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RENASCOR RESOURCES

ASX: RNU

ASX Release

28 March 2022

Siviour Battery Anode Material Project - Project Update

Advancing toward final investment decision for the world's first integrated, in-country mine and Purified Spherical Graphite operation outside of China

Renascor Resources Limited (ASX: RNU) (**Renascor** or the **Company**) is pleased to provide the following update for its 100%-owned Siviour Battery Anode Material Project (the **Project**) in South Australia.

Project Development:

- Work is progressing on an updated, optimised Battery Anode Materials Study[1] (**BAM Study**), building on previous detailed feasibility work undertaken by Renascor for the planned vertically integrated mine and advanced manufacturing operation in South Australia. GR Engineering Services (ASX: GNG) is acting as study manager and engineering designer.
- The optimised BAM Study will incorporate **material improvements to the mineral processing parameters** adopted in the earlier study, including increases in spherical graphite milling yields[2] and improvements to both the Graphite Concentrate flotation[3] and downstream purification[4] circuits. As part of the optimised BAM Study, the final operating parameters will be determined.
- The optimised BAM Study is assessing an **increase in Purified Spherical Graphite (PSG) production capacity**, as well as additional **staged expansions of PSG operations in order to meet projected demand**. Studies to date had considered an initial Stage 1 production capacity of 28,000tpa PSG.

Financing:

- In February 2022 the Australian Government, through Export Finance Australia (EFA), conditionally approved an A$185 million loan facility to support the development of the Project[5].
- The Company and EFA are targeting to conclude formal loan facility and security documentation in mid-2022.

Graphite Market and Offtake:

- Purified Spherical Graphite (PSG), which is used in the production of anodes for lithium-ion batteries, is experiencing **further substantial upward price improvement**, with Fastmarkets reporting PSG prices of US$3,500 to US$3,800 per tonne, a 40% increase over the last six months[6], and -194 mesh (a common feedstock for PSG) increasing by 48% to US$830 per tonne over the same period.
- **Positive offtake discussions** are continuing with parties[7] from Korea, Japan and China, with indicative demand of in excess of 60,000tpa of PSG, far outstripping proposed Stage 1 production capacity.

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- Following **deliveries of large-scale PSG samples** produced from Renascor's recent pilot production campaign[8] for product qualification, Renascor is in active discussion on PSG price and other material contract terms.

Regulatory:

- Following the lodgement in September 2021 of the Program for Environment Protection and Rehabilitation (PEPR) for the proposed Siviour Graphite Mine[9], Renascor is in active discussions with South Australia's Department for Energy and Mining to seek approval for a processing capacity of up to 1.65 million tonnes per annum, which would **permit Renascor to produce up to 150,000 tonnes of Graphite Concentrates per year**[10].

Downstream Purification Circuit and Patent Opposition:

- Renascor recently lodged an opposition to a pending patent application relating to the purification of graphite. Renascor considers the pending patent application to be overly broad and relating to processing procedures that are not novel or inventive to merit patent protection.
- Irrespective of the outcome of the pending patent application, Renascor does not anticipate the Siviour Project will be adversely impacted, as Renascor's purification process can exceed lithium-ion battery anode purity specifications with processes that are outside the scope of the pending patent application.

Commenting on recent project developments, Renascor Managing Director David Christensen stated:

> *"I am very pleased with our progress since the start of the year. The Renascor team has done a tremendous job in advancing the Siviour Project across multiple workstreams, and the team continues to work tirelessly with the primary objective of bringing the Siviour Project to realisation as soon as possible.*
>
> *Our Project's development looks well timed. We are seeing increasing evidence that the anode market will continue to see strong upward price pressure, reflecting what we have seen on the cathode side of the battery, with lithium, nickel and other battery metals all having experienced extraordinary price growth in the last 12 months."*

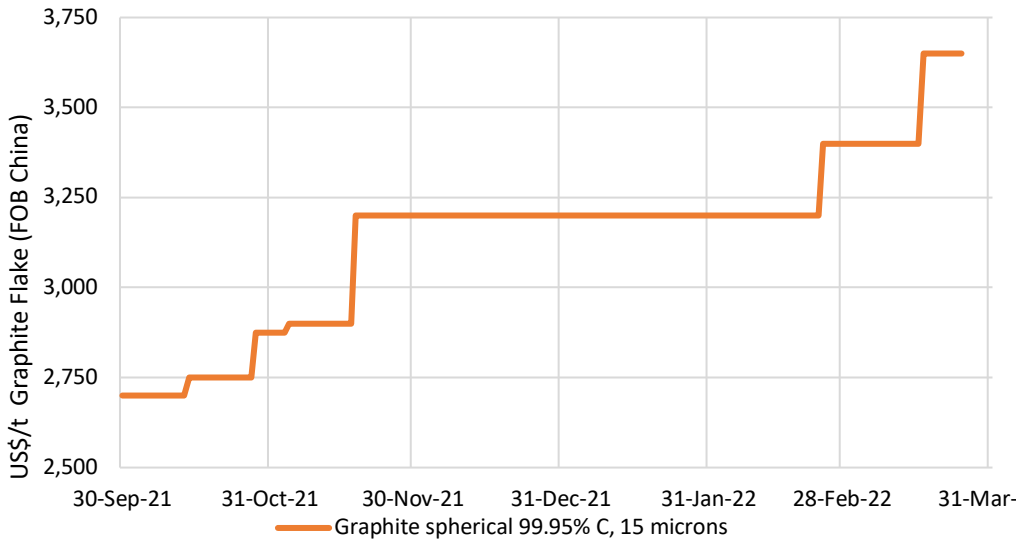

Figure 1. Purified Spherical Graphite Prices (Source: Fastmarkets)

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Project Development – Further Commentary

Work is progressing on an updated, optimised Battery Anode Materials Study[11] (BAM Study), assessing the viability of Renascor's planned vertically integrated mine and advanced manufacturing operation in South Australia, with GR Engineering Services (ASX: GNG) acting as study manager and engineering designer, with Wave International continuing to work with Renascor under the integrated owner's team.

The optimised BAM Study is assessing an increase to the previously planned Purified Spherical Graphite (PSG) production capacity of 28,000tpa, as well as additional staged expansions to both the planned Graphite Concentrate and PSG operations in order to meet projected demand.

The optimised BAM Study includes an update to the Siviour Graphite Concentrate Definitive Feasibility Study completed in November 2019 (the Siviour DFS)[12] and incorporates improvements to the Graphite Concentrate flotation circuit from subsequent mineral process test work, including:

- Locked cycle flotation tests that achieved graphite recovery of up to 94.5%[13], as compared to 91.0% in the Siviour DFS[14], and
- Pilot trials conducted at an independent commercial graphite facility that achieved graphite purities of up to 97.5% total carbon with graphite recovery of 93.2%[15]. This compares favourably to the Siviour DFS, which adopted average purities of approximately 94% total graphitic carbon[16].

The optimised BAM Study also includes an update to Renascor's previous downstream studies (including the Spherical Prefeasibility Study completed in February 2019[17] and the 2020 BAM Study) and incorporates subsequent improvements made to both the downstream milling and purification circuits. These improvements include:

- Commercial-scale downstream milling trials that achieved spherical graphite yields from in excess of 65% (versus the 50% yield adopted in the previous BAM Study)[18], and
- Locked cycle purification trials undertaken by leading German independent battery mineral consultancy group Dorfner ANZAPLAN that confirmed that the ability to meet or exceed lithium-ion battery anode purity specifications, with results of up to 99.99% C, with no impurities detected above acceptable anode customer specifications[19].

Graphite Market and Offtake – Further Commentary

Rising Graphite Prices

The graphite market continues to experience upward price pressure, with Fastmarkets reporting Purified Spherical Prices of US$3,500 to US$3,800 per tonne, a 40% increase over the last six months[20] (see Figure 1 on page 2 of this Announcement), and -194 mesh Graphite Concentrates (a common feedstock for PSG) increasing by 48% to US$830 per tonne.

Offtake

Negotiation of binding PSG offtake agreements for Renascor's existing offtakers is progressing. Following deliveries of large-scale PSG samples produced from Renascor's recent pilot production campaign[21], Renascor is in active discussion on PSG price and other material contract terms.

Renascor continues to have discussions with other leading battery anode material customers concerning potential PSG offtake. Renascor has provided PSG samples to support customer qualification and commenced offtake discussions with these parties concerning potential offtake from the initial or subsequent stages of production.

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Regulatory – Further Commentary

In September 2021, Renascor lodged a Program for Environment Protection and Rehabilitation (PEPR) for the proposed Siviour Graphite Mine[22]. Renascor's PEPR seeks approval for a processing capacity of up to 1.65 million tonnes per annum, which would permit Renascor to produce up to 150,000 tonnes of Graphite Concentrates per year[23].

The PEPR, which must be approved by the South Australian Department for Energy and Mining (DEM) before mining operations may commence, is the second step in the Government's two-stage assessment and approval process and follows the grant of the Siviour Mineral Lease in 2019[24].

DEM has now completed its initial review of the PEPR, and Renascor is in active discussions with DEM regarding final approval.

Renascor's Downstream Purification Circuit and Patent Opposition

Renascor has developed an eco-friendly purification process to purify Siviour Graphite Concentrates to battery-grade without the use of hydrofluoric acid (HF), which is generally used in Chinese PSG operations. Instead, Renascor will use less environmentally harmful reagents to purify Siviour graphite for use in lithium-ion battery anodes.

Renascor's purification process is based on previously existing and well documented mineral processing procedures in the public domain that use a caustic roast and an HF-free leaching process. Renascor believes these mineral processing procedures are not subject to patent protection. Renascor has adapted these procedures for the purpose of purifying its Siviour graphite to meet battery anode requirements.

Renascor's caustic roast and HF-free leaching purification process permits the use of several alternative procedures that apply varying reagent regimes, retention times and other processing parameters to achieve the requirements of potential battery anode customers.

Renascor recently became aware of an application seeking patent protection over certain previously known and published procedures for purifying graphite[25]. In Renascor's view, the pending patent application is overly broad and relates to processing procedures that are not novel or inventive to merit patent protection. Renascor (as well as at least one other industry participant) has now opposed the pending patent application to protect and preserve its flexibility to use these processing procedures (or similar), should it wish to do so.

Irrespective of the outcome of the pending patent application, Renascor does not anticipate the Siviour Project will be adversely impacted. Renascor's purification process will allow it to purify Siviour graphite to battery-grade using a caustic roast, HF-free procedure. Renascor's purification process has achieved battery-grade PSG, exceeding lithium-ion battery anode purity specifications, through caustic roasting and HF-free leaching processes that are outside the scope of the pending patent application. Renascor expects that the adoption of these processes (and/or other well-documented HF-free processes) would not adversely impact its ability to produce high quality and low-cost battery-grade PSG.

As part of the optimised BAM Study, the final operating parameters of the purification processes will be determined.

This ASX announcement has been approved by Renascor's Board of Directors and authorised for release by Renascor's Managing Director David Christensen.

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[1] See Renascor ASX announcement dated 1 July 2020.
[2] See Renascor ASX announcement dated 10 January 2022.
[3] See Renascor ASX announcement dated 13 August 2021, 28 July 2021, 12 July 2021
[4] See Renascor ASX announcement dated 13 December 2021, 1 July 2021, 28 May 2021
[5] See Renascor ASX announcement dated 2 February 2022
[6] Fastmarkets current mid-point PSG price is US$3,650 per tonne. In September 2021, Fastmarkets PSG price was US$2,575 per tonne.
[7] Renascor has entered into four non-binding offtake agreements covering up to 60,000tpa of PSG. The existing non-binding offtake agreements are comprised of up to 30,000tpa of PSG to South Korean conglomerate POSCO (See Renascor ASX announcement dated 7 September 2021) and up to 10,000tpa of PSG to each of Japan-based trading company Hanwa Co. Ltd. (See Renascor ASX announcement dated 25 March 2021) and Chinese anode companies Shanxi Minguang New Material Technology Co. Ltd (see Renascor ASX announcement dated 29 September 2020) and Jiangxi Zhengtuo New Energy Technology Co. Ltd (see Renascor ASX announcement dated 11 February 2021).
[8] See Renascor ASX announcement dated 7 February 2022.
[9] See Renascor ASX announcement dated 27 September.
[10] The 1.65 million tonne per annum approval sought pursuant to the PEPR relates to the volume of ore processed from the proposed Siviour mine through the adjacent processing plant. Pursuant to Renascor's proposed mining plan, this would result in up to 150,000 tonnes per annum of Graphite Concentrate production at full capacity. See Renascor ASX announcement dated 11 November 2019, page 40. Renascor has previously announced plans for a staged start-up at Siviour, starting with an ore processing capacity of 825,000 tonnes per annum and Graphite Concentrate production of up to 78,000 tonnes per annum in the first of a two-stage expansion to 1.65 million tonnes per annum of processing capacity. See Renascor ASX release dated 11 November 2019. During this first stage, 60,000 tonnes per annum of Graphite Concentrate would be used as raw material feedstock for Renascor's planned downstream battery anode material manufacturing operation to produce approximately 28,000 tonnes of Purified Spherical Graphite per annum. See Renascor ASX release date 1 July 2021. As a result of increasing interest in Siviour Purified Spherical Graphite from existing and potential offtake partners, Renascor is currently evaluating an expansion to the initial, Stage One production of Purified Spherical Graphite and an additional Stage Two production capacity of Purified Spherical Graphite. See Renascor ASX announcement dated 1 April 2021.
[11] See Renascor ASX announcement dated 1 July 2020.
[12] See Renascor ASX announcement dated 11 November 2019.
[13] See Renascor ASX announcement dated 12 July 2021.
[14] See Renascor ASX announcement dated 11 November 2019, page 17.
[15] See Renascor ASX announcement dated 28 July 2021.
[16] See Renascor ASX announcement dated 11 November 2019, page 17.
[17] See Renascor ASX announcement dated 21 February 2019.
[18] See Renascor ASX announcement dated 10 January 2022.
[19] See Renascor ASX announcement dated 13 December 2021.
[20] See note 6.
[21] See Renascor ASX announcement dated 7 February 2022.
[22] See Renascor ASX announcement dated 27 September.
[23] See note 10.
[24] See Renascor ASX announcement dated 8 April 2019.
[25] See e.g., the following publications describing procedures that adopt caustic roast and HF-free leaching and are amenable to purifying graphite concentrates to lithium-ion battery anode purity specifications: Ge, P. et al., *Preparation of high purity graphite by an alkaline roasting leaching method*. New Carbon Materials. 2010: Vol. 25, No. 1; Tan, X. et al., *Research on alkali-acid process of graphite purification*. China Mining Magazine. 2015: Vol. 24, No. 10; Zhang, Q. et al., *Baking kinetics for silicic impurity in purification process of aphanitic graphite*. Journal of Central South University. 2005: Vol. 36, No. 1.

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About Renascor

Renascor is committed to powering the clean energy transition through the development, in Australia, of a vertically integrated graphite mine and manufacturing operation to produce sustainable and ethically-sourced battery anode material for the lithium-ion battery market.

The Project will combine:

- the Siviour Graphite Deposit in South Australia, the largest reported graphite Reserve outside of Africa[26]; and
- a state-of-the-art processing facility in South Australia to manufacture purified spherical graphite through Renascor's eco-friendly purification process.

Total capital expenditure for the Project has been estimated to be A$204 million[27].

The Siviour Project has previously been granted a Major Project status by the Federal Government in recognition of its potential to contribute to Australia's Critical Mineral Strategy and Resource Technology and Critical Mineral Processing National Manufacturing Priority Roadmap.

The Siviour Graphite Project's competitive advantage is underpinned by:

- being the largest Graphite Reserve outside of Africa[28] and second largest Proven Reserve in the world;
- a vertically integrated operation allowing the production PSG wholly within South Australia, a Tier-1 jurisdiction with low sovereign risk with established infrastructure;
- favourable geology allowing manufacturing of PSG at costs that are competitive with current Chinese production and advantaged over developments outside of China; and
- a proven, HF-free, eco-friendly purification process endorsed by leading global anode companies.

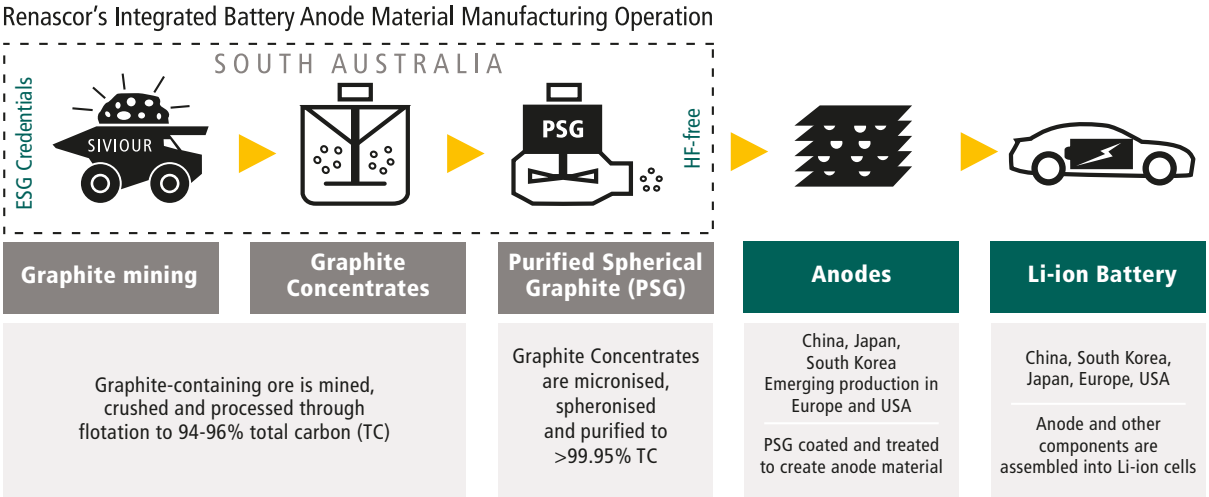

Figure 1: Renascor's vertically integrated Mine and Concentrator and Downstream PSG production facility within the Electric Vehicle supply chain

Renascor's aim is to become a leading supplier of 100% Australian-made and low-cost purified spherical graphite for lithium-ion battery anode makers worldwide.

Renascor confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. Renascor confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

Disclaimer

This report may contain forward-looking statements. Any forward-looking statements reflect management's current beliefs based on information currently available to management and are based on what management believes to be reasonable assumptions. It should be noted that a number of factors could cause actual results, or expectations to differ materially from the results expressed or implied in the forward-looking statements.

[26] See Renascor ASX release dated 21 July 2020.
[27] See Renascor ASX release dated 1 July 2020.
[28] See Renascor ASX release dated 21 July 2020.

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