



# ***UNLOCKING AUSTRALIA'S ENERGY FUTURE***

**SEAAOC CONFERENCE**

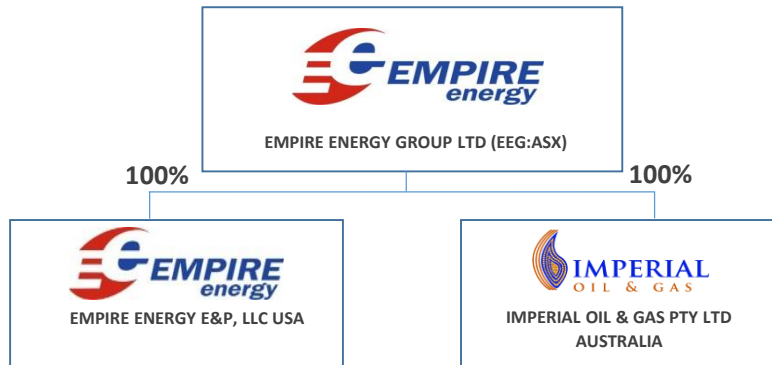
**DARWIN**

**SEPTEMBER 2018**

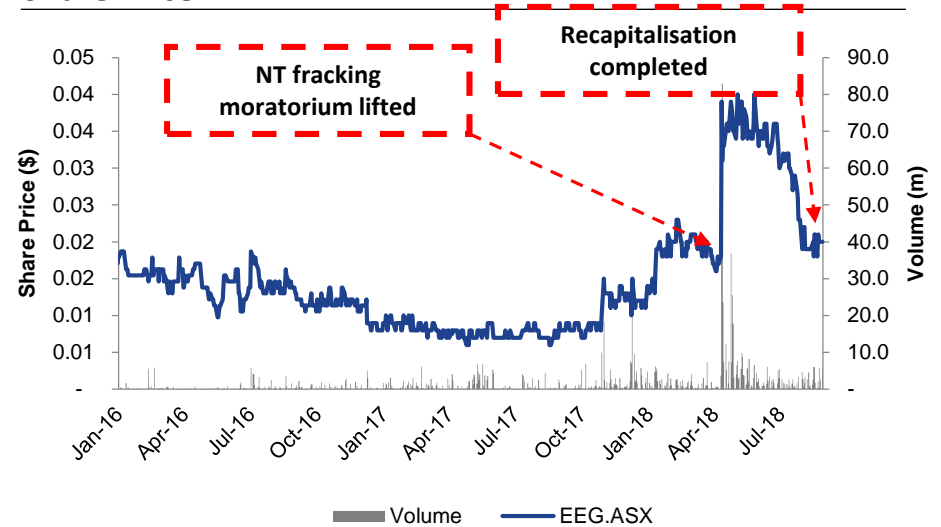
## Pro-Forma Capital Structure<sup>1</sup>

Shares on issue	2,298m
Options on issue <sup>3</sup>	498m
Share price	A\$0.02
Market cap	A\$46m
Cash at bank	A\$4m
Net debt	A\$33m
Enterprise value	A\$79m

## Corporate Structure



## Share Price<sup>2</sup>



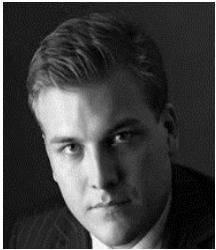
## Pro-Forma Top 5 Shareholders<sup>1</sup>

Macquarie Bank Ltd	14.8%
Global Energy and Resources Development Ltd	10.3%
Nominees (HSBC / JP Morgan)	6.0%
Liangrove Media Pty Ltd	4.8%
Elphinstone Holdings Pty Ltd	3.0%

1: Pro-forma balance sheet assumes shareholder approval is received for recent recapitalisation at EGM on 20<sup>th</sup> September 2018

2: Source: IRESS

3: 23m management and broker options @ A\$0.03, 120m Macquarie options @ A\$0.032 and 375m investor options @A\$0.03



**Alex Underwood**  
Chief Executive Officer  
Empire Energy Group Limited  
Imperial Oil & Gas Pty Limited

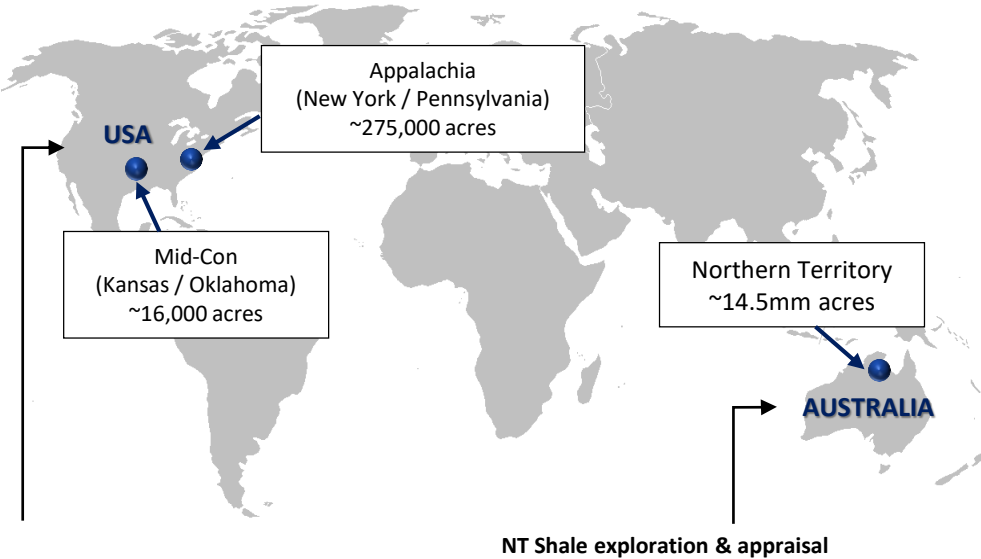
- 12 years Energy Markets Division of Macquarie Bank (Sydney and Singapore) and Natural Resources Division of Commonwealth Bank of Australia (Singapore)
- Extensive experience investing debt and equity in the upstream oil and gas sector and the identification of value creation opportunities for upstream oil and gas development / production assets



**Prof John Warburton**  
Director  
Imperial Oil & Gas Pty Limited

- 30 years technical & leadership experience in leading E&P companies including BP, LASMO-Eni and Oil Search
- Previously Chief of Geoscience & Exploration Excellence for Oil Search
- Non-Executive Director of Senex Energy

## Asset Location and Acreage



### Conventional oil & gas

- >11.5 mmbob 2P reserves
- ~1,200 boe per day

### Potential NY shale

- > 500 mmbob Prospective Resource P(50)<sup>1</sup>

- >14.5mm acres
- >13,000 Pj eq Prospective Resource P(50)

## Commentary

### USA

- 350 barrels oil per day net and 5.5 mmcf gas per day net production
- Budgeted FY18 EBITDAX of ~US\$4m
- Positive stable cash flow with over 2,000 long life oil & gas wells
  - PDP reserves<sup>2</sup> NPV10 US\$32m
  - 1P reserves<sup>3</sup> NPV10 US\$46m
  - 2P reserves<sup>4</sup> NPV10 US\$60m
- Refinancing process successfully completed<sup>5</sup>
  - US\$38m Macquarie Bank facility extended by 3 years to Feb 2022
  - Macquarie agreed to US\$4m debt to equity conversion
  - Additional US\$7.5m cash repayment to be made
  - Debt facility balance to reduce to US\$26.5m by end of Sept 2018
- Oil price continuing to strengthen increasing US oil production margins
- Significant Marcellus / Utica Shale landholding in NY State provides US shale optionality at no cost to hold. NY State fracking ban prevents development at current time

### Australia

- Very large footprint in a world class emerging petroleum shale play in Northern Territory
  - Over 14.5m acres including the Beetaloo sub-Basin and McArthur Basin
- 100% working interest and operatorship in all tenements
- Independent Prospective Resource Estimate P(50) >13,000Pj eq
- Shales in the basin up to 3km thick
- Strategically located near pipeline infrastructure
- Recent approaches from potential new joint venture partners
- Strong market dynamics - tight East Coast gas and LNG markets
- Significant expenditure by Santos, Origin, Hancock Prospecting and others to drive acreage values

<sup>1</sup>: Prospective Resource P(50) – unrisked, is the estimated quantities of petroleum that may potentially be recovered by the application of future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further exploration appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable hydrocarbons

<sup>2</sup>: PDP reserves – Proved Developed Producing Reserves. See Appendix “US Reserves and Resources” on slide 21

<sup>3</sup>: 1P reserves – Total Proved Reserves. See Appendix “US Reserves and Resources” on slide 21

<sup>4</sup>: 2P reserves – Total Proved plus Probable Reserves. See Appendix “US Reserves and Resources” on slide 21

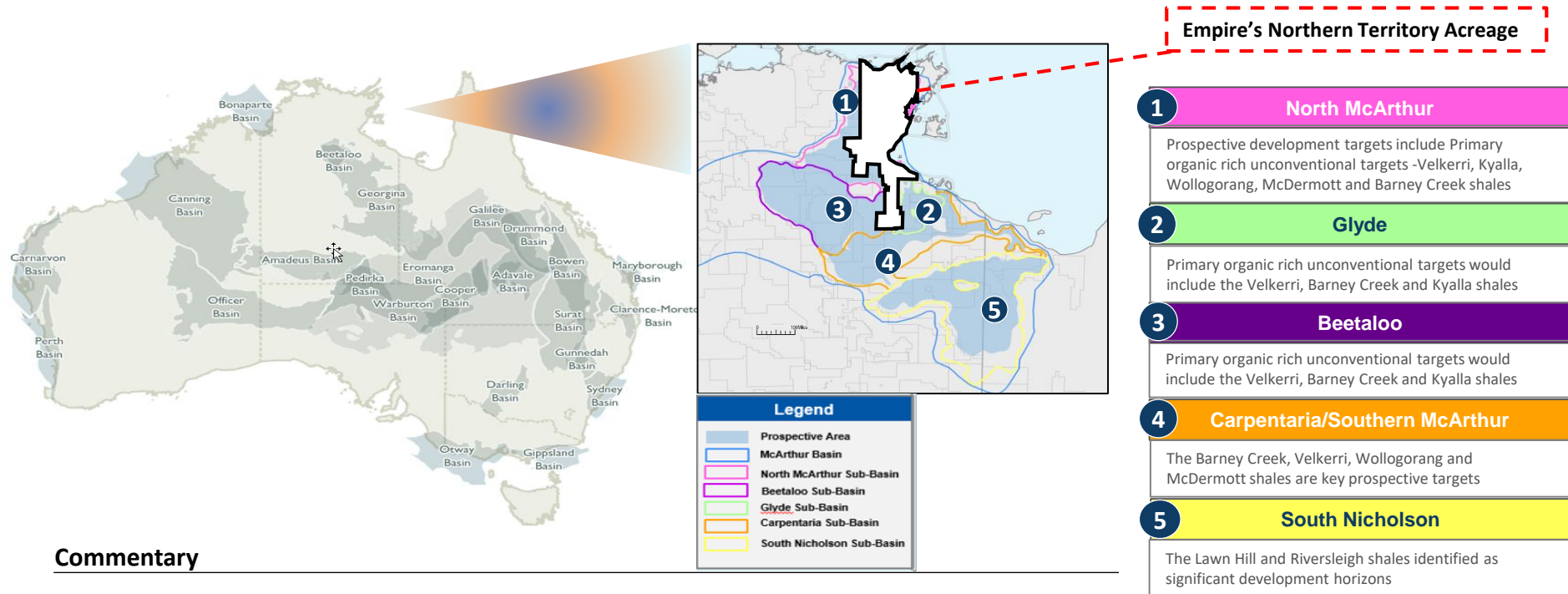
<sup>5</sup>: Subject to shareholder approval



## AUSTRALIA OPERATIONS OVERVIEW

# McArthur Basin – The Opportunity

The Greater McArthur Basin, which includes the Beetaloo sub-Basin, is Australia's most prospective shale basin

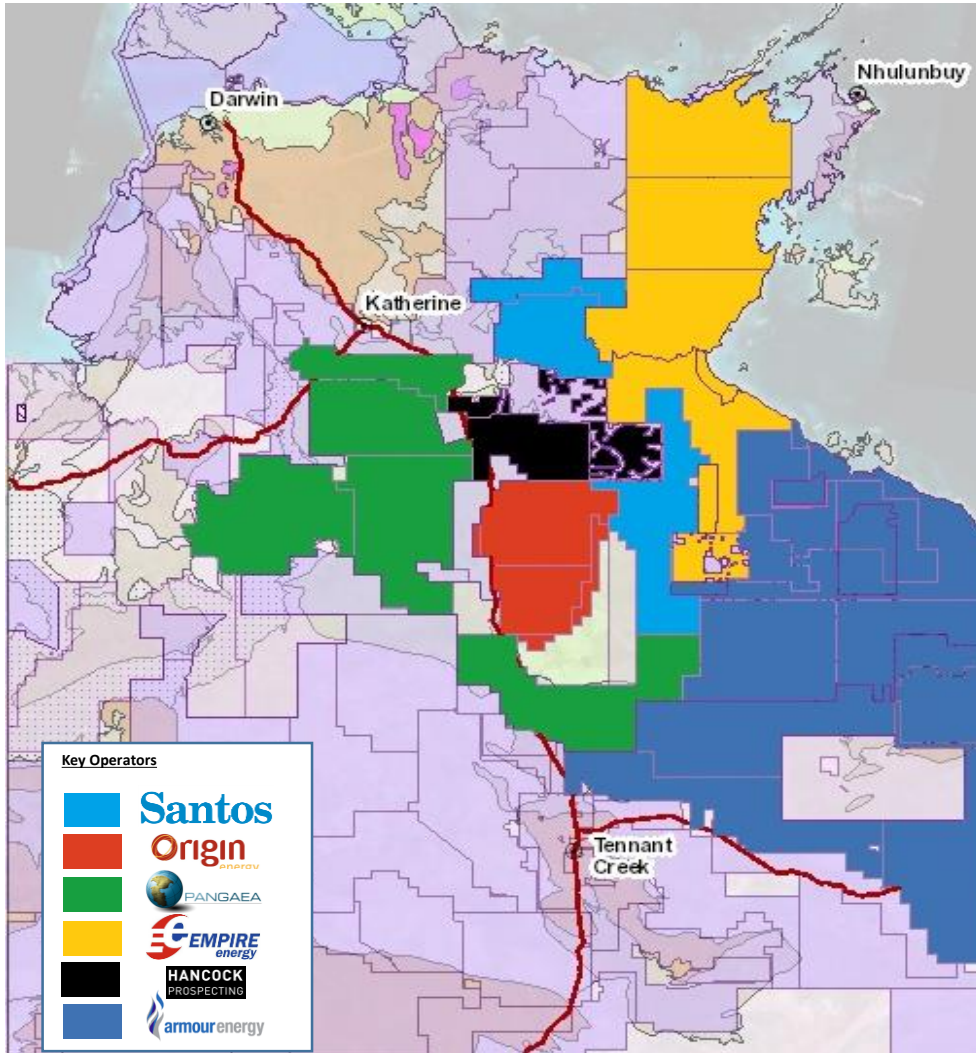


## Commentary

- The Northern Territory Fracking Moratorium was lifted in April 2018
- NT Government is very supportive of recommencement of shale gas exploration activities and is proactively implementing industry regulations
- Prior to enactment of the fracking moratorium, over A\$800m has been committed to commercialise the basin
- **Northern Gas Pipeline (“NGP”) is being constructed by Jemena to connect NT shale to East Coast gas market which is critically undersupplied**
- **Jemena has publicly stated it intends to invest \$4b to increase the capacity of the NGP from 90Tj / day to 700 Tj / day to transport NT shale gas**
- **Queensland and Darwin LNG plants are producing below capacity and looking for additional gas supplies**

# Greater McArthur Basin Ownership

Key operators in the Greater McArthur Basin are highlighted in the map below



## Commentary

- Numerous large independent oil and gas companies hold substantial acreage positions in the Greater McArthur Basin. This includes:
  - Origin Energy/Falcon Oil & Gas JV
  - Santos/Tamboran Resources JV
  - Hancock Prospecting
  - Pangaea Resources
  - Empire Energy
  - Armour Energy
- Following the lifting of the fracking moratorium, drilling activity is expected to ramp up materially
- Santos plans to focus 2019 expenditure on the tenement immediately adjacent to Empire<sup>1</sup>
- Origin plans to drill 5 additional fracked horizontal wells<sup>2</sup>
- Hancock Prospecting has indicated the potential to invest A\$150m - A\$200m in exploration<sup>3</sup>

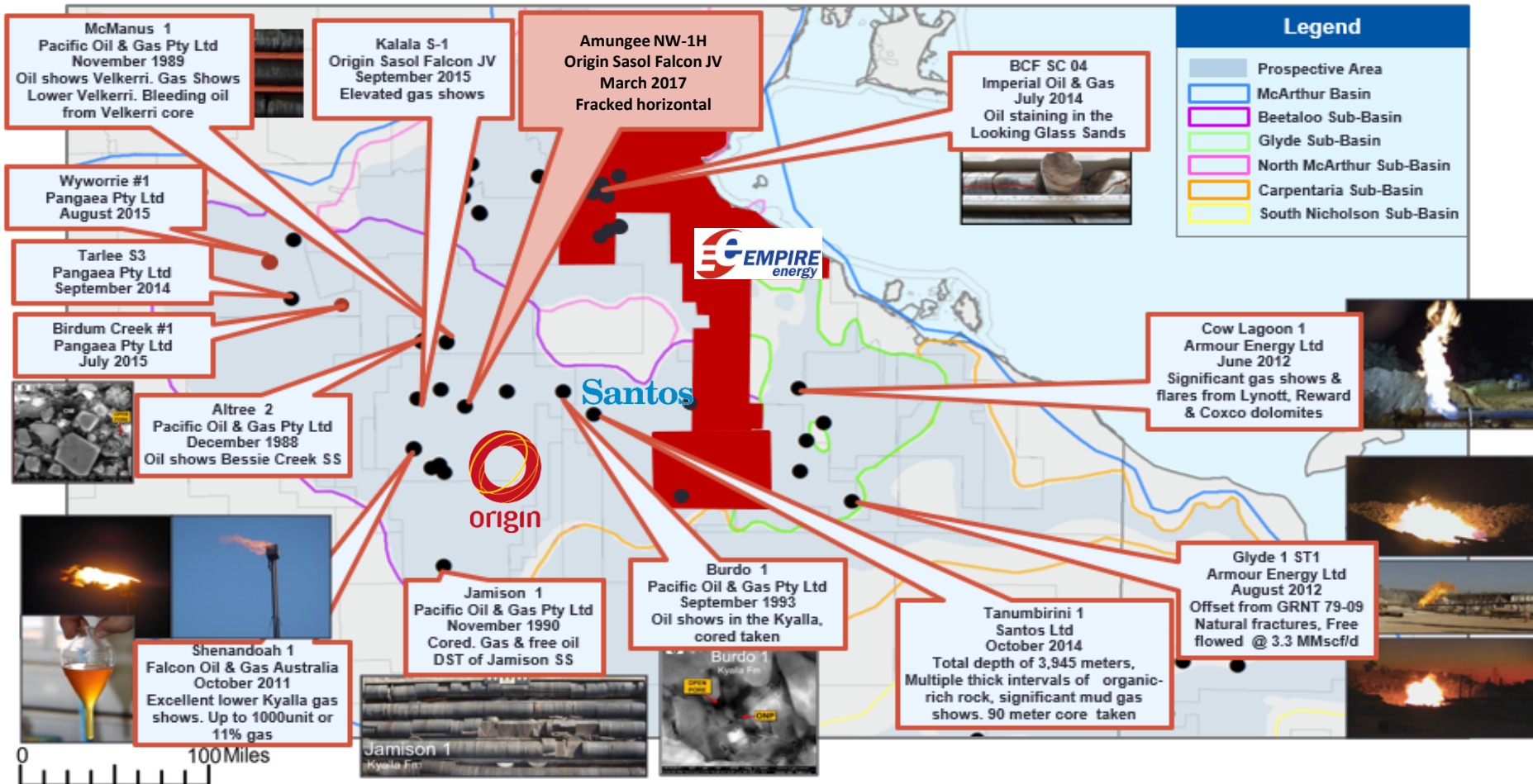
1: Santos media release 9 November 2017 "Santos 2017 Investor Day"

2: Origin Energy ASX Announcement 30 April 2018 "March 2018 Quarterly Production Report"

3: Hancock Prospecting Submission #461 to the Fracking Inquiry (6 September 2017)

# McArthur Basin – Vast & Proven Petroleum System

Multiple well tests and core holes have encountered oil, gas and liquids across the basin including in and immediately adjacent to Empire's tenements





# Beetaloo Basin – Origin Amungee Discovery Well<sup>1</sup>

**Amungee NW-1H, drilled by Origin Energy, the first fracked horizontal well in the Beetaloo Basin, flowed at similar rates to the US wells that commercialised shale in 1998 ... Flow rates are almost certain to improve as completion designs are optimised**

## Key Highlights

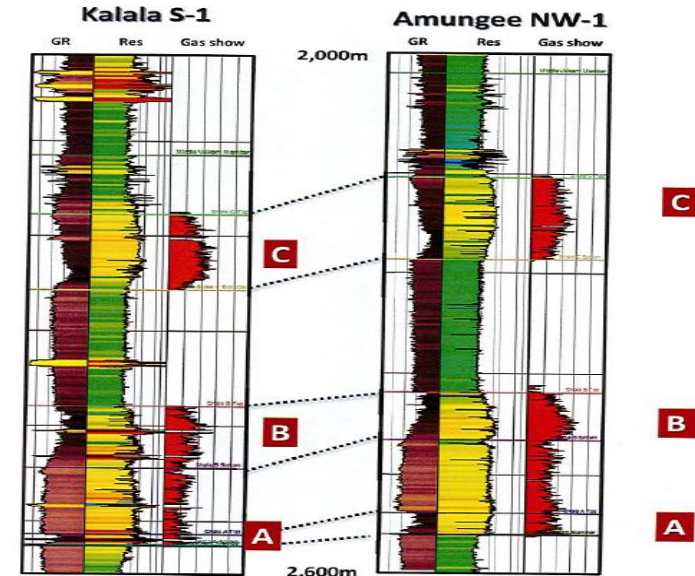
- Drilled by Origin Energy in Dec 15 - TD 3,808m, incl. 1,100m horizontal section in the B Shale of the Middle Velkerri formation
- Hydraulically fracture simulated in Nov 2016
- 11 Hydraulic stimulation stages completed across approx. 600m
- 95% of programmed proppant placed
- Successful production test in February 2017
- Av TOC ~4%; Porosity 4% to 7.5%; Permeability 50 to 500 nD
- **IP averaged 1.10MMscf/d over 57 days**
- **Final production rate 1.07mmscfd**
- Cumulative production 63mmscfd
- Estimated dry gas composition of 92% methane, 3% ethane, 5% carbon dioxide
- **2C Contingent Resource Estimate is 6.6TCF (486,000 acres)**

## Amungee NW-1H flow rate in relation to 1998 US shale wells<sup>2</sup>

The S.H. Griffin #4 produced 1.3 million cubic feet of natural gas per day for the first 90 days, an unbelievable amount for the time.<sup>36</sup> Steinsberger, in an interview with The Atlantic, said,

*“This was the ‘aha moment’ for us, it was our best well ever in the Barnett, and it was a slick water frack. And it was my baby!”<sup>37</sup>*

This was a revolutionary moment, marking the beginning of modern-day fracking in shale as we know it. Since the S.H. Griffin, more than a hundred thousand wells have been fracked in the United States, and most of them use a technique similar to what was first done in the Barnett Shale.<sup>38</sup> Steinsberger had finally figured out how to get shale rock formations to give up their natural gas and do so in an economical way.

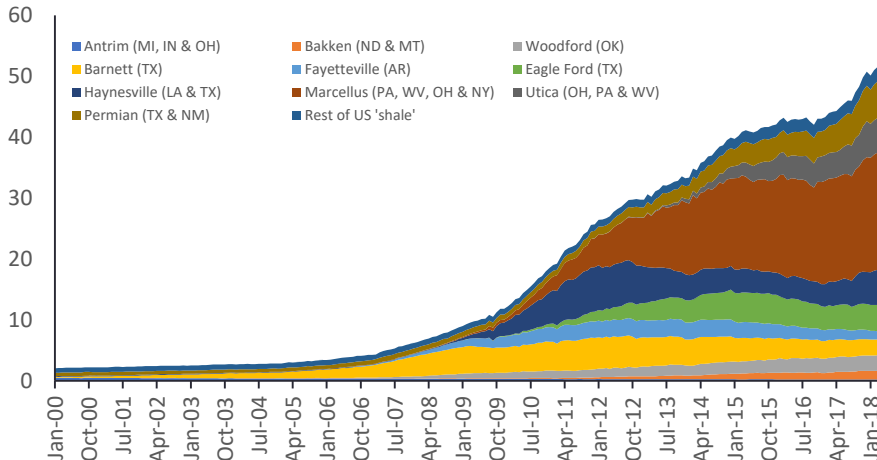


- 3 organic rich shale intervals (A, B & C shales) within the Middle Velkerri Formation
- Gross thickness of mid-Velkerri up to 500m with net pay in B & C shales >30m each
- Average TOC 3% to 4%
- Favorable geo-mechanics for hydraulic stimulation.
- 20% to 25% overpressure, excellent for volumetric and reservoir productivity
- Good porosity and gas storage

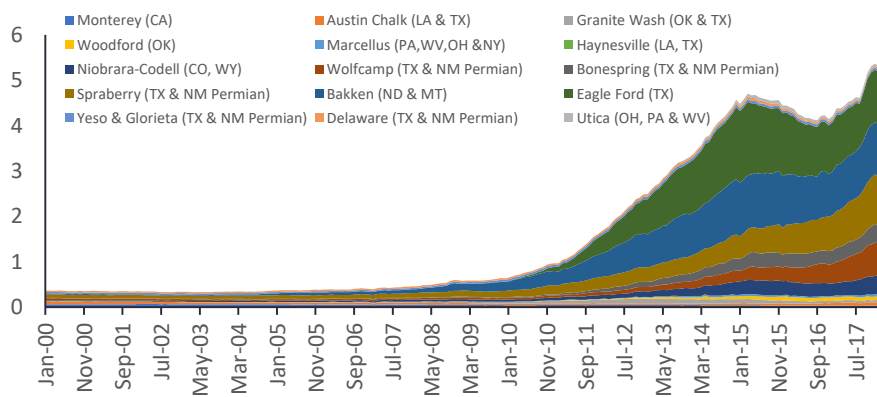
# Fracking - Transformational Impact on Market

## US fracking has changed the oil and gas market forever

### Monthly shale gas production since 2000<sup>1</sup>



### Monthly shale oil production in the US since 2000<sup>2</sup>



### Commentary

#### Unconventional gas and oil production in the US

- Over 50 billion cubic feet of gas per day
  - 60% of total US gas production from shale in 2017
- Over 5 million barrels of oil per day
  - 50% of total US oil production from shale in 2017
- Commercial production is derived from numerous US shale basins
- Technological advancements in hydraulic fracturing and horizontal drilling have opened up a significant number of shale basins in the US

### Key Takeaway

- US industry scale, continuous improvements and 'production line' drilling and completion have reduced costs, increased recoveries and improved economics
- US fracking technology and experience is being used to commercialise other shale basins around the world
- US basins are not the only ones in the world that can be successfully fracked
- New shale basins outside of the US are being developed
- **Empire believes this will be the case with the Northern Territory shales basins**

# McArthur Basin – Gas Commercialisation

## LNG processing infrastructure available well beyond current gas supply

### Strong Gas Demand

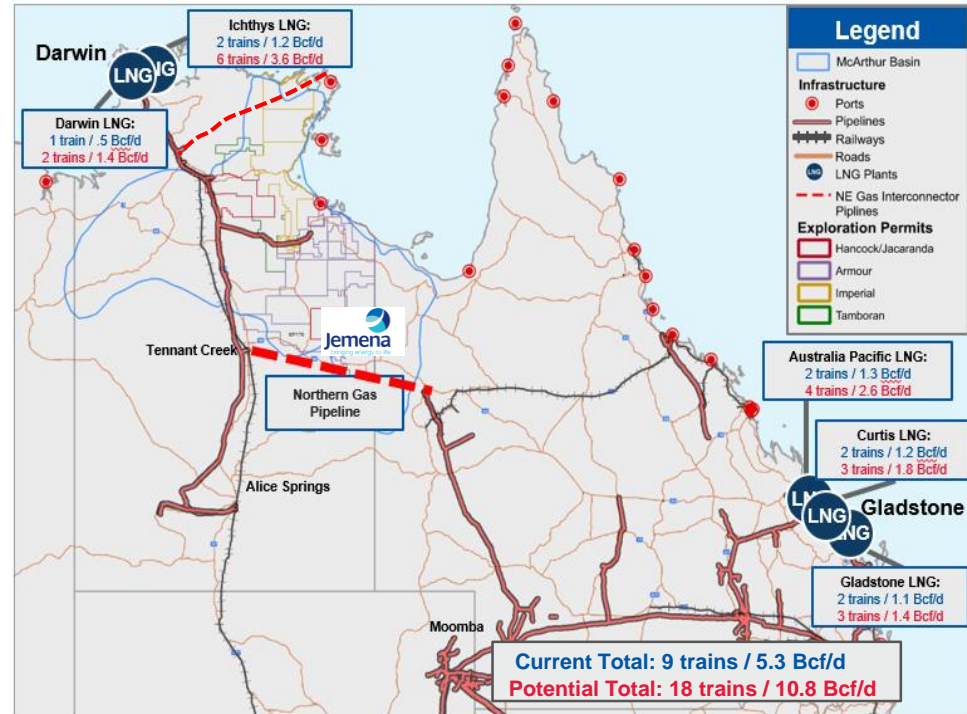
- Massive buildout of East Coast LNG has created substantial domestic gas shortfall
- LNG plant expansions could double installed capacity
- Rapidly increasing Asian demand for LNG with strong prices
- Australia very strategically located to fulfil Asian demand with low sovereign risk

### Pipeline Infrastructure

- There is already a pipeline in place going directly through Empire's EP187 tenement which allows for near-term commercialisation. Rights of way in place to build new, larger pipeline alongside existing pipeline.
- A 1.0 Bcf/d pipeline to Darwin would cost ~\$1.5b, and could be expanded to 2 to 3 Bcf/d with compression. This cost could be borne by pipeline operators upon reserve certification by Santos / Origin / Pangea / Empire

**Domestic** { Jemena has publicly stated that following lifting of the NT Fracking Moratorium it will increase its \$800m investment in the Northern Gas Pipeline by up to \$4bn to increase installed capacity from 90 Pj / day to 700 Pj / day<sup>1</sup>

**Export** { "Santos is focused on further exploring and appraising the McArthur Basin in the NT, a multi-TCF prospective resource position analogous to US shale plays. Santos' focus for this region is to support Darwin LNG backfill, expand our acreage footprint and explore and appraise the McArthur Basin."<sup>2</sup>













Plant	Status	Operator	Capacity
COP's Darwin	Online	ConocoPhillips	0.5 Bcf/d
QLNG	Online		1.2 Bcf/d
GLNG	Online	Santos	1.1 Bcf/d
APLNG	Online		1.3 Bcf/d
Ichthys LNG	Commissioning	INPEX	1.2 Bcf/d
<b>Total</b>			<b>5.3 Bcf/d</b>

1: Jemena Media Release: Jemena welcomes decision to lift fracking moratorium (17 April 2018)  
 2: www.santos.com/what-we-do/assets/northern-Australia/

# McArthur Basin – Substantial Committed Investment

Numerous farm-out deals have been carried out resulting in capital commitments of hundreds of millions of dollars by major oil and gas companies<sup>1</sup>

Year	Vendor	Investor	WI	Basin	Cash Upfront	Carried expenditure	Acres (mm)
2011			62.5%	Beetaloo	A\$27m	A\$162m	6.2
2013			75.0%	Beetaloo / McArthur	A\$10m	A\$71m	6.4
2014			70.0%	Beetaloo	A\$20m	A\$185m	4.6
2015 <sup>2</sup>			80.0%	Beetaloo / McArthur	A\$20m	A\$80m + A\$133m	14.5
2015			75.0%	McArthur / Nicholson	A\$31m	A\$173m + A\$133m	31.3

- In 2014 one of the world’s most experienced shale groups, American Energy Partners (“AEP”) identified the McArthur Basin as an opportunity for potential shale oil and gas development
- In 2015 Imperial entered into a Farm-out Agreement with AEP, founded and led by Aubrey McClendon, the co-founder of Chesapeake Energy
- On a results driven basis, AEP committed up to US\$560m (US\$60m in the 1st 3 years), however due to the passing of the Founder of AEP, the Farm-out agreement was terminated in 2017
- Exploration activities since AEP deal have increased understanding of the Beetaloo Basin and oil and gas prices have improved, so an improved farm out deal is likely to be achievable
- **Since the NT Government announcement that the moratorium would be lifted, Imperial has received inbound inquiries from multiple US shale operators regarding investment in Imperial’s Beetaloo Basin acreage**
- **Imperial recognizes US companies’ expertise in the rapid and efficient commercialization of shale basins and intends to leverage that expertise to commercialise its Northern Territory holdings**

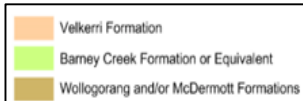
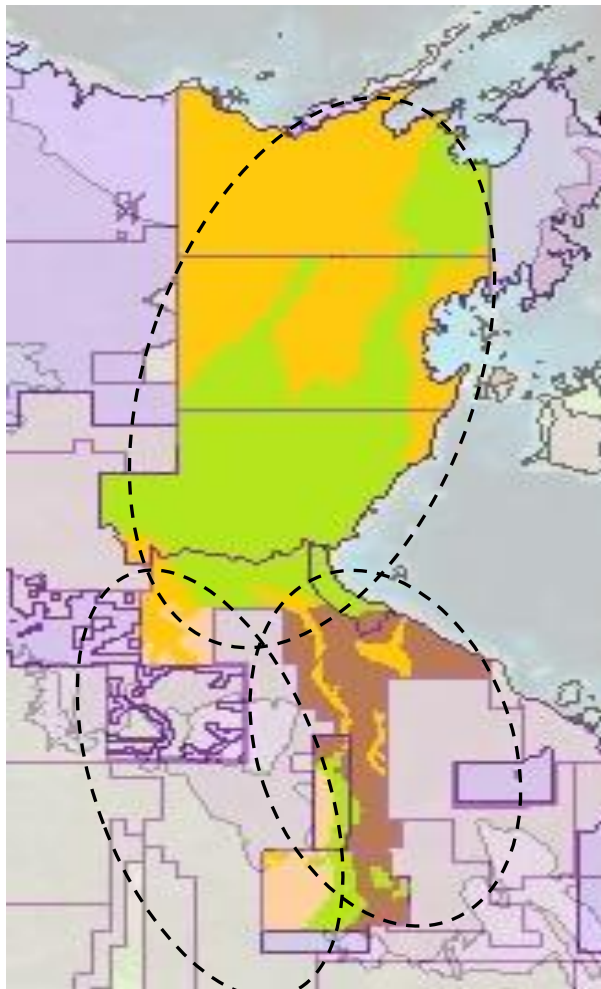
1: Company filings / press releases

2: Transactions did not proceed due to passing of founder of AEP

# Beetaloo / McArthur Basin – Empire Shale Targets

## Empire is targeting significant shale zones

### Empire Shale Targets



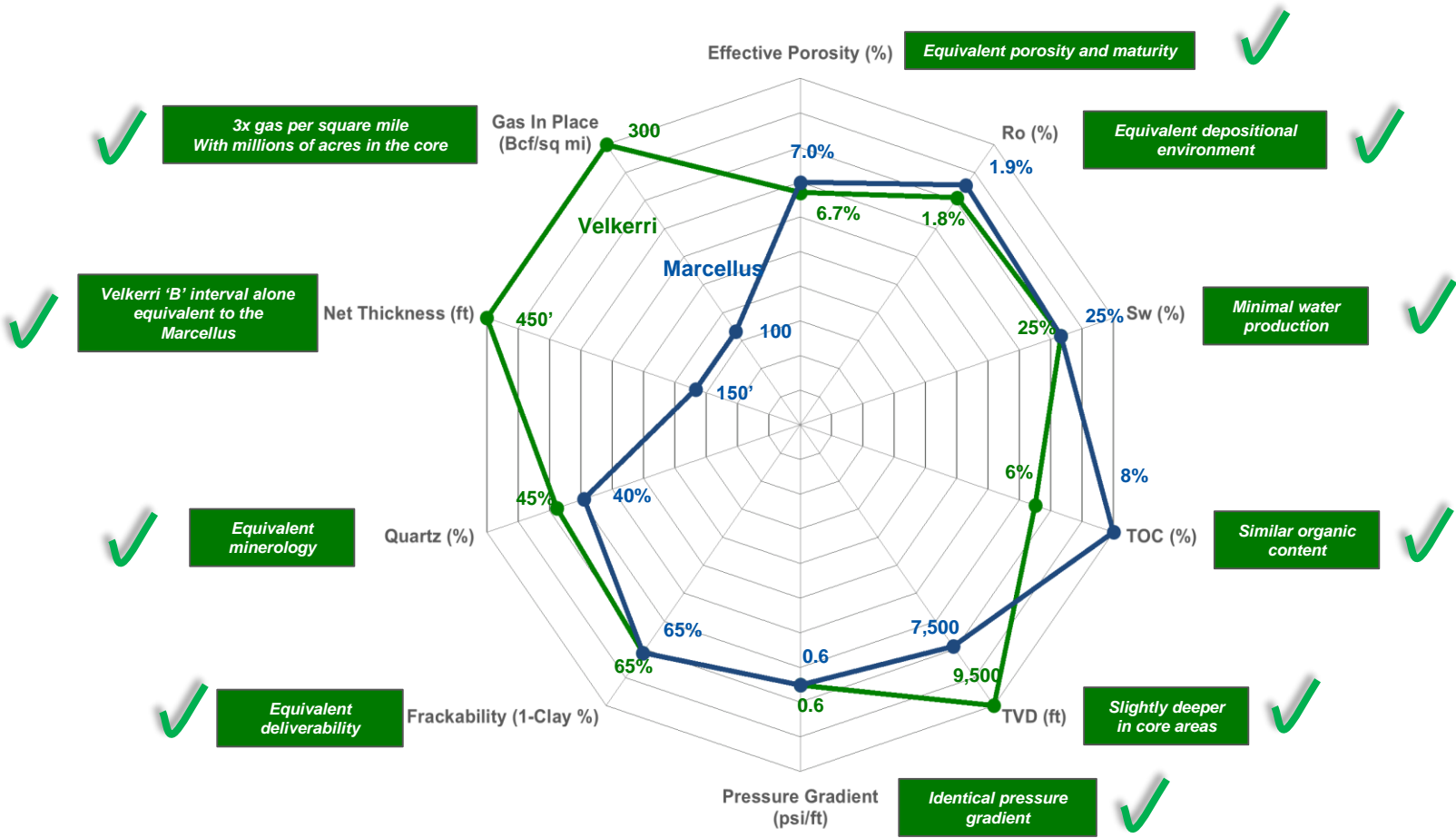
Age Group	Absolute ages	Lithology	Stratigraphy	Thickness	Oil & gas potential			
					Source	HC shows (Sw) (O)	Unconventional reservoir	Conventional reservoir
Mesozoic-Preterozoic		Chambers River Fm		<300 m				
		McArthur Fm	Kyalla Mb	ca 250 m		●	■	■
			Shenwin Mb	up to 100 m		●	■	■
			Moroak Mb	2.5-6 m		●	■	■
		Velkerri Fm		330-600 m		●	■	■
		Bessie Creek Sandstone		23-367 m		●	■	■
		Corcoran Fm		180-225 m		●	■	■
		Abner Fm		80-500 m		●	■	■
		Crawford Fm		0-235 m		●	■	■
		Mainoru Fm		ca 130->1000 m		●	■	■
		Limmen Sandstone		20-100 m		●	■	■
		Dunganinnie Fm		<240 m		●	■	■
Neoproterozoic	1558 ± 2 Ma	Balbinni Fm		<1500 m		●	■	■
	1552 ± 3 Ma	Smythe Sandstone		<100-250 m		●	■	■
	1513 ± 4 Ma	Kams Dolomite		100-250 m		●	■	■
	1514 ± 4 Ma	Amos and Looking Glass Fms		30-140 m		●	■	■
	1525 ± 2 Ma	Stretton Sandstone		<5-270 m		●	■	■
	1538 ± 4 Ma	Yalco Fm		<50-250 m		●	■	■
		Donnegan Mb		0-140 m		●	■	■
		Hot Spring Mb		50-350 m		●	■	■
		Caranbirini Mb		0-300 m		●	■	■
		Reward Dolomite		30-350 m		●	■	■
McArthur	1542 ± 4 Ma	Barney Creek Fm		10-800 m		●	■	■
		Coxco Dolomite Mb		15-70 m		●	■	■
	1541 ± 4 Ma	Lower Teena Dolomite		<5-270 m		●	■	■
		Emmerugga Dolomite		ca 620 m		●	■	■
		Myrtle Shale		40-60 m		●	■	■
		Lelia Sandstone		<10-30 m		●	■	■
		Tooganinie Fm		ca 200 m		●	■	■
	1541 ± 4 Ma	Tatoola Sandstone		80-350 m		●	■	■
		Amelia Dolomite		50-180 m		●	■	■
		Mallapuruyah Fm		100-ca 450 m		●	■	■
Palaeozoic-Preterozoic		Masteron Sandstone		40-650 m		●	■	■
		Echo Sandstone		265-365 m		●	■	■
		Burash Sandstone		<370 m		●	■	■
	1708 ± 5 Ma	Nyanantu Fm		ca 450 m		●	■	■
	1713 ± 7 Ma	Tanumbirini Rhyolite		ca 450 m		●	■	■
		Warramana Sandstone		>250 m		●	■	■
		Packsaddle Microgranite				●	■	■
		Hobblechain Rhyolite		70-100 m		●	■	■
		Gold Creek Volcanics		15-230 m		●	■	■
		Wollongorang Fm		>350 m		●	■	■
Terrestrial	1723 ± 4 Ma	Settlement Creek Dolomite		100-200 m		●	■	■

### Target Regions

- Total 33,867 km<sup>2</sup> (8.4mm acres) of identified shale for Independent Prospective Resource identification
- Multiple accessible targets in Imperial licenses reduce commercialization risk and increase resource volume
- **Velkerri Shale / Kyalla (Beetaloo sub-Basin)**
  - 628,000 acres (>2,500km<sup>2</sup>)
  - Independent Prospective Resource (P50) 1.2TCF gas + 24 mmbbls oil / condensate
- **Barney Creek Formation (McArthur Basin)**
  - 6.2mm acres (>25,000km<sup>2</sup>)
  - Independent Prospective Resource (P50) 8.7TCF gas + 174 mmbbls oil / condensate
  - Shales up to 3km thick
- **Wollongorang Formation (McArthur Basin)**
  - 1.5mm acres (>6,000km<sup>2</sup>)
  - Independent Prospective Resource (P50) 1.2TCF gas + 24 mmbbls oil / condensate

# Velkerri Shale – Marcellus Equivalent

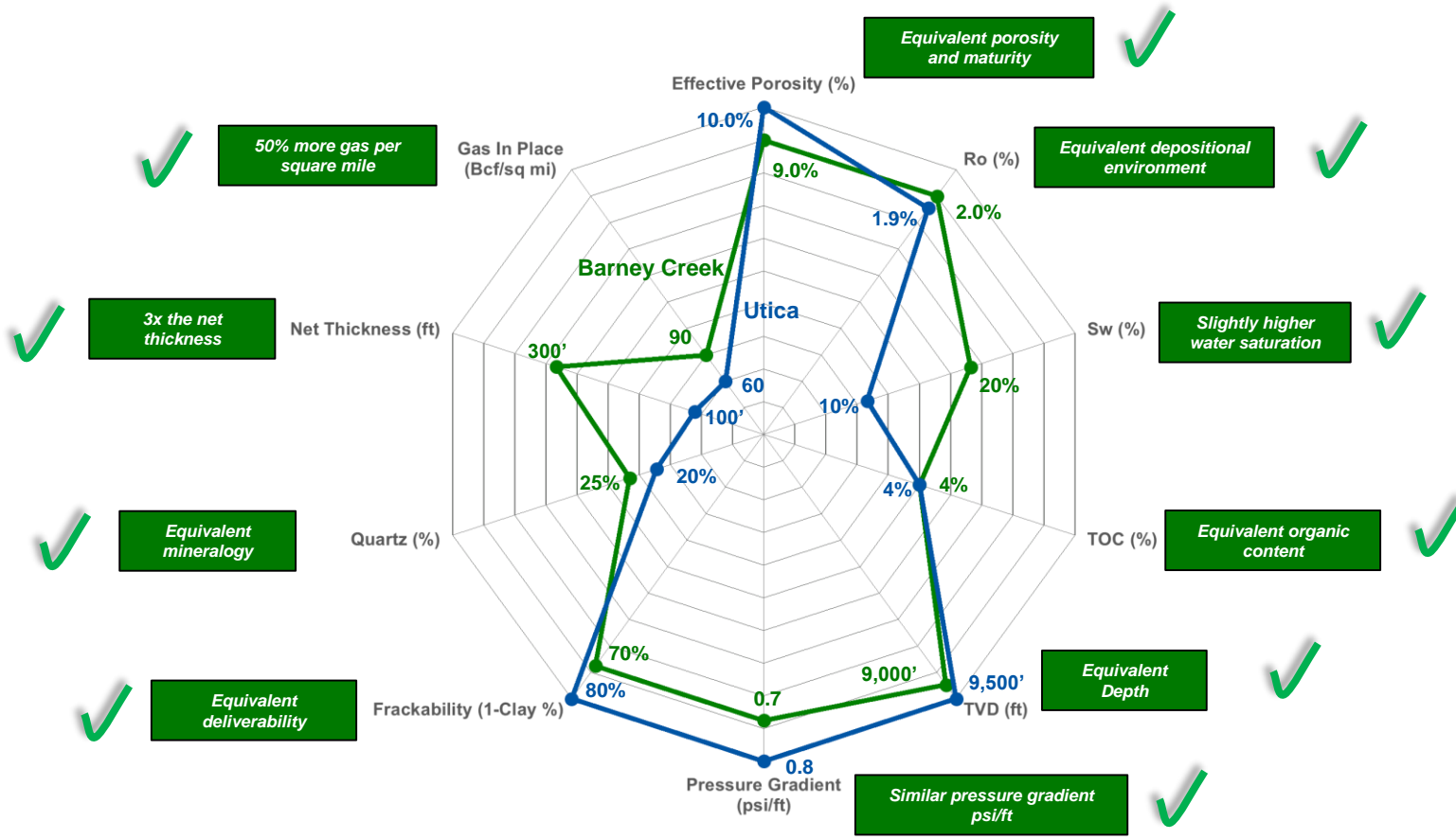
A major unconventional opportunity with the Velkerri/Kyalla shales, with original gas in place equivalent to 3 stacked Marcellus shale plays



Clear USA shale analog of Marcellus shale identified for the Velkerri shale

# Barney Creek Shale – Marcellus Equivalent

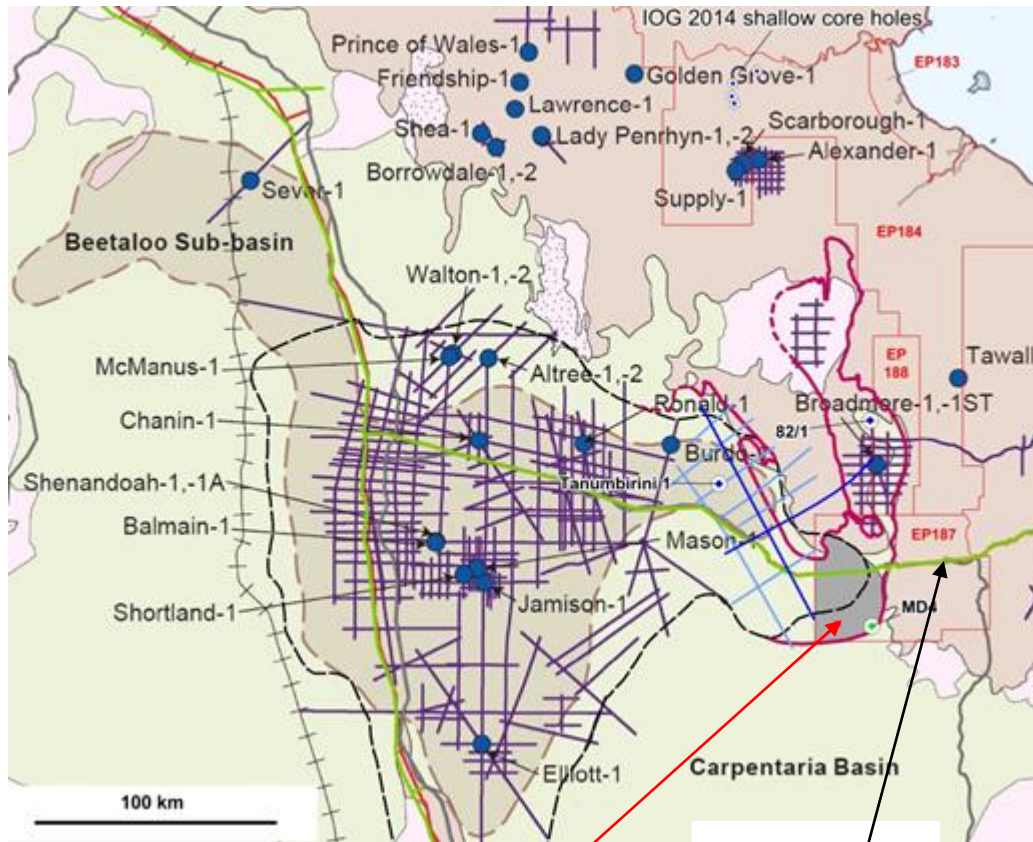
A major unconventional opportunity with the Barney Creek shale, with original gas in place equivalent to 50% more than Utica shale plays



**Clear USA shale analog of Utica shale identified for the Barney Creek shale**

# Beetaloo Sub Basin – Empire Initial Target

## Empire's 1.2 TCF target on trend with major Origin discovery and Santos work program



**EMPIRE VELKERRI SHALE TARGET**

Existing sealed all weather road and gas pipeline

### Key Highlights

- Empire ~2,543km<sup>2</sup> (630,000 acres) in eastern Beetaloo sub-basin
- Empire 1.2 TCF prospective resource target is conservative and based only on Velkerri Shale
- Amungee NW-1H – TD 2,500m considered Beetaloo sub-basin
- Tanumbirini-1 well encountered Velkerri shale from 2,400m to >3,800m
- Santos to undertake major fracked horizontal development program in adjacent block

### Empire EP187 Work Program

- Velkerri Shale in EP187 will be Empire's initial exploration, appraisal and development target
- 231 line km 2D seismic will delineate the shape of the basin and identify drilling targets
- Initial drilling program to comprise stratigraphic wells and a core well to confirm hydrocarbon content and rock characteristics
- Thereafter, fracked horizontal production wells will be drilled and put into production
- EP 187 is located on an existing sealed road and gas pipeline which reduces drilling costs and allows for near term commercialisation

**Expected volume per typical 10,000 ft Hz – Velkerri producing >10 Bcf/well<sup>1</sup>**



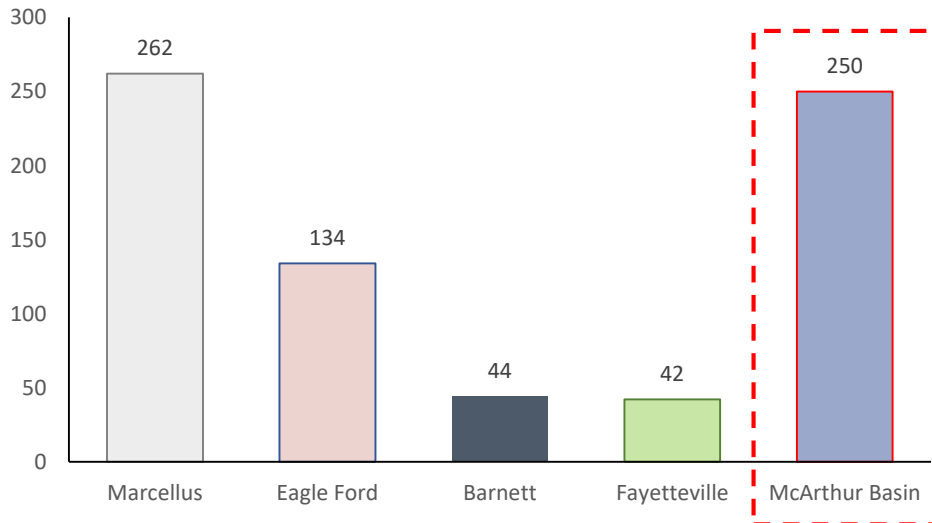
# Prospective Resource Overview

The below overlay illustrates the size of Empire's acreage in the McArthur Basin

## US Prospective Resource Estimates

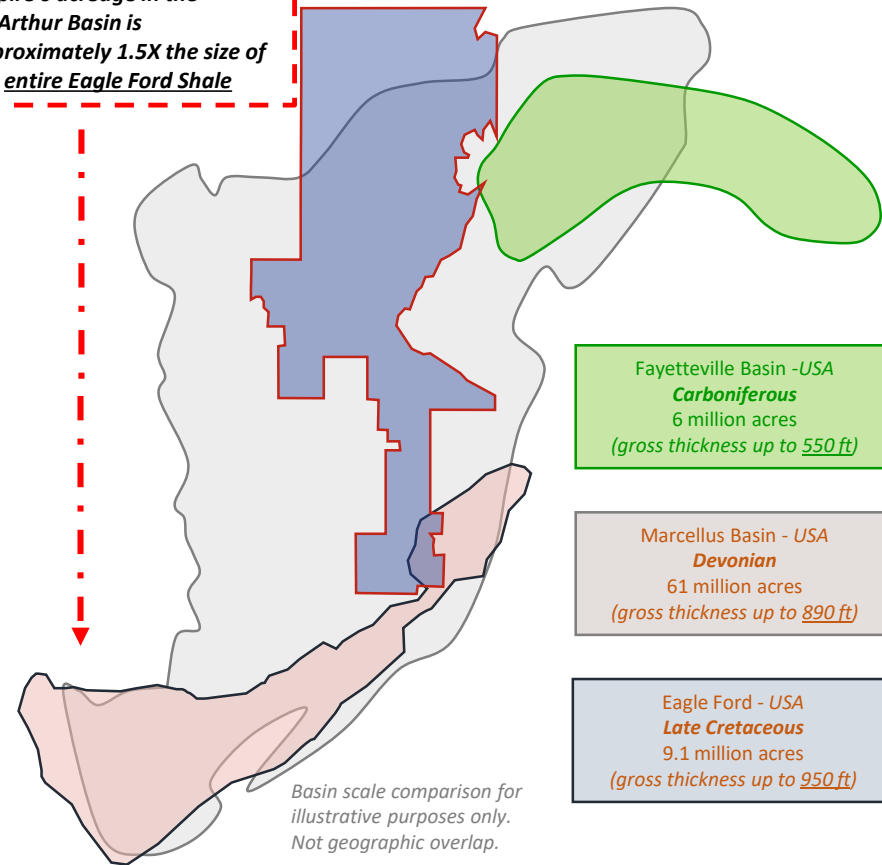
Basin	Prospective Area km <sup>2</sup> (million acres)
Marcellus	246,000 (61 mm)
Eagle Ford	36,894 (9.1 mm)
Barnett	12,950 (3.2 mm)
Fayetteville	23,309 (6 mm)

## Un-risked Prospective / Technically Recoverable Resource



## Basin Overlay Comparison

Empire's acreage in the McArthur Basin is approximately 1.5X the size of the entire Eagle Ford Shale



"Prospective Resource" is the estimated quantities of petroleum that may potentially be recovered by the application of a future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further exploration appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable hydrocarbons

- ✓ Fracking Moratorium has been lifted by Northern Territory Government
- ✓ Government decision paves the way for resumption of industry exploration activities
- ✓ NT Government and most Traditional Owners supportive of renewed activity
- ✓ Huge acreage in the prospective McArthur Basin with investment from industry heavyweights
- ✓ Ongoing discussions with potential new joint venture partners
- ✓ Significant gas resource potential to help solve East Coast gas crisis and LNG plant shortage
- ✓ Opportunity to develop NT downstream industries following resource definition
- ✓ Empire believes the McArthur Basin has the potential to replicate the US shale boom
- ✓ Empire is one of very few remaining independent operators in the Beetaloo basin

# APPENDICES

## Independently certified estimated Prospective Resource

Formation	Permits	Geological factor discount	Area m acres	Units	P90	P50	PV10
Barney Creek	EP 184, EPA180, 181, 182, 183, 188	50-90%	3,559	Bcf	3,304	8,699	20,172
		50-90%		MMBO	66	174	403
Velkerri	EP184, 187, EPA 188	50%	315	Bcf	383	1,192	3,086
		50%		MMBO	8	24	62
Wollogorang	EP 184, 187, EPA 188	90%	1,384	Bcf	524	1,185	2,371
		90%		MMBO	10	24	47
<b>Total</b>				<b>MMBOe</b>	<b>851</b>	<b>2,238</b>	<b>5,183</b>

**Significant prospective resource – P50 13,000 Pj equivalent**

# US Reserves and Resources



As at December 31, 2017

Reserves (NYMEX STRIP - DEC 31, 2017)	Gross Wells	Oil (Mbbbls)	Gas (MMcf)	MBoe	Capex US\$M	PVO US\$M	PV10 US\$M
Region (Reserves) - USA							
Proved Developed Producing	2,211	1,612	26,787	6,077	0	62,697	31,919
Proved Developed Non-producing	21	503	0	503	1,546	10,858	5,361
Proved Behind Pipe	6	148	39	155	532	4,988	1,472
Proved Undeveloped	80	1,027	3,396	1,593	14,542	27,755	7,480
<b>Total 1P</b>	<b>2,318</b>	<b>3,290</b>	<b>30,222</b>	<b>8,327</b>	<b>16,620</b>	<b>106,298</b>	<b>46,232</b>
Probable	83	1,248	12,654	3,357	19,776	47,087	13,519
<b>Total 2P</b>	<b>2,401</b>	<b>4,538</b>	<b>42,876</b>	<b>11,684</b>	<b>36,396</b>	<b>153,385</b>	<b>59,751</b>
Possible	208	1,749	3,772	2,378	24,589	54,735	10,284
Possible - NY Shale		90,740	12,460	92,817			
<b>Total 3P</b>	<b>2,609</b>	<b>97,027</b>	<b>59,108</b>	<b>106,878</b>	<b>60,985</b>	<b>208,120</b>	<b>70,035</b>
<b>Prospective Resource New York Shale P(50)<sup>(1)</sup></b>		<b>203,500</b>	<b>1,221,000</b>	<b>407,000</b>		0	0
<b>Total Reserves &amp; Resources</b>		<b>300,527</b>	<b>1,280,108</b>	<b>513,878</b>			

# DISCLAIMER & CONFIDENTIALITY



This presentation has been prepared by Empire Energy Group Limited (“Empire” or the “Company”). The information in this presentation is information of a general nature and is subject to change without notice. The information in this presentation does not purport to be complete, nor does it contain all of the information which would be required in a prospectus prepared in accordance with the requirements of the Corporations Act 2001 (Cth). It contains information in a summary form only and should be read in conjunction with Empire’s other periodic disclosure announcements to the ASX available at [www.asx.com.au](http://www.asx.com.au).

An investment in Empire shares is subject to known and unknown risks, many of which are beyond the ability of Empire to control or predict. These risks may include, for example, movements in oil and gas prices, a failure to acquire some or all of the targeted acreage, risks associated with the development and operation of the acreage, exchange rate fluctuations, an inability to obtain funding on acceptable terms or at all, loss of key personnel, an inability to obtain appropriate licences, permits and/or other approvals, inaccuracies in resource estimates, share market risks and changes in general economic conditions. Such risks may affect actual and future results of Empire and its shares.

This presentation contains statements, opinions, projections, forecasts, and other material (“forward looking statements”). These statements can be identified by the use of words like ‘anticipate’, ‘believe’, ‘intend’, ‘estimate’, ‘expect’, ‘may’, ‘plan’, ‘project’, ‘forecast’, ‘will’, ‘should’, ‘could’, ‘seek’ and other similar expressions. Forward looking statements may be based on assumptions which may or may not prove to be correct. None of Empire, its respective officers, employees, agents, advisers or any other person named in this presentation makes any representation as to the accuracy or likelihood of fulfilment of the forward looking statements or any of the assumptions upon which they are based and disclaim any obligation or undertaking to revise any forward looking statement, whether as a result of new information, future event or otherwise.

Maps and diagrams contained in this presentation are provided to assist with the identification and description of Empire’s lease holdings and Empire’s intended targets and potential exploration areas within those leases. The maps and diagrams may not be drawn to scale and Empire’s intended targets and exploration areas may change in the future.

All share price information is in Australian dollars (AU\$) and all other dollars values are in United States dollars (US\$) unless stated otherwise.

The information contained in this presentation does not take into account the investment objectives, financial situation or particular needs of any recipient and is not financial product advice. Before making an investment decision, recipients of this presentation should consider their own needs and situation and, if necessary, seek independent professional advice.

To the maximum extent permitted by law, Empire and its respective officers, employees, agents and advisers give no warranty, representation or guarantee as to the accuracy, completeness or reliability of the information contained in this presentation. Further, none of Empire nor its respective officers, employees, agents or advisers accept, to the extent permitted by law, responsibility for any loss, claim, damages, costs or expenses arising out of, or in connection with, the information contained in this presentation. Any recipient of this presentation should independently satisfy themselves as to the accuracy of all information contained herein.

# DEFINITIONS & RESERVES INFORMATION



## Notes to Reserves

- The scope of the Reserve Studies reviewed basic information to prepare estimates of the reserves and contingent resources.
- The quantities presented are estimated reserves and resources of oil and natural gas that geologic and engineering data demonstrate are “In-Place”, and can be recovered from known reservoirs.
- Oil prices for Reserve calculations are based on NYMEX West Texas Intermediate (WTI) as at December 31, 2017.
- Gas prices for Reserve calculations are based on NYMEX Henry Hub (HH) as at December 31, 2017.
- Prices were adjusted for any pricing differential from field prices due to adjustments for location, quality and gravity, against the NYMEX price. This pricing differential was held constant to the economic limit of the properties.
- All costs are held constant throughout the lives of the properties.
- The probabilistic method was used to calculate P50 reserves.
- The deterministic method was used to calculate 1P, 2P & 3P reserves.
- The reference point used for the purpose of measuring and assessing the estimated petroleum reserves is the wellhead.
- “PVO” Net revenue is calculated net of royalties, production taxes, lease operating expenses, and capital expenditures but before Federal Income Taxes.
- “PV10” is defined as the discounted Net Revenues of the company’s reserves using a 10% discount factor.
- “1P Reserves” or “Proved Reserves” are defined as Reserves which have a 90% probability that the actual quantities recovered will equal or exceed the estimate.
- “Probable Reserves” are defined as Reserves that should have at least a 50% probability that the actual quantities recovered will equal or exceed the estimate.
- “Possible Reserves” are defined as Reserves that should have at least a 10% probability that the actual quantities recovered will equal or exceed the estimate.
- Prospective Resource P(50) - unrisked, is the estimated quantities of petroleum that may potentially be recovered by the application of future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further exploration appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable hydrocarbons.
- Utica shale gas potential resources have only been calculated for the region where drill data is available. Very few wells have been drilled into the Utica in Western NY and NW Pennsylvania. Estimates for GIP have been made were the few existing wells have been drilled. Empire holds additional acreage outside the current potential resource region. It is expected that as with shale characteristics, the shale formations will continue within the remaining acreage. The potential GIP may increase if more data was available.
- “Bbl” is defined as a barrel of oil.
- “Boe” is defined as a barrel of oil equivalent, using the ratio of 6 Mcf of Natural Gas to 1 Bbl of Crude Oil. This is based on energy conversion and does not reflect the current economic difference between the value of 1 Mcf of Natural Gas and 1 Bbl of Crude Oil.
- “D&C” means drilled and completed and “F&D” means cost of finding and developing a project.
- “EBITDAX” means Earnings Before Interest, Tax, Depreciation/Depletion, Amortization & Exploration.
- “LOE” means lease operating expenses.
- “M” is defined as a thousand.
- “MM” is defined as a million & “MMBoe” is defined as a million barrels of oil equivalent.
- “Mcf” is defined as a thousand cubic feet of gas & “MMcf” is defined as a million cubic feet of gas.
- All volumes presented are net volumes and have had subtracted associated royalty burdens which means the Net revenue interest or “NRI”..

## Qualified petroleum reserves and resources evaluators

*The information in this report which relates to the Company’s reserves is based on, and fairly represents, information and supporting documentation prepared by or under the supervision of the following qualified petroleum reserves and resources evaluators, all of whom are licensed professional petroleum engineer’s, geologists or other geoscientists with over five years’ experience and are qualified in accordance with the requirements of Listing Rule 5.42:*

Name	Organisation	Qualifications	Professional Organisation
Mel Hailey	Graves & Co Consulting, LLC	BPE	SPE*
John P Dick	Pinnacle Energy Services, LLC	BPE	SPE*
Wal Muir	Muir and Associate P/L	BSc, MBA	PESA**

\* SPE: Society of Petroleum Engineers \*\*PESA: Petroleum Exploration Society of Australia

*None of the above evaluators or their employers have any interest in Empire Energy E&P, LLC or the properties reported herein. The evaluators mentioned above consent to the inclusion in the report of the matters based on their information in the form and context in which it appears.*