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Corporate Presentation

March 2024

ASX: HYT

# WHITE HYDROGEN

## A WORLD OF OPPORTUNITY

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Exploring for natural hydrogen and helium in the United States.



HYTERRA

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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

## Upcoming drilling campaign on the Nemaha Ridge, Kansas, USA

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Drilling for hydrogen and helium starting Q3'2024

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

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Significant leverage on exploration success

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USA incentivising investment into hydrogen

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\* H<sub>2</sub> + He % 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 H<sub>2</sub> or He.



# NEMAHA PROJECT KANSAS, USA

## Exploring for natural hydrogen and helium resources near major industrial hubs.

- Exploration acreage covers over 9,600 acres and is 100% owned and operated by HyTerra.
- 10+ occurrences within the region, some up to 92% hydrogen and 3% helium\*.
- Potential off-takers nearby include ethanol and ammonia manufacturers, and petrochemical plants.
- Off-takers connected via railways, roads, and/or pipelines.

\* H2 + He % 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.

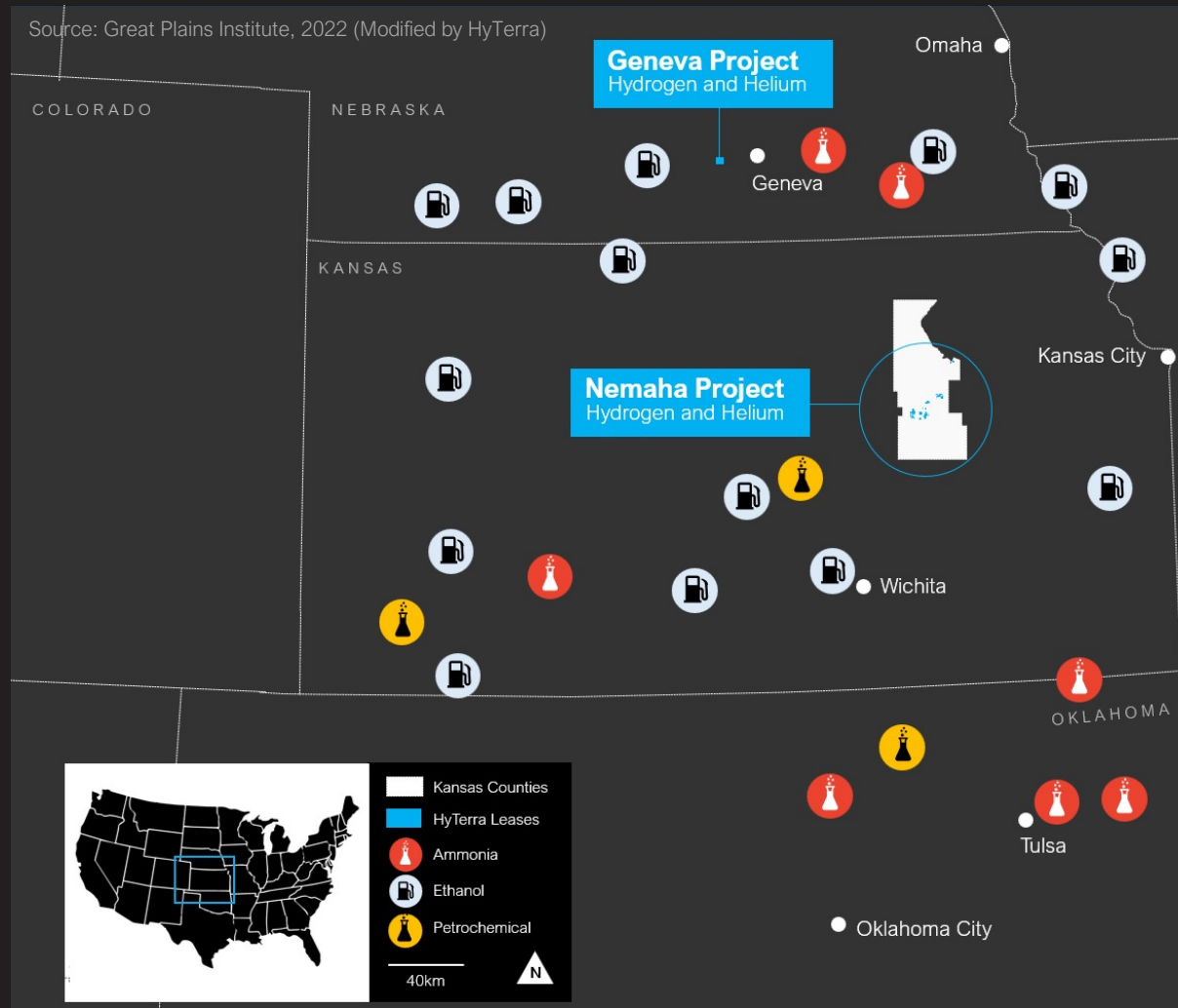
Aggregated Net Recoverable  
Prospective Hydrogen Volumes (bcf)#

P90	P50	P10
47.1	100.2	238.4

Aggregated Net Recoverable  
Prospective Helium Volumes (bcf)#

P90	P50	P10
0.04	0.47	1.63

Source: Great Plains Institute, 2022 (Modified by HyTerra)

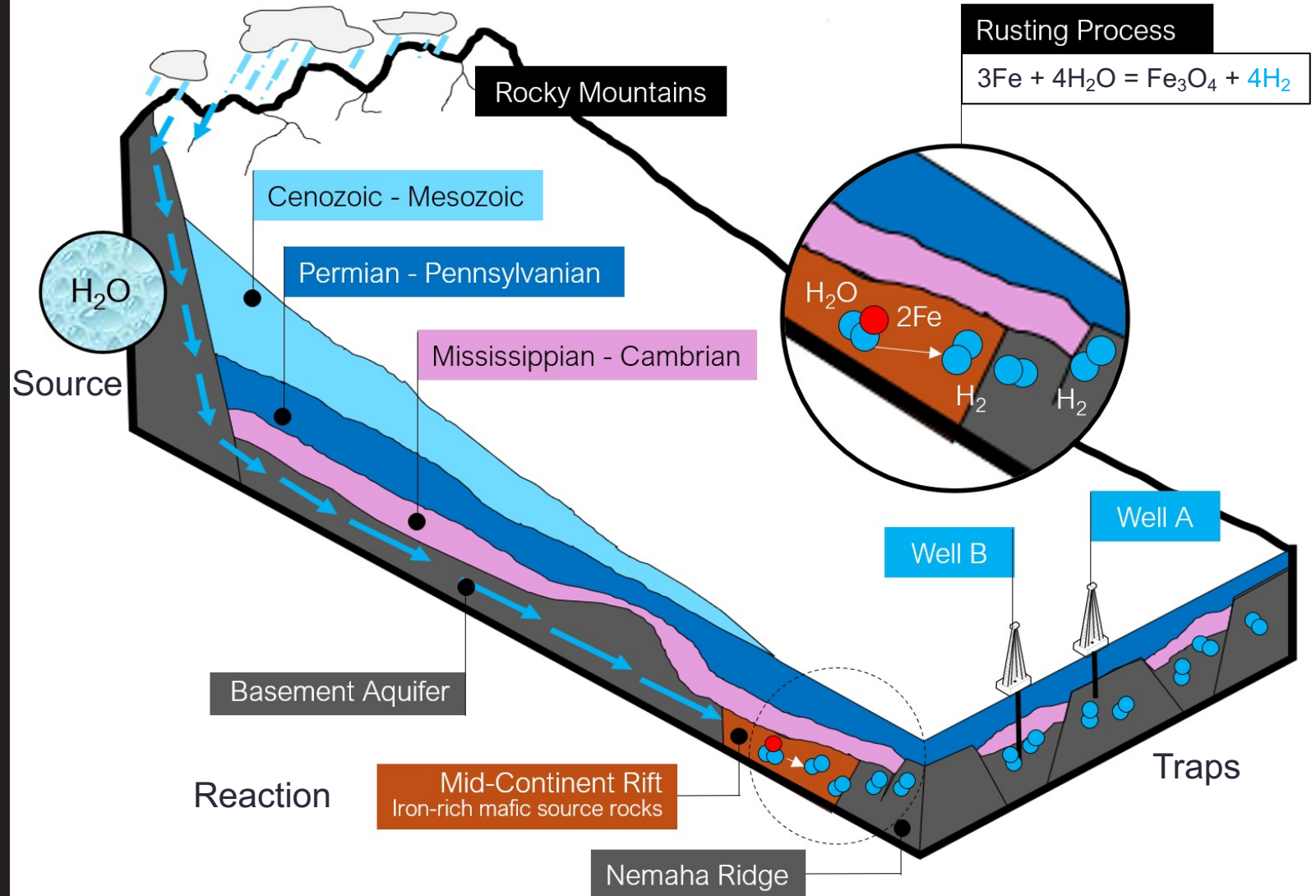


**#Cautionary Statement:** The estimated quantities of natural hydrogen and helium that may potentially be recovered by the application of a future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further 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 unrisken basis and are aggregated arithmetically by category. Please refer to the ASX release dated 13 December 2023 for full details with respect to the Prospective Resource estimate, associated risking and Cautionary Statement.

# 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.

HyTerra's white hydrogen is created naturally by the Earth. Water from the Rocky Mountains seeps underground and flows eastward. Hydrogen is then split from this water when in contact with iron-rich mafic source rocks in Kansas (Mid-Central Rift). Then, the hydrogen migrates upwards into various traps along the Nemaha Ridge. Here, hydrogen and helium occurrences were recovered in wellbores.



# 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 2050<sup>1</sup>.

<sup>1</sup>Source: <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 COULD HAVE THE LOWEST PRODUCTION COSTS AND CARBON EMISSIONS

## Grey Hydrogen

Made from natural gas.  
H<sub>2</sub> separated from CH<sub>4</sub>.  
Carbon emissions not captured.

○ ~9.0kg CO<sub>2</sub>e per kg H<sub>2</sub><sup>#</sup>

## White Hydrogen

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

○ <1.0kg CO<sub>2</sub>e per kg H<sub>2</sub><sup>\*</sup>

## Blue Hydrogen

Made from natural gas.  
H<sub>2</sub> separated from CH<sub>4</sub>.  
Carbon emissions captured.

○ ~3.0kg CO<sub>2</sub>e per kg H<sub>2</sub><sup>#</sup>

## Green Hydrogen

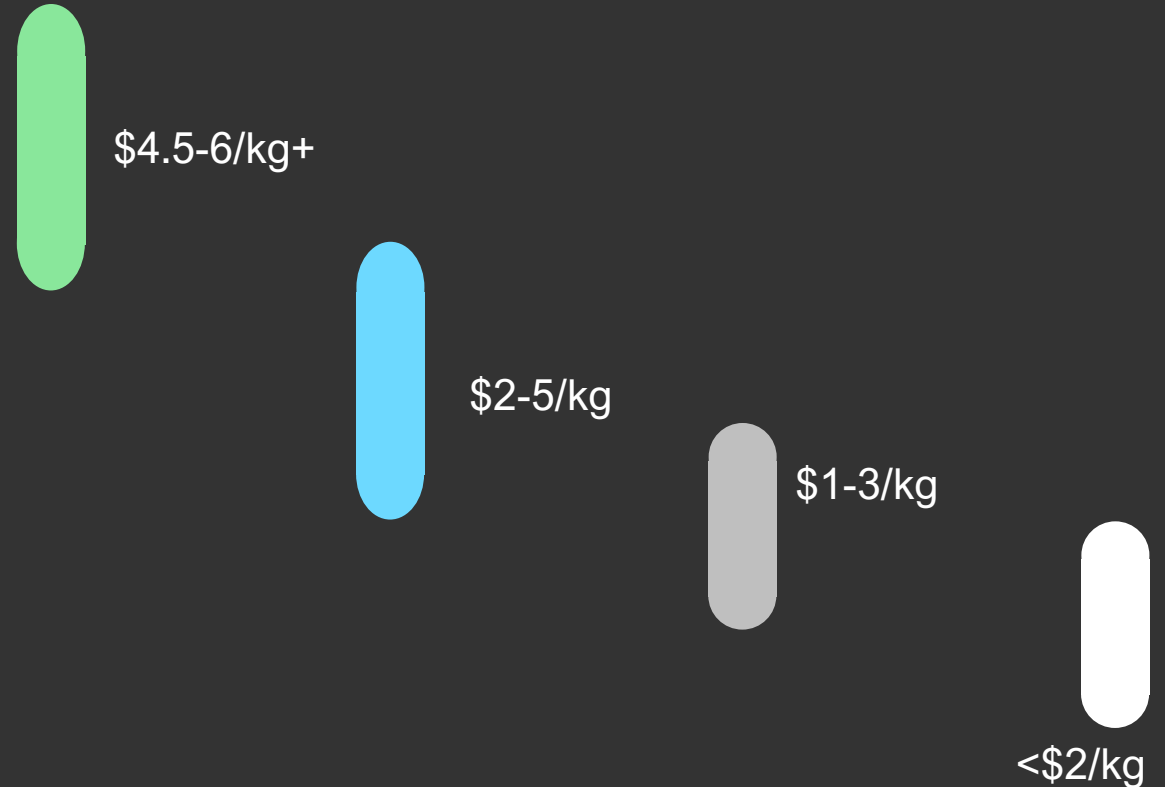
Made by using renewable energy to electrolyse water.  
H<sub>2</sub> separated from H<sub>2</sub>O.  
Production is expensive.

○ <1.0 kg CO<sub>2</sub>e per kg H<sub>2</sub><sup>#</sup>

<sup>#</sup> 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>

## Hydrogen production cost ranges 2022-2023<sup>^</sup>, \$US



<sup>\*</sup>Geologic hydrogen (white) has a carbon intensity of 0.37 kg CO<sub>2</sub>e 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.

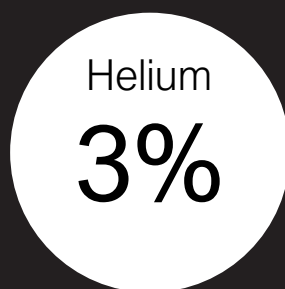
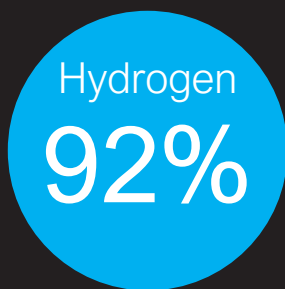
<sup>^</sup> Numerous ranges of production costs exist due to changing variables such as, but not limited to, technology advancement, existing infrastructure, feedstock price etc  
Source: Ranges sourced from BloombergNEF, IEA, Lazard, IRENA. 'At the dawn of a hydrogen era', Clota Varde Feb 2023,

# NEMAHA PROJECT KANSAS, USA

The Nemaha leases have historic wells with both hydrogen and helium occurrences\*#

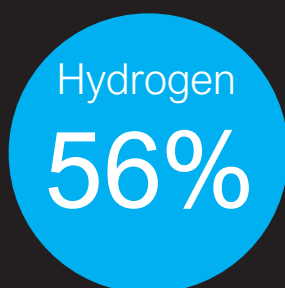
Sue Duroche-2  
2009

Total depth  
1,441ft (440m)



Scott-1  
1982

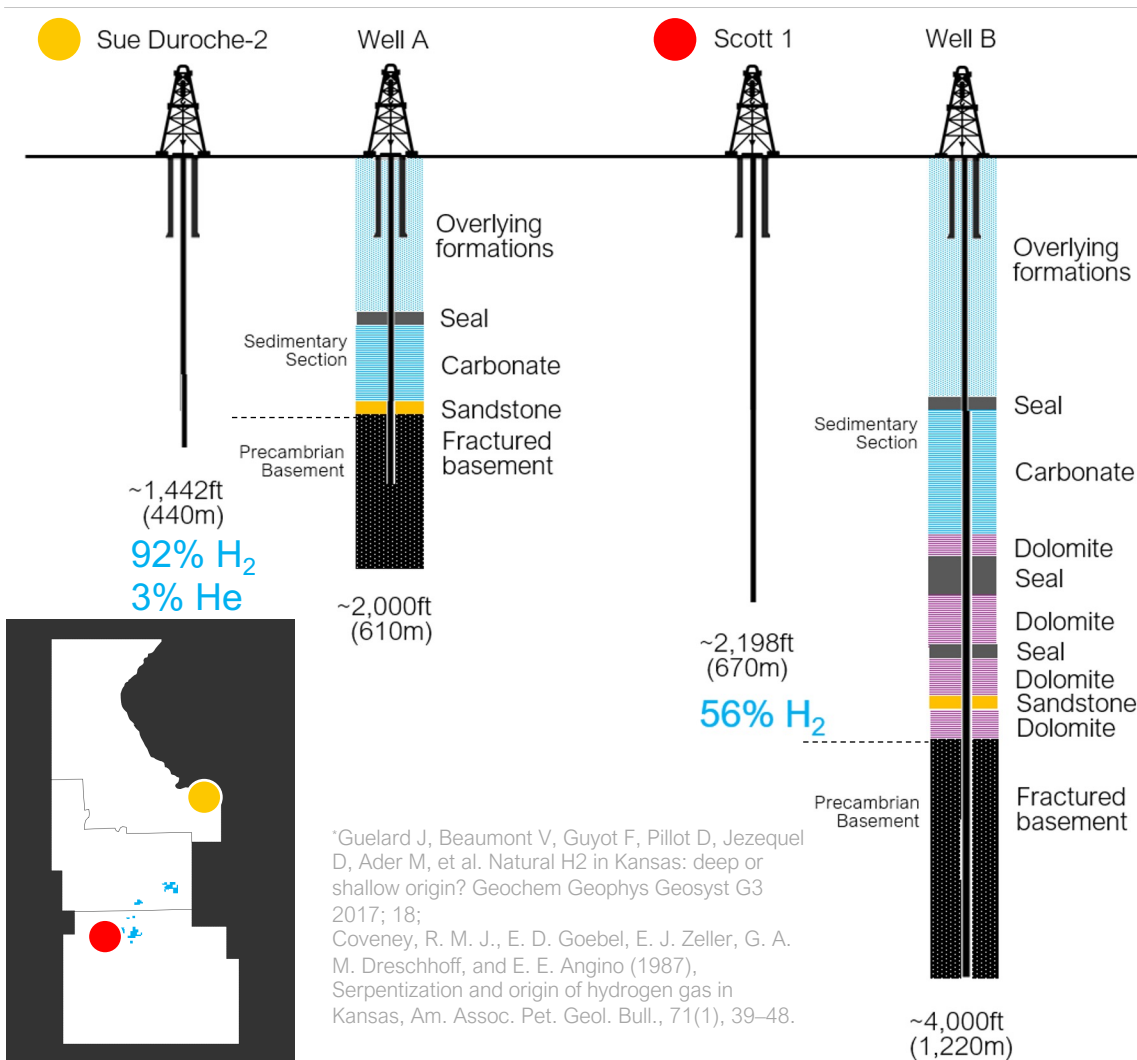
Total depth  
2,198ft (670m)



# H<sub>2</sub> + He % 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 H<sub>2</sub> or He.

## Examples: drilling adjacent to historic wells

Ranking and final well selection is made after additional leasing is completed





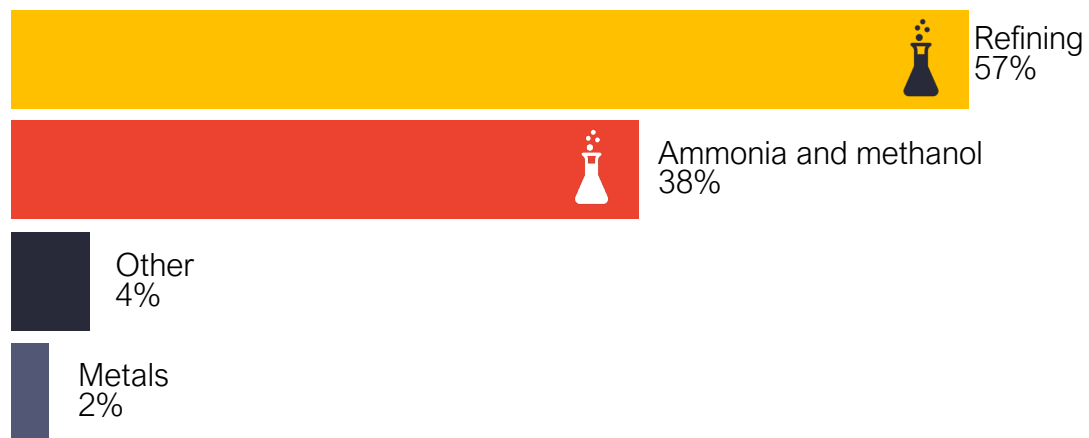
# NEMAHA PROJECT KANSAS, USA

Mid-West is a very important location in the United States for ammonia and fertiliser production.

## US Hydrogen Market today

Current consumption in the US H<sub>2</sub> market, percent

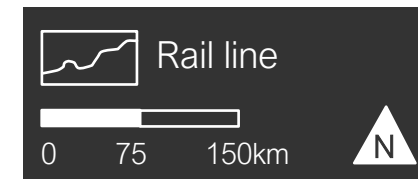
- The majority of hydrogen today is used in petrochemicals, oil refining, ammonia production, and methanol production.
- Over 35 % of US ammonia is produced in Kansas and neighbouring states\*.



Source: <https://www.statista.com/statistics/1179429/us-hydrogen-consumption-share-by-sector/>

## Offtakers near Nemaha Project

Within 250km#



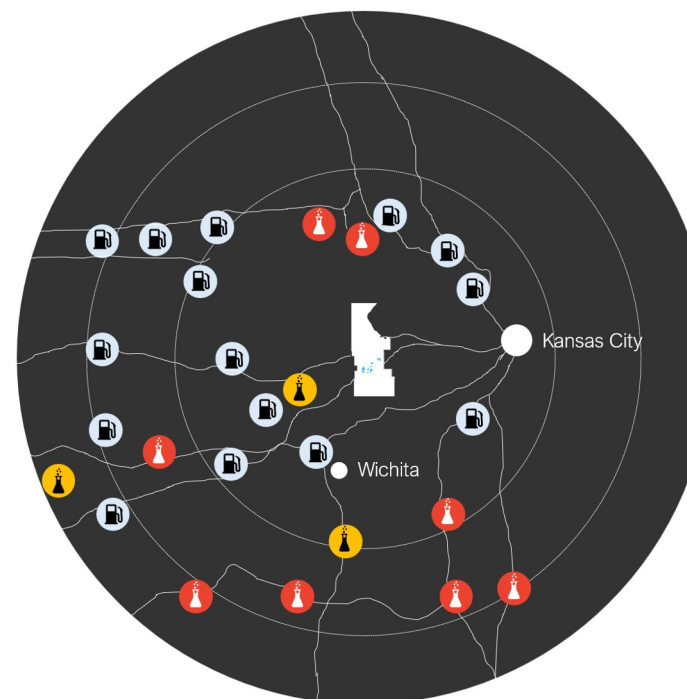
Ethanol



Petrochemical/oil refining



Ammonia plant



\* Source: <https://www.statista.com/statistics/1266392/ammonia-plant-capacities-united-states/>

#Source: Great Plains Institute, 2022 (Modified by HyTerra)

# 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.
- US\$500 million for clean hydrogen manufacturing and recycling research and development activities.
- \$8 billion for regional clean hydrogen hubs.
- 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 CO<sub>2</sub>-equivalent per kilogram of H<sub>2</sub>.
- 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.



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>

# NEMAHA PROJECT ALSO PROSPECTIVE FOR HELIUM

Sue Duroche-2 well drilled in 2009 returned 3% helium concentration.

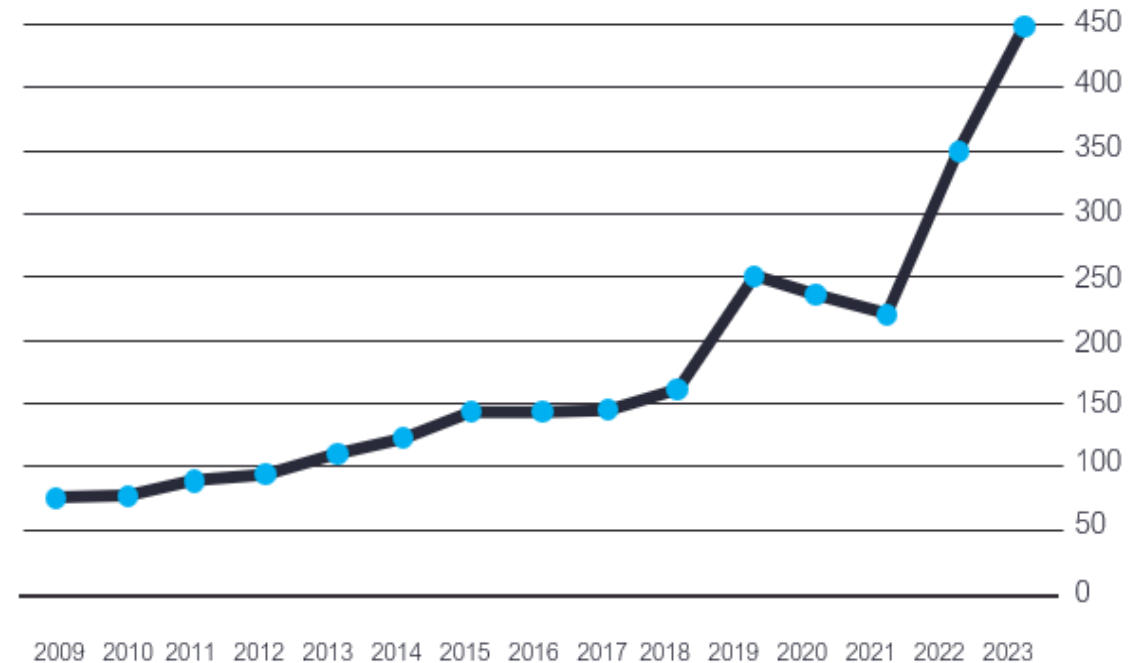
- Helium is an irreplaceable input for many important technologies, with significant demand from manufacturers of semi-conductors to MRI's.
- The economic threshold for helium-rich fields in U.S. is concentrations >0.3%#.
- Helium pricing has been on an upward trend as a result of declining volumes from US BLM storage facility and growing demand for helium globally.
- Liquid helium sells at up to 50 times the price of LNG<sup>^</sup>. Current prices are approx. USD450/thousand standard cubic feet.

HyTerra continues to explore high-graded areas of significant helium potential.

<sup>#</sup><https://www.sciencedirect.com/science/article/pii/S0009254122000845>

<sup>^</sup><https://mining.com.au/the-rise-of-helium-a-critical-raw-material-and-not-just-a-party-balloon-filler/>

Historical price of bulk liquid helium  
US\$/thousand standard cubic feet (Mscf)



Source: Kornbluth Consulting LLC

# HYTERRA LTD

## WORK PROGRAM & BUDGET

Please note that timeframes are indicative and may be subject to change.  
Workplan & budget is notional and subject to final costs based on signed contracts.

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

Indicative use of proceeds timeline

Continue leasing priority areas in Nemaha Project

Ranking of drilling candidates in Nemaha Project.

Venture decision on Geneva Project.

Screening new growth opportunities.

Q2 2024

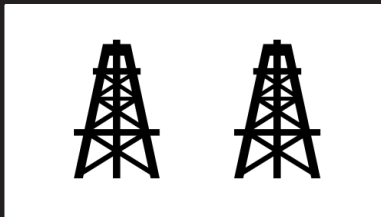
Q3 2024

Q4 2024



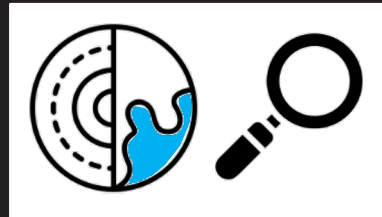
Resume leasing of priority areas

~ A\$1.5m



Drill 2 wells

~ A\$2.0m



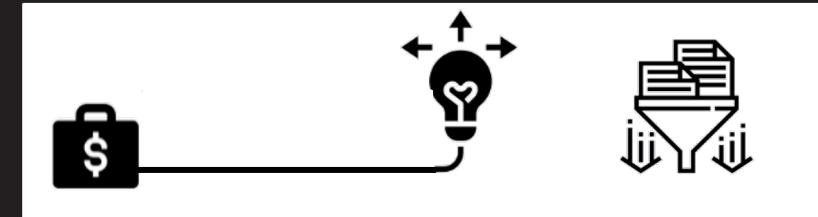
Acquire geophysical data

~ A\$0.5m



Resource evaluations

~ A\$0.25m



Commercialisation plan.  
Screening new growth opportunities

~ A\$0.25m



# BOARD & MANAGEMENT

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

## Ambitions



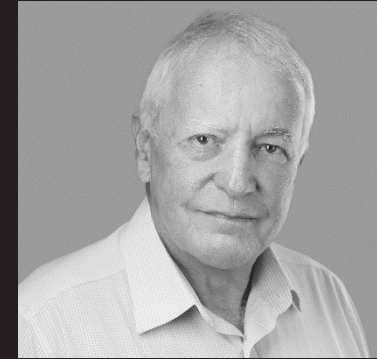
**Benjamin Mee**  
Executive Director

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.



**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).



**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 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.

# CORPORATE OVERVIEW

## Share price

A\$0.019

As 25 March 2024  
52 week high \$0.28, low \$0.015

## Market capitalisation

A\$11.2m

As at 25 March 2024

## Top 20 ownership

46.9%

As at 25 March 2024

## Shares on issue

606m

As at 25 March 2024  
44 million escrowed

## Cash

A\$0.8m

As at 31 December 2023

## Options

326m

As at 25 March 2024  
32.15 million escrowed

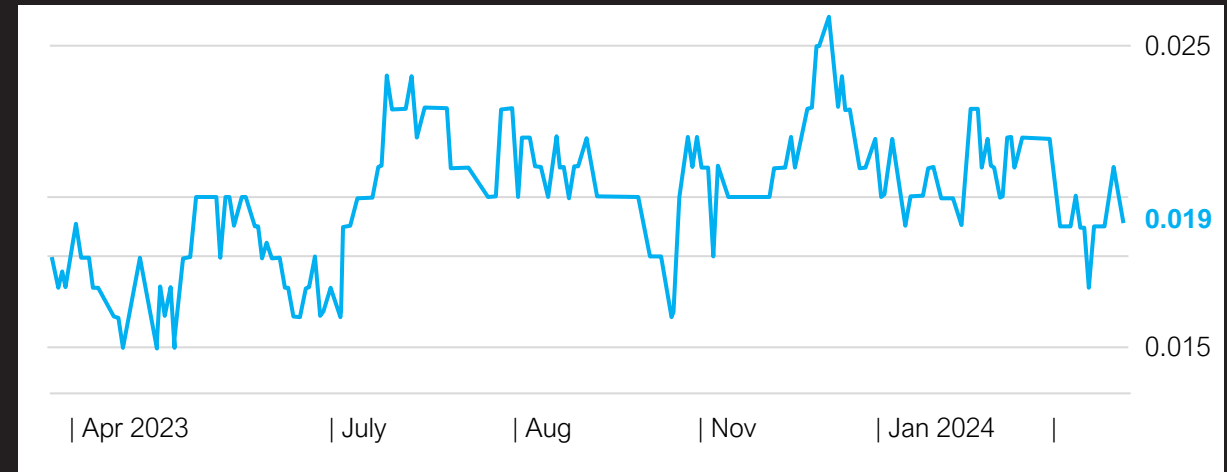
## Debt

Nil

As at 25 March 2024

## ASX Share price performance (\$A)

12 months to 26 March 2024



# A WORLD OF OPPORTUNITY.

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

- 01** Exploring for natural hydrogen and helium resources near major industrial hubs
- 02** USA is incentivising investment into cleaner energy with clear need for hydrogen.
- 03** Drilling planned to start in Q3 2024.
- 04** Expected ramp up in news-flow in 2024 based on leasing, geophysics, and drilling results.
- 05** Experienced leadership developing onshore gas fields across the world.





HYTERRA

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# APPENDICES

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- A. Nemaha Project. Maiden Prospective Resource

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  - B. Kansas hydrogen occurrences are globally competitive

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  - C. Geneva Project, Nebraska USA

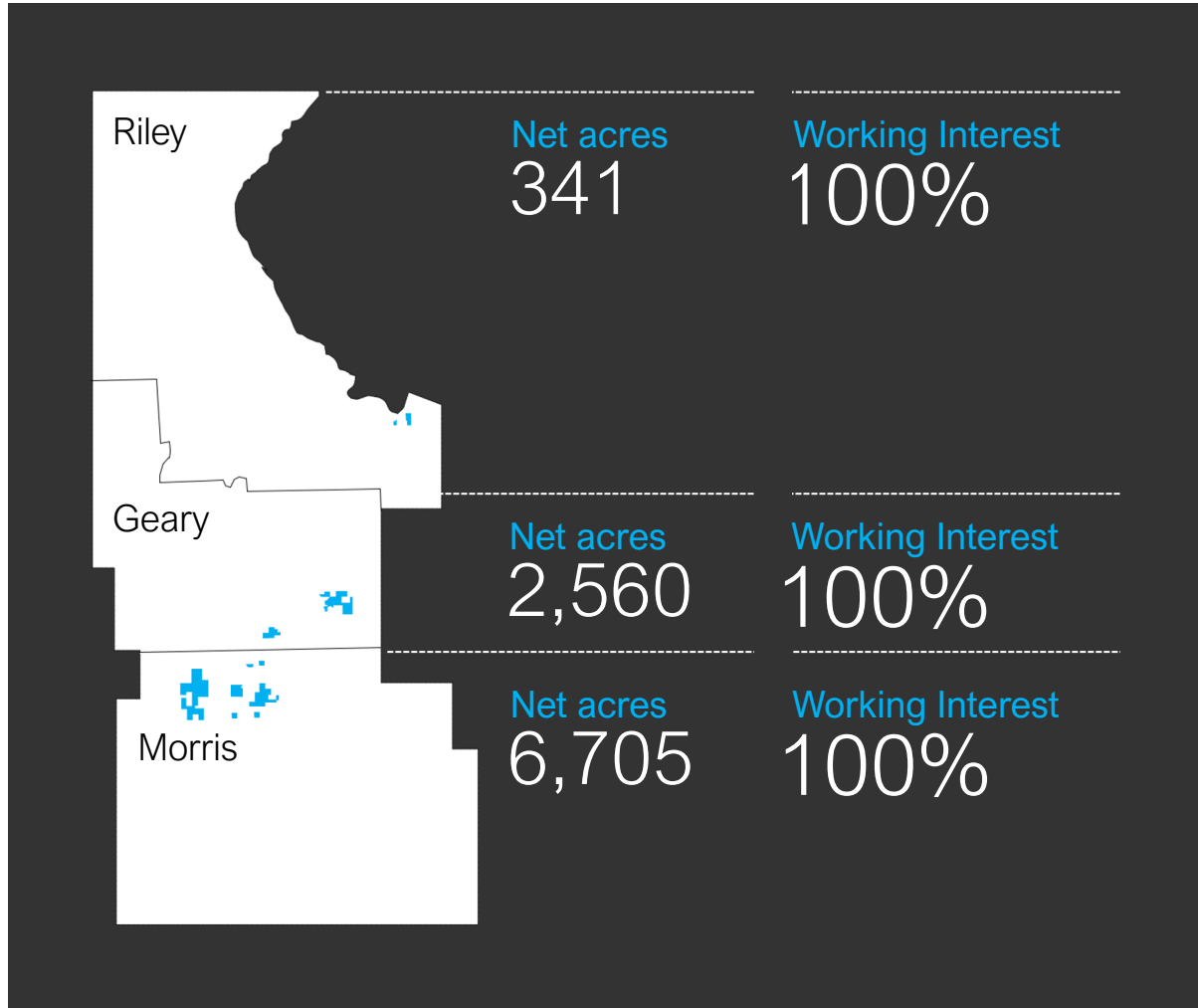
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  - D. White hydrogen. Demand accelerating.

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# NEMAHA PROJECT MAIDEN PROSPECTIVE RESOURCE



Independent assessment identifies significant hydrogen and helium resources.

1kg H<sub>2</sub> = 423cf (cubic feet)

## Aggregated Net Recoverable Prospective Hydrogen Volumes (kg)

Prospect	Reservoir	Kg P90	Kg P50	Kg P10
Central Geary	All	8,887,319	19,558,270	47,346,856
Eastern Geary	All	25,222,246	54,507,470	134,967,715
Morris North	All	77,118,309	162,075,581	379,540,959
Zeandale	Lansing	509,948	1,401,763	3,534,056
<b>TOTAL</b>	<b>All</b>	<b>111,737,822</b>	<b>237,543,083</b>	<b>565,389,585</b>

## Aggregated Net Recoverable Prospective Helium Volumes (kg)

Prospect	Reservoir	MMscf P90	MMscf P50	MMscf P10
Central Geary	Basement	3	37	134
Eastern Geary	Basement	8	93	312
Morris North	Basement	25	328	1,138
Zeandale	Basement	1	13	45
<b>TOTAL</b>	<b>Basement</b>	<b>37</b>	<b>471</b>	<b>1,629</b>

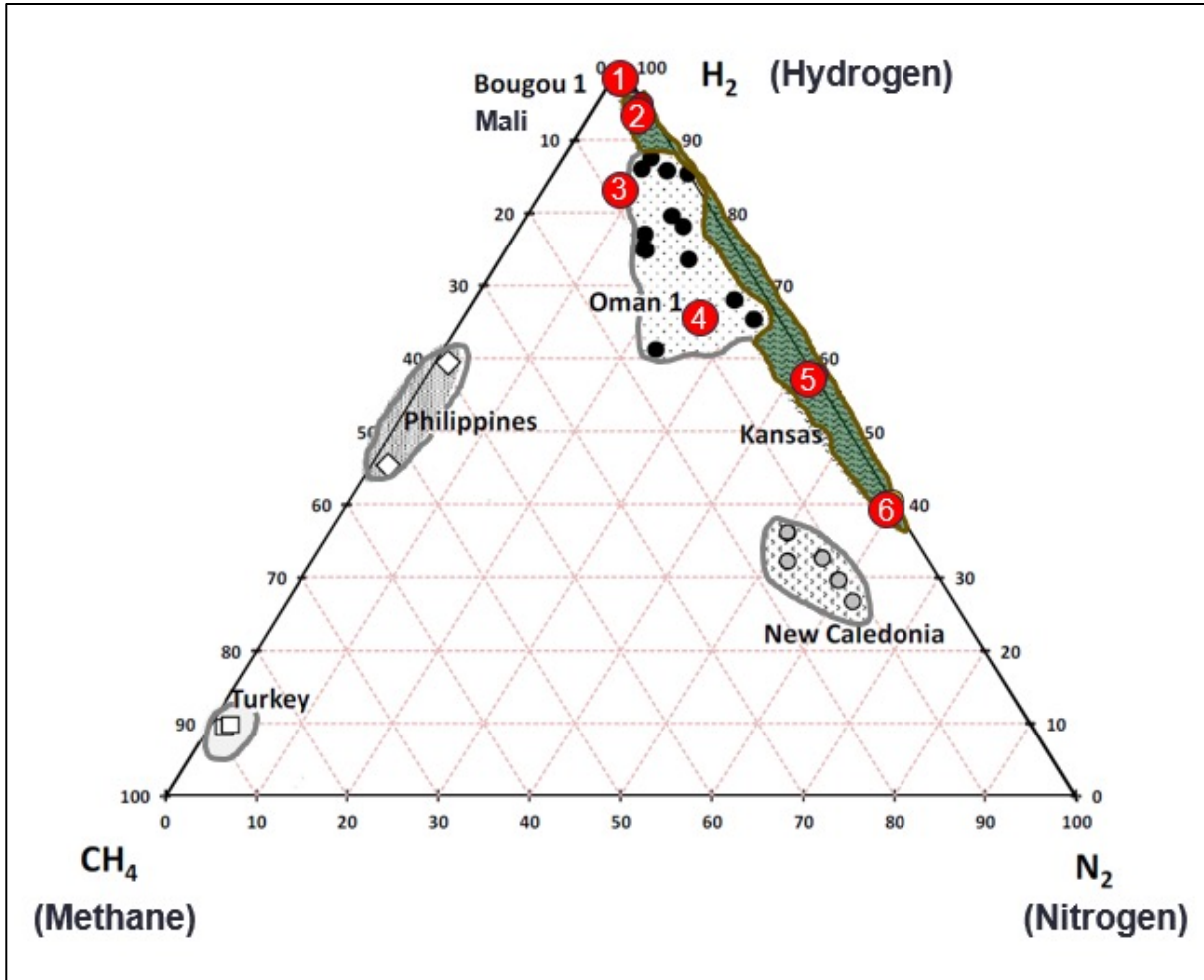
Probabilistic methods are used to prepare the estimates. The distribution of the estimates is the "full distribution" and has not been truncated by application of the MEPS (minimum economic pool size concept).

\*Please refer to the ASX release dated 13 December 2023 for full details with respect to the Prospective Resource estimate, associated risking and Cautionary Statement on page 4.

**Disclaimer:** The Company is not aware of any new information or data that materially affects the information included in the ASX announcement dated 13 December 2023 and that all material assumptions and technical parameters underpinning the estimates in the same announcement continue to apply and have not materially changed.

# KANSAS HYDROGEN OCCURANCES ARE GLOBALLY COMPETITIVE.

These hydrogen molecules are advantaged due to negligible carbon gases present.



#	Well Name	Location	Permit Holder
1	Bougou-1	Mali, Africa	Hydroma
2	Sue Duroche-2	Kansas, USA	Hyterra
3	Minlaton Bore (Ramsay-1),	South Australia	Gold Hydrogen
4	American Beach Bore	South Australia	Gold Hydrogen
5	Scott-1	Kansas, USA	HyTerra
6	Heins-1	Kansas, USA	<i>unheld</i>

Modified from Prinzhofer, A, Cheick Sidy Tahara Ciss, C, Boubacar Diallo, A, Discovery of a large accumulation of natural hydrogen in Bourakebougou (Mali), International Journal of Hydrogen Energy 43 (2018), 19315-19326.

# GENEVA PROJECT

## NEBRASKA, USA

HyTerra has a 16% interest (and the right to earn up to 51%) in a Joint Development Agreement with Natural Hydrogen Energy LLC.

- Wildcat well specifically targeting white hydrogen (Hoarty NE3) in Geneva, Nebraska.
- Well is situated on margin of mid-continental rift and was drilled to 11,200ft (3,400m)
- Elevated hydrogen and helium was detected during drilling and gas was flared during swab testing.
- Joint development partners are awaiting the provision of key data and metrics to make a joint decision on flow testing operations and the work program going forward.



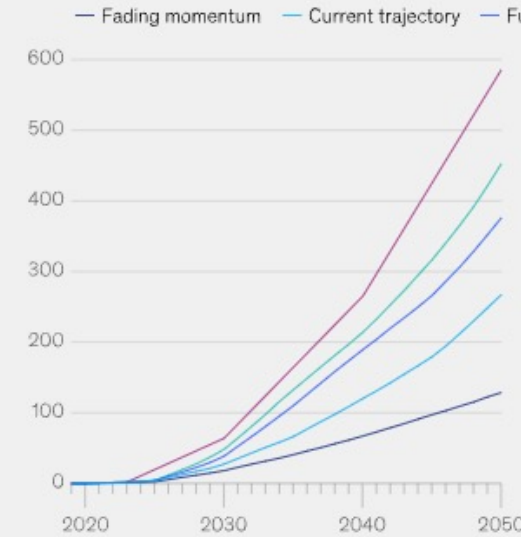


# WHITE HYDROGEN DEMAND ACCELERATING

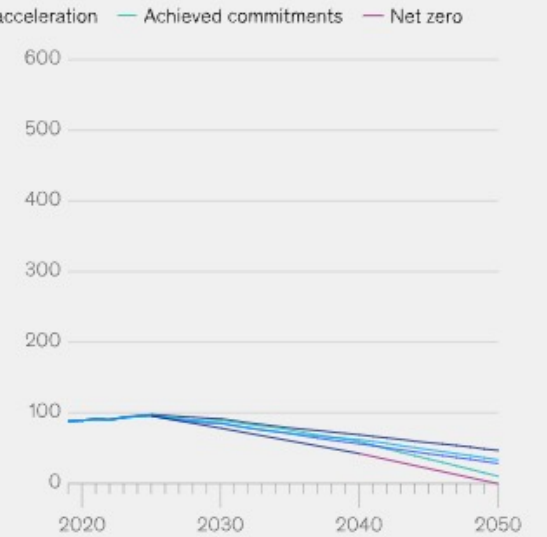
Clean hydrogen demand is expected to reach 125-585 million tons per year by 2050\*.

- Nearly all hydrogen consumed today is grey hydrogen (approx. 90 million tons per annum), using fossil fuel-based steam methane reforming.
- However, grey hydrogen demand is projected to decline as demand for clean hydrogen rises.
- McKinsey predicts clean hydrogen demand could account for up to 73 to 100 percent of total hydrogen demand by 2050.
- After 2025, nearly all new hydrogen production coming online is expected to be clean hydrogen.

Global clean hydrogen demand outlook by scenario, Mt per year of hydrogen equivalent



Global grey hydrogen demand outlook by scenario, Mt per year of hydrogen equivalent



## Scenario descriptions

- **Net Zero**  
Net-zero commitments achieved by all countries by 2050, through ambitious policies across geographies
- **Achieved Commitments**  
Net-zero commitments achieved by leading countries through purposeful policies, followers transition at slower pace
- **Further Acceleration**  
Further acceleration of transition driven by country-specific commitments, though financial and technological restraints remain
- **Current trajectory**  
Current trajectory of renewables and electrolyzers costs decline continues, however currently active policies remain insufficient to close gap to ambition
- **Fading Momentum**  
Delayed uptake of FCEV in road transport as well as uptake of alternative fuels in aviation drives lower hydrogen demand

Source: McKinsey Energy Solutions' Global Energy Perspective 2023

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