

EXPLORATION RESULTS IN ATP 299P(A)

D.J. Morton, Chief Geologist,
Hartogen Energy Ltd

Authority to Prospect (ATP) 299P(A), covering an area of 7450 km² is located in south-western Queensland where Jurassic-Cretaceous Eromanga Basin sediments directly overlie hardrock basement or sediments of Permian or Devonian age. The Jurassic-early Cretaceous sequence consists of fluvial to lacustrine sandstones, siltstones, and shales overlain by Cretaceous shales and mudstones deposited in a shallow sea. The potential oil and gas reservoirs within ATP 299P(A) occur in Jurassic-early Cretaceous sandstones in the Hutton Sandstone, Birkhead Formation, Westbourne Formation, Adori Sandstone, Namur Sandstone, Murta Sandstone, and Wyandra Sandstone.

The main structural traps are of several types which may or may not be combined. Firstly, old basement highs, generally related to old faults, with onlap and drape closure due to differential compaction; secondly, closures located on the upthrown side of Tertiary wrench faults; thirdly, erosional remnants associated with large early Cretaceous submarine channels.

Hydrocarbons have been sourced from organic material deposited with shales and siltstones of Permian, Triassic, Jurassic and early Cretaceous age.

Prior to Hartogen Energy Limited farming into ATP 299P(A) in 1982, hardly any exploration had been conducted within or near the permit. Two percussion oil exploration wells — Orient 1 and 2 — were drilled in 1961, located in the far south-western part of the permit without the benefit of adequate seismic. Although basic data are poorly recorded, the wells certainly penetrated the Hutton Sandstone on basement overlain by a complete

Jurassic-Cretaceous sequence.

Prior to 1982, the only useful seismic data consisted of one Bureau of Mineral Resources regional line in the Orient area and a sparse grid of poor quality seismic data in the northern part of the permit, of limited exploration value.

In 1982 the Harkaway Seismic Survey recorded 350 km of 12-fold Vibroseis (trade mark of Conoco Inc.) in the northern part of the permit, mainly located along the Harkaway Fault trend, which was known from surface mapping and seismic data outside the permit. This was followed in 1983 by the Minedilla Seismic Survey, which recorded 120 km of 24-fold Vibroseis, once again mainly along the Harkaway Fault trend, to detail for drilling several leads indicated by the 1981 data.

Later in 1983, Tintaburra 1 was spudded within closure on the upthrown side of a Tertiary wrench fault. The prospect also had closure mapped in the early Cretaceous which had been modified by erosional submarine channelling. The well intersected a Jurassic-Cretaceous sequence with the Hutton Sandstone lying directly on basement. On drill stem test the Hutton Sandstone flowed 1750 barrels API oil a day, the Wyandra Sandstone 85 barrels API oil a day with associated water at 340 barrels a day, and 10 ft of oil was recovered from the Murta Sandstone.

The well was important not only in significantly extending the productive limits of the Eromanga Basin from the Jackson Oil Field 100 km to the south-west but also as it was drilled on a prospect that did not have the ingredients that were previously presumed essential for oil discoveries in the Jurassic, namely — presence of Permian section on or immediately adjacent to the prospect; demonstratable paleostructure (Tertiary structures were generally considered too young for entrapment); and proximity to presumed source generating areas.

This year, 1000 km of seismic data are being recorded for both prospect detail and regional control. Landsat studies have indicated major structural trends within the permit which will be investigated by the regional seismic programme. Four wells are planned to be drilled this year, two of which will be Tintaburra appraisals.

