

ASX:EEG

Material Beetaloo Resource Upgrade

22 February 2021



Level 19, 20 Bond Street
Sydney NSW 2000

Empire Energy Group Limited (“Empire”) is pleased to advise shareholders that Netherland, Sewell & Associates, Inc. (“NSAI”) has prepared an updated independent resource report for Empire’s 100% owned and operated EP187 tenement located in the Beetaloo Sub-basin, Northern Territory, utilising the technical results of the Carpentaria-1 drilling program.

Highlights

- **Empire’s best estimate prospective gas resource for EP187 has increased by 47% to 3.5 TCF**
- **Empire has booked a maiden best estimate prospective condensate resource of 27 million barrels**
- **Empire has booked a maiden best estimate contingent gas resource of 41 BCF in the immediate vicinity of the Carpentaria-1 well location**
- **Empire has received Northern Territory Government approvals to carry out hydraulic stimulation and flow testing of the vertical Carpentaria-1 well**
- **Tendering for the hydraulic stimulation and flow testing is well advanced, with operations expected to commence in Q2 2021**
- **The program will be fully funded from existing cash at bank**
- **Current cash balance is A\$12.3 million**

Comments from Managing Director Alex Underwood:

The NSAI report, which incorporated the results of our drilling program, updated petrophysical understanding gained from the W.D. Von Gonten & Co core analysis, and comparison of our results to key wells drilled by other operators across the Beetaloo Sub-basin, demonstrates that our EP187 contains significant resource potential, particularly for a company of our size. The increased prospective gas resource volumes, maiden assessment of valuable liquid hydrocarbons, and maiden booking of contingent gas resources in the vicinity of Carpentaria-1 validate the decision we made to drill Carpentaria-1 last year amid challenging economic conditions.

Since that time, market conditions for the energy sector have improved materially, and the important role of gas in the energy transition has been a focus of the Australian Government which is actively supporting the development of the Beetaloo Sub-basin.

We look forward to commencing the fully funded and approved flow testing program at Carpentaria-1 to assess which zones within the Velkerri Formation are likely to provide the optimal flow rates and gas / liquids contributions.

While we prepare for this program, we are also continuing to advance opportunities to commence commercial production utilising existing infrastructure and markets.

Updated NSAI Report

The independent resource assessment for Empire's 100% owned and operated EP187 permit was prepared by NSAI, a worldwide leader of petroleum property analysis to industry, financial organisations and government agencies.

Following completion of the evaluation program of the Carpentaria-1 well core and wireline data by W. D. Von Gonten & Co. in Houston, Texas, NSAI has incorporated the analyses and interpretations into its independent resource assessment for Empire's EP187 permit.

The reservoir properties and shale pay thickness exceeded pre-drill expectations for Carpentaria-1, which has driven material increases in assessed gas and now condensate resources.

Empire's shales in the target Velkerri Formation are both thicker and contain more liquid hydrocarbons than expected prior to drilling. Furthermore, an additional interval, which we are referring to as the Intra A-B, was identified immediately adjacent to the target Velkerri Formation A and B shales.

NSAI has assessed a best estimate condensate (C5 and greater) prospective resource of 27 million barrels. Assessment of Natural Gas Liquids (C2 to C4) will require further gas analysis (post-flow testing) and those volumes are included in the best estimate prospective gas resource for the purpose of the updated independent assessment.

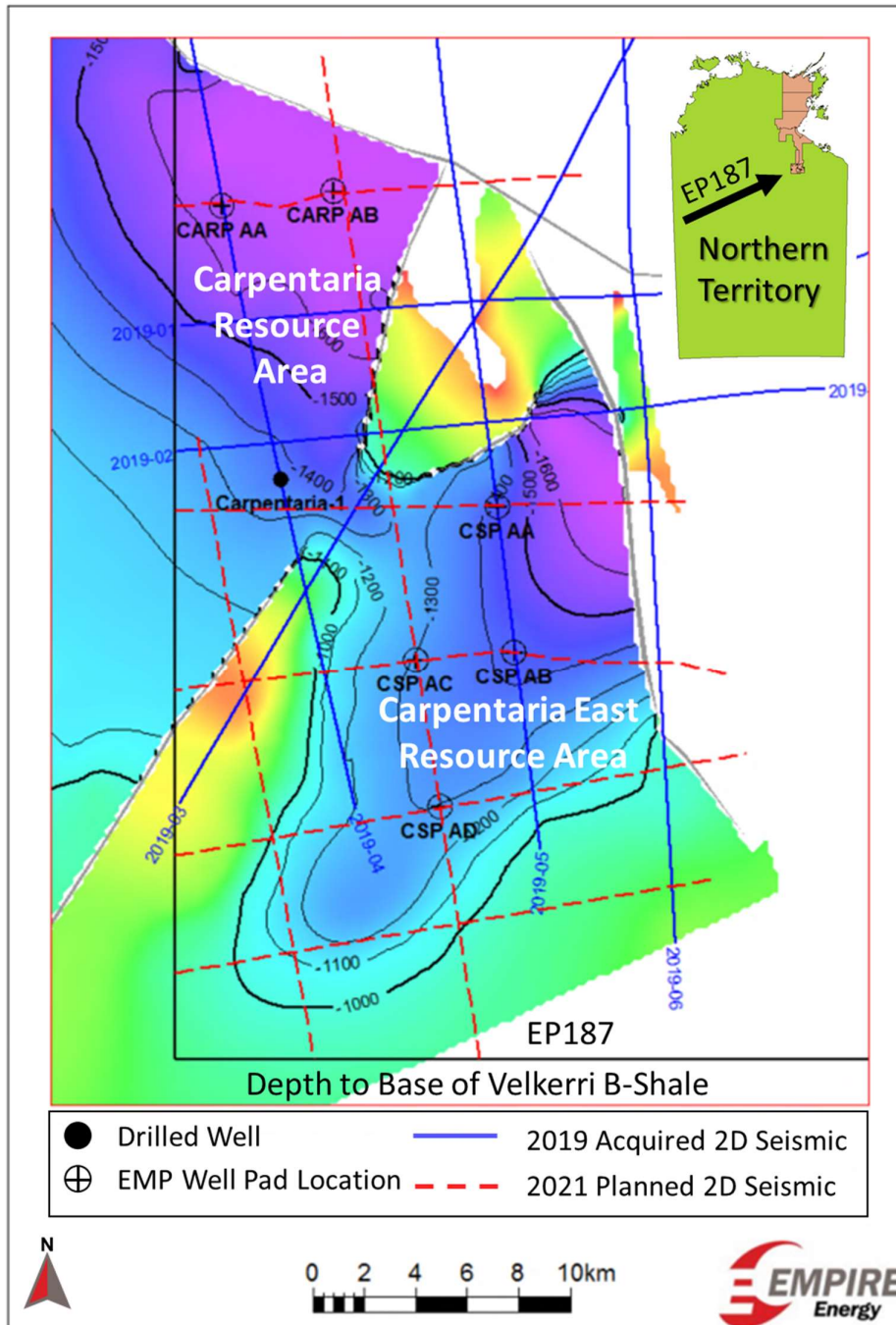
NSAI's analysis was restricted to Empire's current operations in EP187 and did not incorporate further assessment of Empire's northern properties targeting the Barney Creek or other McArthur Basin shale targets. The Kyalla Shale was deemed to be too shallow or not present in EP187 and so has been reduced to zero for prospective resource assessment.

The results of the NSAI EP187 report have been summarised by Empire in the table below. A detailed summary of the NSAI contingent and prospective resource estimates can be found at Appendix A.

Area	Contingent Resource (100%) Net Sales Gas (BCF)			Unrisked Gross (100%) Prospective Sales Gas Resources (BCF)			Unrisked Gross (100%) Prospective Condensate Resources (MMBBL)		
	Estimate			Estimate			Estimate		
	Low (1C)	Best (2C)	High (3C)	Low (1U)	Best (2U)	High (3U)	Low (1U)	Best (2U)	High (3U)
Carpentaria*	-	41	86	1,198	1,988	3,863	3	17	58
Carpentaria East*	-	-	-	792	1,458	3,228	1	10	41
Total*	-	41	86	1,990	3,446	7,091	4	27	99

*Empire derived arithmetic summation of NSAI probabilistic resource estimations.

The Carpentaria area and Carpentaria East area were assessed by NSAI utilising a depth cut-off of 1000 metres below ground level, which reflects the likely depth below which commercial hydrocarbons may be recoverable in future development scenarios.



Empire seismic mapping showing the Velkerri Shale prospective areas within EP187

The total areas assessed in the 'best estimate' scenario were as follows:

Zone	Carpentaria Resource Area km ²	Carpentaria East Resource Area km ²
Velkerri C	129	55
Velkerri B	153	108
Velkerri Intra A-B	152	123
Velkerri A	152	165

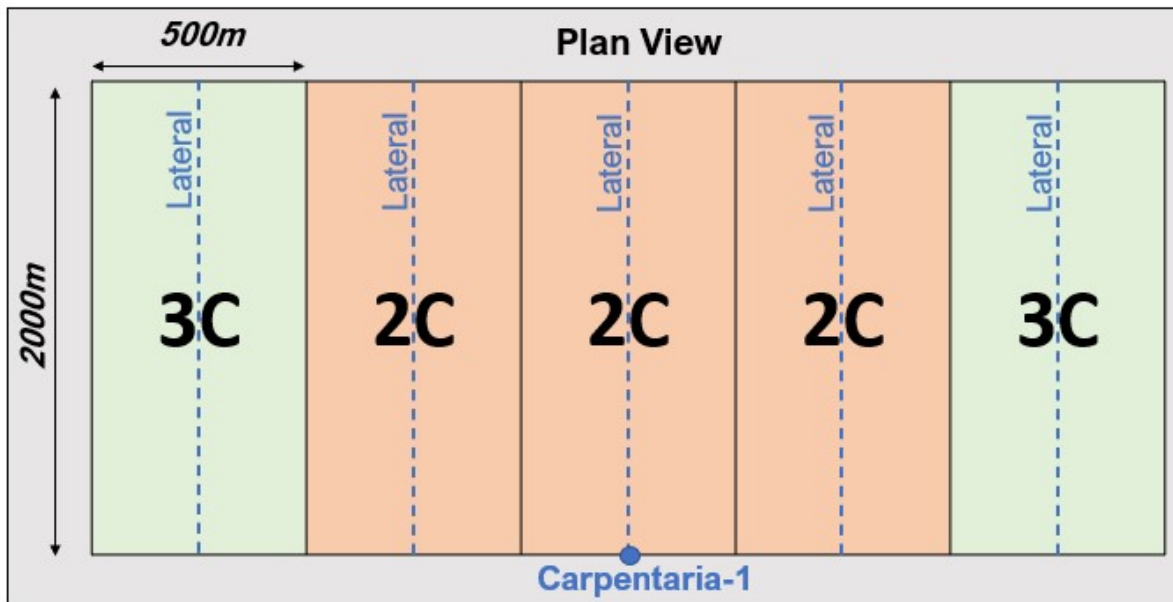
Maiden Contingent Resource Assessment

Empire has booked contingent resources in EP187 for the first time in the immediate vicinity of the Carpentaria-1 well location, utilising the technical results of the Carpentaria-1 well and comparison of those results to analogue wells in the Beetaloo Basin which have flowed gas to surface, including Origin's Amungee NW-1H horizontal well and Santos' Tanumbirini-1 vertical well.

The 2C contingent resource assessment represents hydrocarbon recovery from three (3) horizontal production well locations defined as 'blocks' which are 500m across and 2km long, which represents the assessed area of hydrocarbon recovery from 2km lateral wells into the target formations in future commercial development scenarios. The 3C contingent resource assessment represents hydrocarbon recovery from five (5) horizontal production well locations, two (2) of these locations being in addition to the 2C contingent resource blocks.

Based on this methodology, the 2C area is a total of 3km² and the 3C area is a total of 5km². As detailed above, this represents only a small percentage of the total prospective area within EP187.

The chart below illustrates the methodology NSAI has used for assessing for contingent resources in EP187 using these assumptions.



The key contingencies that presently prevent the booking of proved and probable reserves are demonstration of the economic viability of the project development, successful completion of work program commitments on the leases and commitment to develop the resources.

As Empire works to address these contingencies, our focus is on seeking to establish that the target formations can flow at commercial rates and building commercialisation opportunities for Empire's gas and liquids resources.

Carpentaria-1 Vertical Hydraulic Stimulation and Flow Testing Update

Empire's EP187 Environment Management Plan ("EMP") for the hydraulic stimulation and flow testing of the vertical Carpentaria-1 well was approved by the Northern Territory Government on 16 February 2021. The EMP will remain active for five years from the date of approval.

The tendering process is well advanced for services and ordering long-lead items in preparation for hydraulic stimulation and production flow testing of the vertical Carpentaria-1 well.

The program will be fully funded from existing cash at bank.

Empire expects to commence field operations in Q2 2021.

This ASX release has been authorised by the Managing Director.

For queries about this release, please contact:

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**APPENDIX A – EMPIRE ENERGY EP187 NET CONTINGENT AND PROSPECTIVE GAS RESOURCES
ASSESSED BY NETHERLAND, SEWELL & ASSOCIATES, INC.**

Area	Zone	Contingent Resource (100%) Net Sales Gas (BCF)			Unrisked Gross (100%) Prospective Sales Gas Resources (BCF)			Unrisked Gross (100%) Prospective Condensate Resources (MMBBL)		
		Estimate			Estimate			Estimate		
		Low (1C)	Best (2C)	High (3C)	Low (1U)	Best (2U)	High (3U)	Low (1U)	Best (2U)	High (3U)
Carpentaria	Velkerri C	-	9	20	220	388	800	3	8	26
Carpentaria	Velkerri B	-	15	31	496	774	1424	-	4	15
Carpentaria	Velkerri Intra A-B	-	7	14	163	323	708	-	2	7
Carpentaria	Velkerri A	-	10	21	319	503	931	-	3	10
Carpentaria East	Velkerri C	-	-	-	81	166	411	1	3	13
Carpentaria East	Velkerri B	-	-	-	295	521	1117	-	3	11
Carpentaria East	Velkerri Intra A-B	-	-	-	117	252	623	-	1	6
Carpentaria East	Velkerri A	-	-	-	299	519	1077	-	3	11

Disclosures under ASX Listing Rule 5

- LR 5.25.1** Contingent and Prospective Resource estimates for EP187 were assessed as of 31 January 2021
- Empire confirms that it is not aware of any new information or data that materially affects the information included and that all the material assumptions and technical parameters supporting the estimates continue to apply and have not materially changed
- LR 5.25.2** Petroleum resources are classified in accordance with the Petroleum Resource Management System (PRMS) sponsored by the Society of Petroleum Engineers (SPE)
- LR 5.25.5** All references to petroleum resource quantities in this announcement are Empire's 100% share
- LR 5.25.6** The probabilistic method was used to prepare the estimates of contingent and prospective resources in the NSAI report. These estimates are presented herein using arithmetic aggregation as required by the PRMS. The aggregate of 1C and 1U may be a conservative estimate and the aggregate 3C and 3U may be an optimistic estimate due to the portfolio effect of arithmetic summation
- LR 5.25.7** Contingent and prospective resources were not reported in units of equivalency. When Empire reports contingent and prospective resources in units of equivalency, it uses a conversion factor of 6,000 cubic feet of gas per barrel of oil equivalent
- LR 5.27.1** Contingent resources have been categorised and reported as 1C, 2C and 3C
- LR 5.27.3** An arithmetic summation by category (that is 1C, 2C and 3C) has been used to represent contingent resources
- LR 5.28.2** Prospective resources reported are the estimated prospective resource quantities of petroleum that may potentially be recovered by the application of future development projects related 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
- LR 5.33.1** The contingent resource is contained within Empire's 100% owned and operated EP187 exploration permit in the Northern Territory
- LR 5.33.2** The basis for confirming the existence of a significant quantity of potentially moveable hydrocarbons and the determination of a discovery was large diameter sidewall core and wireline formation evaluation of the Carpentaria-1 well and comparison to well analogues in the Beetaloo Sub-basin which have flowed hydrocarbons to surface
- LR 5.33.3** Contingent resources have been estimated through probabilistic methods.
- The key contingencies that prevent the contingent resources from being classified as petroleum reserves are: (i) demonstration of the economic viability of project development; (ii) successful completion of work commitments prior to expiration of the leases; and (iii) commitment to develop the resources.
- Further appraisal drilling and evaluation work to be undertaken to assess the potential for commercial recovery and to progress the material oil and gas project includes the hydraulic stimulation and flow testing of Carpentaria-1, future drilling and seismic acquisition (subject to additional Government approvals), ongoing discussions with potential customers for Empire's hydrocarbons and ongoing analysis of the surface infrastructure and processing requirements for the sale of hydrocarbons from the project.
- LR 5.33.4** Empire is actively undertaking research and development to adapt existing technologies to the Beetaloo Sub-basin, being the adaptation of hydraulic stimulation and flow testing techniques utilised in shale gas basins in other parts of the world. A pilot for that technology (being the hydraulic stimulation and flow testing of Carpentaria-1), is currently planned, budgeted and fully funded. The

technology has been demonstrated to be commercially viable in other reservoirs, particularly in the United States of America, but requires adaptation to the Beetaloo Sub-basin.

LR 5.33.5 The 2C contingent resource assessment represents hydrocarbon recovery from three (3) horizontal production well location across a land area of 3km².

The 3C contingent resource assessment represents hydrocarbon recovery from five (5) horizontal production well locations across a land area of 5km².

Each contingent resource well location assumes that production wells with a two (2) kilometre horizontal section, draining an area 250 metres each side of the wellbore (500 metres in total), would be drilled.

LR 5.36.1 Empire released an independent prospective resource assessment generated by NSAI on 18 May 2020. The prospective resource assessment has changed materially since that time. Since that time Empire has successfully drilled the Carpentaria-1 well in the EP187 permit. The results of extensive formation evaluation have been incorporated into this updated analysis. Seismic data over the EP187 permit has also been re-interpreted utilising the results of the Carpentaria-1 well.

LR 5.36.2 Utilising the Carpentaria-1 results, reservoir properties and thickness exceeded pre-drill expectations.

LR 5.41 The estimates of contingent and prospective resources contained in this report were prepared in accordance with the SPE-PRMS guidelines and are based on, and fairly represent, information and supporting documentation under the supervision of Geoscientist Dr Alex Bruce, Chief Geoscientist, Empire Energy Group Limited, a qualified person as defined under ASX Listing Rule 5.11. Dr Bruce has consented to the use of the resource estimates figures in the form and context in which they appear in this release.

LR 5.42

Dr Bruce is a full-time employee of Empire Energy Group Limited. Dr Bruce earned a Bachelor of Science with majors in Geology and Environmental Geography from the University of Sydney, Australia, and first-class honours in Geology / Geophysics from the University of New South Wales, Sydney. Dr Bruce holds a PhD from the University of New South Wales in Geology and Artificial Intelligence and holds a Graduate Certificate in Geostatistics from Edith Cowan University, Perth, Australia. Dr Bruce is a member of the American Association of Petroleum Geologists (AAPG).

Furthermore, Dr Bruce has over 20 years of relevant experience in operating oil and gas companies with much of that time in resource estimation, and as such has sufficient experience to qualify as a Reserves and Resources Evaluator as defined in Chapter 19 or the ASX Listing Rules.

The resource assessment was independently carried out by Mr John G. Hattner, Senior Vice President, and Mr Joseph M. Wolfe, Vice President, of Netherland, Sewell & Associates, Inc. in accordance with the SPE-PRMS guidelines. Messrs Hattner and Wolfe meet the requirements of Qualified Petroleum Reserve and Resource Evaluator as defined in Chapter 19 of the ASX Listing Rules. Mr Hattner is a Licensed Professional Geophysicist in the State of Texas, USA and Mr Wolfe is a Licensed Professional Engineer in the State of Texas, USA. Messrs Hattner and Wolfe have consented to the use of the resource estimates figures in the form and context in which they appear in this release.

Mr Hattner has over 39 years of relevant experience. His qualifications include an MBA from Saint Mary's College of California, Master of Science in Geological Oceanography, Florida State University, and a Bachelor of Science in Geology from University of Miami.

Mr Wolfe has over 15 years of relevant experience. His qualifications include a Master of Petroleum Engineering from Texas A&M and a Bachelor of Science in Mathematics from Northwestern State University.