDROCARBON POTENTIAL
Category 1 (OGRA 2005)
Crude oil MMBL 0.0
Condensate MMBL 0.0
LPG MMBL 0.0
Sales gas Tcf 0.01

RESERVOIR THICKNESS

BASIN RANKING VS. CAPACITY

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

STRATIGRAPHY

REGIONAL SEAL AREA


(After Gurba et al., 2009)

(After DPI, NSW)

**Gunnedah Basin**

### Potential Injection Parameters

- **Parameter**
  - Depth base seal
  - Formation thickness
  - Porosity
  - Absolute permeability
  - Formation pressure
  - Fracture pressure

- **Unit**
  - m
  - mD
  - psia

- **Values**
  - Depth base seal: 1900, 2125, 2230 m
  - Formation thickness: 50, 125, 200 m
  - Porosity: 16.7, 15, 13%
  - Absolute permeability: 446, 108, 29 mD
  - Formation pressure: 2860, 3300, 3665 psia
  - Fracture pressure: 4670, 5390, 5985 psia

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**NB.** Existing well data is above 800m.

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**STORAGE CAPACITY ESTIMATE**

<table>
<thead>
<tr>
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<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of storage region</td>
<td>km²</td>
</tr>
<tr>
<td>Gross thickness of saline formation</td>
<td>m</td>
</tr>
<tr>
<td>Average porosity of saline formation over thickness interval</td>
<td>%</td>
</tr>
<tr>
<td>Density of CO₂ at average reservoir conditions</td>
<td>tonne/m³</td>
</tr>
<tr>
<td>E-storage efficiency factor (% of total pore volume)</td>
<td>%</td>
</tr>
<tr>
<td>Calculated storage potential</td>
<td>gigatonnes</td>
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</table>

**Distribution**

- Triangular

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**POTENTIAL INJECTION PARAMETERS**

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**NB.** 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

