

# Norwest Energy NL Company Overview



**SEAPEX Singapore - 2016**

**Shelley Robertson**  
**Asset Manager**  
**April 2016**



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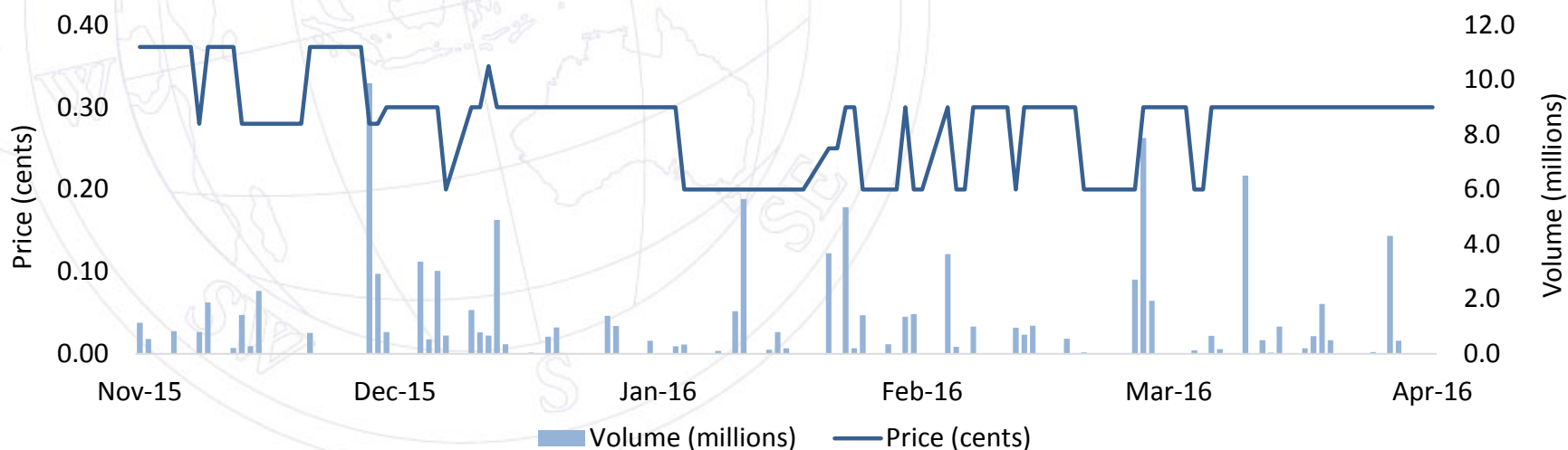
### **Corporate details**

ASX code	NWE
Share price	0.3 cents
Ordinary shares	2,050,569,394
Market capitalisation	\$6.15 million
Cash (at January 2016)	\$1.3 million
Debt	Nil

### **Board and management**

Michael Fry	Non-Executive Chairman
David Kennedy	Non-Executive Director
Ronald Currie	Non-Executive Director
John Annand	GM – Corporate & Commercial
Shelley Robertson	Asset Manager

### **Share price (6 months)**



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# THE PERTH BASIN

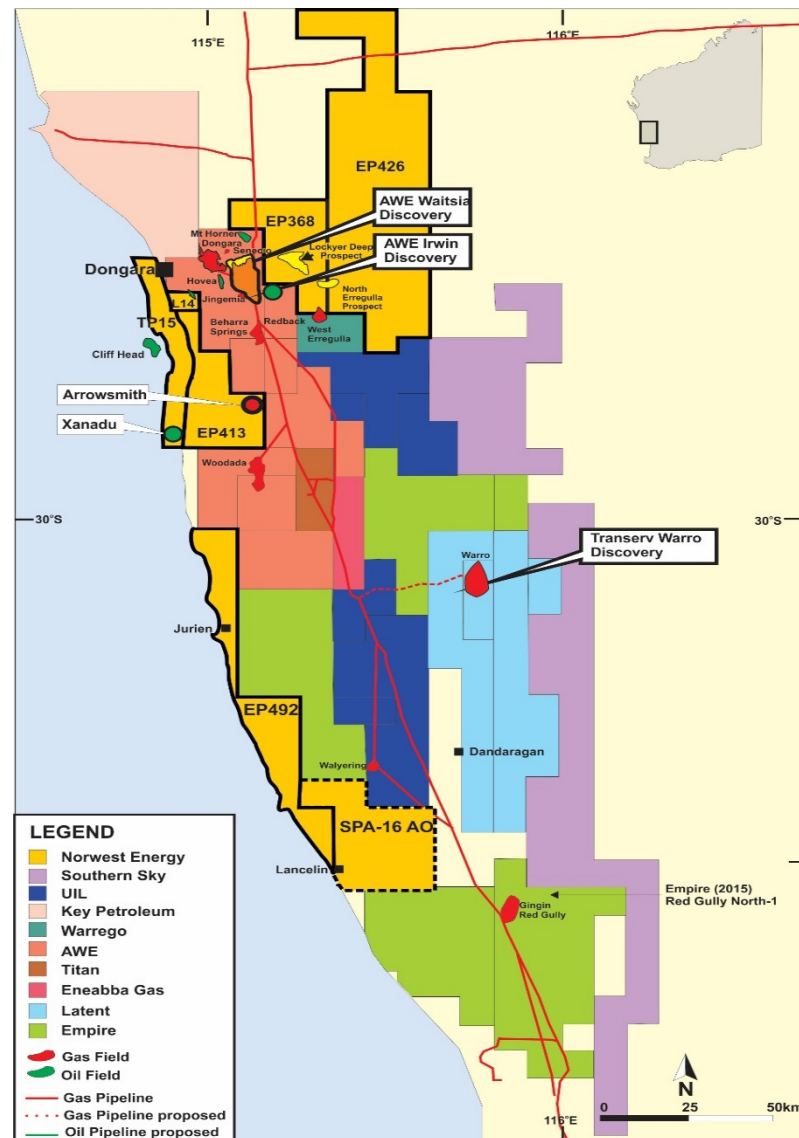






## Perth Basin – Overview

- Proven hydrocarbon province with multiple producing oil and gas fields
- Even though underexplored, since 1990 the Perth Basin has demonstrated a 1 in 4 chance of commercial success
- Recent drilling success highlights the opportunity for major new discoveries to be made (Waitsia, Warro, Red Gully & Arrowsmith)
- In close proximity to pipeline infrastructure servicing the Western Australian domestic gas market
- Attractive economics resulting from falling service and drilling costs within a strong gas market
- The Perth Basin continues to position itself to become a centre of growing exploration, development and corporate activity

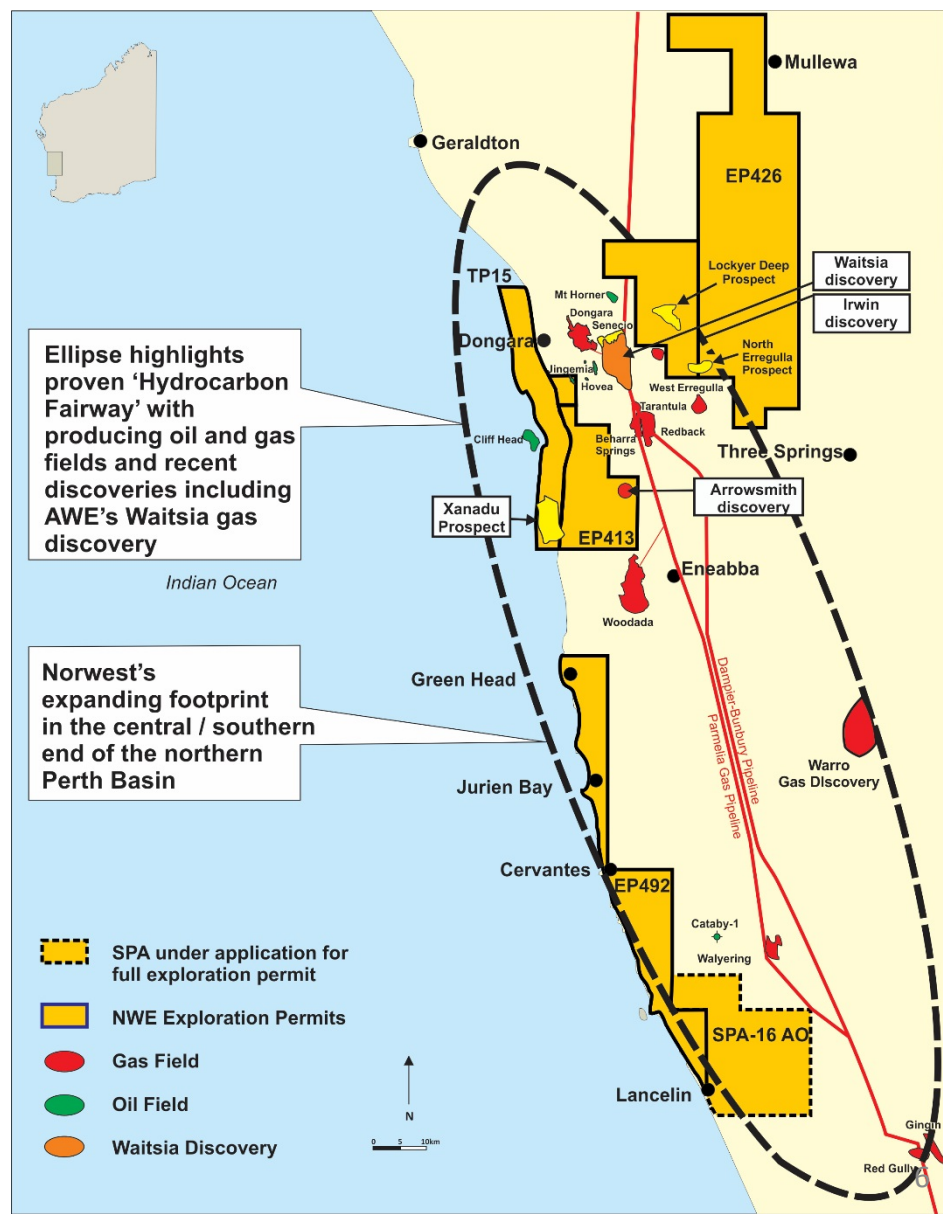




Potential for participating in 3 wells:

- Drill-ready prospect Xanadu in shallow waters within TP/15 - a 160MMbbl prospective recoverable resource.
- Lockyer Deep prospect on EP368 a near-term drill ready target focused on potential extension of the Waitsia play
- Processing and interpretation of Arrowsmith 3D now complete – new conventional leads discovered in the southern end of the permit.

**Over 3100km<sup>2</sup> net to Norwest provides a large footprint containing a diverse portfolio of conventional and unconventional oil and gas projects**



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# PROJECT PORTFOLIO





Permit	Location	Type of Permit	Area (100%)	Norwest %
NORTHERN PERTH BASIN				
EP368	Perth Basin, WA	Onshore	600.3 km <sup>2</sup>	20%
EP426	Perth Basin, WA	Onshore	2360.0 km <sup>2</sup>	22.22%
EP413	Perth Basin, WA	Onshore	508.3 km <sup>2</sup>	27.945%
L14	Perth Basin, WA	Onshore	39.8 km <sup>2</sup>	6.278%
TP/15	Perth Basin, WA	Offshore	645.8 km <sup>2</sup>	100%
EP492	Perth Basin, WA	Onshore	860.0 km <sup>2</sup>	100%
SPA-016 AO	Perth Basin, WA	Onshore	805.0 km <sup>2</sup>	100%
TOTAL AREA NET TO NORWEST    3,100.1 KM <sup>2</sup> (766,261.4 ACRES)				
TIMOR SEA				
AC/L6 (ROYALTY)	Vulcan Sub-Basin, NT	Offshore	252.1 km <sup>2</sup>	1.25% ORRI
UNITED KINGDOM				
P2265	Wessex Basin, UK	Offshore	160 km <sup>2</sup>	65%



# TP/15 Xanadu Prospect

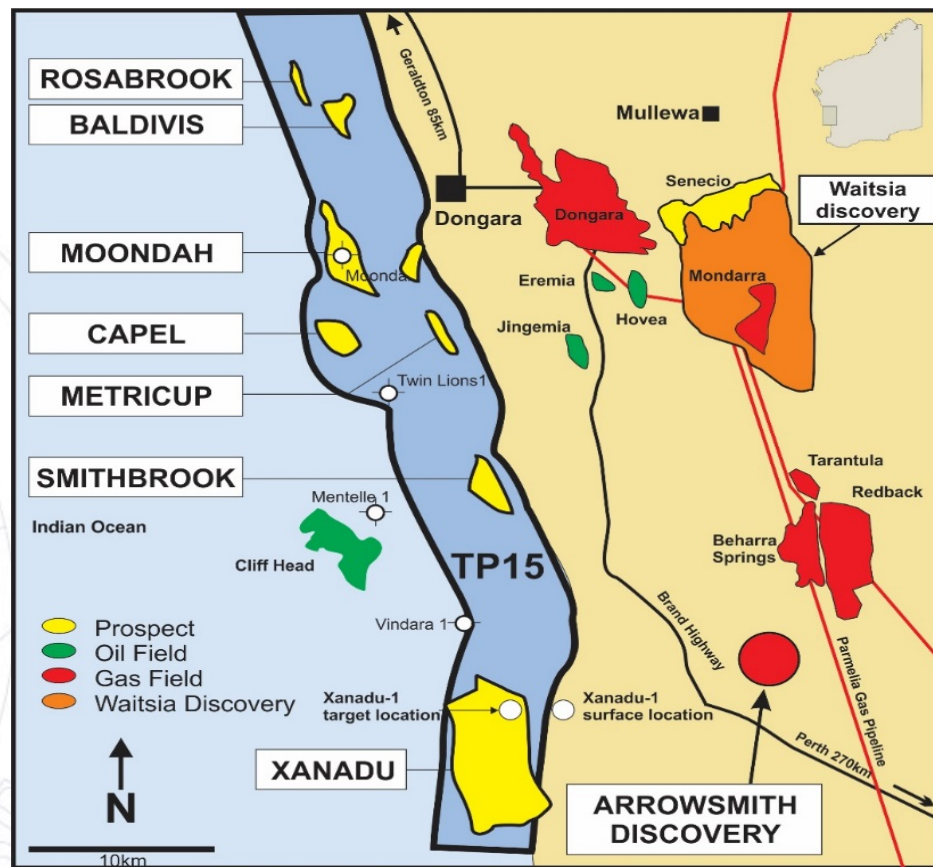
**Un-risked Prospective Recoverable Resource: 160 MMbbls**

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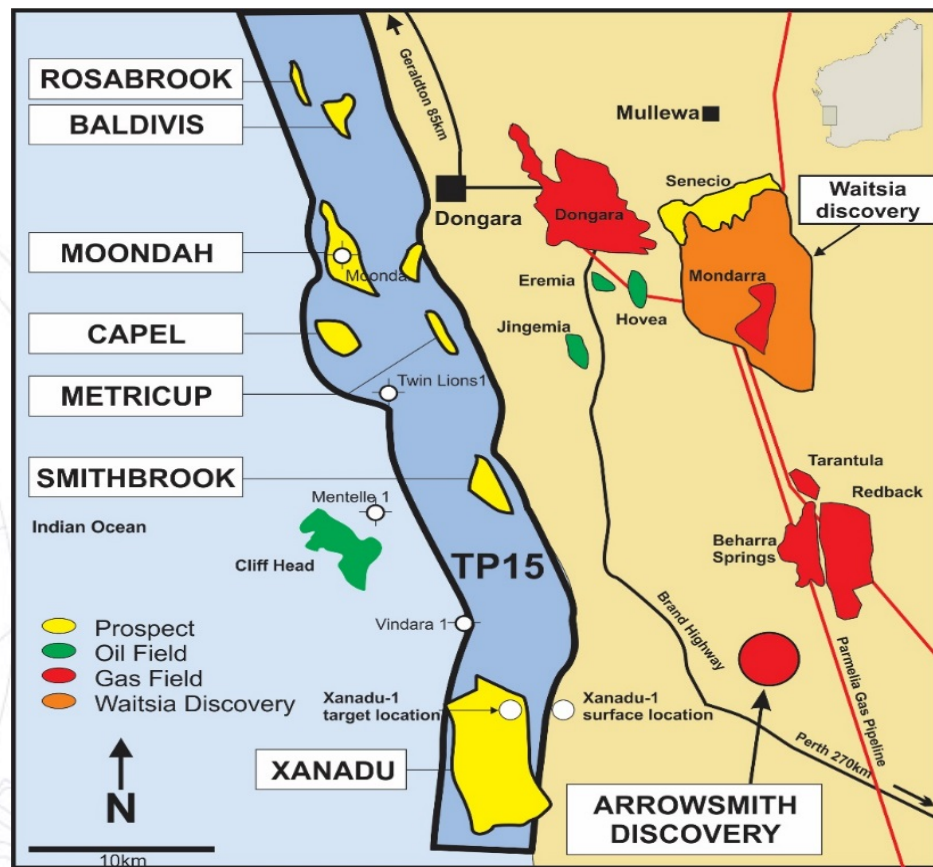
- The Xanadu Prospect lies within TP/15, located in the offshore northern Perth Basin approximately 250 km north of Perth.
- The permit occupies the 3 nautical mile wide state territorial waters of Western Australia and covers an area of 645.8 km<sup>2</sup>.
- Xanadu is a **conventional oil play**, located near the southern end of the permit.
- Xanadu has an un-risked Best Estimate prospective recoverable resource of 160MMbbls, with an estimated cost to drill of AUD\$7M.



Un-risked Prospective Resource: recoverable volumes oil (mmstb)*			
Reservoir	Low estimate	Best estimate	High estimate
Dongara Sandstone	3	12	22
Irwin River Coal Measures	13	88	159
High Cliff Sandstone	29	60	256
Total	45	160	437



- Unique opportunity to drill relatively low cost offshore play from onshore, with high equity position available.
- Since 2001 this play has resulted in **four oilfield discoveries** in the vicinity, namely Cliff Head, Jingemia, Hovea and Eremia.
- Excellent access to infrastructure and situated only 250km north of Perth, with BP Oil Refinery currently processing oil from surrounding fields delivered via road transport.
- Fast-track to development opportunity.

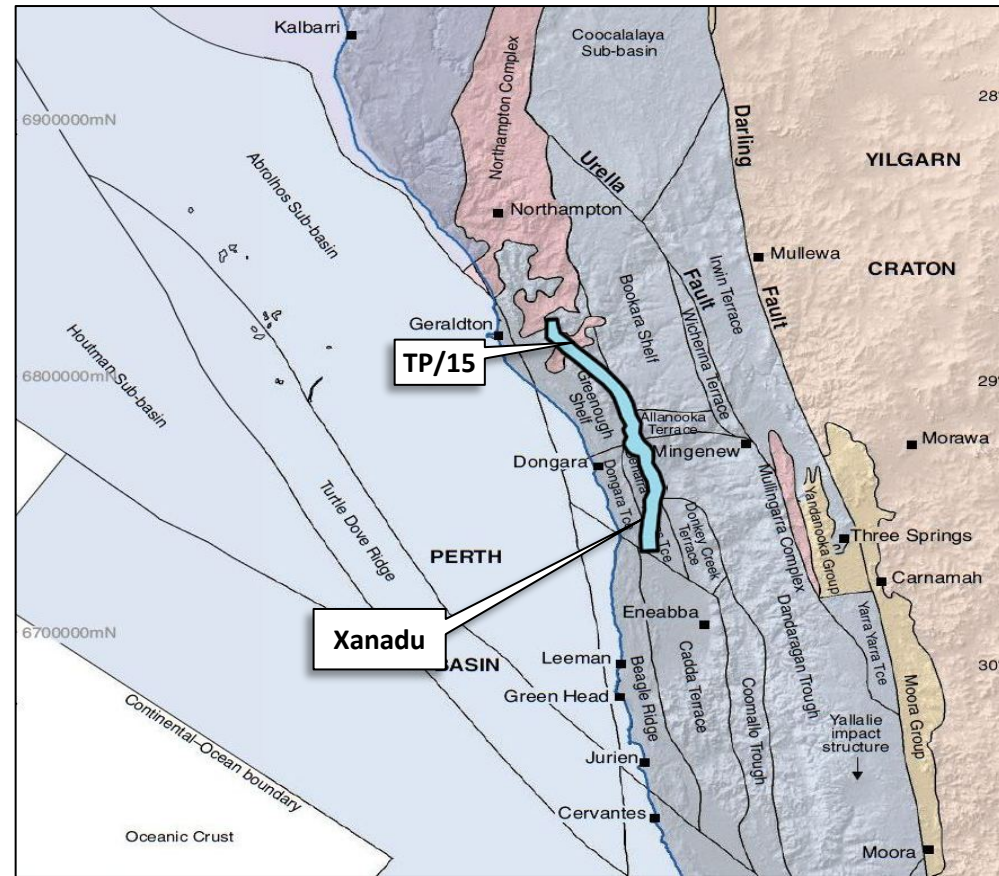


Un-risked Prospective Resource: recoverable volumes oil (mmstb)*			
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High Cliff Sandstone	29	60	256
Total	45	160	437

\*as per ASX announcement dated 29 Oct 2014 (50% recovery factor assumed)

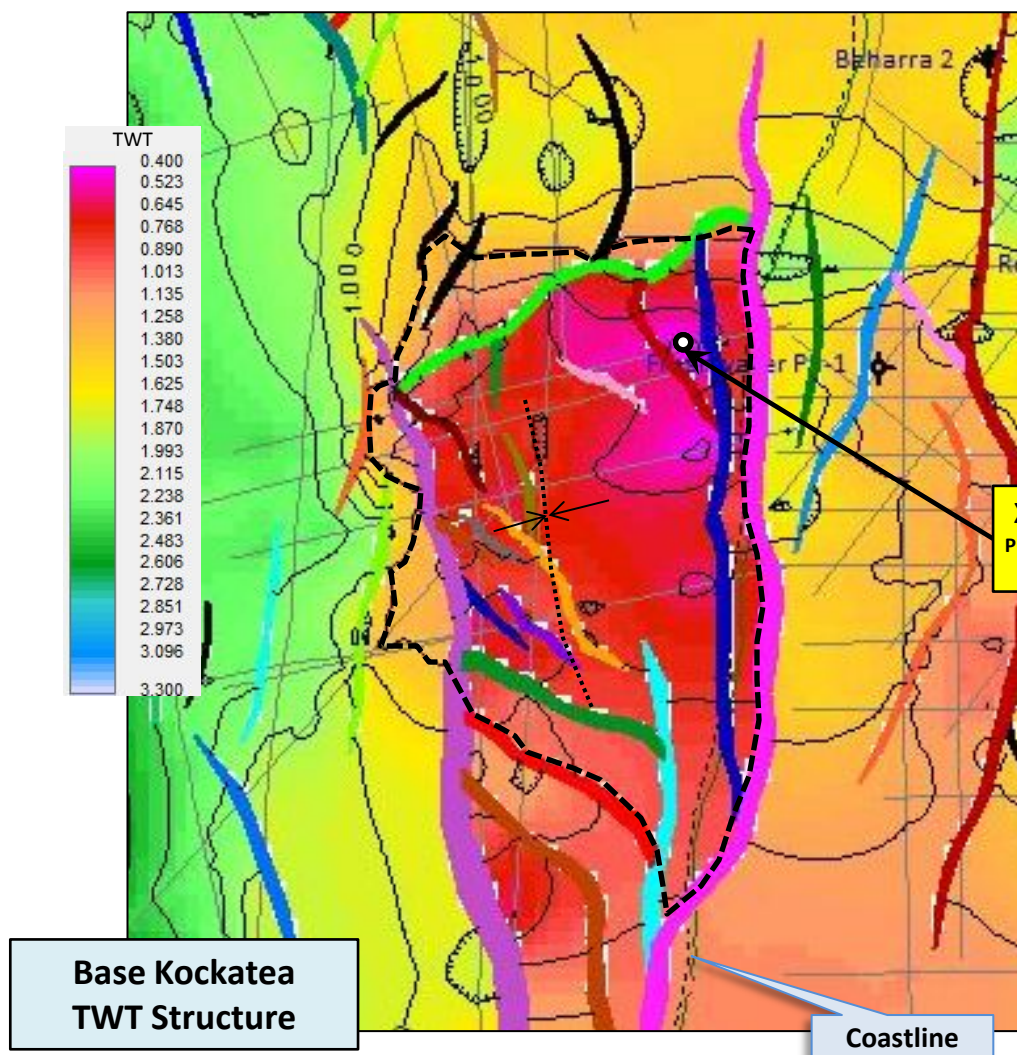


- The Xanadu Prospect targets Permo-Triassic sands at a depth of approximately 800m. It is located in very shallow water immediately adjacent to the coast.
- Seismic lines in the vicinity of the Xanadu Prospect have been acquired over the past 50 years.
- A Full Tensor Gravity survey has been conducted, confirming the presence of a strong positive gravity anomaly coincident with the seismically mapped structural high.
- Regional seal is provided by a Kockatea Shale. The thickness of this unit is expected to exceed the throw on the bounding faults, thus providing cross-fault seal.
- Potential reservoir intervals exist within the Dongara/Wagina Sandstone, Irwin River Coal Measures and High Cliff Sandstone.

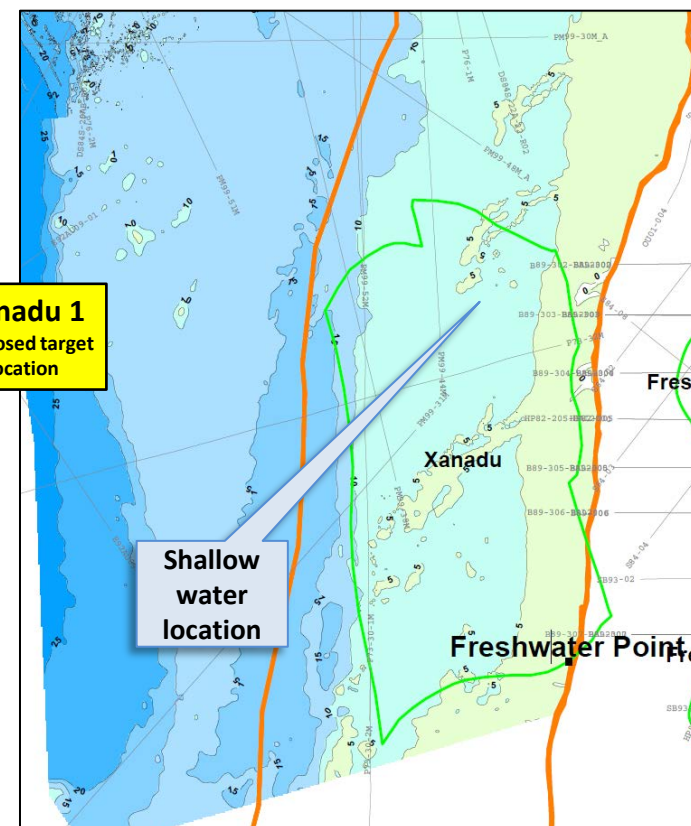




## Prominent Permian Structure



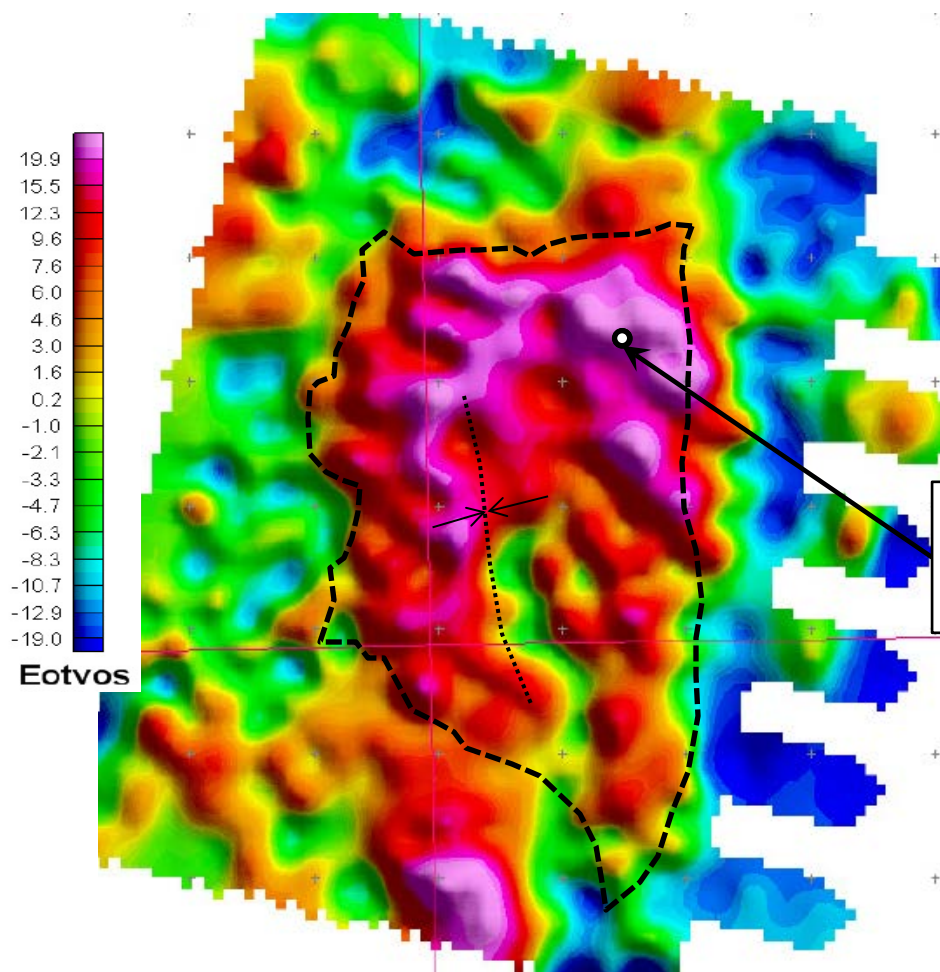
This slide depicts seismically derived structural definition at the top of the Permian reservoir sequence: Dongara/Wagina, IRCM and Kingia/High Cliff







## Prominent Gravity Expression



The gravity expression supports seismic mapping, in terms of both the overall form of the Permian horst and the identification of a crest in the NE corner

**Xanadu 1  
Proposed  
target location**

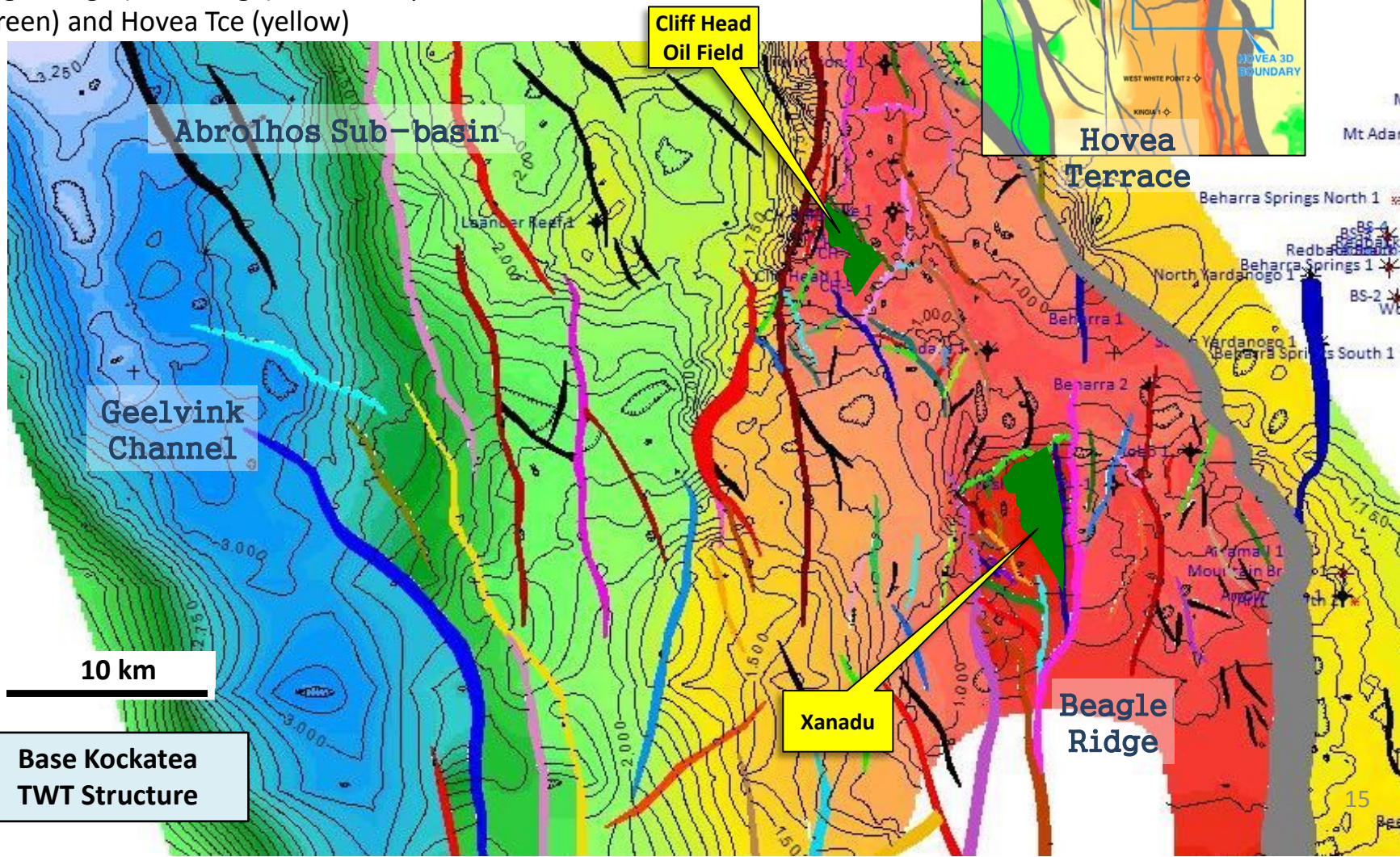
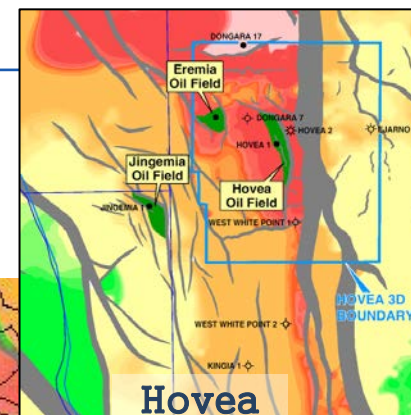




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## TP/15 - Xanadu Prospect

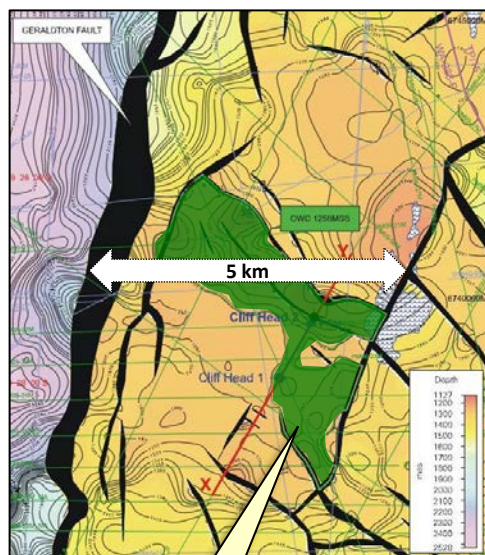
Xanadu Prospect in its regional structural setting, based on seismic mapping, illustrating its proximity and relative size of oil fields in the vicinity, and location on the Beagle Ridge (red-orange), which is up-thrown between Abrolhos Sub-basin (blue-green) and Hovea Tce (yellow)





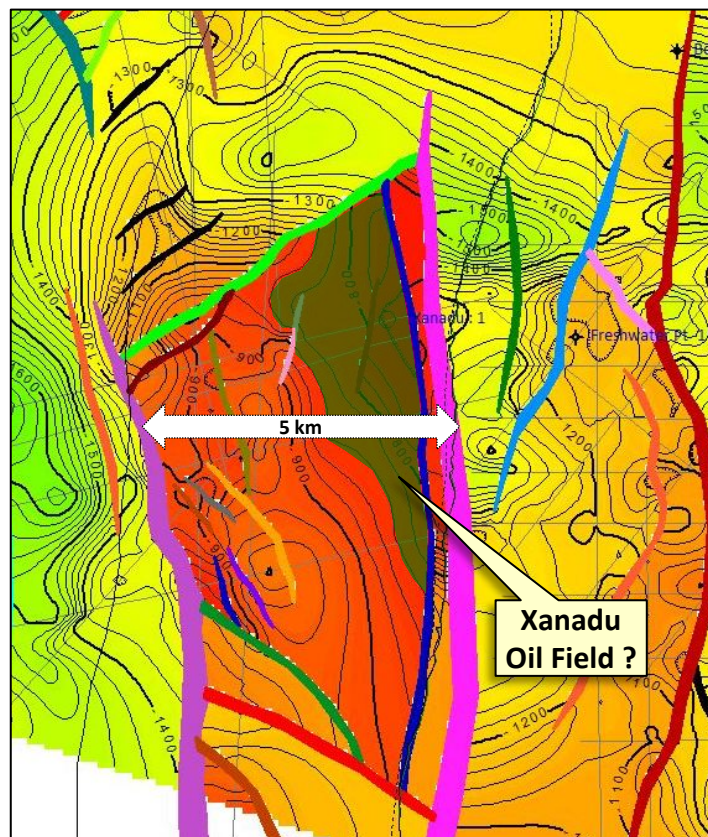


Cliff Head

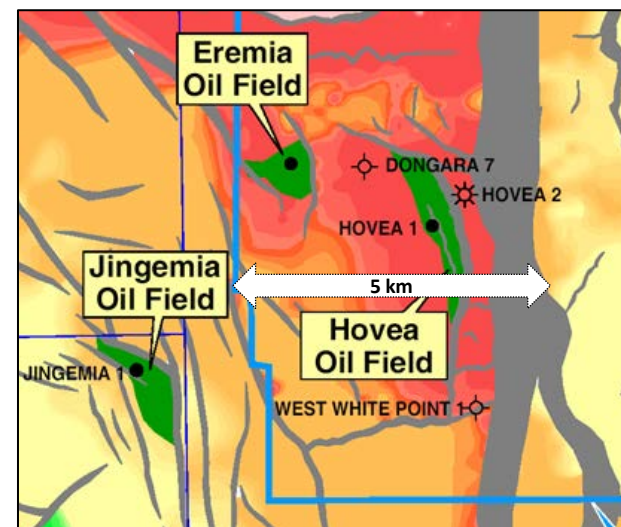


Cliff Head  
Oil Field

Xanadu



Hovea



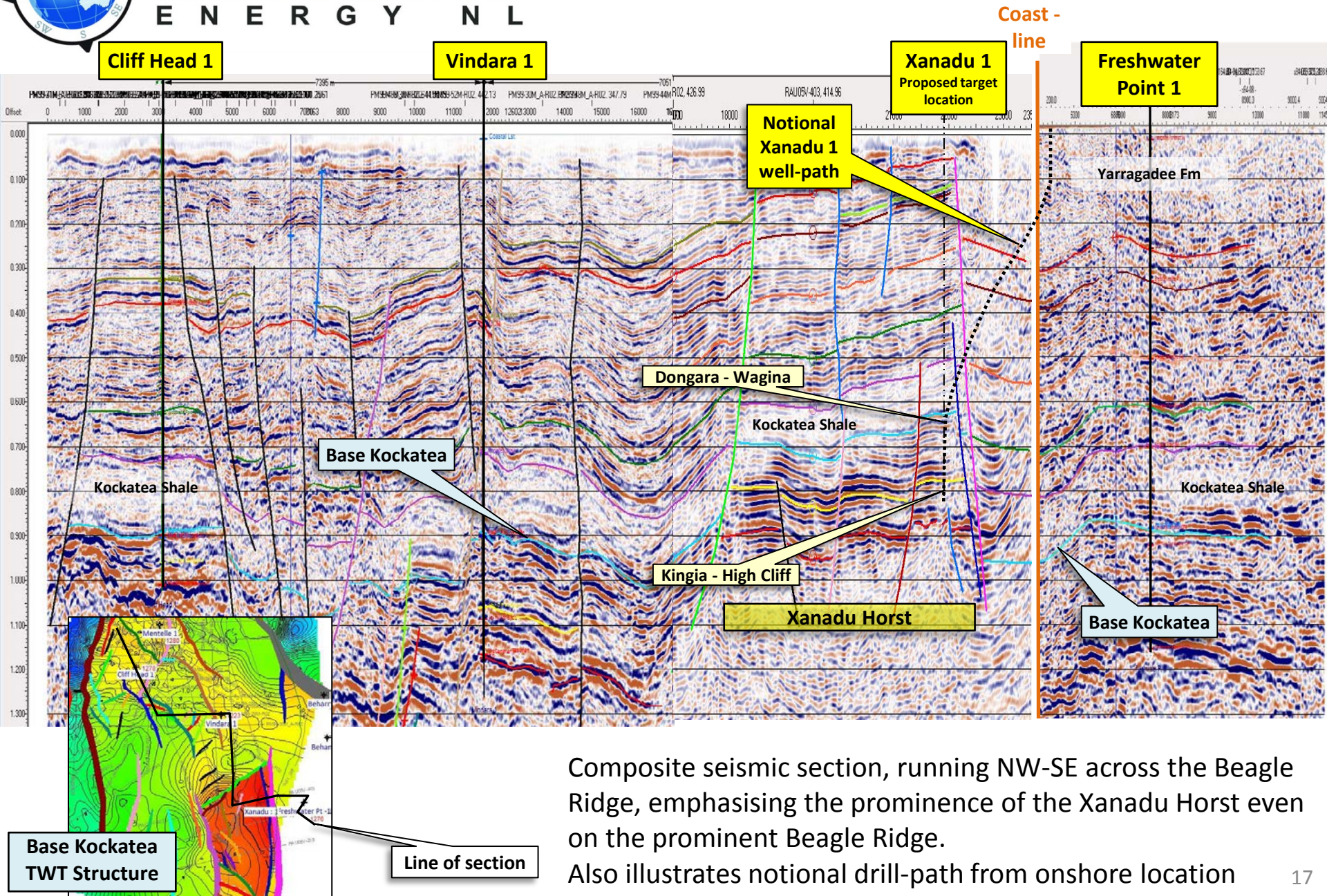
Base Kockatea Depth Structure





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# Drill from Onshore



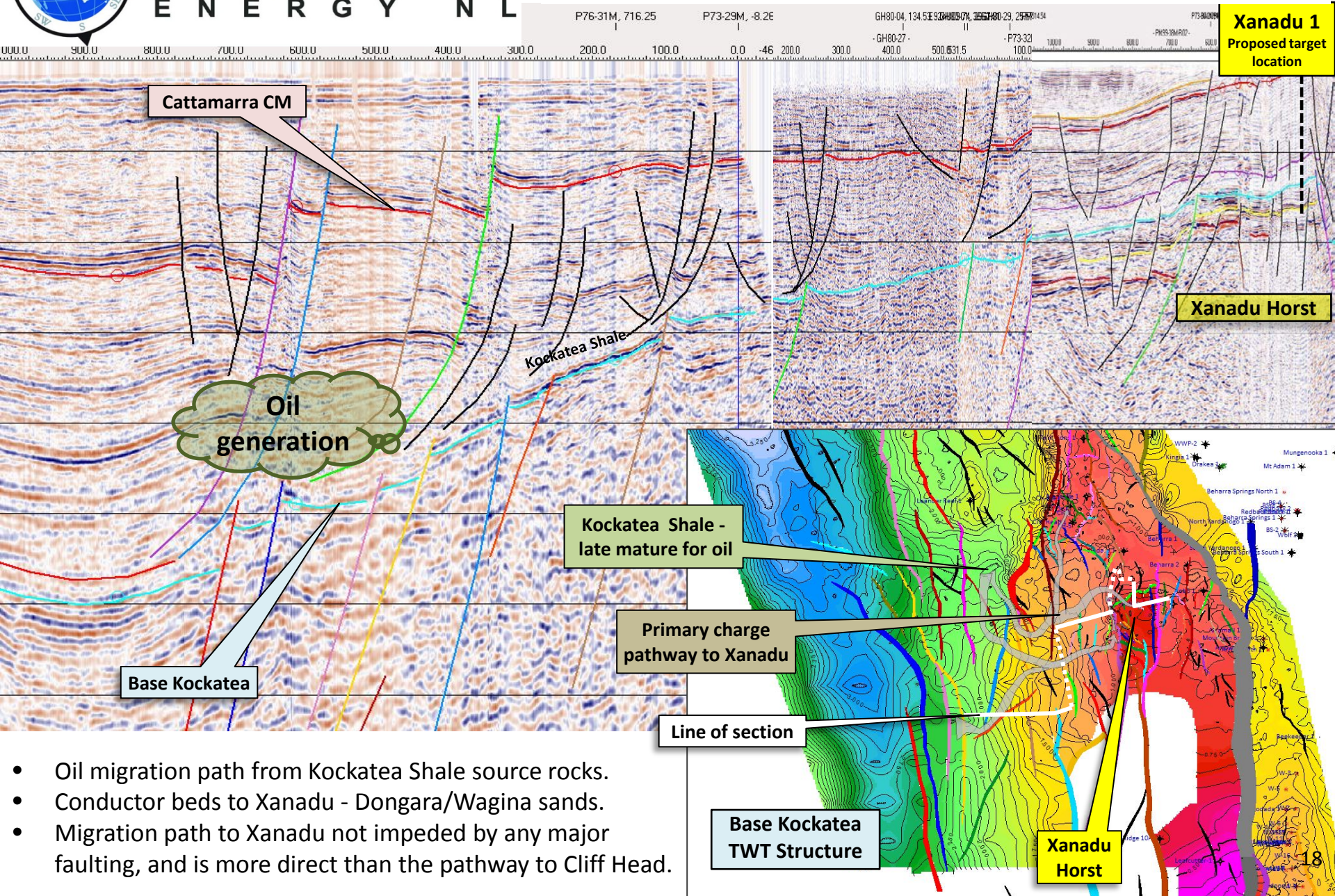
Composite seismic section, running NW-SE across the Beagle Ridge, emphasising the prominence of the Xanadu Horst even on the prominent Beagle Ridge. Also illustrates notional drill-path from onshore location





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# Effective Migration Pathways



- Oil migration path from Kockatea Shale source rocks.
- Conductor beds to Xanadu - Dongara/Wagina sands.
- Migration path to Xanadu not impeded by any major faulting, and is more direct than the pathway to Cliff Head.





Recoverable volumes (mmstb)			
<u>Reservoir</u>	<u>Low Case</u>	<u>Mid Case</u>	<u>High Case</u>
Dongara Sst	3	12	22
Irwin River CM	13	88	159
High Cliff Sst	29	60	256
<b>Totals</b>	<b>45</b>	<b>160</b>	<b>437</b>

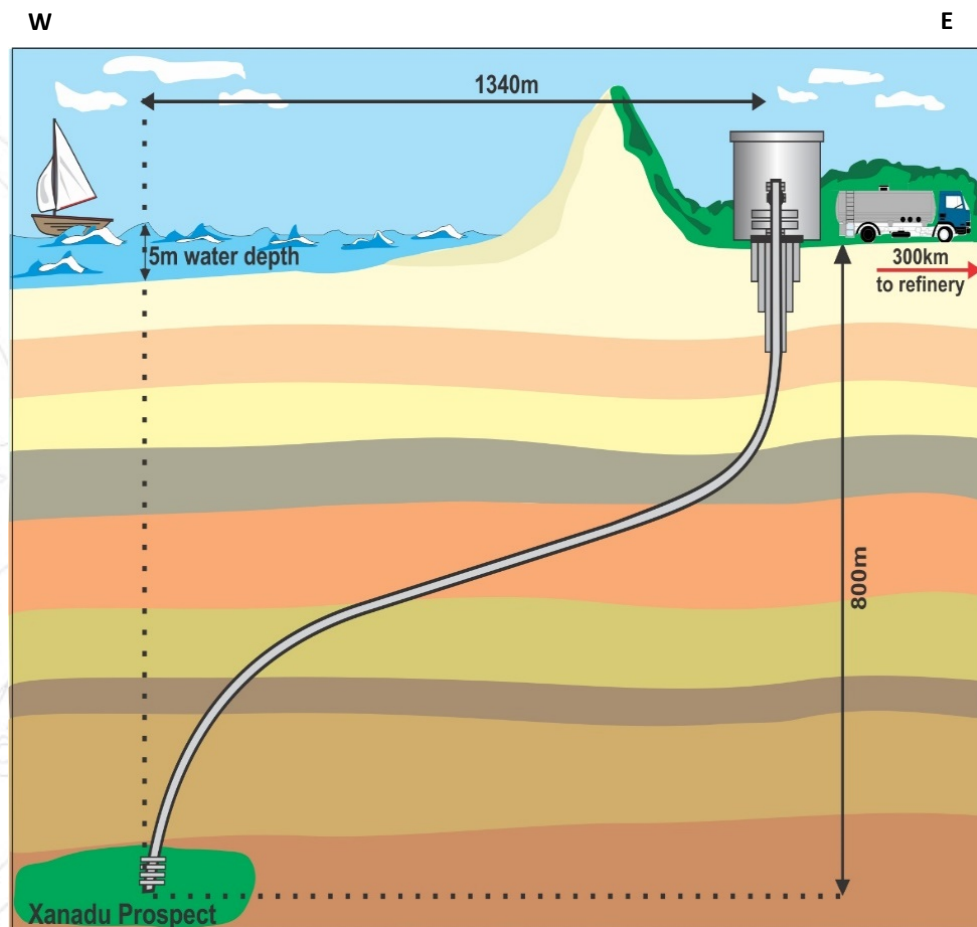
<b>Chance of Success</b> (Dongara Sst reservoir)	<b>14%</b>
<b>Chance of Success</b> (IRCM reservoir)	<b>13%</b>
<b>Chance of Success</b> (High Cliff Sst reservoir)	<b>6%</b>



- Expected timing to drill early 2017 – fast-track to potential discovery
- Estimated cost of well AUD\$7M
- Proposed onshore development concept, low capex
- Planning and approvals process has commenced
- Suitable drilling rig available

**Low cost project with best estimate unrisks recoverable 160MMbbls**

## Development Concept



**Norwest is seeking a farm-in partner to participate in Xanadu.**

# EP368 / 426

Two prospects identified:

Lockyer Deep

North Erregulla Deep

Best Case Estimate 58 BCF

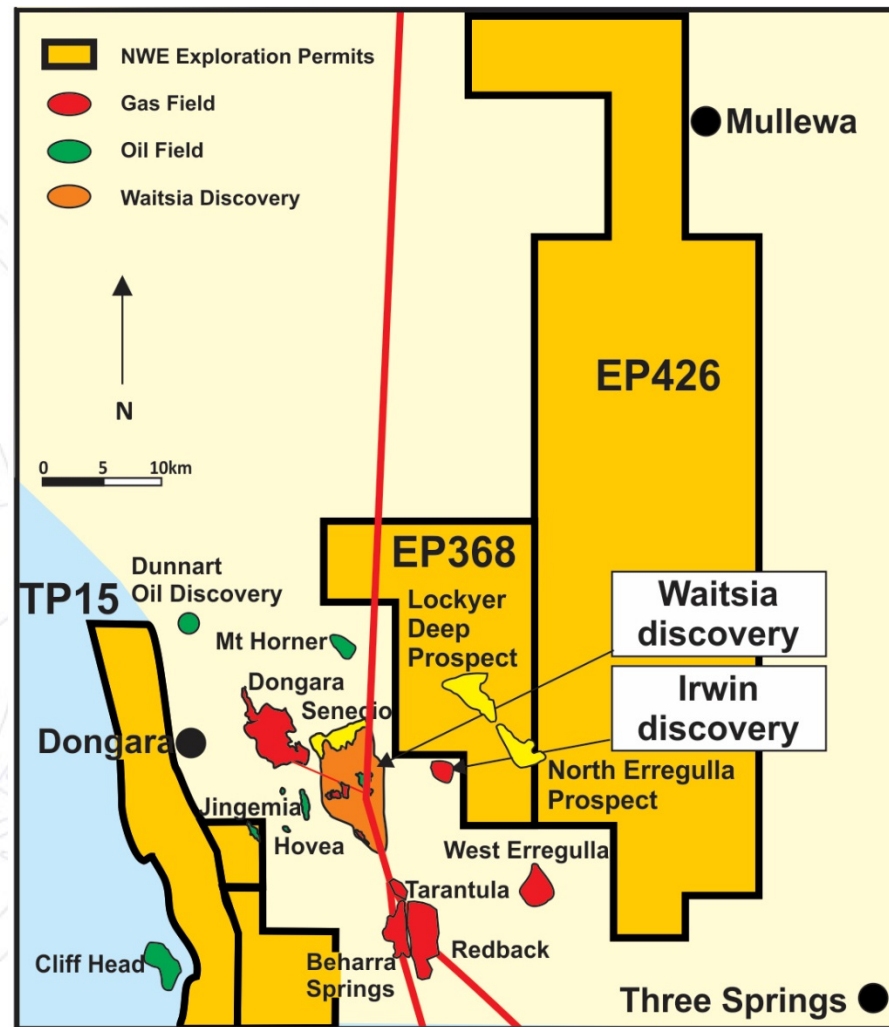
Best Case Estimate 55 BCF





- An airborne 'Black Swan' aerial geophysical survey was completed in Q2 CY2015 over EP368 & EP426
- Lockyer Deep prospect identified as a potential extension of the Waitsia – Kingia Formation play
- An additional structure - North Erregulla Deep located adjacent to Lockyer Deep has been matured to prospect status at the Kingia / High Cliff Sandstone level
- Additional prospective trends highlighted in the aerial survey are also being worked up

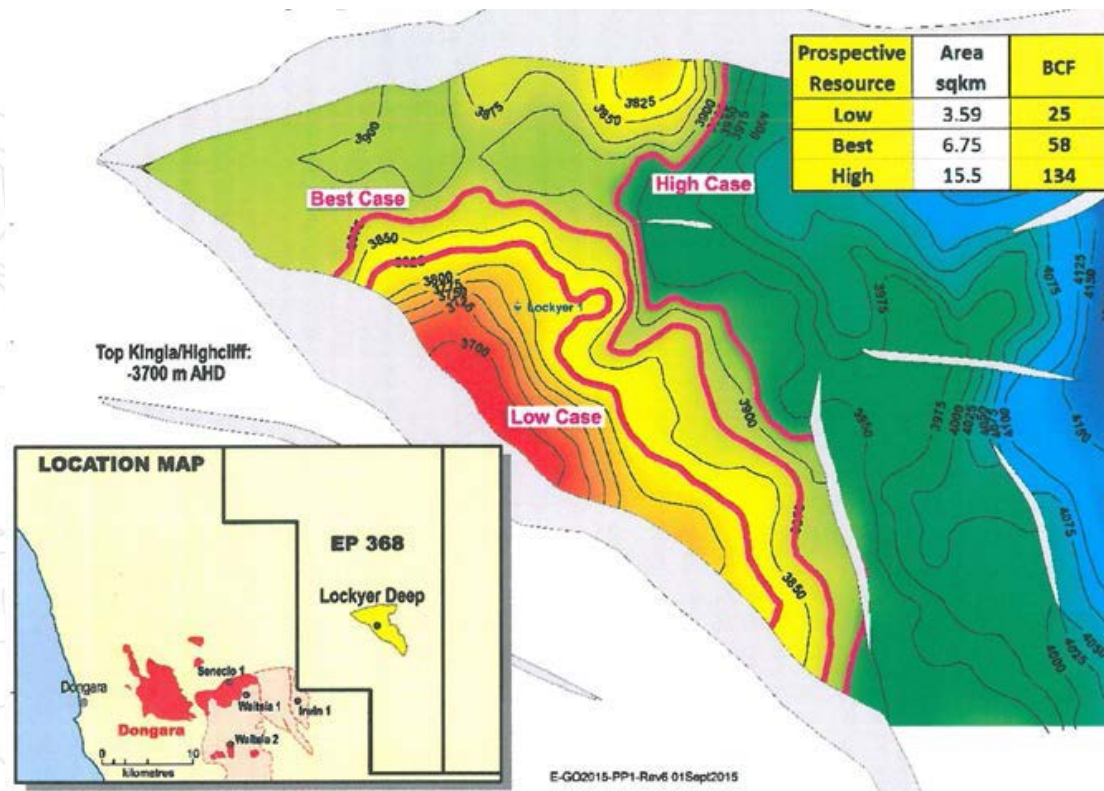
	EP368	EP426
Norwest	20%	22.22%
Empire Oil & Gas (Operator)	80%	77.78%





## Lockyer-Deep

- The Lockyer-North Erregulla trend was proved oil-bearing at the Dongara sandstone level by the historic North Erregulla-1 and Lockyer-1 wells, however the deeper stratigraphic levels of the Kingia and HCSS were not reached in these wells and so remain untested.
- These are the targets that yielded a recent major gas discovery at Waitsia into the west.
- AWE previously announced the combined flow test results of the Waitsia-1 well from the High Cliff Sandstone and Kingia Formation totalled over 50 mmscf/d.



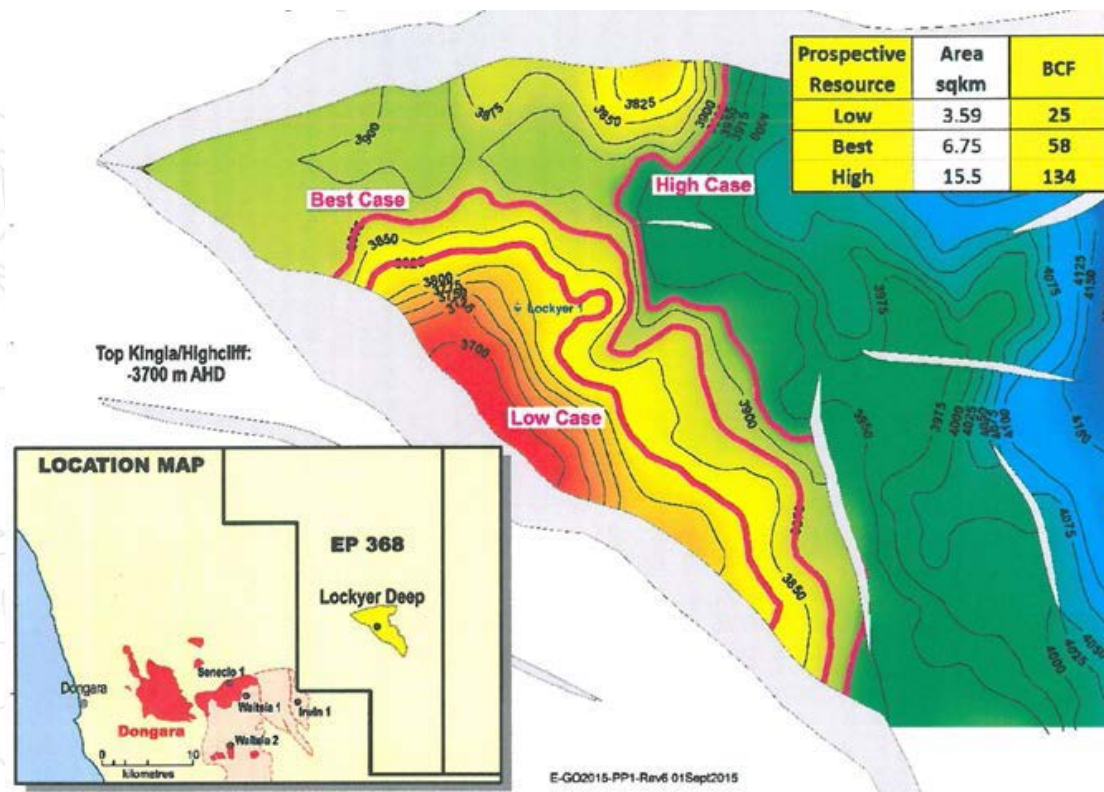
1. Refer Empire Oil and Gas NL (ASX: EGO) Investor Presentation released to ASX on 2nd September 2015





## Lockyer-Deep

- The extent of the Waitsia play extending into EP368 remains to be confirmed however results of AWE's Irwin-1 well suggest that the Kingia reservoir fairway increases in thickness to the east and thus potentially into EP368
- Lockyer Deep is a medium risk well, targeting between 25 and 134 BCF, with a best case estimate of 58 BCF<sup>1</sup>
- Operator Empire Oil and Gas reports that the Lockyer Deep well is expected to be drilled in the second half of 2016, subject to funding.

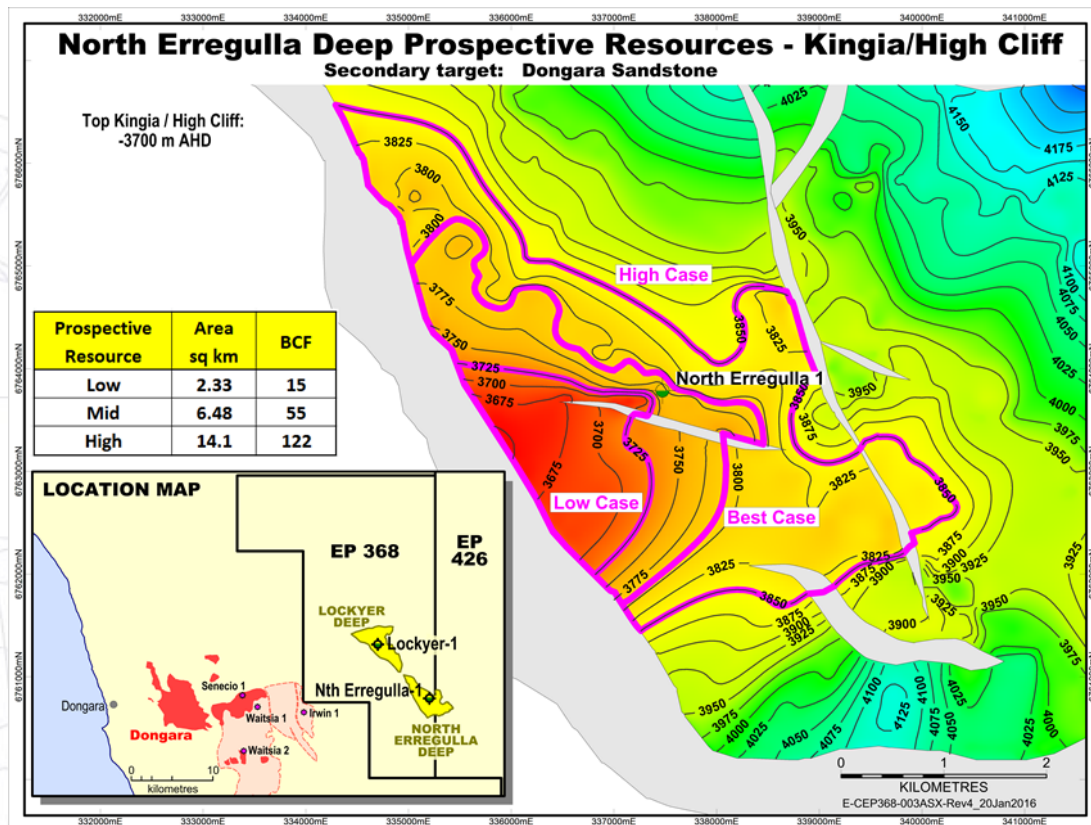


1. Refer Empire Oil and Gas NL (ASX: EGO) Investor Presentation released to ASX on 2nd September 2015



## North Erregulla Deep

- An additional structure, North Erregulla Deep, located adjacent to Lockyer Deep has now been matured to prospect status at the Kingia / High Cliff Sandstone level.
- North Erregulla Deep is located on trend with Lockyer Deep, and extends from EP368 into EP426.
- North Erregulla Deep has estimated prospective resources of between 15 and 122 BCF, with a best case estimate of 55BCF<sup>2</sup>, and represents an immediate follow up prospect should Lockyer Deep-1 be successful.



# EP413 – Arrowsmith Project

**Prospective Gross Recoverable Resource 2.6 TCF\***

**Contingent Gross Recoverable Resource 316 BCF\***

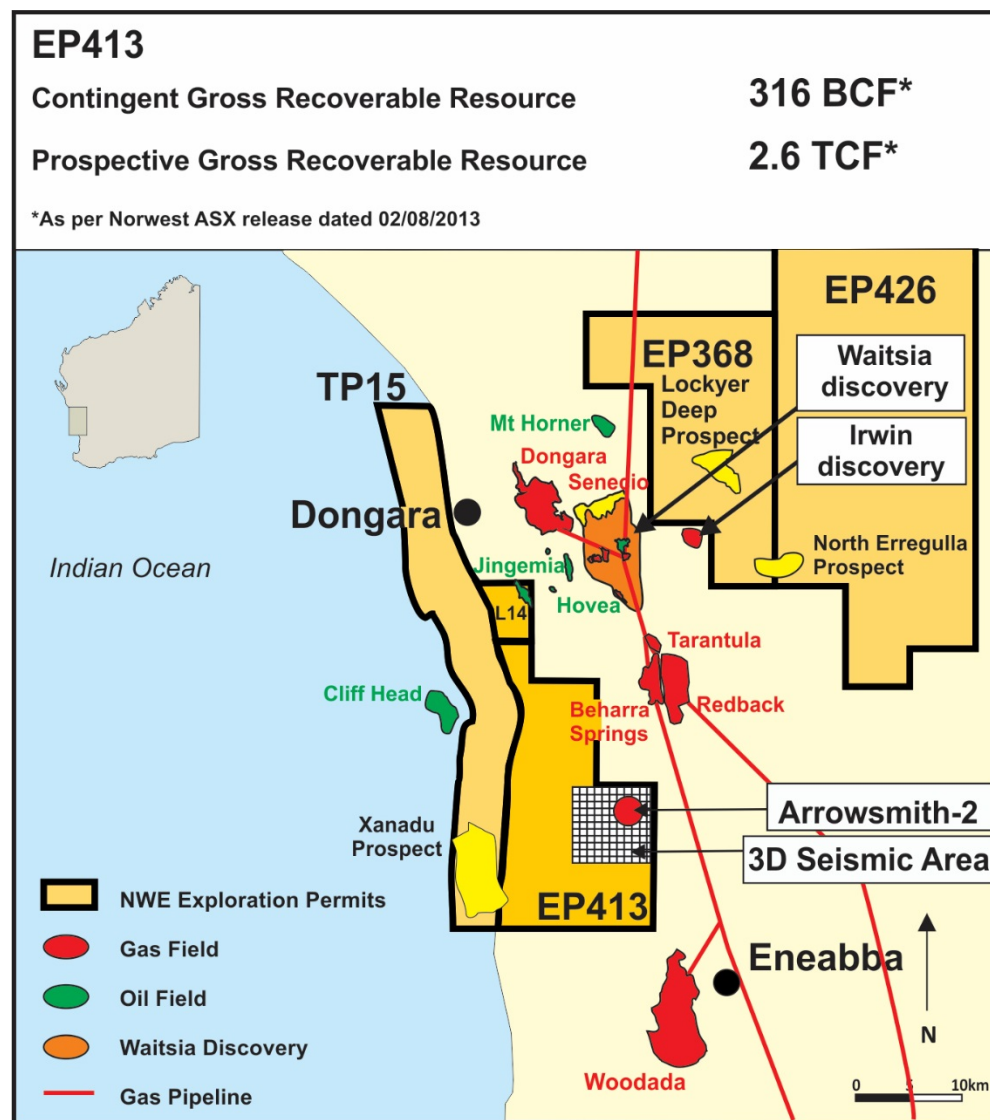


\* As per Norwest ASX release dated 02/08/2013





- EP413 is located approximately 300km north of Perth.
- The Arrowsmith-2 well was drilled in mid-2011 to test the shale gas potential within the region.
- The well was hydraulically stimulated in four formations; the High Cliff Sandstone, the Irwin River Coal Measures, the Carynginia Formation and the Kockatea Shale, with the well flowing at a maximum co-mingled flow rate of 3.5 MMscf/d.
- Testing on Arrowsmith-2 was completed in early 2014 with results high-grading two intervals for development; the Carynginia Formation and the Irwin River Coal Measures.

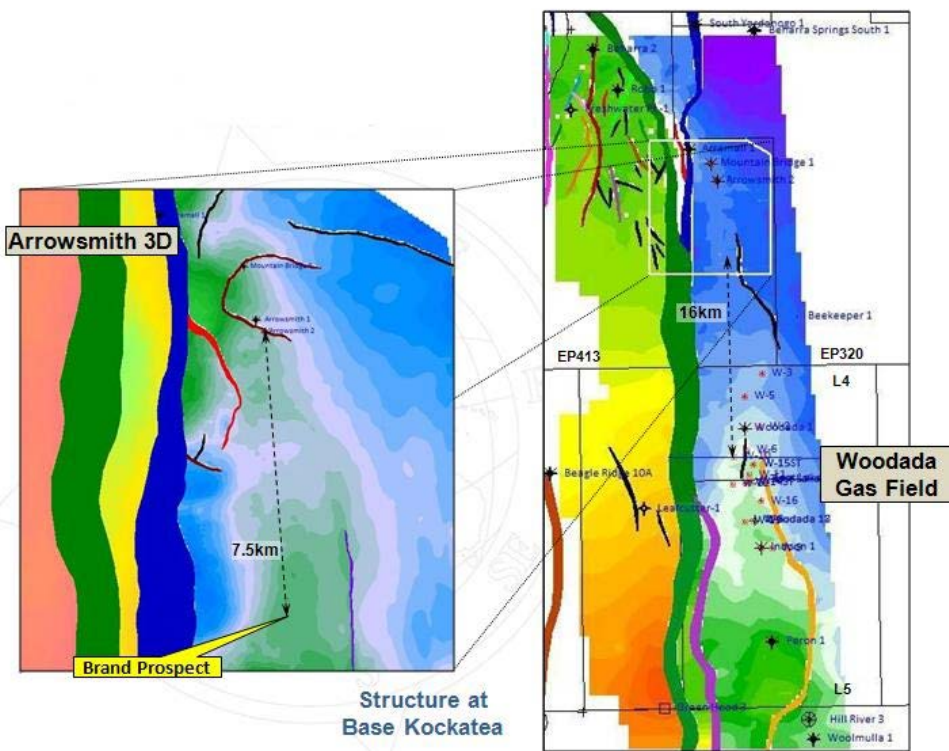




- During 2015, Norwest completed a 3D seismic acquisition survey.
- The survey was designed to assess the extent of the resource surrounding Arrowsmith-2.
- Processing of the 3D dataset is also complete, including pre-stack depth migration and fracture analysis.
- Results indicate a substantial improvement in structural definition, providing a greatly improved understanding of the geology within the permit boundaries, and with confirmation that the geology supports ongoing development plans for the permit.
- The fracture analysis indicates an increased presence of natural fractures to the southern end of the block, meaning increased natural gas flow is likely from this area.



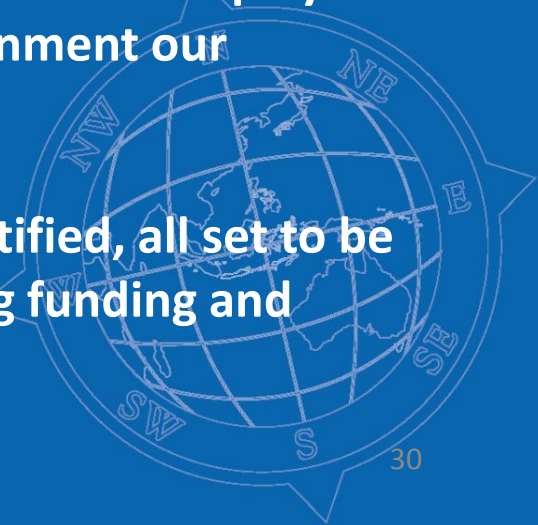




- An unexpected outcome from the 3D seismic survey was the discovery of additional prospectivity in the southern end of the permit, approximately 7 km south of Arrowsmith-2 on the north-plunging Permian anticline, located on the Arrowsmith-Woodada Permian Terrace.
- This prospect targets tight gas in the Kockatea, Beekeeper, Carynginia, IRCM and HCSS, with conventional gas possible from the naturally fractured Carynginia.
- On the basis of similarities in structural form and seismic character with that seen further south over the Woodada Gas Field, there is also the potential for stratigraphically trapped conventional gas.

# In Summary

- Norwest continues to retain a large footprint in the northern Perth Basin, with a net acreage position of 3,100km<sup>2</sup>, containing seven permits with conventional and unconventional oil and gas prospects. Norwest's exploration portfolio is considered to contain a number of highly prospective targets, and the company's focus remains to be the realisation and development of these assets.
- There is currently a heightened focus between northern Perth Basin companies and service providers to work together to ensure an ongoing exploration program continues in the Basin. Norwest continues to play a proactive role to ensure that in a difficult market environment our exploration objectives can still be met.
- Norwest currently has three near-term drill targets identified, all set to be drilled within the next 12-18 months, subject to securing funding and regulatory approvals.





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**For more information  
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