

## GRAPHITE BULK SAMPLE OPERATIONS COMMENCED

- Bulk sample program commenced to produce larger volumes of natural graphite from Kasiya. Samples to be used for downstream testwork and product qualification for the lithium-ion battery sector
- Initial four tonnes of flake graphite pre-concentrate produced at the Company's laboratory in Malawi ready for despatch to world leading laboratory SGS Lakefield
- Significant laboratory upgrade underway to enable continuous production of bulk sample going forward
- Initial characterisation testwork on Kasiya's graphite has already indicated excellent suitability for use in lithium-ion batteries
- Bulk sample program in line with Sovereign's graphite marketing strategy to establish Kasiya as a major supplier of two critical minerals - natural flake graphite and natural rutile
- Active marketing of Kasiya's graphite to end users to follow; Sovereign has already secured rutile offtake MOUs with major blue chip partners including Japan's Mitsui and US-listed Chemours
- Multiple government initiatives across the G7 and other world economies recently announced focusing on securing graphite supply alongside other critical minerals



Figures 1 & 2: LHS: Four tonne graphite pre-concentrate sample produced at the Company's Lilongwe laboratory  
RHS: Close-up of the pre-concentrate showing the coarse, clean graphite flakes



Sovereign Metals Limited (ASX:SVM; AIM:SVML) (**the Company** or **Sovereign**) is pleased to announce the commencement of a graphite bulk sample program for qualification, downstream testwork and product development. The Company is upgrading in-country facilities to enable continuous production of bulk samples for marketing.

The Company's Kasiya Project (**Kasiya**) in Malawi has the potential to be the one of the world's lowest cost and lowest global warming potential (**GWP**) sources of natural rutile and graphite. Kasiya is the largest natural rutile deposit and one of the largest flake graphite deposits in the world. Both minerals are critical to several of the world's economies as well as crucial to decarbonisation solutions required to meet "Net-Zero" and other targets set by policymakers.

Sovereign's product marketing strategy is to align itself with high-quality partners and brands during the technical study and development phases to completely qualify Kasiya's future products for end-markets, including the lithium-ion battery anode market which has now become the largest end-market for natural flake graphite. Demand for high quality flake graphite continues to grow due to global decarbonisation requirements. The demand for anodes grew by 46% in 2022 compared to only 14% growth in natural flake graphite supply.

**Sovereign's Managing Director Dr Julian Stephens commented:**

*"Kasiya will potentially be one of the lowest cost flake graphite projects in the world and is also estimated to have one of the lowest global warming potentials of any current and future graphite projects. Sovereign wants to be at the forefront of these critical mineral supply chains and today's announcement is another important step towards achieving that.*

*"The world's economies need surety of supply for high-quality, low-carbon-footprint graphite suitable for use in lithium-ion batteries. Without graphite there is no electric vehicle revolution. The US, Japan and the EU see it as a critical mineral and have allocated many billions of dollars towards securing graphite supply."*

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## BULK SAMPLE PROGRAM COMMENCED

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Currently, material from the planned mining pits is sourced from remaining samples from the 2022 Kasiya resource drill program. The samples are blended to create a bulk sample which is prepared for processing at the Company's facility in Malawi where it is, sized and deslimed - processes replicating the planned operation.

Post removal of the coarse and fine fractions, the remaining clean sand fraction (45µm to 2mm) containing the graphite and rutile is processed over a wet shaking table to isolate two gravity concentrates. A graphite pre-concentrate (light mineral concentrate) with a target grade of 3-5% graphite (up from ~1.5% in the raw ore) and a heavy mineral concentrate (HMC) containing the rutile.

The graphite pre-concentrate is planned to be sent to SGS Lakefield for flotation and final processing into a final graphite product. This initial representative graphite product will provide samples for:

- Downstream testwork focussed on Coated Spherical Purified Graphite (CSPG) anode material via purification, spheronisation, coating and battery cell cycling tests.
- Assessment and qualification for traditional industrial graphite markets, including the refractory, foundry, and expandable graphite segments.
- Future production of CSPG to be provided to anode / battery manufacturers for assessment and qualification.

## GRAPHITE PRODUCT MARKETING STRATEGY

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Through Sovereign's long-established expertise in graphite, the Company has built a strong understanding of the product's market and developed a number of relationships with well-established offtakers and customers.

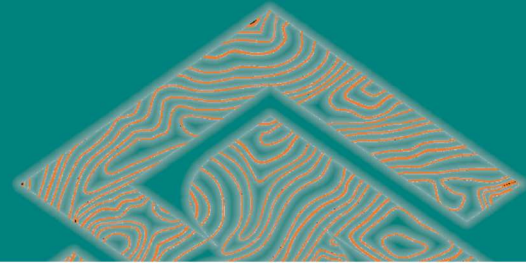
A major component to graphite sales agreements is customer qualification, and this is a key reason for initiating the graphite bulk sample program and scaling up in-country facilities in order to continuously produce bulk sample over the coming months. The graphite produced from this program will be shared with prospective end-users and is an important next step for Sovereign to qualify the Kasiya graphite product.

Sovereign's recent initial graphite characterisation testwork conducted by an independent German industrial minerals specialist demonstrated superior qualities and excellent suitability for its use in lithium-ion batteries. Further downstream testwork is planned that will use the graphite concentrate produced.

Industry's interaction with supply chain participants indicates the progression towards higher proportions of natural graphite used in battery anodes will be supported by its lower cost and superior environmental credentials. Environmental footprint of electric vehicles (EVs) will become increasingly important market consideration as EV penetration accelerates, noting that synthetic graphite has a carbon footprint orders of magnitude higher than flake graphite because it is made from by-products of coke and oil refining via energy intensive processes.

Leading EV producer Tesla Inc.'s (Tesla) "Master Plan 3" outlines its proposed path to reach a sustainable global energy economy through end-use electrification and sustainable electricity generation and storage. In the plan, Tesla suggests that the world would need to produce 10.5Mt of graphite per year and estimates US\$104 Billion of new graphite mining investment is required to achieve its target.<sup>1</sup>

Sovereign has already shared samples of rutile product from Kasiya with major end-users globally, all of which have confirmed its premium chemical and physical specifications will be suitable for use in their titanium metal and pigment processes.



This has resulted in the Company entering initially non-binding Memorandums of Understanding (MoU) with three major partners in the natural rutile sector: Mitsui, Chemours and Hascor. The Company has already over 50% of Stage 1 production under MoU (based on the Company's Expanded Scoping Study released June 2022). Sovereign's next objective is to secure offtake MOUs for the Kasiya flake graphite co-product.

## MALAWI LABORATORY UPGRADE UNDERWAY

Sovereign has constructed a bespoke laboratory in Lilongwe, Malawi in order to process exploration drill samples for rutile and graphite determination. The Lilongwe laboratory has allowed the Company to efficiently process large numbers of exploration samples at a fraction of the cost and time versus sending raw samples directly to commercial laboratories in South Africa or Australia.

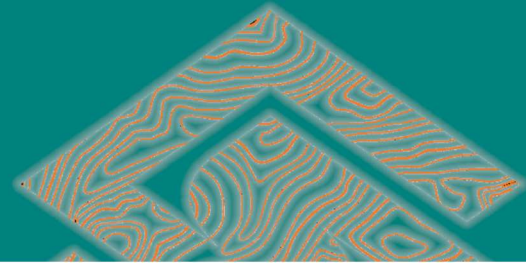


Figure 3: Sovereign's bespoke laboratory in Lilongwe, Malawi

To date, the Company has processed over 16,000 samples from the Kasiya rutile-graphite deposit at the Lilongwe facility. This has resulted in the Company reporting the largest natural rutile and second largest flake graphite deposit in the world delineated in just a three-year period.



Figure 4: Logging and weighing sample at Sovereign's bespoke Malawi laboratory



## LABORATORY UPGRADES & UPSCALING

The Company has recently commenced an upscale and upgrade program of the Lilongwe laboratory to allow processing of about 500 tonnes of raw ore feed per annum (subject to Malawi Government regulatory approvals) resulting in continuous production flake graphite and natural rutile bulk samples.

Raw ore samples will be provided from processing remaining Kasiya resource drill-hole samples in storage and further planned bulk spiral auger drilling at Kasiya. A newly acquired 300mm diameter bulk sampling spiral bit will allow approximately 2 to 2.5 tonnes of representative sample to be acquired per 20m hole.

Key upgrades planned, completed or underway at the laboratory to enable bulk scale production of graphite pre-concentrate and HMC containing rutile include;

### **Sizing and desliming**

Acquisition of two Kwatani 30 inch shaking screens including one single deck and one double deck model with associated sumps, pumps, piping, and electrical components. This will increase the sizing and desliming capacity throughput to approximately 2 tonnes of raw sample per day or around 300kg per hour. This should produce approximately 150kg per hour of clean sand containing rutile and graphite to feed the wet shaking table.

### **Shaking table**

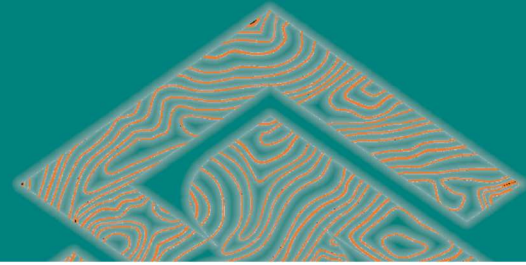
A Holman-Wilfley 2000 Series shaking table has been ordered and is currently under fabrication. The table is rated to process up to 450kg per hour and will produce a bulk graphite concentrate with a targeted grade of 3-5% graphite, upgrading the original ore from approximately 1.5% contained graphite. The table also will produce a bulk rougher heavy mineral concentrate containing the rutile product which would be expected to grade between 25% and 40% rutile.



Figures 5 & 6: LHS: Kwatani shaking screens prepared for despatch to Malawi. RHS: An example of the Holman-Wilfley 2000 Series shaking table that has been ordered and is currently under fabrication

### **Water recycling system**

Installation of a water system for settling fines and recovering water for re-use in the process flowsheet is now complete - reducing the water usage and waste disposal requirements.



## GLOBAL CRITICAL MINERALS INITIATIVES

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In June 2022, the United States and its G7 partners launched the Partnership for Global Infrastructure and Investment to build clean energy supply chains. They also signed the Minerals Security Partnership to produce, process, and recycle critical minerals, including **graphite**.<sup>2</sup>

In August 2022, the US Senate's passage of the Inflation Reduction Act provided tax incentives and other financial support to develop critical minerals whilst providing US\$369 billion for climate and clean energy programs. **Graphite** was named in the list of critical minerals.<sup>3</sup>

Subsequently at Davos, in January 2023, European Commission President Ursula von der Leyen announced that a key pillar of the EU's new industrial strategy will be global partnerships to access inputs needed for industry.<sup>4</sup> This builds on existing EU initiatives, such as the European Battery Alliance and the Critical Raw Materials Act, which both aim to onshore and secure supply chains.

On 28 March 2023, in an effort to support their partnership as allies in the race to strengthen their critical mineral supply chains for electric vehicle batteries, the US and Japan Governments entered into an agreement on Strengthening Critical Minerals Supply Chains.<sup>5</sup> It is noteworthy that the definition of "critical minerals" under the Trade Agreement includes a list of only five minerals— **graphite**, cobalt, lithium, manganese, and nickel.

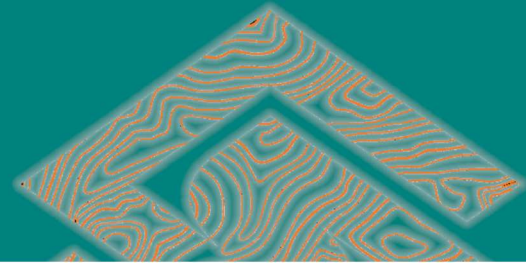
In April 2023, Japan's Ministry of Economy, Trade and Industry announced that it will subsidize up to half the cost of mine development and smelting projects for Japanese companies to secure critical minerals.<sup>6</sup> **Graphite**, lithium, manganese, nickel, cobalt, and rare earths are reportedly the main targets for this financial support.

In the same month, the G7 pledged US\$7 billion to secure a stable supply of critical minerals such as **graphite**. The funds are to be used for mine development and other projects.

*- END -*

### REFERENCES

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## Competent Person Statement

*The information in this announcement that relates to the Mineral Resource Estimate is extracted from the announcement dated 5 April 2023. The announcement is available to view on [www.sovereignmetals.com.au](http://www.sovereignmetals.com.au). Sovereign confirms that a) it is not aware of any new information or data that materially affects the information included in the announcement; b) all material assumptions included in the announcement continue to apply and have not materially changed; and c) the form and context in which the relevant Competent Persons' findings are presented in this report have not been materially changed from the announcement.*

*The information in this announcement that relates to Production Targets, Processing, Infrastructure and Capital and Operating Costs, is extracted from the announcement dated 16 June 2022 entitled 'Kasiya Expanded Scoping Study Results'. Sovereign confirms that: a) it is not aware of any new information or data that materially affects the information included in the announcement; b) all material assumptions and technical parameters underpinning the Production Target, and related forecast financial information derived from the Production Target included in the Announcement continue to apply and have not materially changed; and c) the form and context in which the relevant Competent Persons' findings are presented in this presentation have not been materially modified from the Announcement.*

## Forward Looking Statement

*This release may include forward-looking statements, which may be identified by words such as "expects", "anticipates", "believes", "projects", "plans", and similar expressions. These forward-looking statements are based on Sovereign's expectations and beliefs concerning future events. Forward looking statements are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of Sovereign, which could cause actual results to differ materially from such statements. There can be no assurance that forward-looking statements will prove to be correct. Sovereign makes no undertaking to subsequently update or revise the forward-looking statements made in this release, to reflect the circumstances or events after the date of that release.*

*This ASX Announcement has been approved and authorised for release by the Company's Managing Director, Dr Julian Stephens.*