



Comet Ridge Limited



## **Galilee Basin: Now is the time**

Comet Ridge Limited  
PESA Symposium, Brisbane  
7 September 2016

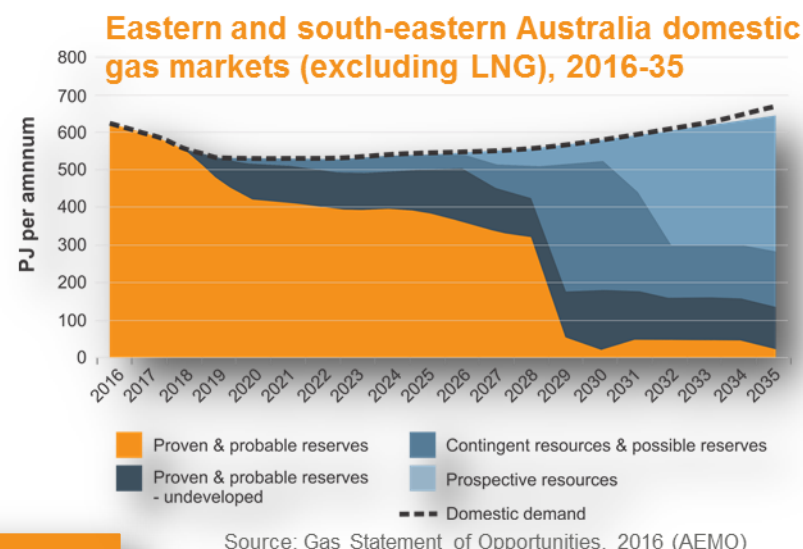
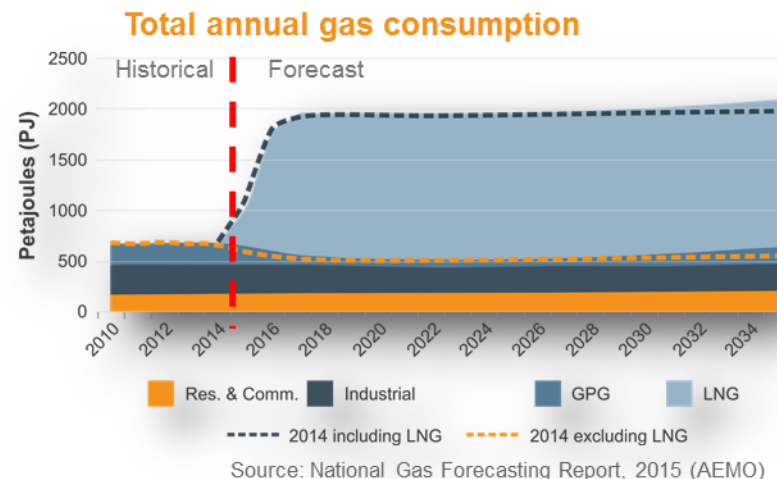
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# Eastern Australia Gas Market - Perfect Storm



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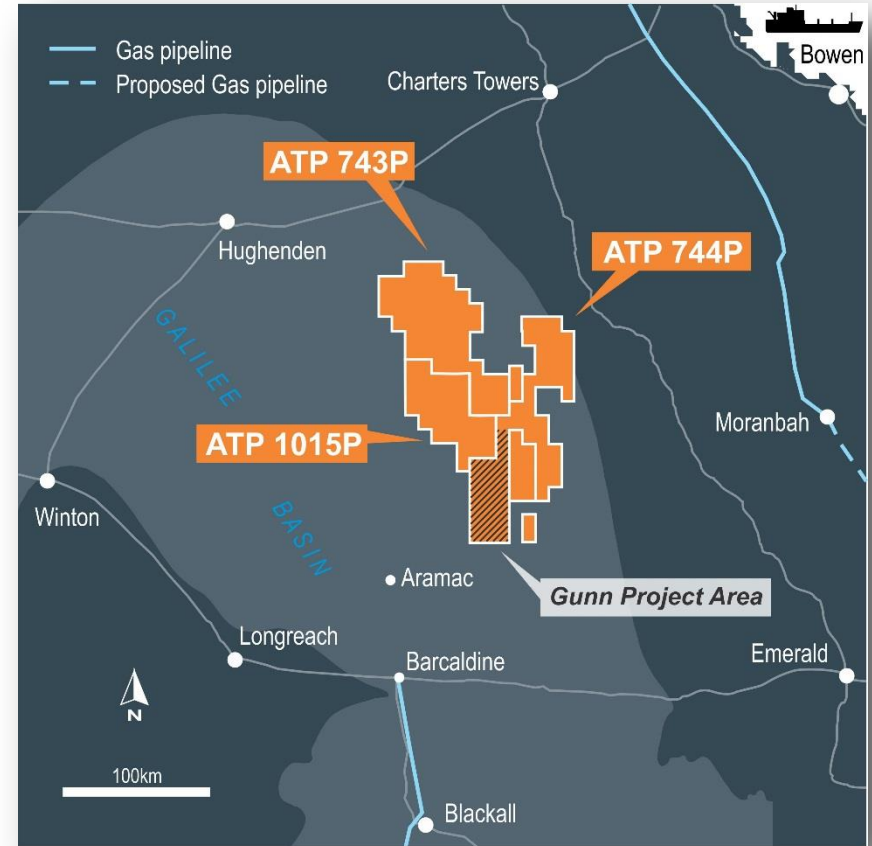
- A perfect storm in the energy market has been brewing in the last few years – **massive increase on the demand side from LNG exports** superimposed with **state and territory government mandated restrictions** on the supply side
- **Queensland** has been blessed with gas **common sense** on both sides of politics over the past several years
- Recent price spikes to **above \$25/GJ** during high demand winter period
  - short term market only
  - long term industrial customers under pressure
- **Shortfall** in gas supply to meet domestic demand from 2019
- **Development of contingent resources** and reserves required to meet forecast domestic demand



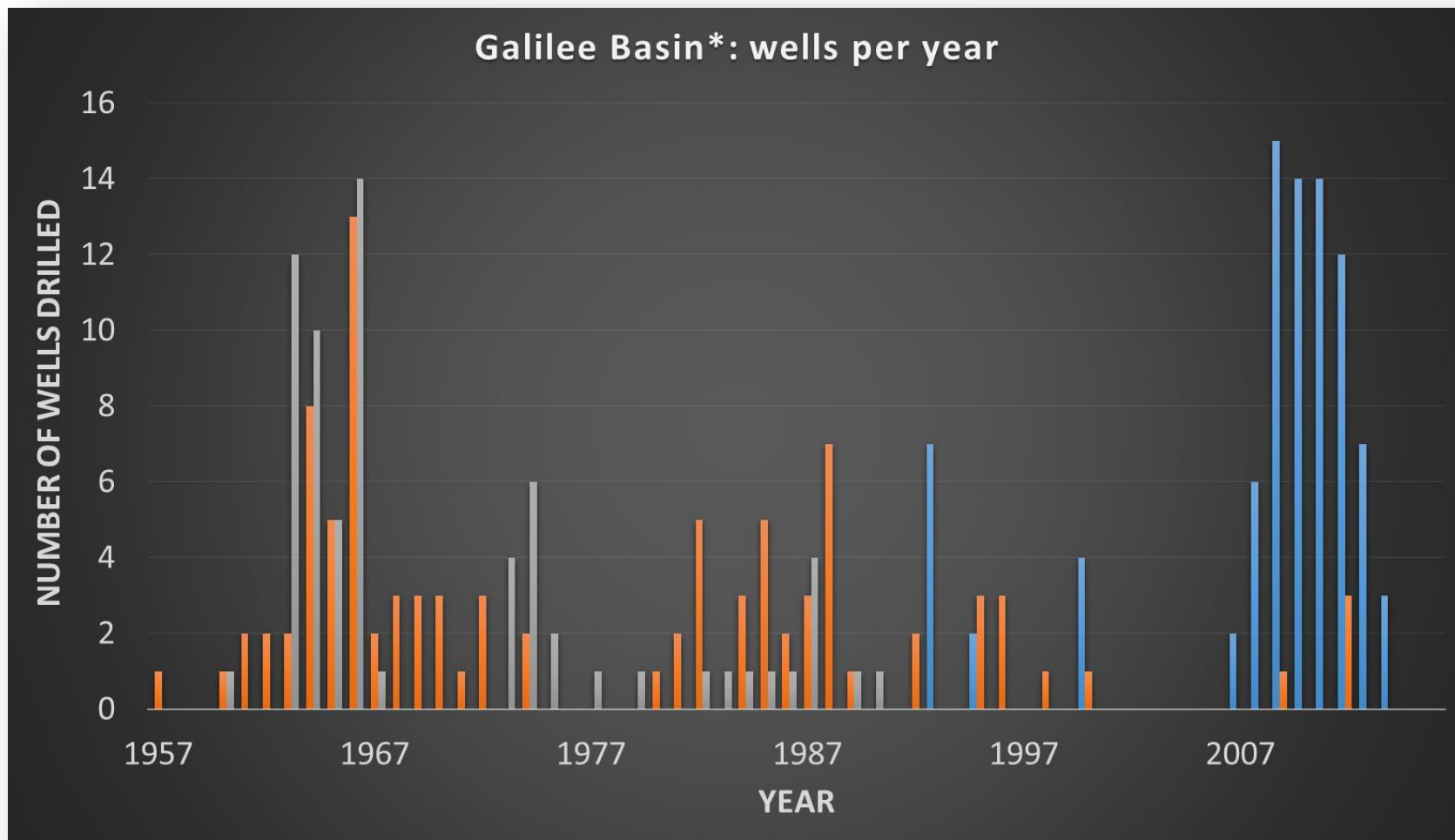
**Galilee Basin – Now is the time**

## Galilee Basin - Background

- Large area (~250,000km<sup>2</sup>) covering a big part of central western Queensland
- Land use is grazing – cattle and sheep on large stations
- Historical exploration - oil recovered and gas flows from multiple wells
- Recent basin-wide focus on CSG
- One operating CSG pilot in the basin
- One shorter term single-well production test by Comet Ridge
- Potential for further exploration and appraisal for conventional and unconventional resources
- Significant coal mine province evolving in the shallow coals in the east



## Exploration History



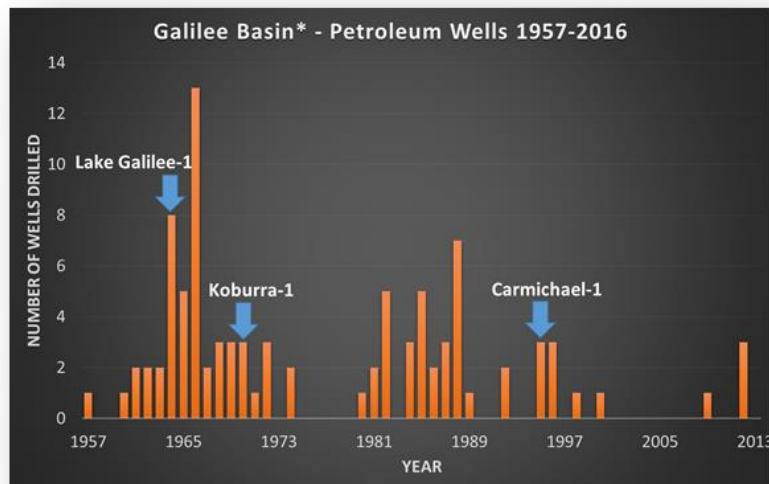
\*wells intersecting Galilee Basin sequence

■ Petroleum Wells
 ■ Stratigraphic Wells
 ■ CSG Wells

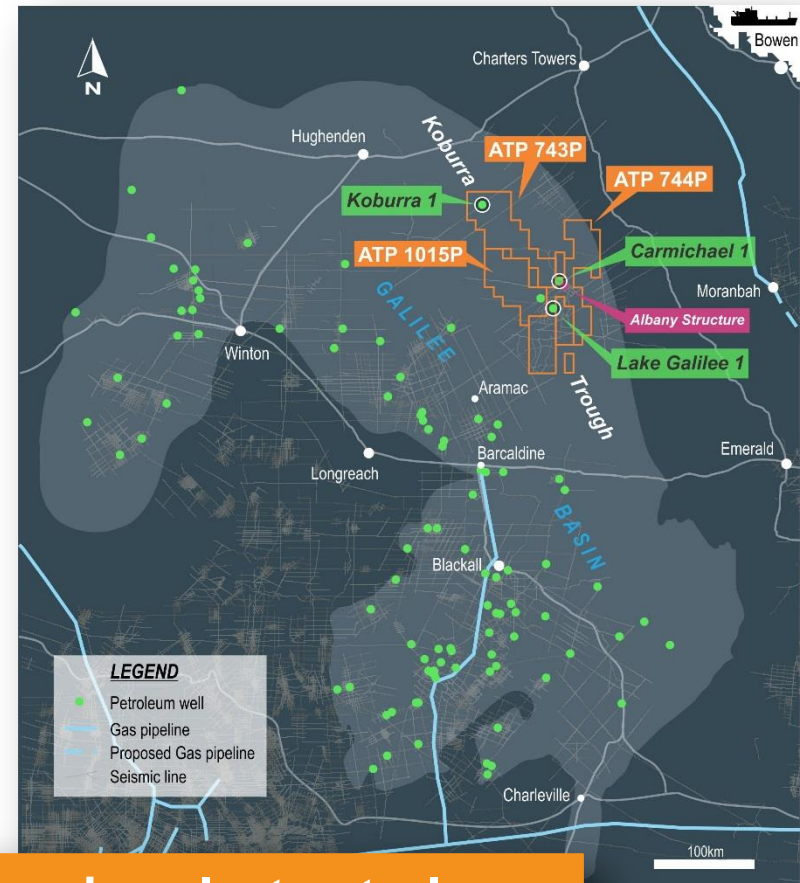
# Galilee Basin – Sandstones

## Conventional Exploration

- ~100 petroleum wells (intersecting Galilee sequence) over 70 years
- Targeting Late Carboniferous to Permian sandstones to depths of ~3000m
- 3 wells had significant hydrocarbon shows – Koburra Trough inside Comet Ridge's current ATP 743 / 744
- No commercial flow of hydrocarbons to date
- 2015 – Basin's first sandstone contingent resource 153PJ (2C)<sup>1</sup> over Albany structure in Koburra Trough



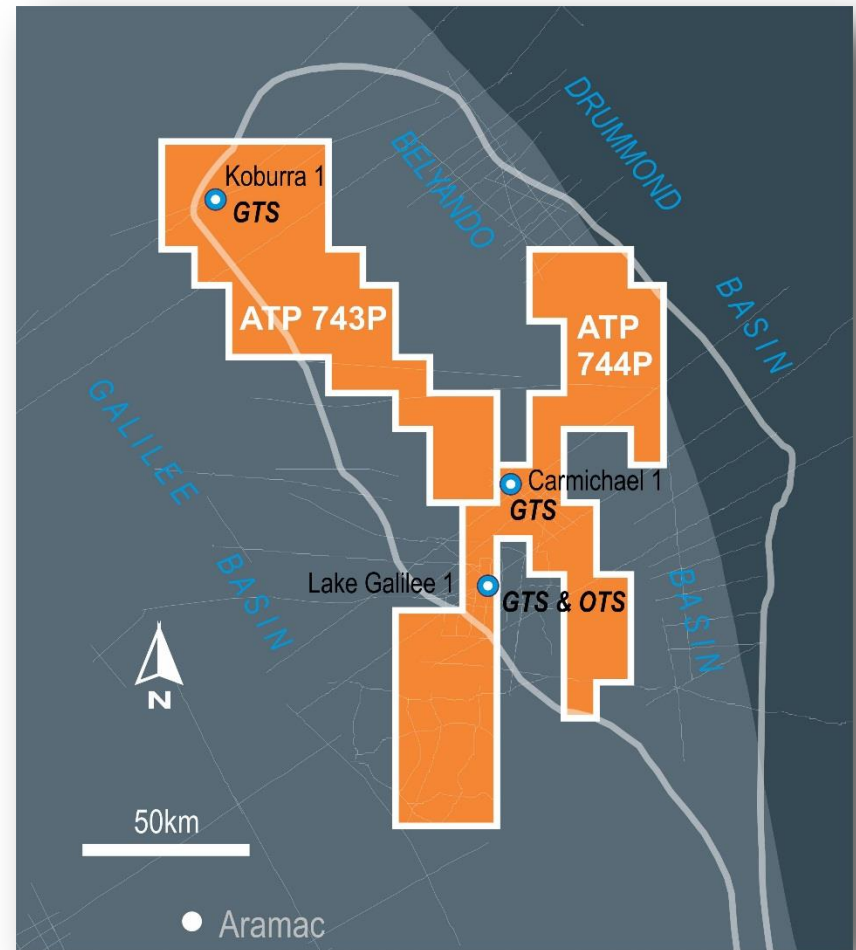
\*wells intersecting Galilee Basin sequence



>20 years since last petroleum well drilled in Koburra Trough – time to revisit

## Koburra Trough

- 3 historic petroleum wells within ATP 743 and ATP 744 recovered gas and/or oil from Lake Galilee Sandstone at base of Galilee Basin section
- Koburra 1, Carmichael 1 and Lake Galilee 1 flowed gas to surface at low rates
- However early basin wells were targeting oil and not designed to evaluate gas potential (high mud overbalance / not tested immediately on penetration etc.)
- Lake Galilee 1 – oil recovered
- Evidence of active petroleum system over the Koburra Trough
- Potential for significant hydrocarbon volumes
- Potential for additional oil and gas resources

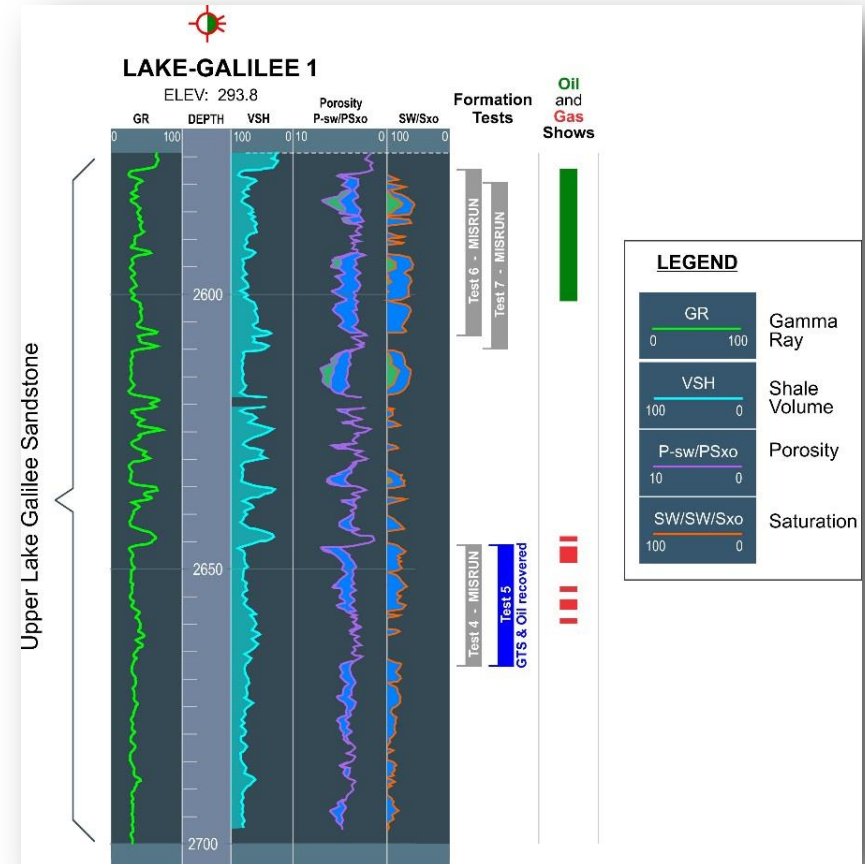


- GTS – flowed gas to surface
- OTS – recovered oil to surface

# Galilee Basin – Sandstones

## Lake Galilee 1

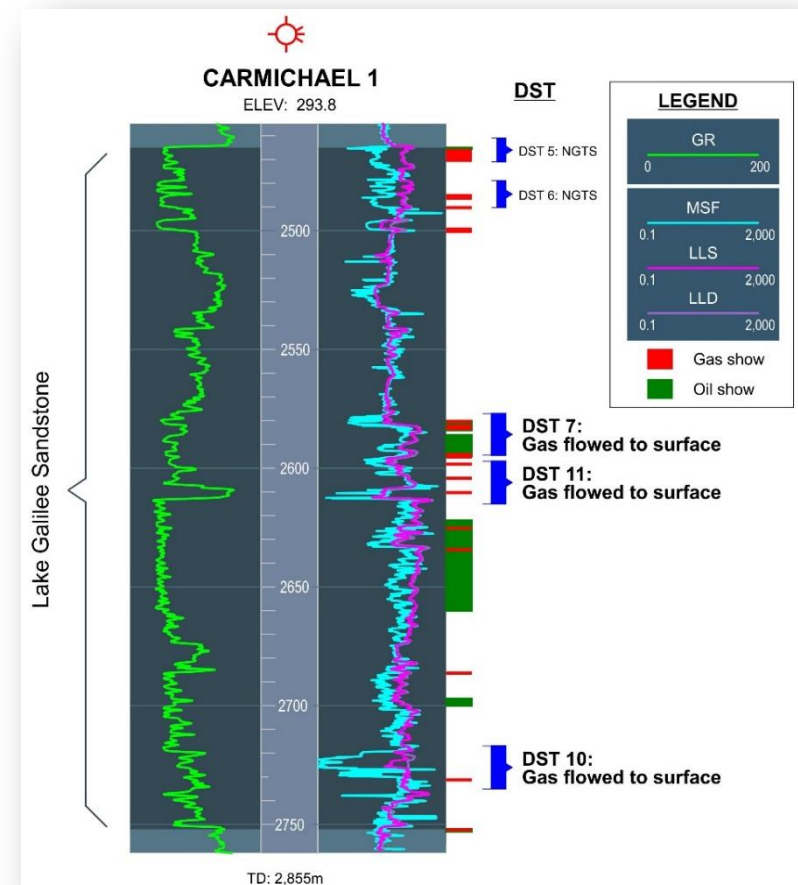
- First deep petroleum well in Kiburra Trough, drilled by Exoil NL in 1964
- Targeting 4-way dip closure (valid structural test?)
- Targeting oil with high mud overbalance
- >260m gross sandstone over Lake Galilee Sandstone
- Gas flow + oil recovered from DST#5
- 3m light green oil @ 43.1°API gravity (Source: Devonian marine)
- Untested upper sandstone section with hydrocarbon bearing zones
- Gas analysis indicates slightly wet gas composition
- Confirmed presence of active hydrocarbon system in Kiburra Trough



# Galilee Basin – Sandstones

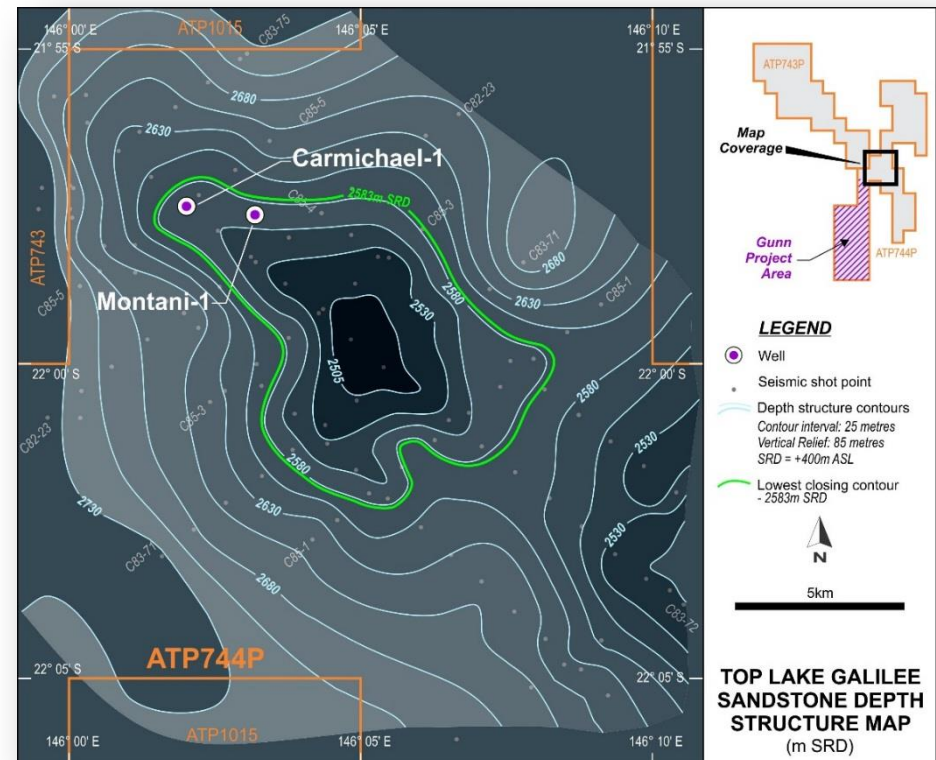
## Carmichael 1

- Drilled by Maple Oil in 1995 - 27km NE of Lake Galilee 1
- Robust NW plunging anticlinal structure on eastern flank of Koburra Trough
- Targeting oil with high mud overbalance
- Three drill stem tests flowed gas to surface at low rates – two other tests over better reservoir quality, but did not flow
- 150m gross sandstone with >30m net pay showing hydrocarbon saturation and porosities up to 13%.
- Discovered large gas accumulation deemed uneconomic then (1995)
- Productivity of reservoir not optimally tested or assessed
- Well confirmed sandstone prospectivity in Koburra Trough



## Albany Structure - Review

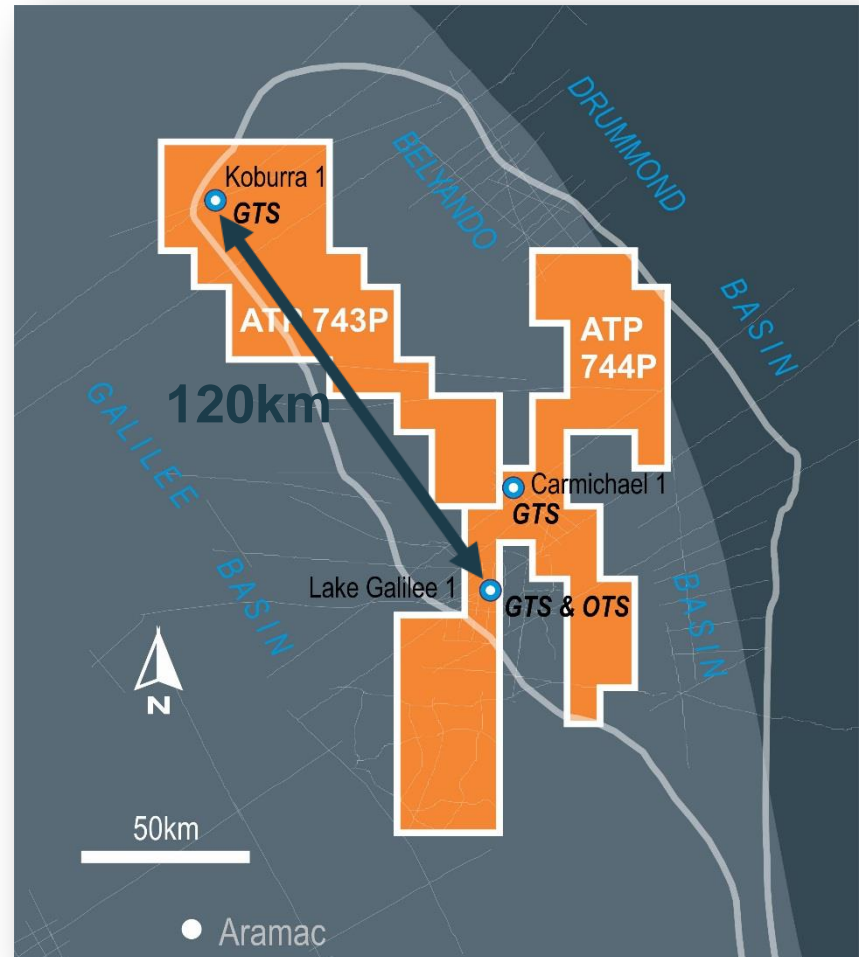
- Large structure with aerial closure 61km<sup>2</sup>
- Significantly larger structure than previously interpreted
- Carmichael 1 within closure but down-dip of crest – upside potential
- Gas flowed despite 500-600psi overbalance
- Reservoir exposed to overbalanced mud for significant time before testing
- Flow test and build up times too short
- Tight-ish gas with condensate
- High perm streaks to assist drainage
- Contingent Resource: 153PJ (2C)<sup>2</sup>



**Balanced/underbalanced drilling should significantly improve production**

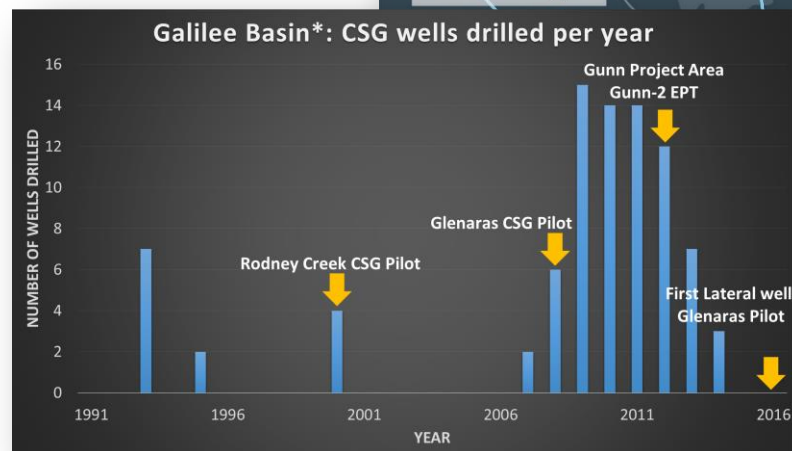
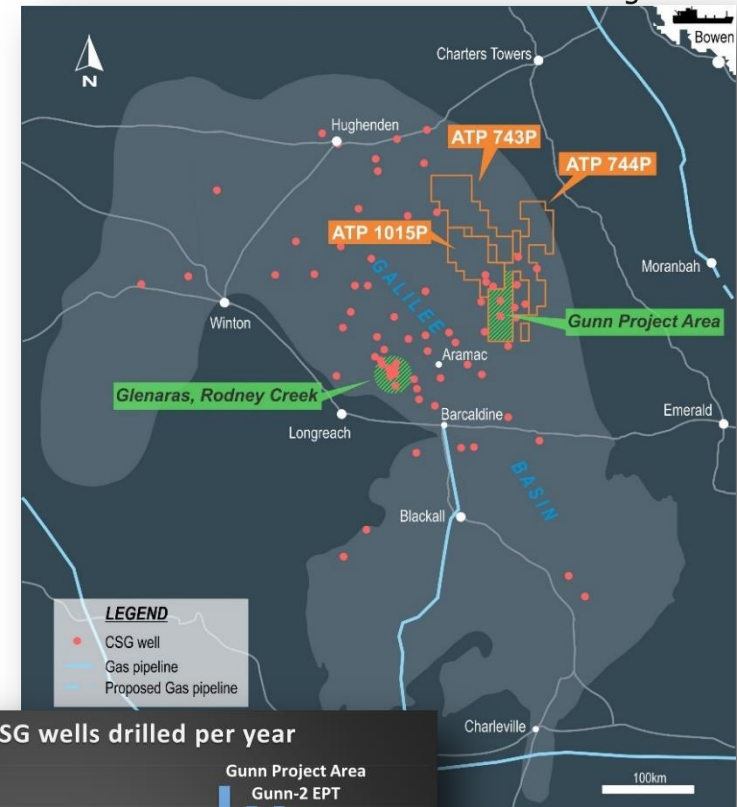
## Koburra Trough – Exploration Potential

- Large extent remains under explored and data poor: Koburra 1 to Lake Galilee 1 =120km
- Underbalanced/air drilling may significantly improve production
- Tight reservoir - fracture stimulation and lateral drilling may change economics
- Potential for additional structures with large gas accumulations – more seismic required
- Commercial upside alongside development of CSG resources



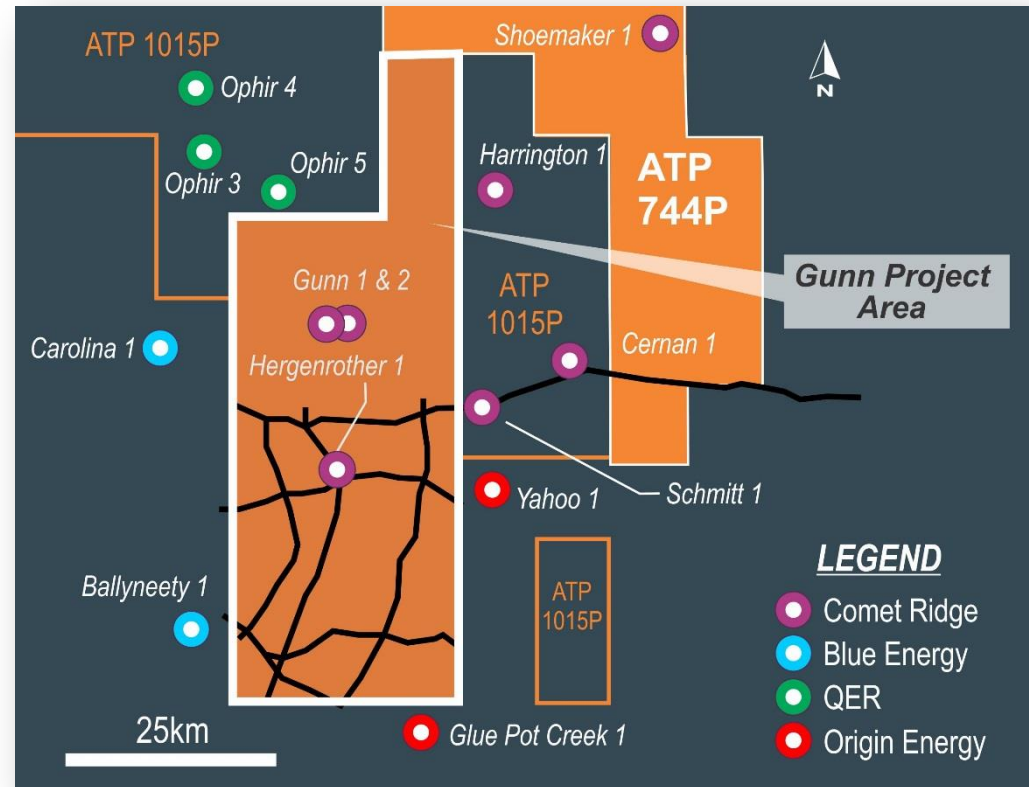
## CSG Exploration

- Glenaras 1 drilled 50 years ago in September 1966 highlighted CSG potential of Galilee Basin  
*“no significant hydrocarbon shows were encountered. Observed methane gas associated with coals”*
- 1993-1995: Enron drilled early CSG wells with potential at Rodney Creek and Crossmore
- 2000: Rodney Creek CSG Pilot
- 2008: Glenaras CSG Pilot – operating with some gas produced
- 2008-2014: Major CSG exploration phase – definition of Gunn Project Area
- 2016: First lateral well drilled at Glenaras Pilot



## Gunn Project Area

- 6 individual coal seams
- depth to coal 700-1,000m
- >16m net coal deposited over large area
- average gas content 4.3 m<sup>3</sup>/t (high 7.3 m<sup>3</sup>/t)
- good to excellent permeability within target coals
- Gunn-2 EPT
  - perforated single 4m coal interval
  - seam isolated above and below by impermeable mudstone
  - established connectivity to coals (i.e. completion methodology)
  - evaluated methods of formation water treatment
  - completed for long term production




**Gunn Project area and ATP 1015 area  
coals contain recoverable gas over an  
estimated 1,865km<sup>2</sup>**

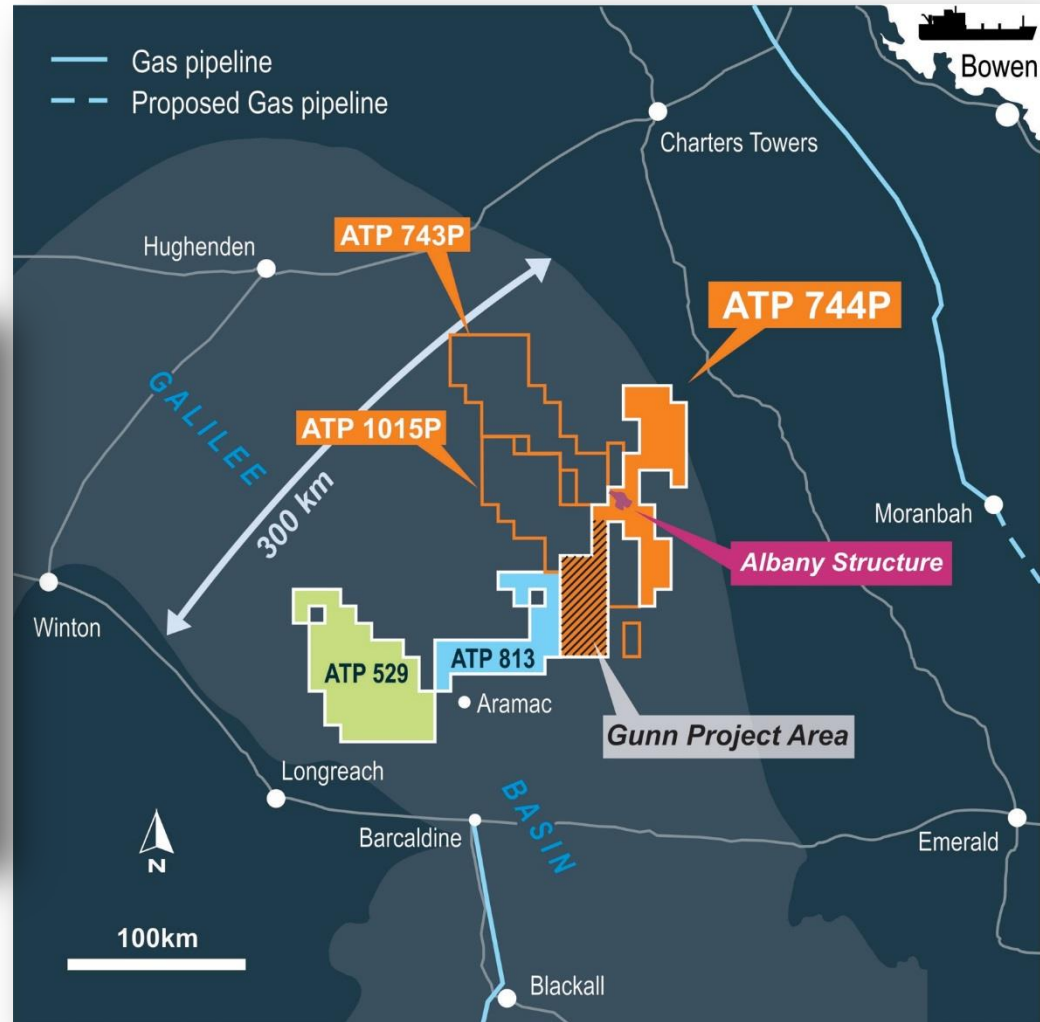
# Galilee Basin - Contingent Resources



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## GALILEE BASIN CONTINGENT RESOURCES (PJ)<sup>3</sup>

COMPANY	PERMIT	PROJECT	1C	2C	3C
 Comet Ridge	ATP 744	Gunn (CSG)	-	67	1,870
		Albany (Sandstone)	56	153	417
Blue Energy	ATP 813		-	62	838
Galilee Energy	ATP 529	Glenaras	308	2,507	5,314
TOTAL			364	2,789	8,439



# Galilee Basin – Positive Relationships



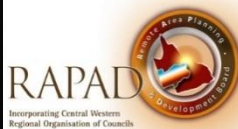
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## Environment and Community



CSG operators to map underground water resources in the Galilee Basin

COAL SEAM GAS currently readily available, and provide a regional understanding of the location of issues in the basin aquifers and use of these for bore water before widespread



## Future Development

- Innovative exploration and development strategies
- Low cost exploration and development
- Wells drilled at low cost with minimal overheads
- Time efficient exploration and appraisal
- Gunn-2: 3 months from lease build to production test running
- Small to mid-cap companies suited to the task
- Commercial upside – development of sandstone gas alongside CSG
- Collaboration with midstream and gas consumers
- Investment to connect to east coast pipeline network
- Non-binding MOU in place with APA Group for connection to east coast market



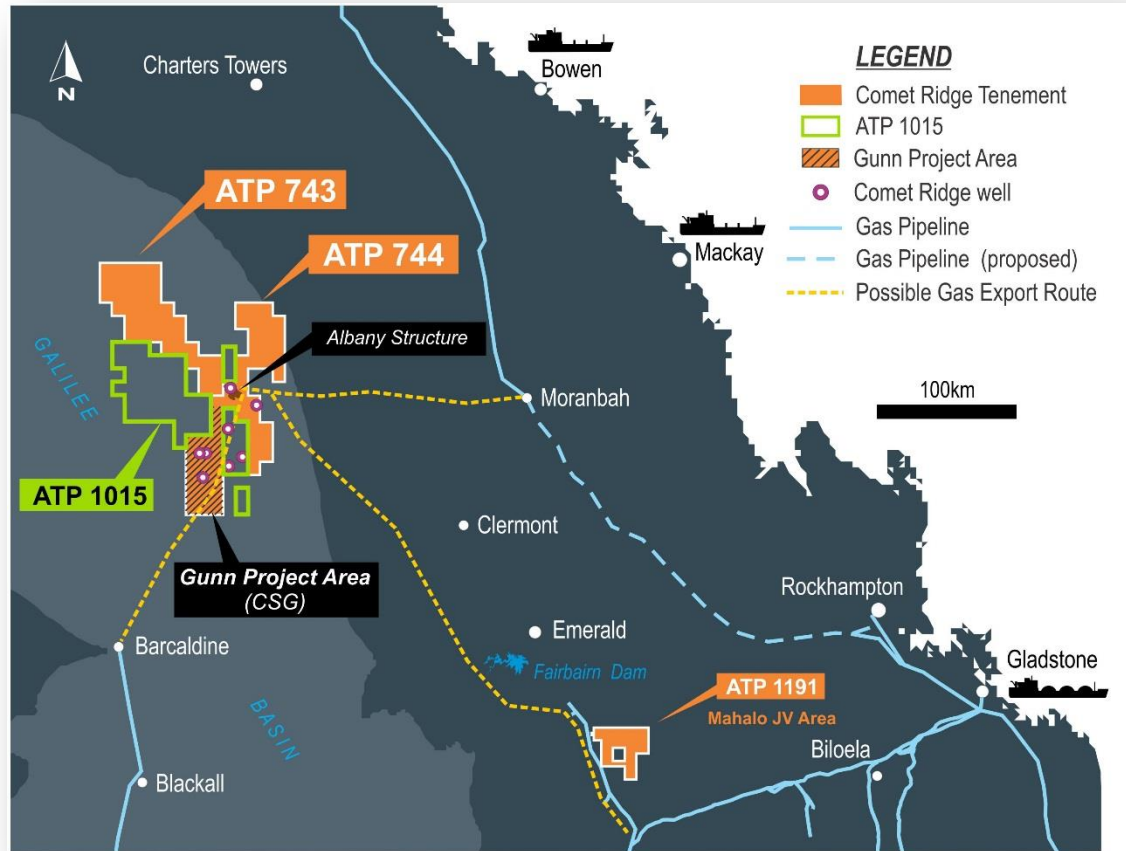
# Galilee Basin – Commercial Options



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## Market Opportunities

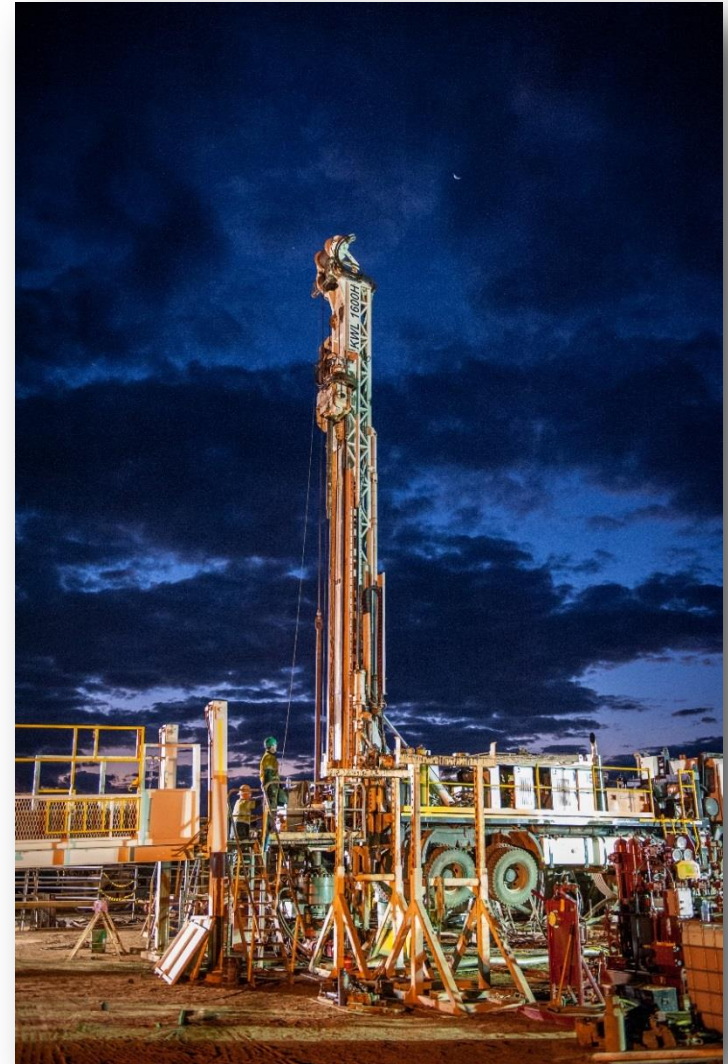
- Different markets exist for commercial development: coal, power, industrial, LNG
- 1) Power for coal mines / power
- 2) LNG project shortfalls
- 3) Industrial gas supply



**Moving gas to the southeast via pipeline provides flexibility around all commercial opportunities – linkage to east coast market**

## Summary

- Nearly 100 years of exploration yet basin remains under explored
- Large area with significant CSG and sandstone contingent resources
- CSG development progressing in two key areas with one working pilot and lateral well underway
- Cost effective exploration, appraisal and development
- Strong community engagement and understanding of critical nature of gas to any economy
- Multiple market segments requiring gas
- Potential to be key supplier to frustrated east coast gas market



# Questions



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## Competent Person Statement and ASX Listing Rules Chapter 5 - Reporting on Oil and Gas Activities

The Contingent Resource for the Albany Structure referred to at pages 5, 9 & 14 of this presentation are taken from an independent report by Dr Bruce McConachie of SRK Consulting (Australasia) Pty Ltd, an independent petroleum reserve and resource evaluation company, originally released to the Market in the Company's announcement of 6 August 2015. The Contingent Resources information has been issued with the prior written consent of Dr McConachie in the form and context in which it appears. His qualifications and experience meet the requirements to act as a Competent Person to report petroleum reserves in accordance with the Society of Petroleum Engineers ("SPE") 2007 Petroleum Resource Management System ("PRMS") Guidelines as well as the 2011 Guidelines for Application.

The contingent resource estimates for ATP 744P quoted at page 14 of this presentation are based on and fairly represent, information and supporting documentation determined by Mr John Hattner of Netherland, Sewell and Associates Inc, Dallas, Texas, USA, in accordance with Petroleum Resource Management System guidelines. Mr Hattner is a full-time employee of NSAI, and is considered to be a qualified person as defined under the ASX Listing Rule 5.42 and has given his consent to the use of the resource figures in the form and context in which they appear in this presentation.

The contingent gas resource estimates for ATP 744P, other than those that relate to the Albany Structure provided in the Resources Table appearing on page 14 of this presentation were originally released to the Market in the Company's announcement of 25 November 2010, and were estimated using the deterministic method with the estimate of contingent resources for ATP 744P not having been adjusted for commercial risk.

COI confirms that it is not aware of any new information or data that materially affects the information included in the two announcements referred to above and that all of the material assumptions and technical parameters underpinning the estimates in the announcements continue to apply and have not materially changed.

The contingent gas resource estimates for ATP813P contained in the Resources Table at page 14 of this presentation were originally released to the Market in the Blue Energy's announcement of 30 October 2014, and were estimated using the deterministic method with the estimate of contingent resources for ATP 813P not having been adjusted for commercial risk.

The contingent gas resource estimates for ATP 529P contained in the Resources Table at page 14 of this presentation were originally released to the Market in the Galilee Energy Limited announcement of 3 September 2015, and were estimated using the deterministic method with the estimate of contingent resources for ATP 529P not having been adjusted for commercial risk.



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