

Dave Naylor (Petrel Resources)

Prospects within Licensing Option 16/24, North-Western Porcupine Basin'

Licence Option 16/24 covers Blocks 26/26, 26/27 (part), 35/1 and 35/2 (part) in the north-western Porcupine Basin. The Petrel Resources Plc applications in the 2015 Atlantic Margin Licencing Round were based on a regional re-appraisal of the Porcupine Basin using a large legacy seismic database, derived from earlier Licencing Rounds, together with more recently acquired seismic data. This study directed the company's main focus to the north-west sector of the basin. A number of basic elements were responsible for this focus;

- Mapping illustrated the northward narrowing and shallowing of the Late Cimmerian unconformity surface into a funnel shape across Blocks 35/1 and 35/2. The basal Cretaceous was deposited on the eroded surface created by the Late Cimmerian tectonic pulses in latest Jurassic-earliest Cretaceous time. The location of submarine fans at Cretaceous level in the Porcupine Basin is typically topographically controlled, with potential reservoir sandstones preferentially focussed into the topographic residual footwall lows.

- Water depths in critical locations are around 500 m and drilling depths are moderate.

- Working petroleum systems have been demonstrated in the Porcupine Basin, with shows or flows of hydrocarbons recorded in many wells. In particular, the best results on test have been in the north of the basin, on blocks adjoining LO 16/24. The general northward shallowing of the basin means that regional migration of hydrocarbons is likely to have been northwards and towards the basin margins. A further positive point is that in LO 16/24 mature Jurassic source rocks are in close proximity to the overlying Lower Cretaceous targets.

- Significant pulses of sand entered the basin during Early Cretaceous and Early Tertiary times, yielding potential reservoir rocks. Work by Evans-Young (funded by Petrel Resources as part of the work commitment in the previous Round), has thrown light on the provenance of the Lower Cretaceous and Palaeogene sand influxes into the Porcupine Basin. A technique using the Pb isotopic composition of detrital K-feldspar was employed to determine the provenance of sandstone samples in the northern part of the basin. Primary source terrains identified were an offshore basement terrain such as the northern part of the Porcupine High, the Caledonian granites onshore in County Galway and an uncharacterized area, possibly from the east of the basin, such as the large Brendan Igneous Centre. Given the nature of the source terrains and the relatively long-reach river systems feeding into the basin from the north, it is probable that significant volumes of sand-dominated sediment were delivered.

Since the award of the blocks Petrel Resources has purchased additional 2D seismic data and undertaken further interpretive mapping, selected line re-processing and inversion. Work has concentrated, in the main, on possible Cretaceous-Tertiary targets. This work, integrated with well analysis, has identified a number of promising leads. The lower part of the Cretaceous section is constrained by the basin

floor topography and consists of ponded turbidites, overlain by basin floor fan deposits. The lowest deposits are isolated areas of mounded turbidites within the main channel (See Figures 1 & 2 below). These are overlain by a number of sedimentary tongues, pinching-out to the NNE and gradually infilling the topography (Figure 3). Correlation with nearby wells 35/6-1 and 35/8-1 suggests that the whole of this basal sequence is Berriasian (and possibly Tithonian) in age. The critical factors in a consideration of the basal Cretaceous plays are those of reservoir quality and up-dip seal. Acoustic inversion of selected lines is ongoing, but early results suggest that the basal sequence contains porous layers intercalated with less permeable sealing units. Sub-seabed drill depths on the basal Cretaceous targets range from 1600m - 3000m, in water depths of ~500m. In-house calculations indicate that the basal build-ups and pinch-out closures, individually or in sequence, could contain commercial quantities of recoverable oil.

Clearly visible on the seismic line shown on Figure 2 are mounded features within the Lower Cretaceous section. These lie beneath the seismic horizon taken as 'Near Base Aptian' and are possibly Hauterivian-Barremian in age. They are interpreted as mounded fans, and map as significant large features (Figure 4). If comprised of reservoir quality sands, they could contain in excess of 500 million barrels of recoverable oil.

Good quality sands have been encountered in nearby wells within both the Albian and Palaeogene intervals. The problem in both cases is to demonstrate closure as the intervals shallow northwards, and work continues on this. The Jurassic in this area must also be considered to have remaining potential, given the proximity of the Connemara oil accumulation. However, the mapped highs are structurally complex and the existing 2D data are mainly of early vintage. An accurate assessment of prospects will require the acquisition of 3D data.

Petrel Resources has identified significant prospects in a sector of the Porcupine Basin where both water depths and drill depths are modest compared with those over much of the basin.

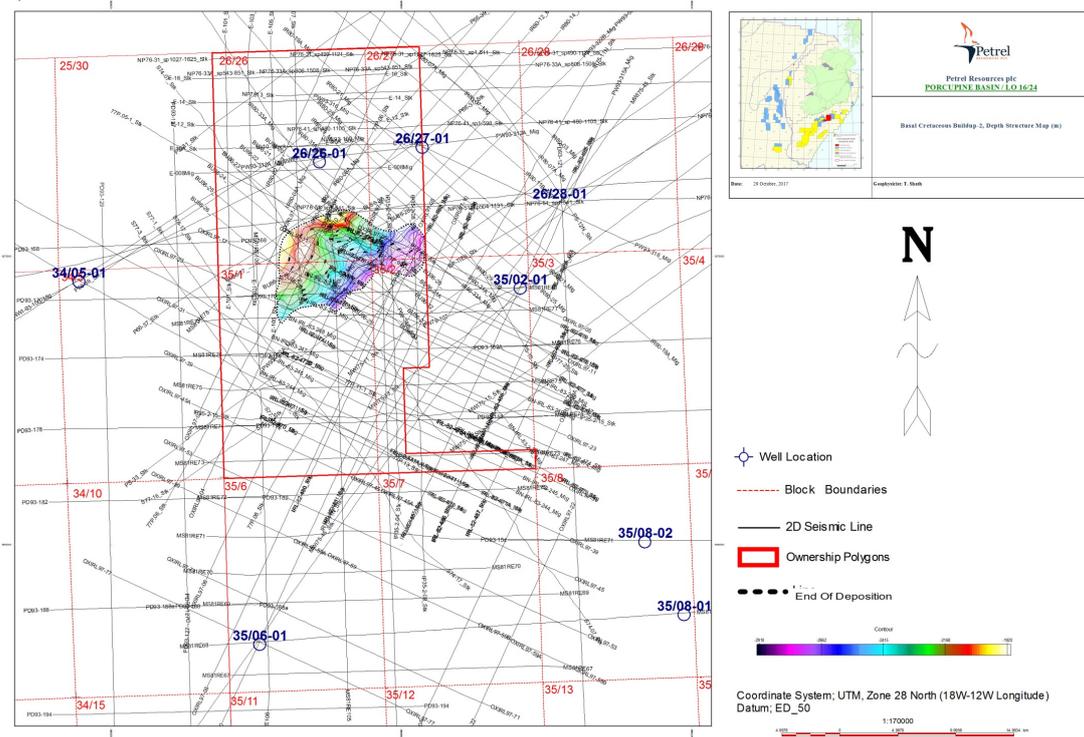


Figure 1: Lower Cretaceous basal turbidite build-up (Depth: m.)

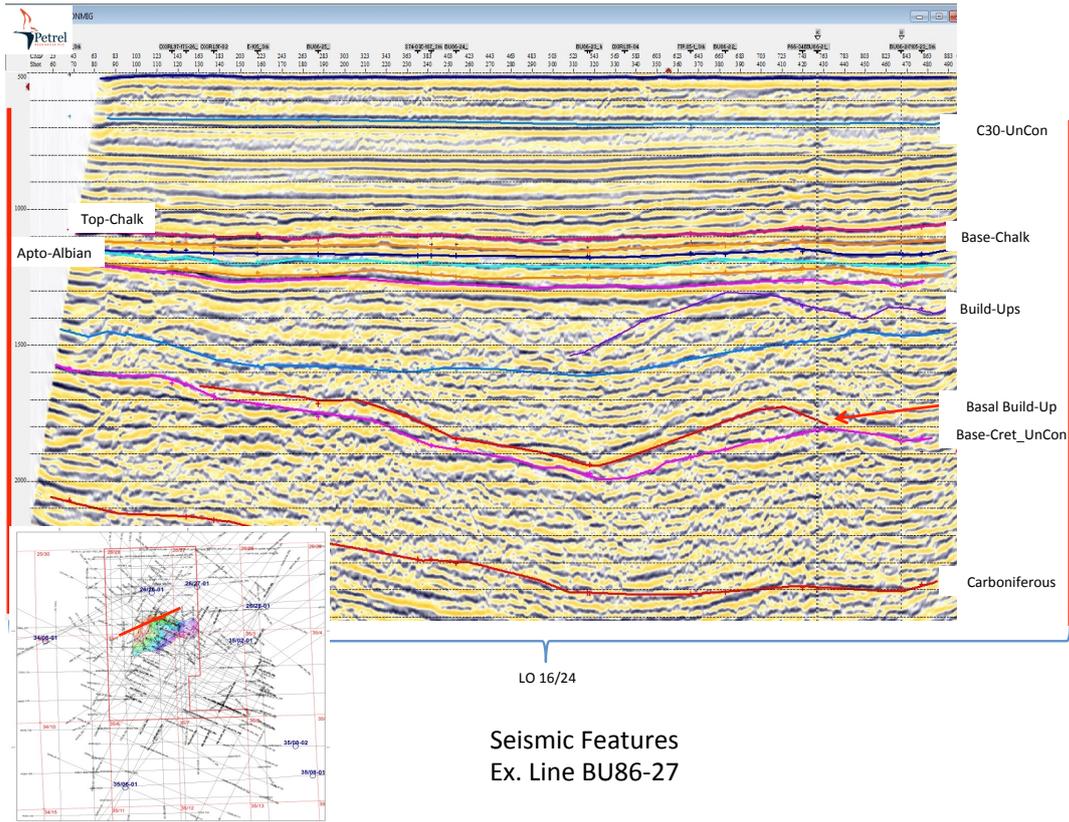


Figure 2: Lower Cretaceous basal turbidite build-up on Late Cimmerian unconformity and overlying mound features

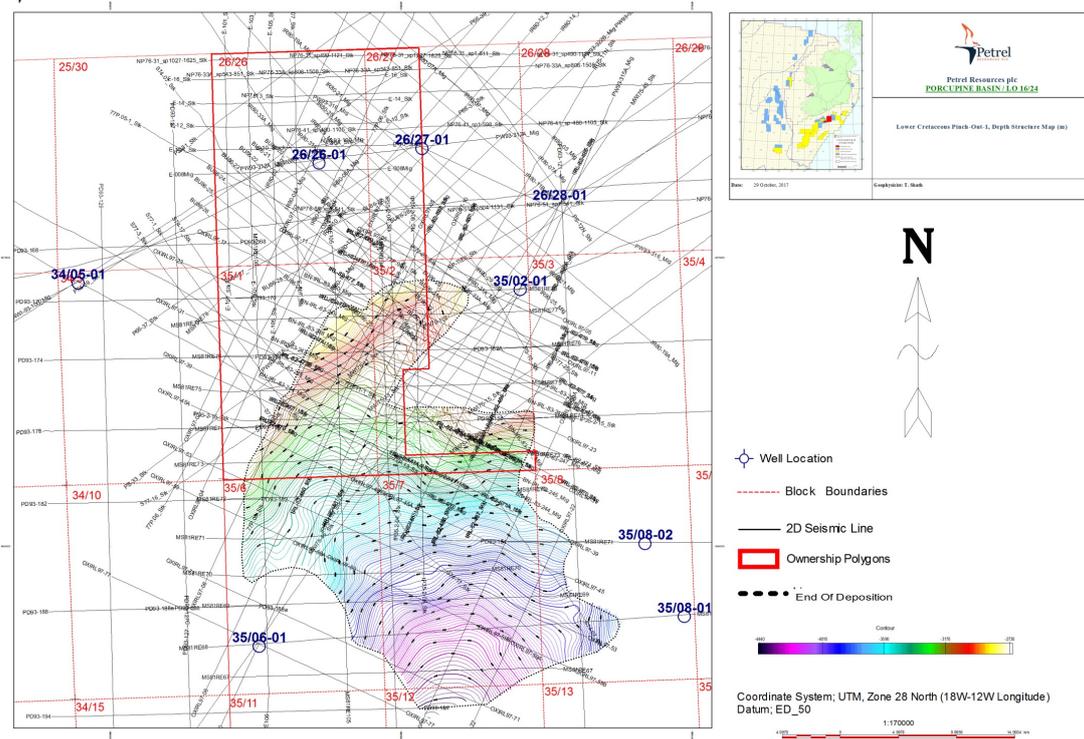


Figure 3: Northward closure of Lower Cretaceous Pinch-out 1 marker (Depth)

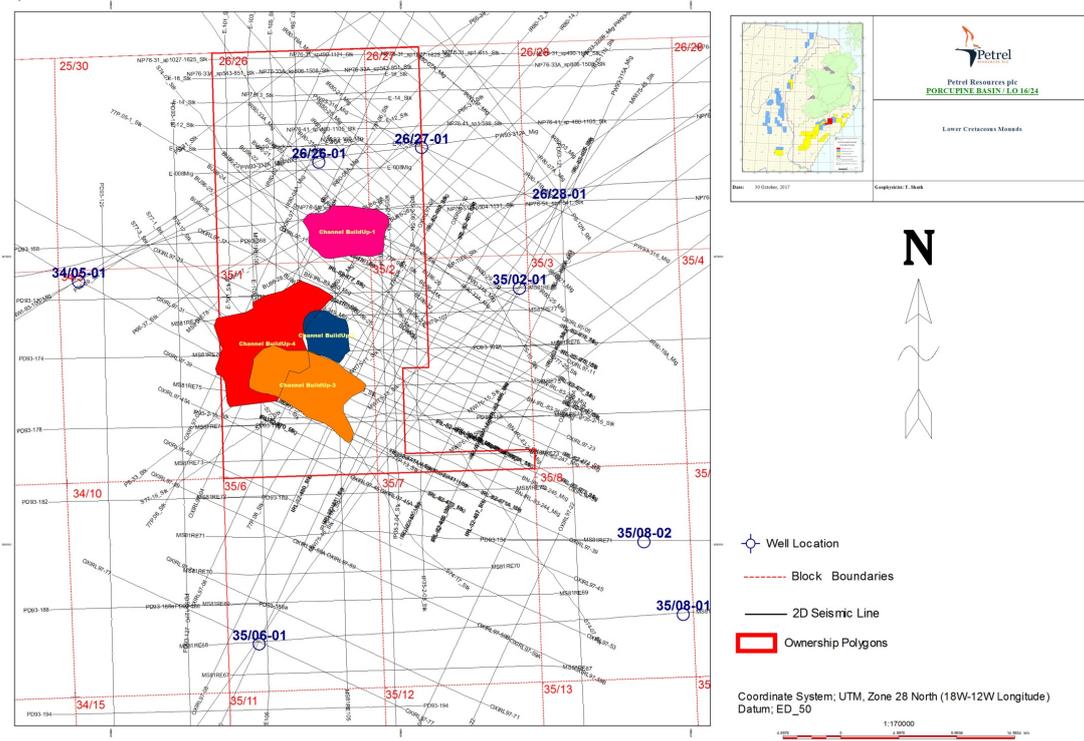


Figure 4: Lower Cretaceous mounded build-ups (Hauterivian-Barremian?)