

ASX Release

17 July 2024

Eight shallow onshore potential free gas Helium targets identified

Highlights

- Eight additional potential shallow free gas helium targets have been identified onshore within the Western Rukwa Upper Lake Beds zone.
- Post-drilling data analysis and in-house studies have also upgraded the hydrogen potential in the NHE Western Rukwa area, with high hydrogen concentrations in high quality reservoir sections.
- In August, a team from the University of Dar es Salaam will undertake a low-cost shallow geophysics program to mature the potential shallow free gas helium targets to drillable status.
- Mbelele appraisal drilling program to be expanded with additional targets to enhance commercialisation program and gather data to further understand the “White” Hydrogen potential.
- All matured shallow free gas helium targets can be drilled and tested this dry season.

Integration and analysis of our exploration data has identified additional Mbelele shallow helium gas cap look-a-like structures, each with the potential for natural or “white” hydrogen. Noble Helium Limited (ASX:NHE) plans to expand the upcoming appraisal activities to include these additional targets, with a view to an upscaled helium development program of the North Rukwa project, and to gather further data to understand the identified “white” hydrogen potential.

NHE Managing Director & CEO, Mr Shaun Scott, said identifying these potential additional targets and white hydrogen potential has significantly enhanced the scope for monetisation and de-risked the Mbelele shallow gas play.

“Identifying the potential free gas cap while drilling Mbelele-1, in conjunction with the widespread high helium concentrations sampled throughout the lake beds and in soil gas surveys gave a strong indication this was not an isolated occurrence. Re-examining all of the data we have gathered to date with a change in focus towards this type of structure has proven successful and we expect to turn many of these additional potential targets into drill prospects for our appraisal program using the simple, quick, low-cost shallow geophysics surveys which will be undertaken by the University of Dar es Salaam.” Mr Scott said.

“We have also had time to focus on the hydrogen potential, following up on the significant above background levels of hydrogen detected in the mud-gas while drilling Mbelele-2. This has resulted in careful, in-house verification and analysis, since the drilling of Mbelele-1 and -2, with high levels of hydrogen observed in both wells and the right geology for natural hydrogen creation. Testing of the hydrogen potential will form part of the upcoming appraisal program.”

“As the rig mobilisation and de-mobilisation costs will stay the same, with the low per hole drilling costs and the low cost of the geophysics surveys, we expect to be able to accommodate the additional wells with our existing cash. Given the nimble nature of the rig and that drilling each well will only take a few days there is plenty of time to complete these additional geophysics surveys and still drill and test all of the potential targets this dry season. The Noble technical team needs to be congratulated for thinking outside the box to identify these additional significant opportunities for the Company. “

Following identification of the 8 (eight) additional potential shallow free gas Helium targets onshore (see Figure 1 below), a team from the University of Dar es Salaam School of Mines and Geosciences is preparing to undertake shallow seismic and electrical resistivity surveys to confirm the targets and mature them to “drillable” status as part of the upcoming appraisal program. It is anticipated that the team will be mobilised into the field in early August at the expected completion of the road repairs and the geophysics program will take approximately 4-6 weeks to complete.

As the survey work is completed at each location and the results integrated into our sub-surface model, the Company will finalise the new drill locations and landowner arrangements, then mobilise the rig to site. It is expected that each well will take approximately 2-3 days to drill with approximately one week of testing to follow while the rig is relocated to the next site.

The Company is having specialised well heads manufactured to allow for gas flow and composition testing using a methodology adapted from the successful shallow helium well tests undertaken by 45-8 Energy a private French Helium exploration and production company.

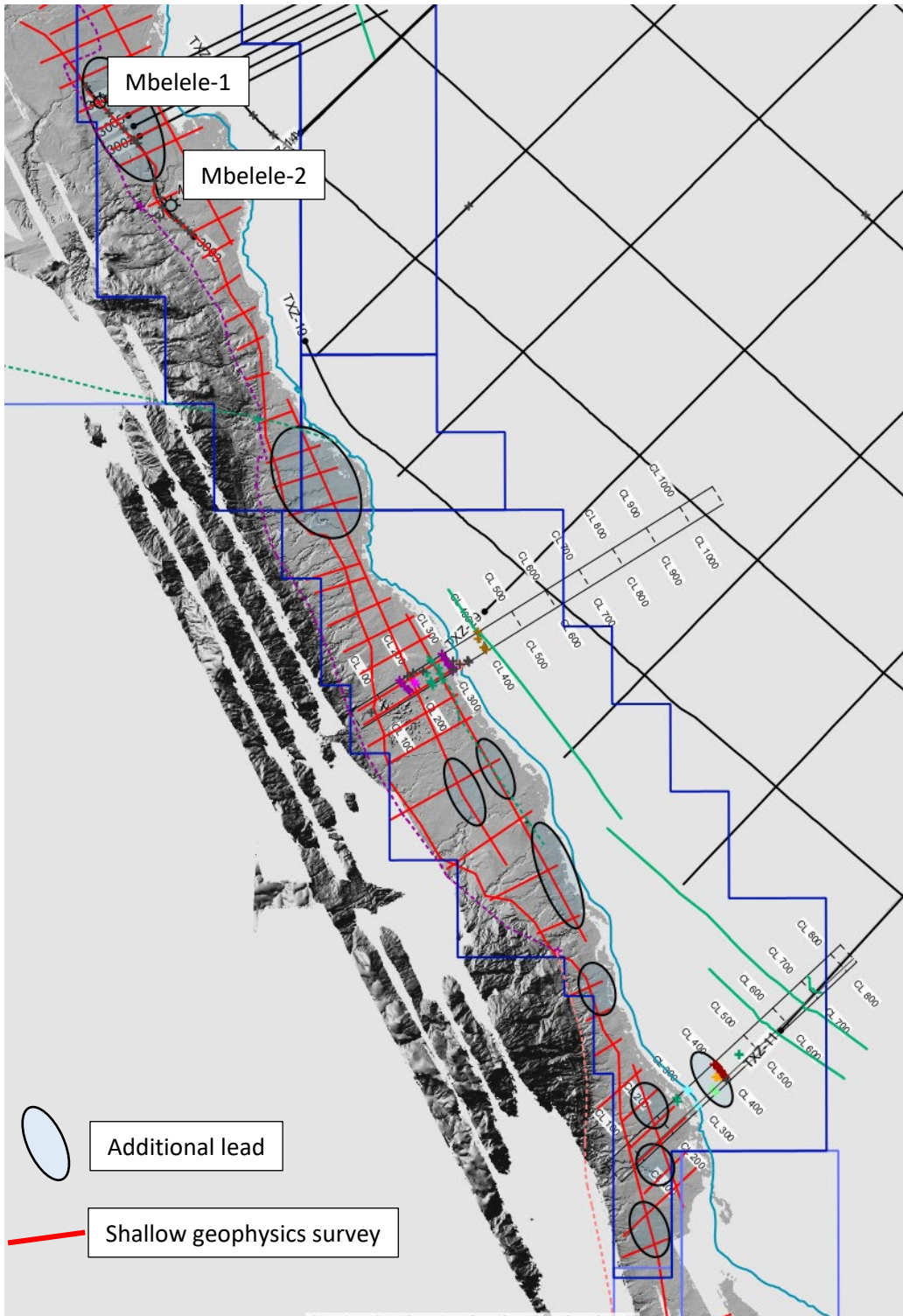


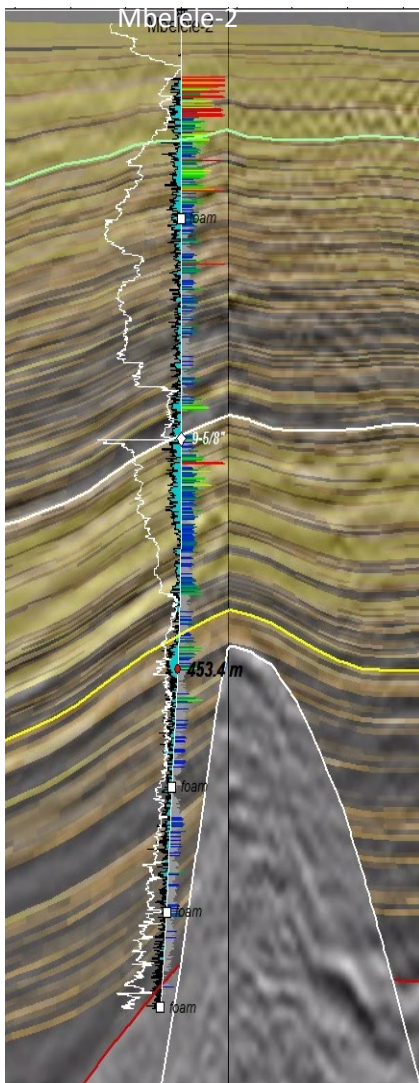
Figure 1. Western Lake Bed Zone – additional potential free gas Helium targets

As noted in our release on 7 February 2024 potential for natural or “white” hydrogen via “natural radiolysis” was identified during pre-drill geological studies conducted by Oxford University. Subsequently, in-house studies identified an additional “white” hydrogen source in the area.

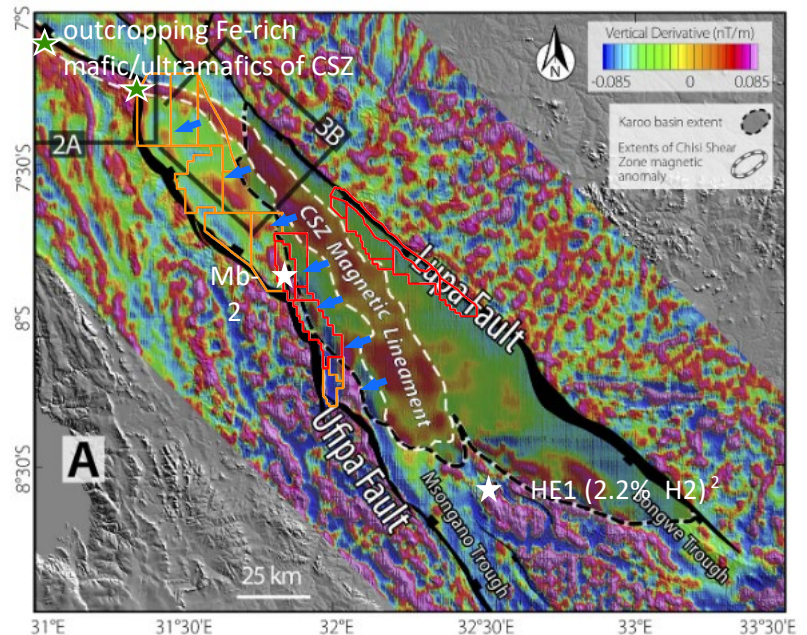
A review of the drilling program data identified significant hydrogen anomalies in the mud gas, with Mbelele-2 mud gas demonstrating an average of ~1,300 times and up to ~2,000 times atmospheric

while drilling the uppermost 480m section (Figure 2a). Mud-gas readings are always highly diluted by air and in-situ downhole hydrogen concentrations are expected to be significantly higher, as noted in our 9 April 2024 announcement where helium mud-gas reading of 6.4ppm compared to the lab analysis of 24,600ppm from the MDT sample taken at approximately the same depth. A follow-up detailed review of Mbebele-1 confirmed elevated mud-gas hydrogen throughout that well also (avg. 930 times atmospheric, max. 1,580 times). Importantly, the highest hydrogen readings in both wells were coincident with excellent reservoir as indicated on wireline logs.

Favourable geology has now been identified trending beneath the northern end of Lake Rukwa for another natural hydrogen-forming mechanism known as serpentinization (Figure 2b). “White” Hydrogen generated by both mechanisms is expected to be focussed into structures in the Noble Helium acreage to the west. The company now has an increased expectation for high hydrogen productivity in its licence areas (Figure 2b), including the upcoming low-cost, shallow drill targets.



(a) Mbebele-2 mud-gas log - hydrogen in white



(b) Magnetic axial zone of the Chisi Shear Zone¹ a favourable setting for white hydrogen formation.

¹After Kolawole et al 2021. Structural Inheritance Controls Strain Distribution During Early Continental Rifting, Rukwa Rift.
²HE1 RNS 5/2/2024

Figure 2. High hydrogen mud-gas readings while drilling Mbebele-1 and Mbebele-2 is consistent with identified favourable “white” hydrogen geology in the North Rukwa

This announcement has been authorised for release on ASX by Noble Helium's Board of Directors.

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Forward-looking statements

This announcement may contain certain “forward-looking statements”. Forward looking statements can generally be identified by the use of forward-looking words such as, “expect”, “should”, “could”, “may”, “predict”, “plan”, “will”, “believe”, “forecast”, “estimate”, “target” and other similar expressions. Indications of, and guidance on, future earnings and financial position and performance are also forward-looking statements. Forward-looking statements, opinions and estimates provided in this presentation are based on assumptions and contingencies which are subject to change without notice, as are statements about market and industry trends, which are based on interpretations of current market conditions. Forward-looking statements including projections, guidance on future earnings and estimates are provided as a general guide only and should not be relied upon as an indication or guarantee of future performance.

Competent Persons Statement

The technical information provided in this announcement has been compiled by Mr. Ashley Howlett, Exploration Manager, Professor Andrew Garnett, Non-Executive Chairman, and Mr. Justyn Wood, Executive Director, all of Noble Helium Limited. The resource estimates have been prepared in accordance with the definitions and guidelines set forth in the Petroleum Resources Management System, 2018, approved by the Society of Petroleum Engineers.

Mr Howlett is a qualified geologist with over 20 years technical, and management experience in exploration for, appraisal and development of, oil and gas resources. Mr Howlett has reviewed the results, procedures and data contained in this announcement and consents to the inclusion in this announcement of the matters based on the information in the form and context in which it appears.

Cautionary Statement for Prospective Resource Estimates

With respect to any Prospective Resource estimates contained within this report, it should be noted that the estimated quantities of gas that may potentially be recovered by the future application of a development project relate to undiscovered accumulations. These estimates have an associated risk of discovery and risk of development. Further exploration and appraisal is required to determine the existence of a significant quantity of potentially moveable helium.

Green helium for a high-tech world.

Noble Helium is answering the world’s growing need for a primary, ideally carbon-free, and geo-politically independent source of helium. Located along Tanzania’s East African Rift System, the Company’s four projects are being advanced according to the highest ESG benchmarks to serve the increasing supply chain fragility and supply-demand imbalance for this scarce, tech-critical and high-value industrial gas.

Priced at up to 50 times the price of LNG in liquid form, helium is now essential to many modern applications as an irreplaceable element in vital hi-tech products such as computer and smartphone components, MRI systems, medical treatments, superconducting magnets, fibre optic cables, microscopes, particle accelerators, and space rocket launches – NASA is a major consumer. Rising demand and constrained supply are fuelling growth prospects within the global marketplace, particularly for cleaner “green helium” sourced from non-carbon environments. At present, more than 95% of the world’s helium is produced as a by-product of the processing of hydrocarbon-bearing gas.

