
RIU SW Connect

October 2024

ASX: HYT

WHITE HYDROGEN

A WORLD OF OPPORTUNITY

Exploring for natural hydrogen
and helium in the United States.



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Competent Person Statement Information

The resources estimate information and supporting documentation referred to in this announcement was reviewed by HyTerra’s Chief Technical Officer and Executive Director, Mr Avon McIntyre, who is a full-time employee of the Company. Mr McIntyre is a qualified oil and gas geologist with over 20 years of international experience. He has extensive experience of oil and gas exploration, appraisal, strategy development and reserve/resource estimation. Mr McIntyre has a BSc, MSc and PhD in geology from The University of Waikato, New Zealand and is a member of The Society of Petroleum Engineers (SPE). Mr McIntyre is qualified in accordance with the ASX Listing Rules and has consented to the form and context in which this statement appears.

A WORLD OF OPPORTUNITY

Nemaha Project, Kansas USA

Exploring for hydrogen and helium

Fortescue acquires strategic interest and invests A\$21.9M, subject to HyTerra shareholder approval

Potential to triple exploration well count

Historical well occurrences grading up to 92% hydrogen and 3% helium*

Significant leverage on exploration success

USA incentivising investment into hydrogen



*Guelard J, Beaumont V, Guyot F, Pilot D, Jezequel D, Ader M, et al. Natural H₂ in Kansas: deep or shallow origin? *Geochem Geophys Geosyst* G3 2017; 18; Coveney, R. M. J., E. D. Goebel, E. J. Zeller, G. A. M. Dreschhoff, and E. E. Angino (1987), Serpentinization and origin of hydrogen gas in Kansas, *Am. Assoc. Pet. Geol. Bull.*, 71(1), 39–48. H₂ + He + N% reflects occurrences of published gas analyses recovered from the wellbore. Uncertainty remains on historic well operations, sampling techniques, and analyses. The values are considered up to a % of H₂ or He.

HYDROGEN IS THE WORLD'S WONDER ELEMENT

Today, hydrogen is used to refine petrochemicals and produce ammonia and methanol.

Tomorrow, it will be a low-carbon fuel option for transportation, manufacturing, and used to generate electricity.

The demand for hydrogen reached an estimated 87 million tonnes per annum (Mtpa) in 2020 and is expected to grow as much as 580 Mtpa by 2050¹

¹Source: <https://www.mckinsey.com/industries/oil-and-gas/our-insights/global-energy-perspective-2023-hydrogen-outlook>

Current uses of hydrogen

Petrochemicals and refining



Fertiliser/ammonia production



Methanol production



Food production



Emerging uses of hydrogen

Transport



Power generation



Heat source alternatives



Steel and cement production

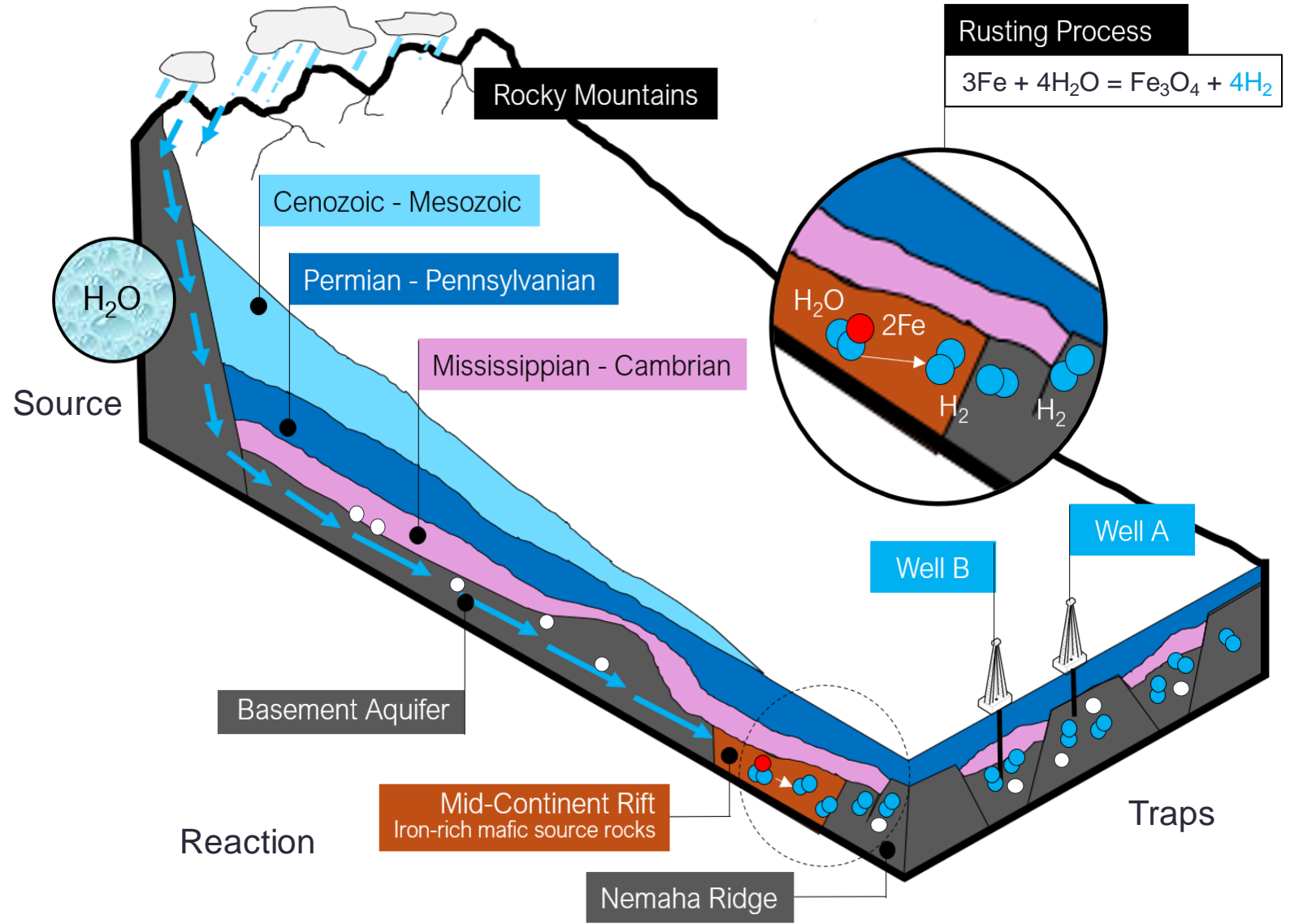


WHITE HYDROGEN MADE BY NATURE

Cleaner, greener, and cheaper to produce using conventional oil and gas techniques, white hydrogen could revolutionise industry and economies worldwide

#Water from the Rocky Mountains seeps underground and flows eastward across the helium enriched Hugoton Basin. When the water reaches the iron-rich mafic source rocks in Kansas (Mid-Continental Rift), the hydrogen is then split from this water. Then, the molecules migrate upwards into various traps along the Nemaha Ridge. Here, both hydrogen and helium occurrences were recovered in wellbores.

● White hydrogen and ○ helium is created naturally by the Earth#.



WHITE HYDROGEN COULD HAVE THE LOWEST PRODUCTION COSTS AND CARBON EMISSIONS

Modified from <https://koloma.com/geologic-hydrogen/>. Values obtained from 2022 GREET Model. Carbon intensity of hydrogen production for natural hydrogen was calculated based on Brandt, A. Greenhouse Gas Intensity of Geologic Hydrogen Produced from Subsurface Deposits. 2023. EarthArXiv preprint. <https://doi.org/10.31223/X5HM1N>. Calculation maintained consistency with GREET methodology. <https://gh2.org/our-initiatives/gh2-green-hydrogen-standard#:~:text=Green%20hydrogen%20is%20hydrogen%20produced,a%2012%2Dmonth%20period>

Grey Hydrogen

Made from natural gas. H₂ separated from CH₄. Carbon emissions not captured.

○ ~9.0kg CO₂e per kg H₂#

White Hydrogen

Naturally occurring, found in the subsurface. Hydrogen made underground.

○ <1.0kg CO₂e per kg H₂*

Blue Hydrogen

Made from natural gas. H₂ separated from CH₄. Carbon emissions captured.

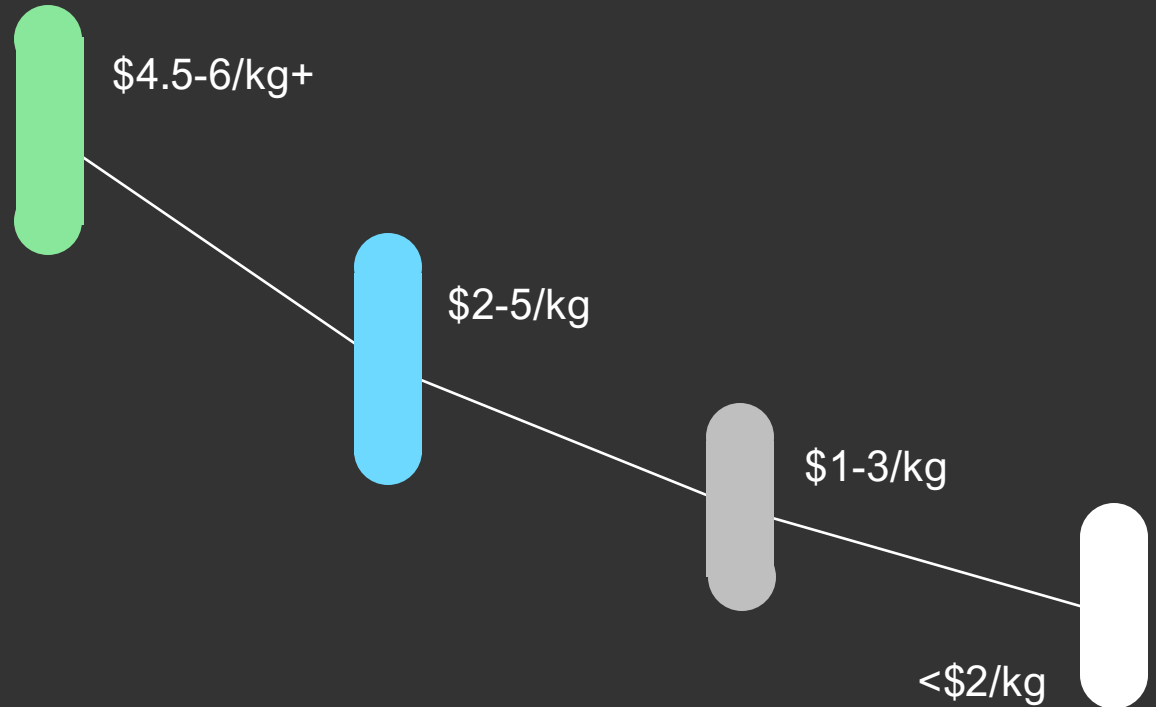
○ ~3.0kg CO₂e per kg H₂#

Green Hydrogen

Made by using renewable energy to electrolyse water. H₂ separated from H₂O. Production is expensive.

○ <1.0 kg CO₂e per kg H₂#

Hydrogen production cost ranges 2022-2023[^], \$US



*Geologic hydrogen (white) has a carbon intensity of 0.37 kg CO₂e per kilogram of hydrogen when including the embodied emissions of the well casing and hydrogen emissions, according to a published paper in Joule by Stanford's Dr. Adam Brandt.

[^] Numerous ranges of production costs exist due to changing variables such as, but not limited to, technology advancement, existing infrastructure, feedstock price etc

Source: Ranges sourced from BloombergNEF, IEA, Lazard, IRENA. 'At the dawn of a hydrogen era', Clota Varde Feb 2023,

HYTERRA MID-WEST, USA

Exploring white hydrogen and helium resources near major industrial hubs.

- Nemaha Project exploration acreage covers approx. 52,000 acres.
- 10+ occurrences within the Nemaha region, some up to 92% hydrogen and 3% helium*.
- Potential off-takers nearby include ammonia producers and petrochemical plants.
- Off-takers connected via existing transport infrastructure.

*Guelard J, Beaumont V, Guyot F, Pillot D, Jezequel D, Ader M, et al. Natural H₂ in Kansas: deep or shallow origin? *Geochem. Geophys. Geosyst.* G3 2017; 18; Coveney, R. M. J., E. D. Goebel, E. J. Zeller, G. A. M. Dreschhoff, and E. E. Angino (1987), Serpentinization and origin of hydrogen gas in Kansas, *Am. Assoc. Pet. Geol. Bull.*, 71(1), 39–48. H₂ + He + N% reflects occurrences of published gas analyses recovered from the wellbore. Uncertainty remains on historic well operations, sampling techniques, and analyses. The values are considered up to a % of H₂ or He.

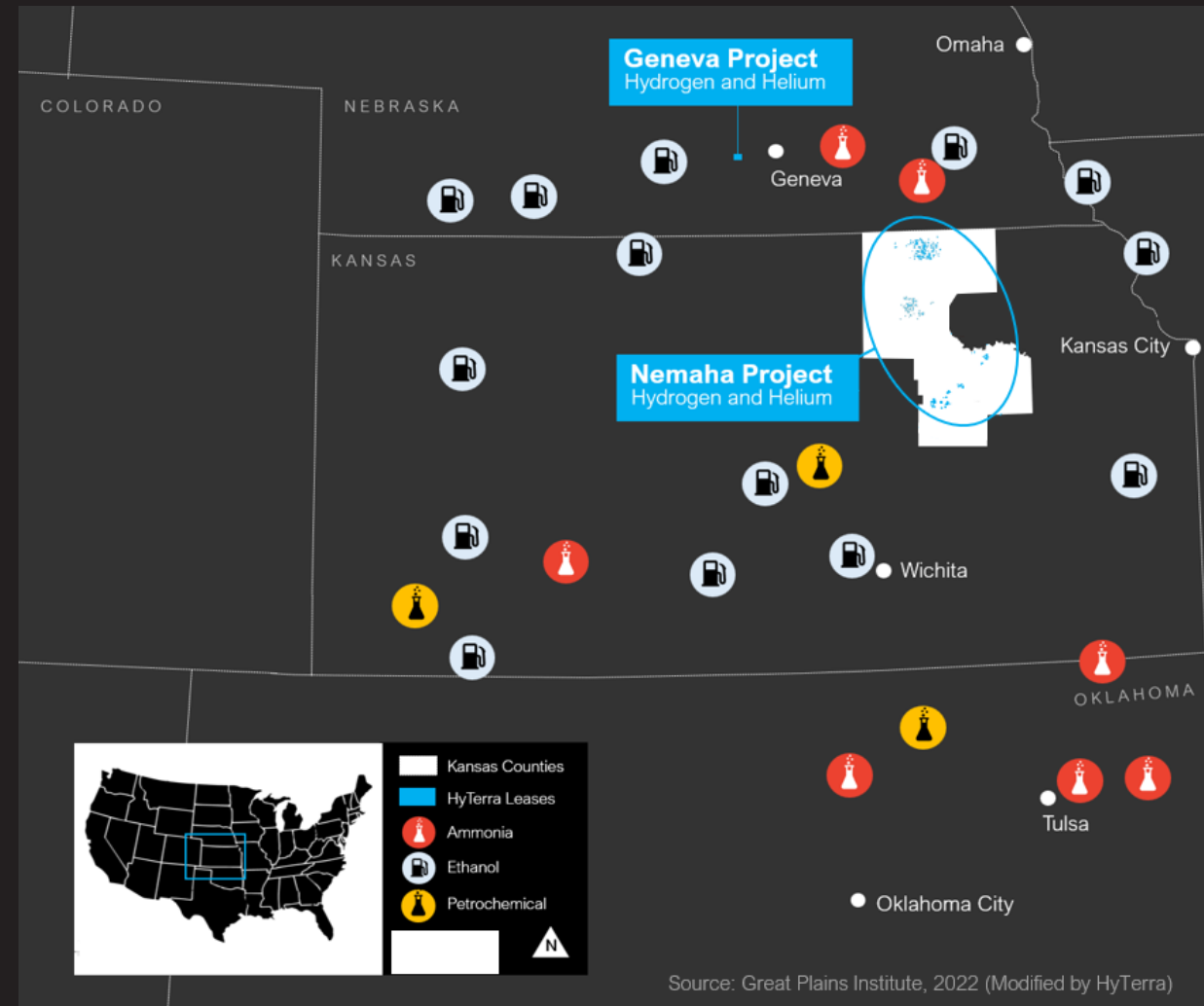
Below unrisked Prospective Resources based on prior leasing position of 12,880 acres

Aggregated Net Recoverable Prospective Hydrogen Volumes (bcf)#

P90	P50	P10
49.0	105.5	251.7

Aggregated Net Recoverable Prospective Helium Volumes (bcf)#

P90	P50	P10
0.05	0.59	2.04

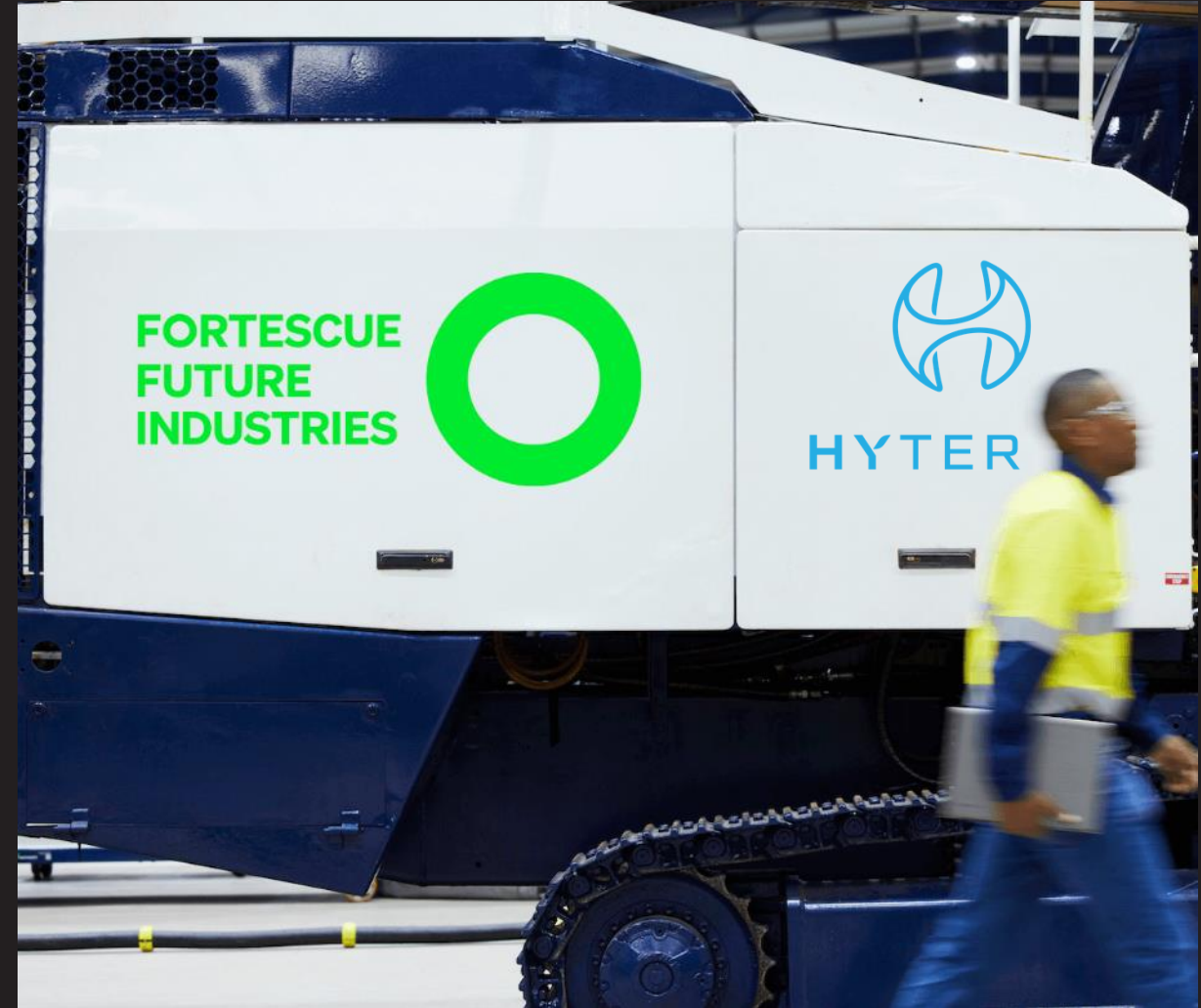


#Cautionary Statement: The estimated quantities of natural hydrogen and helium that may potentially be recovered by the application of a future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further exploration, appraisal, and evaluation is required to determine the existence of a significant quantity of potentially recoverable natural hydrogen and helium. The Prospective Resource estimates are quoted on an unrisked basis and are aggregated arithmetically by category. Please refer to the ASX release dated 13 December 2023 and June 30th Quarterly Activities report for full details with respect to the Prospective Resource estimate, associated risking and Cautionary Statement.

FORTESCUE TO INVEST A\$21.9M IN HYTERRA TO FULLY FUND EXPANDED EXPLORATION PROGRAM

Fortescue to acquire a strategic 39.8% interest in HYT at A\$0.034 per share for a total of A\$21.9m, subject to shareholder approval.

- Funds will be used for significant additional leasing together with an agreed geophysics and an expanded exploration drilling campaign at the Nemaha Project, Kansas USA.
- Fortescue and HyTerra will enter into a Strategic Alliance Agreement to progress the Nemaha Project and mutually explore new opportunities globally.
- Current two well drilling campaign would be replaced by a six well campaign to commence after the finalisation of the Subscription, expected in Q4 2024.

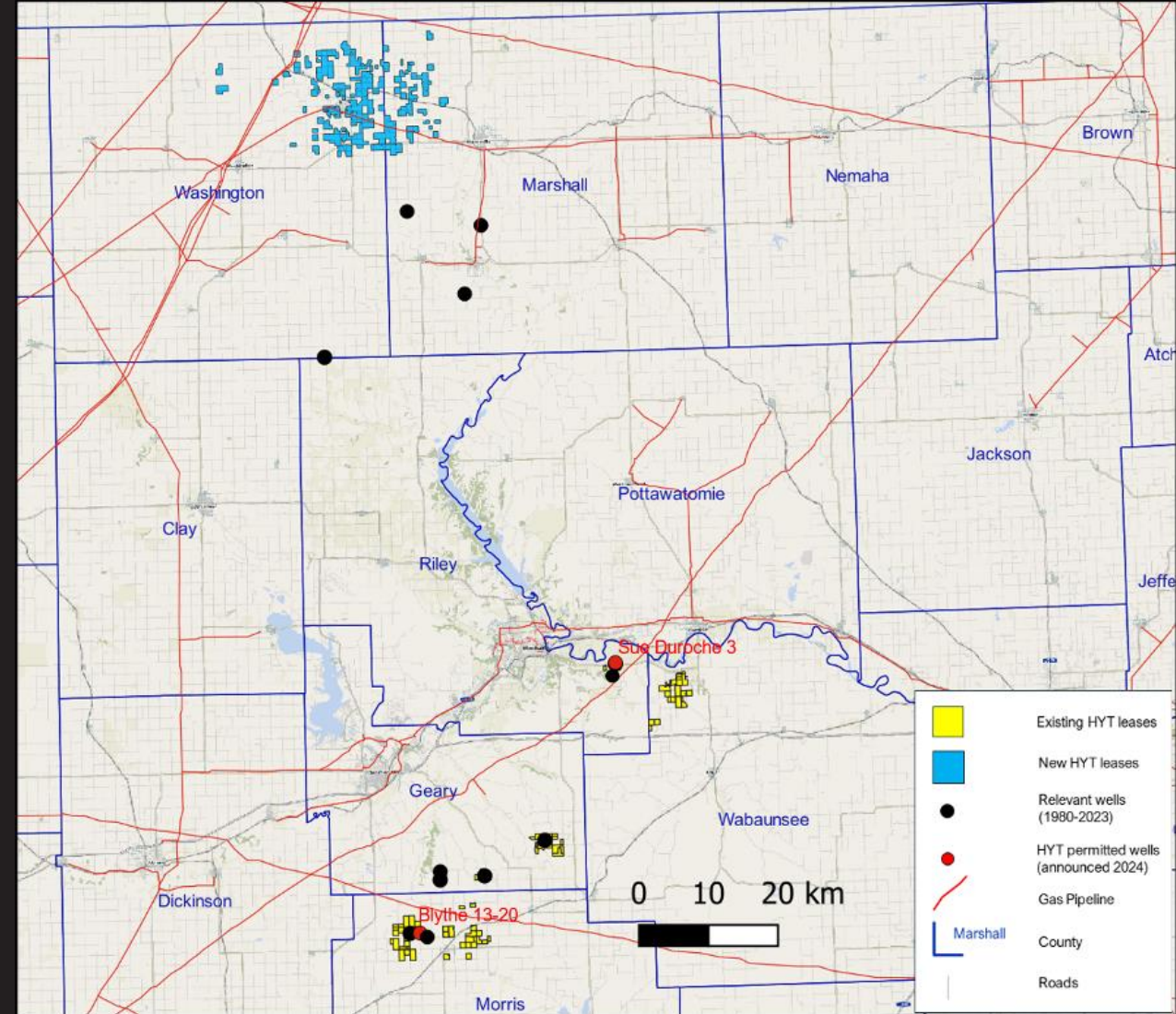


NEMAHA PROJECT KANSAS, USA

Acreage is 100% owned and operated by HyTerra

Approx 52,000 acres with infill leasing continuing

Acreage is geologically contiguous to several historic well occurrences and connected via existing transport infrastructure

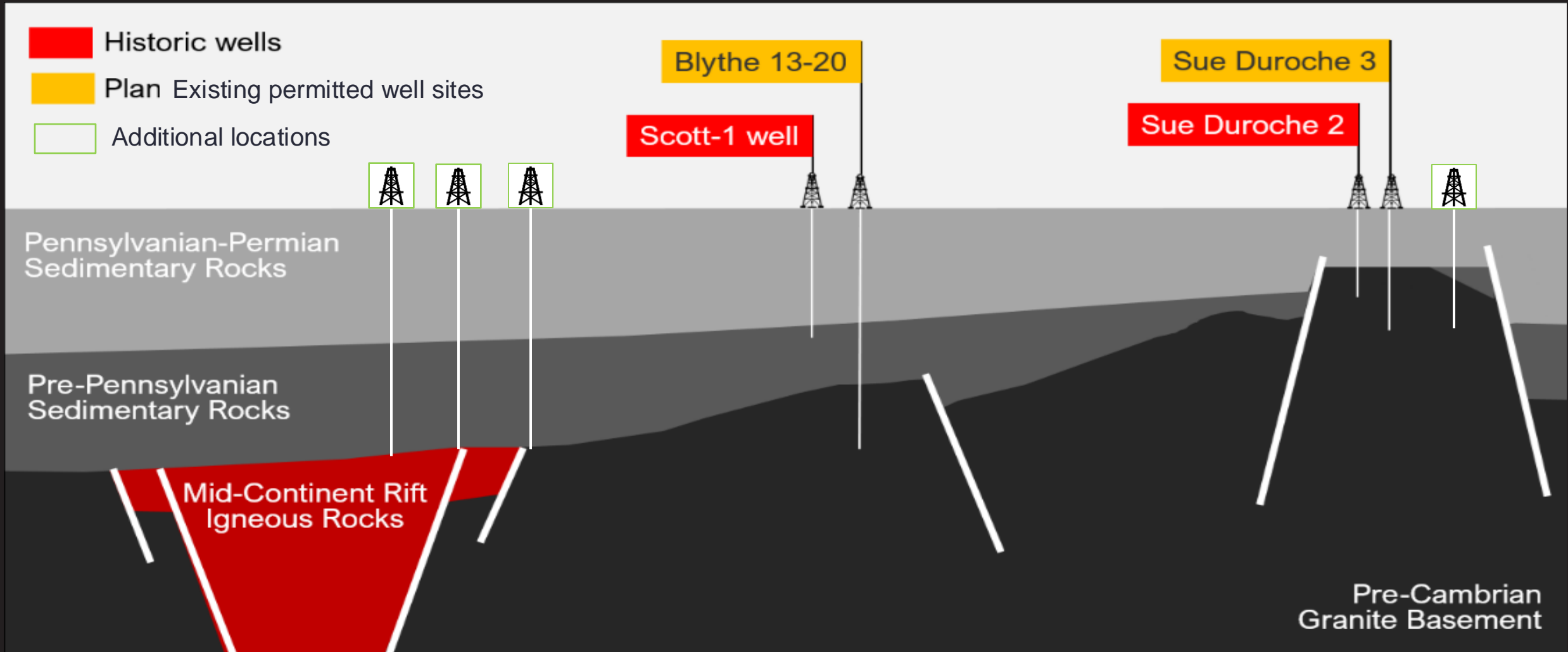


NEMAHA PROJECT DRILLING PORTFOLIO

Range of shallow
to deeper targets

West

East

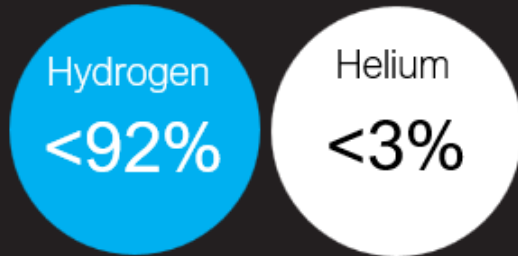


NEMAHA PROJECT PERMITTING UNDERWAY

Two well sites nearby historic wells are planned to be drilled significantly deeper

Sue Duroche-2*
2009

Total depth
1,441ft (440m)

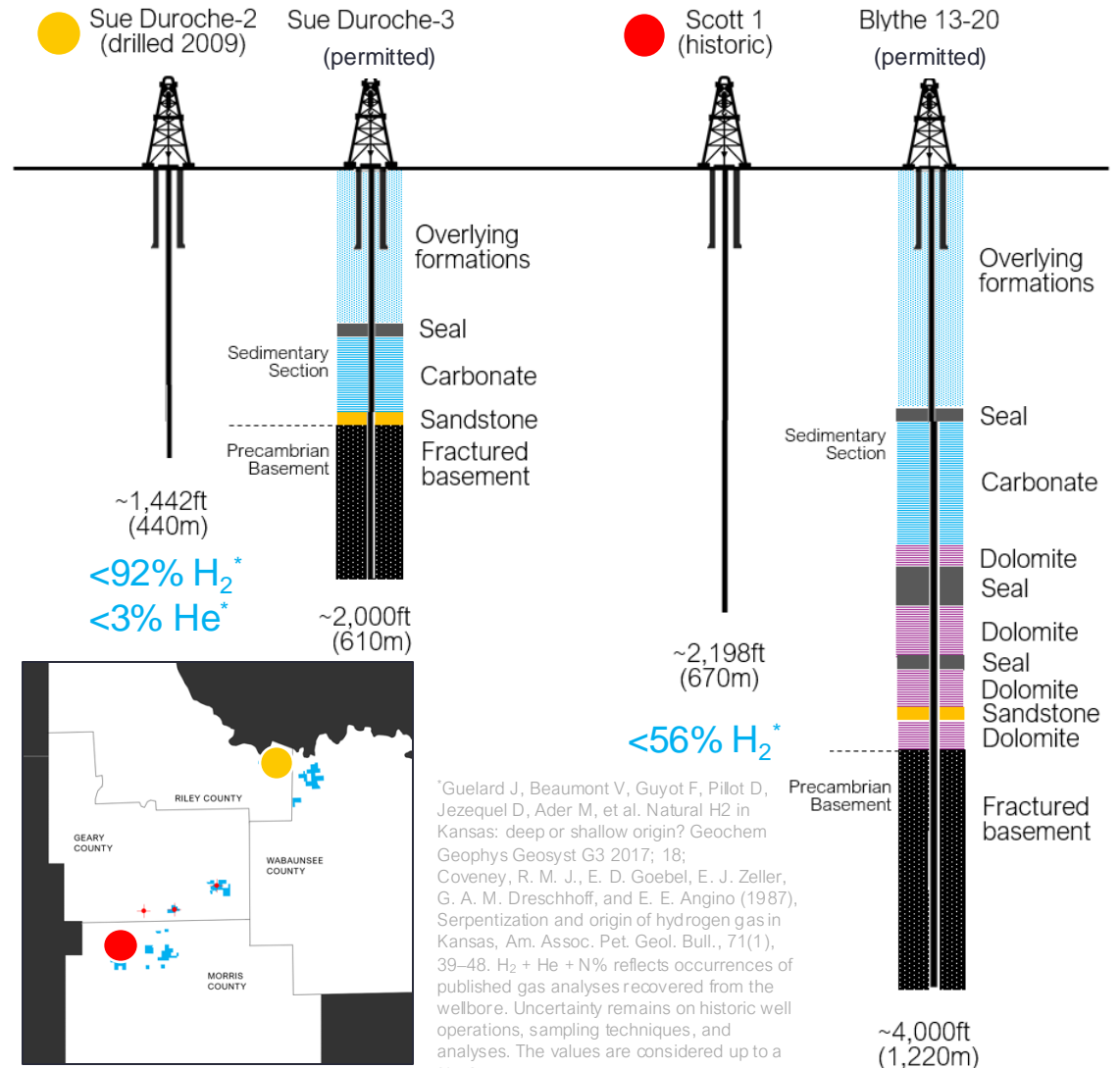


Scott-1*
1982

Total depth
2,198ft (670m)

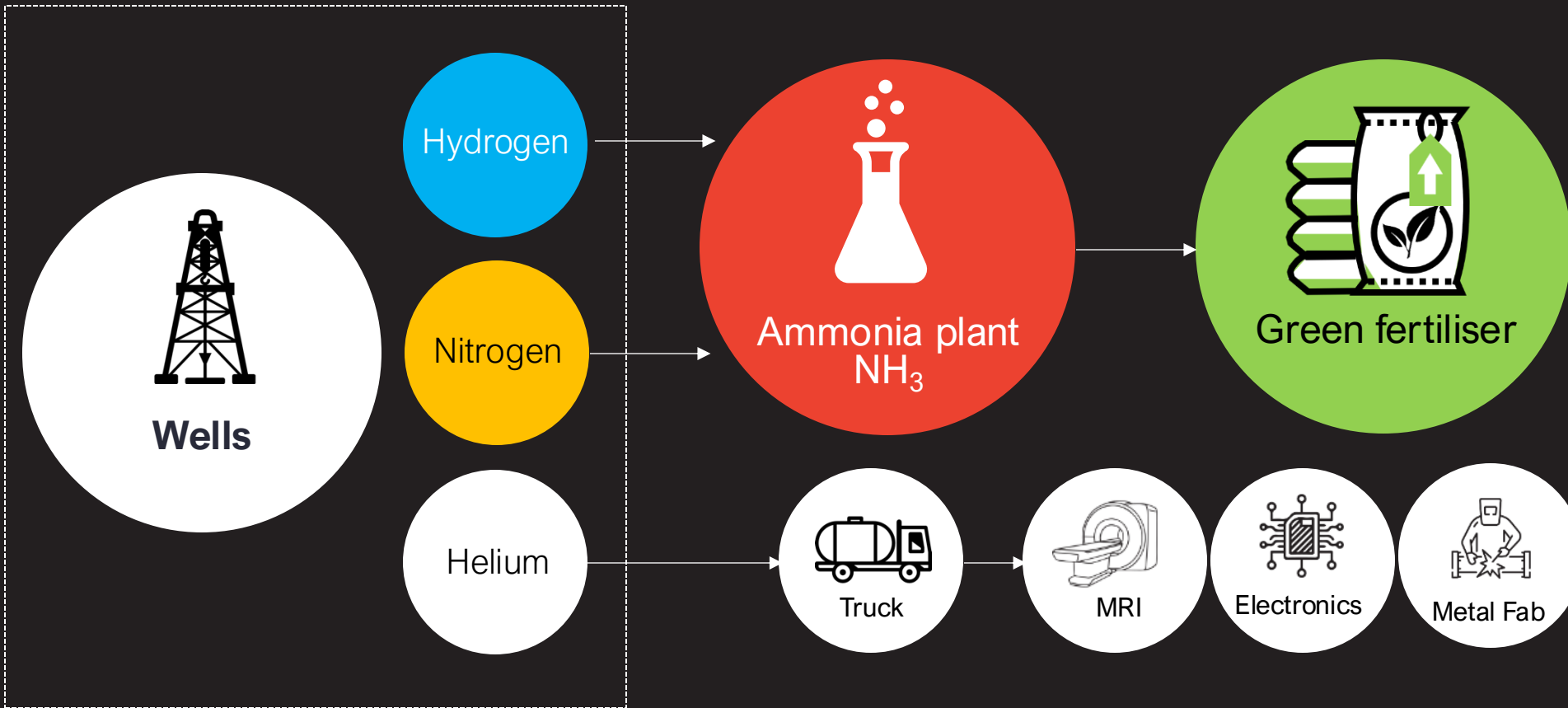


Two examples. Final well selection is made after additional leasing and permitting is completed



A VALUE CHAIN HYDROGEN AND HELIUM

Several local commercialisation pathways to develop.



2023 global ammonia market¹

~US\$80B

2032 forecast of global ammonia market¹

~US\$120B

2027 forecast of global helium market²

~US\$6.5B

¹<https://www.statista.com/statistics/1391399/global-ammonia-market-size/>

²<https://www.statista.com/statistics/1411790/market-value-the-helium-industry-worldwide/>

US GOVERNMENT RECOGNISES WHITE HYDROGEN POTENTIAL.

US Senate holds first congressional hearing 28 February 2024 on white hydrogen.

Hydrogen incentives/funding announced:

- US\$1 billion for a clean hydrogen electrolysis research.¹
- US\$500 million for clean hydrogen manufacturing and recycling research and development activities.¹
- \$8 billion for regional clean hydrogen hubs.²
- The Inflation Reduction Act provides a Hydrogen Production Tax Credit to incentivise the production of clean hydrogen in the US. It creates a new 10-year incentive for clean hydrogen of up to **\$3.00/kilogram**. The level of the credit provided is based on carbon intensity, up to a maximum of four kilograms of CO₂-equivalent per kilogram of H₂.³
- US Department of Energy (DOE) announced up to \$20 million in funding to develop technologies that can **stimulate the generation of hydrogen within the subsurface** at the lowest cost and environmental impact.⁴

¹ <https://www.energy.gov/articles/biden-harris-administration-releases-first-ever-national-clean-hydrogen-strategy-and>

² <https://www.energy.gov/articles/biden-harris-administration-announces-7-billion-americas-first-clean-hydrogen-hubs-driving>

³ <https://www.energy.gov/eere/fuelcells/financial-incentives-hydrogen-and-fuel-cell-projects>

⁴ <https://arpa-e.energy.gov/news-and-media/press-releases/us-department-energy-announces-20-million-16-projects-spearheading>



The potential for geologic hydrogen represents a paradigm shift in the way we think about hydrogen as an energy source.

Dr Evelyn Wang, Director of the Department of Energy's Advanced Research Projects Agency – Energy (ARPA-E).

28 February 2024, Senate Committee on Energy & Natural Resources

<https://www.energy.senate.gov/services/files/A4A4CFF6-A4E4-4D07-A39A-F046322266F5>

HYTERRA LTD WORK PROGRAM

Strong news flow ahead from drilling campaign results and rapid growth of hydrogen and helium resources.

Fortescue fully funded workplan
(subject to shareholder approval)

Portfolio	Current workplan	Fortescue fully funded workplan (subject to shareholder approval)
Nemaha	Continued leasing	Significant increase in leasing
	Acquire geophysical survey	Acquire expanded geophysical survey area
	Drilling of two exploration wells	Drilling of six exploration wells
Geneva	Venture decision on Project	Venture decision on Project
Growth	Screening new opportunities	Joint screening of new opportunities

BOARD & MANAGEMENT

HyTerra's executive team has proven experience in developing oil and gas projects around the world.



Benjamin Mee

Executive Director

Benjamin has over 20 years' experience in international oil and gas with a successful track record in project delivery from exploration, through to appraisal, development and production both onshore and offshore in various global locations. Most recently he held the title of Exploration Manager Deepwater Africa for Shell, during which time significant petroleum discoveries were made.



Dr Avon McIntyre

Executive Director & CTO

Avon has more than 20 years' experience in minerals and oil and gas exploration industries, with roles in government, service and operating companies. He worked for Shell in Australia and internationally in new ventures and new energies from 2008 to 2021, during which time he developed an interest in natural hydrogen and helium occurrences.



Russell Brimage

Non-Executive Chairman

Russell has over 40 years' experience in the upstream oil and gas industry, ranging from public listed oil & gas companies to the service industry – both onshore and offshore. He has served in the capacity of Operations Manager and CEO on several ASX listed entities since 1997. Currently he is a Non-Executive Director of Lion Energy (ASX: LIO).



Dr Jeff Goodall

Principal Geologist

Jeff has 30 years' experience in both oil and gas exploration and development, holding senior geological roles in several major exploration companies in both Australia and Indonesia. From 2014 Jeff held the role of chief geologist role at Carnarvon Energy, being heavily involved in the numerous Bedout Basin oil and gas discoveries. Jeff was also the owner and director of MGPaleo until 2020.



Dr Dirk Smit

Consulting Geophysicist

Dirk has over 30 years in Shell working in various roles including Chief Geophysicist for Shell UK, and Vice President Exploration and Upstream Technology. From 2015 as VP Research Strategy, his work shifted to "systems thinking and engineering" aspects of the energy transition to a net-zero emission system and became Shell's first Chief Scientist in 2019.

A WORLD OF OPPORTUNITY.

HyTerra is advancing hydrogen and helium projects in the heart of an established agriculture and manufacturing hub

- 01** Explore to develop natural hydrogen and helium resources near major industrial hubs
- 02** USA is incentivising investment into cleaner energy with clear need for hydrogen
- 03** Fortescue will fully-fund an expanded exploration of the Nemaha Project, subject to HyTerra shareholder approval
- 04** Expected ramp up in news-flow based on leasing and drilling campaign results
- 05** Experienced leadership developing onshore gas fields across the world





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