

CANNING BASIN GSA Waukarlycarly 1

Introduction

The Geological Survey of Western Australia (GSA) and Geoscience Australia (GA) are drilling a stratigraphic well in the southern end of the depocentre of the Waukarlycarly Embayment of the southwest Canning Basin, between August and November 2019 (Fig. 1). The well is fully funded by GA under the Exploring for the Future Program, and is operated by GSWA. The drilling is a follow-up project to the recently acquired Kidson seismic survey. The well is a stratigraphic test of a very poorly known tectonic component of the southern Canning Basin.

The well site is about 214 km east of Marble Bar and 51 km west-northwest of Telfer gold mine in the Pilbara region of Western Australia. It is the first well to access this tectonic subdivision of the Canning Basin, apart from shallow water bores and mineral exploration drillholes that do not penetrate deeper than about 200 m. The predicted total depth is between 2200 and 2500 m based on seismic interpretation. The well is named after Waukarlycarly Embayment and Lake Waukarlycarly.

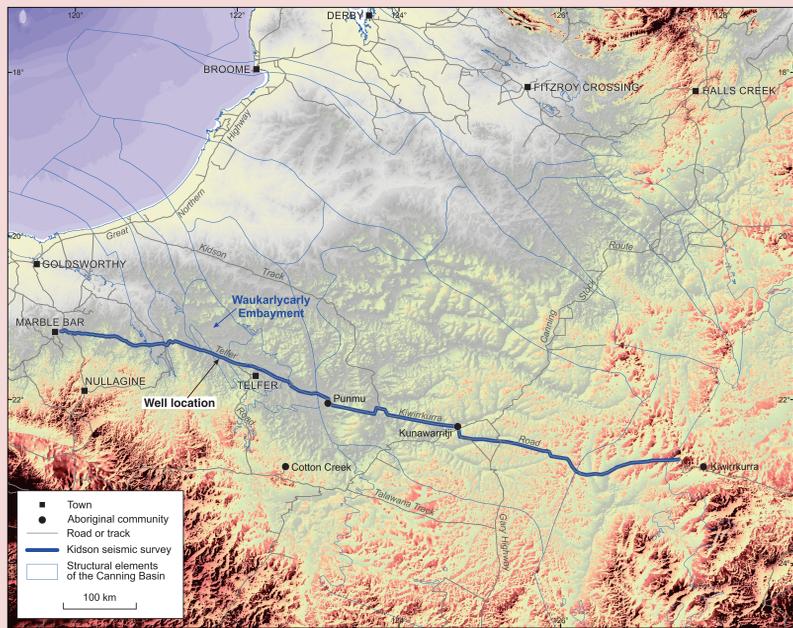


Figure 1. Map showing location of the GSWA Waukarlycarly 1 drill site and Kidson seismic survey

Geophysics

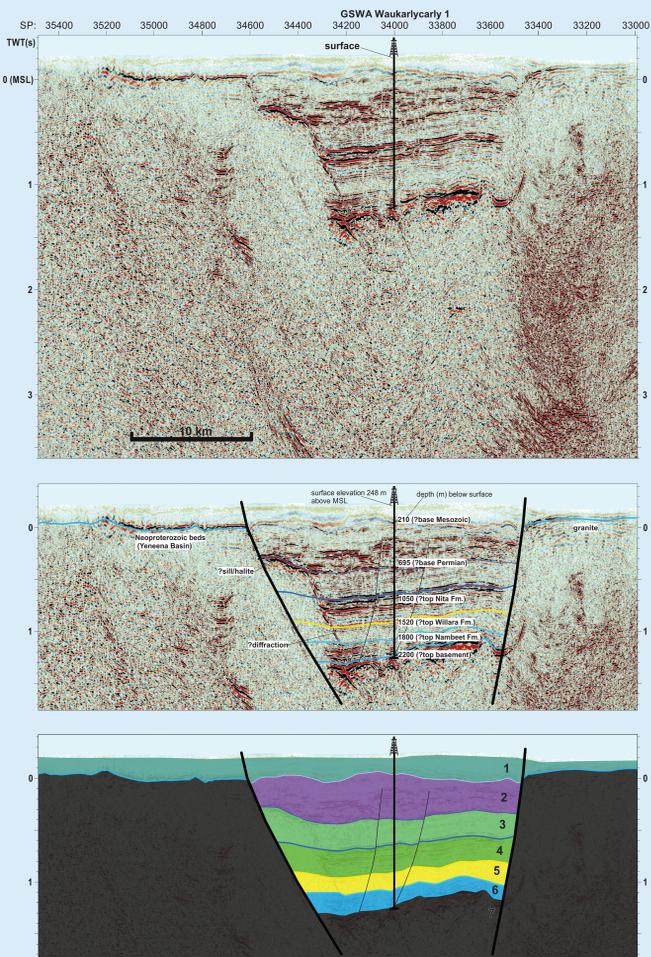


Figure 2. Interpretation of a portion of the Kidson seismic line. The following sedimentary packages are predicted: 1) Cenozoic and Mesozoic; 2) Permian; 3) Devonian and Carribuddy Group; 4) Nita and Goldwyer Formations; 5) Willara Formation; 6) Nambeet Formation; 7) basement. Abbreviations: MSL, mean sea level; TWT, two-way time in seconds (s)

The stratigraphic well site was chosen to be on the Kidson seismic survey (Fig. 2), adjacent to an all-weather road (Telfer Road) and close to four existing water bores drilled for Newcrest Mining Ltd as part of the Telfer mine operation. A cleared area already exists around the water bores, but has been expanded to accommodate a rig and accommodation.

The site is in approximately the centre of the embayment at this transect and avoids any obvious structural traps based on the available seismic data. The thickness of the Canning Basin succession in this area is estimated at about 2200 m, thickening slightly towards the western bounding fault, and thinning towards the eastern bounding fault (Fig. 3).

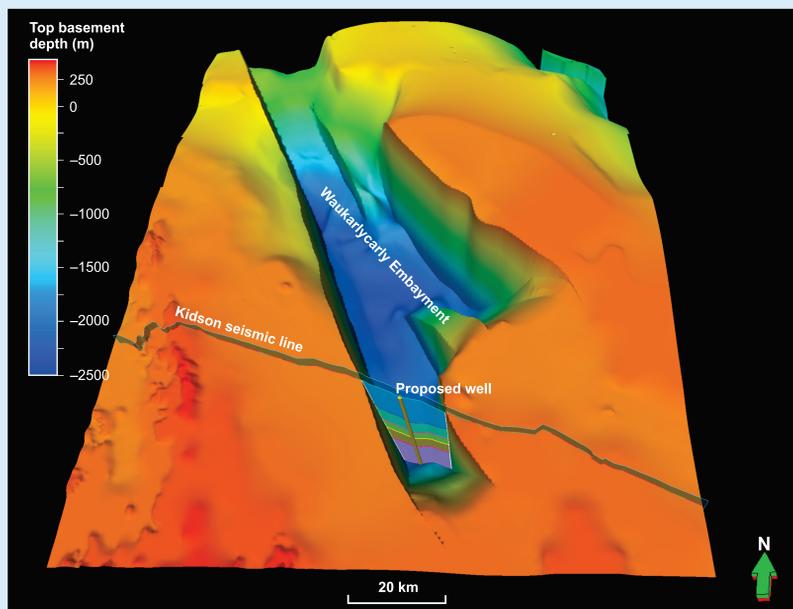


Figure 3. Oblique 3D model of the depocentre of the Waukarlycarly Embayment showing proposed well site

Geology

Due to the lack of deep drilling in the Waukarlycarly Embayment, and the inability to tie the limited seismic data to regional Canning Basin grids, the geological predictions for the well are speculative (Fig. 4, Table 1).

Being a stratigraphic well, there are no specific objective horizons. The primary objective is coring the complete Waukarlycarly Embayment stratigraphic section. The secondary objective is coring the top of basement to a depth that provides adequate fresh rock (there is likely a paleo-weathering horizon at the top) for a full suite of analytical studies.

Stratigraphy	Top depth (m)	Uncertainty ± (m)	Expected lithology	Age
Cenozoic, possibly overlying Mesozoic and Permian	Surface	0	Clay, sandstone and minor mudstone	Cenozoic, Mesozoic, Permian
Paterson Formation	210	50	Sandstone and diamictite	Lower Permian
Carribuddy Group, possible Worrall and Tandalgoo Formations	695	90	Mudstone, dolomite and sandstone	Upper Ordovician to Devonian
Nita and Goldwyer Formations	1050	150	Limestone interbedded with mudstone and dolomite	Middle Ordovician
Willara Formation	1520	240	Limestone	Lower Ordovician
Nambeet Formation (+upper Cambrian)	1800	270	Interbedded mudstone and limestone; basal sandstone	Lower Ordovician
Basement (Yeneena Basin)	2100	275	Low-grade metasedimentary rocks (quartzite, phyllite, marble)	Early Neoproterozoic

Table 1. GSWA Waukarlycarly 1 predicted stratigraphy and lithology

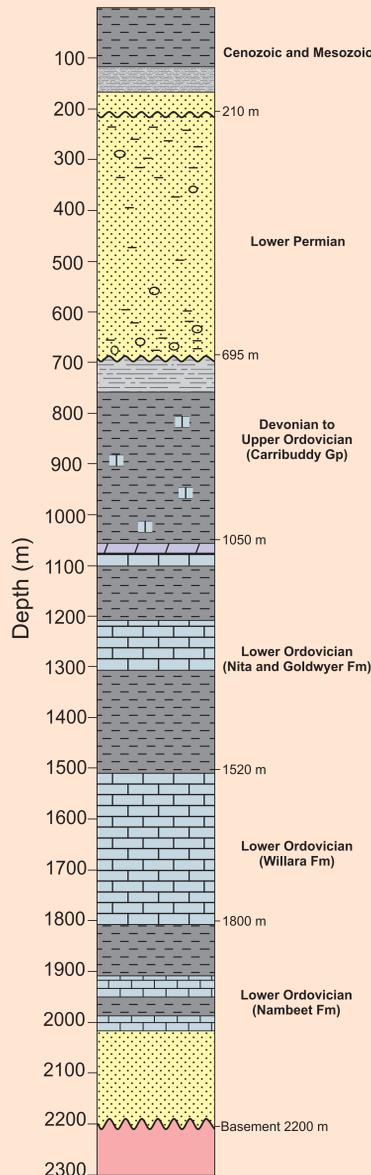


Figure 4. Predicted stratigraphic column

For more information, contact:
Peter Haines (peter.haines@dmirs.wa.gov.au)
Leon Normore (leon.normore@dmirs.wa.gov.au)
Alex Zhan (alex.zhan@dmirs.wa.gov.au)
Deidre Brooks (deidre.brooks@dmirs.wa.gov.au)

www.dmirs.wa.gov.au www.ga.gov.au/efft