

PROSPECTIVITY REVIEW CASE STUDY

Senex Energy Energy - PRL-109 & PRL-110
Cooper Basin, Australia

AWT DISCIPLINES

Geology
Geophysics
Reservoir Engineering
Petrophysics
Resource Assessment
Prospect Risking

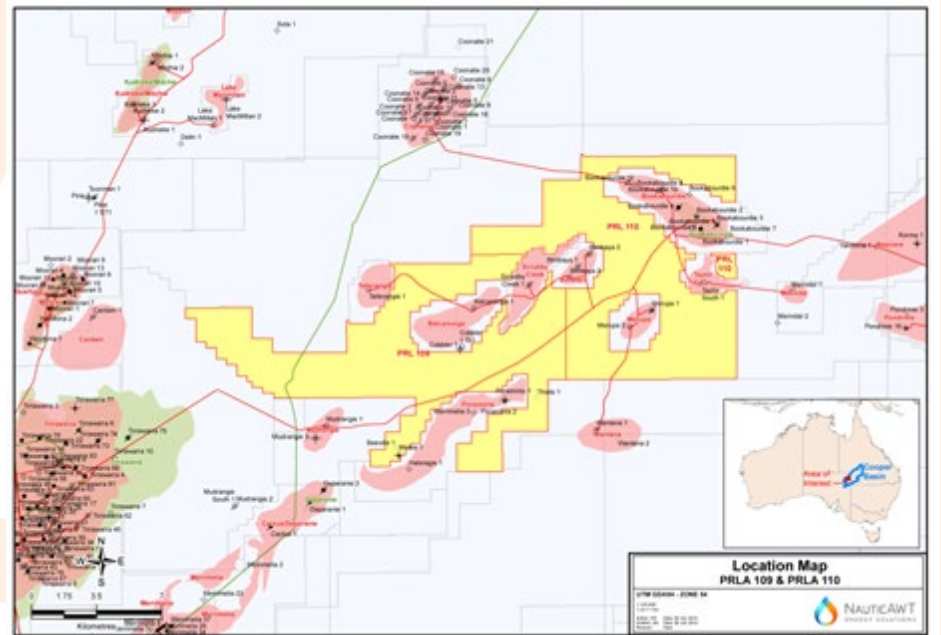
PROJECT BACKGROUND

AWT International (AWT) was contracted by Senex Energy Ltd (Senex) to complete a review of the remaining conventional hydrocarbon prospectivity of the Birkhead Formation and Permian section of permits PRL-109 and PRL-110. Wells and vintage seismic data were evaluated and interpreted in an attempt to identify channel sandstones and other stratigraphic plays and potential structural traps.

The Study Area was located within the South Australia Cooper Basin. A number of gas discoveries (eg Bookabourdie) had been made around the permits and oil has been found in multiple reservoirs within the neighbouring fields.

Location:
Cooper Basin,
Australia

For more information contact:
Tel: (+603) 2162 3127 or visit our
website at: www.awtinternational.com



AWT WORKSCOPE

As well as identifying possible areas for an upcoming drilling program, a review of reservoir parameters based on the gamma ray and sonic log was undertaken. Detailed petrophysical analysis of wireline logs was not initially part of this review. Primary reservoir intervals were evaluated in order to provide an estimate of gross sand interval, net sand and average porosity. Production data, hydrocarbon shows and DST information have been tabulated and posted on cross-sections to assist with reality checking of the petrophysical evaluation. The geological and seismic interpretation was carried out in parallel rather than in series.

AWT VALUE ADDED

A sequence concept was applied to a well cross-section, including all wells. This identified flooding surfaces and sequence boundaries. This study would be improved if the PELs had been part of a basin-wide framework with sequences extending from the Eromanga and Cooper basin depocentres.

It was generally able to determine depositional timelines and lateral (facies) relationships for the Birkhead Formation, Toolachee Formation, Upper and Lower Patchawarra Formation and the Tirrawarra Sandstone.

PROSPECTIVITY REVIEW CASE STUDY

Senex Energy Energy - PRL-109 & PRL-110
Cooper Basin, Australia

AWT DISCIPLINES

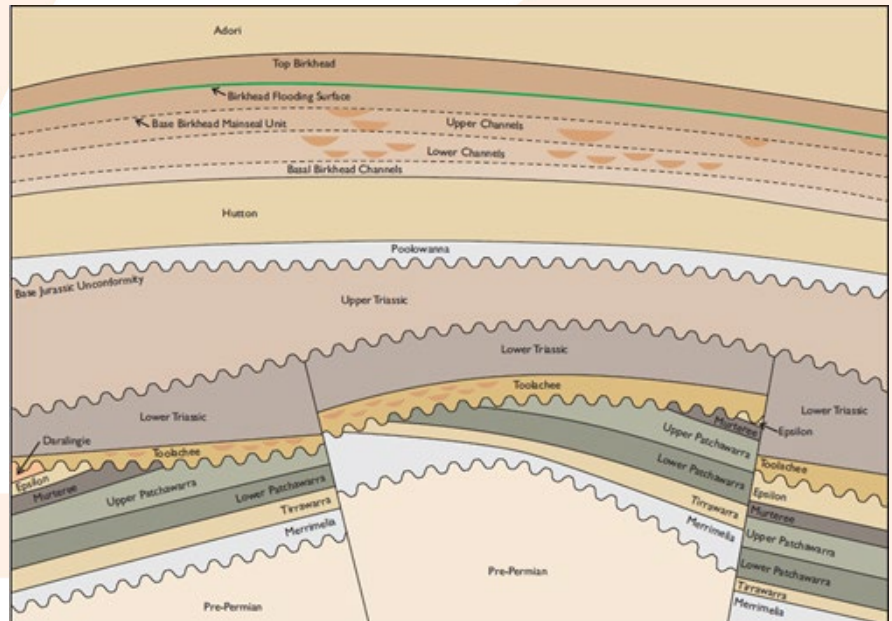
Geology
Geophysics
Reservoir Engineering
Petrophysics
Resource Assessment
Prospect Risking

PROJECT BACKGROUND

AWT International (AWT) was contracted by Senex Energy Ltd (Senex) to complete a review of the remaining conventional hydrocarbon prospectivity of the Birkhead Formation and Permian section of permits PRL-109 and PRL-110. Wells and vintage seismic data were evaluated and interpreted in an attempt to identify channel sandstones and other stratigraphic plays and potential structural traps.

The Study Area was located within the South Australia Cooper Basin. A number of gas discoveries (eg Bookabourdie) had been made around the permits and oil has been found in multiple reservoirs within the neighbouring fields.

Location:
Cooper Basin,
Australia



Seismic interpretation could be tied to the newly identified surfaces and anomalies in the seismic indicating lateral stratigraphic changes at particular stratigraphic levels have been identified. AWT provided a Birkhead seismic interpreted surface and an early version of the Birkhead geological channel model to Sproule for specialist analysis of 3D seismic to determine if that could find channels. Sproule successfully identified channel morphology and several play areas.

Improvements in identifying channels could be made on 3D seismic surveys which were acquired and/or reprocessed to identify Birkhead channels. The main challenge to this play type is lateral seal and oil charge. The seismic mapping of the plays that had been identified at the beginning of the study yielded several leads and four prospects. The prospects are:

1. Birkhead down-dip of Tallerangie Prospect – stratigraphic channel
2. Toolachee North Prospect - stratigraphic
3. Epsilon D prospect – downside fault
4. Tirrawarra A Prospect – downside fault

As a second part of the project, the channels and sand bodies identified were subject to some petrophysical analysis to determine volume of clay in the sandstone (Vsh) and porosity. A Vsh of 50% was applied to identify sandstone. A porosity of 12% was applied to identify net sand in the Birkhead suitable for oil pay and 6% in the Permian section for gas pay. P99 and P1 parameters for gross sand thickness, net to gross and average porosity were determined from the petrophysics. Birkhead channel widths and remnant lengths were estimated from the seismic interpretation and P99 and P1 end members.