Greenvale ENERGY LIMITED

ASX ANNOUNCEMENT **27 April 2023**

QUARTERLY ACTIVITIES REPORT 31 MARCH 2023

OUTSTANDING RESULTS FROM TEST PROGRAM TWO SHOW IMPROVED BITUMEN PRODUCING POTENTIAL AT ALPHA TORBANITE PROJECT, WITH FINAL TESTWORK UNDERWAY

Highlights

Alpha Torbanite Project, QLD (100%-owned):

- **Highly encouraging results received from Alpha Liquefaction Test Program Two, focused on staged enhanced recovery from the cannel coal component of the Alpha Project Resource at increased temperature.**
- **Results indicate improved bitumen producing potential, with:**
  - **Substantially improved yields of heavy oil fractions from cannel coal.**
  - **Conversion included of up to 6.5wt% asphaltenes from cannel coal.**
  - **Continued trend of low production of light ends and gas when compared to traditional pyrolysis.**
- **Cannel coal currently accounts for ~76% of the total Alpha Resource, reinforcing the strategic importance of these positive results.**
- **University of Jordan engaged to run pivotal Test Programs 3 & 4.**
- **Test Program 3 underway and scheduled for delivery in Q2 2023.**
- **Early observations from Test Program 3 indicate that higher temperatures deliver improved liquefaction conversion close to target values.**
- **Geothermal tenement applications advance to grant.**

Georgina Basin IOCG Project, NT (20%-owned):

- **Assay results from diamond drilling at Banks and Leichhardt West prospects confirm IOCG prospectivity and similarity to major Tennant Creek IOCG deposits.**
- **Leichhardt West hole intersected 0.22% Cu from 536.05-536.3m and 0.15% Cu from 600-600.8m (at the end of the hole).**
- **Down-hole magnetic and electromagnetic geophysical surveying completed.**
- **Diamond drill-hole completed at the Leichhardt East prospect last year displays strong multi-element anomalism of copper, silver and bismuth, associated with ironstones.**

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- **Drilling also confirmed the presence of uranium mineralisation, intersecting intervals grading 0.24% U_3O_8 from 689.09-689.41m and 0.11% U_3O_8 from 481.1-481.85m, with associated elevated copper and bismuth.**
- **The assay results from Leichhardt East are considered to be highly significant, reinforcing the IOCG prospectivity and highlighting similar characteristics to other IOCG deposits.**
- **Petrographic studies and magnetic remanence testwork underway.**

Corporate:

- **Completion of institutional placement to Pioneer Resource Partners, LLC a U.S.-based institutional investor, raising $4 million.**

Overview

During the March 2023 Quarter, Greenvale Energy Ltd (ASX: **GRV**, "**Greenvale**" or "**the Company**") continued to make strong progress with development studies for its 100%-owned Alpha Torbanite Project, substantially progressing the pivotal liquefaction test work phase and successfully completing Liquefaction Test Program Two with highly encouraging results.

Testing continued with the University of Jordan engaged to undertake the final liquefaction test work program (Test Programs 3 & 4) as the Company works to complete the final key inputs to the Alpha Pre-Feasibility Study (PFS).

Early observations indicate that increasing temperatures, varying catalysts and substituting carrier fluids has had a positive influence on the yields of heavy hydrocarbons (required for bitumen production) being achieved from both the cannel coal and torbanite components of the Alpha Torbanite Mineral Resource.

The results from Test Program Two demonstrated that the liquefaction process can recover increased amounts of heavy oil fractions and asphaltenes from the cannel coal portion of the Resource, without excessive gas generation or the production of light boiling liquids.

This is particularly exciting as cannel coal accounts for approximately 76% of the Alpha deposit's total estimated Mineral Resource.

During the test program, there was a notable 57% improvement in the conversion of solids to oil and gas compared to Test Program One, along with an increase in the percentage of asphaltenes obtained from the cannel coal samples.

It is noteworthy that these significant improvements were attained with a modest increase of 25 degrees Celsius in temperature, indicating the potential to further enhance the performance metrics during Test Program Three.

Despite the positive results achieved from Test Program Two, delays in its completion have impacted the timelines for Test Programs 3 & 4 and therefore the finalisation of the Alpha Project Pre-Feasibility Study (PFS). Greenvale Energy is confident that the

issues causing these delays have now been resolved and has learned from the experience. The Company will provide an update on the timing of the delivery of the PFS together with the results from Test Program 3 in the June 2023 Quarter.

Greenvale Energy strengthened its technical capabilities by partnering with the University of Jordan during the quarter to conduct the remaining liquefaction testing for the Alpha Project. The University of Jordan brings relevant expertise in geotechnical/chemical engineering, liquefaction studies and bituminous products. Test Program 3 is now nearing completion, and early results indicate continued improvements in achieving the targeted solubility of torbanite and cannel coal at 400° C. Moreover, the testing program has included simulations of the initial plant design to gain a better understanding of the processing flow.

The Company has also continued to advance its geothermal project including the finalisation of agreements with native title claimants across a number of the Company's geothermal application areas.

The Company also has 20% interest plus a 2% royalty over the Georgina Basin Project in the Northern Territory with Astro Resources NL (ASX: ARO). Drilling results reported during the quarter from the Banks and Leichhardt West prospects confirmed the IOCG prospectivity and similarity to Tennant Creek IOCG deposits. Additional significant results were reported for drilling at Leichhardt West.

During the quarter, the Company also completed a $4 million raising, putting it in a strong position as it moves to complete the Alpha Project Pre-Feasibility Study.

Projects

Alpha Project, Queensland

Background

The Alpha Torbanite Project is located approximately 50km south of the town of Alpha in Central Queensland.

The Alpha torbanite deposit consists of two seams, an upper seam of mostly lower-grade mineralisation with an average thickness of 1.12m and a lower seam containing lenses of torbanite up to 1.9m thick. The Project has been subject to extensive exploration and laboratory testing since its initial discovery in 1939.

During 2019, SRK Consulting Pty Ltd ("SRK") was engaged to reassess the project's commercialisation strategy. SRK's report set out a potential new development strategy based on the production of a diversified suite of value-added products. SRK noted that, in contrast with typical oil shale deposits, the Alpha torbanite deposit is

exceptionally high-grade, containing up to 650 litres of hydrocarbons per tonne of torbanite, and can produce high-value bitumen, light crude oil and activated carbon.

The upper and lower bituminous shales also produce similar products, albeit at lower yields of 110-140 litres per tonne. Additionally, the torbanite and bituminous shales

can deliver high-quality value-added products through appropriate investment in processing infrastructure.

SRK was engaged to undertake a staged work program to assist in evaluating the commercial viability of the project.

Activities during the December Quarter

During the quarter, Company continued its work for its flagship Alpha Torbanite Project in central Queensland as follows:

Liquefaction testing program:

During the March 2023 Quarter, the Company announced the results of its second round of liquefaction test work. Liquefaction Test Program Two focused on increasing recovery from the cannel coal component of the Alpha Project Mineral Resource.

The test results indicated that the liquefaction process can recover increased amounts of heavy oil fractions and asphaltenes from cannel coal, without excessive gas generation or the production of light boiling liquids.

With the cannel coal seams accounting for approximately 76% of the Alpha deposit's total estimated Mineral Resource of 18.6Mt (see ASX Announcement 10 March 2022), the significance of the increase in yields observed from Test Program Two cannot be understated.

A comparison between the cannel coal test results derived from Test Program 1 and Test Program 2 indicates a 57% increase in conversion from solids to oil and gas.

Test Program 1 achieved a conversion of approximately 24.8wt% at 340º C, 3,500 kPa and 1.5wt% catalyst. However, the recently completed Test Program 2 achieved a maximum of 39.0wt% (avg. 34.9wt%) conversion at 365º C, 3,500 kPa and 6wt% (average 4 wt%) of catalyst.

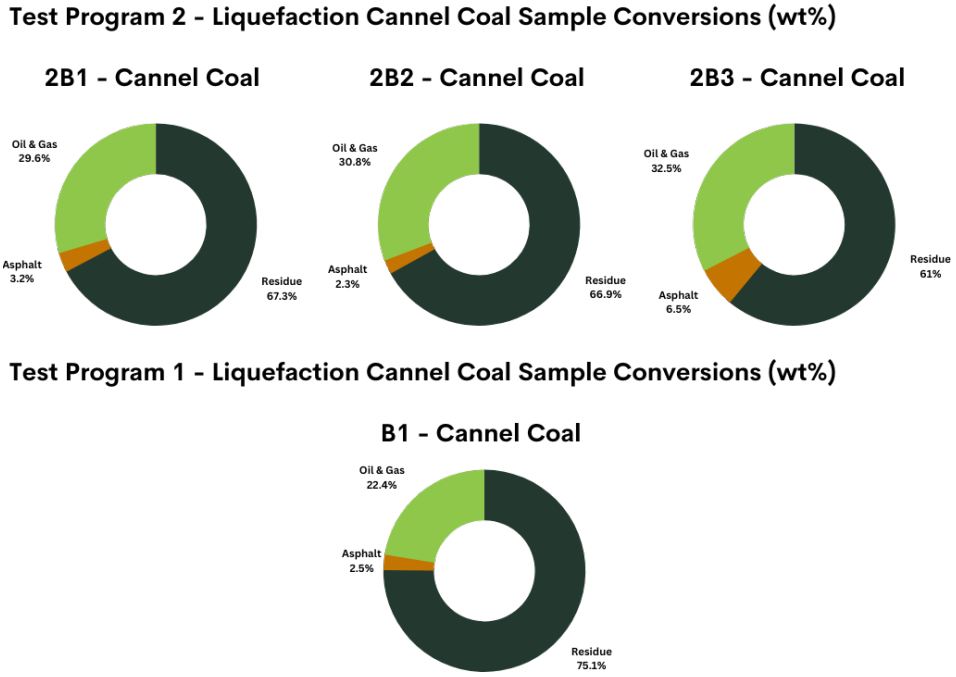

Figure 1: *Cannel Coal Sample Conversion Comparisons*

The second encouraging observation from the test program was the increase in percentage of asphaltenes derived from the cannel coal samples. Bituminous products typically contain 5-25% asphaltenes, meaning that the ability to produce commercial quantities of asphaltenes via liquefaction – specifically from the cannel coal – could significantly enhance the value of the Alpha Project.

Overall, the results observed from Test Program 2 have the potential to greatly enhance the Alpha Project's overall economic returns. The positive outcomes seen in Test Program 2 were generated from a modest 25-degree Celsius increase in temperature, with the potential to further enhance the performance metrics under Test Program 3, where various temperatures up to 450-degrees Celsius are being tested, starting with a base hydrogen pressure of 7MPa.

During the Quarter, Greenvale also engaged the highly regarded University of Jordan to carry out the remainder of the liquefaction testing for Alpha. The Company has struggled to find Australian metallurgical laboratories with the requisite capacity, expertise, and equipment to carry out the specialist test work for the Alpha Project.

Many Australian labs lack the competencies and experience in relation to the liquefaction process, as well as knowledge of the unique properties of torbanite and bituminous materials. The Company has found that Australia's local crudes have not been processed to produce bitumen – which has resulted in a lack of demand for investment and support to develop the skills, knowledge and infrastructure needed for the process as well as efficient laboratory testing, processing and refinement of locally sourced bitumen products.

The appointment of the University of Jordan comes after slight delays to the delivery of Stage 2 of the test program. The University of Jordan is a world-class institution with significant expertise in geotechnical/chemical engineering, liquefaction studies and bituminous products specifically relevant to the Alpha Project.

During the quarter, the University of Jordan commenced Test Program 3. Greenvale CEO Mark Turner expressed confidence that the University of Jordan's involvement would deliver accurate and reliable results for the Alpha Pre-Feasibility Study.

Test Program 3 is now nearing completion, with early results indicating continued improvement in achieving the target solubility of torbanite and cannel coal at 400ºC. The results of the tests will be reviewed and interpreted, along with further laboratory analyses to characterise the collected solids and liquids from the reaction tests, to provide information for the Test Program 3 report.

The preliminary results indicate that increasing temperatures, varying catalysts, and substituting carrier fluids have had a positive influence on the yields of heavy hydrocarbons required for bitumen production.

As the testing program has continued throughout the quarter, the initial plant design has been simulated to better understand the processing flow. Variations of the initial process flows are being investigated to simplify the design and focus it on achieving greater yields of the desired heavier hydrocarbon fractions. The simulations are awaiting input from the results of Test Program 3, which will be delivered in the June Quarter.

Additionally, Greenvale's geothermal tenements have progressed further to grant, with significant progress being made in relation to the initial community engagement and native title discussions. The Company has also commenced the engagement process with several geothermal consultancy firms and environmental advisory groups for an initial feasibility study relating to the most prospective of its application sites. Greenvale looks forward to providing an update on the advancement of it geothermal projects in the coming quarter.

Test Procedures

The liquefaction reactions were carried out in a Parr Reactor vessel with a capacity of 7 litres. In a typical experiment, powdered oil shale samples and the iron-based catalyst were mixed with the carrier oil and then charged into the reactor. After loading, the reactor was first purged to replace air using nitrogen and pressurised with hydrogen to 3,500 kPa at room temperature and checked for leaks.

Table 1: *Summary of the experiment tests and conditions*

No	Items	Samples (g)	Carrier Oil (l)	Catalyst (g)	Catalyst/Shale (wt%)
1	2B1- Cannel	409	2	14	3.4
2	2B2- Cannel	500	1.8	12.5	2.5
3	2B3- Cannel	372	1.8	22.7	6.1

The charged Parr Reactor was heated to a temperature of 3650C. Once the target temperature was reached, the temperature was held for half an hour before forced cooling was commenced. At the end of each run, the reactor rig is cooled to room temperature by pumping water through cooling coils in the jackets around the reaction vessel and left overnight. The samples were collected at the start of the new day prior to loading for subsequent tests.

No gas samples were taken under this testing program. The final gas pressure once the unit was cooled was equal to the starting pressure. Negligible amount of gas evolution was detected from Test Program 1 and the gas analyses did not vary substantially between the equivalent samples. Further testing of off-gas is anticipated to be conducted in the yield tests eventually conducted on the core samples in Test Program 4.

Table 2 summarises results of the Parr Reactor experiment of the samples. Under this Test Program 2, the cannel coal sample 2B3 achieved the highest conversion and aligns with the highest catalyst concentration (6.1wt%) compared to samples 2B1 (3.4wt%) and 2B2 (2.5wt%). Under Section 3, the remaining solid samples are further characterised using standard laboratory analyses.

Table 2: *Test Program 2 oil shale liquefaction results of conversion and yield products of cannel coal samples*

Samples	Oil Shale Feed (g)	Conversion (wt%)	Oil + Gas (wt%)	Asphalt (wt%)	Residu (wt%)
2B1-Cannel	409	32.74	29.56	3.18	67.26
2B2-Cannel	500	33.06	30.80	2.26	66.94
2B3-Cannel	372	**39.03**	32.55	6.48	60.97

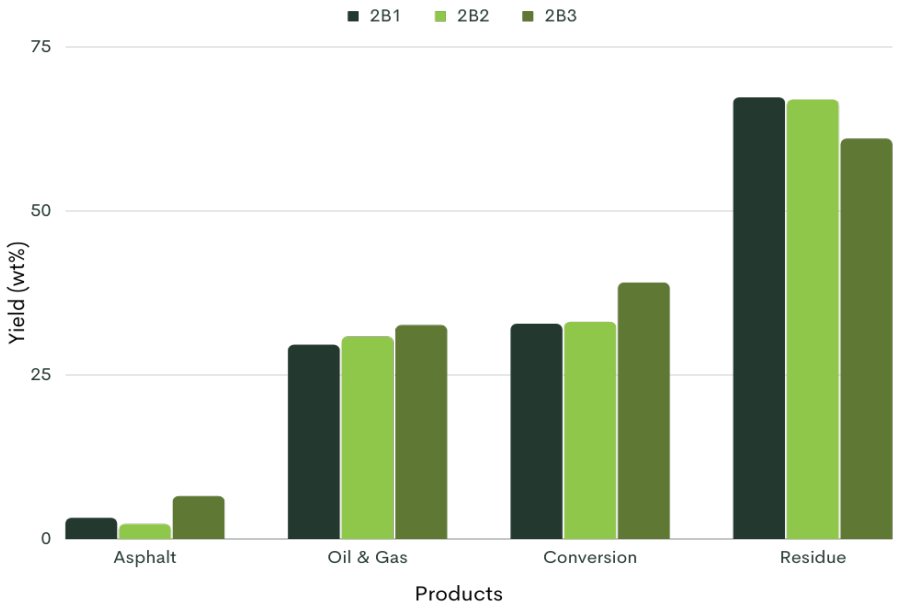

Figure 2: *Product distribution for the samples under Test Program Two*

Conclusions

The program concentrated on the performance of cannel coal under liquefaction at lower-than- optimal temperatures (as limited by the test facility), as torbanite was shown to process well with increased temperature in the first program. This program demonstrates good progress in converting cannel coal by liquefaction. While oil and gas in combination are reported as a fraction of the conversion, there is no evidence of increased gas yield which remains <1% wt (typically up to 30% is lost to gas in pyrolysis reactions at the referenced conversions).

Other key conclusions included:

- The hexane washed samples from Test Program 1 were subjected to a toluene wash to recover adsorbed asphaltenes. This additional washing step demonstrated that asphaltenes had adhered to and were recoverable from the remaining solids after a liquefaction processing step. This washing step was added to subsequent test programs.

- The three cannel coal results did provide consistent results which conformed to expectation and demonstrated the impacts of increased catalyst. The consistent results add to the confidence in the program and the liquefaction process.

- Test Program 2 demonstrates the potential of liquefaction to successfully recover increased amounts of heavy oil and asphaltenes from cannel coal without the loss of excessive amounts of gas or the production of light boiling material (<3600C). Thus, liquefaction is preferred over a normal pyrolysis process.

- Under this testing program, the cannel coal samples provided higher conversion (39 wt%) of solids to liquids with increased temperatures from 3400 to 3650C and increased catalyst concentrations compared to the cannel coal sample from the previous testing program where conversions were limited to approximately 22%.

- Increasing catalyst concentration has a positive impact on the conversion and asphaltene content, hence optimisation of catalyst content will continue into the future trials. TGA analysis of the remaining solids shows that there is more organic material available for conversion under the correct conditions.

- The amount of extractable asphaltenes as a proportion of the liquefied solid can be increased by variation of catalyst and temperature, hence the program going forward will concentrate on impact of these variables across all seams in the deposit.

- Conversion of approximately 39wt% was achieved, and approximately 17% of the oil produced is asphaltenes with the remainder heavy oils, most of which may also be usable in the production of bitumen. The application of the oils produced will be studied in subsequent programs using the expertise of bitumen technology experts.

The overall result is promising and demonstrates the need to conduct the next series of tests to support and more clearly define operating conditions which enhance production of heavy oil and asphaltenes in a commercial plant.

Activities proposed for the June 2023 Quarter

The June Quarter will see the completion of Test Program 3, with the experimental program and instructions agreed, the samples shipped and initial tests already showing good results.

The maximum experiment condition of this program is initially set to hydrogen pressure of 7MPa and a maximum temperature of 450°C. Progressive and transforming experiment conditions are also proposed under this testing program to investigate the effects of different temperature, oil/water carriers and catalyst on oil shale conversions.

These future results will provide data to allow development of a commercialisation process concept at an optimal operating and capital cost. The outcomes of Test Program 3 will provide a targeted basis to develop the subsequent laboratory Test Program 4 of core samples, which will also be conducted in Jordan, subject to continued encouraging results.

These results will support yield and cost assumptions for the Pre-Feasibility Study.

In the June 2023 Quarter, Greenvale will also present an updated geothermal strategy and appoint engineering consultants who will deliver the Company's maiden geothermal feasibility study.

Georgina Basin IOCG Project, Northern Territory

Activities during the March 2023 Quarter

Background

The Georgina Basin Project is owned by Knox Resources Pty Ltd (**Knox**), a company which is 20% owned by Greenvale. In November 2022, Greenvale completed the sale of an 80% majority stake in Knox to Astro Resources NL (ASX: ARO) (**Astro**), receiving 46,000,000 Astro fully-paid ordinary shares (subject to certain voluntary restrictions) and retaining a 2% net smelter royalty (**Royalty**) for all IOCG product exploited in the future from the existing tenements owned by Knox. Greenvale is required to contribute to the funding of its share of Knox's future costs.

The sale of a majority stake in Knox is consistent with Greenvale's strategic focus to become a sustainable producer of bitumen and a significant participant in the renewable energy sector.

Project Overview

The following is an overview of the Georgina Basin Project:

- Located in the highly prospective East Tennant province in the Northern Territory, the Georgina Project comprises seven granted Exploration Licences and three under application, for a combined total of approximately 4,500km^2 (Table 4).

- The East Tennant province has been the subject of intense geoscientific investigation by both Geoscience Australia and the Northern Territory Geological Survey for over five years. Pre-competitive work undertaken as part of the Federal Government's $225 million Exploring for the Future program (EFTF) included solid geology interpretation, alteration proxy mapping and mineral prospectivity mapping for Iron Oxide Copper Gold (IOCG) deposits.

- The collaborative MinEx CRC National Drilling Initiative, conducted in late 2020, confirmed the highly prospective nature of the region by intersecting prospective host rocks, IOCG-style alteration and sulphide mineralisation as part of a 10-hole program at East Tennant.

IOCG deposits are typically large, economically attractive copper-gold deposits with some smaller high-grade variants – most notably those at Tennant Creek. This style of deposit contains elevated levels (10-60wt %) of the iron oxide minerals magnetite and hematite, which gives rise to their (typically) elevated magnetic and gravity (density) properties.

Australian IOCG's include the South Australian Olympic Dam, Prominent Hill, and Carrapateena deposits, Ernest Henry in north-west Queensland, and the high-grade Northern Territory Warrego and Juno deposits, located west of the Georgina Project at Tennant Creek.

Work During the Quarter

The following highlights occurred during the quarter:

Assay results from holes drilled by Greenvale Energy

Assay results were received by Astro for two diamond drill holes completed by previous owner, Greenvale Energy, at the **Banks** and **Leichhardt West** prospects in mid-2022.

Visual results reported by GRV[1],[2] indicated that both holes intersected trace to minor chalcopyrite (copper mineral) mineralisation in prospective altered host-rocks. Laboratory assay results have now confirmed these visual observations of copper, as well as revealing anomalous levels of other elements commonly associated with IOCG deposits (e.g. bismuth which is commonly associated with Tennant Creek-style IOCG deposits).

The results included:

- Leichhardt West hole KNXLW001RDD intersected 0.22% Cu from 536.05-536.3m associated with elevated bismuth and silver.
- Leichhardt West hole KNXLW001RDD intersected 0.15% Cu from 600-600.8m (end of hole) associated with elevated bismuth and silver.
- General increased anomalism in copper, bismuth and silver observed in spatial association with modelled 3D gravity and magnetic anomalies.
- Banks hole KNXBA001RDD intersected elevated copper, bismuth and silver from 433-440m.

The results are considered highly significant as they suggest the drilling may have intersected rocks peripheral to an IOCG system, indicate a hydrothermal component to the Banks and Leichhardt West prospects, and illustrate compelling similarity to Tennant Creek IOCG deposits.

[1] ASX: GRV 29 June 2022 'First Diamond hole at the Banks Target intersects IOCG-style Alteration'

[2] ASX: GRV 27 July 2022 'Diamond hole at Leichhardt confirms IOCG potential at Georgina

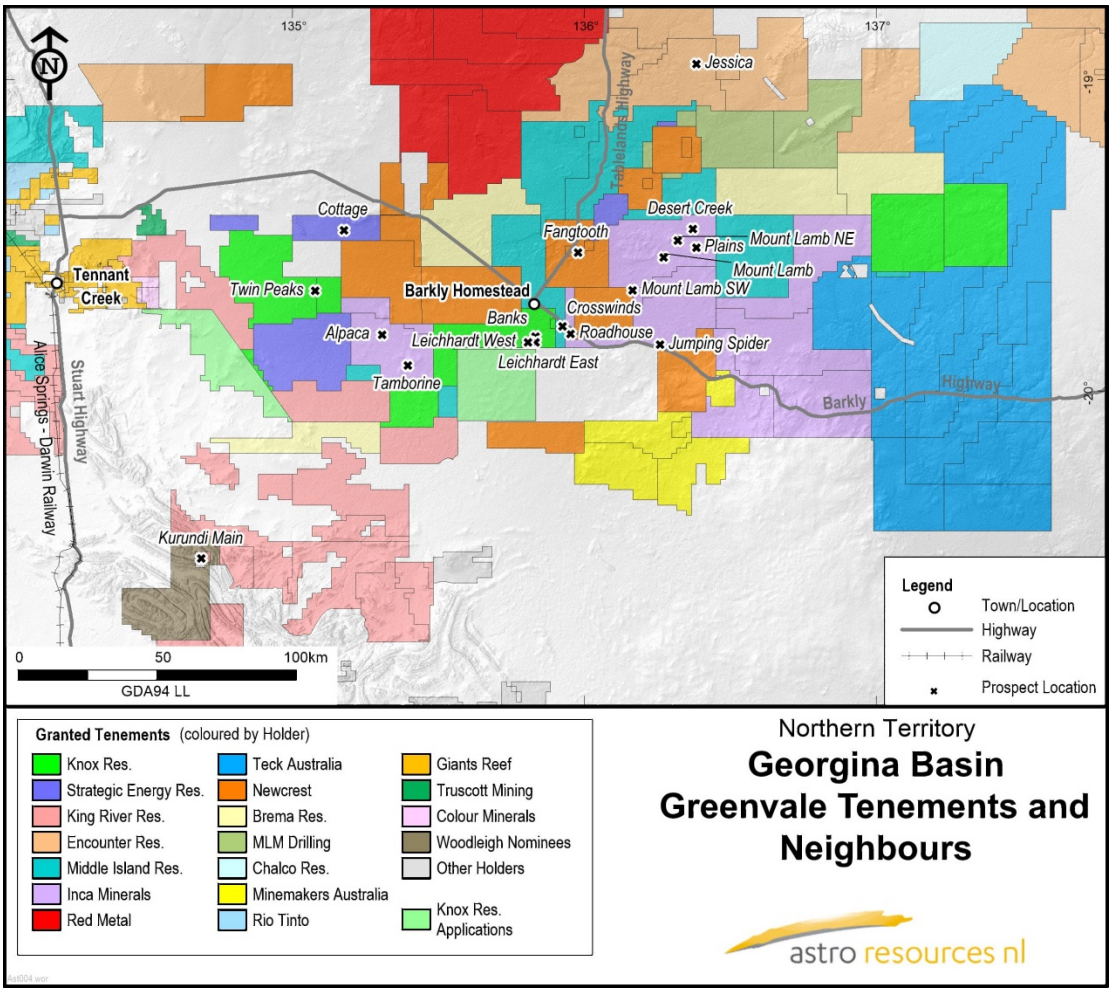

Figure 3. *Knox's East Tennant tenement holding, showing neighbouring holders and key regional prospects.*

Down-hole Geophysical Surveying

A down-hole survey campaign at Astro's highly prospective Central Tenement, comprising both a triaxial magnetic survey and EM. All three holes drilled in the Central Tenement area were surveyed as part of the campaign, with the Banks hole surveyed to 445m depth, Leichhardt West hole to 600m and Leichhardt East hole to 365m.

The main objective of the survey was to characterise the magnetic characteristics of the holes, as magnetic surveying is one of the principal tools utilised in IOCG exploration. Magnetics are important for several reasons, including that remanent magnetism (a permanent magnetic field direction recorded in magnetic minerals) is observed in some IOCG deposits, such as at Tennant Creek. Furthermore, magnetic characteristics of overlying 'cover' rock types (such as the Helen Springs Volcanics, observed in all holes drilled to date at Georgina), may have a 'masking' or influencing effect on the response of underlying host rocks in surface geophysical data.

To complement data collected from the downhole surveys, a selection of drill samples displaying magnetic properties will be sent to CSIRO for magnetic remanence testwork. In addition to triaxial magnetic surveying, downhole EM was also conducted. Down-hole EM is designed to test for off-hole conductors, which may be the result of sulphide mineralisation.

Down-hole magnetic responses were observed in basement rocks of all three holes, with down-hole EM data yet to be finalised and interpreted.

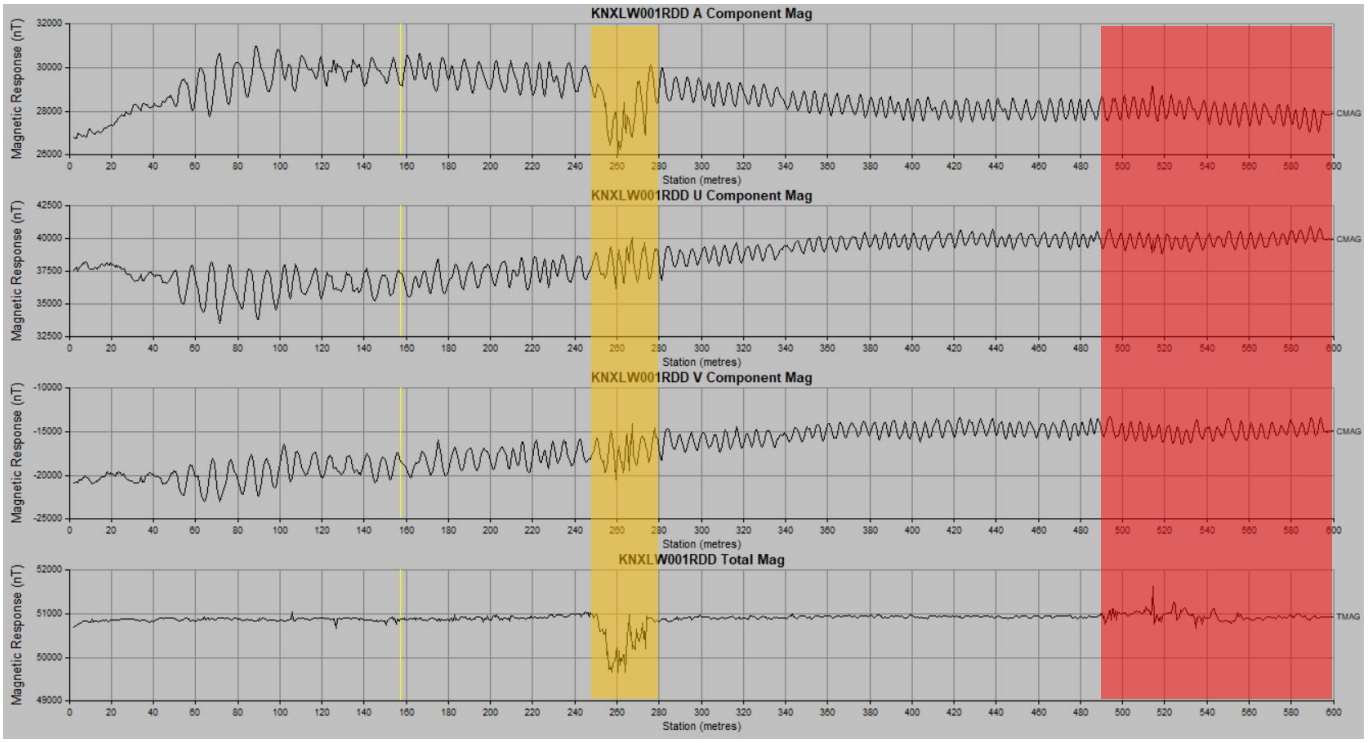

Figure 4. *Triaxial downhole magnetic survey data from Leichhardt West hole KNXLW001RDD showing magnetic field responses from the Helen Springs Volcanics (yellow overlay) and targeted basement rocks (red).*

Leichhardt East Drill Hole

Following completion of the Leichhardt East drillhole KNXLE001RDD in December 2022, work has been prioritised on mark-up and processing of drill core. As announced previously, this hole intersected anomalous copper mineralisation as bornite and chalcopyrite, ironstones with sulphide veining, and widespread chlorite and hematite IOCG-style alteration.

Since completion, the hole has undergone detailed geological logging, with bulk density and magnetic susceptibility measurements taken. The drill core will be cut, sampled and despatched for assay in the current month.

The Leichhardt East drilling is supported by an NT Government grant, following a successful application under Round 15 of the Resourcing the Territory Geophysics and Drilling Collaborations Program. As part of grant funding conditions, half-core must be supplied to the NT Geological Survey.

The remaining half-core will be sampled for magnetic remanence testing at CSIRO, petrographic thin section preparation for microscopy and conventional multi-element assay including fire assay for gold.

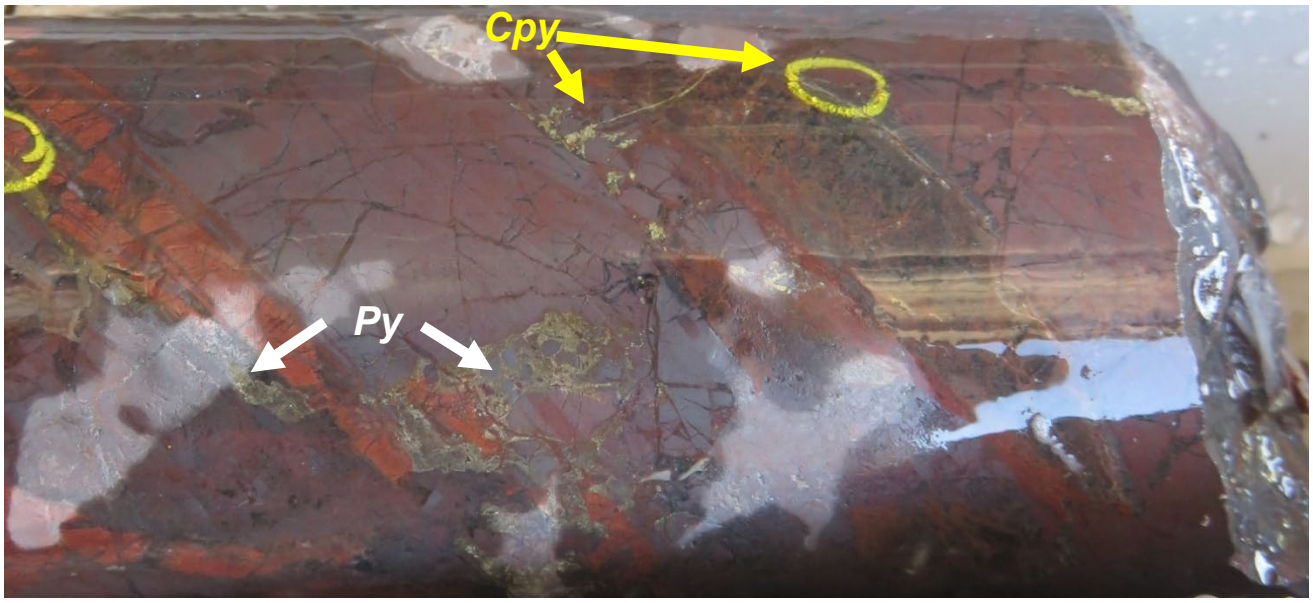

Figure 5. *Veinlet/in-fill sulphide minerals pyrite (py) and chalcopyrite (cpy, yellow) in hematitic ironstone (689.5m) from Leichhardt East drill-hole KNXLE001RDD.*

Follow-up on Astro drilling

Astro received initial assay results from a deep diamond drill-hole completed at the **Leichhardt East Prospect** last year, with the results demonstrating the presence of copper mineralisation associated with ironstones, as well as significant anomalism in the key pathfinder metals known to be associated with large-scale IOCG deposits, including strong uranium mineralisation in a number of samples.

The results are considered to mark a significant step forward in Astro's and Greenvale's ongoing search for a large-scale IOCG discovery in the emerging East Tennant mineral province in the Northern Territory.

Assay Results

Results from Leichhardt East hole KNXLE001RDD include:

- 0.24% U_3O_8, 819ppm copper (Cu) and 0.15g/t silver (Ag) in ironstone from 689.09-689.41m; and

- 374ppm U_3O_8, 11.8ppm bismuth (Bi) and 78.6ppm Cu in ironstone from 693.3-694.2m:
- Both forming part of a broader 5.11m zone of anomalism grading 256ppm U_3O_8 and 115ppm Cu; and
- 0.11% U_3O_8, 40.8ppm Bi and 0.11g/t Ag in hematitic siltstone from 481.1-481.85m; and
- 635ppm Cu and 0.26g/t Ag from 576.34 – 577.38m in brecciated metasediments

Significance of Results

The results are considered highly significant. As with previous drilling results from the Banks and Leichhardt West prospects, they suggest that Knox's drilling may have intersected rocks peripheral to an IOCG system, indicate a hydrothermal component to the rock packages encountered, and illustrate compelling similarity to Tennant Creek IOCG deposits.

However, while the geochemical anomalies observed are of the same metals (copper, silver and bismuth) as at Banks and Leichhardt West, the Leichhardt East hole has also intersected strong uranium mineralisation in a number of samples – an element also associated with IOCG deposits and discussed in further detail below.

There is a general observation of anomalism in copper, bismuth and silver in association with ironstones, which occur with an increasing frequency toward the base of the hole. This is highly significant, as ironstones represent a geochemical depositional mechanism upon which metals may precipitate from ore-forming fluids, according to research undertaken by Geoscience Australia[3].

The elevated geochemistry in copper, bismuth, silver and uranium indicates that IOCG-style geochemical deposition processes are at play in the rocks at Leichhardt East, further validating Astro's exploration strategy and model at Georgina, given the known association of these metals with IOCG deposits.



Figure 6. *Ironstone that hosts 0.24% U3O8 mineralisation from 689.09 – 689.41m in drill-hole KNXLE001RDD.*

[3] Tennant Creek – Mount Isa IOCG mineral potential assessment in Exploring for the Future: Extended Abstracts, Murr et al., Geoscience Australia 2020
Mapping the Mineral Zonation at the Ernest Henry Iron Oxide Copper-Gold Deposit: Vectoring to Cu-Au Mineralization using Modal Mineralogy, Tobias U. Schlegel, Renee Birchall, Tina D. Shelton, and James R. Austin, Economic Geology (2022), v. 117, no. 2, pp. 485-494

Uranium and IOCG Deposits

While uranium is associated with a number of IOCG deposits, the uranium-IOCG association is best known at the giant Olympic Dam IOCG deposit in South Australia, where uranium occurs in sufficient grade to be sold as a co-product, along with copper and gold.

Uranium is also present within the mineralised zone at the Ernest Henry[4] IOCG deposit in north-west Queensland and at the high-grade Juno deposit in Tennant Creek[5]. Of note, silver is also present within the ore breccia at Ernest Henry[6].

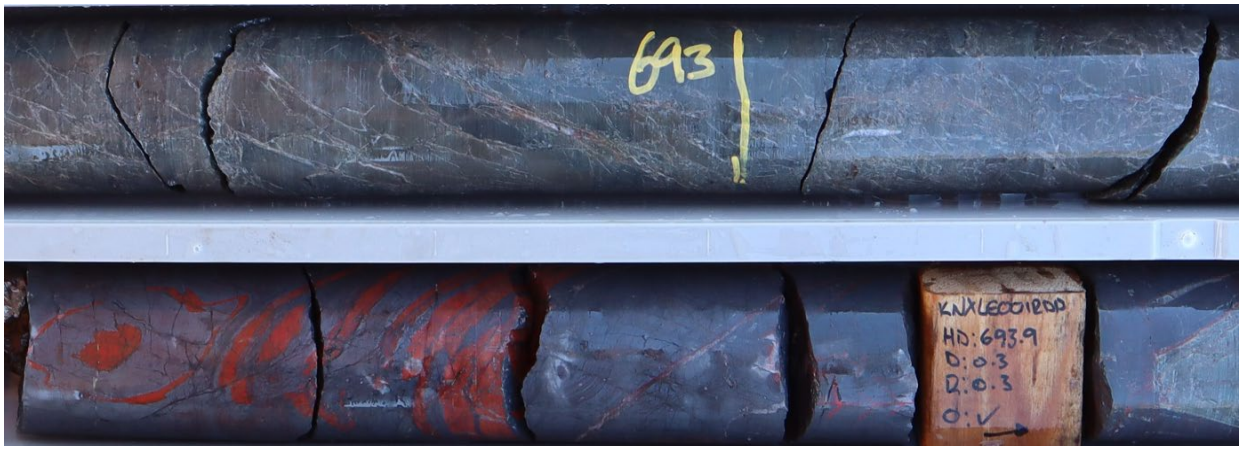

Figure 7. *Ironstone that hosts 0.24% U3O8 mineralisation from 689.09 – 689.41m in drillhole KNXLE001RDD.*

Leichhardt East

Leichhardt East was originally identified as a high-ranking conceptual IOCG target within the Georgina Project as part of a project-scale prospectivity review conducted by highly-regarded international consulting group SRK Consultants.

Follow-up work conducted by Greenvale comprised high-resolution magnetic and gravity surveying, followed by geophysical modelling of the identified responses.

In mid-2022, two diamond holes tested nearby targets at Banks and Leichhardt West (KNXBA001RDD and KNXLW001RDD, respectively, Figures 2 and 3). Both holes intersected deformed host rocks, IOCG-style alteration and anomalous geochemistry, with the Leichhardt West hole intersecting copper mineralisation up to 0.22% Cu from

4 Mapping the Mineral Zonation at the Ernest Henry Iron Oxide Copper-Gold Deposit: Vectoring to Cu-Au Mineralization using Modal Mineralogy, Tobias U. Schlegel, Renee Birchall, Tina D. Shelton, and James R. Austin, Economic Geology (2022), v. 117, no. 2, pp. 485-494

5 Zonation of hydrothermal minerals at the Juno Mine, Tennant Creek goldfield, central Australia, Ross Large, Economic Geology (1975), no. 70, pp. 1387-1413

6 Mineralogical and Chemical Evolution of The Ernest Henry Fe Oxide–Cu–Au Ore System, Cloncurry District, Northwest Queensland, Geordie Mark, Nicholas H. S. Oliver, Patrick J. Williams , Australia, Mineralium Deposita (2006), no 40: pp. 769-801

536.05 – 536.3m and the hole ending in 0.15% Cu (600-600.8m – end-of-hole), as announced in February 2023.

The Leichhardt East target has the highest intensity magnetic and gravity anomalies of the whole tenement area, exceeding that in both of the previously drilled prospects.

Drilling of the prospect was conducted in November and December 2022, with the hole intersecting a number of occurrences of strong IOCG-style hematite and chlorite alteration, copper-bearing minerals and the presence of hematitic ironstone. The ironstone was observed to contain veinlets of sulfide minerals such as pyrite and chalcopyrite (a copper mineral), indicating a depositional process at work.

Drill holes

Below is a table of drill holes referenced in this quarterly announcement:

Hole ID	East (MGA)	North (MGA)	RL	Dip	Azimuth (MGA)	Depth
KNXLE001RDD	586519	7806821	225	-70	320.6	699.8
KNXLW001RDD	584975	7806808	225	-68.3	326.9°	600.8
KNXBA001RDD	588116	7809650	225	-75	127°	550

Table 3. *Central Tenement drillhole collar details – as drilled*

Corporate Activities

During the Quarter, the following activities took place:

Completion of institutional placement

During the quarter, the Company that it made an institutional placement raising $4 million (**Placement**) to Pioneer Resource Partners, LLC (the **Investor**), a U.S.-based institutional investor.

The proceeds from the Placement will be largely used by Greenvale to finalise its Pre-Feasibility Study on the Alpha Torbanite Project and commence the pilot plant trial, as well as for general working capital requirements.

The Placement will raise $4,000,000 as a pre-payment of $4,320,000 worth of ordinary shares in the Company (**Shares**) to be issued by the Company. A summary of the key terms of the subscription agreement between the Company and the Investor (**Subscription Agreement**) is set out in in the ASX release dated 1 February 2023 (**Announcement**).

The Company will issue Placement Shares, at the Investor's request, within twenty-four months of the date of the related prepayment. The number of Placement Shares so issued by the Company will be determined by applying the Purchase Price (as

described in the annexure of the Announcement) to the subscription amount, but subject to the Floor Price (as described in the annexure of the Announcement).

ASX Additional Information

The Company provides the following information pursuant to ASX Listing Rule requirements:

1. **ASX Listing Rule 5.3.1:**
   Exploration and Evaluation Expenditure spend during the quarter was $606,861. Full details of exploration activity during the March 2023 quarter are set out in this report.

2. **ASX Listing Rule 5.3.2:**
   The Company confirms that there was no mine production and development activities for the quarter.

3. **ASX Listing Rule 5.3.5**: Payment to related parties of the Company and their associates during the quarter was $209,075, in cash.

   The Company advises that this relates to remuneration of Directors only. Please see the Remuneration Report in the Company's Prospectus for further details on Directors' Remuneration. Set out below is the following additional information in relation to the cash flow statement:

Name of Director	Nature of Payment	Amount ($) [Excluding GST]
Neil Biddle	Ongoing director fees, plus superannuation entitlements	31,575
Anthony Leibowitz	Ongoing Director fees	10,000
Elias (Leo) Khouri	Ongoing Director fees	-
Mark Turner	Ongoing director fees and bonus, plus superannuation entitlements	167,500
	Total	**209,075**

4. **ASX Listing Rule 5.3.3**: In accordance with Listing Rule 5.3.3, Greenvale the following Information concerning its exploration licences:

Alpha Project, Queensland

Tenement	%age Ownership	Owned by	Status
MDL 330	100%	Alpha Resources Pty Ltd	Current to 31 January 2027
EPM 27718	100%	Alpha Resources Pty Ltd	Current to 14 February 2026

Alpha Project, Queensland

Tenement	%age Ownership Of Applicant	Applicant	Status
EPM 28265	100%	Alpha Resources Pty Ltd	Under Application
EPM 28266	100%	Alpha Resources Pty Ltd	Under Application
EPM 28487	100%	Greenvale Energy Ltd	Current to 29 August 2027
EPM 28488	100%	Greenvale Energy Ltd	Current to 29 August 2027
EPM 28489	100%	Greenvale Energy Ltd	Under Application
EPG 2019	100%	Alpha Resources Pty Ltd	Under Application
EPG 2020	100%	Alpha Resources Pty Ltd	Under Application
EPG 2021	100%	Alpha Resources Pty Ltd	Under Application
EPG 2022	100%	Alpha Resources Pty Ltd	Under Application
EPG 2023	100%	Greenvale Energy Ltd	Under Application
EPG 2024	100%	Greenvale Energy Ltd	Under Application
EPG 2025	100%	Greenvale Energy Ltd	Under Application

Authorised for Release

This announcement and the accompanying Appendix 5B have been approved by the Board for release.

Kurt Laney
Joint Company Secretary
Contact
For further details, contact:
Mark Turner, CEO, 0459 519 999

Media Inquiries:
Nicholas Read – Read Corporate
Nicholas@readcorporate.com.au
Mobile: 0419 929 046

COMPETENT PERSON'S STATEMENT – ALPHA TORBANITE PROJECT:

The information in this report that relates to Exploration Results is based on information compiled by David Cavanagh, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy AusIMM Member number 112318. David Cavanagh is a full-time employee of Core Resources.

David Cavanagh has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.

David Cavanagh consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The Company confirms that it is not aware of any new information or data that materially affects the information included in the Mineral Resource Estimate dated 9 March 2022 as announced to the ASX on that date and which is available at www.greenvaleenergy.com.au The Company confirms that in relation to the Alpha Torbanite Project Mineral Resource Estimate, all material assumptions and technical parameters underpinning the estimate continue to apply and have not materially changed when referring to its resource announcement made on 9 March 2022.

COMPETENT PERSON'S STATEMENT – GREORGINA BASIN IOCG PROJECT:

The information in this report that relates to Exploration Results is based on information compiled by Mr Matthew Healy, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy (AusIMM Member number 303597).

Mr Healy is a full-time employee of Astro Resources NL (ASX: ARO).

Mr Healy has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.

Mr Healy consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Appendix 5B

Mining exploration entity or oil and gas exploration entity quarterly cash flow report

Name of entity	
Greenvale Energy Ltd	
ABN	**Quarter ended ("current quarter")**
54 000 743 555	31 March 2023

Consolidated statement of cash flows		**Current quarter $A'000**	**Year to date (9 months) $A'000**
1.	**Cash flows from operating activities**		
1.1	Receipts from customers		
1.2	Payments for		
	(a) exploration & evaluation		
	(b) development		
	(c) production		
	(d) staff costs	-	(80)
	(e) administration and corporate costs	(76)	(898)
1.3	Dividends received (see note 3)		
1.4	Interest received	19	24
1.5	Interest and other costs of finance paid		
1.6	Income taxes paid		
1.7	Government grants and tax incentives		
1.8	Other (provide details if material)	-	20
1.9	**Net cash from / (used in) operating activities**	**(57)**	**(934)**

2.	**Cash flows from investing activities**		
2.1	Payments to acquire or for:		
	(a) entities		
	(b) tenements		
	(c) property, plant and equipment	-	(22)
	(d) exploration & evaluation	(612)	(2,701)
	(e) investments		
	(f) other non-current assets	-	(27)

Consolidated statement of cash flows		Current quarter $A'000	Year to date (9 months) $A'000
2.2	Proceeds from the disposal of:		
	(a) entities		
	(b) tenements		
	(c) property, plant and equipment		
	(d) investments		
	(e) other non-current assets	-	7
2.3	Cash flows from loans to other entities		
2.4	Dividends received (see note 3)		
2.5	Other (provide details if material)		
2.6	**Net cash from / (used in) investing activities**	**(612)**	**(2,743)**

3.	**Cash flows from financing activities**		
3.1	Proceeds from issues of equity securities (excluding convertible debt securities)	-	1,466
3.2	Proceeds from issue of convertible debt securities		
3.3	Proceeds from exercise of options		
3.4	Transaction costs related to issues of equity securities or convertible debt securities	(26)	(40)
3.5	Proceeds from borrowings	4,000	4,000
3.6	Repayment of borrowings		
3.7	Transaction costs related to loans and borrowings		
3.8	Dividends paid		
3.9	Other (provide details if material)		
3.10	**Net cash from / (used in) financing activities**	**3,974**	**5,426**

4.	**Net increase / (decrease) in cash and cash equivalents for the period**		
4.1	Cash and cash equivalents at beginning of period	2,791	4,347
4.2	Net cash from / (used in) operating activities (item 1.9 above)	(57)	(934)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(612)	(2,743)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	3,974	5,426

Consolidated statement of cash flows		Current quarter $A'000	Year to date (9 months) $A'000
4.5	Effect of movement in exchange rates on cash held	-	-
4.6	**Cash and cash equivalents at end of period**	**6,096**	**6,096**

5.	Reconciliation of cash and cash equivalents at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	Current quarter $A'000	Previous quarter $A'000
5.1	Bank balances	4,378	1,091
5.2	Call deposits	1,718	1,700
5.3	Bank overdrafts		
5.4	Other (provide details)		
5.5	**Cash and cash equivalents at end of quarter (should equal item 4.6 above)**	**6,096**	**2,791**

6.	Payments to related parties of the entity and their associates	Current quarter $A'000
6.1	Aggregate amount of payments to related parties and their associates included in item 1	(50)
6.2	Aggregate amount of payments to related parties and their associates included in item 2	(159)

Note: if any amounts are shown in items 6.1 or 6.2, your quarterly activity report must include a description of, and an explanation for, such payments.

7.	**Financing facilities** *Note: the term "facility' includes all forms of financing arrangements available to the entity.* *Add notes as necessary for an understanding of the sources of finance available to the entity.*	**Total facility amount at quarter end $A'000**	**Amount drawn at quarter end $A'000**
7.1	Loan facilities	3,000	-
7.2	Credit standby arrangements	-	-
7.3	Other (please specify)	-	-
7.4	**Total financing facilities**	3,000	-

7.5	**Unused financing facilities available at quarter end**	3,000

7.6 Include in the box below a description of each facility above, including the lender, interest rate, maturity date and whether it is secured or unsecured. If any additional financing facilities have been entered into or are proposed to be entered into after quarter end, include a note providing details of those facilities as well.

(a) Loan facilities – directors

The Company announced on 20 October 2022 that it had received a letter of support from its directors for $3.00 million. The letter of support is to provide an unsecured loan to the Company, with the following terms:

- interest at 12.00% per annum; and
- to be repaid at the earlier of the next capital raising (including an offer entitlement) or 18 months from when the final drawdown has been made by the Company.

(b) Facility – Pioneer Resources LLC

The Company has a facility with an institutional investor, Pioneer Resources LLC for $4.320 million (inclusive of a premium paid). This facility was fully drawn at 31 March 2023.

The facility is repayable by way of issue of ordinary shares in the Company, unless Greenvale otherwise elects to repay the facility in cash. For the purposes of Greenvale's Appendix 5B, the proceeds from this facility have been reflected as debt and not equity, as it represents the form of the proceeds received. However, given that the substance of the of the facility is/will be in the form equity, it has not been shown as part of the financing facilities under Response 7 above.

8.	**Estimated cash available for future operating activities**	**$A'000**
8.1	Net cash from / (used in) operating activities (item 1.9)	(57)
8.2	(Payments for exploration & evaluation classified as investing activities) (item 2.1(d))	(612)
8.3	Total relevant outgoings (item 8.1 + item 8.2)	(669)
8.4	Cash and cash equivalents at quarter end (item 4.6)	6,096
8.5	Unused finance facilities available at quarter end (item 7.5)	3,000
8.6	Total available funding (item 8.4 + item 8.5)	9,096
8.7	**Estimated quarters of funding available (item 8.6 divided by item 8.3)**	13.59

Note: if the entity has reported positive relevant outgoings (ie a net cash inflow) in item 8.3, answer item 8.7 as "N/A". Otherwise, a figure for the estimated quarters of funding available must be included in item 8.7.

8.8 If item 8.7 is less than 2 quarters, please provide answers to the following questions:

8.8.1 Does the entity expect that it will continue to have the current level of net operating cash flows for the time being and, if not, why not?

Answer:
Not applicable, as Item 8.7 is greater than 2 quarter.

8.8.2 Has the entity taken any steps, or does it propose to take any steps, to raise further cash to fund its operations and, if so, what are those steps and how likely does it believe that they will be successful?

Answer:
Not applicable, as Item 8.7 is greater than 2 quarter.

8.8.3 Does the entity expect to be able to continue its operations and to meet its business objectives and, if so, on what basis?

Answer:
Not applicable, as Item 8.7 is greater than 2 quarter.

Note: where item 8.7 is less than 2 quarters, all of questions 8.8.1, 8.8.2 and 8.8.3 above must be answered.

Compliance statement

1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.

2 This statement gives a true and fair view of the matters disclosed.

Date: 27 April 2023

Authorised by: The Board of Directors of Greenvale Energy Ltd
(Name of body or officer authorising release – see note 4)

Notes

1. This quarterly cash flow report and the accompanying activity report provide a basis for informing the market about the entity's activities for the past quarter, how they have been financed and the effect this has had on its cash position. An entity that wishes to disclose additional information over and above the minimum required under the Listing Rules is encouraged to do so.

2. If this quarterly cash flow report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 6: Exploration for and Evaluation of Mineral Resources* and *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly cash flow report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standards apply to this report.

3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.

4. If this report has been authorised for release to the market by your board of directors, you can insert here: "By the board". If it has been authorised for release to the market by a committee of your board of directors, you can insert here: "By the [*name of board committee – eg Audit and Risk Committee*]". If it has been authorised for release to the market by a disclosure committee, you can insert here: "By the Disclosure Committee".

5. If this report has been authorised for release to the market by your board of directors and you wish to hold yourself out as complying with recommendation 4.2 of the ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations*, the board should have received a declaration from its CEO and CFO that, in their opinion, the financial

records of the entity have been properly maintained, that this report complies with the appropriate accounting standards and gives a true and fair view of the cash flows of the entity, and that their opinion has been formed on the basis of a sound system of risk management and internal control which is operating effectively.