

**ASX:EEG**

**2021 Reserves & Resources  
Statement**

16 February 2022



Level 19, 20 Bond Street  
Sydney NSW 2000

## Substantial Resources and Reserves Increase

- **Successful 2021 Beetaloo work program (production testing of Carpentaria-1, drilling of Carpentaria-2H and acquisition of the Charlotte 2D seismic survey) has resulted in a substantial increase in resources independently assessed by Netherland, Sewell & Associates (“NSAI”) for EP187:**
  - **1,402% increase in 3C Contingent Resources from 86 BCF to 1,292 BCF**
  - **866% increase in 2C Contingent Resources from 41 BCF to 396 BCF**
  - **Maiden 1C Contingent Resources of 81 BCF**
- **Empire’s total Beetaloo 2C Contingent Resources are now 554 BCF**
- **EP187 best estimate P(50) Prospective Resources have increased by 23% to ~4.3 TCF following identification of improved prospectivity across the block, increasing total Northern Territory P(50) Prospective Resources to ~43 TCF plus 797 mmbbls**
- **NPV(10) of Empire USA PDP (Proved Developed Producing) Reserves has increased by 85% to US\$15.9 million from US\$8.6 million, reflecting improved forward US gas prices**

### **Comments from Managing Director Alex Underwood:**

“The Empire team ended 2021 delighted with the results of our Beetaloo work programs. We successfully flowed gas to surface from all of the four Velkerri shale zones we fracked in the Carpentaria-1 vertical well, which gave us the confidence to acquire additional seismic in EP187 (the Charlotte 2D Seismic Survey) and drill our first horizontal well, Carpentaria-2H (“C-2H”). C-2H was successfully drilled in Q4, with the entire 1,345m horizontal section successfully placed in the target Velkerri B shale following which we successfully cased the entire horizontal section. We look forward to fracture stimulating and flow testing C-2H in Q2, with all approvals in place, the job fully funded and long lead items ordered.

NSAI’s updated assessment of our resources in EP187 has validated our 2021 investments, with substantial contingent (i.e. discovered) resources booked, and additional prospectivity identified. This is another big step forward as we pursue our goal of being the first company to sell Beetaloo gas.”

Empire Energy Group Limited (“Empire”) is pleased to announce an update to its Beetaloo Sub-basin Contingent and Prospective Resources and US gas production asset reserves.

**EP187 Contingent Resources**

The revised estimate of the Contingent Resources for EP187 incorporated the technical results from the Carpentaria-2H (“C-2H”) well which was drilled in Q4 2021, the Carpentaria-1 (“C-1”) vertical fracture stimulation and flow test which was carried out in Q2 2021, and the Charlotte 2D Seismic Survey (“Charlotte Seismic Survey”) which was acquired in Q4 2021. C-2H comprised a vertical and horizontal well section. The C-2H vertical section intersected the Velkerri A, Intra A/B, B and C shales with near identical rock and gas characteristics as those intersected at C-1, albeit ~240 metres deeper. C-1 was successfully fracture stimulated and production tested in Q3 2021 and produced gas to surface from all four of the Velkerri shale zones. Empire intends to fracture stimulate and flow test C-2H in Q2 2022 with all approvals in place and operational planning well advanced.

NSAI’s updated assessment incorporates additional Contingent Resources in the Velkerri B and C shales in addition to Contingent Resources assessed in the Velkerri A, Intra A/B, B and C shales in early 2021. As a result, total independently assessed EP187 Contingent Resources are now as follows:

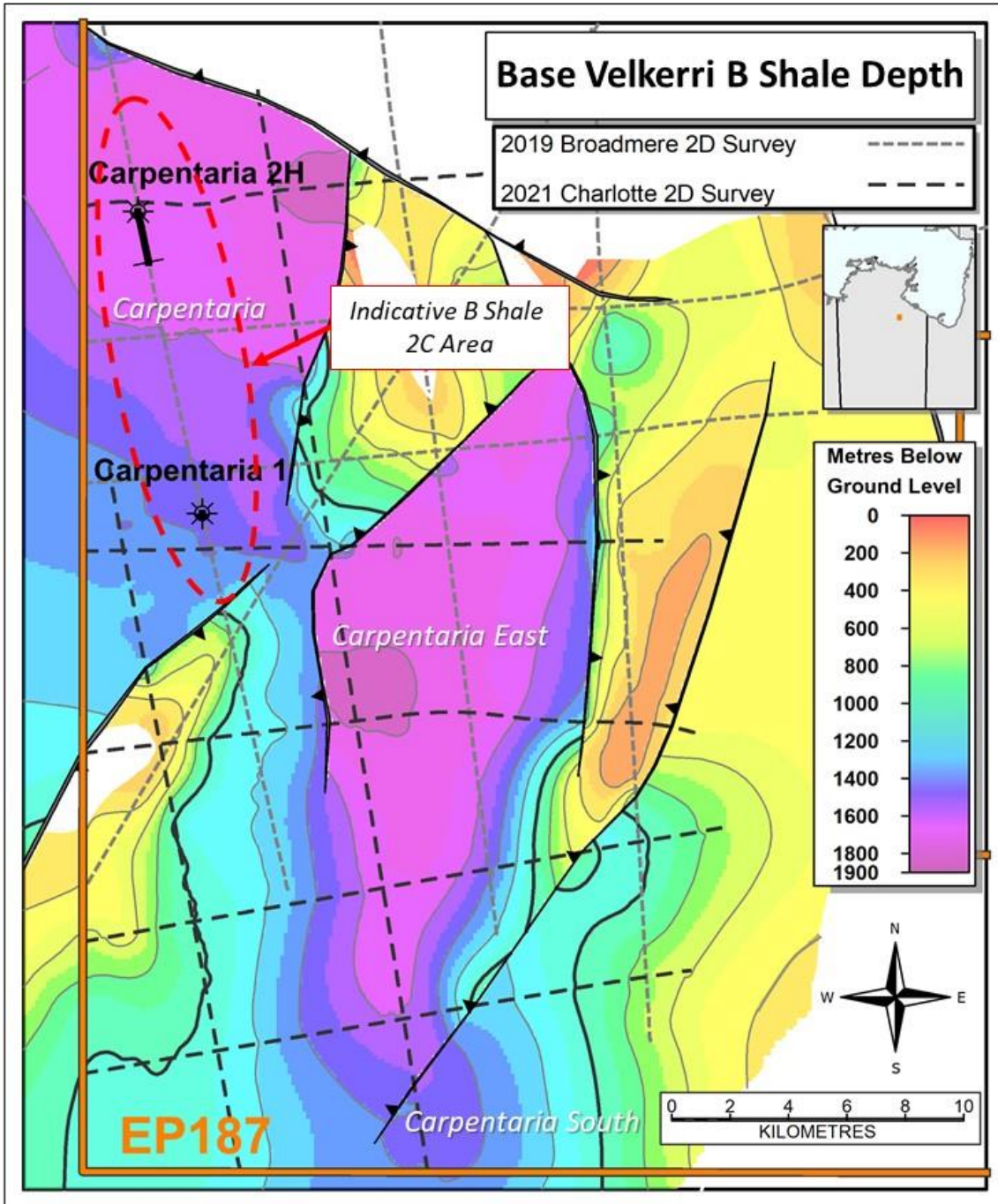
Area	Reservoir	Contingent Resource (100%) Net Sales Gas (BCF)		
		Low Estimate (1C)	Best Estimate (2C)	High Estimate (3C)
Carpentaria	Velkerri C	21	84	319
Carpentaria	Velkerri B	60	295	938
Carpentaria	Velkerri Intra A/B	-	7	14
Carpentaria	Velkerri A	-	10	21
<b>Total*</b>		<b>81</b>	<b>396</b>	<b>1,292</b>

*\*Empire derived arithmetic summation of NSAI probabilistic resources estimations*

**EP187 Prospective Resources**

The revised estimate of the Prospective Resources incorporates the results of the Charlotte Seismic Survey and the C-2H drilling results.

The seven-line, 164 km survey followed the Broadmere 2D Seismic Survey, acquired by Empire in 2019, providing greater seismic definition through infill coverage (nominal line spacing of ~4 km) in the Carpentaria area and greater seismic coverage across the Carpentaria East immediately adjacent to the Carpentaria area and Carpentaria South prospective areas as shown on the map below.



\*Map showing depth to base of Velkerri B shale across the Greater Carpentaria project area

The Charlotte Seismic Survey provided additional coverage over the prospective Carpentaria East and Carpentaria South areas, immediately adjacent to the Carpentaria area where Empire has now drilled two successful wells.

The updated mapping has derisked the Carpentaria East and Carpentaria South areas, demonstrating that they are substantially deeper than previously thought (at equivalent depths to Carpentaria-2H) across an area approximately 2.5 times larger than previously mapped.

## 2021 Reserves & Resources Statement

Following the acquisition and interpretation of the Charlotte Seismic Survey there has been an ~80% increase in P(50) Prospective Resources in the combined Carpentaria East and Carpentaria South areas.

The results of the NSAI EP187 Prospective Resources assessment are summarised by Empire in the table below. A detailed summary can be found at Appendix A.

Area	Unrisked Gross (100%) Prospective Gas Resources (BCF)			Unrisked Gross (100%) Prospective Condensate Resources (MMBBL)			Unrisked Gross (100%) Prospective Oil Equivalent Volumes (MMBOE)		
	Low Estimate (1U)	Best Estimate (2U)	High Estimate (3U)	Low Estimate (1U)	Best Estimate (2U)	High Estimate (3U)	Low Estimate (1U)	Best Estimate (2U)	High Estimate (3U)
Carpentaria	1,108	1,609	2,588	3	16	52	188	283	483
Carpentaria East	1,320	2,383	5,402	3	15	64	222	413	963
Carpentaria South	143	258	583	0	2	8	25	45	105
<b>Total*</b>	<b>2,571</b>	<b>4,250</b>	<b>8,573</b>	<b>6</b>	<b>33</b>	<b>124</b>	<b>435</b>	<b>741</b>	<b>1,551</b>
Previous Total (31-Jan-21)	1,990	3,446	7,091	4	27	99	338	600	1,281

\*Empire derived arithmetic summation of NSAI probabilistic resources estimations

NSAI's analysis was restricted to Empire's current operations in EP187 and did not incorporate further assessment of Empire's 2021 acquired Western Beetaloo properties or its northern properties targeting the Barney Creek or other McArthur Basin shale targets.

Following completion of the updated NSAI EP187 independent resource assessment, Empire's total Northern Territory Contingent and Prospective Resources including its recently acquired Western Beetaloo properties and Northern McArthur Basin properties are as follows:

Zone	Unrisked Net Contingent Resources Liquids (MMBBL)			Unrisked Net Contingent Resources Sales Gas (BCF)			Unrisked Net Prospective Resources Liquids (MMBBL)			Unrisked Net Prospective Resources Gas (BCF)		
	Estimate			Estimate			Estimate			Estimate		
	Low (1C)	Best (2C)	High (3C)	Low (1C)	Best (2C)	High (3C)	Low (1U)	Best (2U)	High (3U)	Low (1U)	Best (2U)	High (3U)
Kyalla*	0.8	3.0	11.1	0.8	4.5	27.7	88	378	1,571	184	857	4,891
Mid Velkerri*	0.1	0.5	3.0	138	549	1,680	82	419	2,062	10,744	31,018	89,217
Barney Creek*	-	-	-	-	-	-	-	-	-	1,633	11,053	45,380
<b>Total*</b>	<b>0.9</b>	<b>3.5</b>	<b>14.1</b>	<b>138.8</b>	<b>553.5</b>	<b>1,707.7</b>	<b>170</b>	<b>797</b>	<b>3,633</b>	<b>12,561</b>	<b>42,928</b>	<b>139,488</b>

\*Empire derived arithmetic summation of previous and current NSAI probabilistic resources estimations

### USA Reserves

Empire's USA reserves are reviewed annually by certified independent third-party reservoir engineers, Graves & Co. Consulting LLC ("Graves"). The scope of the reviews is to prepare an estimate of the Proved, Probable and Possible Reserves attributable to Empire's ownership position in its USA assets located in New York State and Pennsylvania, USA. Graves assessed Empire's USA Reserves as at 30 November 2021 (NYMEX Strip 30 November 2021 including hedges) are set out in the table below:

Reserves - as of Nov 30, 2021	Oil (Mbbbls)	Gas (MMcf)	MMcfe	Capex US\$M	PV0 US\$M	PV10 US\$M
Proved Developed Producing	46	28,032	28,308	-	\$27,809	\$15,867
Proved Developed Non-producing	-	155	155	\$54	\$(155)	\$(63)
Proved Behind Pipe	-	-	-	-	-	-
Shut-in	-	-	-	-	-	-
Proved Undeveloped	-	-	-	-	-	-
<b>Total 1P</b>	<b>46</b>	<b>28,187</b>	<b>28,463</b>	<b>\$54</b>	<b>\$27,654</b>	<b>\$15,804</b>
Probable	-	10,177	10,177	\$7,809	\$23,176	\$4,304
<b>Total 2P</b>	<b>46</b>	<b>38,364</b>	<b>38,640</b>	<b>\$7,863</b>	<b>\$50,830</b>	<b>\$20,108</b>
Possible	158	3,916	4,864	\$5,102	\$14,234	\$3,542
<b>Total 3P</b>	<b>204</b>	<b>42,280</b>	<b>43,504</b>	<b>\$12,965</b>	<b>\$65,064</b>	<b>\$23,650</b>

\*Empire derived arithmetic summation of Graves deterministic reserves estimations

The valuation of Empire's USA reserves assessed by Graves has increased substantially since December 2020, due primarily to a material increase in forward US gas prices.

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 PROSPECTIVE RESOURCES ASSESSED BY NETHERLAND, SEWELL &amp; ASSOCIATES, INC.

Area	Zone	Unrisked Gross (100%) Prospective Gas Resources (BCF)			Unrisked Gross (100%) Prospective Condensate Resources (BCF)			Unrisked Gross (100%) Prospective Oil Equivalent Volumes (MMBOE)		
		Low Estimate (1C)	Best Estimate (2C)	High Estimate (3C)	Low Estimate (1U)	Best Estimate (2U)	High Estimate (3U)	Low Estimate (1U)	Best Estimate (2U)	High Estimate (3U)
Carpentaria	Velkerri C	246	378	602	3	7	22	44	70	123
Carpentaria	Velkerri B	399	441	419	-	4	14	67	77	83
Carpentaria	Velkerri A-B	150	297	650	-	2	7	25	51	115
Carpentaria	Velkerri C	313	493	917	-	3	9	52	85	162
Carpentaria East	Velkerri C	214	394	915	2	5	19	37	71	171
Carpentaria East	Velkerri B	512	884	1,949	1	4	19	86	152	344
Carpentaria East	Velkerri A-B	162	347	873	-	2	9	27	60	154
Carpentaria East	Velkerri A	432	758	1,665	-	4	17	72	130	294
Carpentaria South	Velkerri C	15	30	72	-	1	2	3	6	14
Carpentaria South	Velkerri B	45	78	171	-	-	2	8	13	30
Carpentaria South	Velkerri A-B	13	28	71	-	-	1	2	5	13
Carpentaria South	Velkerri A	70	122	269	-	1	3	12	21	48
<b>Total*</b>		<b>2,571</b>	<b>4,250</b>	<b>8,573</b>	<b>6</b>	<b>33</b>	<b>124</b>	<b>435</b>	<b>741</b>	<b>1,551</b>

\* Empire derived arithmetic summation of NSAI probabilistic resources estimations

### Disclosures under ASX Listing Rule 5

- LR 5.25.1** Contingent and Prospective Resources estimates for EP187 were assessed as of 31 January 2022.
- 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.
- Reserves estimates for Empire's USA assets were assessed as of 30 November 2021.
- 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 reserves and resources quantities in this announcement represent Empire's equity interest in the relevant asset
- 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.
- The deterministic method was used to prepare the estimate of reserves in the Graves & Co, Consulting LLC report.
- LR 5.25.7** Reserves, Contingent and Prospective Resources reported in units of equivalency used a conversion factor of 6,000 cubic feet of gas per barrel of oil equivalent
- LR 5.26.1** Empire is producing and selling gas in the USA thereby demonstrating commercial producibility of the reservoir
- LR 5.26.2** Empire is producing and selling gas in the USA thereby demonstrating commercial producibility of the reservoir
- LR 5.26.3** Petroleum reserves have been categorised and reported as 1P, 2P and 3P
- LR 5.26.4** Petroleum reserves are reported net of lease fuel up to the reference point.
- LR 5.26.5** The reference point used for measuring and assessing the estimated petroleum reserves is the wellhead.
- LR 5.26.6** "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.
- "2P Reserves" or "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.
- "3P Reserves" or "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.
- LR 5.26.7** Not applicable
- LR 5.26.8** Not applicable
- LR 5.26.9** Not applicable

## 2021 Reserves & Resources Statement

- LR 5.27.1** Contingent Resources have been categorised and reported as 1C, 2C and 3C
- LR 5.27.2** Not applicable
- LR 5.27.3** An arithmetic summation by category (that is 1C, 2C and 3C) has been used by represent Contingent Resources
- LR 5.27.4** Not applicable
- LR 5.28.1** Prospective Resources have been categorised as 1U (low estimate), 2U (best estimate) and 3U (high estimate)
- LR 5.28.2** The estimated Prospective Resources quantities of petroleum that may potentially be recovered by the application of future development projects 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

**LR 5.41** The estimates of petroleum reserves were prepared in accordance the SPE-PRMS guidelines under the supervision of William (Bill) Vail of Graves & Co. Consulting LLC.

**LR 5.42**

Mr Vail has extensive experience throughout North America during his thirty-seven years of professional engineering, evaluating various reservoirs in basins undergoing all stages of exploration and development. Mr Vail is a co-author of the SPEE Monograph 3, a Member of the Society of Petroleum Engineers, Society of Petroleum Evaluation Engineers and Association of Professional Engineers and Geoscientists of Alberta. He has a B.S. in Petroleum Engineering from the University of Tulsa and an MBA from the University of Virginia.

The estimates of Contingent and Prospective Resources in the Northern Territory 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.

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.



## 2021 Reserves & Resources Statement

Mr Hattner has over 41 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 13 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.