

## ASX ANNOUNCEMENT

19 September 2024

### **Presence of Organic-Rich Source Rocks on EP 144**

Top End Energy Limited (**Top End** or the **Company**) (ASX:TEE) is pleased to provide an update on its recently acquired Exploration Permit (**EP**) 144 (the **Permit**), which is located in the South Nicholson Basin area of the Northern Territory (**NT**) of Australia.

#### **HIGHLIGHTS**

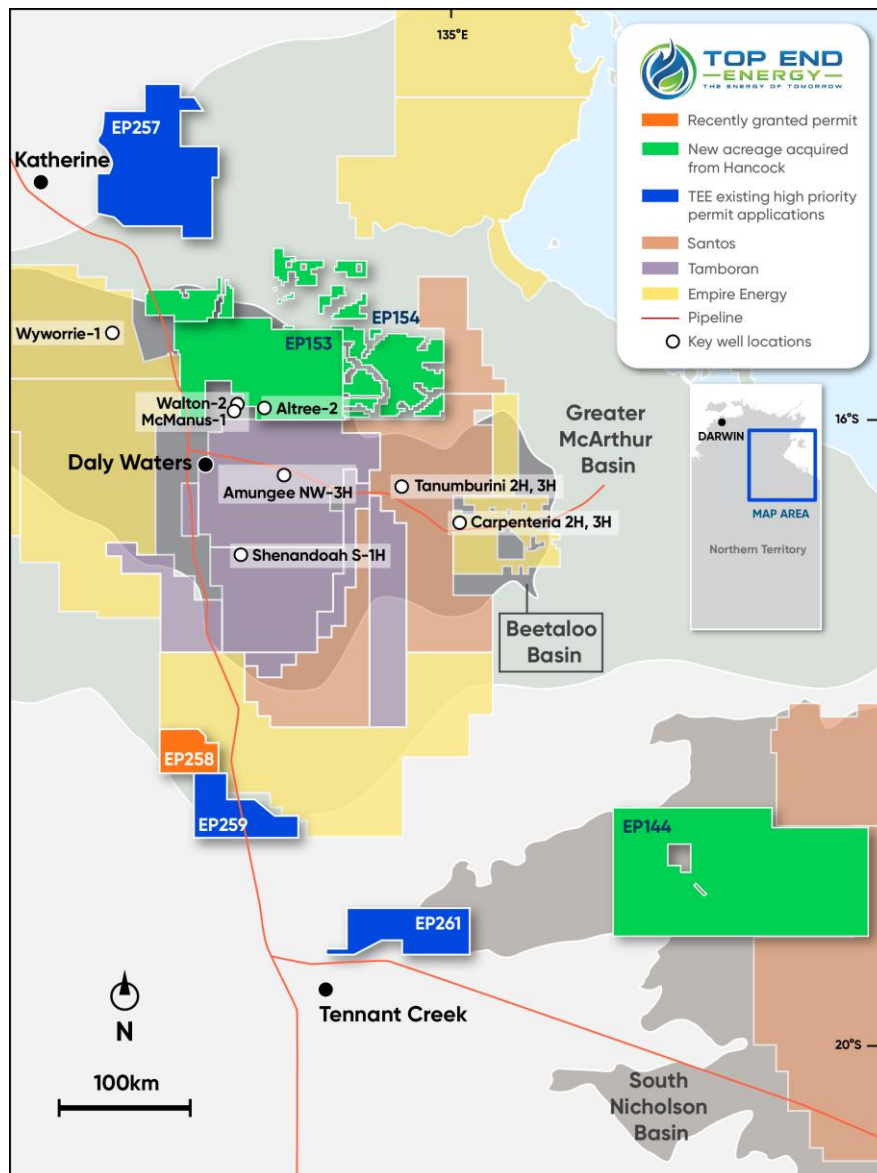
- Existence of organic-rich shales on EP 144 proven by recent drilling on overlapping mineral tenure.
- Preliminary analysis confirms Proterozoic organic-rich source rocks are present with up to 3.1wt% TOC, sampled from whole core captured during Encounter Resources' recent drilling campaign.
- Data is consistent with the Lawn Hill shale interval intersected at nearby NDI Carrara-1 stratigraphic well, where TOC was sampled up to 3.2 wt%.
- Ongoing organic petrographic analyses to help determine thermal maturity of organic-rich intervals.
- Geophysical wireline logging of Encounter's wells planned ahead of resampling whole core intervals.
- Deep stratigraphic well planning to test deeper source rock intervals interpreted on seismic to be present and confirm stacked shale play potential.

#### **Commenting on the implications for the potential of the EP 144 acreage in the South Nicholson Basin, outgoing Managing Director Oliver Oxenbridge said:**

*"The fortuitous timing and location of Encounter Resources' recent drilling campaign is a huge advantage for Top End and we are grateful to Encounter for permitting us to inspect and sample their cores. The preliminary results are very encouraging and contribute to the team's increasing confidence in the unconventional gas potential of EP 144 and the broader South Nicholson Basin. We look forward to continuing to work closely with Encounter and pursuing additional near-term, low capital initiatives and activities to further de-risk the resource opportunity."*

#### **EP 144 and the South Nicholson Basin**

EP 144 was acquired by Top End as part of its recently completed transaction with Minerals Australia Pty Ltd and Jacaranda Minerals Limited (wholly owned subsidiaries of Hancock Prospecting Pty Ltd) (the **Transaction**), which also saw the Company acquire EP 153 and EP 154 (refer *Figure 1*). For full details of the Transaction, refer to Top End ASX releases dated 27 February 2024 and 12 July 2024.

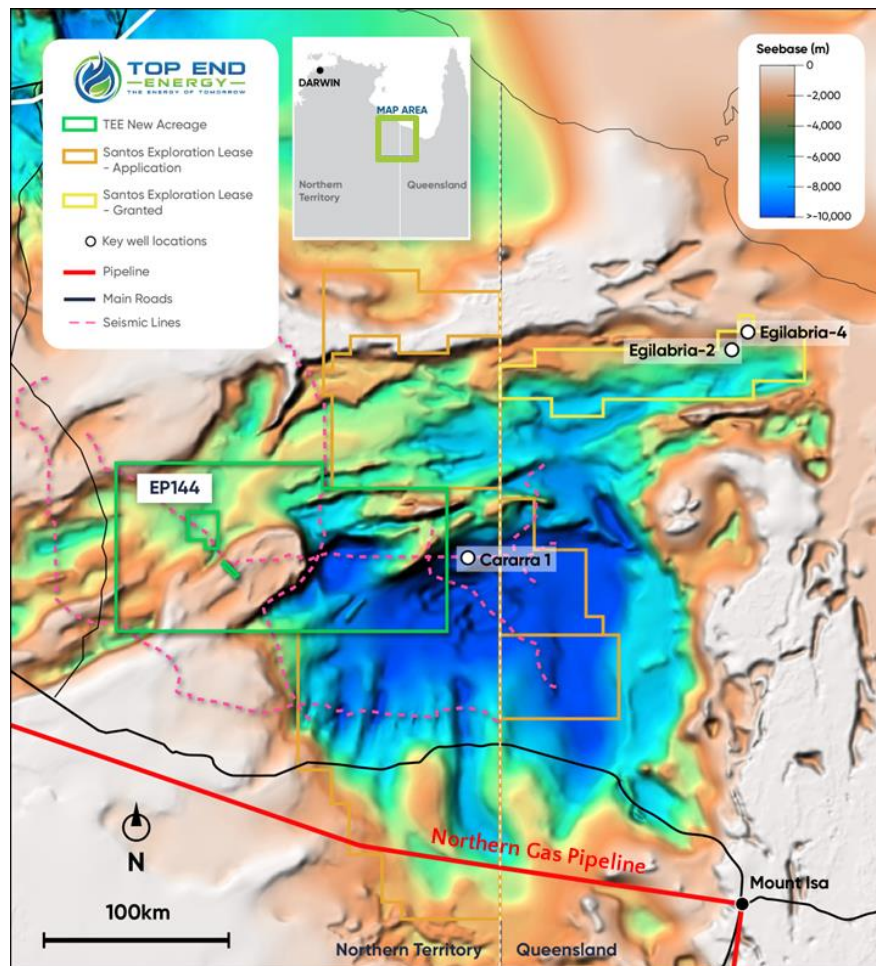


**Figure 1: Location of EP 144 amongst broader Top End NT acreage portfolio**

Located in the South Nicholson Basin, EP 144 represents highly prospective underexplored acreage in a proven hydrocarbon region, with potential ties to the Proterozoic shale plays of the Lawn Hill Platform and the Beetaloo Sub-basin Velkerri Formation. Santos Ltd (ASX:STO) is the only other energy company with a granted acreage position in the South Nicholson Basin (refer Figure 2).

EP 144 is strategically located in proximity to the Northern Gas Pipeline, which provides access to Mount Isa and the East Coast gas market. There is significant existing hard rock exploration and mining activity in the area, providing potential opportunities for additional data sources, exploration collaboration and offtake counterparties.

A Co-existence and Exploration Agreement is in place with the Traditional Owners of the Permit, which is in year three of the initial five-year exploration period, and renewable for up to two further periods of up to five years each. Environmental Management Plans and Well Operations Management Plans have been approved for drilling of stratigraphic wells on the Permit, and the Company is engaging with pastoral lease holders to extend existing Land Access Agreements.



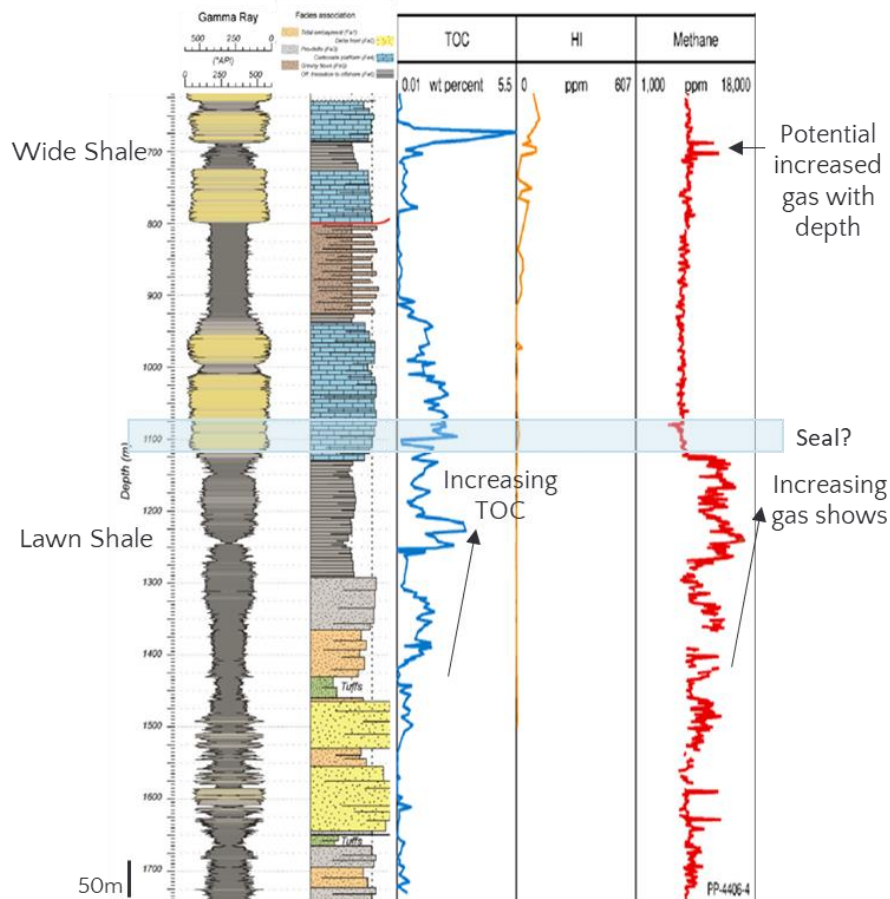
**Figure 2: Regional setting of EP 144 including proximate infrastructure, surrounding well locations and existing seismic lines**

### Proven presence of organic-rich source rocks within EP 144

As announced on 15 July 2024, the Company has identified significant unconventional gas play potential on the Permit. In combination with the assessment and interpretation of existing available data, the Company has also been engaging with mining companies actively drilling on overlapping mineral licenses. Encounter Resources Limited (**Encounter**)(ASX: ENR) is one such company holding minerals acreage over EP 144. In December 2023, an eight well drilling campaign was completed on Encounter's mineral tenure and recently Top End examined the resulting core samples.

Following observation of Proterozoic black shale sections in multiple drill hole cores, the Company procured samples from the cores to be assessed for Total Organic Carbon (TOC), pyrolysis and thermal maturity. Preliminary analysis by Stratum Reservoir in the United States confirms organic-rich source rocks are present within the Permit with up to 3.1wt% TOC and HI 24 mg HC/gTOC in the sampled intervals. This is consistent with Lawn Hill shale interval intersected in the NDI Carrara-1 well, which sampled up to 3.2 wt% TOC and mean HI 3 mg HC/gTOC. As the holes drilled by Encounter have not yet been logged, the core samples acquired by the Company were done so during core viewing. Subject to agreement from Encounter, the Company intends to undertake a geophysical wireline logging program on the drill holes, including gamma ray, density, resistivity and sonic logs with a subsequent resampling of whole core intervals post logging. The expectation is that this will provide more precise data on source rock intervals for further testing. Further preliminary TOC, pyrolysis and thermal maturity evaluation remains ongoing.

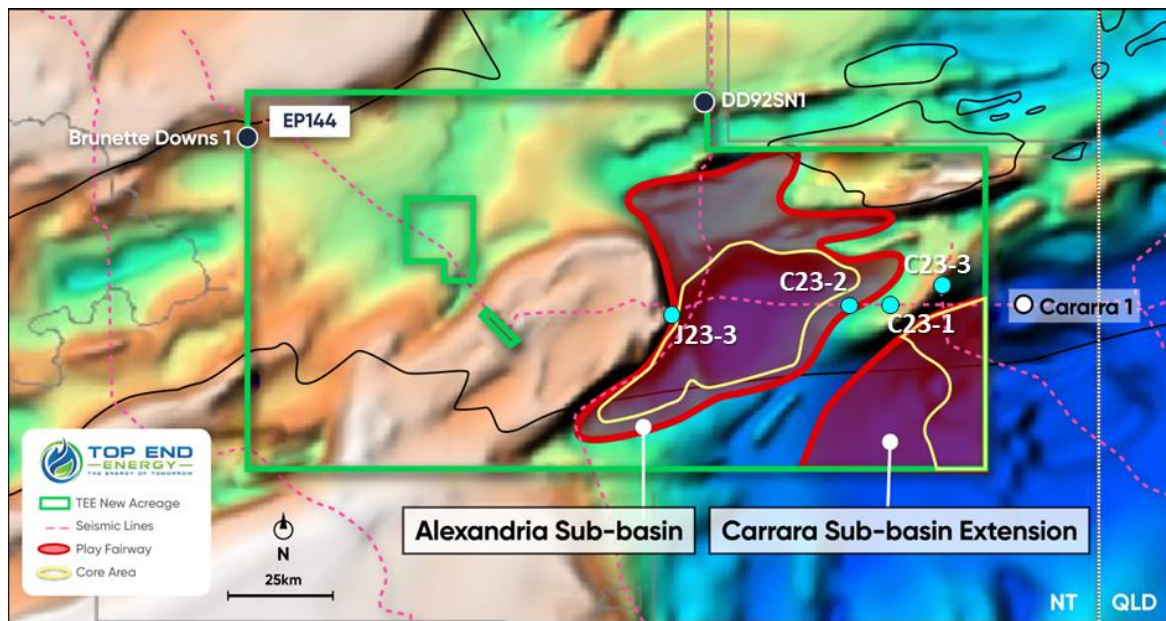
It is the Company's expectation that deeper source rock intervals are also present on the Permit, including the River sequence source rocks. The River sequence has been intersected by other historical wells across the South Nicholson Basin and interpreted on 2D seismic data to be present in the Permit.



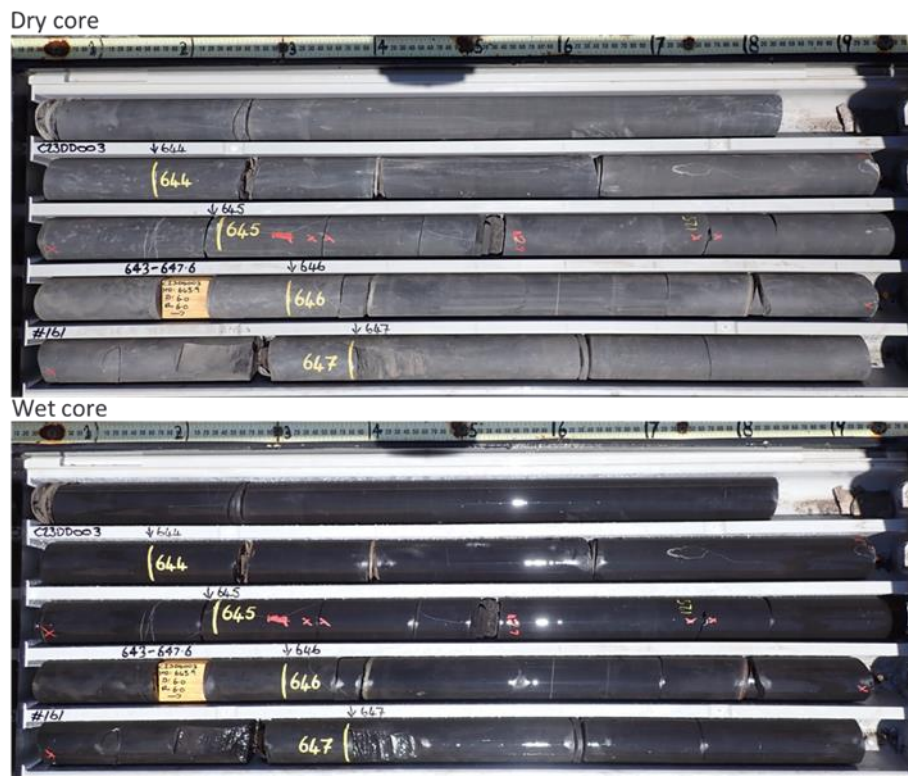
**Figure 3: NDI Carrara-1 well log showing multiple source rock intervals<sup>1</sup>– source rocks intersected in EP 144 expected to be older than those intersected in NDI Carrara-1**

<sup>1</sup> Crombez, V., Delle Piane, C., Dewhurst, D. N. 2022. NDI Carrara 1 sedimentology, microstructural analyses, and sequence stratigraphy (Appendix 3). CSIRO





**Figure 4: Wells C23-3 and C23-1 both intersected Proterozoic black shales directly beneath the Cambrian unconformity at ~633m and ~626m respectively. Both C23-3 and C23-1 observed multiple intervals of black shales below the Cambrian unconformity until TD at ~1,000m. Well C23-2 was drilled to TD of 800m and did not intersect any significant thickness of black shales, interpreted due to shallow depth of drilling. Well J23-3 (TD 1,300m) intersected black shale at ~1,289m but samples yet to be taken at this stage**



**Figure 5: C23-3 dry and wet core images with 3.1wt% TOC sampled at 645m**

## Next steps

The ability to test the core samples drilled by Encounter and prove the presence of source rock intervals on the Permit is an important step in accelerating the Company's de-risking activities. The Company will continue to engage closely with Encounter to maximise the opportunity for mutual learnings and operational synergies from the companies' respective ongoing work programs.

Building on the recent data, near-term activities intended to further delineate and better understand the unconventional resource potential on the Permit include:

- Further organic petrographic analyses to help determine thermal maturity of the organic-rich intervals;
- Geophysical wireline logging of Encounter's drillholes and resampling of whole core intervals, post-wireline logging evaluation;
- Well to seismic correlation of key organic-rich sequences;
- Updated seismic interpretation based on the above data findings; and
- Drilling of a deep stratigraphic well to test multiple source rock intervals.

**- END -**

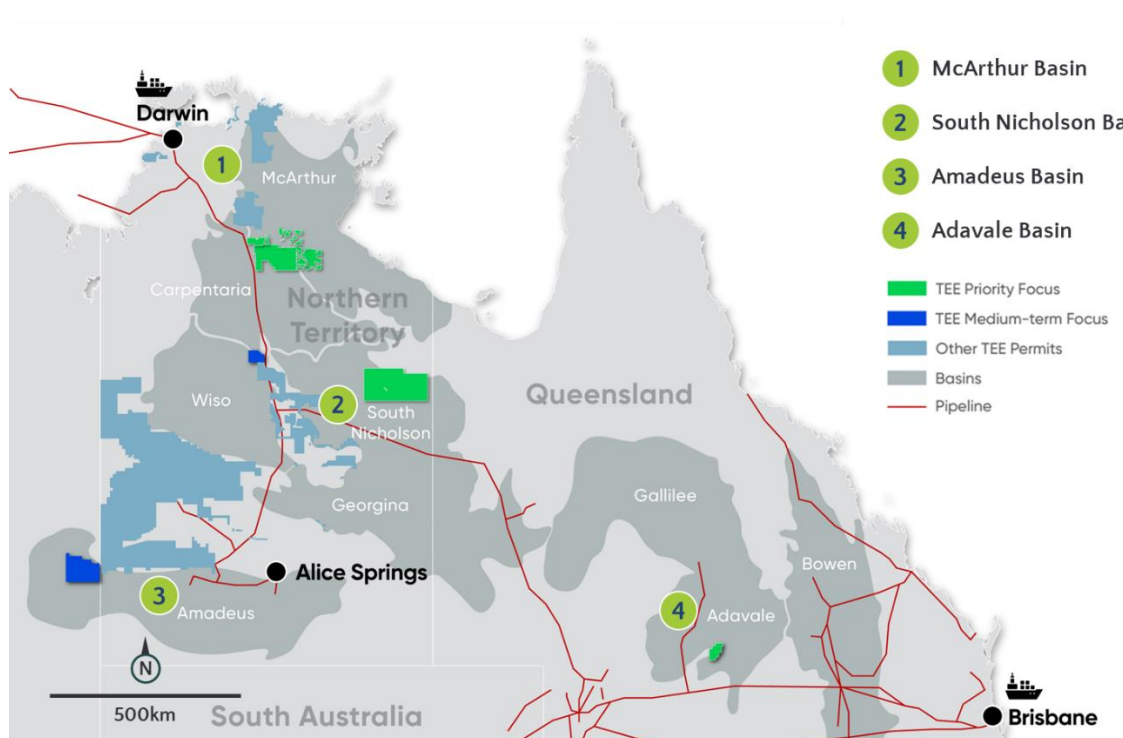
This announcement was authorised for release by the Board of Directors of Top End Energy Limited.

For more information please contact:

**Kelly Moore and Michelle Kennedy**  
**Joint Company Secretaries**  
**+61 8 6245 9836**  
[info@topendenergy.com.au](mailto:info@topendenergy.com.au)  
**About Top End Energy Limited**

Top End aims to be a leading Australian diversified energy provider at the forefront of the energy transition. Combining an attractive portfolio of granted and in-application petroleum permits across Australia, intending to pursue complementary clean energy solutions and achieve a target of net zero (Scope 1 and 2) emissions.

For further information on Top End Energy Limited please visit [www.topendenergy.com.au](http://www.topendenergy.com.au)



#### Disclosures under ASX Listing Rule 5.30

**a) The name and type of well.**

C23DD-003 and C23DD-001 – diamond drilled mineral exploration holes.

**b) The location of the well and details of the permit or lease in which the well is located.**

C23DD-003 (Lat: -18.9259, Long: 137.6373) and C23DD-001 (Lat:-18.9727, Long: 137.5198) are located in mineral exploration license (EL) 32476. EL 32476 overlaps EP 144.

**c) The entity's working interest in the well.**

The Company holds no working interest in either C23DD-003 or C23DD-001 drillholes, but recently acquired EP 144 upon which EL 32476 overlies. EL 32476 is held by Encounter Resources Limited and subject to a farm-in agreement with South32.

**d) If the gross pay thickness is reported for an interval of conventional resources, the net pay thickness.**

Not applicable

**e) The geological rock type of the formation drilled.**

Black shale with minor siltstone.

**f) The depth of the zones tested.**

C23DD-003:

- Interval tested: 633m – 920m, thickness: 287m
- Interval tested: 940m – 1000m, thickness: 60m

C23DD-001:

- Interval tested: 626m – 849m, thickness: 223m
- Interval tested: 892m – 1001m, thickness: 109m

**g) The types of test(s) undertaken and the duration of the test(s).**

The Company undertook geochemical analysis of core samples from the mineral exploration holes previously drilled on EL 32476, including TOC, pyrolysis and thermal maturity testing.

**h) The hydrocarbon phases recovered in the test(s).**

Not applicable.

**i) Any other recovery, such as, formation water and water, associated with the test(s) and their respective proportions.**

Not applicable.

**j) The choke size used, the flow rates and, if measured, the volumes of the hydrocarbon phases measured.**

Not applicable.

**k) If flow rates were tested, information about the pressures associated with the flow and the duration of the test.**

Not applicable.

**l) If applicable, the number of fracture stimulation stages and the size and nature of fracture stimulation applied.**

Not applicable.

**m) Any material volumes of non-hydrocarbon gases, such as carbon dioxide, nitrogen, hydrogen sulphide or sulphur.**

Not applicable.

**n) Any other information that is material to understanding the reported results.**

Not applicable.