

The background features a series of overlapping, semi-transparent blue geometric shapes that create a layered, mountain-like effect. A thin white vertical line runs down the right side of the page, intersecting the text.

SOUTH WEST HUB

CARBON CAPTURE STORAGE



Government of Western Australia
Department of Mines and Petroleum

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SOUTH WEST HUB

Presentation to

NATIONAL CCS CONFERENCE

22 October 2012

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Coordinator Carbon Strategy



Government of Western Australia
Department of Mines and Petroleum

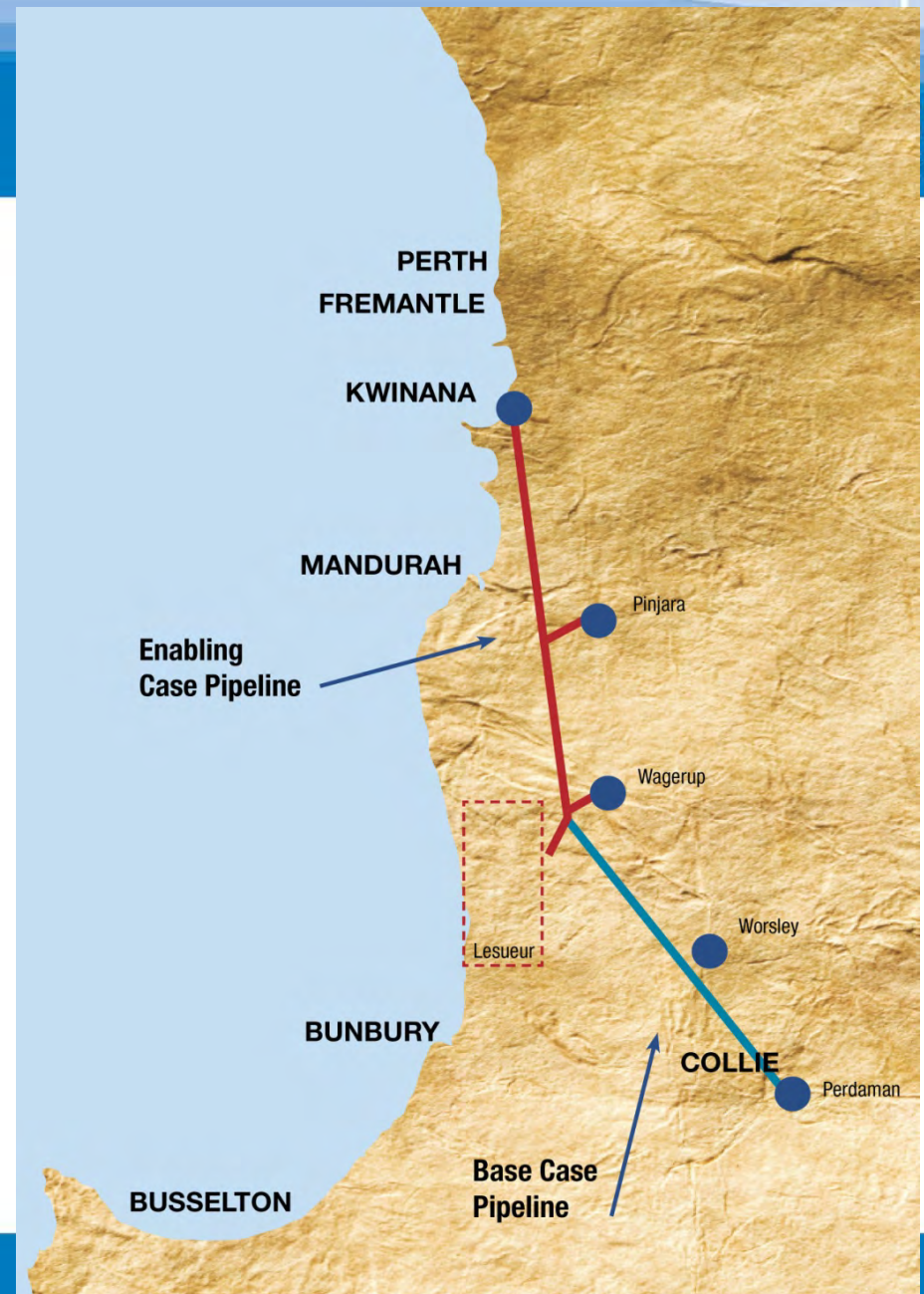
- DEPARTMENT OF MINES AND PETROLEUM
- VERVE ENERGY
- ALCOA AUSTRALIA
- PERDAMAN CHEMICALS AND FERTILISERS
- GRIFFIN ENERGY
- PREMIER COAL
- RESEARCH PARTNERSHIP:
 - WA:ERA (Western Australian Energy Research Alliance) a collaborative arrangement between University of Western Australia, Curtin University and the CSIRO



THE CONCEPT

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- Integrated industrial CO₂ geosequestration system
- Storage within an identified area
- Residue (red mud) sequestration 300,000 tpa (Alcoa)
- 2.4 mtpa Perdaman CO₂
- Potential for up to 7 mtpa for future power generation



CCS ELEMENTS

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- Barrow Island (Gorgon) approved under its own Agreement Act
- GHG Legislation to be introduced in 2012
 - Exposure draft finalised and has been out for comment.
 - Amendments to the *Petroleum and Geothermal Resources Act (1967)* and the *Petroleum Pipelines Act (1969)*
 - Consequential minor amendments to other legislation including the *Dampier to Bunbury Pipeline Act (1997)*
- DMP continue under its current powers to end 2013



- Proponent applies for Exploration and Storage title in normal Petroleum Act manner
 - Conditions regarding CO2 source and exploration program may apply – work program will apply
- Liability is proponents during operation
- Proponent applies for site closure certificate at end of injection – 5 year application period
- Proponent remains responsible for site for minimum 15 year period post closure
- Crown then accepts long term liability



- Knowledge sharing plan developed
- Arrangements with Global Carbon Capture and Storage Institute
- Regular contact with CarbonNet, New South Wales and Wandoan
 - eg drilling contracts, core handling etc.



STAKEHOLDER ENGAGEMENT

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- Ongoing with DRET, ACALET
- Regularly with other regulators (Dept of Water, Environment etc)
- Transport – all landowners along pipeline route covered



- Consultation strategy developed in 2010, constantly being reviewed
- Discussions with Shires, local Members of Parliament etc as part of developing strategy
- Locally accessible, have talked to community groups (including environment groups) for last 3 years
- Lesueur Community Consultative Committee established in August 2011
 - Local Chair
 - Nominations from community (advertised)
 - Nominations from Shires and Local Members of Parliament





CarbonKids is providing valuable science education to local schools and integrating CCS into the curriculum



- Established by CSIRO, Curtin University and The University of Western Australia
- Leading expertise and capabilities from research partners
- On multiple sites
- Focussed nationally and beyond
- Responsive to industry needs
- Focussed on storage and land based sequestration

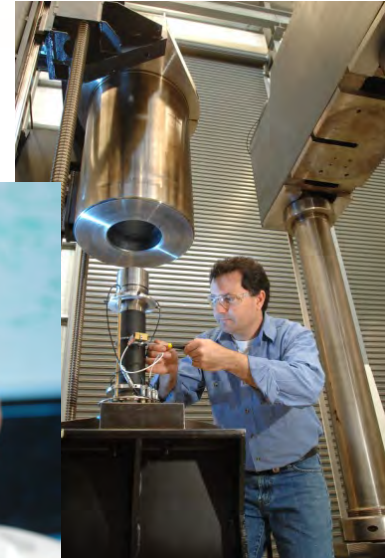
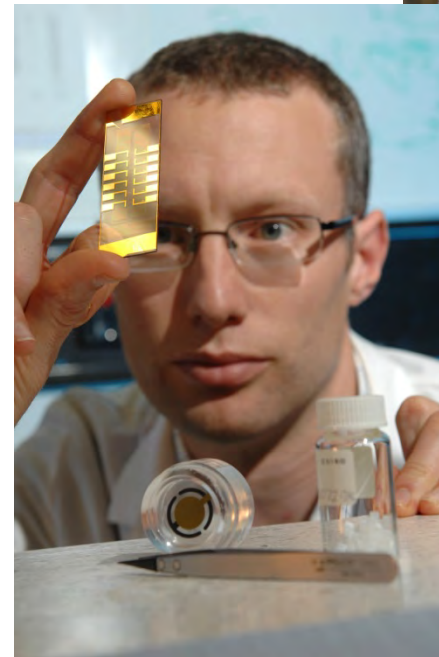
National Geosequestration Laboratory



NGL MAJOR ASSETS

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- Organic and inorganic geochemistry laboratories
- Sensors laboratory
- Rock mechanics, including petrophysics, core flooding and computer tomography
- CO₂ processing and sequestration laboratory
- Mobile (containerised) geophysical and geochemical laboratories



NGL MAJOR ASSETS

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- 3D immersive visualisation
- Surface and down-hole seismic sources
- Environmental (shallow groundwater, soil and atmospheric) monitoring
- Calibration and training facilities, including a 1,000m borehole at ARRC
- “in situ” laboratory

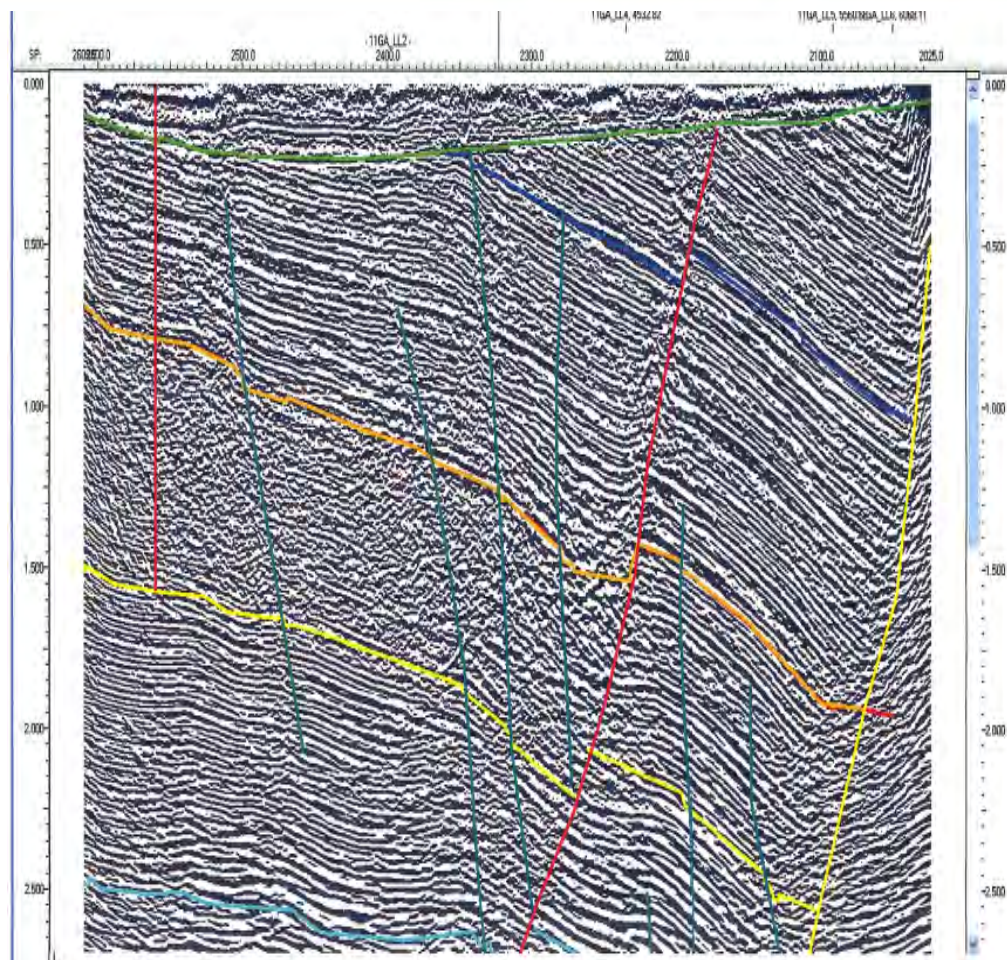
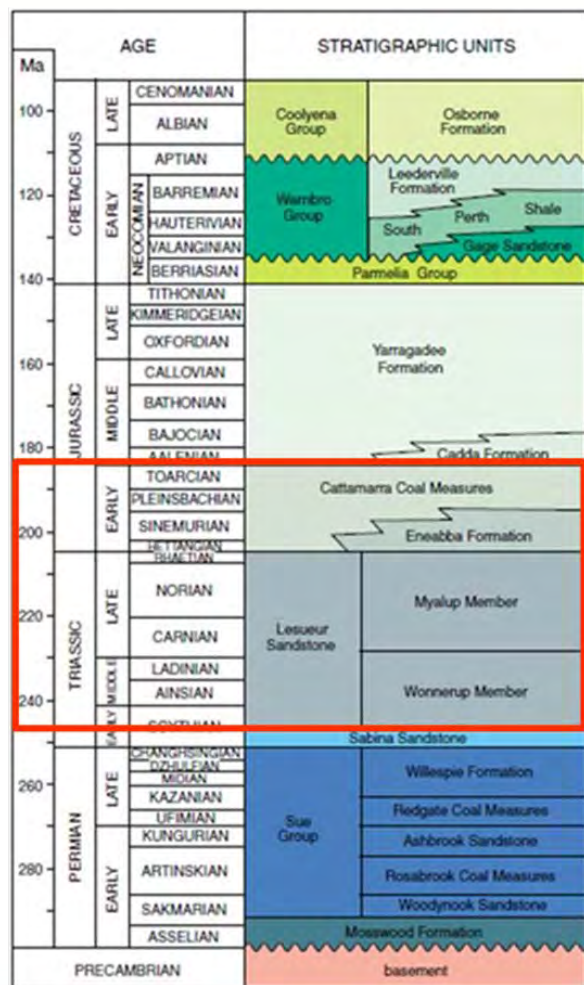


- In the early phases, so nothing physically on-site (2014)
- Financial modelling for whole of project as part of business case
- Financial model for storage, pipeline and injection capital funding
- Pipeline easement and compatibility issues being tested
- CO2 chain of custody issues being investigated
- And more...



STORAGE

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HARVEY 1

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EXAMPLE CORE

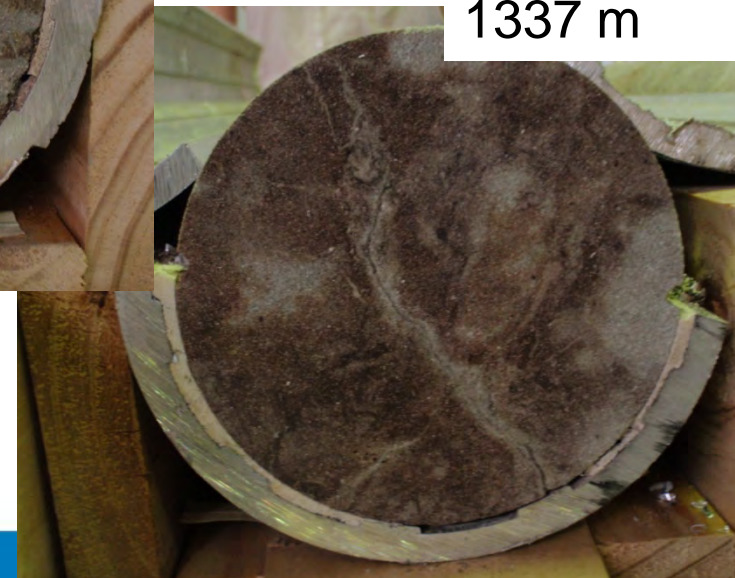


1335 m

basal Yalgorup Mbr



1336 m



1337 m



EXAMPLE CORE

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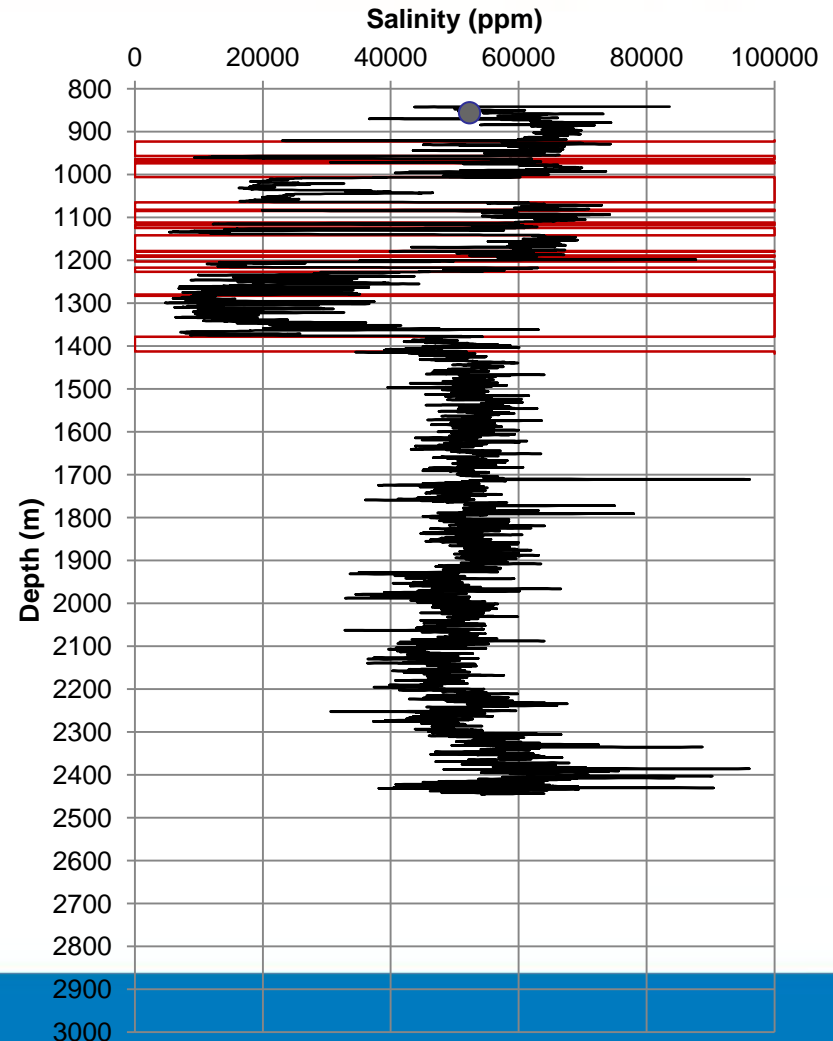
2491 m
Wonnerup Mbr



SALINITY vs. DEPTH

- A curve of salinity from Harvey 1 is shown (dark blue line)
- One salinity sample was taken at 856 m, measuring 52,320 ppm
- This value matches closely with the salinity log (light blue point)
- The log is not valid washed-out zones (**red lines**)

Salinity from GSWA Harvey 1



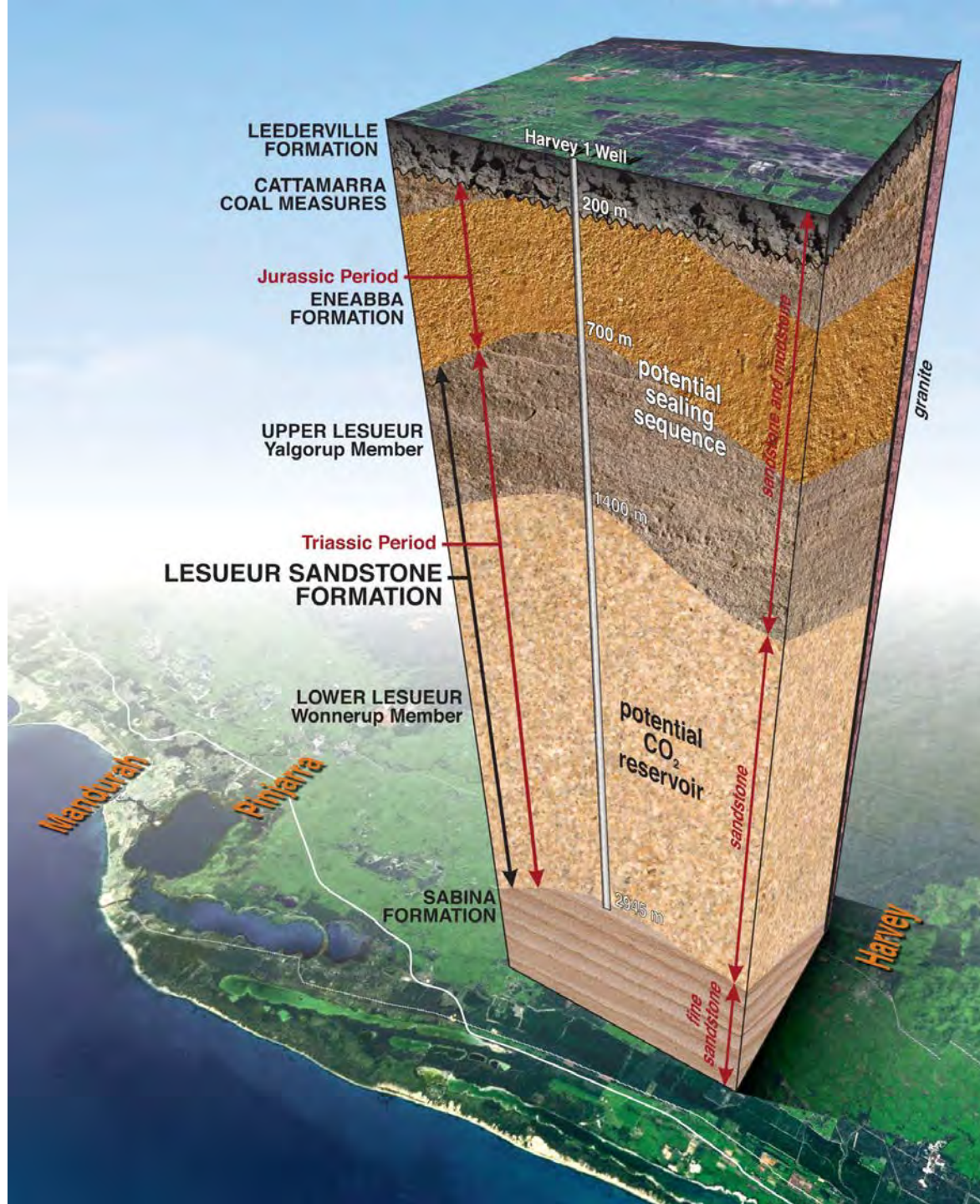
Wash outs

Top (m)	Bottom (m)	Thickness (m)
920	923	3
957	964	7
970	974	4
1006	1065	59
1082	1085	3
1112	1118	6
1125	1142	17
1178	1180	2
1189	1192	3
1203	1217	14
1227	1280	53
1283	1378	95
1413	1418	5

● Fluid Sample — Wash-outs — Salinity vs. Depth

- **Shales**
 - Plenty of them, through the Eneabba and the Yalgorup
 - Pressured and weathered
 - Some up to 100 metres thick
 - Between 650 to 1380 metres
- **Reservoir**
 - 1,500 metres thick
 - Good porosity/permeability (100md – Darcy)
- **Drilling**
 - Need to revise drilling and casing program to place the shales behind casing before entering the reservoir in future wells
- **Confidence to proceed to the next stages**







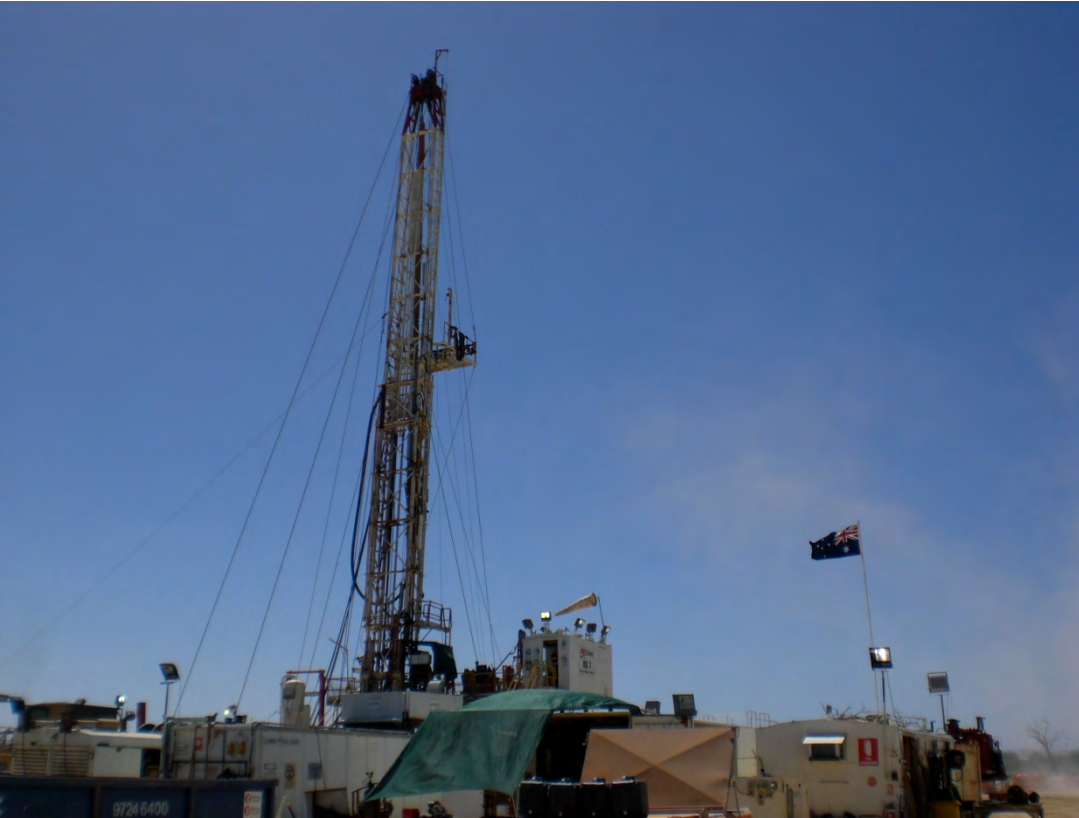
**Community
Acceptance**

We are asking the community for permission to prove up the storage.

Acceptance will come when we can answer the community's questions

THANK YOU

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