

New Gas, Helium and Condensate Plays in the Southern Amadeus Basin

(090508 Technical Note CTP)

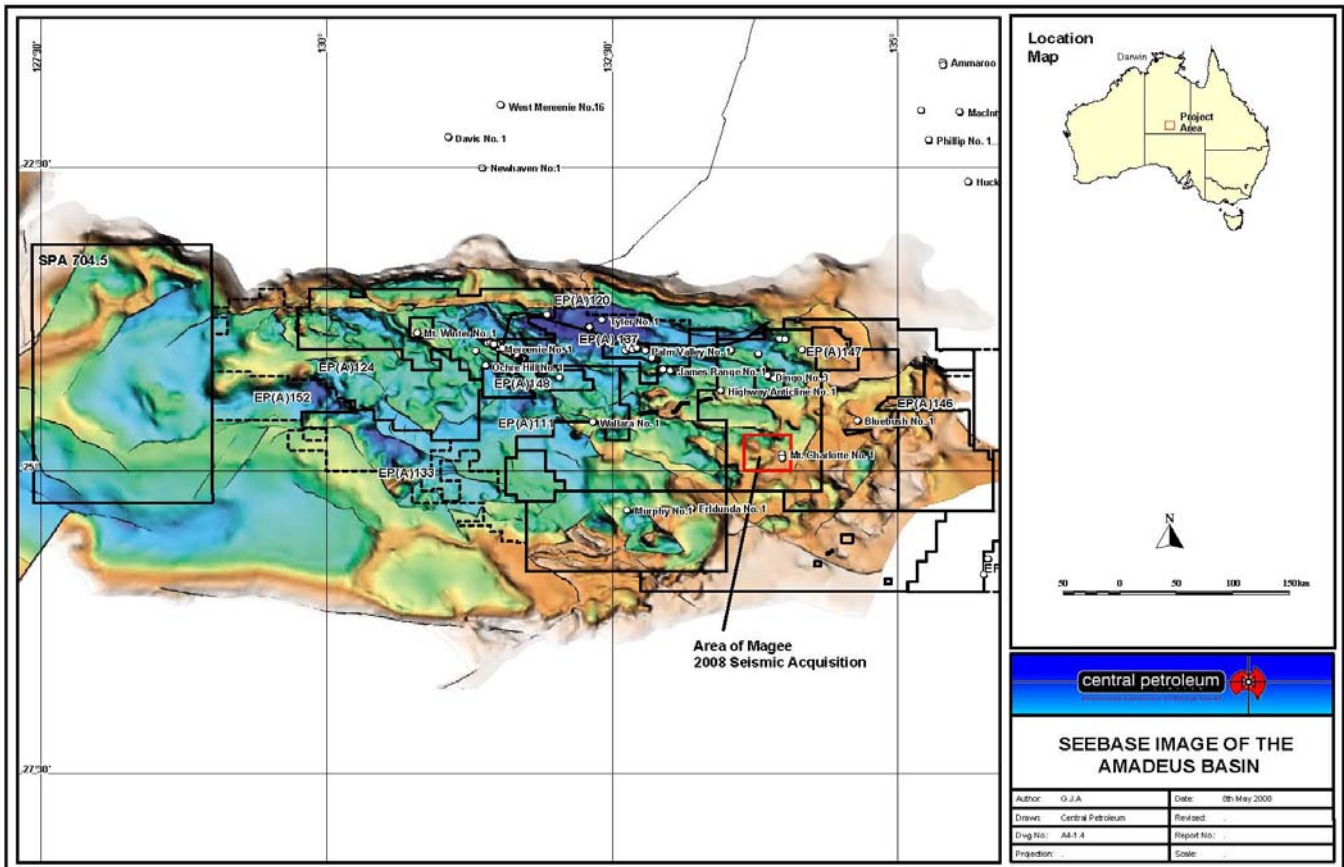
Introduction

New log correlations and results from the 2008 seismic acquisition programme in the southern Amadeus Basin have important regional implications, significantly enhancing the prospectivity of the area and providing a wealth of hitherto unrecognised new play types. These new play types will be described in more detail in subsequent Technical Notes.

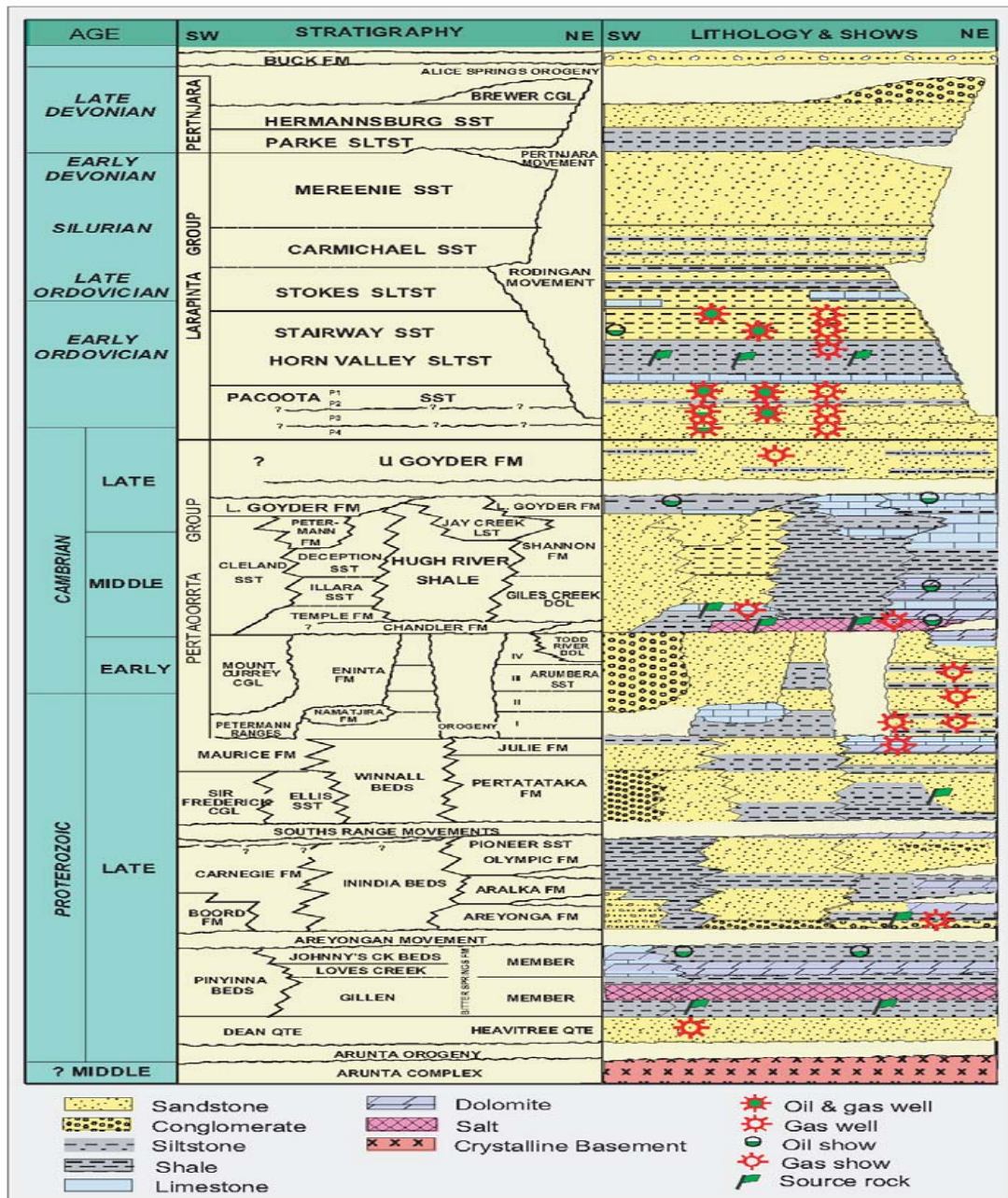
Central plans on the drilling of the Mt Kitty 1 and Magee 2 wells in Joint Venture with Helium Australia Limited. Both of these wells are targeting gas, Helium and condensate based on correlation with the Magee 1 well drilled in 1992 by Pacific Oil and Gas. Sub-commercial quantities of gas, Helium and condensate flowed to the surface on test from this well from the Heavitree Formation, effectively sealed by the overlying Gillen Salt member of the Bitter Springs Formation. The Gillen Salt member and the underlying Heavitree Formation is thought to be ubiquitous over virtually all of the Amadeus Basin.

A. New log correlations in the southern Amadeus Basin wells Murphy-1 and Eridunda-1 :

- verify the presence of the Sturtian (Neoproterozoic) Aralka petroleum system in the southern part of the basin adding a new dimension to the area's prospectivity.
- recognise for the first time the potential of the Neoproterozoic Pioneer Sandstone/ Pertatataka Formation reservoir seal-couplet (proven petroleum system in the north) in the southern Amadeus
- recognise for the first time that the Neoproterozoic Arumbera Sandstone (a major gas reservoir in the northern Amadeus Basin) occurs in Eridunda-1 and in the southern part of the basin.



Area of study in the 2008 Magee Seismic Programme



Generalised Stratigraphic Table – Amadeus Basin

B. The acquisition by Central of a 2008 seismic grid in the Magee area (180 line km) in EP 82 has elucidated a number of new plays with regional potential including :

- 1) Potential 4 way dip closures at the level of the following reservoir/seal couplets :
 - Heavtree Quartzite/Gillen Salt (proven petroleum system)
 - the Pioneer Sandstone/Pertatataka Fm (proven petroleum system)
 - the Cyclops Sandstone Member /Pertatataka Formation (proven petroleum system)
 - the Arumbera/ Chandler Salt (proven petroleum system)
 - the Giles Creek Formation

- 2) Thrusted fault block plays relate to the Heavitree/ Gillen petroleum system.
- 3) Structural and subcrop plays at the level of the Cyclops Sandstone Member
- 4) Four way dip closures at the level of the Arumbera Sandstone/Chandler Salt seal
- 5) Stratigraphic and "Halo" type plays in the Arumbera Sandstone
- 6) "Halo" type plays in the Pioneer Sandstone
- 7) Stratigraphically isolated (and intraformationally sealed) sandstone bodies within the Pertatataka (shale) Formation
- 8) Diapiric structures offer typical diapiric "Halo" plays on their flanks at the level of the Pioneer / Pertatataka and Arumbera / Chandler reservoir seal couplets

(These new plays have regional implications and will be considered in more detail in forthcoming Technical Notes – this Technical Note focuses on new log correlations)

New log correlations in the southern Amadeus Basin wells Murphy-1 and Eridunda-1

Historically, in the very lightly explored southern Amadeus Basin, the main target reservoir-seal couplet has been the Heavitree/ Gillen reservoir-seal couplet which produced gas, condensate and Helium to surface at a low rate in Magee-1. This play and the petroleum geology of this part of the basin are described by Young and Ambrose (2007).

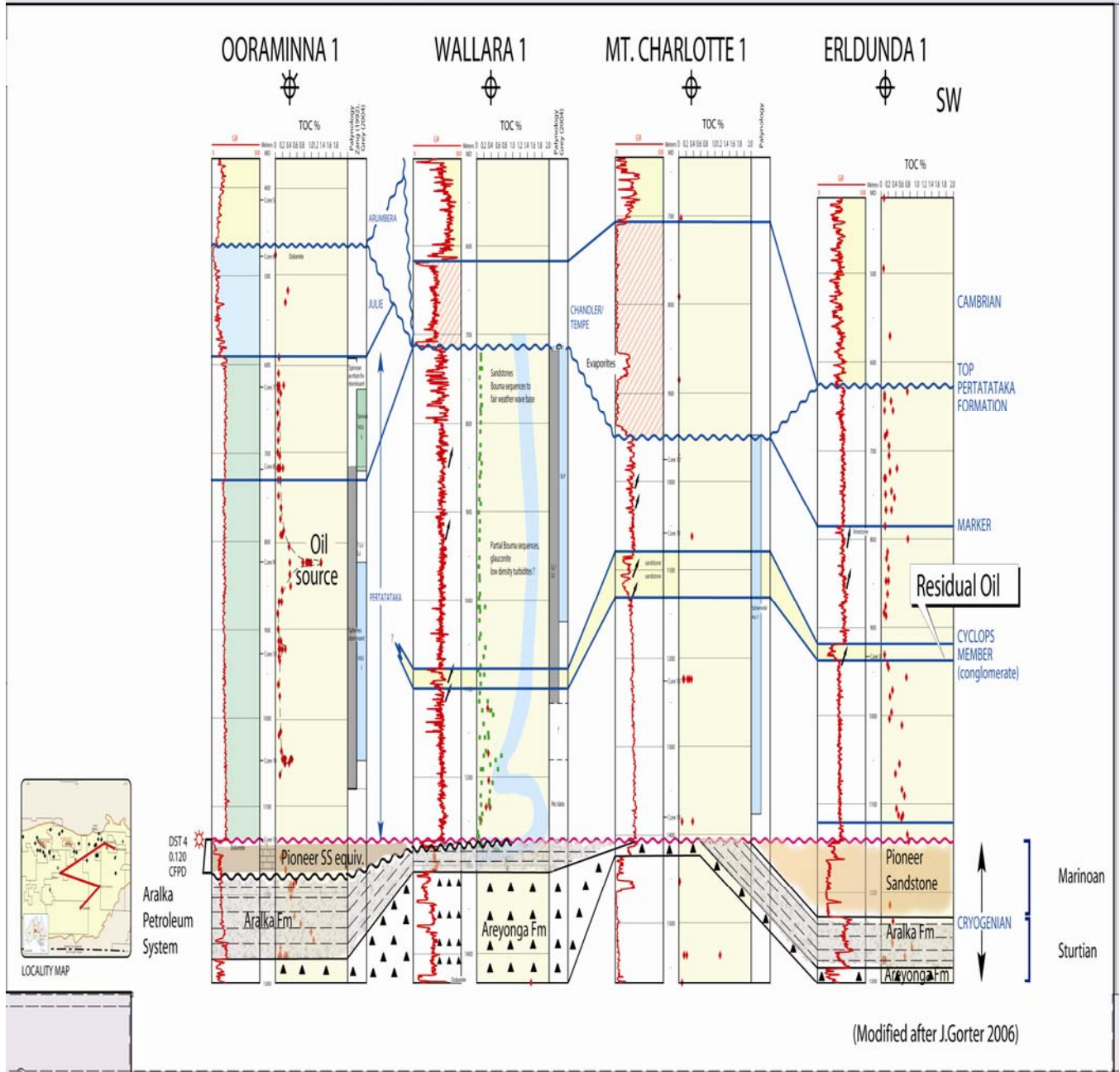
The Aralka petroleum system hosts the richest source rocks in the Proterozoic (TOC's ranging from 2 to 4 percent) and provides a very important regionally developed petroleum system. An oil stain was recorded in the Aralka/Pertatataka Formation in NTGS stratigraphic drillhole BRD05DD01. The migrated oil sample and the sedimentary bitumen share several very unusual characteristics including acyclic isoprenoids >C20 which were unusually abundant and included C40 carotenoids. Also present in both samples were unusual dihopanes and farrihopanes. These hydrocarbon signature compounds, whilst being very unusual, closely match similar Neoproterozoic oils from Oman believed to have been derived from a similar stratigraphic interval. A residual oil sample in the Cyclops Member at Eridunda 1 was not analysed but is thought to have essentially similar characteristics.

In both the Murphy-1 and Eridunda-1 wells the previously unrecognised potential of the Neoproterozoic Pioneer Sandstone/ Pertatataka Formation reservoir seal-couplet has also been verified by new log correlations. The Pioneer is a very important target which produced gas to surface at a low rate in the northern part of the basin (Ooraminna-1). It is important to note that this Marinoan (Neoproterozoic) glacial outwash sandstone is sandwiched between the Aralka and Pertatataka Formations, both of which are proven source rocks and the latter is a regional seal extending over 400 km across the southern part of the basin.

New stratigraphic interpretation of Eridunda-1 has recognised for the first time that the Arumbera Sandstone occurs in that well, and indeed in the southern part of the basin. This is an important breakthrough as this unit is a major gas reservoir in the northern part of the basin where it is sourced from the Pertatataka Formation and sealed by Chandler Salt, both of these units being widespread in the south - southeastern Amadeus Basin. The sandstone was previously erroneously correlated with the Middle Cambrian Cleland Sandstone. This new correlation is an important breakthrough in that the Arumbera/ Chandler Salt reservoir-seal couplet is now believed to be widespread in the southern part of the basin where it was previously perceived to be absent.

The Marinoan shale sequence (ie NeoProterozoic Pertatataka Formation) in this area is basically a synrift sequence of distal argillaceous turbidites deposited in two transgressive - regressive cycles, the lowermost shale sequence being capped by regressive shoreline sands of the Cyclops Sandstone Member (residual oil shows were recorded in Eridunda -1). This sandstone is encased in shale some of which are oil-prone (Fig.2) and have been type matched with rich Sturtian-Marinoan source rocks from Oman and Siberia. The upper regressive cycle comprises transgressive synrift shales capped by regressive carbonates of the Julie Formation. New seismic in the Magee area has imaged thick (80 m) , lensoid sand bodies in the lower Pertatataka Fm which may be a facies variant of the Cyclops shoreline sandstones or possibly a turbidite apron sand.

Source rocks in the Cryogenian of the Amadeus Basin



Pertatataka Fm, Cyclops Sst and Aralka Fm correlations

Greg Ambrose
Manager Geology

John Heugh
Managing Director