



Northern
Territory
Government

energyNT|2013

Energy activities for the Northern Territory, Australia



AUSTRALIA'S
Northern Territory

energyNT|2013

Department of Mines and Energy, Energy Directorate

Darwin, January 2014

© Northern Territory Government

ISSN 1838-3874 (print)

ISSN 1838-3882 (online)

ISSN 1838-4250 (CD-ROM)

Bibliographic reference: Department of Mines and Energy, Energy Directorate, 2014. *EnergyNT 2013*. Northern Territory Government, Darwin.

Cover photos:

Magellan Petroleum (NT) Pty Ltd's Palm Valley Gas Field Facilities within OL3, Amadeus Basin and Vibroseis Trucks conducting Santos Ltd's MCSAN13 2D Seismic Survey within EP161, McArthur Basin. Photos taken by Department of Mines and Energy and published with permission from Magellan Petroleum Australia Limited and Santos Ltd.

Disclaimer

While all care has been taken to ensure that information contained in this publication is true and correct at the time of publication, changes in circumstances after the time of publication may impact on the accuracy of its information. The Northern Territory of Australia gives no warranty or assurance, and makes no representation as to the accuracy of any information or advice contained in this publication, or that it is suitable for your intended use. You should not rely upon information in this publication for the purpose of making any serious business or investment decisions without obtaining independent and/or professional advice in relation to your particular situation. The Northern Territory of Australia disclaims any liability or responsibility or duty of care towards any person for loss or damage caused by any use of, or reliance on the information contained in this publication.

CONTENTS

Executive Summary	iv
Activities in NT Onshore and Coastal Waters	v
Petroleum	v
Licensed pipelines	vi
Geothermal	vi
About energyNT	vi
2013 Activities	1
NT Onshore and Coastal Waters	1
Petroleum	1
Permits/Titles/Work Programs	1
Onshore	1
Coastal Waters	3
Exploration Operations	5
Geological and Geophysical surveys	5
Drilling	11
Appraisal & Development Operations	13
Production Operations	13
Oil	13
Gas	14
Upcoming and Proposed Exploration, Appraisal and Development Operations	15
Licensed pipelines	16
Geothermal	18
Titles & Operations	18
Useful Northern Territory Government Contacts	19
Acknowledgements	19

Figures

1. Areas administered by Northern Territory Department of Mines and Energy in 2013	1
2. Northern Territory Coastal Waters (includes the 3 nautical mile-wide release area)	3
3. Petroleum operations and development in 2013	4
4. Armour Energy Ltd's Glyde Sub-basin Airborne Gravity Gradiometry and Magnetic Survey 2012–2013 acquired at 400 m line spacing	5
5. Beach Energy Limited's Bonaparte Basin Airborne Gravity Gradiometry and Magnetic Survey 2013 acquired at 500 m line spacing	6
6. Pangaea Resources Pty Ltd's Sturt Airborne Gravity Gradiometry Survey 2013 acquired at 2000 m line spacing	7
7. Santos Ltd's AMSAN13 NW Mereenie 2D Seismic Survey 2013	8
8. PetroFrontier Ltd's Amy 2D Seismic Survey 2013	8
9. Santos Ltd's MCSAN13 McArthur Basin 2D Seismic Survey 2013	9
10. Pangaea Resources Ltd's Hidden Valley 2D Seismic Survey 2013	10
11. Santos Ltd's AMSAN13B Southern Amadeus Basin 2D Seismic Survey 2013	11
12. Northern Territory oil production for period 1984–2013	13
13. Northern Territory gas production for period 1983–2013	14
14. Geothermal exploration permits and applications in 2013	17

Tables

1. NT Onshore and Coastal Waters Petroleum Titles	2
2. NT Drilling and Well Testing Activities	12
3. NT Oil and Gas Production Data (1983–2013)	15
4. NT Operating Pipelines	18
5. NT Geothermal Title	18

Executive Summary

While we take time to re-cap on the 2013 petroleum activities in Territory, now is a good opportunity to look ahead to 2014 and beyond. The Government has an elevated focus on the Territory energy sector as a whole and has recently established a new Energy Directorate within the Department of Mines and Energy.

The Energy Directorate will deliver a whole of government energy policy and oversee the strategic development of the Northern Territory's natural gas resources. A particular focus of government is the potential for energy infrastructure to be linked to regional areas to provide energy supply options for existing and new developments.

The Energy Directorate will become well resourced to continue carrying out regulation of the upstream energy sources and downstream energy activities and to provide industry support. The Titles and Operations teams will continue to provide a professional client service and are set to grow in order to meet the demands of industry expansion. Our Pipelines team will be resourced to continue delivering pipeline licences to support the development of onshore energy infrastructure, like the development of the Inpex LNG facilities.

Importantly, to encourage even further investment in the Territory, under the Government's *Creating Opportunities for Resource Exploration* (CORE) initiative, the Geological Survey will soon release a publication summarising the current understanding of the onshore petroleum geology and potential. A major program of geoscience data acquisition and resource assessment will follow in the McArthur and Amadeus Basins that will promote their gas potential to the global industry.

Since our 2012 energyNT Report, confidence in the oil and gas potential of the Territory continues to build. On the back of results from recent on ground efforts, companies are keen to pursue further exploration opportunities in their pursuit for new oil and gas discoveries.

The Australian Government's Geoscience Australia report issued late last year '*Upstream Petroleum and Offshore Minerals Working Group Inaugural Report to the Standing Council on Energy Resources on Unconventional Reserves, Resources, Production, Forecasts and Drilling Rates*' summed up:

"The rapid uptake of acreage in the Northern Territory is an indication of the interest in the prospectivity of the basins in this region. There have been widespread indications of petroleum during petroleum and stratigraphic drilling and mineral exploration over many years."

The dry season of 2014 is set to be very exciting, and we expect to see continued high levels of onshore petroleum exploration, driven in part by major companies such as Santos and Statoil who have joint ventured into projects in the Amadeus, McArthur and Georgina basins.

A clear indication of the high level of confidence that companies have in the potential offered in the Northern Territory, is that current work programs indicate that no fewer than 25 exploration wells are planned for drilling within the next 12 months.

Projected expenditure on oil and gas exploration on granted tenements exceeds \$200 million for the next five years and this figure will grow as more tenements are granted.

There is also a surge of greenfields exploration in the McArthur and Beetaloo basins, with many areas being explored for petroleum for the first time.

Activities in NT Onshore and Coastal Waters

Dredging as part of the Ichthys LNG project in Darwin Harbour for the ship basin is ongoing. Dredging for the shipping channel through the harbour, along with a berthing area for LNG vessels arriving at the proposed gas processing facility has commenced. These activities are 45% complete. A trench will also be dredged for the project's gas export pipeline.

The Ichthys LNG Plant will include two LNG trains (with room to expand to six trains), a liquefied petroleum gas processing facility and a condensate separation plant located at Blaydin Point in Darwin Harbour. Gas from the Ichthys Field in the Browse Basin west of Darwin will be supplied through an 890 km, 1065 mm diameter gas pipeline. The plant is expected to be operational with shipment of LNG commencing by the end of 2016.

Petroleum

The main exploration and production highlights for 2013 are:

- Armour Energy Ltd completed the Glyde Sub-basin Gravity Gradiometry and Magnetic Survey over EP171, EP176 and EP190 within the McArthur Basin.
- Armour Energy Ltd drilled Myrtle Basin 1 and Lamont Pass 3 wells within EP176 and EP190. Myrtle Basin 1 was suspended after drilling. Lamont Pass 3 was drilled, cored and plugged and abandoned.
- Beach Energy Ltd completed the Bonaparte Basin Gravity Gradiometry and Magnetic Survey over EP126, EP138, NTC/P10 and EP386.
- Pangaea (NT) Pty Ltd completed the Sturt Gravity Gradiometry Survey over EP167, EP168, EP169, EP198 and EP(A)305 within the Beetaloo Sub-basin and Birrindudu Basin.
- Pangaea (NT) Pty Ltd completed the Hidden Valley 2D Seismic Survey over EP167, EP168 and EP198 Beetaloo Sub-basin and McArthur and Birrindudu basins.
- PetroFrontier (Australia) Pty Ltd undertook the Amy 2D Seismic Survey over EP103 and EP128 within the Georgina Basin.
- Santos Ltd completed the AMSAN13 NW Mereenie 2D Seismic Survey over OL4, OL5 and EP115 within the Amadeus Basin.
- Santos Ltd completed the MCSAN13B McArthur Basin 2D Seismic Survey over EP161.
- Santos Ltd completed the AMSAN13B Southern Amadeus Basin 2D Seismic Survey within EP82, EP105, EP106, EP107, EP112, EP125 and RL2.
- Santos Ltd commenced drilling of its Mereenie Appraisal and Development (MADD) Project. A total of eight wells will be drilled within OL4 and OL5. Surface hole sections of the wells have been drilled and drilling of the production hole sections is progressing.
- Santos Ltd drilled the Surface Hole section of Mt Kitty well within EP125 and suspended the well.

Proposed and upcoming onshore activities for 2014 are expected to include the following:

- Armour Energy Ltd is expected to conduct appraisal and exploration drilling within McArthur Basin.
- Central Petroleum Ltd is expected to conduct appraisal drilling within the Surprise Field.
- Magellan Petroleum (NT) Pty Ltd is expected to commence development of Dingo Gas Field within RL2 if the Production Licence is granted in 2014.
- Santos Ltd's Mereenie to continue its MADD Project through 2014 and potentially into 2015, which covers drilling and completion of all eight wells.
- Santos Ltd will re-enter and complete drilling Mt Kitty well within EP125. The Surface hole section was drilled in 2013.
- Statoil Australia Theta B.V is expected to start its exploration drilling within the Georgina Basin.
- Tri-Star Energy Company has a well approved to be drilled in EP134 within Pedirka Basin. Drilling is expected to commence in 2014.

Licensed pipelines

Amadeus Gas Pipeline (Pipeline Licence 4)

- Substantial work was carried out on coating faults and the cathodic protection system as part of a major, multi-year program for system maintenance and upgrade.

Ichthys Gas Export Pipeline (Pipeline Licence 26)

- Dredging work supporting construction of the pipeline from the Ichthys Gas Field in the Browse Basin to the Ichthys LNG Plant at Blaydin Point in Darwin Harbour commenced in late 3rd quarter of 2013.
- Construction of the offshore portion of the pipeline is scheduled to begin in Darwin Harbour 2nd quarter of 2014 and the onshore portion later in the year.

Geothermal

Areas in the Northern Territory were made available for geothermal exploration in February 2011. There is currently one active geothermal permit GEP 27829 held by Western Desert Resources Ltd.

About energyNT

energyNT focuses on petroleum and geothermal energy activities in the NT's onshore and coastal waters (to the 3 nautical mile limit) areas. Enquiries on petroleum activities in Commonwealth offshore areas previously administered by the Northern Territory should be directed to NOPTA and NOPSEMA.

2013 ACTIVITIES

NT Onshore and Coastal Waters

PETROLEUM

Permits/Titles/Work Programs

Onshore

The NT onshore area is over 1.35 million km² (**Figure 1**) and as of December 2013, there were 55 active exploration permits, 4 retention licenses and 3 production licenses, where hydrocarbons have been produced since the early 1980s. **Table 1** contains a list of Onshore Titles and Titleholders.

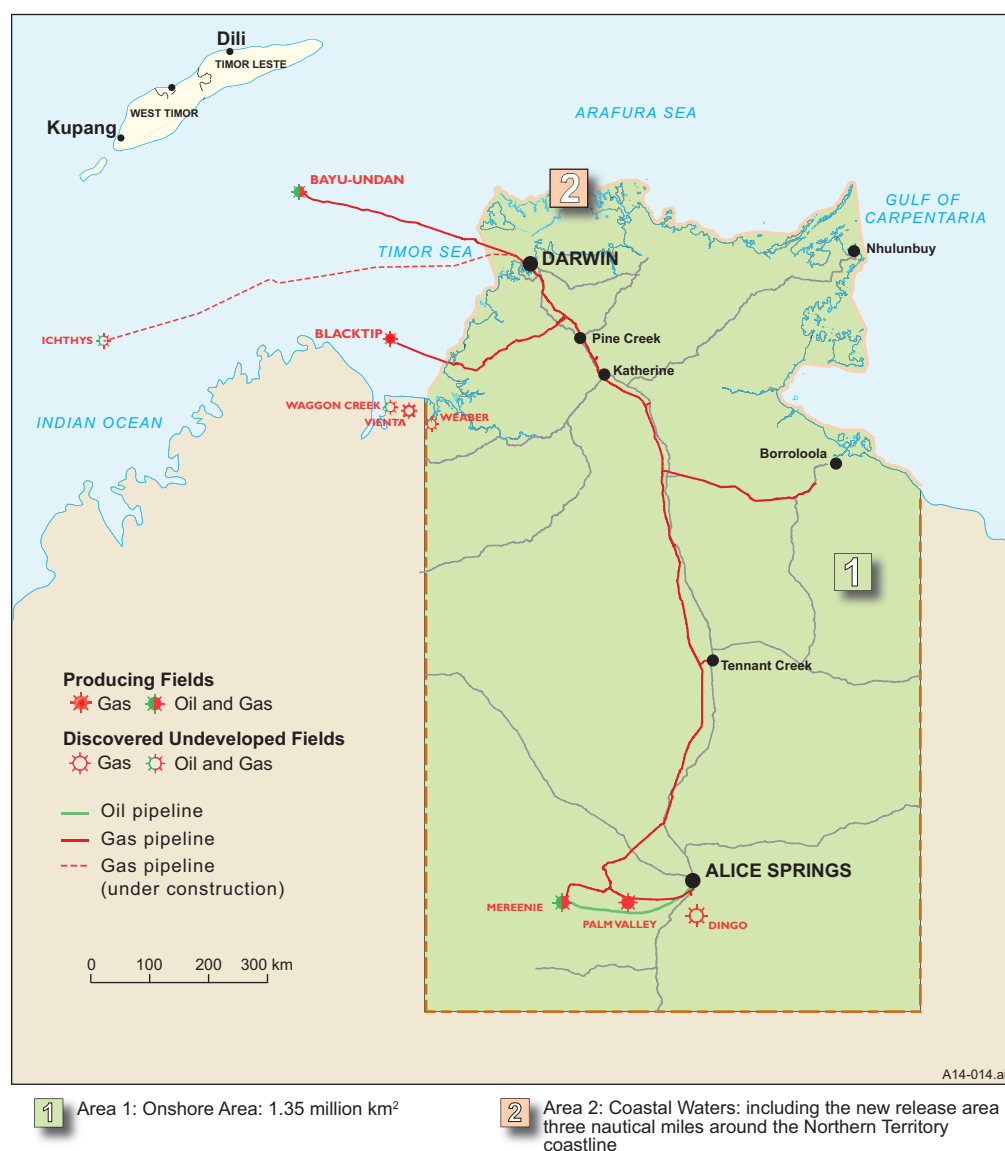


Figure 1. Areas administered by Northern Territory Department of Mines and Energy in 2013.

NT Onshore Title	Title Holder/Operator	Date Awarded
EP76	Falcon Oil & Gas Australia Limited	8-Mar-01
EP82	Helium Australia Pty Ltd	2-Sep-05
EP93	Merlin Energy Pty Ltd	30-Jan-13
EP97	Merlin Energy Pty Ltd	23-May-11
EP98	Falcon Oil & Gas Australia Pty Ltd	4-Feb-04
EP99	Falcon Oil & Gas Australia Pty Ltd	4-Feb-04
EP103	Statoil Australia Theta B.V	21-Nov-06
	Texalta Australia Pty Ltd	
	Petrofrontier (Australia) Pty Ltd	
EP104	Statoil Australia Theta B.V	21-Nov-06
	Texalta Australia Pty Ltd	
	Petrofrontier (Australia) Pty Ltd	
EP105	Merlin Energy Pty Ltd	28-Sep-07
	Santos QNT Pty Ltd	
EP106	Merlin Energy Pty Ltd	28-Sep-07
	Santos QNT Pty Ltd	
EP107	Merlin Energy Pty Ltd	28-Sep-07
	Santos QNT Pty Ltd	
EP112	Frontier Oil & Gas Pty Ltd	21-Jul-05
	Santos QNT Pty Ltd	
EP115	Frontier Oil & Gas Pty Ltd	17-Aug-07
EP117	Falcon Oil & Gas Australia Pty Ltd	14-Mar-06
EP125	Ordiv Petroleum Pty Ltd	7-Dec-05
	Santos QNT Pty Ltd	
EP126	Territory Oil and Gas Pty Limited	15-Jun-11
	Beach Petroleum (NT) Pty Ltd	
EP127	Statoil Australia Theta B.V	14-Dec-07
	Baraka Petroleum Limited	
	Petrofrontier (Australia) Pty Ltd	
EP128	Statoil Australia Theta B.V	14-Dec-07
	Baraka Petroleum Limited	
	Petrofrontier (Australia) Pty Ltd	
EP134	Tri-star Energy Company	26-Feb-08
EP135	Territory Oil and Gas Pty Limited	23-Aug-12
	Beach Petroleum (NT) Pty Ltd	
EP136	Sweetpea Petroleum Pty Ltd	28-Aug-12
	Paltar Petroleum Limited	
EP138	Territory Oil and Gas Pty Limited	23-Aug-12
	Beach Petroleum (NT) Pty Ltd	
EP143	Sweetpea Petroleum Pty Ltd	28-Aug-12
	Paltar Petroleum Limited	
EP144	Conarco Minerals Pty Ltd	21-May-13
EP153	Mineral Australia Pty Ltd	1-Jul-13
	Jacaranda Minerals Limited	
EP156	Oilco Pty Ltd	7-Nov-11

NT Onshore Title	Title Holder/Operator	Date Awarded
EP161	Tamboran Resources Pty Ltd and Santos QNT Pty Ltd	21-May-12
EP162	Tamboran Resources Pty Ltd	21-Aug-12
	Santos QNT Pty Ltd	
EP163	Tamboran Resources Pty Ltd	14-May-10
EP164	Tamboran Resources Pty Ltd	23-Aug-13
EP165	Tamboran Resources Pty Ltd	15-Jul-13
EP166	Tamboran Resources Pty Ltd	28-Aug-13
EP167	Pangaea (NT) Pty Ltd	10-Jan-13
EP168	Pangaea (NT) Pty Ltd	10-Jan-13
EP169	Pangaea (NT) Pty Ltd	4-Apr-13
EP171	Armour Energy Pty Ltd	29-Jun-11
EP174	Armour Energy Pty Ltd	11-Dec-12
EP176	Amour Energy Pty Ltd	29-Jun-11
EP184	Imperial Oil & Gas Pty Ltd	21-Aug-13
EP189	Tamboran Resources Pty Ltd	21-Aug-12
	Santos QNT Pty Ltd	
EP190	Armour Energy Pty Ltd	11-Dec-12
EP191	Armour Energy Pty Ltd	3-Oct-13
EP192	Armour Energy Pty Ltd	3-Oct-13
EP198	Pangaea (NT) Pty Ltd	10-Jan-13
EP200	Wiso Oil Pty Ltd	16-Feb-12
EP205	Wiso Oil Pty Ltd	16-Feb-12
EP207	Wiso Oil Pty Ltd	16-Feb-12
EP222	Wiso Oil Pty Ltd	22-Aug-12
EP231	Paltar Petroleum Limited	5-Sep-12
EP232	Paltar Petroleum Limited	3-Oct-13
EP234	Paltar Petroleum Limited	5-Sep-12
EP237	Paltar Petroleum Limited	5-Sep-12
EP300	Tom Oates	17-Apr-13
EP301	Tom Oates	15-May-13
EP309	Tamboran Resources Pty Ltd	15-Jul-13
RL1	Onshore Energy Pty Ltd	9-Jul-13
RL2	Magellan Petroleum (NT) Pty Ltd	4-Feb-09
RL3	Helium Australia Pty Ltd	6-Mar-13
	Santos QNT Pty Ltd	
RL4	Helium Australia Pty Ltd	6-Mar-13
	Santos QNT Pty Ltd	
OL3	Magellan Petroleum (NT) Pty Ltd	6-Nov-03
OL4	Santos QNT Pty Ltd	6-Nov-02
	Santos Limited	
OL5	Santos QNT Pty Ltd	6-Nov-02
	Santos Limited	
NT Coastal Waters Title	Title Holder/Operator	Date Awarded
NTC/P10	Territory Oil and Gas Pty Limited	8-Mar-13
	Beach Petroleum (NT) Pty Ltd	

Table 1. NT Onshore and Coastal Waters Petroleum Titles.

The total nominated exploration expenditure work program for onshore titles for the period 2013–2018 is estimated at A\$168M for petroleum exploration. The work commitment for the period includes the drilling of 30 wells and the acquisition of 5734 line km of 2D seismic data.

Sixteen titles were granted in 2012 (**Table 1**) and 2 applications were received. There are now 55 active exploration permits (EP), 4 retention leases (RL) and 3 operating licenses (OL).

Expenditure for onshore petroleum exploration activities in the Northern Territory in 2013 was approximately \$27M, including \$9.4M from the 16 new permits granted.

Coastal Waters

Coastal Waters include all waters between the mean low water mark and a line 3 nautical miles seaward of the Australian Territorial Sea Baseline (**Figures 1, 2**). This area was first released for applications in 2009 and is approximately 15 000 km². Unlike Commonwealth Waters, acreage in Coastal Waters is not released for competitive tender, but is available for application at any time. A Coastal Waters exploration permit was granted in 2013 (**Table 1**) with a work program valued at approximately \$6.55M over a 6-year permit term.

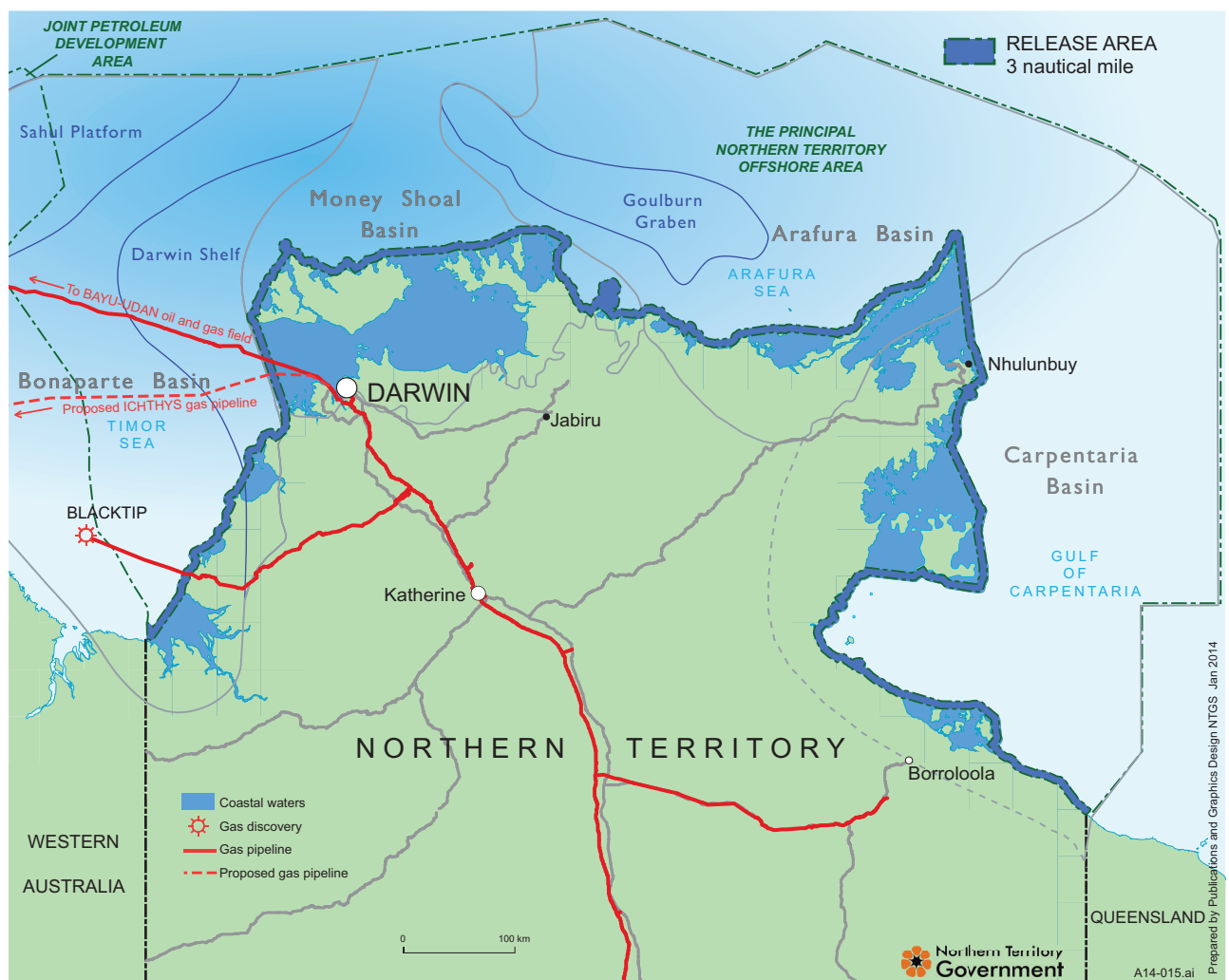


Figure 2. Northern Territory Coastal Waters (includes the 3 nautical mile-wide release area).

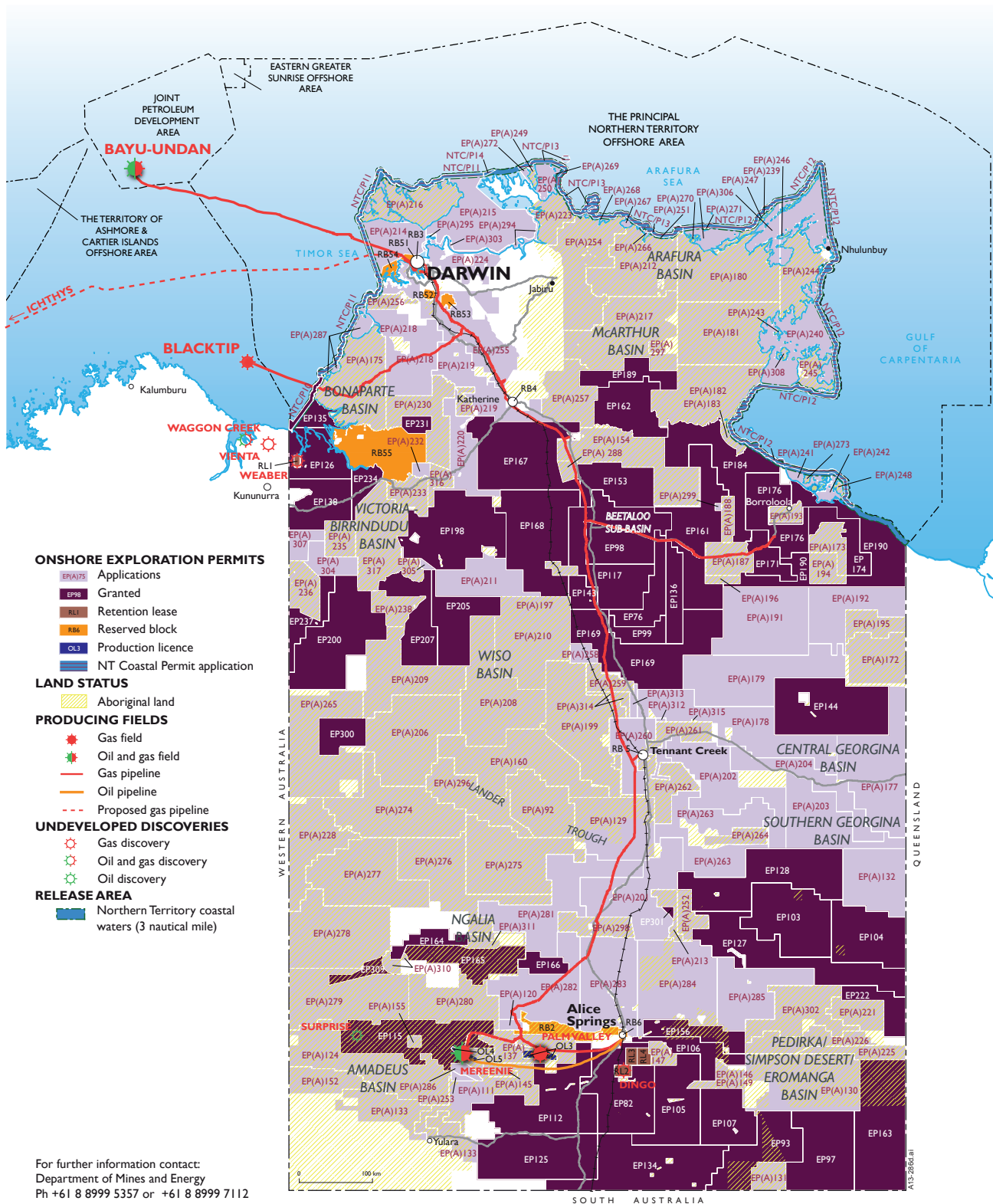


Figure 3. Petroleum operations and development in 2013.

Exploration Operations

Geological and Geophysical surveys

In 2013, there were five 2D seismic surveys and two airborne surveys undertaken within Northern Territory onshore areas and one airborne survey conducted partly onshore and within the 3 nautical miles off the coast of Northern Territory in 2013:

Armour Energy Ltd

On 30 December 2012, Armour commenced the Glyde Sub-basin gravity gradiometry and magnetic survey at 400 m line spacing over EP171, EP176 and EP190 in the McArthur Basin (**Figure 4**). The survey was completed on 5 January 2013 with 4272 line km of data acquired.

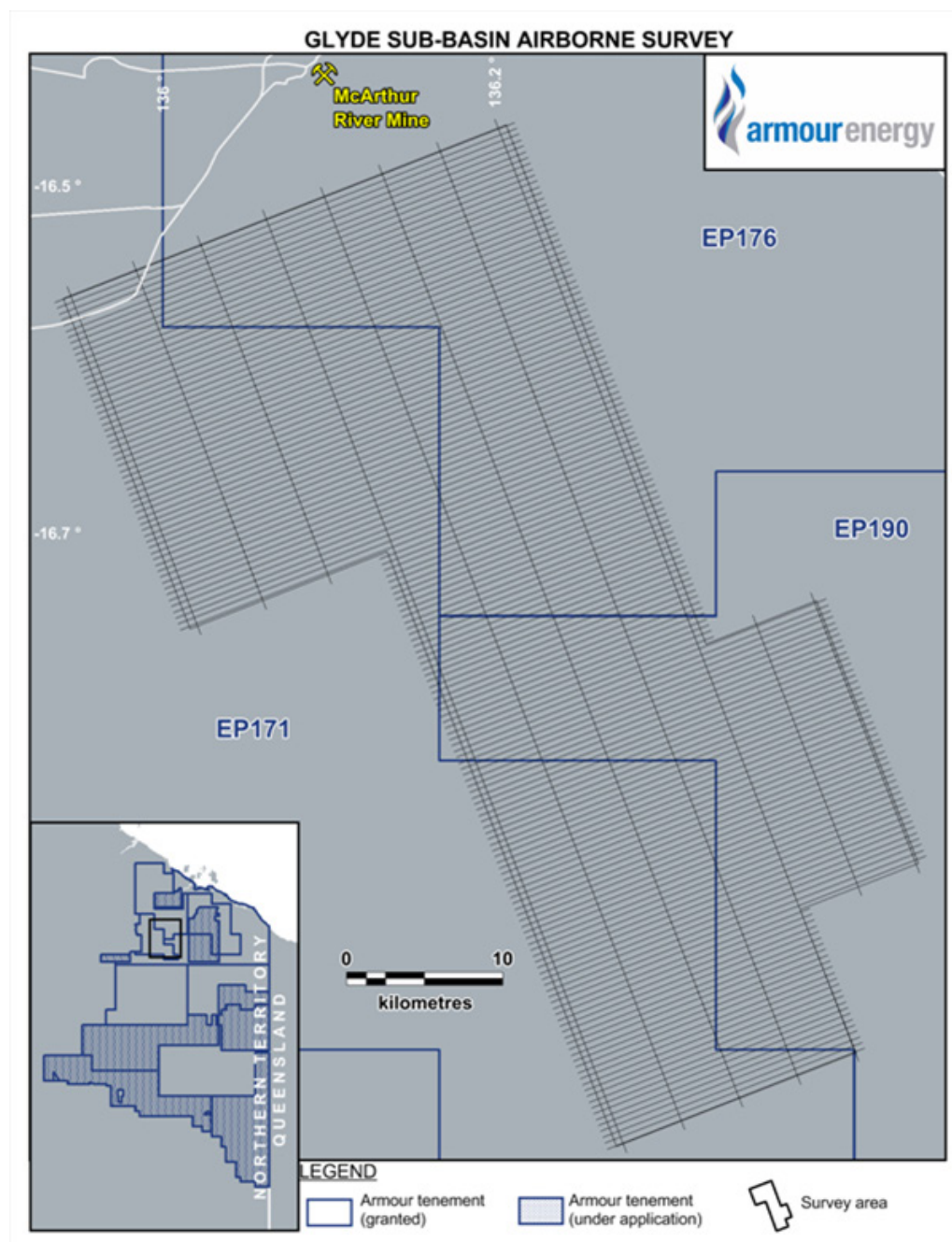


Figure 4. Armour Energy Ltd's Glyde Sub-basin Gravity Gradiometry and Magnetic Survey 2012–2013 acquired at 400 m line spacing.

Beach Energy Limited

On 24 January 2013, Beach Energy commenced the Bonaparte Basin gravity gradiometry and magnetic survey at 500 m line spacing over EP126, EP135, EP138 and NTC/P10 within Northern Territory onshore and coastal waters and over EP386 within onshore Western Australia (**Figure 5**). A total of 15 732 line km of data was acquired, of which 893.7 line km was within EP386 and 14 838.3 line km was over EP126, EP138 and NTC/P10. The survey was completed on 18 March 2013.

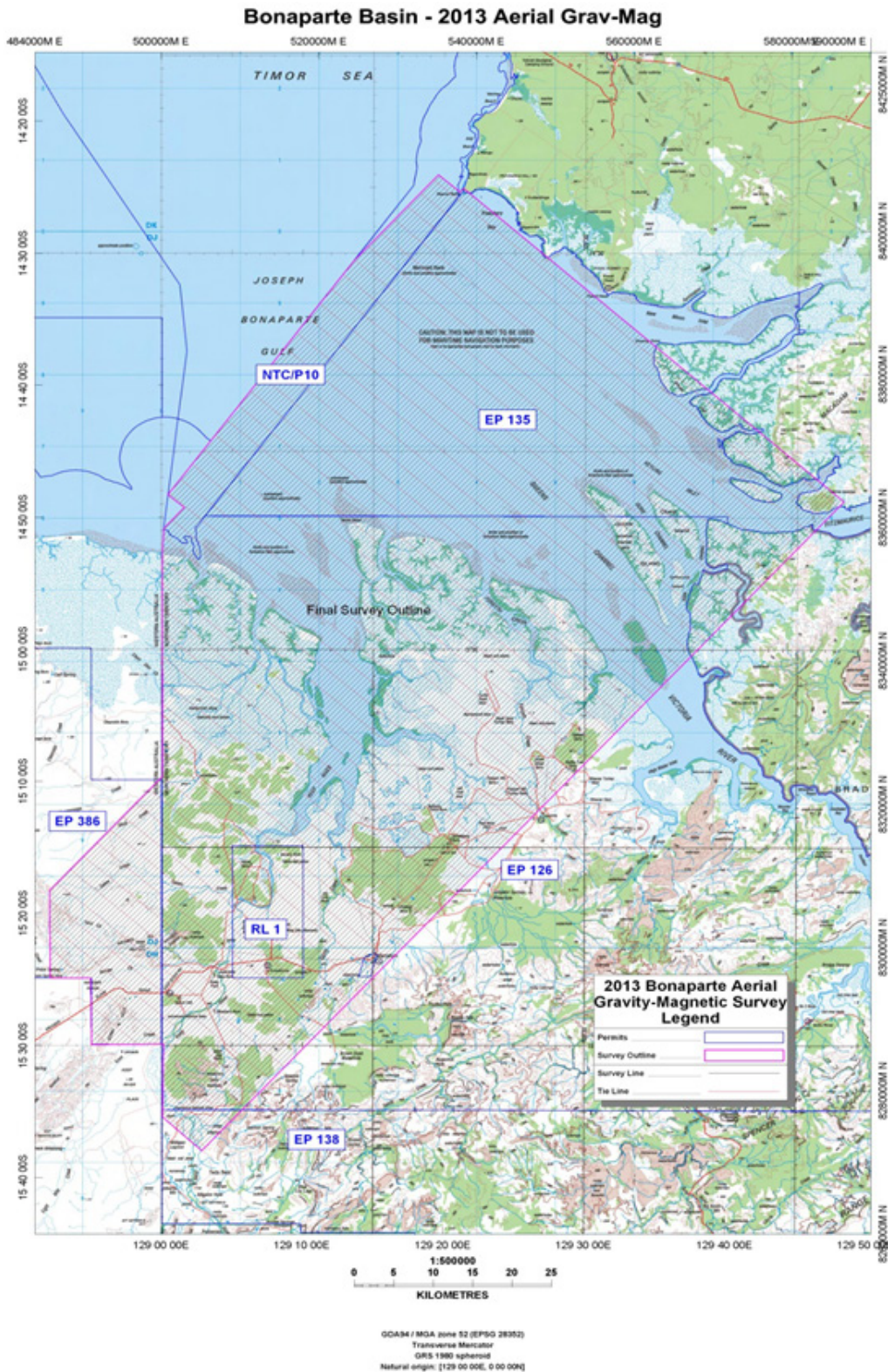


Figure 5. Beach Energy Limited's Bonaparte Basin Gravity Gradiometry and Magnetic Survey 2013 acquired at 500 m line spacing.

Pangaea (NT) Pty Ltd

On 8 March 2013, Pangaea commenced the Sturt gravity gradiometry survey at 2000 m line spacing over the Beetaloo Sub-basin and Birrindudu Basin. The survey was flown over EP167, EP168, EP169, EP198 and EP(A)305 (**Figure 6**). At the end of the survey on 27 June 2013, a total of 29 629.35 line km was acquired.

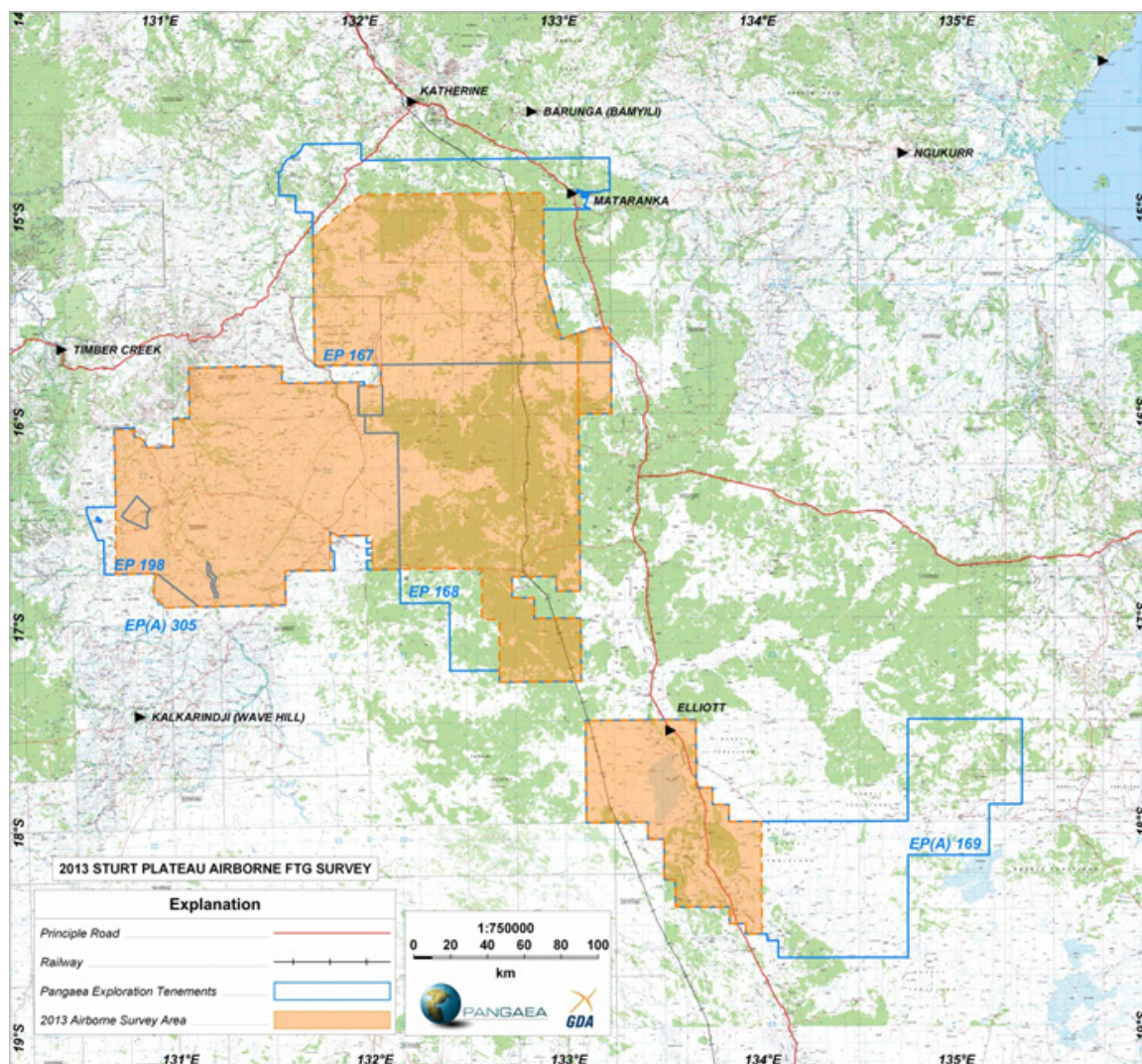


Figure 6. Pangaea Resources Pty Ltd's Sturt Gravity Gradiometry Survey 2013 acquired at 2000 m line spacing.

Santos Ltd

The AMSAN13 NW Mereenie 2D seismic survey commenced on 20 July 2013 and was completed on 23 August 2013. The survey was acquired over OL4 and OL5 (Mereenie Operating Field) and EP115 within the Amadeus Basin (**Figure 7**). At the end of the survey, a total of 386.62 line km was acquired.

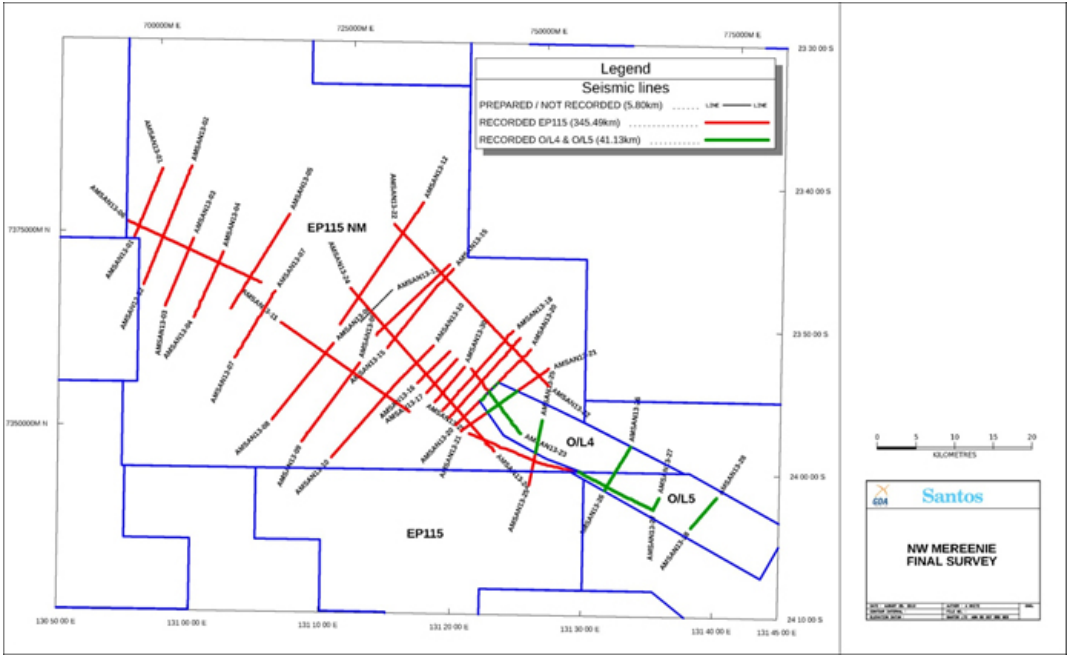


Figure 7. Santos Ltd's AMSAN13 NW Mereenie 2D Seismic Survey 2013.

PetroFrontier (Australia) Pty Ltd

The Amy 2D seismic survey was conducted by PetroFrontier over EP103 and EP128 within the Georgina Basin (**Figure 8**). The survey commenced on 27 July 2013 and was completed on 25 August 2013. A total of 304.28 line km was acquired. In September 2013, Statoil Australia Theta B.V took over operatorship of the permits over which the survey was conducted.

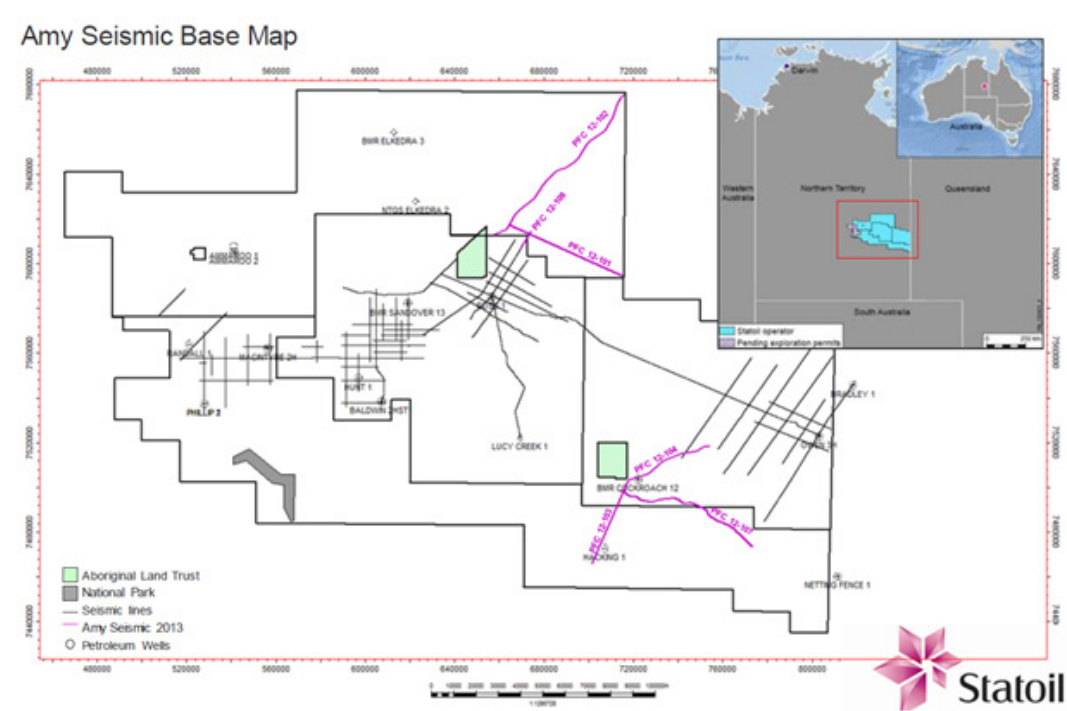


Figure 8. PetroFrontier Ltd's Amy 2D Seismic Survey 2013.

Santos Ltd

The MCSAN13 McArthur Basin 2D seismic survey commenced on 24 July 2013 and was completed on 15 October 2013. The survey was conducted within EP161 (**Figure 9**). A total of 497.24 line km was acquired.

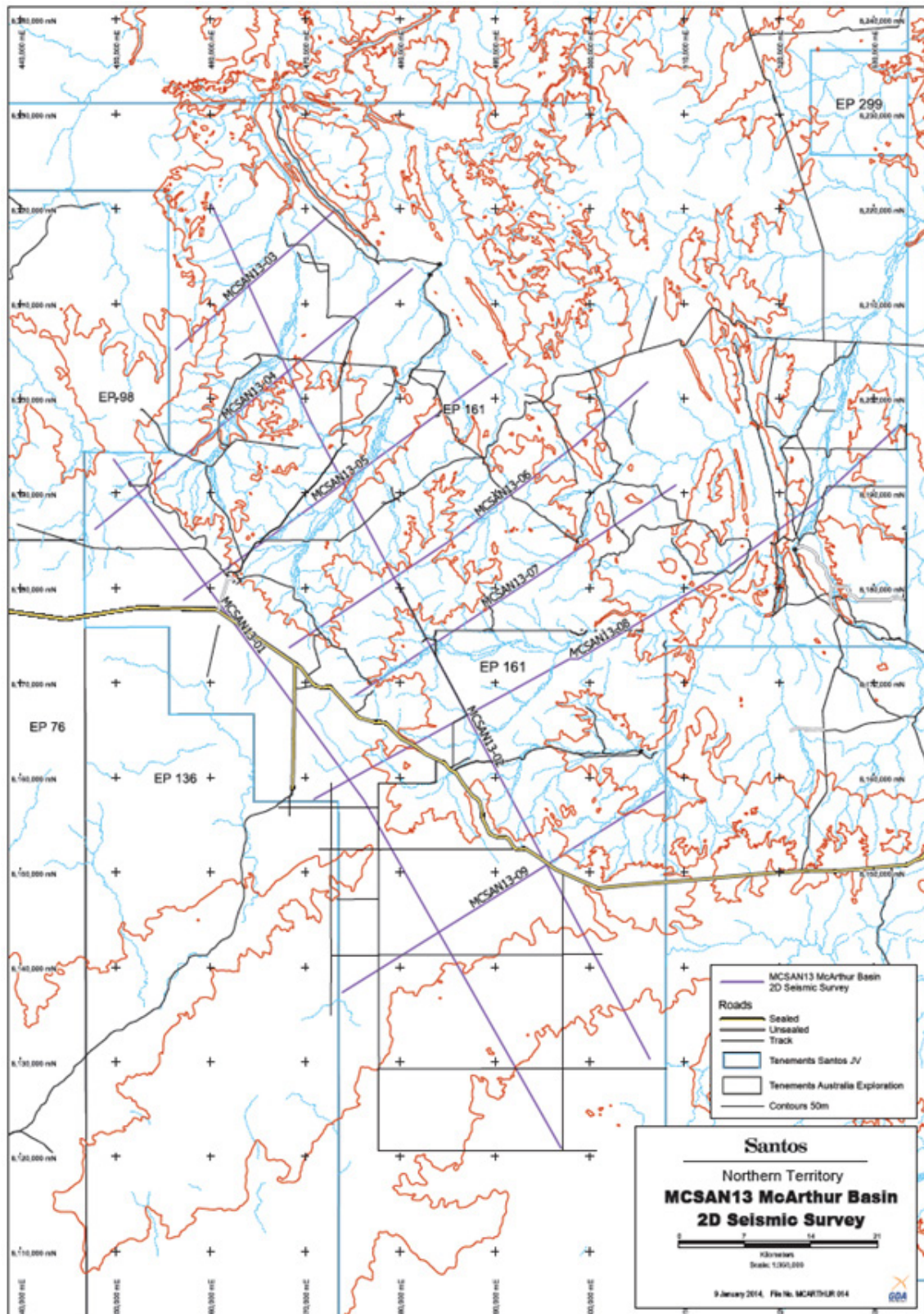


Figure 9. Santos Ltd's MCSAN13 McArthur Basin 2D Seismic Survey 2013.

Pangaea (NT) Pty Ltd

On 17 June 2013, Pangaea commenced the Hidden Valley 2D seismic survey over the Beetaloo Sub-basin and McArthur and Victoria-Birrindudu Basins. The survey was conducted within EP167, EP168 and EP198 (Figure 10). By the end of the survey on 19 October 2013, a total of 1407.28 line km had been acquired.

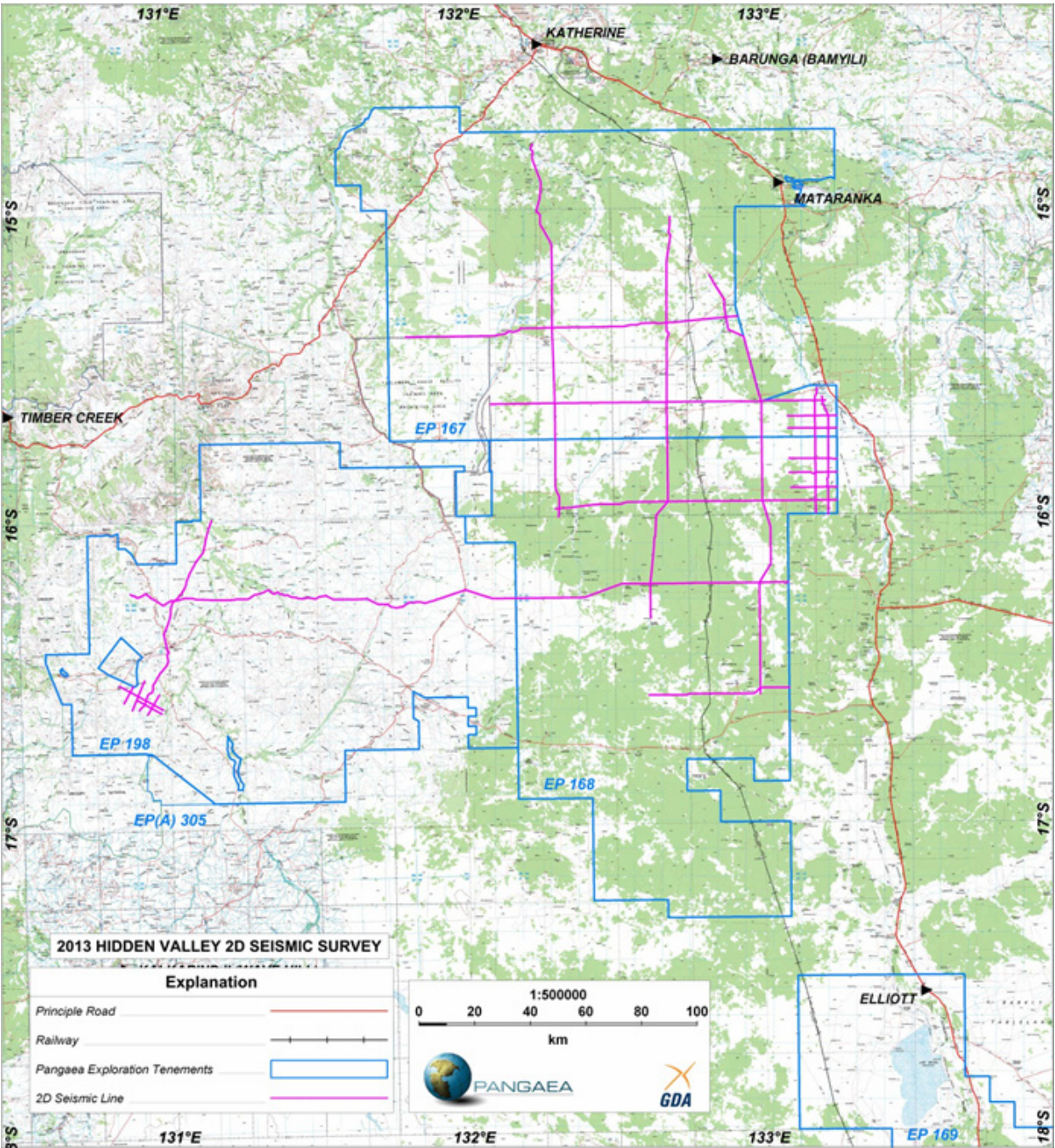


Figure 10. Pangaea Resources Ltd's Hidden Valley 2D Seismic Survey 2013.

Santos Ltd

The AMSAN13B Southern Amadeus Basin 2D seismic survey commenced on 25 August 2013 and was completed on 25 November 2013. The survey was conducted within Santos-operated EP82, EP105, EP106, EP107, EP112, EP125 and RL2 which covers the Dingo Gas Field operated by Magellan Petroleum Australia Limited (**Figure 11**). A total of 1586.23 line km was acquired.

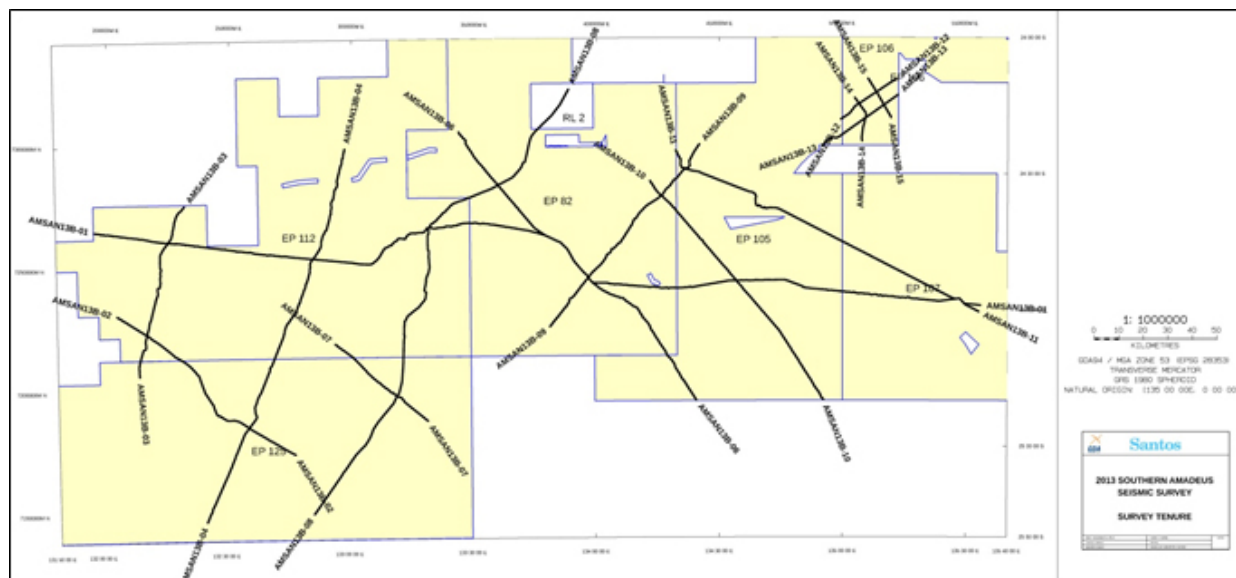


Figure 11. Santos Ltd's AMSAN13B Southern Amadeus Basin 2D Seismic Survey 2013.

Drilling

In 2013, a total of eleven new wells were drilled; *two wells were drilled to total depth and nine wells had their surface hole sections drilled and suspended*. Operations are now in progress to re-enter and drill the production hole sections of the nine wells.

Well Name	Operations	Operator	Permit	Operations Summary	Drill Rig	Well Spud Date	Rig Release Date	Total Depth (m-MD)	Comments
East Mereenie 44 Surface Hole	Appraisal - (focusing on Conventional and Unconventional Hydrocarbons)	Santos Ltd	OL5	Drilled; Suspended.	WW07 Schramm T130XD - drilled the Surface Hole section	2/09/13	10/09/13	578	Surface Hole section drilled and well suspended. Production Hole section to be drilled in 2014.
East Mereenie 45 Surface Hole	Appraisal - (focusing on Conventional and Unconventional Hydrocarbons)	Santos Ltd	OL5	Drilled; Suspended.	WW07 Schramm T130XD - drilled the Surface Hole section	20/08/13	1/09/13	723	Surface Hole section drilled and well suspended. Production Hole section to be drilled in 2014.
Lamont Pass 3	Exploration - (focusing on Conventional and Unconventional Hydrocarbons)	Armour Energy Ltd	EP190	Drilled; Cored; abandoned	Nitro # 1 - DE 880	5/10/13	30/11/13	1275	Gas shows and Oil discovered. Well plugged and abandoned.
Mt Kitty Gas WC-A Surface Hole	Exploration - (focusing on Conventional Hydrocarbons)	Santos Ltd	EP125	Drilled; Suspended.	WW07 Schramm T130XD - drilled the Surface Hole section	13/09/13	2/10/13	788	Surface Hole section drilled and well suspended. Production Hole section to be drilled in 2014.
Myrtle Basin 1	Exploration - (focusing on Conventional and Unconventional Hydrocarbons)	Armour Energy Ltd	EP176	Drilled; Suspended.	Nitro # 1 - DE 880	13/09/13	2/10/13	861.42	Well drilled and suspended.
West Mereenie 19	Appraisal - (focusing on Conventional and Unconventional Hydrocarbons)	Santos Ltd	OL4	Drilled; Suspended.	WW07 Schramm T130XD - drilled the Surface Hole section; Ensign Rig 918 - drilled the Production Hole section	1/07/13	11/12/13	1511	Well drilled in 2 phases. Surface Hole section drilled, suspended and then well re-entered and Production Hole section drilled. Well suspended after drilling of the Production Hole section. Well encountered minor gas flow.
West Mereenie 20 Surface Hole	Appraisal - (focusing on Conventional and Unconventional Hydrocarbons)	Santos Ltd	OL4	Drilled; Suspended.	WW07 Schramm T130XD - drilled the Surface Hole section	10/08/13	19/08/13	551	Surface Hole section drilled and well suspended. Production Hole section to be drilled in 2014.
West Mereenie 21 Surface Hole	Appraisal - (focusing on Conventional and Unconventional Hydrocarbons)	Santos Ltd	OL4	Drilled; Suspended.	WW07 Schramm T130XD - drilled the Surface Hole section	12/07/13	18/07/13	557	Surface Hole section drilled and well suspended. Production Hole section to be drilled in 2014.
West Mereenie 22 Surface Hole	Appraisal - (focusing on Conventional and Unconventional Hydrocarbons)	Santos Ltd	OL4	Drilled; Suspended.	WW07 Schramm T130XD - drilled the Surface Hole section	19/07/13	25/07/13	567	Surface Hole section drilled and well suspended. Production Hole section to be drilled in 2014.
West Mereenie 23	Appraisal - (focusing on Conventional and Unconventional Hydrocarbons)	Santos Ltd	OL4	Production Hole section drilling in-progress as of 31/12/13	WW07 Schramm T130XD - drilled the Surface Hole section; Ensign Rig 918 - drilled the Production Hole section	2/08/13	Production Hole section drilling in-progress as of 31/12/13	Production Hole drilling in-progress as of 31/12/13	Well drilled in 2 phases. Surface Hole section drilled, suspended and then well re-entered and Production Hole section drilled. Drilling of the Production Hole section in progress as of 31/12/13.
West Mereenie 24 Surface Hole	Appraisal - (focusing on Conventional and Unconventional Hydrocarbons)	Santos Ltd	OL4	Drilled; Suspended.	WW07 Schramm T130XD - drilled the Surface Hole section	26/07/13	1/08/13	530	Surface Hole section drilled and well suspended. Production Hole section to be drilled in 2014.

Table 2. NT Drilling 2013

Appraisal & Development Operations

Armour Energy Ltd

Armour Energy Ltd drilled two wells in their EP176 and EP190 permits within the McArthur Basin. One of the wells, Lamont Pass 3 discovered oil and also had gas shows. Armour is planning its 2014 exploration program to further appraise its oil and gas discoveries so far within its McArthur Basin permits.

Central Petroleum Ltd

Central Petroleum Limited is now finalizing its field appraisal and development plans for the Surprise Field within EP115. Central Petroleum has lodged an application for a Production Licence over the field.

Magellan Petroleum (NT) Pty Ltd

Magellan Petroleum has submitted an application for a Production Licence over the Dingo Gas Field with current RL2. Magellan Petroleum is planning to develop the gas field and produce gas to supply the Owen Springs Power Station at Brewer Estate near Alice Springs. In 2013, as part of the preparation for field development, Magellan Petroleum also conducted several well tests and hydrocarbon sampling activities on Dingo-2 and Dingo-3 wells in the Dingo Gas Field.

Santos Ltd

Santos has commenced its Mereenie Appraisal and Development Drilling (MADD) project to further appraise and develop its conventional oil resources in the Mereenie Field (OL4 & OL5) within the Amadeus Basin. The MADD project involves the drilling of eight new wells. All surface hole sections of the wells have been drilled and drilling of the production hole sections is in progress.

Production Operations

Oil

The Northern Territory's total onshore oil production comes from the Santos-owned and operated Mereenie field west of Alice Springs. Until December 2013, Mereenie produced 0.203 mmbbl of oil (**Figure 12**), a 12% reduction from the 0.228 mmbbl produced in 2012.

Production is set to increase during 2014 as Santos refocuses on the oil side of its operations after the current appraisal and development project (MADD project) is completed.

Shipment of oil from Mereenie to South Australia continues to be by truck, but the viability of refurbishing the pipeline is being reassessed in light of the impending increases in production.

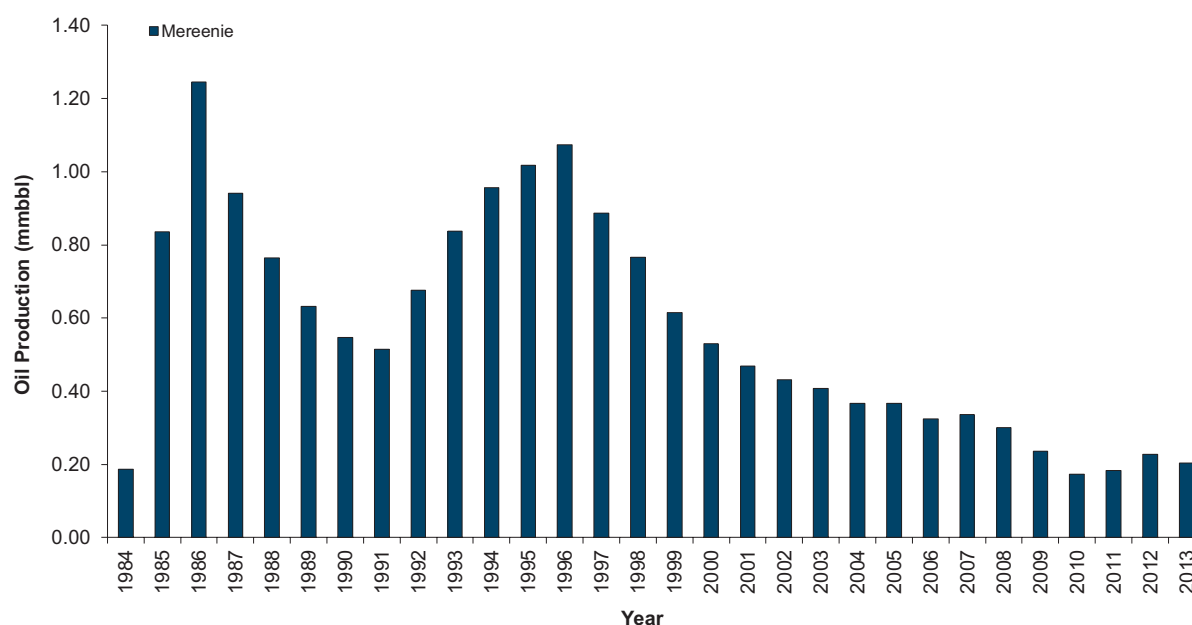


Figure 12. Northern Territory oil production for period 1984–2013.

Gas

NT's onshore gas production comes from the Mereenie and Palm Valley fields in the Amadeus Basin, west of Alice Springs. In 2013, 1.426 bscf of gas was produced from the fields (**Figure 13**). Mereenie produced 1.202 bscf while Palm Valley produced 0.224 bscf at the end of 2013.

Gas produced at Mereenie currently consists exclusively of solution gas associated with oil production. At present, the gas is being reprocessed and reinjected into the main oil production reservoir to assist in maintaining pressure.

Gas from Palm Valley, which is owned and operated by Magellan Petroleum Australia Ltd, was supplied to Power and Water Corporation in Alice Springs for power generation up till 16 January 2012 when the contract ended. However, Magellan has been able to continue with limited production through working arrangements with Santos Ltd.

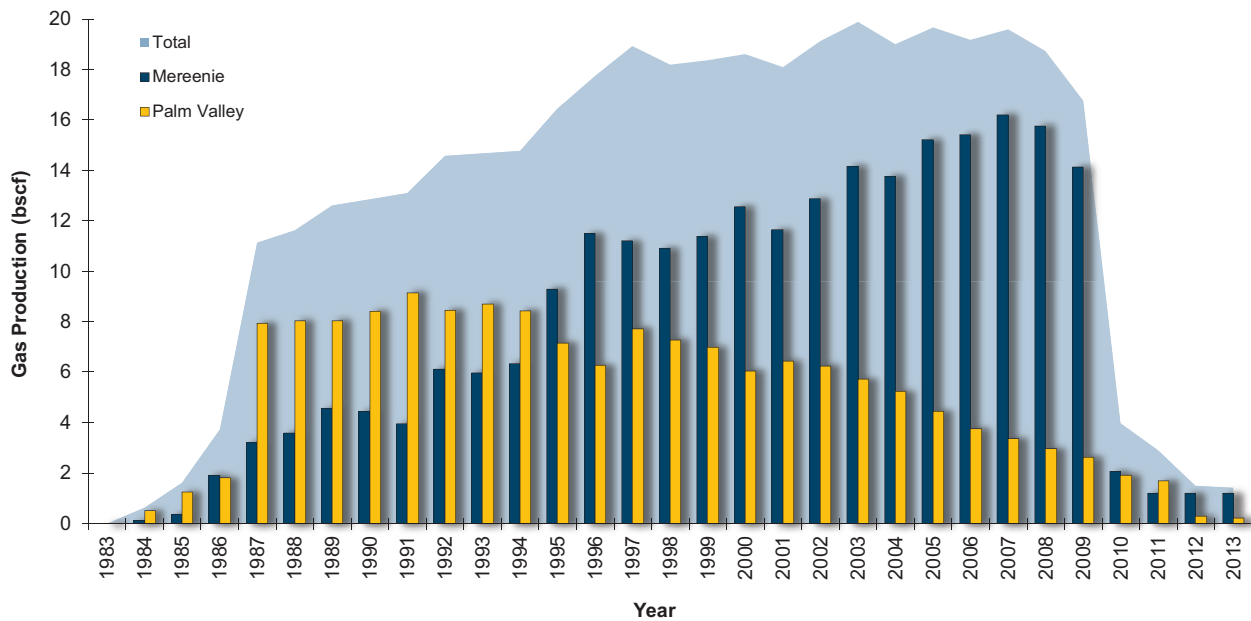


Figure 13. Northern Territory gas production for period 1983–2013.

YEAR	OIL PRODUCTION (MMBBL)		GAS PRODUCTION (BSCF)		
	Mereenie	TOTAL	Mereenie	Palm Valley	TOTAL
1983				0.029	0.029
1984	0.187	0.187	0.125	0.519	0.644
1985	0.835	0.835	0.365	1.259	1.624
1986	1.246	1.246	1.919	1.804	3.723
1987	0.941	0.941	3.207	7.928	11.135
1988	0.765	0.765	3.587	8.023	11.610
1989	0.631	0.631	4.560	8.043	12.603
1990	0.547	0.547	4.453	8.391	12.844
1991	0.514	0.514	3.944	9.147	13.091
1992	0.676	0.676	6.121	8.450	14.571
1993	0.838	0.838	5.972	8.687	14.659
1994	0.956	0.956	6.339	8.424	14.763
1995	1.018	1.018	9.297	7.148	16.445
1996	1.073	1.073	11.491	6.263	17.754
1997	0.886	0.886	11.208	7.724	18.932
1998	0.766	0.766	10.911	7.267	18.178
1999	0.614	0.614	11.387	6.981	18.368
2000	0.530	0.530	12.558	6.053	18.611
2001	0.469	0.469	11.652	6.430	18.082
2002	0.431	0.431	12.867	6.248	19.115
2003	0.407	0.407	14.161	5.718	19.879
2004	0.366	0.366	13.771	5.220	18.991
2005	0.366	0.366	15.209	4.448	19.657
2006	0.324	0.324	15.413	3.754	19.167
2007	0.336	0.336	16.202	3.371	19.573
2008	0.301	0.301	15.759	2.973	18.732
2009	0.236	0.236	14.123	2.639	16.762
2010	0.173	0.173	2.051	1.922	3.973
2011	0.184	0.184	1.212	1.697	2.909
2012	0.228	0.228	1.205	0.294	1.499
2013	0.203	0.203	1.202	0.224	1.426
TOTAL	17.047	17.047	242.271	157.078	399.349

Table 3. NT Oil and Gas Production Data (1983–2013).

Upcoming and Proposed Exploration, Appraisal and Development Operations

Armour Energy Ltd

Armour is planning its 2014 exploration program to further appraise its oil and gas discoveries within its McArthur Basin permits by drilling several more wells.

Central Petroleum Ltd

Central Petroleum Limited is planning to:

- Develop and produce its Surprise Field upon granting of the Production Licence over the field.
- Further appraise the Surprise Field by drilling of additional exploration and appraisal wells.

Magellan Petroleum Australia Limited

Magellan Petroleum is planning to commence development of the Dingo Gas Field with current RL2 once Production Licence over the field is granted by NT government.

Santos Ltd

Santos Ltd will continue its Mereenie Appraisal and Development Drilling (MADD) project. This will include further appraisal and development of its conventional oil resources in the Mereenie Field (OL4 & OL5) within the Amadeus Basin with completion of the 8-well drilling operations and moving into the next stage of the project which is fracture stimulation and completion. In addition, Santos is planning to fracture stimulate, workover and recompleat several of the existing wells in the Mereenie Field. Santos will also re-enter and complete drilling of the Mt Kitty well within EP125 in 2014.

Statoil Australia Theta B.V

Statoil Australia Theta B.V is expected to commence its exploration drilling within the Georgina Basin in 2014.

Tri-Star Energy Company

Tri-Star Energy Company has received approval from NT government to commence drilling a well within EP134 as part of its work commitment for permit Year 5.

Other Operations

In 2014, several operators are required to conduct drilling operations as per their approved work commitments. A total of over 20 wells will be drilled if the following operators complete their 2014 work commitments as planned.

- Merlin Energy Pty Ltd
- Frontier Oil & Gas Pty Ltd
- Territory Oil and Gas Pty Ltd
- Sweetpea Petroleum Pty Ltd
- Tamboran Resources Pty Ltd
- Pangaea (NT) Pty Ltd

In addition to the drilling operations above, a total of approximately 700 line km of 2D seismic survey is expected to be acquired by the following operators as per their approved work commitment for 2014:

- Merlin Energy Pty Ltd
- Oilco Pty Ltd
- Pangaea (NT) Pty Ltd
- Wiso Oil Pty Ltd

Licensed pipelines

There are 20 current licenses under the NT's *Energy Pipelines Act*: 13 operational pipelines (12 gas, one condensate and one LPG; **Table 4**), two mothballed pipelines (one oil and one gas), two decommissioned gas pipelines and two sections of the yet-to-be-constructed 890 km Ichthys Project gas export pipeline from the Ichthys Gas Field in the Browse Basin to the Ichthys LNG plant in Darwin Harbour, construction of which is scheduled to commence in Q2 2014.

There are 4 current licenses under the NT's *Petroleum (Submerged Lands) Act*: 3 operational pipelines (two gas and one condensate; **Table 4**), and a section of the Ichthys Project gas export pipeline scheduled for construction in 2014–15.

Substantial work was carried out on the Amadeus Gas Pipeline (PL4) on coating faults and cathodic protection system as part of a major, multi-year program for system maintenance and upgrade.

Dredging work supporting the construction of the 890 km, 1065 mm diameter Ichthys Gas Export Pipeline (PL26) from the Ichthys Gas Field in the Browse Basin to the Ichthys LNG Plant at Blaydin Point in Darwin Harbour commenced in late 3rd quarter of 2013. Construction of the offshore portion of the pipeline is scheduled to begin in Darwin Harbour in 2nd quarter of 2014 and the onshore portion later in the year.

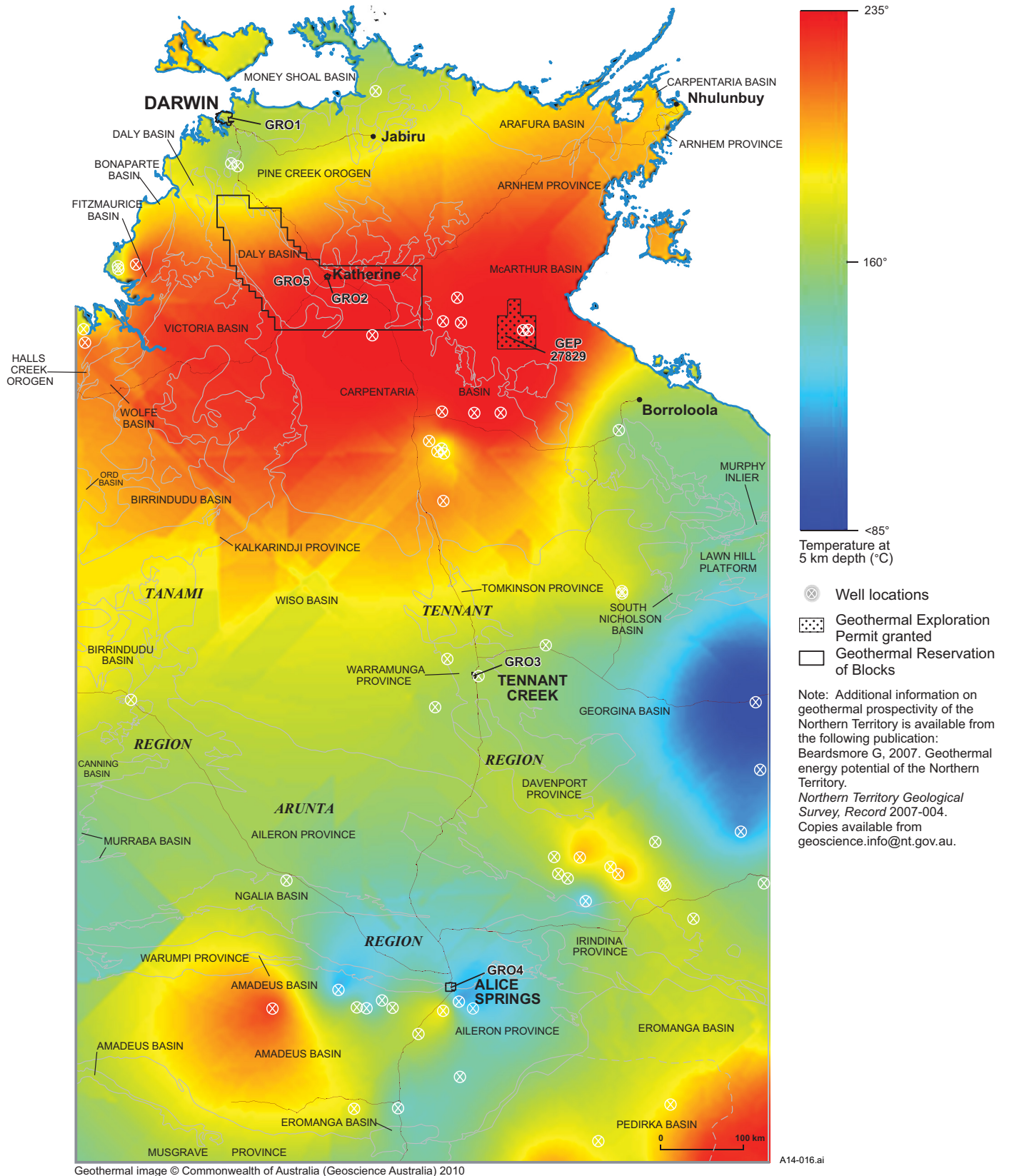


Figure 14. Geothermal exploration permits and applications in 2013.

Operating Petroleum Pipelines Licensed Under the NT Energy Pipelines Act (PLs) and the NT Petroleum Submerged Lands Act (NTCPs)						
License No.	Onshore/ Offshore	Name	Product	Length (km)	Nominal Diameter (mm)	Year Constructed
PL1	Onshore	Palm Valley to Alice Springs (incl. laterals)	Gas	156	200/150/50	1983–2011
PL4	Onshore	Amadeus Basin Pipeline (incl. laterals)	Gas	1628	350/300/250/100	1986
PL7	Onshore	Central Energy Pipeline	Gas	10	100	1988
PL10	Onshore	Elliot Pipeline	Gas	4	60	1990
PL15	Onshore	Channel Island LPG Pipeline	Gas	<1	150	1992
PL17	Onshore	McArthur River Mine Pipeline	Gas	333	150	1995
PL18	Onshore	Berrimah Pipeline	Gas	19	150	1996
PL20	Offshore	Bayu-Undan to Darwin Pipeline	Gas	92	660	2005
NTCP-1	Offshore	Bayu-Undan to Darwin Pipeline	Gas	7	661	2005
PL21	Onshore	Bonaparte Gas Pipeline	Gas	286	300	2008
PL22	Onshore	Weddell Interconnect Pipeline	Gas	1	300	2007
PL23	Offshore	Blacktip Gas Export Pipeline	Gas	3	450	2008
NTCP-2	Offshore	Blacktip Gas Export Pipeline	Gas	5	451	2008
PL24	Offshore	Blacktip Condensate Pipeline	Condensate	3	300	2008
NTCP-3	Offshore	Blacktip Condensate Pipeline	Condensate	6	301	2008
PL25	Onshore	Wickham Point Interconnect Pipeline	Gas	10	300	2008
PL26	Offshore	Ichthys Gas Export Pipeline	Gas	~90	1050	To commence 2014
NTCP-4	Offshore	Ichthys Gas Export Pipeline	Gas	~7	1050	To commence 2014
PL27	Onshore	Ichthys Gas Export Pipeline	Gas	~4	1050	To commence 2014

Table 4. NT Operating Pipelines.

GEOTHERMAL

Titles & Operations

There were two active geothermal permits until 2013 when one was surrendered. The active permit is GEP27829, operated by Western Desert Resources Limited and is located in the McArthur Basin. The permit was granted in 2011 (Table 5) and is now in its fourth permit year. The estimated expenditure for the remaining years of the permit term is \$10.9M.

Between 2014 and 2015, the operator is expected to complete the following as per the approved work commitment for GEP27829:

- Well design, drill site selection and rig contracting
- Gain necessary approvals for the drilling operations
- Drill and test a deep geothermal well.

Title	Title Holder	Date Awarded
GEP 27829	Western Desert Resources Limited	23-Feb-11

Table 5. Northern Territory Geothermal Title.

Useful Northern Territory Government Contacts

Energy Titles and Operations Administration and Regulation

Energy Directorate, Northern Territory Department of Mines and Energy

Administers and regulates petroleum and geothermal tenure and operations and petroleum pipelines in Northern Territory onshore and coastal waters areas.

Director of Energy
Phone: +61 8 8999 5293
Fax: +61 8 8999 5191
Email: directorenergy@nt.gov.au

Petroleum/Geothermal Titles
Phone: +61 8 8999 7112
Fax: +61 8 8999 5191
Email: petroleum.operations@nt.gov.au

Petroleum/Geothermal Operations
Phone: +61 8 8999 6350
Fax: +61 8 8999 5191
Email: petroleum.operations@nt.gov.au

Pipeline Operations
Phone: +61 8 8999 5460
Fax: +61 8 8999 5191
Email: petroleum.operations@nt.gov.au

Energy Resource Development

Industry Development and Investment, NT Department of Business

This group facilitates development of:

- NT's oil and gas resources
- Darwin as a production hub and offshore petroleum supply base
- NT supply and service industries to support the regions oil and gas industry.

Enquiries

Phone: +61 8 8999 5201
Fax: +61 8 8999 5106
Email: investment.dob@nt.gov.au

Acknowledgements

This annual report is a compilation of contributions made by several sections within the Northern Territory Government. The report was prepared by the Energy Directorate's Petroleum Operations Team and was edited and formatted by the Publications and Graphic Design section of the Northern Territory Geological Survey.

Department of Mines and Energy

Scott Perkins	<i>Chief Executive</i>
Victoria Jackson	<i>Executive Director, Energy</i>
Ian Scrimgeour	<i>Executive Director Northern Territory Geological Survey</i>