2 August 2024

ASX Announcement

Ramsay Project

Stage 2 Exploration Well Testing Update

Amongst highest Helium purities ever reported at 20% to 25%, extensive regional Hydrogen and Helium play and international first to see initial Helium and Hydrogen concentrations at surface with increasing concentrations and strong indications of high Helium purities

Highlights:

- **Hydrogen and Helium concentrations at surface. The Company understands that this has not been achieved before, and would be an international first for a non-petroleum system.**
- **Helium concentrations in gas at standard conditions extracted from water, with third-party interim laboratory results of up to 20% to 25% purity (50,000 times the concentration in the atmosphere) and which is among the highest reported. Testing is ongoing.**
- **There is current and historical evidence that confirms the presence of both Natural Hydrogen and Helium in numerous locations across PEL 687 (per Figure 1).**
- **Initial Stage 2 exploration testing shows very promising and increasing purities of both Natural Hydrogen and Helium being detected at surface as the Ramsay 1 and 2 wells are dewatered. (Refer Figure 2 for Hydrogen in the Ramsay 2 well).**
- **The acquisition phase of the Ramsay 2D seismic program is completed, and initial results show the data to be suitable for selecting future well locations on a regional basis for the ongoing drilling program.**
- **In conjunction with our Australian advisors, Gold Hydrogen and Mizuho (a leading global Japanese Bank) have signed a non-binding MOU to establish a framework for the development of their relationship, including the consideration of future advisory assignments and the cooperative promotion of Natural Hydrogen and Helium usage. Mizuho has a number of Japanese energy industry clients with global operations that are interested in a range of issues associated with the discovery, usage and ESG / sustainability benefits of Natural Hydrogen and Helium.**

Gold Hydrogen Managing Director, Neil McDonald said: *"We successfully continue our efforts to confirm that potentially extensive quantities of both Natural Hydrogen and Helium in world class purities exist over only a portion of this permit, and we believe this will be extended to larger portions of our permitted area as outlined in the historical data. To have an initial world first to see Hydrogen and Helium to surface is very exciting for our further ongoing exploration and drilling programs in even better locations. Our results to date only confirm the global interest our project has been receiving, and why we are very proud to be working with Mizuho Bank with their global clients' interests in both Natural Hydrogen and Helium."*

The Directors of Gold Hydrogen Limited (**Gold Hydrogen**, ASX: **GHY**, the **Company**) are pleased to provide the following operational and commercial update. The Company's project related activities are currently focused on its groundbreaking Ramsay Project on the Yorke Peninsula, prospective for both Natural Hydrogen and Helium.

Further Detail:

Relationship with Mizuho Securities of Japan

In the last months the Company attended investor and technical / industry related conferences in Adelaide, Perth, and Tokyo, Japan.

Mizuho Securities (Mizuho) is a leading global Japanese corporate bank, and has been promoting Gold Hydrogen to existing global Japanese Energy companies. The Japanese documentary about Natural Hydrogen, partly filmed in South Australia, and featuring Gold Hydrogen (amongst other industry participants) was released in Japan during the June 2024 quarter. As a result of this documentary, and the Company's attendance at the Japan Energy Summit, a relationship was established with Mizuho to manage multiple inquiries from Japanese Energy Companies for future investment into the Gold Hydrogen and its projects.

Gold Hydrogen and Mizuho have now signed a non-binding MOU to establish a framework for the development of their relationship, including the consideration of future advisory assignments and the cooperative promotion of Natural Hydrogen and Helium usage. Mizuho has a number of Japanese energy industry clients with global operations that are interested in a range of issues associated with the discovery, usage and ESG / sustainability benefits of Natural Hydrogen and Helium.

Early Gas Analysis Results Show High Helium Purity of 20% to 25% – 50,000 Times More Than for Atmosphere

A leading internationally recognised laboratory has reported to the Company its preliminary compositional measurements from gas dissolved in water samples taken from the Helium zone in Ramsay 2, which show Helium levels in the order of 50,000 times the concentration of Helium in the atmosphere. Subject to confirmation in the finalised reports, this would equate to purity levels of 20% to 25% Helium and would be among the highest levels of Helium measured from dissolved gas. Refer Appendix A for Listing Rule 5.30 disclosure requirements.

Status of Ramsay 2D Seismic Survey

The primary objectives of the Ramsay 2D regional seismic program are to assist in the delineation of potential Natural Hydrogen and Helium accumulation(s), and to support the identification of future drilling targets on the Yorke Peninsula. Results from historical well core sample fluid inclusion analysis confirms that both Natural Hydrogen and Helium are present across the Yorke Peninsula and Kangaroo Island (PEL 687) as outlined below in **Figure 1**.

The data acquisition phase of the Ramsay 2D seismic survey has been completed with 575km of 2D seismic lines recorded. The data is currently undergoing processing.

Once analysed, the data from the 2D seismic survey, when combined with the Company's other data sets such as the airborne survey data, soil-gas survey data, historical offset well data, and the Ramsay 1 & 2 drill log data and flow test data, will assist the Company in planning future well locations and well designs.

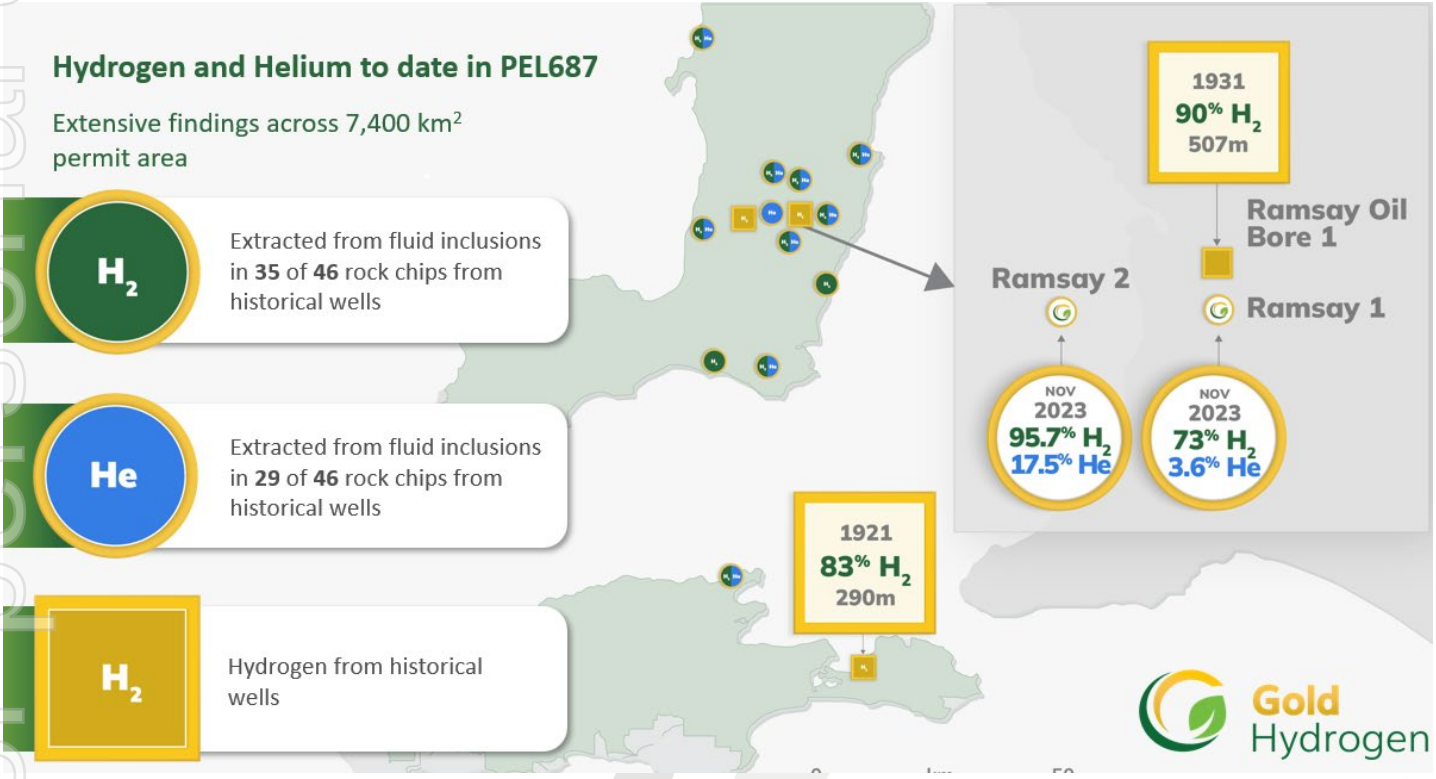

Figure 1 – Various Data Points Indicating the Presence of Natural Hydrogen and Helium in PEL 687

Commencement of Stage 2 Exploration Well Testing – Ramsay 1 & 2 Exploration Wells

Initial Stage 2 exploration testing results indicate increasing levels for purities of both Natural Hydrogen and Helium are being measured. As depicted in **Figure 2** for Hydrogen in Ramsay 2, the shallow Hydrogen zone is showing an increasing trend for daily recorded levels of Natural Hydrogen (corrected for air contamination) at surface. Testing on Ramsay 1 commenced seven days after Ramsay 2, and the Company has been focussing on the Helium zone down hole. The compilation and verification of the data recorded to date is ongoing whilst testing continues.

Ramsay 1 is dewatering the deeper Helium zone, and gas from the produced water in the separator at surface, and the preliminary data to be verified, show significant and increasing purity levels of Helium. Ramsay 2 is dewatering the shallow Hydrogen zone, and results being recorded highlight the increasing levels of Natural Hydrogen (**refer blue line in Figure 2**) measured from the annulus at surface. Refer Appendix A for Listing Rule 5.30 disclosure requirements.

These are interim results, but they are highly encouraging for the future of the Ramsay Project, as it is likely that future wells to be drilled in more optimal locations will demonstrate the potential for further improved gas flow and / or purity results.

In this phase of testing, we have identified some isolated formation water in several zones of high permeability. We are managing this produced formation water in line with the Environmental Approval Conditions issued by the State Government.

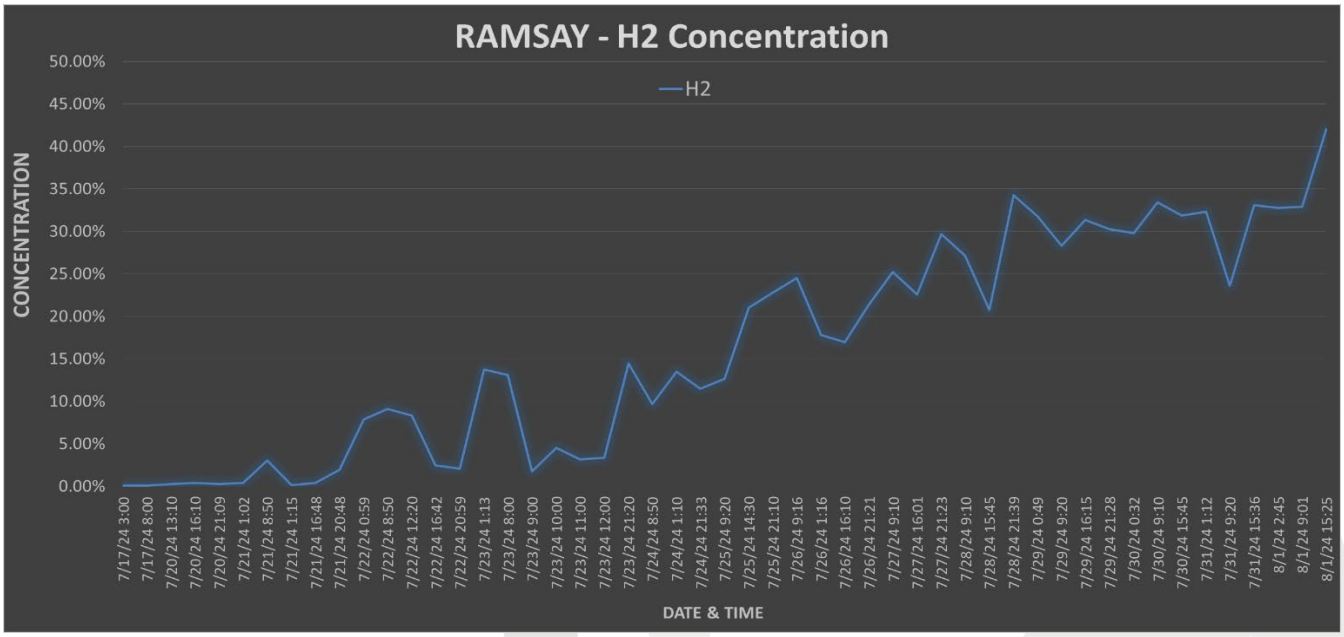

Figure 2 – Ramsay 2 Testing 200 to 350m Shallow Hydrogen Zone 7 & 8 – Hydrogen concentrations increasing as testing continues as measured from the annulus (corrected for air and Nitrogen contamination)

First Key Step on the Journey to Future Commercialisation

The Company is of the view that the Ramsay Project contains significant prospective resources of both Natural Hydrogen and Helium (refer Tables 1 & 2), with large scale potential that it is aiming to commercialise over time.

There is very little data available for dedicated Hydrogen wells anywhere in the world due to the lack of analogue wells. Accordingly, there is inherent uncertainty with regard to the expected outcomes of the Ramsay 1 and Ramsay 2 exploration well testing program.

To the Company's knowledge, the only Natural Hydrogen field currently in production is located in Mali, West Africa, where Natural Hydrogen production is used to power the small town of Bourakebougou. It has been reported that the Natural Hydrogen wells in Mali do not have any decline in production and are continually regenerating and producing at the same rate.[1]

Helium is extremely valuable and indicatively, longer-term bulk pricing is expected to approximate USD450 per Mcf (thousand cubic feet).[2]

Natural Hydrogen has a high energy content and extracting it even in small quantities may prove commercial for localised applications. Furthermore, given that Helium was also found within both the Ramsay 1 and Ramsay 2 wells, being able to extract and process both gases in small quantities may provide potential short-term commercial and / or proof of concept opportunities to help progress the Ramsay Project. The Company's activities to date represent the start of a very exciting technical journey and is not dissimilar to the eventual success of existing world-renowned oil and gas energy projects, which took time to reach their full potential.
Results from the testing program will provide the Company with valuable information for future drilling and well completion designs, for the future pilot program, and longer-term commercialisation planning.

Important Risk Commentary

It is important to note that there remain both geological and potential development risks associated with the Ramsay Project and the Company's commercial and business objectives. These risks relate to the presence, recovery and potential volumes of both Hydrogen and Helium, but also due to the location of the resource within agricultural areas and the proximity to National Parks on both Yorke Peninsula and Kangaroo Island, requiring significant landholder and community engagement. The worldwide, Federal and South Australian Government and industry efforts to secure Hydrogen as an alternative energy source provides confidence that any technical and social concerns may be overcome.

[1] "Natural Hydrogen: a new source of carbon free and renewable energy that can compete with hydrocarbons", First Break Volume 40, October 2022 (available via www.goldhydrogen.com.au/technical-articles/)
[2] February 2024, www.noblehelium.com.au , quoting Kornbluth Consulting.

About Gold Hydrogen

Gold Hydrogen is focused on the discovery and development of world class Natural Hydrogen and Helium gases in a potentially extensive province in South Australia. This region has only recently had its Natural Hydrogen and Helium potential confirmed by the Company via its maiden drilling campaign. The domestic and global demand for Hydrogen and Helium, combined with new exploration techniques and experienced personnel, provides Gold Hydrogen with an extraordinary opportunity to define and ultimately develop a new Natural Hydrogen and Helium gas province.

The combined permit area of the Gold Hydrogen group is approximately 75,332km^2. Gold Hydrogen holds one granted exploration license (the Ramsay Project - PEL 687) and its two 100% owned subsidiary companies (White Hydrogen Australia and Byrock Resources) hold an additional seven (7) applications for Natural Hydrogen and Helium exploration within South Australia. Gold Hydrogen is also the preferred applicant for four (4) gas storage exploration licenses applications (GSELA) covering an area of 8,107km^2 within the Yorke Peninsula portion of PEL 687 in South Australia. These storage licence applications are in addition to the granted exploration licence and application licences.

The group's permit areas are characterised by low population densities, cooperative stakeholders and aspects of the natural environment suited to the exploration and development of a future Natural Hydrogen and Helium gas province. Gold Hydrogen places considerable importance on close liaison with landholders, traditional owners and all other stakeholders, and this approach has led to the grant of its key tenement PEL 687 in South Australia. The Company intends to continue to invest in these efforts.

Further Information

Further information on the Gold Hydrogen group, its projects, and its Board and Management can be found on the Company's website (www.goldHydrogen.com.au) together with a copy of the Company's Replacement Prospectus of 29 November 2022.

Gold Hydrogen also has accounts on LinkedIn and Twitter (@GHY_ASX), and copies of market releases will be emailed to all interested parties who register via info@goldHydrogen.com.au

*** _ *** _ ***

This announcement has been authorised for release by the Managing Director.

On behalf of the Board
Karl Schlobohm
Company Secretary

For Company Enquiries Contact:

Neil McDonald – Managing Director
nmcdonald@goldHydrogen.com.au
+61 7 3521 8038

Karl Schlobohm – Company Secretary / CFO
kschlobohm@goldHydrogen.com.au
+61 7 3521 8038

For Media Enquiries Contact:

Matthew Doman – Creastview Strategy
Matthew.doman@crestviewstrategy.com
+61 421 888 858

Prospective Resource Statements

The Prospective Resource Statements for Natural Hydrogen and for Helium have been included in this announcement under the approval of Mr Billy Hadi Subrata, Chief Technical Officer for Gold Hydrogen, who is a Qualified Petroleum Reserves and Resources Evaluator. Mr Hadi Subrata confirms that, as at the date of this announcement, there is no change to information or additional information, since the effective dates, that would materially change the estimates of prospective resources quoted.

Forward Looking Statement / Future Performance

This announcement may contain certain forward-looking statements and opinion Forward-looking statements, including projections, forecasts and estimates, are provided as a general guide only and should not be relied on as an indication or guarantee of future performance and involve known and unknown risks, uncertainties, assumptions, contingencies and other important factors, many of which are outside the control of the Company and which are subject to change without notice and could cause the actual results, performance or achievements of the Company to be materially different from the future results, performance or achievements expressed or implied by such statements. Past performance is not necessarily a guide to future performance and no representation or warranty is made as to the likelihood of achievement or reasonableness of any forward-looking statements or other forecast. Nothing contained in this announcement, nor any information made available to you is, or and shall be relied upon as, a promise, representation, warranty or guarantee as to the past, present or the future performance of Gold Hydrogen Limited.

Table 1 – Prospective Resource Statement for Natural Hydrogen

Gold Hydrogen's Ramsay Project: Prospective Resources* of Hydrogen in '000 Tonnes – 30 Sept 2021										
PEL	**Prospects**	**SPE PRMS Sub-class**	**1U Low Estimate**	**2U Best Estimate**	**Mean**	**3U High Estimate**		**Pg**	**Pd**	**Pc**
PEL 687	**All Prospects and Leads**		**207**	**1,313**	**4,187**	**8,820**		**22%**	**48%**	**10%**
Yorke Peninsula										
PEL 687	Ramsay FB	Prospect	124	931	2,712	6,989		22%	50%	11%
PEL 687	Ramsay Lst	Prospect	10	70	191	492		26%	50%	13%
PEL 687	Maitland	Lead	7	26	40	92		17%	35%	6%
Kangaroo Island										
PEL 687	Navigator	Lead	34	152	280	678		19%	40%	8%
PEL 687	Kanmantoo	Prospect	32	134	237	569		25%	40%	10%

***This estimate of Natural Hydrogen Prospective Resources must be read in conjunction with the notes in the Company's ASX release of 13 January 2023.**

It should be noted that the estimated quantities of Natural Hydrogen 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.

QPRRE Statement – Natural Hydrogen

The Prospective Resource Statement for Natural Hydrogen in this announcement is based on, and fairly represents, information and supporting documentation prepared by independent consultants "Teof Rodrigues & Associates" with an effective date of 30 September 2021, and which forms part of the Company's Replacement Prospectus dated 29 November 2022. The Prospective Resource Statement, together with all relevant notes, also appears in the Company's ASX release of 13 January 2023.

Table 2 – Prospective Resource Statement for Helium

Gold Hydrogen Prospective Resources* of Helium in Bcf - Ramsay Project (PEL 687 Yorke Peninsula) 21 February 2024											
PEL	**Prospects**	**SPE PRMS Sub-class**	**Formation**	**1U Low Estimate**	**2U Best Estimate**	**Mean**	**3U High Estimate**		**Pg**	**Pd**	**Pc**
PEL 687	**All Prospects**		**All Formations Total**	**7**	**41**	**96**	**243**		**17%**	**60%**	**10%**
PEL 687	**Ramsay Fault Block**	**Prospect**	Kulpara Formation	0.8	3.6	7.0	17.1		29%	60%	17%
			Winulta Formation	0.1	0.6	1.6	4.0		12%	60%	7%
			Fractured Basement	0.7	3.8	6.9	16.7		13%	60%	8%
			Total	**2**	**8**	**15**	**38**		**20%**	**60%**	**12%**
PEL 687	**South of Ramsay Fault Block**	**Prospect**	Kulpara Formation	2.1	12.8	30.5	77.6		23%	60%	14%
			Winulta Formation	0.3	2.4	7.7	19.8		8%	60%	5%
			Fractured Basement Hilbata Suite	1.6	10.3	25.5	65.2		12%	60%	7%
			Fractured Basement Yorke Peninsula Heel	1.4	7.7	17.0	42.7		12%	60%	7%
			Total	**5**	**33**	**81**	**205**		**16%**	**60%**	**10%**

***This estimate of Helium Prospective Resources must be read in conjunction with the notes in the Company's ASX release of 21 February 2024.**

It should be noted that the estimated quantities of 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 Helium.

QPRRE Statement - Helium

The Prospective Resource Statement for Helium in this announcement is based on, and fairly represents, information and supporting documentation prepared by independent consultants "Teof Rodrigues & Associates" with an effective date of 21 February 2024, and which was announced by the Company on that date together with the accompanying assumptions and notes.

Appendix A

Summary Table of Preliminary Results on Additional Samples

Name:	**Ramsay 2**		
Location (UTM zone 53 GDA2020)			
X	747,707.85		
Y	6149385.46		
Permit	PEL687		
Entity holders	Gold Hydrogen 100%		
Zones tested	Zone 1	Zone 2 and 3	Zone 7 and 8
Resources	Helium	Helium	Hydrogen
Formation	Granite Basement	Kulpara Dolomite	Parara Limestone
Gross thickness and net pay thickness	>200m Gross	180m Gross	406m Gross
Geological rock type	Granite	Dolomite	Limestone
Depth of the zones tested	1002mMD	712 mMD	197mMD and 289mMD
Type of test	Pressure test	Commingled pressure test	Commingled pressure test
Phase recovered	Gas/Water	Gas/Water	Gas/Water
Corrected H2 and He concentration in gas recovered from downhole sample	20 to 25% He	20 to 25% He	42% H2 (still increasing)*
Flow rates, choke size, volumes recovered	TBA		
Fracture stimulation	None	None	None
Material non hydrocarbons	Nitrogen, Hydrogen	Nitrogen, Hydrogen	Nitrogen, Helium

**** Please refer to Figure 2***