

#### 8 February 2024

# FIRST SARYTOGAN GRAPHITE LITHIUM-ION BATTERIES OUTPERFORM

Sarytogan Graphite Limited (ASX: SGA, "the Company" or "Sarytogan") is pleased to report that the first lithium-ion batteries have been made with Sarytogan Graphite.

# **Highlights**

- Six coin-cell batteries were manufactured from Sarytogan Uncoated Spherical Purified Graphite (USPG).
- Consistently superior capacity demonstrated compared to many synthetic graphite anodes that are currently used in electric vehicles.
- Testing of Coated Spherical Purified Graphite (CSPG), to be commissioned imminently, is expected to improve performance further.
- Long-term charge and discharge cycling of these cells is continuing.

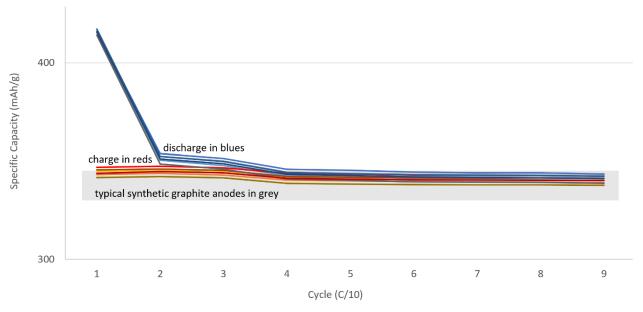


Figure 1 – Short-term galvanic cycling of six CR2016 lithium-ion batteries made with Sarytogan USPG

Sarytogan Managing Director, Sean Gregory commented:

"We are delighted with the achievement of this major and revolutionary technical milestone that demonstrates Sarytogan Graphite to be highly suitable for use in lithium-ion batteries. Sarytogan Graphite is proving itself to be a unique combination of high performance and lower costs due to its exceptionally high-grade microcrystalline nature. Investors can look forward to the well-advanced Pre-Feasibility Study quantifying the anticipated financial returns associated with the long list of superlatives that the Sarytogan Graphite deposit commands."



# **Battery Manufacture**

Six lithium-ion coin-cell batteries were manufactured by our American technology partner using Sarytogan USPG previously produced (refer ASX Announcement 19th December 2023). The different sized spheres that made up the high spheroidization yield of 54% reported were recombined to make what we now know to be Active Anode Material (AAM) with high tap density measured at 1.05 g/cm3. The AAM was dispersed into slurry and coated onto copper foil using the drawdown technique. The electrode was dried under vacuum and weighed. It was welded to the bottom can of a stainless-steel test cell of standard size, CR2016, being 20mm diameter by 1.6mm thick.

# **Battery Performance**

The batteries demonstrated reversible capacities ranging from 342 to 347 mAh/g across the six batteries tested (Figure 1, Figure 2). This is superior to many synthetic graphite products used in electric vehicle batteries which typically return specific capacities of 330 to 345 mAh/g (Figure 1). This is the first result and further optimisation is expected.

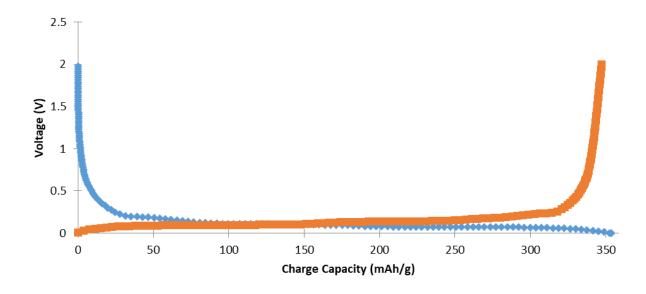


Figure 2 - Example Charge and Discharge curves for the Sarytogan batteries. Coin-cell 3, cycle 2.

Furthermore, all six cells were measured as having remarkably repeatable and consistent results. No significant degradation in performance was observed after nine rounds of 10-hour charge and discharge cycles (Figure 1).

These results are highly significant and pioneering because of the unique microcrystalline nature of Sarytogan Graphite, which sets it apart from the normal classification of natural graphite categories such as vein, flake, and amorphous. Sarytogan Graphite offers all the benefits of high performance at lower costs due to its exceptionally high-grade, natural microcrystalline sizing, high spheroidization yield, simple flowsheet, and proximity to market.



#### **Next Steps**

These tests on USPG cells will continue to cycle over the next three months to measure long-term performance.

A second round of testing will now be commissioned on CSPG. This is the value adding step of surface coating the USPG with carbon to reduce surface roughness further improve battery performance, particularly in the first cycle. This is the normal pathway for all electric vehicle battery anodes.

The Ultra High Purity Fines (UHPF) co-product is also undergoing characterization and testing for use as a cathode conductive additive.

These tests are all important inputs into the Pre-Feasibility Study which is on-track to be completed no later than Q3 this year.

Sarytogan is in discussions with several candidates for the position of Marketing Manager, either in-house or by agency to promote the emerging specifications for Sarytogan Graphite products amongst potential customers and move towards product offtake agreements.

This announcement is authorised by:

**Sean Gregory** 

**Managing Director** 

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# **About Sarytogan**

The Sarytogan Graphite Deposit is in the Karaganda region of Central Kazakhstan. It is 190km by highway from the industrial city of Karaganda, the 4th largest city in Kazakhstan (Figure 3).



Figure 3 - Sarytogan Graphite Deposit location.



The Sarytogan Graphite Deposit was first explored during the Soviet era in the 1980s with sampling by trenching and diamond drilling. Sarytogan's 100% owned subsidiary Ushtogan LLP resumed exploration in 2018. An Indicated and Inferred Mineral Resource has recently been estimated for the project by AMC Consultants totalling 229Mt @ 28.9% TGC (Table 1), refer ASX Announcement 27 March 2023). Sarytogan has upgraded the mineralisation to 99.87% purity by chemical purification (refer ASX Announcement 6 December 2022) and to 99.998% purity by thermal purification, without any chemical pre-treatment (refer ASX Announcement 7 December 2023). Furthermore, spheres of graphite have been made at a high yield (refer ASX Announcement 19 December 2023) and performance lithium-ion batteries has been demonstrated (refer ASX Announcement 8 February 2024). A Pre-Feasibility Study as part of its strategy to supply high-quality anode pre-cursor material for the rapidly growing electric vehicle battery market is well advanced and scheduled for completion no later than Q3 2024.

Table 1 - Sarytogan Graphite Deposit Mineral Resource (> 15% TGC).

Zone		In-Situ Tonnage (Mt)	Total Graphitic Carbon (TGC %)	Contained Graphite (Mt)
North	Indicated	87	29.1	25
	Inferred	81	29.6	24
	Total	168	29.3	49
Central	Indicated	39	28.1	11
	Inferred	21	26.9	6
	Total	60	27.7	17
Total	Indicated	126	28.8	36
	Inferred	103	29.1	30
	Total	229	28.9	66

# **Compliance Statement**

The information in this report that relates to other Exploration Results is cross referenced to the relevant announcements in the text. These reports are available at www.asx.com.au. The information in this report that relates to Sarytogan Mineral Resources was first reported in ASX announcement dated 27 March 2023.

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