

17 June 2024

## ANOTHER HIGH VALUE USE – LEAD ACID BATTERY ANODES

Sarytogan Graphite Limited (ASX: SGA, “the Company” or “Sarytogan”) is pleased to report high performance for lead acid batteries made with Sarytogan Ultra High Purity Graphite (UHPG) added to the anode.

### Highlights

- Sarytogan's inverted flowsheet delivers Ultra-High Purity Fines (UHPF) as the by-product for advanced industrial use at premium prices.
- Sarytogan UHPF has demonstrated superior performance as an additive to the anode in lead acid batteries.
- Lead acid batteries are the most widely used battery chemistry in the world, providing half of the world's rechargeable power.
- Graphite for this application is sold at US\$12,000 to US\$20,000 at high volumes.
- Pre-Feasibility Study on track for completion no later than September 2024.

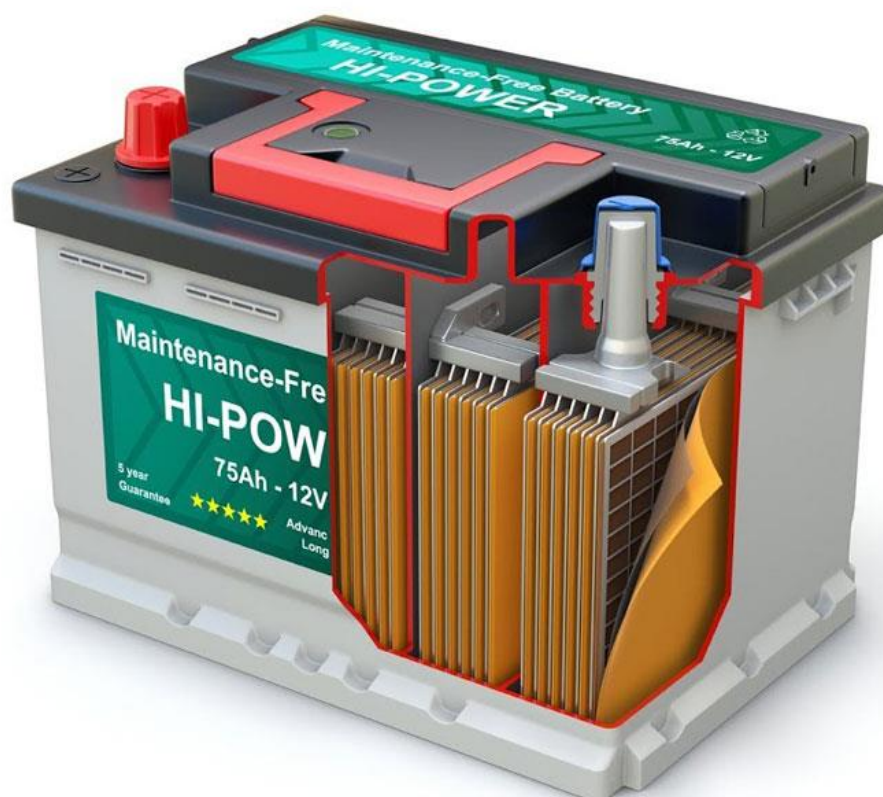


Figure 1 – Cut away of a typical 12 volt, 6-cell lead acid battery showing interlayered positive and negative plates, grids and separators.

Sarytogan Managing Director, Sean Gregory commented:

“Lithium-ion batteries rightly grab the headlines due to their enormous forecast growth for electric vehicles. The unique attribute of Sarytogan Graphite is that its inverted flowsheet purifies the graphite ahead of spheroidization generating Ultra High Purity Fines as a by-product. Sarytogan UHPF has been demonstrated to be suitable for use in alkaline batteries, lithium primary batteries and now lead acid batteries, all markets which command premium pricing.”

## Sarytogan Flowsheet and Product Mix

Sarytogan plans to produce 3 product types to place as many carbon units into as many markets as possible (Table 1) from its giant and exceptionally high-grade Mineral Resource (Table 2).

Table 1 - Sarytogan proposed products, demonstrated performance and pricing  
 (¹source: Wood Mackenzie, Lone Star Tech Minerals, Company analysis)

Product Groups	Micro-Crystalline	UHPF	USPG and CSPG
Grade (% C)	80 to 85	Up to 99.9992	>99.99
Indicative Pricing¹ (US\$/t)	\$400 to \$850	\$2,500 to \$20,000	\$2,500 to \$8,000
Uses	Traditional - Lubricants, Friction Products, Drilling Fluids, Foundry	Advanced – Alkaline, Lithium, and Lead Acid Batteries; Nuclear	Lithium-Ion Battery Anodes
ASX Announcements Demonstrating Performance	<a href="#">22 May 2024</a>	<a href="#">11 April 2024</a> <a href="#">14 May 2024</a> this announcement	<a href="#">8 February 2024</a> <a href="#">20 May 2024</a> <a href="#">11 June 2024</a>

Most USPG and CSPG producers undertake a spheroidization process ahead of purification, generating a lower-grade finely-sized by-product suitable only for traditional industrial markets. Sarytogan's inverted flowsheet envisages purification ahead of spheroidization (Figure 2). The by-product is UHPF, a premium priced product with many advanced battery and industrial applications. One of the markets for UHPF is anodes of lead acid batteries, the subject of this announcement.

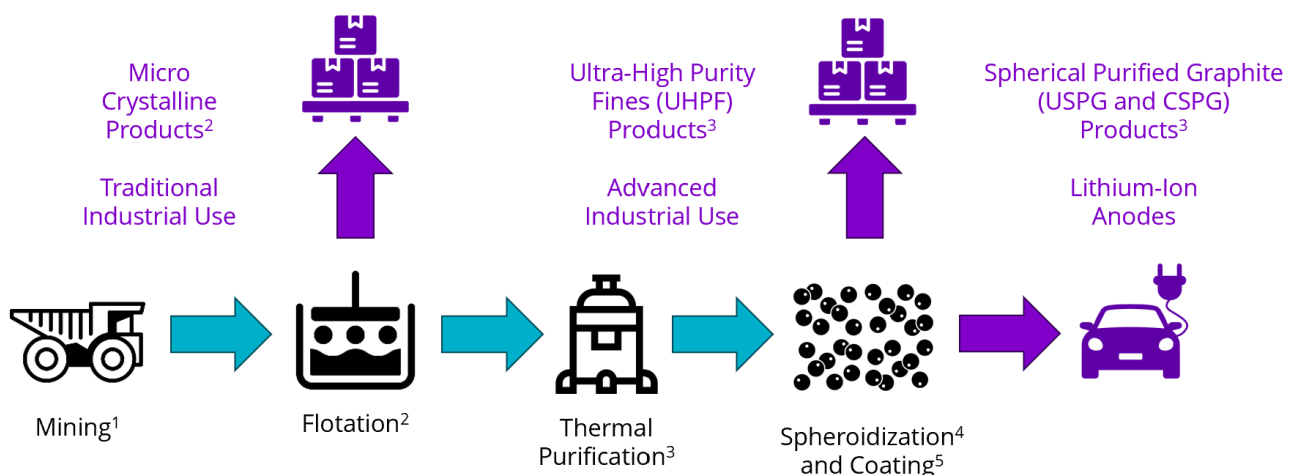


Figure 2 – Sarytogan Graphite Simplified Flowsheet and Product Mix  
 Refer ASX Announcements: <sup>1</sup> 27/3/23, <sup>2</sup> 13/11/23, <sup>3</sup> 5/3/23, <sup>4</sup> 19/12/23, <sup>5</sup> 12/6/24

## Lead Acid Battery Performance

Sarytogan's American Technology Partner manufactured lead acid battery cells with a nominal capacity of 12 Ah using Sarytogan UHPF. The UHPF made up half of the "expander" powder that is added to the negative electrode. The performance of the lead acid batteries was measured to have a higher and more consistent discharge capacity compared to control batteries manufactured with a leading expanded delaminated graphite product used in this application (Figure 3).

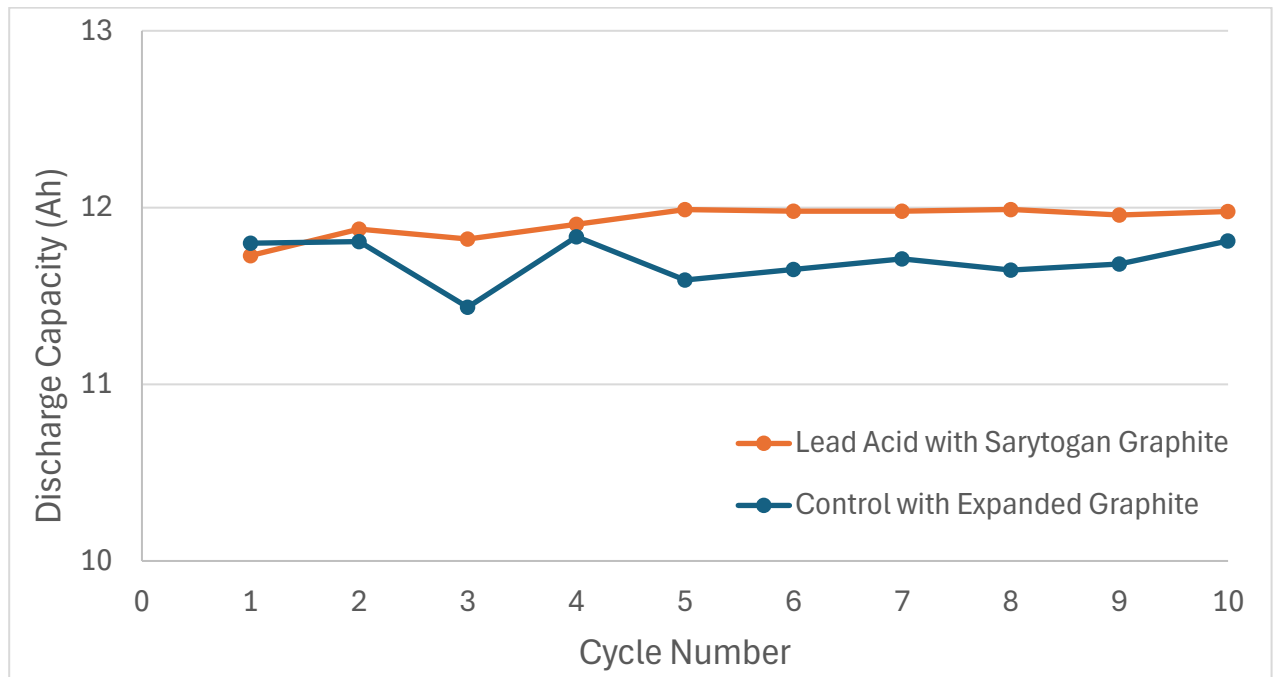


Figure 3 - Sarytogan Coated Spherical Purified Graphite Close Up

## Market

Lead acid batteries are the most widely used battery chemistry in the world, providing half of the world's rechargeable power. They are widely used in many applications including transportation, grid storage, and communications.

The lead acid battery market generated approximately 450GWh of capacity in 2021 in 300 million batteries. 200g to 250g of carbon or graphite is added to each battery, for a total market size of 60,000 to 75,000 tpa.

Lead acid batteries have many advantages over lithium-ion batteries as established and safe technology. They are lower-cost and being 95% recyclable, they are the sustainable choice for many applications in the green energy revolution.

The expanded graphite used in the control batteries for this test has a list price of US\$18,000 per tonne and sells at high volumes into the lead-acid battery market for US\$12,000 per tonne. Some high-performing high-purity graphite powers are sold into this market at up to US\$20,000 per tonne.

## Next Steps

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

This announcement is authorised by:

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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 4<sup>th</sup> largest city in Kazakhstan (Figure 4).



Figure 4 - 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 2, refer ASX Announcement 27 March 2023). Sarytogan has upgraded the mineralisation up to **99.9992% C** "five nines purity" by thermal purification, without any chemical pre-treatment (refer ASX Announcement 5 March 2024). 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 September 2024

Table 2 - Sarytogan Graphite Deposit Mineral Resource (> 15% TGC).

Zone	Classification (JORC Code)	In-Situ Tonnage (Mt)	Total Graphitic Carbon (TGC %)	Contained Graphite (Mt)
<b>North</b>	Indicated	87	29.1	25
	Inferred	81	29.6	24
	Total	168	29.3	49
<b>Central</b>	Indicated	39	28.1	11
	Inferred	21	26.9	6
	Total	60	27.7	17
<b>Total</b>	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](http://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.