Geophysical and structural interpretation of the greater McArthur Basin

ANZLIC Identifier:	05599886D801ED1FE050CD9B21444AEF
Title:	Geophysical and structural interpretation of the greater McArthur Basin
Custodian:	Northern Territory Geological Survey (NTGS) Department of Mines and Energy
Abstract:	The greater McArthur Basin is a Palaeo to Mesoproterozoic basin that contains key stratigraphic intervals prospective for both petroleum and mineral resources. Much of the basin remains a greenfields exploration province with past exploration limited and information on the basin architecture and geological evolution are lacking. Numerous investigations since the late 1990s have recognised stratigraphic correlations between the McArthur Basin, Birrindudu Basin and Tomkinson Province, the outcropping and undercover extent of these contiguous regional correlatives are informally referred to as the greater McArthur. PGN Geoscience was contracted by NTGS to produce a potential field (magnetic and gravity) structural interpretation of the greater McArthur Basin and depth to basement estimates derived from unconstrained gravity inversion. The work focussed on understanding the basin architecture and evolution through time, identifying potential growth faults and depocentres. Stratigraphic units across the greater McArthur Basin have been collated into packages based on their geophysical textural relationships and stratigraphic correlations. Each package is separated by major unconformities associated with significant basin inversion events (Betts P et al 2014).
Search Word(s):	McArthur Basin, geophysical interpretation, structural interpretation, geophysical inversion, gravity, magnetic
Bounding Coordinates:	North Bounding Coordinate: -11.75 South Bounding Coordinate: -19.5 East Bounding Coordinate: 138.5 West Bounding Coordinate: 128
Reference System Information:	GIS projects and depth to basement estimates are supplied in Geocentric Datum of Australia (GDA94), latitude and longitude [EPSG: 4283]. Package and fault layers are provided in GDA94, Map Grid of Australia Zone 53 [EPSG: 28353]
Data Currency Start Date:	2013-01-01

Data Currency End Date: 2014-10-31

Progress: Complete

Maintenance and Update Frequency: Not Planned

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Lineage: Geophysical interpretation and inversion are based on the following datasets:

- Onshore_geodetic_Spherical_Cap_Bouguer_June_2009 830 metre survey (GADDS)
- Magnetic_Map_of_Australia_grid_fifth_edition_80m_cell _size (GADDS)
- Southern_McArthur_Basin_Gravity_p201381_Spherical_ Cap_Bouguer 2013 - 800 metre (GADDS)
- Fergusson River P425 BMR and Katherine Mt Evelyn P428 BMR magnetic grid. (NTGS).

Geophysical images have been tailored using upward continuation, low pass, high pass, band pass, tilt derivative, first vertical derivative, automatic gain correction and reduce to pole filters and were imaged with various sun-shade orientations and colour stretches to highlight different structural trends and textures.

Interpretations have also considered the NTGS 1:250000 scale geological maps and explanatory notes and the McArthur Basin 1:1000000 scale geology map.

Positional Accuracy: Data are interpretative and positional accuracy is influenced by both input datasets and interpretation uncertainty. Source inputs range in scale from 80 m magnetic datasets through to 1:1000000 scale geological maps.

Attribute Accuracy: Attribution accuracy is high, accurately reflecting the interpretation.

Logical Consistency: Data is logically consistent for the purposes of the geophysical and structural interpretation of the greater McArthur Basin project.

Completeness: The data is complete within the scope of the project and is limited by the vintage of geological and geophysical input data available at the time.

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