31 October 2023

ASX Announcement

Ramsay Project Update

Significant Concentrations of Hydrogen and Helium Detected in the Ramsay 1 Well

Highlights:

- **Significant concentrations of hydrogen and helium have been encountered in sections of the Ramsay 1 well, confirming historic measurement and demonstrating an active hydrogen system in the Ramsay Project area.**
- **Testing and laboratory results measured air-corrected hydrogen at 73.3% at 240m below ground level, consistent with the 76% air-corrected concentration of hydrogen reported in the Ramsay Oil Bore 1 in 1931. These measurements validate historical results, and confirm the presence of a hydrogen play at shallow depths in the Ramsay Project area.**
- **A major connected fracture zone was encountered in the Parara limestone, which is key for the migration of hydrogen from deeper sources to shallow zones.**
- **Helium was also detected with an air-corrected content of 3.6% at 892mMD depth. This is a relatively high concentration of helium which is a rare and valuable resource, and if found in commercial grades and quantities, could be a significant value-add to the Ramsay Project. Globally there are projects producing helium at < 1% due to its high commercial value.**
- **The Ramsay 1 well was drilled to a depth of 1,005m on time, under budget and with no HSE incidents.**
- **Following the suspension of the Ramsay 1 well, and whilst drilling and sampling results continue to be analysed and further testing is being considered, the Company is preparing to drill the Ramsay 2 well to further appraise the Ramsay Project's Prospective Resource (refer Table 2). The Ramsay 2 well is expected to spud in mid-November.**
- **Managing Director Neil McDonald hailed the test results: "It is incredibly exciting that we have replicated the results of 100 years ago at 240m. With the additional find of helium, which could be a significant value-add to the project, we view these results as being better than planned."**

Further to previous market releases regarding its flagship Ramsay Natural Hydrogen Project, the Directors of Gold Hydrogen Limited (**Gold Hydrogen**, ASX: **GHY**, the **Company**) are pleased to provide further detail on the preliminary results from its Ramsay 1 well.

Drilling operations on the first dedicated natural hydrogen exploration well in Australia, Ramsay 1, were completed on 28 October 2023. The well reached a total depth of 1005m measured depth (**MD**), and drilled a relatively small section (just over 100m) of the Precambrian basement. The drilling operations were completed within the pre-drill time estimates, under budget and without any HSE incidents. The final well bore was evaluated with a complete set of wireline logs, and with 100% of the rotary sidewall core samples recovered from various depths and formations. The successful completion of drilling operations has demonstrated the capability of Gold Hydrogen and its supporting drilling team to plan and execute Australia's first dedicated natural hydrogen drilling program.

Whilst drilling through the Parara limestone at 316mMD, a major connected fracture zone was encountered. The presence of wide-spread connected fracture systems within the target formations is essential for the migration of hydrogen from the deeper source to shallow zones from which it can potentially be extracted. Establishing the presence of such a fracture system was a major objective of the drilling of the Ramsay 1 well. However, drilling was impacted when intersecting the fractures due to several instances of drilling fluid losses, and the resulting limited returns made it difficult to monitor and analyse mud gas samples from that point on. The Company will aim to obtain more data on the composition of the gas trapped in the faults and fractures within the hydrogen bearing Parara limestone and other target formations in future wells. The gas sample results received to date from Ramsay 1 are part of an ongoing laboratory analysis program being undertaken on the Company's behalf at Petrolab Australia Pty Ltd in Adelaide. As well as ongoing analysis of gas samples taken at various depths from Ramsay 1, Petrolab will be involved in testing gas samples from the Ramsay 2 well. Rock chip and side wall cores collected from both wells will ultimately be tested at specialty laboratories.

Mud gas samples collected from the levels above the top of fracture zone have shown air-corrected hydrogen levels of up to 73.3%, with the highest level measured from a sample collected from 240mMD. This hydrogen level aligns with the measurement taken while drilling the historic Ramsay Oil Bore 1 in 1931, which recorded an air-corrected hydrogen level of 76% at 240.8m. Multiple other samples returned hydrogen contents at elevated levels. This demonstrates that the measurements taken during the drilling of the historic Ramsay Oil Bore 1 can be replicated with modern drilling processes and confirms there is a hydrogen play present at the location of the Ramsay Natural Hydrogen project.

The stratigraphy encountered by the Ramsay 1 well is in line with the pre-drill predictions, with a thick section of fractured Parara limestones overlaying a regionally consistent dolomitic sequence of the Kulpara formation. Within the Kulpara formation, several additional fracture and fault zones have been identified, and there are indications of zones with vuggy porosity within the highly dolomitised sequences.

The Precambrian basement was covered by a thick weathered zone, and both the weathered as well as the unweathered basement were found to be heavily fractured. Detailed analysis of the wireline logging data is needed to further evaluate the orientation and aperture of the various fracture systems and what level of porosity and permeability has been generated by the weathering process. Further analysis, establishing the basement depth and the reservoir properties associated with the fractures in the basement, is essential for the estimation of the hydrogen and helium resource potential of the regional extensive basement play.

Sampling with the formation testing tool was compromised due to the heavily fractured nature of the zones selected for testing. A sample recovered from the interval at 892mMD was analysed for formation fluid composition, and the associated gas revealed an air-corrected helium content of up to 3.6% with the remainder being nitrogen. This suggests that the basement is generating helium in significant amounts, and that the overlying weathered zone may act as a reservoir retaining the helium in commercial concentrations.

Helium is a valuable and rare commodity, and its unique properties gives it a widespread usage in the medical industry, as well as for scientific research, space exploration, diving and energy industry applications. There is no way to manufacture helium artificially, and its price fluctuates based on global demand and declining supply. Helium currently trades upwards of USD600 / MCF, which is up to 200 times more than LNG.

The results remain preliminary in nature and further ongoing evaluation of the well and sampling data will be required to reduce the remaining uncertainties around the vertical and lateral distribution of the natural hydrogen. However, the Company is pleased that these preliminary results support its ongoing work in discovering Australia's first natural hydrogen field. Further work is also required to understand the extent of helium within the Ramsay 1 well bore. Well testing is being considered, with a final decision to be made following an analysis of the drilling and sampling results of the Ramsay 2 well.

Gold Hydrogen considers these encouraging results warrant the immediate drilling of Ramsay 2, which is located in close proximity to the Ramsay 1 (refer Figure 1). The technical objectives of Ramsay 2 will be similar to Ramsay 1 in terms of well depth and target formations, and Ramsay 2 is planned to be drilled within the November-December 2023 period.

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 hydrogen, 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.

Table 1 – Listing Rule 5.30 Information

Name:	**Ramsay 1**	
Location (UTM zone 53 GDA2020)		
X	748,145.25	
Y	6149515.81	
Permit	PEL687 on Yorke Peninsula, South Australia	
Entity holders	Gold Hydrogen 100%	
Resources	Hydrogen	Helium
Formation	Parara Limestone	Granite Basement
Gross thickness and net pay thickness*	279m Gross	62m Gross
Geological rock type	Fractured Limestones	Weathered Basesment
Depth of the zones tested	240mMD	892mMD
Type of test and duration	Isojar Mudgas	MDT
Phase recovered	Gas	Water
Other types of recovery	N/A	N/A
Flow rates, choke size, volumes recovered	N/A	N/A
Fracture stimulation	None	None
Material non-hydrocarbons	C1	N2-CO2

* *Insufficient information is presently available to determine net pay thickness*

About Gold Hydrogen

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

The combined natural hydrogen permit area of the Gold Hydrogen group is approximately 75,332km^2. Gold Hydrogen holds one granted petroleum 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 exploration within South Australia.

The Company's Prospective Resource Statement is attached as **Table 2**.

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 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 – Australian Public Affairs
mdoman@apa.au
+61 421 888 858

Figure 1: Location of Ramsay 1 and 2 Relative to the Historic Ramsay Oil Bore

Table 2 – 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

The Prospective Resource Statement 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.

The Prospective Resource Statement has been included in this announcement under the approval of Mr Billy Hadi Subrata, Chief Engineer 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 date of 30 September 2021, 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.