

# Finding and developing low cost, high grade helium in USA

Presentation to Resurgence Conference

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14-16 September 2020

ASX : BNL

**BLUE STAR** | HELIUM



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The Company owns 4 wells (3 operated) in Dawson County, Texas with minor, non-material production. Various options are under consideration for the disposal of all or part of this asset.

The Board has authorised this announcement to be given to ASX. Security holders and other interested parties can contact Joanne Kendrick, Managing Director at [info@bluestarhelium.com.au](mailto:info@bluestarhelium.com.au)

Net Recoverable Helium (mmcf)	1U (P90)	2U (P50)	3U (P10)
Enterprise Prospect	372	2,296	5,003
Galileo Prospect	270	725	1,389
<b>Total Net Recoverable Helium</b>	<b>641</b>	<b>3,021</b>	<b>6,391</b>

Note 1: The estimated quantities of helium that may potentially be recovered by the application of a future development project 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.

Note 2: The resource estimates have been prepared using the probabilistic method and are presented on an unrisks basis.

Note 3: The resource estimates are reported as at an evaluation date of 30 April 2020.

Note 4: The resource estimates are presented on a net entitlements basis and represent Blue Star's net economic interest in the prospective recoverable helium volumes after deductions for the volume weighted royalty burden in accordance with the methodology described in Schedule A of the Company's announcement of 27 May 2020.

The resource estimate set out above is based on and fairly represents information and supporting documentation prepared under the supervision of Trent Spry who is employed as an executive director of BNL. Mr Spry is a qualified geoscientist with over 20 years of oil and gas industry experience and a member of the American Association of Petroleum Geologists and the Petroleum Exploration Society of Australia. Mr Spry consents to the inclusion of the information in this report relating to helium Prospective Resources in the form and context in which it appears.

## HELIUM PURE-PLAY STRATEGY

- Find and develop low cost, high grade helium resources in USA
- High price commodity; increasing high-tech demand
- Only helium pure play on ASX

## ASSET BASE

- Enterprise & Galileo
  - 3BCF P50 prospective helium resource (independently assessed)
  - High resource grades
- Proven helium play fairway
- Colorado location central to helium supply chain, in high demand
- Circa 130,000 gross (73,000 net) acres
- 9 additional prospects and leads being matured

## NEAR-TERM ACTIVITY

- Enterprise drilling planning and approvals
- Get 1-3 additional prospects drill-ready and staked
  - Consolidate leasing, in-field surveys
  - Independent prospective resource assessments
- Low cost drilling campaign starting 4Q 2020 after permit approval (US\$300k/well)
- Short schedule to production upon success – 6 months rental facility mobilisation



# HELIUM DEMAND & PRICING

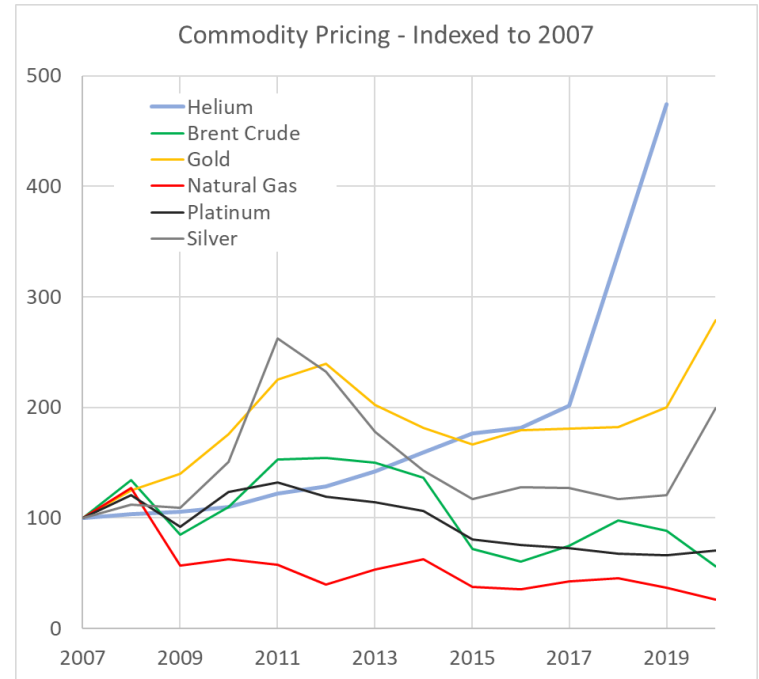
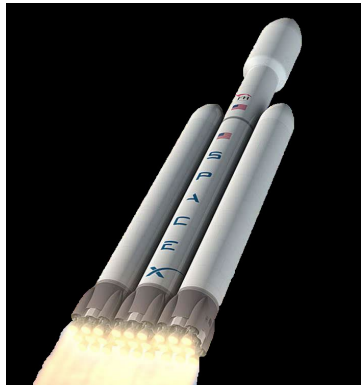
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NETFLIX



amazon



Sources : International Monetary Fund; BLM

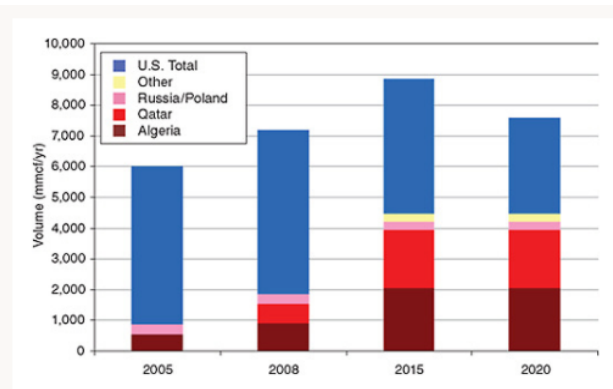
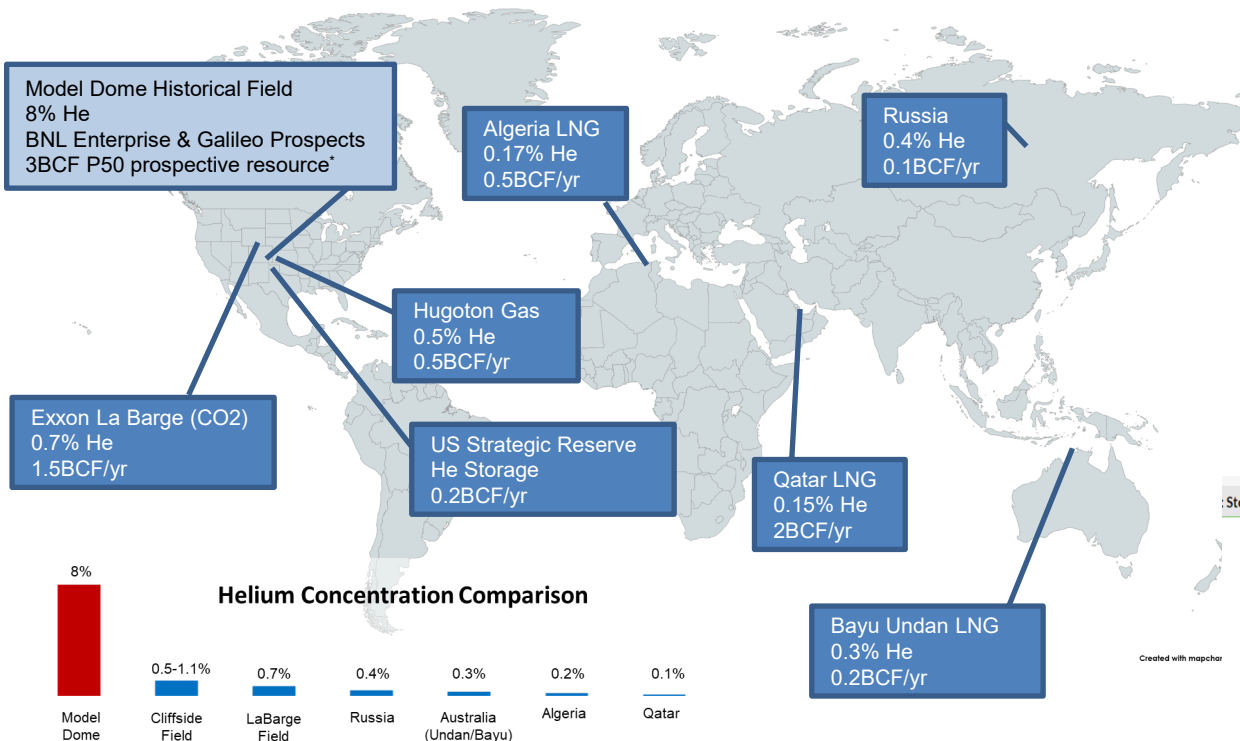
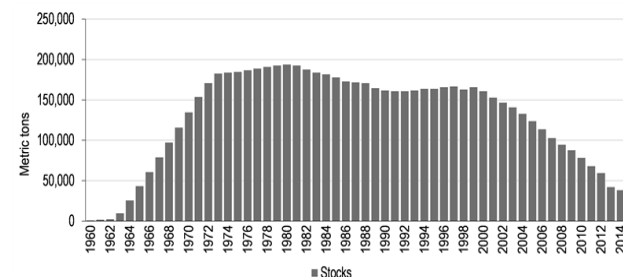


FIGURE 4.4 Actual (2005 and 2008) and estimated (2015 and 2020) crude helium capacities by crude source country.

Stocks of helium in US strategic reserve



Sources : USGS; Edison Research; Kornbluth; National Academy of Sciences

\* The estimate of prospective helium resources must be read in conjunction with the cautionary statement on page 2 that the estimated quantities of helium that may potentially be recovered by the application of a future development project 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 helium.



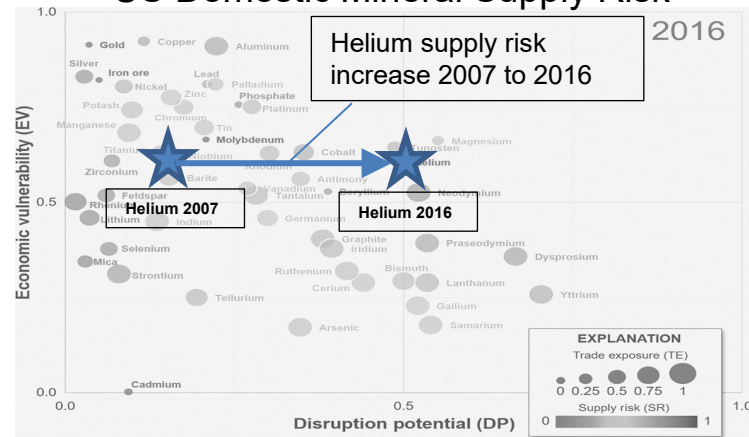
## USA – CENTRE OF GLOBAL HELIUM MARKET AND SUPPLY CHAIN

- 40% total market share feeding greatest demand
- Premium in-ground helium grades
- “Strategic Commodity” classification
- Significant increase in domestic mineral supply risk as BLM sales cease
- Developed market for helium processing equipment and services

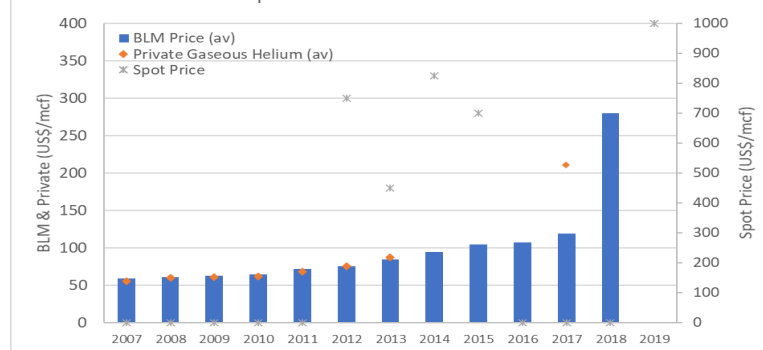
## LOCAL HELIUM PRODUCTION

- Blue Star early mover in growing trend towards helium-centric E&P outside of hydrocarbon areas
- Helium product generally sold :
  - as a compressed gas at 98%+ concentration
  - under long-term take or pay contract
  - sold at plant gate and trucked by buyer
- \$280/mcf last published price average from BLM Auction
  - BLM auction has historically served as a “defacto” crude price for plant-gate sales (according to the US BLM)
- Growing B2B spot market

## US Domestic Mineral Supply Risk



## Upstream Gaseous Helium Price





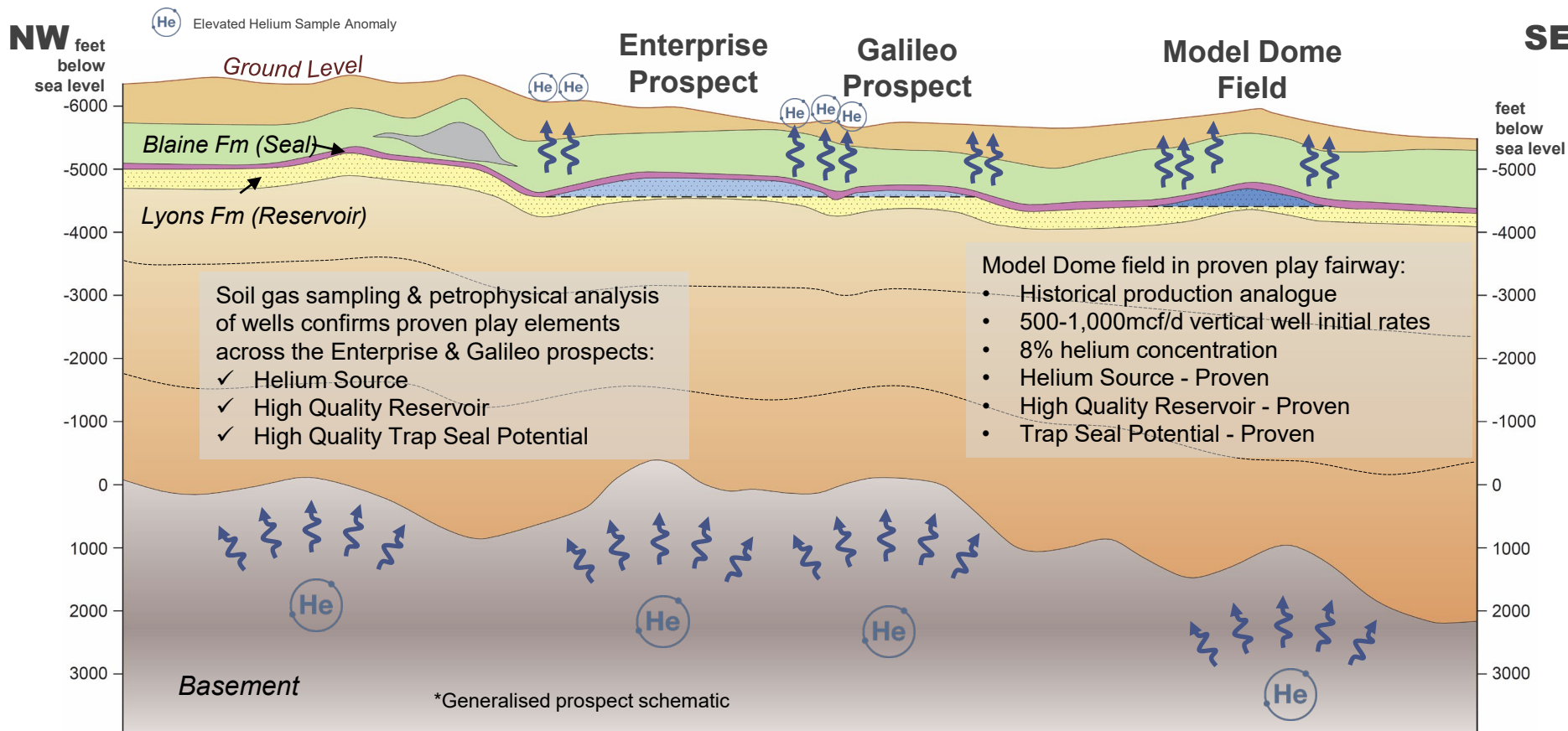
## DRILLING PLANNED 4Q 2020

3BCF in Enterprise and Galileo

Fast, low cost, modular development concept upon success

Prime location & high grade resource

# PROVEN HELIUM PLAY FAIRWAY





## 3 BCF (3,000,000 mcf) P50 Prospective Helium Resource\*

- Net to Blue Star, after applicable royalties
- Shallow target depth 1,000-1,200 ft
- US\$300k proof-of-concept dry hole drilling cost
- Drilling location staked and drilling planned 4Q 2020

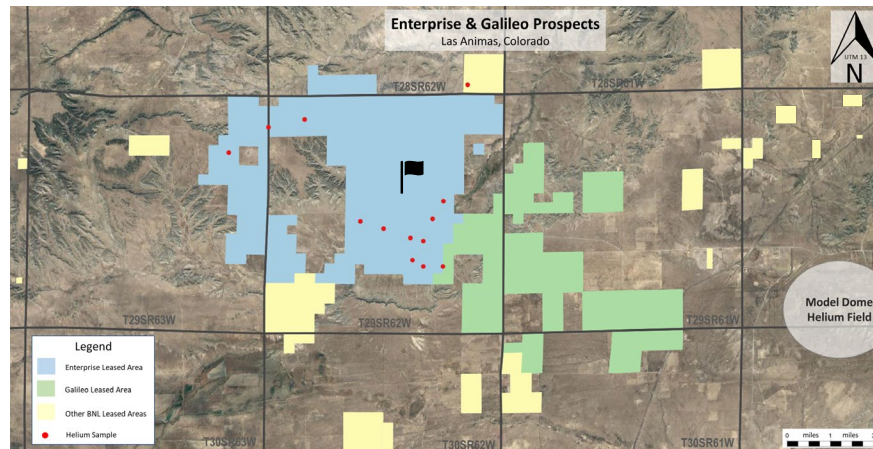
## Proven Helium Play Fairway

- **Historic Production at Model Dome**
  - 8% helium concentration
  - 500-1,000mcf / vertical well initial rates
  - BNL leases within 6 miles
- **Proven Helium Source and Active Charge**
  - 13 elevated soil gas sample locations under lease
  - Up to 100% above normal atmospheric levels
- **Proven High Quality Reservoir (Lyons Formation)**
  - Petrophysical analysis confirms ~ 20% porosity, 160mD perm
- **Proven Trap Sealing Formation (Blaine Formation)**
  - Petrophysical analysis confirms high-quality anhydrite/shale seal

## Prospect Definition

- Structural definition utilizing gravity/magnetics, well data, surface and subsurface mapping to define individual trap risk

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## SURFACE FACILITIES

- Staged, standard-size modular development concept upon success
  - 2mmcf/d raw gas nameplate capacity
  - ~50mmcf helium per annum (at P50 He concentration)
  - Plant mobilisation time to site ~6 months
  - 5 simple vertical producers (similar to proof of concept well)
- Use of standard modules
  - Reduces up-front capital expenditure, rental units available
  - Accelerates time to first production
  - Allows redeployment to subsequent locations
- Development expansion to multiple modules as required
- Discussions ongoing with potential suppliers



Modular units used to treat the raw gas stream to remove nitrogen, CO2 and concentrate helium



## HELIUM OFFTAKE

- 10+ year contracts are customary
- Sellers' market
  - Take or pay with price reopeners
  - Potential to retain spot market component
  - Potential for development funding support by buyer
- Sell at plant gate into buyers' tube trailers
- Discussions ongoing with potential offtakers





## ACCELERATING THE PORTFOLIO

Dominant land position across proven helium play fairway  
Maturing 1-3 additional prospects to boost drilling campaign  
Additional acreage and prospective resources estimates





# BLUE STAR HELIUM

Las Animas, Colorado Leasehold Position



**Enterprise Leases**  
2.3 BCF P50  
Prospective Resources

Enterprise

**Galileo Leases**  
0.7 BCF P50  
Prospective Resources

Defiant

Voyager

Model Dome  
Helium Field

Galileo

Red Dwarf

Galactica

Argo

Serenity

Prometheus

Millennium

Falcon

## Legend



BNL Leased Area



Helium Soil Gas Sample

Prospect/Lead Name

0 miles 6 miles 12 miles

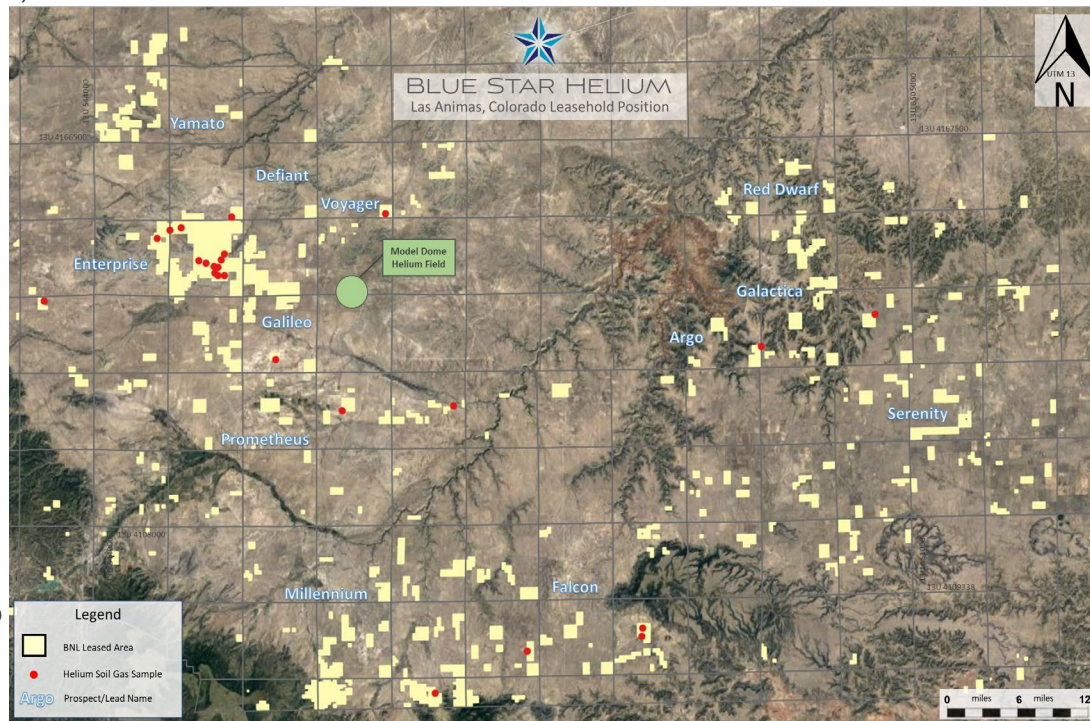


## First mover in Las Animas, Colorado

- Historical production at Model Dome (Top 3 grade in USA)
- Proven helium play fairway
  - Helium charge
  - High quality reservoir & seal pair
- 11+ prospects and leads within proven play fairway
- Technical work focused on reducing trap risk
- Prime market location - low cost area within trucking distance to customers (~150miles)
- Dominant land position secured, circa 130,000 gross (73,000 net) acres leased

## Building the Drilling Program

- Drilling program planned to start 4Q2020 after approval
- Enterprise Prospect staked awaiting approvals
- Actively working up 1-3 additional preferred prospects to drill-ready
  - Consolidate leasing, in-field surveys
  - Independent prospective resources assessment/s
  - Stake location/s, seek approval to drill



## Enterprise Drilling Program

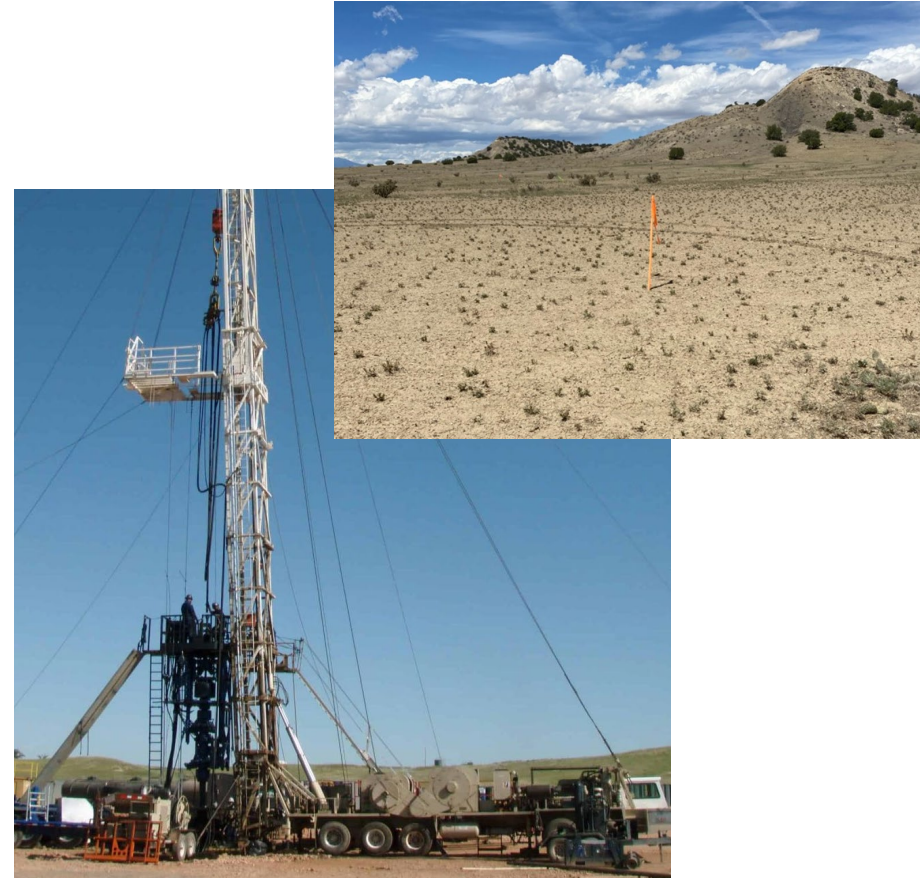
- Well permitting approvals and surface use agreements
- Contract and mobilise rig
- Drill and test 4Q 2020 after permit approval

## Mature Further Prospects and Leads

- Consolidate leasing
- Infield surveys
- Prospective resources assessment/s
- Stake location/s
- Promotion/s to drilling program

## Development Concept

- Finalise concept selection
- Select potential development well locations
- Select and contract with surface equipment supplier/s
- Progress discussions with potential offtakers







## HELIUM PURE-PLAY

Proven Helium Play Fairway  
High grade resource

Low cost, high impact drilling program 4Q 2020

## Market Snapshot ASX: BNL

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Issued Share Capital (at 10 Sep 20)	1,060M
Unlisted Options (at 1.2¢ expiring Dec 21)	86M
Share Price (at 11 Sep 20) A\$	2.7¢
Market Capitalisation A\$	28.6M
Cash (as at 30 Jun 20)* A\$	1.72M

\* Excluding subscriptions totalling \$1.4m received post 30 Jun 2020

## Supportive Shareholder Base\*

Shareholder	Undiluted	Fully Diluted
Board and Management	3.3%	8.8%
Pamplona	4.1%	5.3%
Ms Chunyan Niu	4.3%	4.0%
United Equity Partners Pty Ltd	2.9%	2.7%
BNP Paribas Nominees Pty Ltd	3.6%	3.3%
Top 20	47.5%	49.4%

\*as at 10 September 2020

## Share Price Performance (to 11 September 2020)



## Board and Management

### Ross Warner – Executive Chairman

Lawyer with 15+ years in oil and gas particularly in the United States, UK and Indonesia

### Joanne Kendrick – MD

Petroleum and reservoir engineer with 20+ years in exploration, development and production

### Trent Spry – Executive Director

Experienced geoscientist with 20+ years in oil, gas and helium, exploration, development and new ventures



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**BLUE STAR** | HELIUM



Unit	Measure
B	Prefix - billions
mm	Prefix - millions
m	Prefix - thousands
/d	Suffix - per day

Unit	Measure
Bcf	billion cubic feet
mmcf	million cubic feet
mcf	thousand cubic feet

Term	Description
1U (P90), 2U (P50) and 3U (P10)	In a probabilistic resource distribution, 1U (P90), 2U (P50), 3U (P10) estimates represent the 90% probability, 50% probability and 10% probability respectively that the quantity recovered will equal or exceed the estimate assuming a success case in the prospect
gross acres and net acres	The minerals in a tract of land may be owned by one or more owners. Each owner may lease its respective percentage share of the minerals. The gross area of the tract of land is referred to as the "gross acres" of a lease. The "net acres" refers to the lessor's percentage share of the gross acres.
lead	A project associated with a potential accumulation that is currently poorly defined and requires more data acquisition and/or evaluation to be classified as a Prospect. A project maturity sub-class of Prospective Resources.
net revenue interest or NRI	A share of production after all burdens, such as royalty and overriding royalty, have been deducted from the working interest. It is the percentage of production that each party actually receives.
oil and gas lease	An agreement between a mineral owner (lessor) and an oil and gas company (lessee) permitting the lessee to explore, drill and produce oil and gas from the tract of property. Typically, the lease provides that lessee will pay a Royalty to the lessor. Also referred to as a "mineral lease" or a "lease".
operator	The owner of the right to drill or produce a well, or the entity contractually charged with drilling of a test well and production of subsequent wells.
overriding royalty	A percentage share of production, or the value derived from production, which is free of all costs of drilling and producing, and is created by the lessee or working interest owner and paid by the lessee or working interest owner.
PRMS	The Petroleum Resources Management System of the Society of Petroleum Engineers, World Petroleum Council, American Association of Petroleum Geologists and Society of Petroleum Evaluation Engineers as revised in June 2018.
prospect	A project associated with an undrilled potential accumulation that is sufficiently well defined to represent a viable drilling target. A project maturity sub-class of Prospective Resources.
royalty	A percentage share of production, or the value derived from that production, paid from a producing well.
working interest or WI	A percentage of ownership in an Oil and Gas Lease. Working Interest owners are obliged to pay a corresponding percentage of the cost of leasing, drilling and producing and operating a well or unit. After payment of Royalties, the working interest also entitles its owner to a share in production revenues with other working interest owners, based on the percentage of working interest owned.

1. The system of mineral ownership and development in the USA is substantially different to the system in Australia. The following is a general description of the system that commonly applies in the oil and gas producing states. It is important to note that local variations may apply.
2. The owner of land owns the surface and all oil, gas and other minerals beneath his/her tract, unless a severance has occurred that creates two distinct estates: the surface estate and the mineral estate. A severance of the mineral estate results from a conveyance or reservation of all, or a portion, of the oil, gas and other minerals in and to a specific tract.
3. The oil, gas and other minerals beneath a tract of land are a part of the realty until produced and become personal property when brought to the surface. Because the mineral estate is considered real property, it may be acquired, divested, encumbered, devised and inherited, thereby resulting in the possibility that an unlimited number of persons ("mineral owners") may own undivided interests in a tract's minerals.
4. Accordingly, the mineral estate in a tract may be owned by one or more distinct owners and each distinct owner may comprise one or more persons. The mineral estate may be divided amongst distinct owners by depth or geological formation. Where there is more than one distinct owner of a mineral estate, each such owner will own a percentage share of that mineral estate. The percentage shares of that mineral estate need not be equal. Therefore, each such distinct owner owns its percentage share of an undivided share in the mineral estate in that tract. In addition, private individuals may own the mineral rights directly beneath public surface owners or users, eg the mineral rights beneath a public road. This is commonly summarised by referring to the lessor's "net acreage" in a tract. This means the lessor's percentage share of the undivided total area of the tract's minerals ("gross acres") net of the percentage share of other mineral owners in the same tract. For example, assume the mineral rights in a tract of 100 acres are owned by 4 mineral owners in equal shares. If one of those mineral

owners leases its mineral interests to a lessee, the lessee will have an interest in 100 gross acres and 25 net acres. If a second mineral owner leases its mineral interests to the same lessee, the lessee will then have an interest in 100 gross acres and 50 net acres.

5. If an owner of a mineral estate, whether severed or intact with the surface, chooses to pursue development of and production from the minerals beneath the ground, such owner may exercise its rights and may generate revenue through one or more of these methods: (1) the "right to develop" the mineral estate by contracting directly with a drilling and operating company and directly selling the minerals; (2) the "right to lease" the mineral estate to a third party, specifying the terms of the lease and defining the minerals that may be produced; (3) the "right to receive a bonus payment" for leasing the mineral estate, usually calculated per acre, from the lessee for leasing the mineral estate; (4) the "right to receive delay rentals" when the mineral estate is leased but not being produced; and (5) the "right to receive royalty payments" based on a percentage of minerals produced by the lessee. Given the inherent risk, cost of development and required technology to produce oil and gas, most mineral owners do not independently develop their minerals, and as a result, rely on their ability to lease to a third party.
6. The oil and gas lease serves as both a conveyance and a contract which establishes the parties' rights and obligations. There is no "standard form" of lease. The details within the lease are the contract which defines the rights and obligations of the parties.
7. An oil and gas lease creates rights in relation to the mineral estate only and does not grant surface rights to the lessee. Surface rights must be negotiated separately with the surface right owners. This process is facilitated by legislation.
8. The execution of an oil and gas lease that reserves a royalty to the lessor creates the leasehold estate and a royalty interest. The lessee acquires the working interest, or the cost bearing interest, which provides the lessee the right to develop the oil and gas the subject of

the lease at its sole risk and expense ("working interest" or "WI"). The lessee may keep and sell its proportionate share of the oil and gas produced from the lease until the lease expires ("net revenue interest" or "NRI"). The NRI is the lessee's share of production derived from the lease after royalties and other burdens. The leasehold estate created by the oil and gas lease may be conveyed, assigned and encumbered similar to any other real estate, and it is common for the original lessee to assign undivided working interests to numerous parties, who share the burden of costs in developing the mineral estate. Generally, a lease will include a provision that allows the lessee to continue to produce the lease as long as it is economically producing a minimum amount of oil and gas. Such a lease is said to be "held by production" or "HBP".

9. The identity of the mineral ownership in respect of any tract may not be maintained in any single definitive register. The landman establishes the title of the mineral owner by ascertaining the chain of transfers from the original date of grant to the present day. It is customary before drilling a well on a leased property to obtain a drilling title opinion, by which the lessor(s) in question are determined to have the required authority to grant the right to explore, exploit and to assign the minerals in a specific tract of land based on a thorough examination of the chain of title. If errors are found in the course of that examination, it is customary for the lessor and lessee to conduct "Title Curative," which involves, but is not limited to, executing instruments, affidavits, conveyances and filing previously unrecorded documents to resolve any disputes, ambiguities or errors so that the operator has substantial support for its claims prior to undertaking the expense of drilling.
10. All of the major US oil and gas producing states other than California and Kansas have adopted some kind of mandatory pooling scheme to facilitate the development of oil and gas resources owned by more than one stakeholder. These rules provide a process to compel all mineral estate owners in a drilling area to contribute or pool their mineral estate to the drilling of a well in relation to that mineral estate.