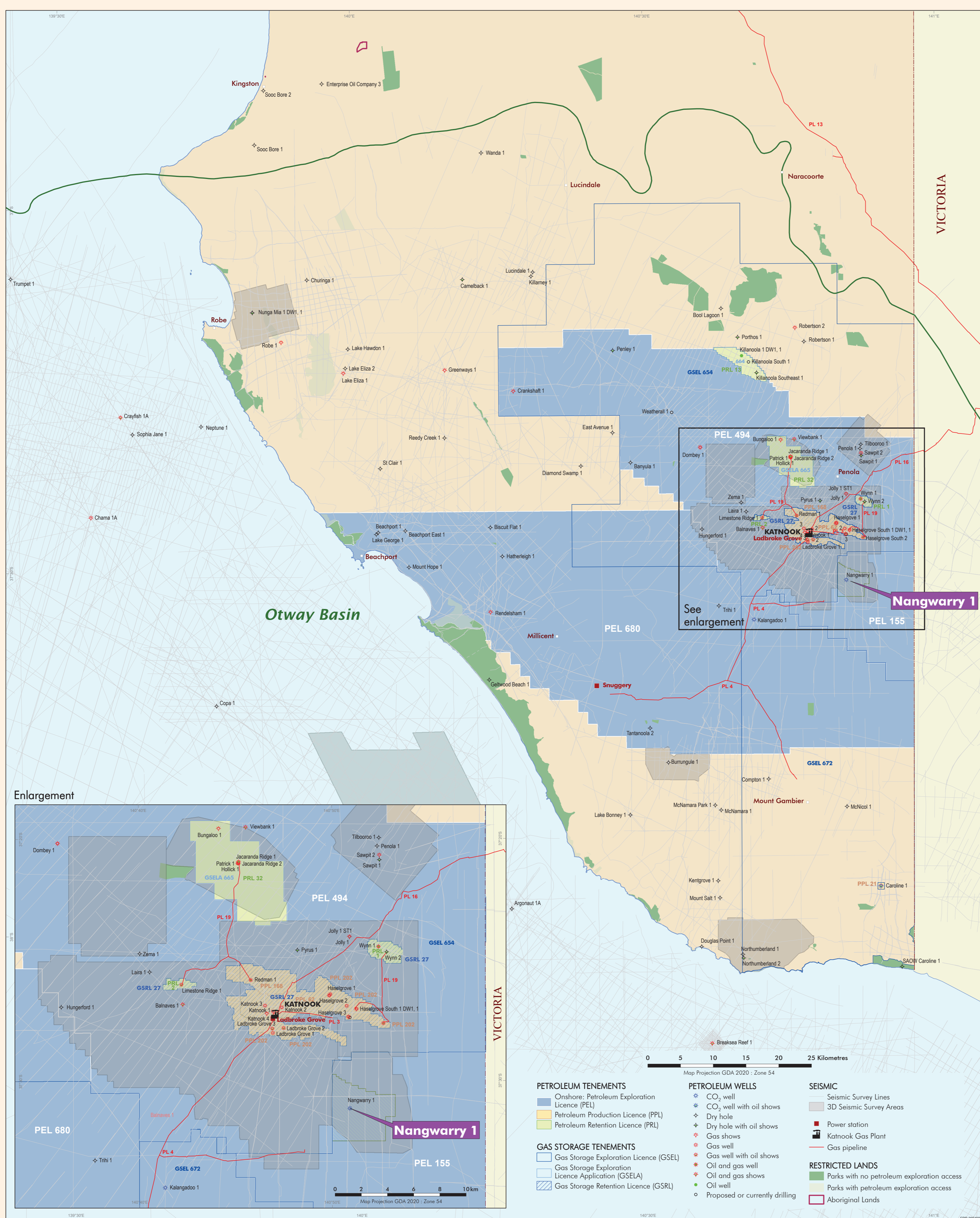


Potential of So

Otway Basin



Prospectivity

The Early Jurassic – Late Cretaceous Otway Basin contains both mature and immature conventional gas play trends in five prospective troughs, with potential for oil discoveries

Data

- access to free downloads
- Seismic TWT and Depth grids
- well log LAS files
- well completion reports
- geological and geophysical reports
- PEPS database
- ESRI ArcGIS Project
- selected SEG-Y seismic line data.

GISERA

In 2017 the South Australian Government partnered with CSIRO's Gas Industry Social and Environmental Research Alliance (GISERA) for a three-year in-depth study.

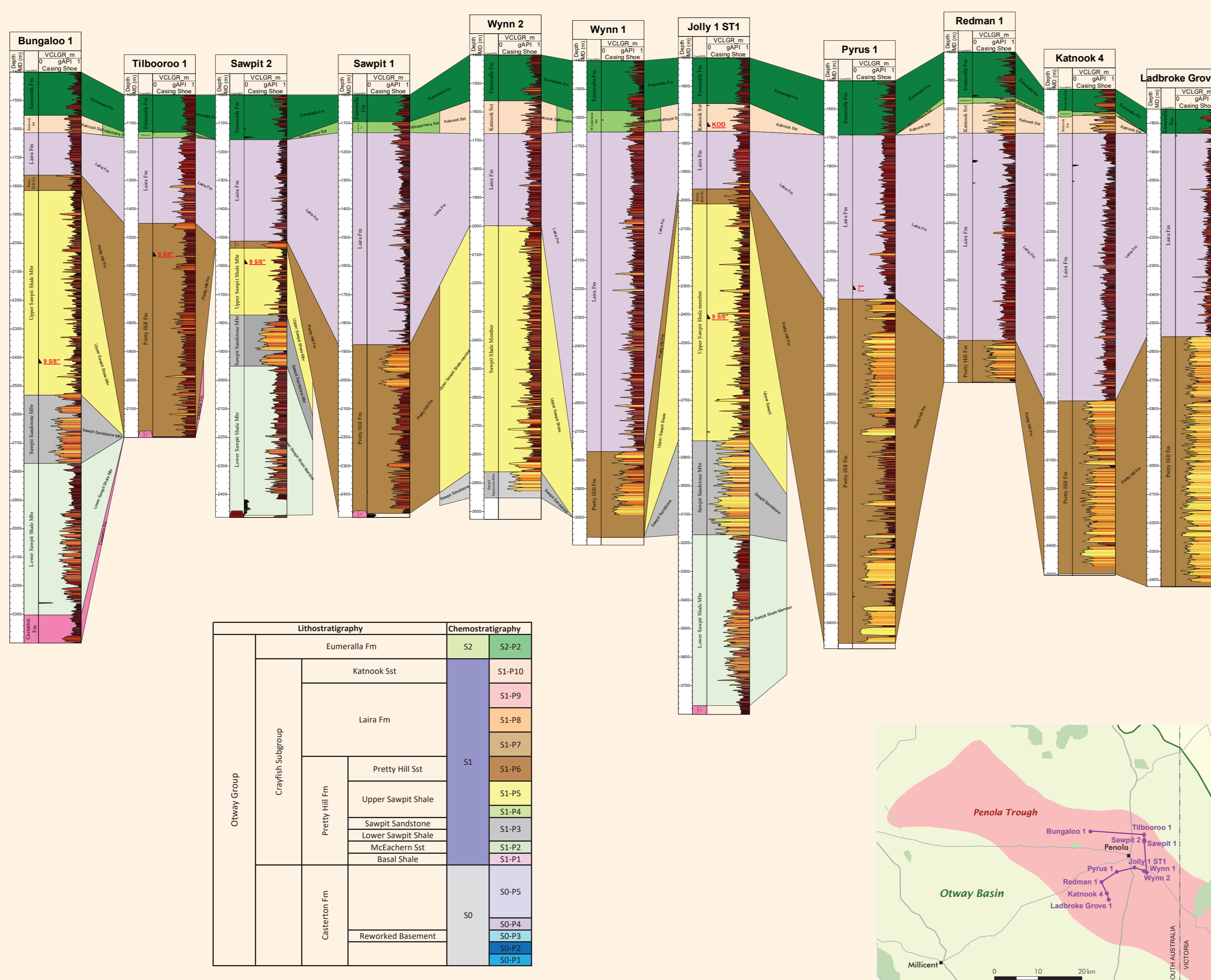
GISERA have engaged local stakeholders as well as industry and regulators to research social and environmental issues related to natural gas operations.

The initial tranche of six projects have been completed and four research projects are ongoing and will conclude in 2021-22 (<https://gisera.csiro.au/states/sa/>).

Petroleum Systems Model

ERD-DEM are developing a petroleum systems model of the Early Cretaceous sequence incorporating new and revised data sets which is due for release in late 2021.

Lithostratigraphic Correlation



Despite decades of successful exploration and production of hydrocarbons from the Penola Troughs the existing lithostratigraphic characterisation of the basin is poor, particularly with respect to the Early Cretaceous Crayfish Group and Jurassic Casterton Formation.

Repetition and juxtaposition of largely similar lithological packages are unable to be resolved using well log correlation, or palaeontological data.

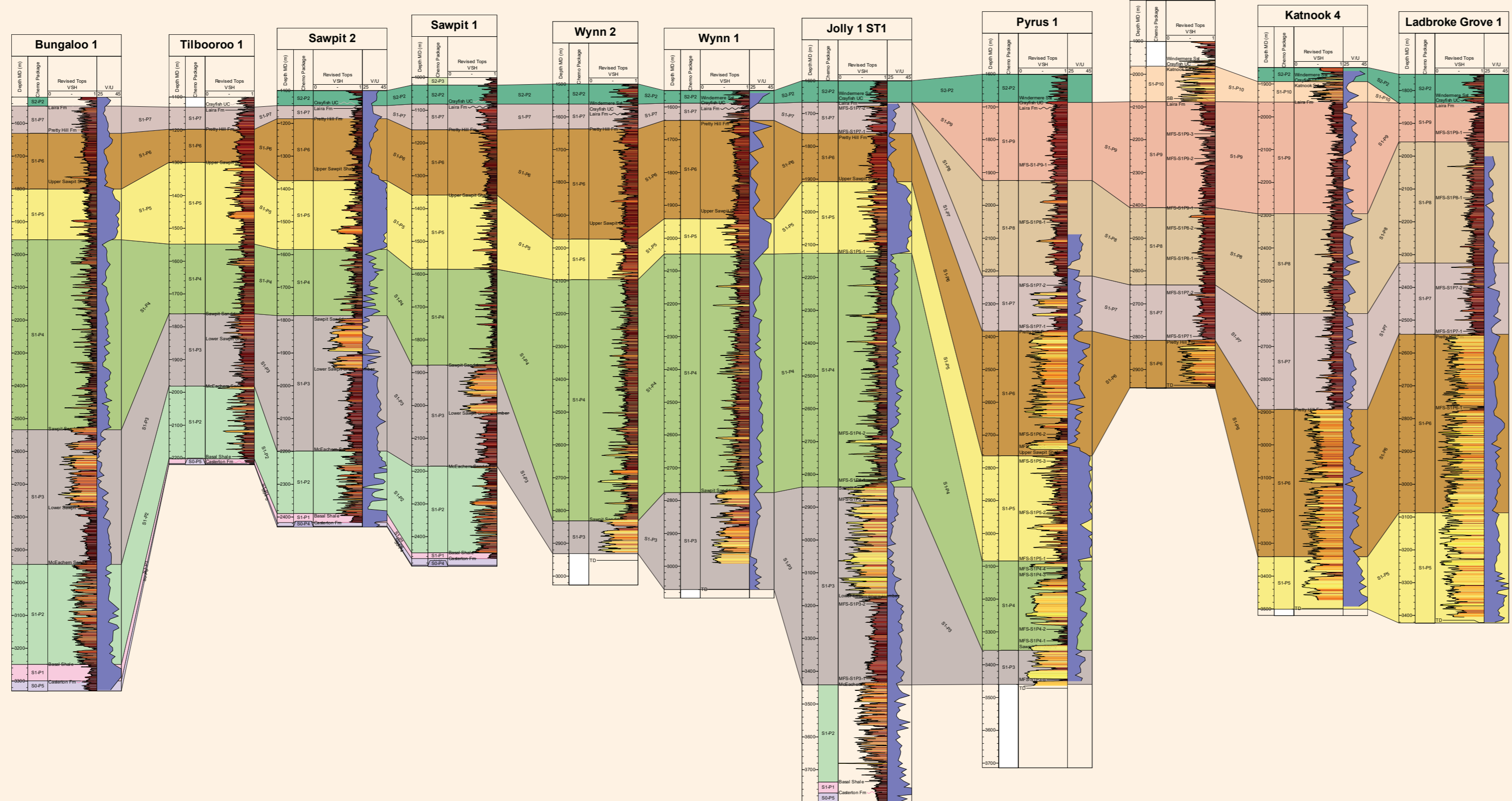
ERD-DEM have applied a rigorous chemostratigraphic approach to investigate the problem, expanding on the work of Forbes et al, (2020) and Bendall et al, (2020).

Chemostratigraphy is able to consistently identify and characterise the Crayfish Group as a single sequence with 10 diagnostic packages (S1-P1 through S1-P10). The Casterton Formation is characterised as a separate sequence with 5 diagnostic packages (S0-P1 through S0-P5).

Reinterpretation of the stratigraphy in the Penola Trough using the chemostratigraphic scheme has led to a more geologically sensible structural model and clearly distinguishes the distribution of 3 potential sandstone reservoirs within the Crayfish Group (i.e. Pretty Hill Sandstone, Sawpit Sandstone, McEachern Sandstone).

The chemostratigraphic model is applicable across the entire Otway Basin enabling correlation between SA and Victorian geology.

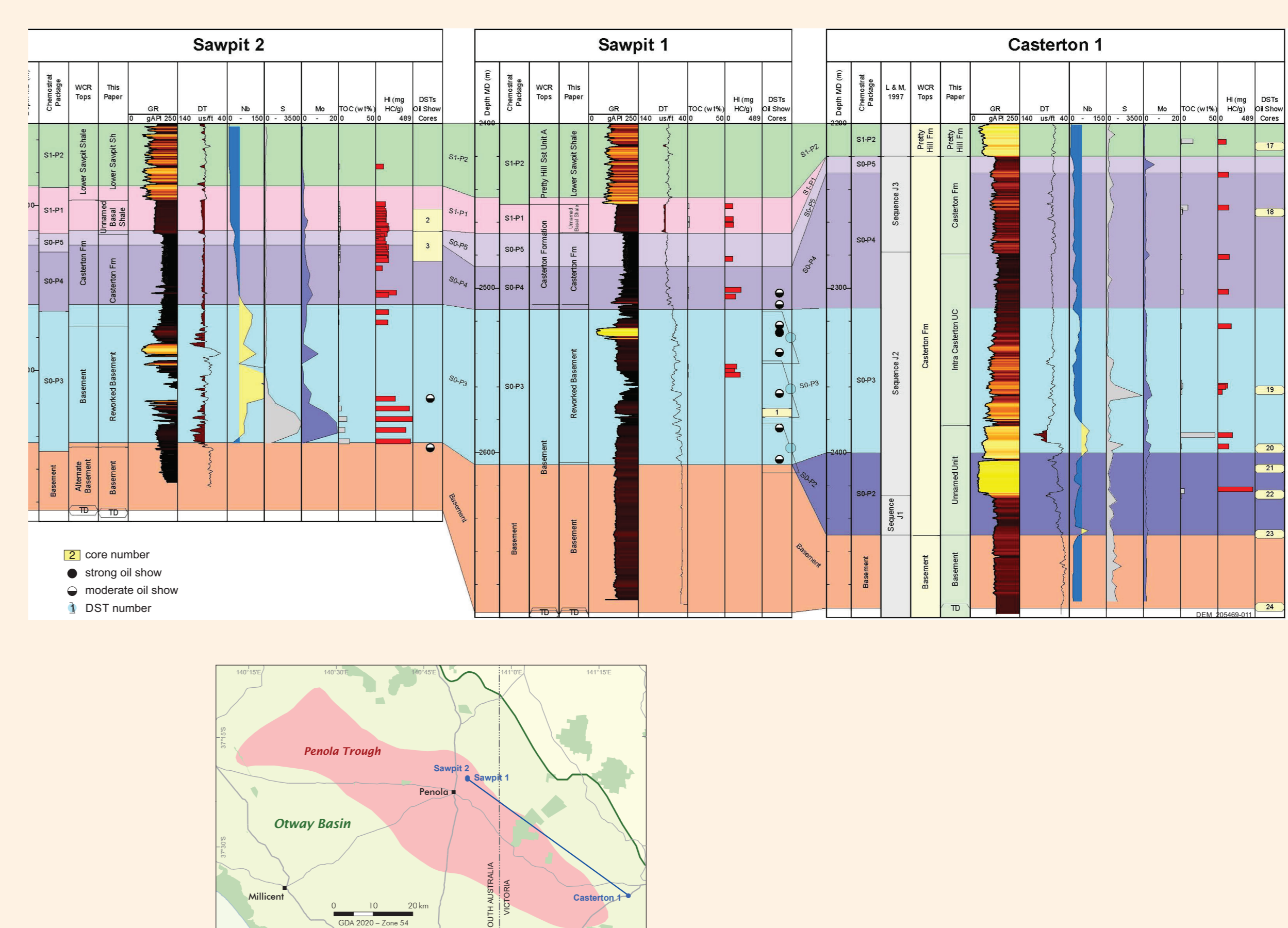
Chemostratigraphic Correlation



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- Bendall, B., Forbes, A., Revie, D., Eid, R., Herley, S., and Hill, A. (2020). New insights into the stratigraphy of the Otway Basin. *The APPEA Journal* 60, 691–696. doi:10.1071/AJ19035
- Forbes, A., Munday S., and Revie, D. (2020). An elemental chemostratigraphic study, Onshore Otway Basin, Victoria. Victorian Gas Program 5 Technical Report 12. (Geological Survey of Victoria. Department of Jobs, Precincts and Regions. Melbourne, Victoria.) 346p.
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New Source Rock



Underlying the Casterton Formation shales, an unnamed Late Jurassic syn-rift sequence of interbedded metasediments, tuffaceous sediments and organically-rich shales has been chemically characterised as S0P3.

A low Sulphur, medium-gravity, paraffinic oil was recovered from S0P3 in Sawpit 1 well in the Penola Trough.

Subsequent Total Organic Carbon and Rock-Eval analyses for S0P3 in Sawpit 2 identified a source rock containing algal organic matter though to be related to a deep anoxic lake environment.

Where intersected, this unit can be correlated across the entire Otway Basin using chemostratigraphy.

Nangwarry 1 CO₂ Discovery



Vintage Energy (JV partner of the operator of PEL 155 Otway Energy) reported CO₂ flow rates of 12-14 mmscfd during production testing in April 2021.

The aim is to produce food grade CO₂ for refrigeration/dry ice, soft drinks and beer, firefighting equipment, medical devices and winemaking.

CO₂ was previously sourced from the Caroline 1 well operated by Air Liquide, also in the SA Otway Basin, which was on production between 1969 and 2017.