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# Red Helium Project Update

November 2022

GRANDGULF  
ENERGY LIMITED

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## Competent Person’s Statement

The information in this report is based on information compiled or reviewed by Mr Keith Martens, Technical Director. Mr Martens is a qualified oil and gas geologist/geophysicist with over 45 years of Australian, North American and other international executive oil and gas experience in both onshore and offshore environments. He has extensive experience of oil and gas exploration, appraisal, strategy development and reserve/resource estimation. Mr Martens has a BSc. (Dual Major) in geology and geophysics from The University of British Columbia, Vancouver, Canada.



# Red Helium Project

## Pure-play Helium, Potential for Near Immediate Production

### Location

- Helium-prolific Four Corners area
- Drill Friendly Utah
- Dominant Lease Position
- > 29,000 acres leased / 250,000 acre AMI



### Midstream

- Helium Offtake Agreement
  - executed with nearby Lisbon helium plant – already connected by pipeline
- Within 20 miles to 2 of only 8 US helium plants
- Spot prices >US\$2000/mcf, ↑~300%



### Producing Analogue

- Doe Canyon (DC)
  - 15 miles east
  - 3 - 5 bcf anticipated helium production
  - High rate gas wells: Avg. IP ~20mmcf/d
  - Avg. helium grade ~0.4%



### Large Resource

- Known Geology, 315km quality 2D seismic
- Vintage wells within AMI proved non-flammable gas and working helium system
  - Maiden Helium Prospective Resource
  - Gross P50 un-risked 10.9bcf<sup>1</sup>



### Jesse Discovery

- 1% helium concentration<sup>3</sup>
- >200ft Gross Gas Column, 101ft Net Pay
  - (Independently Audited, Sproule<sup>2</sup>)
  - DC analogue well @1% He ~200mcf/d helium
- High BHP 2,645psi (on trend with DC virgin)



### Project Development

- Jesse-2 to spud late Q4 '22 / early Q1 '23
- Forward leasing priorities well defined
- Additional drill permits expected in Q4 2022
- Third well anticipated for Q1 2023



## Project Delivery & Monetisation: Fully Funded for Jesse#2



<sup>1</sup> ASX announcement 8 Dec 2021, Maiden Prospective Resource, based on Sproule Report, detailed in Slide 4. <sup>2</sup> ASX Announcement 21 Sep 2022, <sup>3</sup> ASX Announcement 19 Oct 2022

# Corporate Snapshot

## US-Focused Pure-play Helium Explorer

### Financial Information

ASX Trading Symbol (OTCQB)	GGE (GRGUF)
Total Shares	1,546 million
Market Cap @ 2.1c	A\$32.5 million
Net Cash @ 30 Sep 2022	A\$7.1 million
Performance Shares/Rights	165 million
Options (3 years at 2.5 cents each)	60 million
Options (3 years at 7.0 cents each)	10 million
Options (3 years at 8.0 cents each)	103 million



### Red Helium Project: Earning 85% of Valence

	Earning	WI	Max Earn-in Cost \$US
Current Interest		70%	
Drilling second well	7.5%	77.5%	\$1.5M
Drilling third well	7.5%	85%	\$1.5M
Total Payments Remaining			\$3.0M

Recoverable Helium (bcf) <sup>1</sup>	P90(1U)	P50(2U)	P10(3U)
Gross to Valence (28,046 gross acres)	7.6	10.9	12.9
Net to Valence (18,959 net acres)	5.2	7.4	8.5
Net to GGE (earning 85% of Valence)	4.4	6.3	7.2
Red Project Total	7.9	20.8	57.6

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 is required to determine the existence of a significant quantity of potentially moveable helium.



### De-risked asset base

Assets have existing wells with Helium present and extensive 2D seismic



### Low-cost exploration

Multiple Drill Ready Targets:  
Future wells ~US\$3.3m



### Carbon market exposure

45Q Tax Credit upside through CO<sub>2</sub> sequestration potential



### Robust netbacks

Low breakeven and low production costs with high torque to commodity prices



### Skilled executive team

Management brings track record of North American asset development



### Access to capital

ASX/OTCQB listing expands investor base, provides exposure to international capital  
DTC application in process

<sup>1</sup> ASX announcement 8 December 2021, Maiden Prospective Resource, based on Sproule Report. The Company is not aware of any new information or data that materially affects the information included in the referenced ASX announcement and confirms that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. (Pre-drill Jesse#1A)

# Jesse-2: Location

## Potential Company-making Pure-play Helium Well

### Jesse Discovery

- >200 ft gross gas column exceeding pre-drill expectation increases areal extent to over 70,000 acres

### Jesse-2: Second Red Helium Project Well<sup>1</sup>

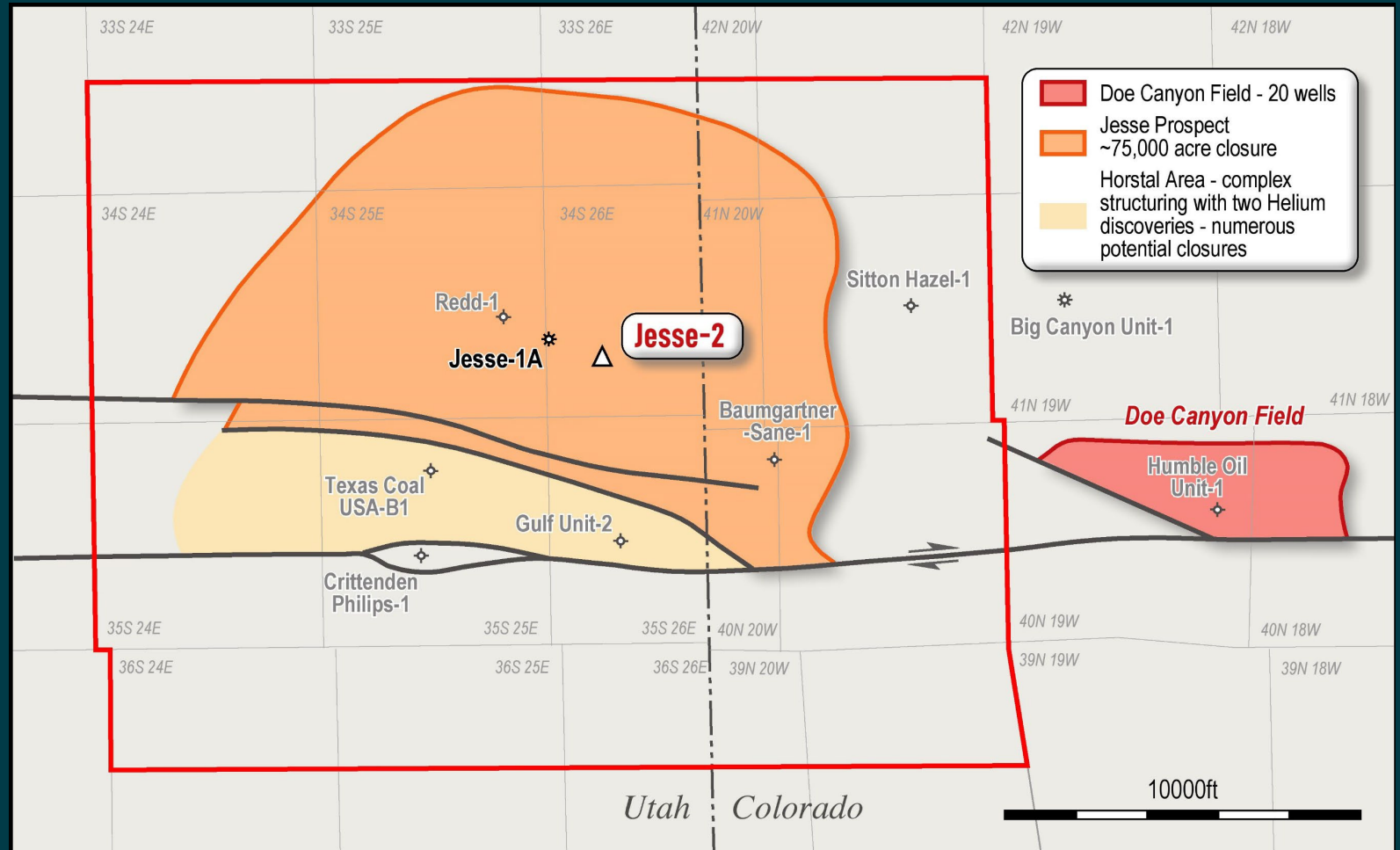
- Best location on Jesse structure, located 1.5 miles south-east of Jesse-1A
- Calibration of 2D seismic data with Jesse-1A and historic well results to target a structural high location on the Jesse feature to maximise the thickness of the gas pay zone and avoid water

### Primary Reservoir Target

- Mississippian Leadville Dolomite

### Forward Plan / Catalysts

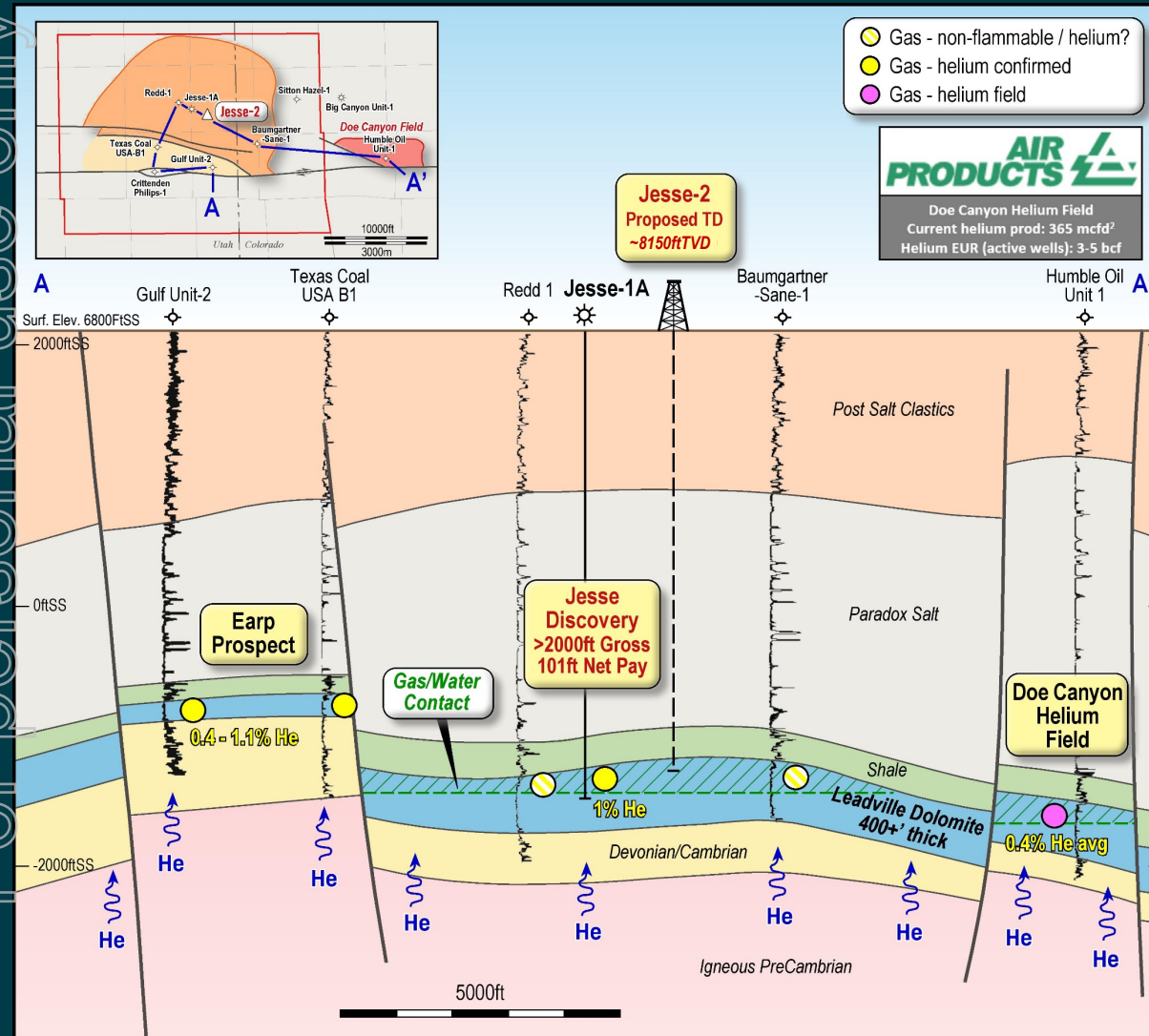
- Jesse-2 planned for late Q4 2022 / early Q1 2023 spud - potential for near immediate production in success case
- Forward leasing priorities well defined
- Additional drilling permits expected Q4 2022
- Third Red Helium Project well anticipated Q1 2023



<sup>1</sup> ASX announcement 7 November 2022, Drilling of Jesse-2 Planned for Q4 2022

# Jesse-2: Low Cost / Low Risk Pathway to Production

Planned for late Q4 2022 / early Q1 2023 spud



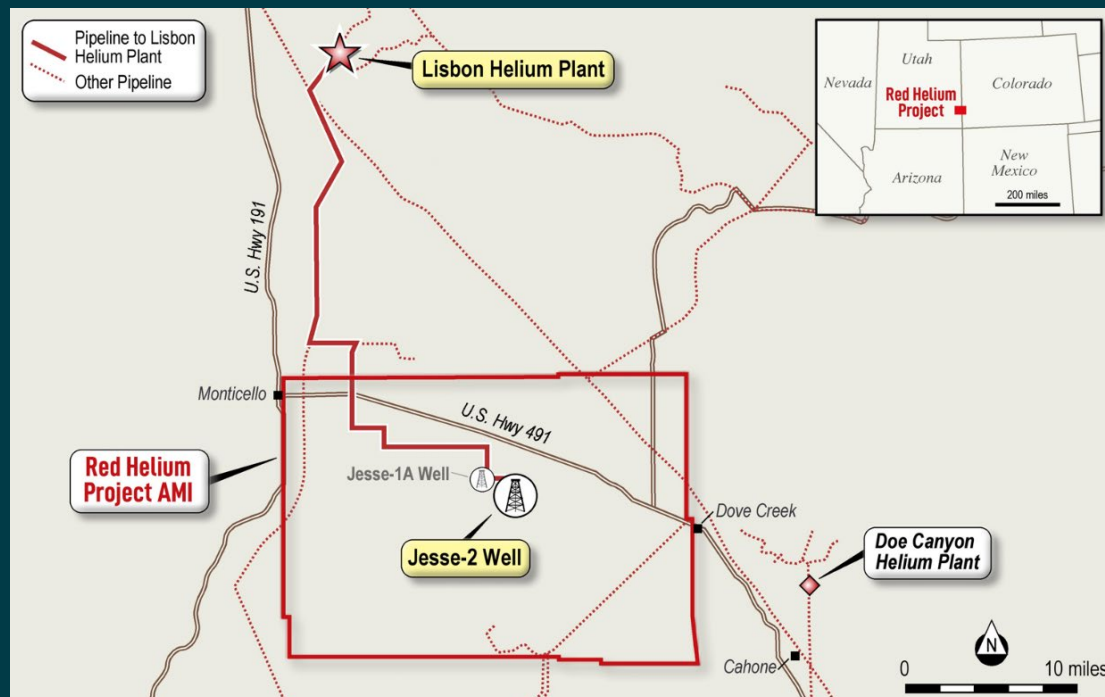
Attribute <sup>1</sup>	Status	Comments
1% proven helium conc.	✓	<ul style="list-style-type: none"> <li>Far exceeded pre-drilling estimates</li> <li>Commercial grade</li> <li>Evidence for upside helium charge model</li> </ul>
Strongly pressured reservoir	✓	<ul style="list-style-type: none"> <li>2,465psi bottom hole pressure at Jesse-1A</li> <li>On trend with Doe Canyon virgin pressure</li> </ul>
200ft gross gas column at Jesse-1A	✓	<ul style="list-style-type: none"> <li>Exceeded pre-drill expectation increasing closure</li> <li>101ft net pay</li> <li>Vugular porosity with extensive hydrothermal dolomitization and productive reservoir</li> </ul>
10.9 bcf helium Resource	✓	<ul style="list-style-type: none"> <li>&gt;70,000 acre closure at Jesse</li> <li>Up to 4x closure of nearby massive Doe Canyon helium field</li> </ul>
Offtake agreement and existing pipelines	✓	<ul style="list-style-type: none"> <li>Binding offtake agreement with Lisbon helium plant 20 miles to the north</li> </ul>
Booming commodity	✓	<ul style="list-style-type: none"> <li>Helium price soaring with rationing to customers</li> <li>Structural market deficit with international buyers desperate for supply</li> <li>De-coupled to market / normal commodity cycles</li> </ul>
Commercial production from Jesse-2	🎯 ?	<ul style="list-style-type: none"> <li>Well design exclusively targets gas zone production – same as Doe Canyon well evolution</li> <li>Priority to complete well above the gas/water contact to manage the risk of water ingress</li> <li>Managed pressure drilling to minimize damage and maximize gas flowrates, with preliminary flow-testing during the drilling phase</li> <li>Prolific analogue 15 miles to the east</li> </ul>

<sup>1</sup> ASX announcement 19 October 2022, Jesse-1A Downhole Sample Increases Helium Grade <sup>2</sup>Internal Estimates



# Helium Offtake Agreement Secured

Gas Sales & Processing Agreement (GSPA) executed with Paradox Resources LLC<sup>1</sup>



## Lisbon Valley Gas Plant Specifications

- 60mmcf/d treating plant, 45mmcf/d cryogenic plant
  - 0.5mmcf/d liquefaction high purity 99.9995% helium – “5½ Nines”
  - Demands premium pricing multiplier
  - 0.6mmcf/d 99.989% gaseous helium
- Currently sequestering CO<sub>2</sub> well advanced in permitting to qualify for carbon capture tax credits (Revenue - 45Q Tax Credits)

2 of the 8 helium purification plants in the U.S. are within 20 miles

## Offtake: Jesse to Lisbon

- Validates technical merit of Greater Red Helium project
- Industry standard commercial terms such as 80/20 revenue split, gas gathering / treatment tariffs
- Established gathering system in project AMI immediately adjacent to Jesse-1A/2 and connects directly to the Lisbon plant
- Pathway to monetization and FCF with minimal time delay / CapEx for success case well
- Strategic Alliance to work with offtake partner to identify high tech end users (space, semiconductor)<sup>2</sup>
- Identify long term large volume contracts for premium liquified helium, which demands premium pricing (x4 – 5 multiplier)



<sup>1</sup> ASX announcement 16 Mar – Helium Offtake Agreement Secured, <sup>2</sup> ASX announcement 11 Apr 2022, Strategic Alliance

# Helium Demand: Irreplaceable Technological Enabler

Major growth predicted in all areas, particularly:

*Space, Medical, Semiconductor and Fibre-Optic*

## Inert

Doesn't react with other elements and non-flammable unlike hydrogen

## Non-toxic

Can be used in many applications without posing health or wellness risks

## Lighter than air

Ability to lift or float. Atmospheric molecules escape to space

## Boiling point -269°C

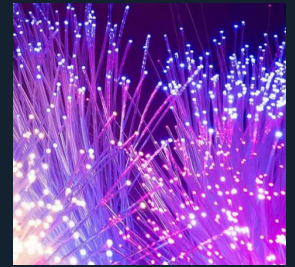
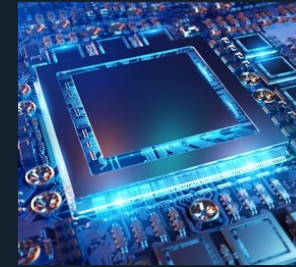
Liquid at ultra cool temperatures enables superconductivity

## High Thermal Conductivity

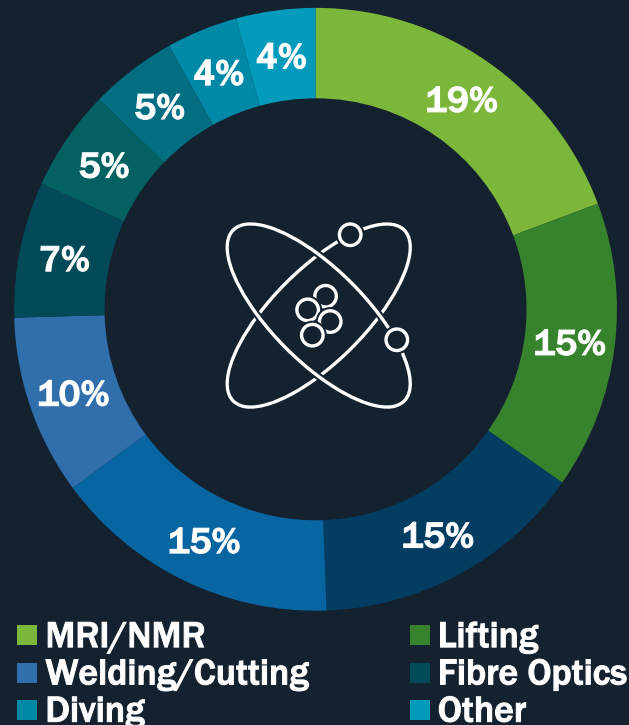
Removes heat in space applications and electronics manufacturing

## Small molecular size

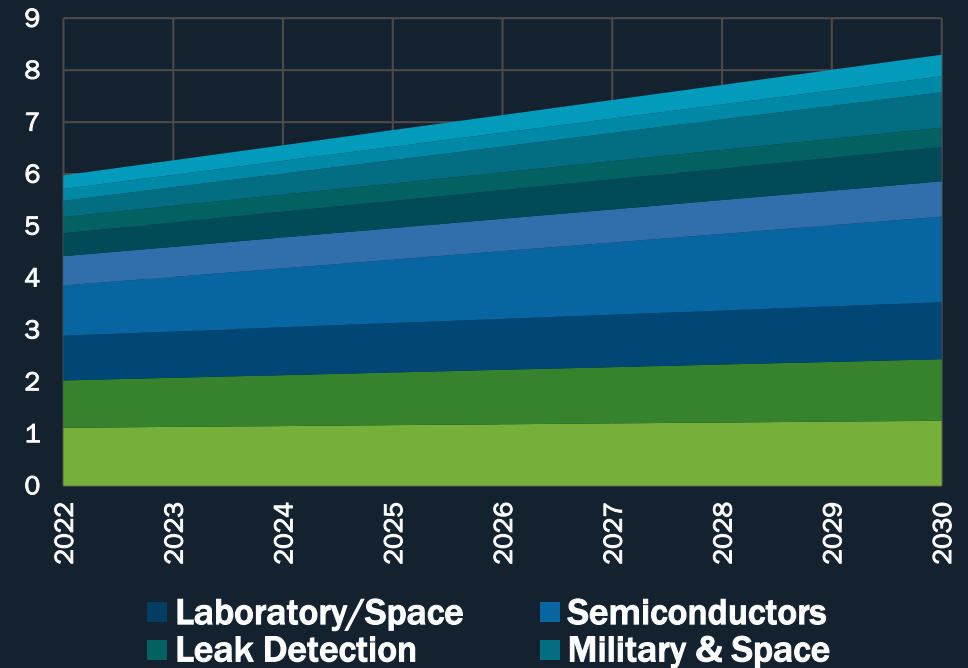
Can be used to find the smallest of leaks



Helium Usage by Industry



Forecast helium consumption by industry 2022 - 2030E (bcf/y)



Source: H&P Equity Research / Akap Energy estimates Feb 2022



# Helium Supply Demand Balance

## Helium Supply Shortage: extending through 2023

### Supply: Helium Shortage v4.0<sup>1</sup>

Devastating fire at Amur facility impacts 20-30% of potential global helium capacity through at least 2023, exacerbated by increased geopolitical tensions. Russian supply dominated by Amur increasing to ~1.4bcf/yr by 2025, now significantly delayed.

US Strategic Helium Reserve 6-month shutdown 1H22 impacted up to ~20% of US supply (10% global). Production re-instated, but quickly depleting.

Other major suppliers historically unreliable, majority of supply shifting from US to Russia / Qatar.

Simply not enough supply, even before outages.

### Market

Wholesale global helium is a multi-US\$b market<sup>3</sup>

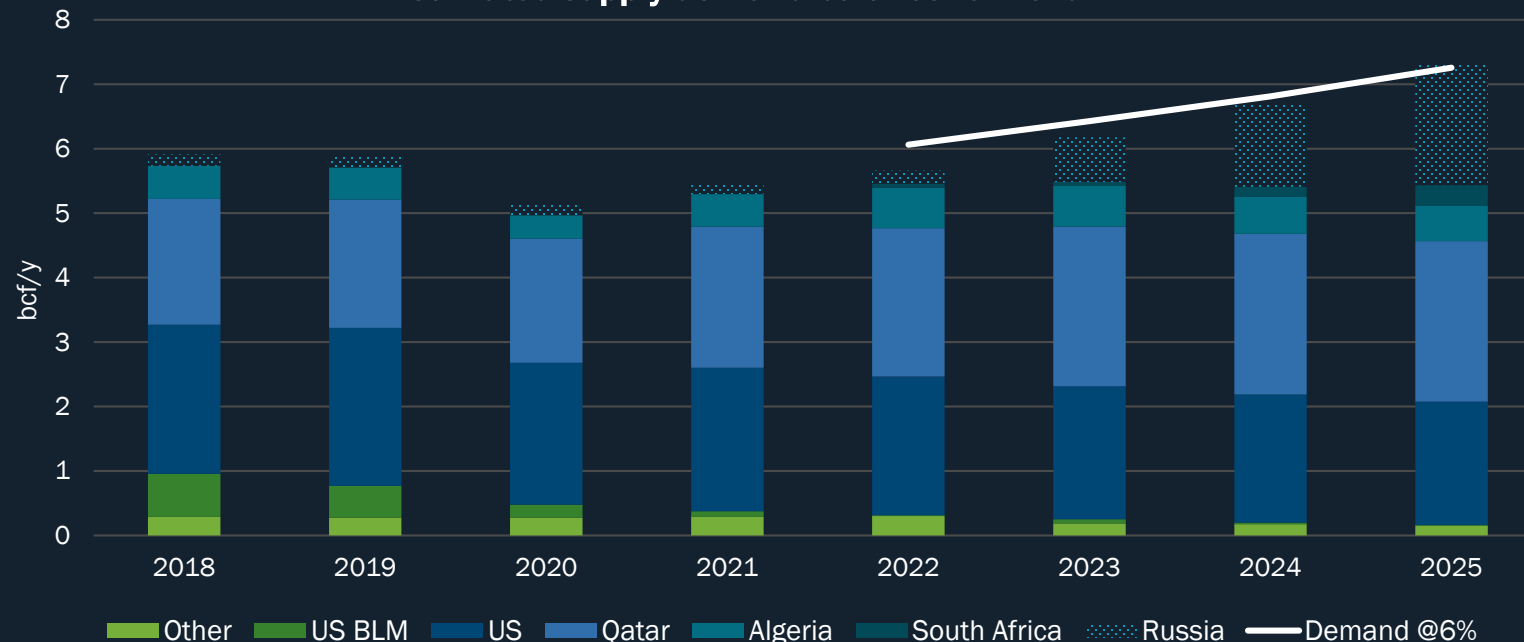
Most US majors are in Force Majeure, unable to meet supply contracts and rationing helium

**US spot market prices >US\$2,000/mcf<sup>1</sup>**

- An increase of circa 300% over last year

US\$52b CHIPS act to promote domestic semiconductor fabrication, with Intel and TSMC investing >US\$30b in Arizona, proximal to the Red Helium Project

Estimated supply demand balance for helium<sup>2</sup>

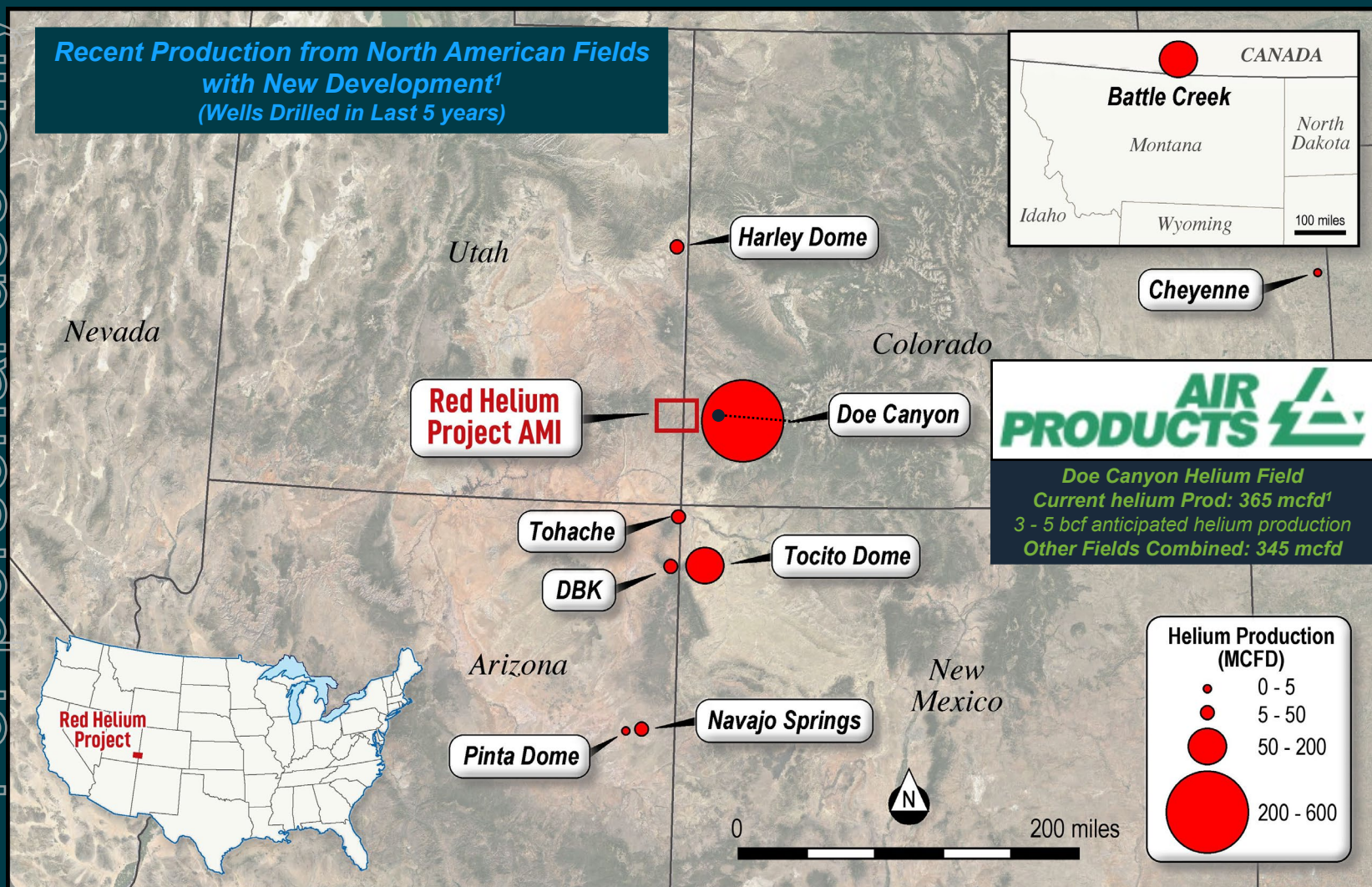


<sup>1</sup><https://www.gasworld.com/helium-markets-now-experiencing-helium-shortage-40/2022650.article>

<sup>2</sup>Source: H&P Equity Research / Akap Energy estimates Feb 2022, <sup>3</sup> Edison Research Global Helium Market Update, May 2021 <sup>1</sup>

# Four Corners Area: New Helium Production

## Prolific Proven Producing Helium Region



### Doe Canyon Analogue

- Up to 50% of new North American production is from the Doe Canyon Field<sup>1</sup>
  - Located 15 miles to the east
  - High rate gas wells: Avg. IP ~20mmcf
  - Average helium grade ~0.4%
  - = high helium flow rates ~80 mcf
  - Doe Canyon Analogue Well @1% helium ~200mcf helium

### Recent Market Activity

- NASA / Air Products: 0.9 bcf helium for US\$1.07b<sup>2</sup>
  - 2022 long-term contract implies >US\$1200/mcf
  - Air Products, NYSE:APD, Market Cap US\$68b

### Four Corners Near Term Development Areas

- Paradox Basin (UT/CO inc. Red Helium Project)
- Holbrook Basin (AZ) / Tocito (NM)

### Greater Eastern Rockies

- Prolific LaBarge Field to the North (WY)
- Provides majority of US production

<sup>1</sup> Estimated recent field production for fields with new development activity (wells drilled in the last 5 years): Four Corners Helium LLC Internal Estimates, <sup>2</sup> <https://www.gasworld.com/story/air-products-inks-potential-1bn-helium-deal-with-nasa/2118880.article>



# Red Helium Project – High Quality Dataset

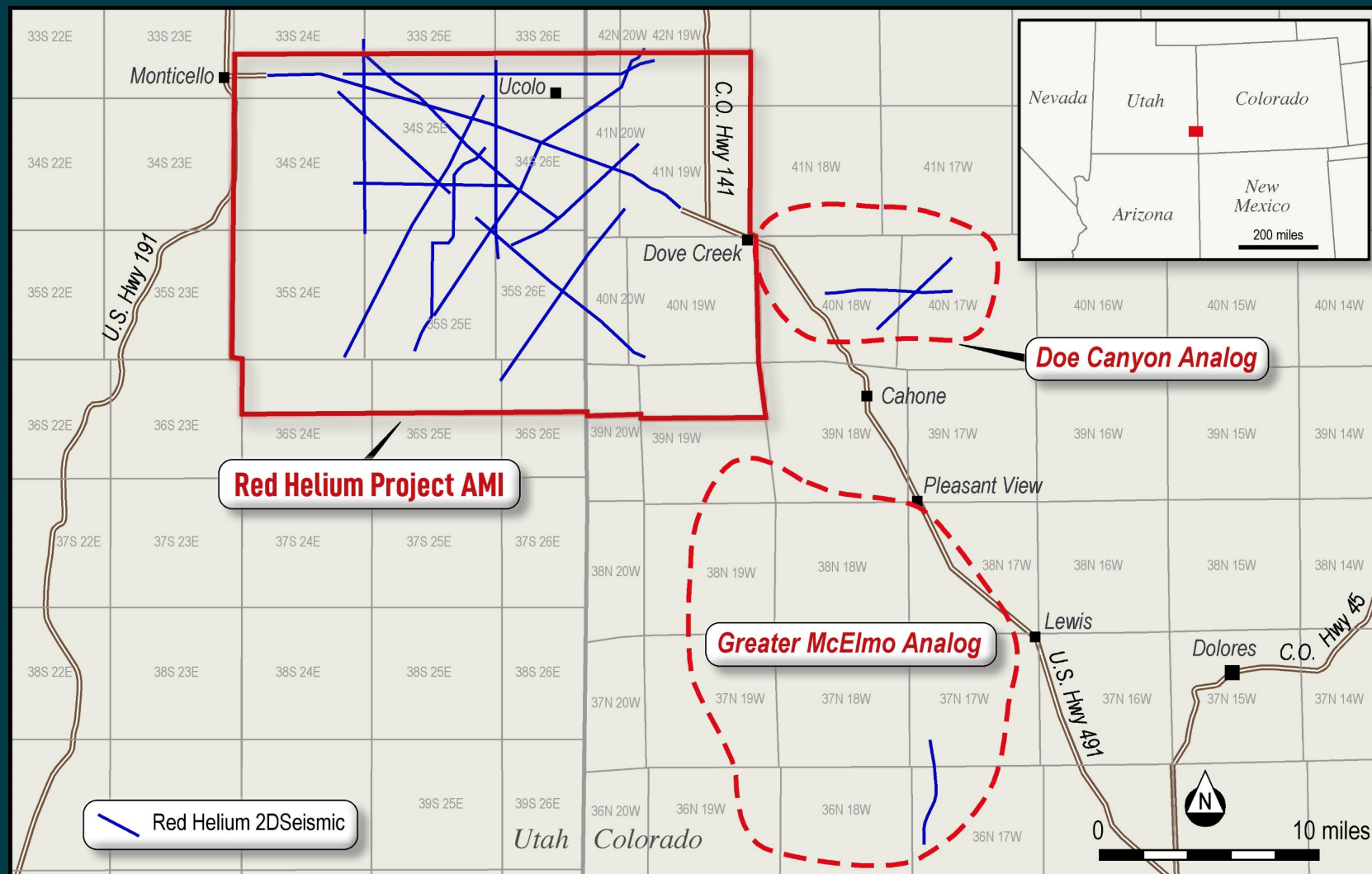
## High Quality 2D Seismic Coverage and Well Control

### Red Helium Project & Dataset

- Dominant lease position focused on prime prospective locations, driven by high quality seismic
- >29,000 acres (private leases/Utah state leases) leased in drill-friendly Utah
- Lease holdings 315 km's of high-quality seismic data acquired and reprocessed
- Excellent data, particularly below the salt seal
- Analog Doe Canyon and McElmo Fields – same reservoir/same trap/same source rock
- Geologic analogs, and historic wells exclusively targeting hydrocarbon in the AMI, with proven helium concentrations

### Jesse Discovery

- 1% helium consistent with upside helium charge model exceeding pre-drill expectation, and further de-risking greater Red Helium project





# Strategic Alliance with Helium Offtake Partner

## Exploit Significant Synergies Between Red Helium project and Paradox Resources Assets

Pursue several advanced opportunities to optimize and prioritize near-term exposure to the burgeoning helium market with potential mutually commercially advantageous revenue sharing agreements

### Paradox liquefier

- Potential priority supplier to re-start the Paradox liquefier
- Current helium production gaseous purified 99.989%
- Liquefaction high purity 99.9995% helium
- Attracts premium pricing, US spot recently over **US\$2,000/mcf**
- Expansion of Jesse-1A to Lisbon Offtake Agreement

### Collaborative downstream marketing

- Targeting end users of high-purity helium such as semi-conductor manufacturers and the space industry



### CO2 Disposal Options with Revenue Generating Potential

- Joint investigation of Red Helium Project CO<sub>2</sub> for enhanced oil recovery (flooding) from Paradox's Lisbon Oil Field
- Investigate expansion of carbon sequestration activities at Paradox's Lisbon Plant to include CO<sub>2</sub> from Red Helium Project and application for tax credits (revenue) under Section 45Q of the US Tax Code
- 2022 Inflation Reduction Act increases value to \$85 per metric tonne CO<sub>2</sub>

### Corporate opportunities

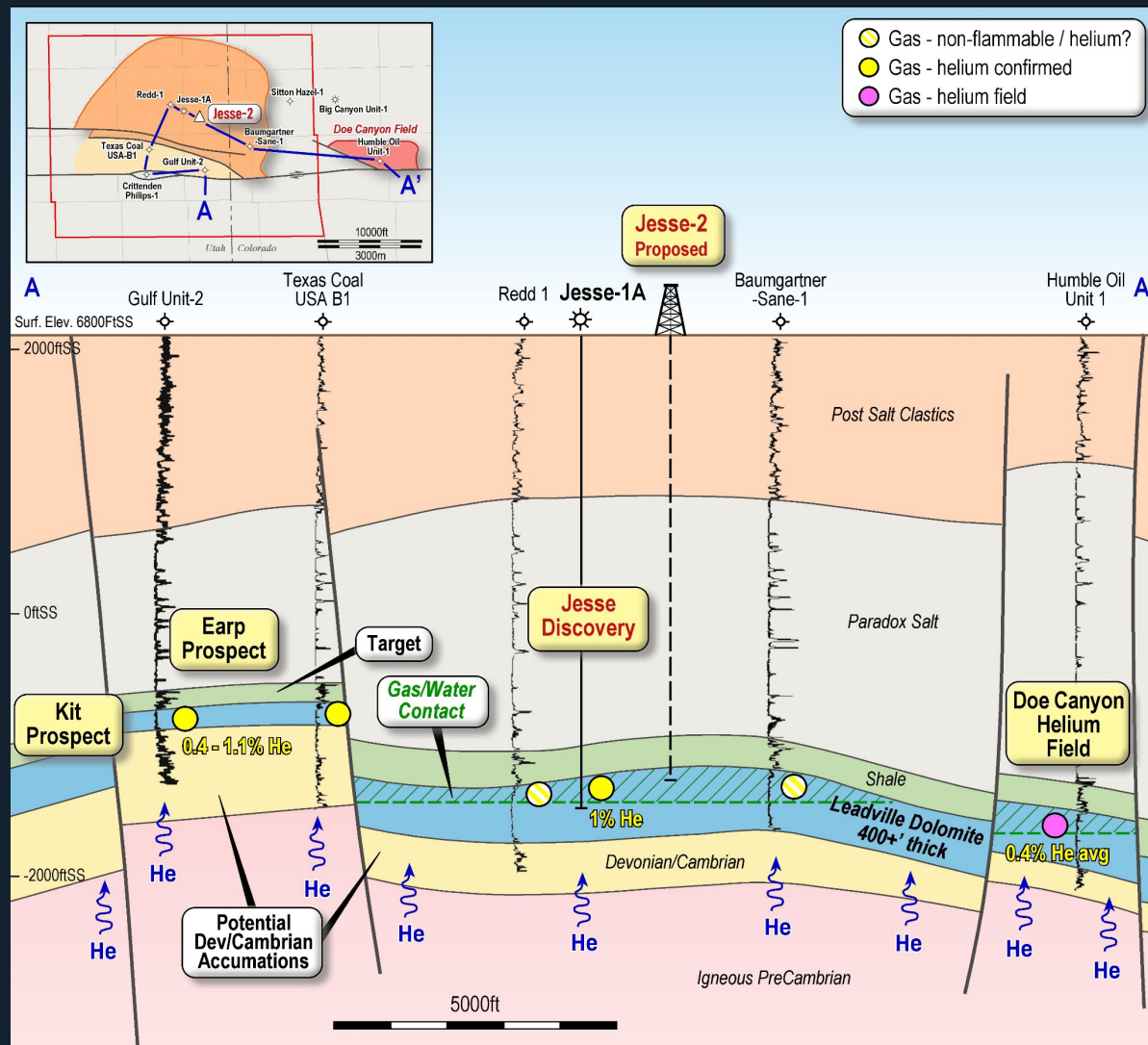
- Potential synergistic commercial benefits in assessing corporate opportunities that involve both Paradox assets and the Red Helium Project and have agreed to jointly pursue such opportunities.



# Investment Highlights: Low Cost / Low Risk Pathway to Production

Jesse-2 Planned for Late Q4 2022 spud

- *Multiple near-term catalysts / huge upside*
- *De-risked geology, high flow rates, commercial helium grade*
- *GGE positioned to capitalise quickly / cost effectively*
  - Existing infrastructure: minimal time / CapEx
  - Significant near term FCF potential
- *Resource scale / Asset play*
  - 10.9bcf He vs multi-\$b global market of ~6bcf/yr
  - Target high tech end users with long term, large volume contracts
- *Structural deficit in helium market = High prices*
  - Booming commodity, de-coupled to normal cycles
- *Running Room*
  - Multiple Independent Prospects, including drill-ready Earp<sup>1</sup>
  - Deeper Potential – Devonian / Cambrian



<sup>1</sup> ASX announcement 4 April 2022, Additional Drill Locations Identified



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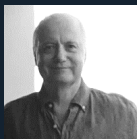
# Strong Management & Board

## Leadership



**Dane Lance**  
Managing Director

- >18 years' experience across E&P Lifecycle, Reservoir Engineer, including many major/mega development projects with significant exploration and MA&D
- Woodside Energy, Oil Search, Ophir



**Keith Martens**  
Technical Director

- >40 years' experience as an oil finder
- North America – Hudson Bay, Home Oil, Marathon, and Saggasco
- Australia – SANTOS, Tap Oil, Bow Energy, Victoria Petroleum/Senex
- International – Jupiter (Kazakhstan)



**Lloyd Flint**  
CFO / Company Secretary

- >25 years' experience in the corporate and financial services arena.
- Chartered Accountant, BAcc, FINSIA and MBA
- Numerous management / senior administrative positions, and corporate advisory services as a consultant to corporate clients



**Craig Burton**  
Chairman

- Experienced active investor in emerging oil and gas companies
- Provides financial backing and legal advice

## Red Helium Project (Valence Resources LLC) Joint Venture Partner: Four Corners Helium LLC - [www.fourcornersheliumllc.com](http://www.fourcornersheliumllc.com)

Four Corners Helium is a powerhouse of professionals with over 400 years of combined experience and expertise that are committed to finding and producing helium reservoirs.

**Tim Rynott**  
CEO, Exploration Geologist

- 40 years of oil and gas experience
- Has generated or endorsed discoveries with a gross net worth of almost US\$1Bn
- Has held key leadership positions on numerous national and regional Boards, including AAPG, GCAGS, and LOGA.

**David McCarver**  
COO, Contracts/Land

- >46 years experience in oil and gas
- Ex State and Federal basins in Texas and Louisiana Gulf Coast, Ark-La-Tex, Mid-Continent, Permian, Rockies and the Gulf of Mexico
- Leased and directed the leasing of >200 drilling prospects, managed E&P programs, created joint ventures, raised capital from direct investors and promoted industry partners.

**Eric Cummins**  
Vice President, Exploration and Production

- 30yrs experience in exploration and as production geologist
- Ex Geological Manager for Apache – instrumental in reaching goal of 150,000 BOPD in the Permian.

**Sabina Kraushaar**  
Partner, Petrophysicist, Structural Geologist

- Geoscientist with expertise mapping subsurface geology utilizing Petra software.
- Manages a database with >100,000 wells, 17,000 geologic tops and >10,000 digital logs.

**Doug Frederick (Valence Resources LLC)**  
Drilling Manager

- Over 40 years of experience in drilling and well operations.
- Directed the drilling and workover of over 2500 wells.
- Responsible for annual drilling and workover budgets of over \$500M.
- Drilled in 7 different States

**Jake Cammack**  
Partner, Geochemist, Specialist in Geographic Information Systems (GIS)

- Created a database with >17,000 gas-composition and helium analyses - comprises the most complete gas geochemistry dataset ever assembled for Utah, Colorado, New Mexico and Arizona.

**GRANDGULF**  
ENERGY LIMITED

## Contact Us

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Abbreviation	Description
He	helium
US BLM	US Bureau of Land Management – National Strategic Helium Reserve
UDGOM	Utah Division of Gas Oil and Mining
SITLA	Utah School and Institutional Trust Lands Administration
U	Prospective Resources – 1U/2U/3U – P90/P50/P10 - low/most likely/high
cf	Cubic Foot of Gas
scf	Standard Cubic Foot of Gas
b	Prefix – Billions
mm	Prefix - Millions
m	Prefix - Thousands
/d, d	Suffix – per day
tCO <sub>2</sub>	Tonnes of Carbon Dioxide
YE	Year End 31 December
WI	Working Interest
NRI	Net Revenue Interest (after royalty)
Net	Working Interest after Deduction of Royalty Interests
NPV (10)	Net Present Value (discount rate), before income tax
EUR	Estimated Ultimate Recovery per well
Net Acres	Working Interest Acres