

## 2H Resources – Natural Hydrogen Business Update

### Highlights

- *2H Resources is confirmed as the preferred applicant for the grant of six South Australian Petroleum Exploration Licences (PELs) for hydrogen exploration that are geologically on trend with legacy hydrogen discoveries. The PEL applications cover some 30,000 sq km and including two additional applications for Gas Storage Exploration Licences (GSELs) of 5,700 sq kms, cover an area the size of Belgium.*

*The granting of the hydrogen exploration and gas storage licenses is subject to a valid land access agreement executed in accordance with the requirements of the Commonwealth Native Title Act 1993 (NTA) over any area where native title interests exist.*

- *An independent third-party resource assessment by RISC Advisory indicates a range of risked prospective hydrogen resources across the six application areas of between 49 million kilograms (1U) and 1.3 billion kilograms (3U) with a risked Prospective Best Estimate Resource (2U) of 343 million kilograms.*

*Prospective Resources relate to the estimated quantities of naturally occurring hydrogen gas that may potentially be recovered by the application of future development projects to undiscovered accumulations. These estimates have both an associated risk of discovery and risk of development. Further exploration and appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable naturally occurring hydrogen gas.*

- *Using state of the art technology, 2H Resources has detected anomalous hydrogen concentrations in recent exploration wells, and hydrogen has been detected in many legacy drill holes in Australia and as seeps and flowing accumulations in international areas.*
- *2H Resources notes strong investor interest through recent market response to an Initial Public Offering (IPO) of a proximate South Australian natural hydrogen explorer and developer.*

Buru Energy Limited (**Buru**) is pleased to provide the following operations update in relation to its wholly owned hydrogen and helium business, 2H Resources.

2H Resources is an established and active explorer for natural hydrogen. Natural or “gold” hydrogen occurs geologically in the earth, and it has been recognised as potentially a major source of hydrogen that offers significant comparative advantages in terms of cost and emissions.

2H Resources has been a first mover in the new field of natural hydrogen development drawing on both proven geological expertise and new and evolving technologies.

2H Resources has established a major presence in one of the most prospective areas in Australia for natural hydrogen and is moving quickly to evaluate these areas including commissioning an independent resource assessment that has confirmed their significant potential.

**Buru's CEO Thomas Nador commented:**

*"I'm very pleased with the progress our 2H Resources subsidiary has made to date. We are in the value creation phase of resource development and are following a structured path to mature a highly prospective hydrogen exploration play in South Australia."*

*Our initial hydrogen Prospective Resource assessment by RISC places the size of the opportunity in context and provides further impetus for us to be part of South Australia's rich history of developing clean energy industries, whilst generating value for our shareholders and the communities where we operate."*

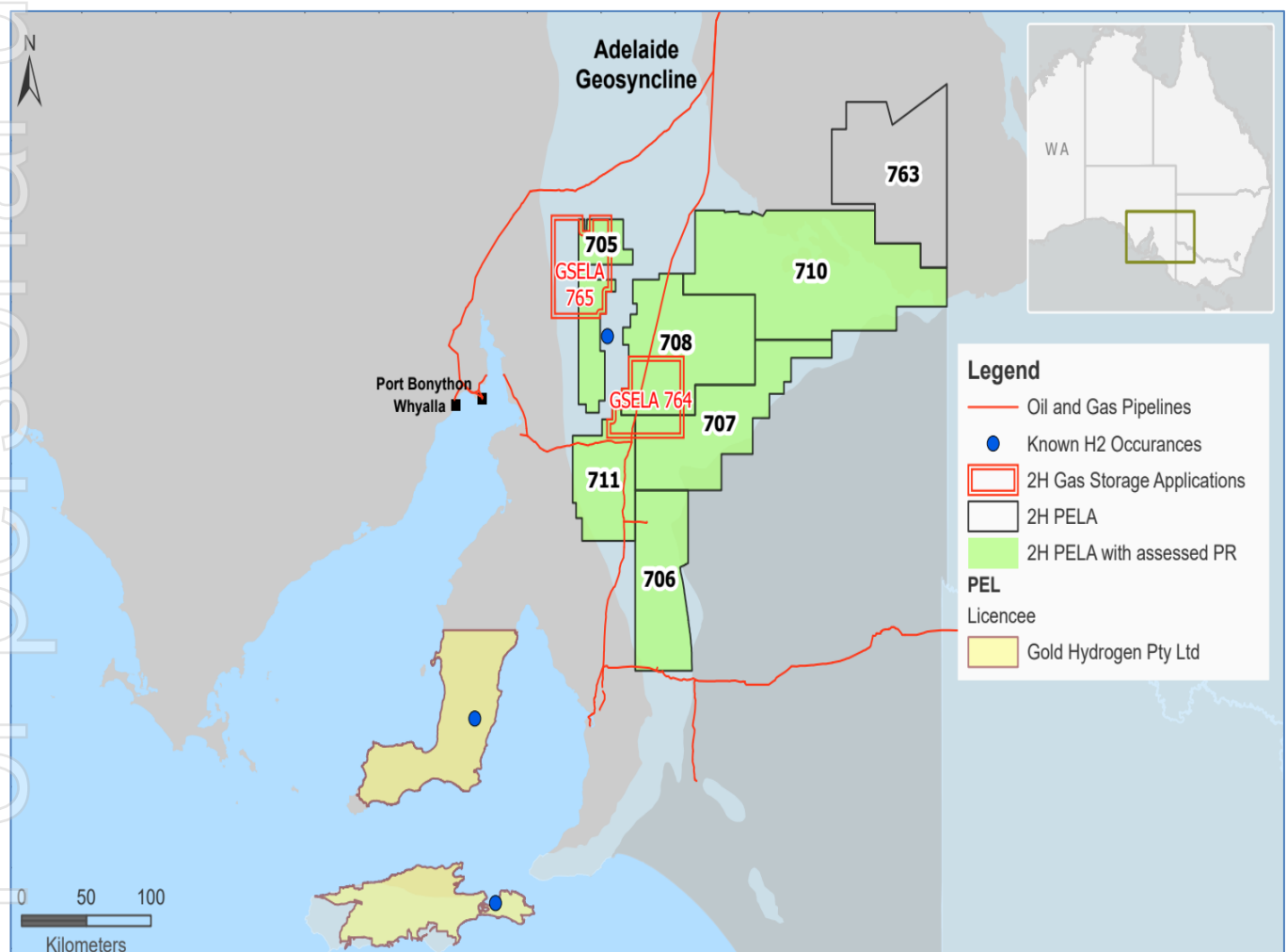


Figure 1: 2H Resources South Australian application areas

## Background and rationale

In 2020, Buru made a strategic decision to diversify from its core oil and gas activities to pursue energy expansion and transition opportunities that leveraged Buru's competency and intellectual property. Buru's expertise in subsurface geology, exploration, appraisal and development and its demonstrated expertise in stakeholder relations, particularly with the Native Title holders of the areas in which it operates, provides it with a competitive advantage in these adjacent activities.

This strategic decision was in response to what Buru observed as a major transition in the global energy landscape driven by simultaneous shifts in technological development, regulations, consumer preferences and investor sentiment.

As part of this strategy, 2H Resources, currently a wholly owned subsidiary of Buru, was formed to explore for naturally occurring hydrogen (White or Gold hydrogen), together with helium exploration and development in Australia, initially funded and supported by Buru but with the objective of becoming an independent entity in due course.

2H Resources has initially focused its activity on hydrogen in South Australia where the forward looking legislative framework has led to heightened interest in exploration for both hydrogen and helium. This focus was also driven by South Australia's Hydrogen Action Plan and the National Hydrogen Strategy.

2H Resources is also actively evaluating other areas in Australia and internationally where there is potential for natural hydrogen or helium occurrences.

## Current Acreage position

In February 2021, the South Australian Petroleum and Geothermal Energy Regulations were amended to declare hydrogen, hydrogen compounds and by-products from hydrogen production as regulated substances under the Petroleum and Geothermal Energy Act 2000. This provided the framework for 2H Resources and other companies to explore for naturally occurring hydrogen in South Australia.

In September 2021, 2H Resources submitted applications for six Petroleum Exploration Licences (PELs) and subsequently two Gas Storage Exploration Licences (GSELs) geologically on trend with legacy natural hydrogen discoveries across the Adelaide Geosyncline in South Australia.

In June 2022, 2H Resources was advised by the South Australian Department for Energy and Mining (DEM) that 2H Resources is the preferred applicant for six PELs covering approximately 29,519 sq km and the two GSELs covering approximately 5,705 sq km. These PELAs and GSELAs are close to existing pipeline and regional road and rail infrastructure.

The grant of the six PELs and GSELs to 2H Resources is subject to reaching an agreement with relevant Native Title parties. 2H Resources has commenced engagement with these Native Title parties.

An application for a further PEL (PELA 763) covering approximately 5,913 sq km was made in June 2022 and is currently under consideration by DEM.

## Why Natural Hydrogen

Hydrogen is a versatile energy carrier, feedstock and fuel that can potentially play a key role in the structured decarbonisation of Australia's energy, transport, and industrial sectors. It is fundamental for the manufacture of ammonia, and hence fertilisers, and of methanol, used in the manufacture of many polymers. Current hydrogen production for these industrial

processes relies on natural gas as a feedstock and produces large amounts of greenhouse gases as a by-product.

Natural hydrogen is generated by geological processes and can essentially be produced without carbon dioxide emissions if the produced hydrogen is used to fuel the associated production and transport activity. Geologists have been aware of the presence of natural hydrogen for many years, but the use of hydrogen as part of the transition to cleaner energy is now driving the emergence of natural hydrogen as a viable resource.

Hydrogen can be stored as a gas and delivered through existing natural gas pipelines. When compressed or liquified, hydrogen can also be transported on trucks and in ships. This means hydrogen can also be exported overseas, effectively making it a tradable energy commodity. Global demand for hydrogen is increasing, with investment in hydrogen projects forecast to reach \$629 billion by 2050<sup>1</sup>.

Australia is considered one of the most prospective locations for natural hydrogen due to its favourable geology, with natural hydrogen having been noted as essentially a curiosity in many petroleum exploration wells, including those on trend with 2H Resources acreage in South Australia, and in exploration wells in Western Australia's Canning Basin.

Helium exploration and development is also a valuable part of the 2H Resources business model. Due to its comparable molecular size, helium is considered to follow similar migration pathways as hydrogen and the exploration methodology for both resources have significant overlap.

Helium is critical to many applications across multiple sectors of the economy from medical, defence, space, and resources. It is used in cryogenics, lasers, medical imaging, space, diving and in the production of silicon and titanium. Although the fourth largest producer of Helium globally, Australia accounts for less than 3% of global production with only one source of produced helium at the Darwin LNG facility<sup>2</sup>.

### **Independent Resource Assessment of South Australian acreage**

To assess the potential for natural hydrogen in the application areas held by 2H Resources in South Australia, RISC Advisory were engaged to undertake a hydrogen Prospective Resource assessment, which was concluded in January 2023 with results set out below.

Because of the relatively early stages of development of the natural hydrogen industry, there is a lack of broad legislative coverage and also evaluation frameworks.

Hydrocarbon resources have a well established and accepted evaluation framework known as the Petroleum Resources Management System (PRMS) which allows a consistent and reliable definition, classification and estimation of hydrocarbon (petroleum) resources.

In August 2022 the Society for Petroleum Engineers Oil and Gas Reserves Committee advised that the principles of the PRMS can be extended to substances other than hydrocarbons, including the gaseous extraction of carbon dioxide, helium, and hydrogen, paving the way for 2H Resources to seek an independent external assessment of the hydrogen potential of its South Australian exploration application areas.

1. International Energy Agency (IEA), Global Hydrogen Review, 2021

2. National Energy Resources Australia (NERA), 2021

The results of the RISC Advisory review are as follows, noting the wide range of resources and risk factors applied to the estimates due to the early stage of the quantification of the resources.

Exploration Portfolio	Hydrogen Prospective Resources					
	Gross Unrisked			Gross Risked		
	1U	2U	3U	1U	2U	3U
Hydrogen (Bcf)	246	1,713	6,567	21	148	566
Hydrogen (t)	570,236	3,977,110	15,249,222	49,850	342,846	1,313,425

(t=metric tonnes)

*Note – Hydrogen Prospective Resources relate to the estimated quantities of naturally occurring hydrogen gas that may potentially be recovered by the application of future development projects to undiscovered accumulations. These estimates have both an associated risk of discovery and risk of development. Further exploration and appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable naturally occurring hydrogen gas.*

Notes to the table in accordance with ASX Listing Rule 5.35 & 5.42:

#### 5.35.1

The estimates relate to South Australian permit application areas (PELAs 705, 706, 707, 708, 710 and 711) for which 2H Resources is the Preferred Applicant. The grant of these PELs to 2H Resources is subject to reaching an agreement with relevant Native Title parties. 2H Resources has commenced engagement with these Native Title parties.

#### 5.35.2

##### **Basis on which the prospective resources are estimated:**

1. The estimates are for naturally occurring hydrogen gas only. Adjustments for petroleum gases and inert gases have been made.
2. "Gross" are 100% quantities attributable to PELAs 705, 706, 707, 708, 710 and 711 (2H Resources 100%)
3. 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 hydrogen.
4. The natural hydrogen resource estimates have been derived in accordance with the principles of the PRMS. The PRMS specifically applies to petroleum. However, the PRMS reserves committee advised in August 2022 that although the gaseous extraction of natural hydrogen is outside of the scope of the PRMS, the principles can be applied given the similarities in exploration, evaluation and exploitation.
5. The hydrogen Prospective Resources have been evaluated using probabilistic and deterministic methods.
6. No adjustment has been made to the estimates to account for fuel and flare.
7. Totals are by arithmetic summation. As a result, RISC Advisory cautions that the Low Estimate aggregate quantities may be very conservative estimates and the High Estimate aggregate quantities may be very optimistic due to portfolio effects.
8. Hydrogen mass conversion is 2,321.98 t/Bscf.

## **Further exploration and appraisal activity**

Further exploration activity will include field sampling, geophysical surveys and interpretation of existing geological and geophysical data followed by exploration drilling to determine gas compositions and flow rates.

### **5.35.3**

The risked hydrogen Prospective Resources have been adjusted for the associated chance of discovery. The chance of success has been estimated at between 6% and 10% using a 4-factor risk assessment and dependent on trap configuration.

### **5.42**

#### **Qualified Petroleum Reserves and Resources Evaluator Statement**

RISC is an independent oil and gas advisory firm. All of the RISC staff engaged in this assessment are professionally qualified engineers, geoscientists or analysts, each with many years of relevant experience and most have in excess of 20 years.

RISC was founded in 1994 to provide independent advice to companies associated with the oil and gas industry. Today the company has approximately 40 highly experienced professional staff at offices in Perth, Brisbane, Jakarta and London. RISC has completed over 2,000 assignments in 70+ countries for nearly 500 clients. RISC services cover the entire range of the oil and gas business lifecycle and include:

- Oil and gas asset valuations, expert advice to banks for debt or equity finance;
- Exploration/portfolio management;
- Field development studies and operations planning;
- Reserves assessment and certification, peer reviews;
- Gas market advice;
- Independent Expert/Expert Witness;
- Strategy and corporate planning.

The preparation of this assessment has been managed by Mr Adam Craig who is an employee of RISC. Mr Craig is a highly experienced Geoscientist and Manager, with over 30 years' experience in the upstream oil & gas sector working for small and mid-size independents, as well as NOC related entities. He is a Certified Practising Geologist and member of AAPG, a member of PESA (2021 – 2023 WA Branch President) and a Fellow of the Geological Society. He holds BSc in Geology from Curtin University, Western Australia and is a qualified petroleum reserves and resources evaluator ('QPRRE') as defined by ASX listing rules.

#### **Operational Next Steps**

2H Resources has commenced engagement with key Native Title groups covering its PELAs which is a pre-cursor to the formal granting of the six PELs and two GSELs and this is expected to conclude by year end 2023.

In parallel, 2H Resources is undertaking further geological and geophysical analysis of the PELAs to improve the understanding of hydrogen trap mechanisms and prospectivity and planning for exploration field activities as soon as practicable after the PEL's are granted.

Planning for project development activities have commenced in support of scaled commercialisation via initial light vehicle charging applications to larger scale production to support hard to abate industries.



## Corporate Framework

Investment momentum continues to build for natural hydrogen projects in Australia, with parties operating in South Australia securing funding to support their natural hydrogen exploration and development pathways.

One of the proponents has recently completed an Initial Public Offering of shares, raising \$20 million for a 28.6% stake in a natural hydrogen project on trend with Buru's application areas (Fig 1).

As 2H Resources is currently wholly owned by Buru, Buru is reviewing its capital structure to ensure existing Buru shareholders benefit from the current and future value accretive activities of 2H Resources, whilst attracting investment to support the commercialisation and expansion potential of this new energy business.

## Authorisation

This ASX announcement has been authorised for release by the Board of Buru Energy.

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