

## ASX ANNOUNCEMENT

1 April 2025

### JACKSON 4 FLOW TEST AND GAS ANALYSIS UPDATE GALACTICA PROJECT

#### Highlights

- **Strong Reservoir Flow:** Jackson 4 flowed naturally during drilling and at TD.
- **Increasing Natural Flow Rates:** Flow rate since TD has increased to 190 Mcfd.
- **Projected Stabilised Flow Rates:** 250 to 350 Mcfd constrained to optimise production, with a maximum potential rate of 450 Mcfd.
- **Helium Concentration:** Early samples return helium concentration of up to 1.18% and 85.93% CO<sub>2</sub> in line with expectations and key to the overall development.

Blue Star Helium Limited (ASX:BNL, OTC:BSNLF) (**Blue Star** or the **Company**) is pleased to announce initial results from the Jackson 4 L4 3154 development well at its Galactica helium project in Las Animas County, Colorado.



*Well-head testing at Jackson 4 well, Galactica Project*

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## **Blue Star Managing Director & CEO, Trent Spry, said**

"We are pleased with further strong results from this development drilling campaign. Jackson 4 has confirmed helium and CO<sub>2</sub> resources at the southern edge of the project and provides further evidence of the Lyons reservoir impressive deliverability. The raw gas composition seen in the well is in line with expectations based on the geologic model and adds to our confidence in our understanding of the helium and CO<sub>2</sub> system working in the area allowing future targeted development wells.

### **Summary Analysis**

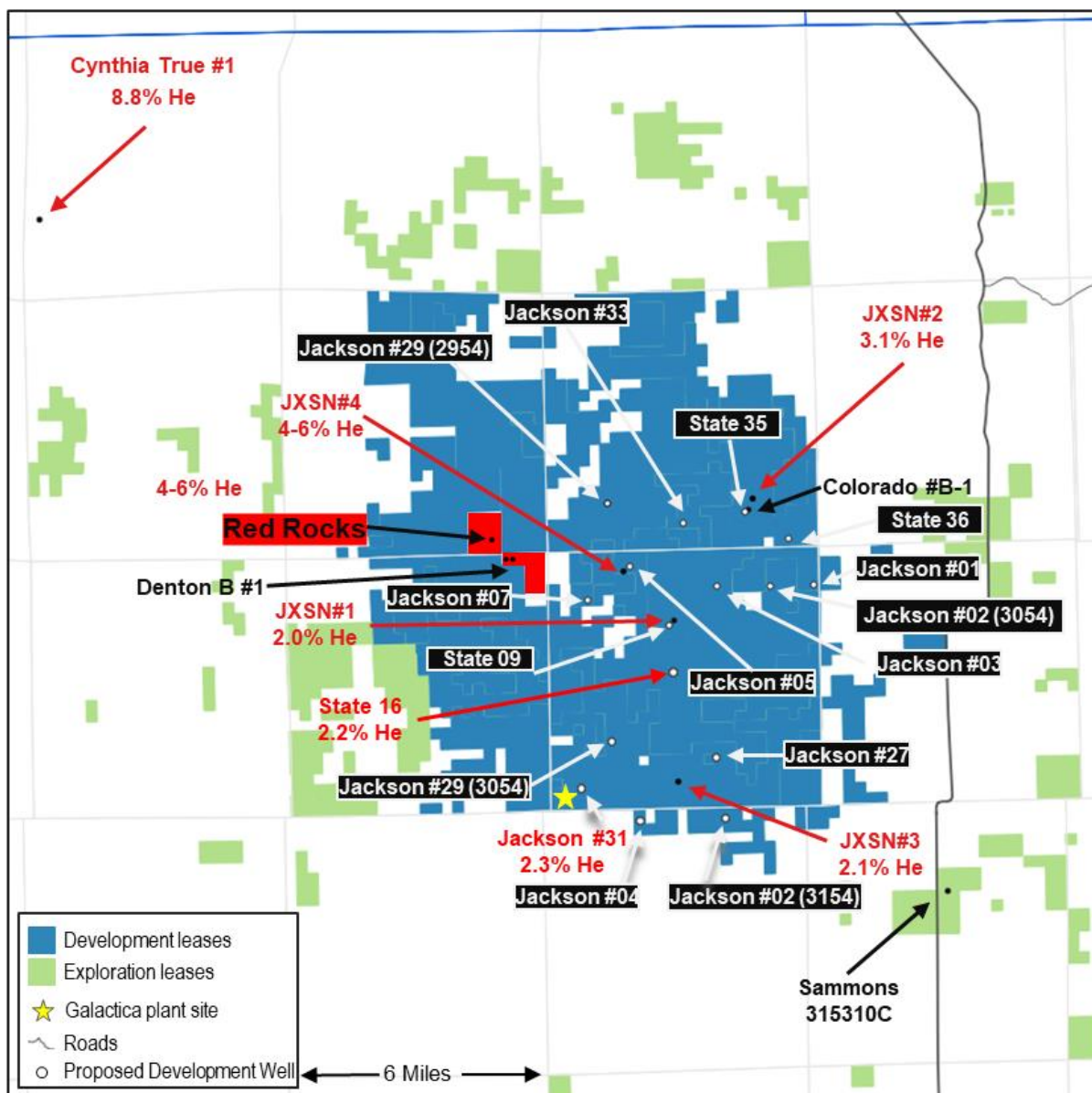
The Jackson 4 well reached TD at 1,260 feet within the upper Lyons Formation, encountering the Lyons Sandstone at 1,198 feet. As expected, no water was encountered during drilling of the Lyons Sandstone with wireline logs confirming the penetrated Lyons sands to be high-quality and gas saturated.

Flow testing since TD has revealed increasing natural flow rates, reaching approximately 190 Mcfd so far. Strong pressure build-up post-testing indicates high permeability and good reservoir communication. Based on the previous engineering study described below, and the observed flow rates, the projected stabilised flow rates constrained for production optimisation are expected to be between 250 to 350 Mcfd, with a maximum of 450 Mcfd.

Initial laboratory analysis of gas samples from Jackson 4 showed a helium concentration up to 1.18% and 85.93% CO<sub>2</sub> (and 12.89% nitrogen) in line with expectations. Jackson 4 is one of the southernmost wells in the project and was expected to access higher CO<sub>2</sub> and lower helium than wells to the north and west.

Maintaining optimal plant throughput for beverage-grade CO<sub>2</sub> production requires a consistent CO<sub>2</sub> feed. High-CO<sub>2</sub> wells are crucial, enabling necessary blending of the input gas to achieve and maintain this optimal feed.

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## Detailed Analysis

### Jackson 4 Well Flow Testing Results

The Jackson 4 well reached a total depth (TD) of 1,260 feet, encountering the Lyons Formation at 1,198 feet. The well was deliberately completed 62 feet into the upper sand of the Lyons Formation. (See BNL ASX announcement of 24 March 2025 *Jackson 4 Well Drilled to TD with Gas Confirmed*). Wireline logs confirming the penetrated Lyons sands to be high-quality and gas saturated.

The well exhibited natural gas flow during drilling and at TD. Flow testing has continued, with increasing results demonstrating natural flow rates of approximately 190 Mcfd. Strong pressure build-up post-testing confirms high permeability and good reservoir communication.

On 1 July 2024 (BNL ASX announcement *State 16 Well Status and Development Update*), the Company released results of an independent engineering analysis of wells in the Galactica/Pegasus project. This analysis established maximum stabilized rates and drawdown for development planning and economic modelling.

The analysis integrated results from the State 16 well with test data from the JXSN#1, JXSN#2, JXSN#3, and JXSN#4 discovery wells, and compared to public information from the adjacent Red Rocks development.

The study concluded:

- Calculated permeabilities in the JXSN discovery wells and State 16 well range from 300 to 750 mD.
- This permeability range suggests initial flow rates at 6 psia wellhead pressure of 334 to 780 Mscfd.
- The State 16 well showed a calculated permeability of 405 mD in the Lyons formation.
- For State 16 (405 mD) stabilized initial flow rates constrained for production optimisation would be 250 to 350 Mcfd with a maximum of 441 Mcfd.

Development planning includes considering vacuum compression ranging from 11 psia (-1 psig) to 6 psia (-6 psig) wellhead pressure which provides the ranges above.

The Jackson 4 well has shown a natural flow rate of approximately 190 Mcfd which compares favourably to the State 16 well which showed a sustained natural flow rate of 150 Mscfd.

Given the higher natural flow at Jackson 4, due to greater permeability in the high-quality Lyons sand, and the previous independent engineering study, projected potential stabilized flow rates, constrained for production optimization, are expected to be 250 to 350 Mscfd with a maximum potential rate of 450 Mscfd.

The information required by ASX Listing Rule 5.30 in relation to these Galactica development wells is set out in the Appendix.

*This ASX Announcement has been authorised for release by the Board of Blue Star Helium Limited.*

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**About Blue Star Helium:**

Blue Star Helium Ltd (ASX:BNL, OTC:BSNLF) is an independent helium exploration company with operations and exploration in North America. Blue Star's strategy is to find and develop new supplies of low-cost, high-grade helium.

**About Helium:**

Helium is a unique industrial gas with applications in various high-tech industries, including MRI and semiconductor manufacturing, fibre optics, and space exploration. Helium is primarily sourced as a by-product of natural gas extraction.

## Appendix

### Information Required by ASX Listing Rules 5.30

5.30	Rule Summary	Company Statement
(a)	Name & type of well	Jackson 4 L4 3154 helium development well
(b)	Location of well and permit details	<p>Location: Section 4 L4 in Township 30 South Range 54 West (see map in this announcement).</p> <p>Mineral Lease: Oil and gas lease between a private mineral owner and Blue Star's wholly owned subsidiary, Las Animas Leasing Inc (LAL). The lease has an effective date of 22 January 2022, the total area of the lease is 4,895 acres, the term is 5 years from the effective date and so long thereafter as gas is produced in paying quantities, and the royalty is 17.5%.</p>
(c)	Working interest in well	50% (see BNL announcement dated 28 August 2024 <i>Helium One Farms into Galactica / Pegasus Project</i> )
(d)	Net pay	Production hole section from 1,198 to 1,260 feet, containing approximately 62 feet of high-quality gas filled sandstone and remains open at depth.
(e)	Geological rock type drilled	Lyons Formation
(f)	Depth of zones tested	1,198 to 1,260 feet
(g)	Test types	Flow tests were conducted with an orifice plate tester directly off of the well-head (more details below).
(h)	Hydrocarbon phases recovered	Nil
(i)	Other recovery	Helium, carbon dioxide, nitrogen
(j)	Choke size etc	Natural flow at up to 190 Mcfd through a 1.25" orifice plate.
(k)	Pressures etc	See announcement text and paragraph (n) below.
(l)	No. of fracture stimulation stages	Nil
(m)	Other volumes	See paragraph (j) above.
(n)	Other information	<p>Gas Sample Analysis</p> <p>While flowing gas samples were taken from a 2" nipple directly off the well-head.</p> <p>The sample analysis was carried out by Gas Analysis Service, Farmington NM using a single thermal conductivity detector (TCD) for gas compositional analysis for the determination of C1-C6+ hydrocarbons, helium, nitrogen and CO2 adopted from Gas Processors Association standard 2261-00. Concentrations of the compounds are measured using thermal conductivity detectors using ultra-high purity hydrogen as a carrier gas.</p>

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	<p>A number of secondary samples were also sent to Dolan Integration Group of 11025 Dover Street, Suite 800, Westminster, Colorado, for cross calibration.</p> <p>Gas compositional analysis methodology for the determination of C1-C6+ hydrocarbons and permanent gases (nitrogen, oxygen, argon, carbon dioxide, helium and hydrogen) are adopted from Gas Processors Association standard 2261-00. Concentrations of the compounds are measured using an Agilent 7890 gas chromatograph equipped with dual thermal conductivity detectors (TCD), each of which uses either ultra-high purity hydrogen or nitrogen as a carrier gas.</p> <p>The laboratory reports un-normalized concentrations in parts per million (ppm). The laboratory runs multiple mixed calibration gases with each sample, so it has multi-point calibration curves for each compound reported.</p> <p><b>Flow Testing</b></p> <p>Flow tests were conducted with an orifice plate tester. Specific gravity of the gas was calculated using data obtained from Gas Analysis Services (GAS) (gas gravity of 1.43; 41.413 molecular weight). Tests were conducted over a multiple 15 min (until stabilised flow was established) periods over a number of days flowing through a 1.25" orifice plate to atmospheric pressure at approximately 60° F.</p> <p><b>Independent Project Engineering Analysis of Flow Potential (referred to in this announcement as the <b>Engineering Study</b>)</b></p> <p>On 1 July 2024 (see BNL ASX announcement of 1 July 2024, State 16 Well Status and Development Update) the Company announced the results of its independent engineering analysis of the wells drilled across the Galactica / Pegasus project establishing maximum stabilised rates and drawdown that will be modelled for incorporation into development planning and economics for the project.</p> <p>At the time the State 16 well results were integrated with the test data from the JXSN#1, JXSN#2, JXSN#3 and JXSN#4 discovery wells drilled by Blue Star and compared to the public information available from the adjacent Red Rocks development.</p> <p>Results show the range of permeabilities calculated in the JXSN discovery wells and State 16 well is 300 to 750 mD which would result in initial flow rates at 6 psia wellhead pressure of between 334 and 780 Mscfd, and that at the State 16 well the calculated permeability for the Lyons formation is 405 mD, with a producing wellhead pressure of 6 psia the well would be capable of 441 Mscfd.</p> <p>As part of the development planning various vacuum compression will be considered for each well from 11 psia (-1 psig) wellhead pressure to 6 psia (-6 psig) wellhead pressure, resulting in stabilised flow rates ranging from 250 Mscfd to 615 Mscfd based on the range of permeabilities seen to date.</p>
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		<p>The Jackson 4 well has shown a natural flow rate of approximately 250 Mcfd which compares favourably to the State 16 well which showed a sustained natural flow rate of 150 Mscfd.</p> <p>Given the higher natural flow at Jackson 4, due to greater permeability in the high-quality Lyons sand, and the Engineering Study, projected potential stabilized flow rates, constrained for production optimization, are expected to be 250-350 Mscfd with a maximum potential rate of 450 Mscfd.</p> <p>In this announcement, Mcfd means thousand standard cubic feet per day.</p>
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5.30	Rule Summary	Company Statement
(a)	Name and type of well	State 16 SWSE 3054 helium well
(b)	Location of well and details of lease	<p>Location: Section 16 SWSE Township 30 South Range 54 West (see map in this announcement).</p> <p>Lease: Oil and Gas Lease No.112989 between the State of Colorado and Blue Star's wholly owned subsidiary, Las Animas Leasing Inc (LAL). The lease has an effective date of 21 November 2019, the total area of the leases is 640 gross acres (640 net acres), the term is 5 years from the effective date and so long thereafter as gas is produced in paying quantities, the rental is payable annually at a rate of \$2.50 per acre per year, the royalty is 20% and LAL's working interest in the lease is 100%.</p>
(c)	Working Interest	100%
(d)	Net pay (if gross pay reported)	Production hole section from 1,111.5 to 1,211 feet, containing approximately 96 feet of high-quality gas filled sandstone
(e)	Geological rock type of formation	Lyons sandstone
(f)	Depth of zones tested	1,111.5 to 1,211 feet
(g)	Types of tests and duration	Flow tests comprising a 12 hour natural flow period followed by a 12 hour flow period under vacuum compression after which a 48 hour pressure build up was performed.
(h)	Hydrocarbon phases recovered	Nil
(i)	Any other recovery	Helium, carbon dioxide, nitrogen
(j)	Choke size, flow rates and volumes measured	Natural flow at up to 208 Mcfd through a 1" orifice plate, stabilized at 150 Mcfd. Vacuum flow at up to 313 Mcfd through a 1.375" orifice plate, stabilized at 285 Mcfd.
(k)	Pressures associated with flow and duration of test	See announcement text and paragraph (n) below.
(l)	Number of fracture stimulation stages	Nil
(m)	Material volumes of non-hydrocarbon gases	See paragraph (j) above.

<p>(n)</p>	<p>Any other material information</p>	<p><b>Gas Sample Analysis</b></p> <p>While flowing gas samples were taken from a 2" nipple directly after the flow meter.</p> <p>The sample analysis was carried out by Gas Analysis Service, Farmington NM using a single thermal conductivity detector (TCD) for gas compositional analysis for the determination of C1-C6+ hydrocarbons, helium, nitrogen and CO2 adopted from Gas Processors Association standard 2261-00. Concentrations of the compounds are measured using thermal conductivity detectors using ultra-high purity hydrogen as a carrier gas.</p> <p>A number of secondary samples were also sent to Dolan Integration Group of 11025 Dover Street, Suite 800, Westminster, Colorado, for cross calibration.</p> <p>Gas compositional analysis methodology for the determination of C1-C6+ hydrocarbons and permanent gases (nitrogen, oxygen, argon, carbon dioxide, helium and hydrogen) are adopted from Gas Processors Association standard 2261-00. Concentrations of the compounds are measured using an Agilent 7890 gas chromatograph equipped with dual thermal conductivity detectors (TCD), each of which uses either ultra-high purity hydrogen or nitrogen as a carrier gas.</p> <p>The laboratory reports un-normalized concentrations in parts per million (ppm). The laboratory runs multiple mixed calibration gases with each sample, so it has multi-point calibration curves for each compound reported.</p> <p><b>Flow Testing</b></p> <p>Flow tests were conducted with a ABB XFC 6413 Total Flow Meter using AGA 1992 calculation method . Flow rate calculations used an assumed gas gravity of 1.3 (37.661 molecular weight) based on offset wells and a pressure base of 14.7 psia. Natural flow tests were conducted over a 12 hour period flowing through a 1" orifice plate to atmospheric pressure. Vacuum flow tests were conducted over a 12 hour period flowing through a 1.375" orifice plate to atmospheric pressure.</p> <p>In this announcement, Mcfd means thousand standard cubic feet per day.</p> <p>The information in this table applies to the procedures and results referred to in the original State 16 well results announcement of 4 June 2024 and to the announcement of 6 March 2025 subject to the comments in the following paragraphs.</p> <p>The new samples were taken from a 2" nipple directly from the wellhead. The sample analysis was carried out by Gas</p>
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		<p>Analysis Service, Farmington NM using a single thermal conductivity detector (TCD) for gas compositional analysis for the determination of C1-C6+ hydrocarbons, helium, nitrogen and CO2 adopted from Gas Processors Association standard 2261-00. Concentrations of the compounds are measured using thermal conductivity detectors using ultra-high purity hydrogen as a carrier gas.</p> <p>Independent Project Engineering Analysis of Flow Potential (referred to in this announcement as the <b>Engineering Study</b>)</p> <p>On 1 July 2024 (see BNL ASX announcement of 1 July 2024, State 16 Well Status and Development Update) the Company announced the results of its independent engineering analysis of the wells drilled across the Galactica / Pegasus project establishing maximum stabilised rates and drawdown that will be modelled for incorporation into development planning and economics for the project.</p> <p>At the time the State 16 well results were integrated with the test data from the JXSN#1, JXSN#2, JXSN#3 and JXSN#4 discovery wells drilled by Blue Star and compared to the public information available from the adjacent Red Rocks development.</p> <p>Results show the range of permeabilities calculated in the JXSN discovery wells and State 16 well is 300 to 750 mD which would result in initial flow rates at 6 psia wellhead pressure of between 334 and 780 Mscfd, and that at the State 16 well the calculated permeability for the Lyons formation is 405 mD, with a producing wellhead pressure of 6 psia the well would be capable of 441 Mscfd.</p> <p>As part of the development planning various vacuum compression will be considered for each well from 11 psia (-1 psig) wellhead pressure to 6 psia (-6 psig) wellhead pressure, resulting in stabilised flow rates ranging from 250 Mscfd to 615 Mscfd based on the range of permeabilities seen to date.</p> <p>The State 16 well has shown a natural flow rate of approximately 150 Mcfd. For the State 16 well (405 mD) these rates would equate to 250 Mscfd to 350 Mscfd. These rates represent constrained rates to maximise the initial production rate plateau which is standard practice in gas developments to maximise recovery and reservoir pressure maintenance while providing a more constant feed rate to be achieved through the plant.</p>
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5.30	Rule Summary	Company Statement
(a)	Name & type of well	Jackson 31 SENW 3054 helium development well
(b)	Location of well and permit details	Location: Section 31 SENW Township 30 South Range 54 West (see map in this announcement).

		Mineral Lease: Oil and gas lease between a private mineral owner and Blue Star's wholly owned subsidiary, Las Animas Leasing Inc (LAL). The lease has an effective date of 22 January 2022, the total area of the lease is 4,895 acres, the term is 5 years from the effective date and so long thereafter as gas is produced in paying quantities, and the royalty is 17.5%.
(c)	Working interest in well	50% (see BNL announcement dated 28 August 2024 <i>Helium One Farms into Galactica / Pegasus Project</i> )
(d)	Net pay	Production hole section from 1,153 to 1,210 feet, containing approximately 57 feet of high-quality gas filled sandstone and remains open at depth.
(e)	Geological rock type drilled	Lyons Formation
(f)	Depth of zones tested	1,153 to 1,210 feet
(g)	Test types	Flow tests were conducted with an orifice plate tester directly off of the well-head (more details below).
(h)	Hydrocarbon phases recovered	Nil
(i)	Other recovery	Helium, carbon dioxide, nitrogen
(j)	Choke size etc	Natural flow at up to 240 Mcfd through a 1.25" orifice plate.
(k)	Pressures etc	See announcement text and paragraph (n) below.
(l)	No. of fracture stimulation stages	Nil
(m)	Other volumes	See paragraph (j) above.
(n)	Other information	<p>Gas Sample Analysis</p> <p>While flowing gas samples were taken from a 2" nipple directly off the well-head.</p> <p>The sample analysis was carried out by Gas Analysis Service, Farmington NM using a single thermal conductivity detector (TCD) for gas compositional analysis for the determination of C1-C6+ hydrocarbons, helium, nitrogen and CO2 adopted from Gas Processors Association standard 2261-00. Concentrations of the compounds are measured using thermal conductivity detectors using ultra-high purity hydrogen as a carrier gas.</p> <p>A number of secondary samples were also sent to Dolan Integration Group of 11025 Dover Street, Suite 800, Westminster, Colorado, for cross calibration.</p> <p>Gas compositional analysis methodology for the determination of C1-C6+ hydrocarbons and permanent gases (nitrogen, oxygen, argon, carbon dioxide, helium and hydrogen) are adopted from Gas Processors Association standard 2261-00. Concentrations of the compounds are measured using an Agilent 7890 gas chromatograph equipped with dual thermal conductivity detectors (TCD), each of which uses either ultra-high purity hydrogen or nitrogen as a carrier gas.</p>

		<p>The laboratory reports un-normalized concentrations in parts per million (ppm). The laboratory runs multiple mixed calibration gases with each sample, so it has multi-point calibration curves for each compound reported.</p> <p>Flow Testing</p> <p>Flow tests were conducted with an orifice plate tester. Specific gravity of the gas was calculated using data obtained from Gas Analysis Services (GAS) (gas gravity of 1.35; 39.096 molecular weight). Tests were conducted over a multiple 15 min (until stabilised flow was established) periods over a number of days flowing through a 1.25" orifice plate to atmospheric pressure at approximately 60° F.</p> <p>Independent Project Engineering Analysis of Flow Potential (referred to in this announcement as the <b>Engineering Study</b>)</p> <p>On 1 July 2024 (see BNL ASX announcement of 1 July 2024, State 16 Well Status and Development Update) the Company announced the results of its independent engineering analysis of the wells drilled across the Galactica / Pegasus project establishing maximum stabilised rates and drawdown that will be modelled for incorporation into development planning and economics for the project.</p> <p>At the time the State 16 well results were integrated with the test data from the JXSN#1, JXSN#2, JXSN#3 and JXSN#4 discovery wells drilled by Blue Star and compared to the public information available from the adjacent Red Rocks development.</p> <p>Results show the range of permeabilities calculated in the JXSN discovery wells and State 16 well is 300 to 750 mD which would result in initial flow rates at 6 psia wellhead pressure of between 334 and 780 Mscfd, and that at the State 16 well the calculated permeability for the Lyons formation is 405 mD, with a producing wellhead pressure of 6 psia the well would be capable of 441 Mscfd.</p> <p>As part of the development planning various vacuum compression will be considered for each well from 11 psia (-1 psig) wellhead pressure to 6 psia (-6 psig) wellhead pressure, resulting in stabilised flow rates ranging from 250 Mscfd to 615 Mscfd based on the range of permeabilities seen to date.</p> <p>The Jackson 31 well has shown a natural flow rate of approximately 250 Mcfd which compares favourably to the State 16 well which showed a sustained natural flow rate of 150 Mscfd. Given the higher natural flow at Jackson 31, due to greater permeability in the high-quality Lyons sand, and the Engineering Study, projected potential stabilized flow rates, constrained for production optimization, are expected to be 300-400 Mscfd with a maximum potential rate of 500 Mscfd.</p> <p>.</p>
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		In this announcement, Mcfd means thousand standard cubic feet per day.
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