

#### 6 December 2022

# **BREAKTHROUGH: 99.87% GRAPHITE PURITY**

Sarytogan Graphite Limited (ASX: SGA, "the Company" or "Sarytogan") is pleased to report a breakthrough in the metallurgical test work for the Sarytogan Graphite Deposit in Central Kazakhstan.

# Highlights

- Low-temperature alkaline roasting improved to 99.70% Total Graphitic Carbon (TGC)
- Alternative chemical purification process separately achieved 99.70% TGC
- Combining both alkaline roasting and chemical purification achieved 99.87% TGC
- Next Steps for Q1 2023 include further optimisation, spheroidization test-work, Mineral Resource upgrade, and commencement of economic studies.



	Mineral Resource	Grinding & Flotation	Alkaline Roasting	Chemical Purification	Spheroidization
Character	Inferred Iow-strip	premium micro- crystalline	caustic Iow-temp	acid	milling
Graphite Purity	209 Mt @ 28.5% TGC	84% TGC	99.70% TGC	99.87% TGC (99.70% without alkaline roasting)	target 99.95% TGC
Next Steps	Q1 2023 upgrade	optimisation	optimisation	optimisation	2023 test work planned

 Table 1 - Current progress of flow sheet development and graphite purity. Refer to Prospectus dated 23 February 2022, published on the ASX 14 July 2022, for full details of the Mineral Resource Estimate.

Sarytogan Managing Director, Sean Gregory commented:

"Sarytogan is thrilled with this breakthrough metallurgical result by our German laboratory partner Pro-Graphite. The graphite purities achieved are a significant step towards battery anode specification. Sarytogan's giant highgrade Mineral Resource is now complimented by its' premium micro-crystalline high-purity product, credentials that now elevate the project to be a potential answer to the world's projected battery anode material shortage."



# Metallurgical Results

Our German laboratory partners Pro-Graphite GmbH (Pro-Graphite) has reported metallurgical test work results for the Sarytogan Graphite Project.

A composite sample was blended from samples collected from six diamond drill holes; three from the Northern Graphite Zone and three from the Central Graphite Zone of the Sarytogan Graphite Deposit.

The composite sample was subjected to the same flotation and grinding steps as used by Independent Metallurgical Operations Pty Ltd (IMO) in Perth which achieved a premium microcrystalline sizing of approximately 10 micron (refer ASX Announcement 12 October 2022). The graphite purity achieved at this stage by Pro-Graphite was similar to IMO at 84% TGC, with a slight improvement due to the measurement method only.

The flotation concentrate was then upgraded by alkaline roasting at low-temperature with caustic soda and a weak sulphuric acid wash. A graphite purity of 99.70% TGC was achieved at this step, which is a significant improvement on the 92.1% TGC previously achieved by alkaline roasting (refer ASX Announcement 12 October 2022).

Separately, the flotation concentrate was upgraded by chemical purification (without the alkali roasting step), also to 99.70% TGC.

Despite the identical purity results achieved by alkaline purification and chemical purification separately, the different methods target different diluent minerals more effectively. Combining both methods in series has been even more effective with 99.87% TGC achieved so far.

# Battery Anode Product Strategy

These results are another step towards Sarytogan's strategy to target the rapidly growing battery anode materials market.

The product to support this strategy will be Uncoated Spherical Graphite (USpG). USpG presently trades at more than US\$3,000/t, which is approximately triple the price of traditional flake graphite products.

To achieve the specification of USpG, the Sarytogan concentrates will require milling to make spherical graphite balls of 5-20 micron in size and further purification to 99.95% TGC.

### Next Steps

IMO are continuing to optimise the flotation process, experimenting with different grind methods and sizes, desliming, and alternative reagents all aimed at designing the most economic method to generate flotation concentrate at similar purities to that already achieved.

Pro-Graphite continue to optimise the purification process. The residue from these tests is being assayed to assess its mineralogy and devise further process improvements, such as alternative acids, aimed at achieving even high purities.

Pro-Graphite are also planning initial spheroidization tests to determine the product yield and physical properties of Sarytogan USpG. This will require additional flotation concentrate to be manufactured, a requirement that is expected to grow as the project advances and for future



customer samples. To get ahead of this demand, Sarytogan is in discussions with several laboratories to upscale the production of flotation concentrate.

The HQ drilling program on site has now been efficiently and safely completed. Further drilling results announcements are planned as assays become available. The planned Mineral Resource upgrade targeting Indicated classification is on track for Q1 2023.

#### This announcement is authorised by the Board of Directors of the Company.

#### Sean Gregory

#### **Managing Director**

### About Sarytogan

The Sarytogan Graphite Deposit is located 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 1).

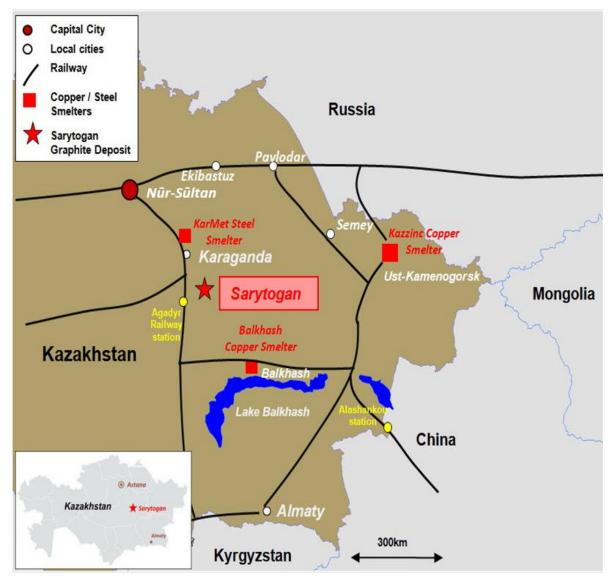


Figure 1 - Sarytogan Graphite Deposit location



The Sarytogan Graphite Deposit was first explored during the Soviet era in the 1980s with sampling by trenching and diamond drilling. Metallurgical test work utilising flotation, sintering, and leaching successfully produced graphite concentrate of up to 98.6% purity (reported in the 23 February 2022 Prospectus). Sarytogan has now achieved 99.9% purity by flotation, alkali roasting, and chemical purification and is pursuing a strategy to supply high-quality anode material for the rapidly growing battery market.

The project hosts an Inferred Mineral Resource of **209Mt @ 28.5% TGC for 60Mt contained graphite** estimated by CSA Global (Table 2). Sarytogan has completed significant additional drilling and plans to upgrade the Mineral Resource Estimate in Q1 2023.

Table 2 - Sarytogan Graphite Deposit Inferred Mineral Resource (cut-off grade of 15%). Refer to Prospectus dated23 February 2022, published on the ASX 14 July 2022, for full details of the Mineral Resource Estimate.

Zone	JORC	In-Situ	Total Graphitic	Contained
	Classification	Tonnage (Mt)	Carbon (IGC %)	Graphite (Mt)
North	Inferred	159	28.8	46
Central	Inferred	49	27.5	14
Total	Inferred	209	28.5	60

# **Competent Person's Statement**

The information in this report that relates to JORC estimates of Mineral Resources and historical Exploration Results was first reported in the Prospectus dated 23 February 2022 and published at <u>www.asx.com.au</u> on 14 July 2022. The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcement 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.

The information in this report that relates to 2022 Exploration Results is based on information compiled by Dr Waldemar Mueller, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy. Dr Mueller is a full-time employee of the Company and 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'. Dr Mueller consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this document that relates to metallurgical test work is based on, and fairly represents, information and supporting documentation reviewed by Mr Peter Adamini, BSc (Mineral Science and Chemistry), who is a Member of The Australasian Institute of Mining and Metallurgy (AusIMM). Mr Adamini is a full-time employee of Independent Metallurgical Operations Pty Ltd, who has been engaged by Sarytogan Graphite Ltd to provide metallurgical consulting services. Mr Adamini has approved and consented to the inclusion in this document of the matters based on his information in the form and context in which it appears.



# JORC Code, 2012 Edition – Table 1

### Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g., cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling. Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g., 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g., submarine nodules) may warrant	ConnentryQuarter HQ diamond core was sampled for metallurgical testing.These tests were completed on a composite of the following samples:ZoneHoleFromToGradeNorthSt-12117.2140.235.2%NorthSt-3011.033.023.5%NorthSt-416.022.033.8%CentSt-6010.048.030.8%CentSt-6111.026.336.0%CentSt-6511.018.132.8%
Drilling techniques	disclosure of detailed information. Drill type (e.g., core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g., core diameter, triple or standard tube, depth of diamond tails, face- sampling bit, or other type, whether core is oriented and if so, by what method, etc).	Core drilling was completed by an XY- 44T drill rig mounted on wheel-based mobile trailed platforms and equipped with a smooth-bore drill with a detachable core receiver of the Boart Longyear system equipped with double core tubes. Pre-drilling is completed with carbide crowns with a diameter of 112-132 mm to a depth of 2-4 m, followed by



Criteria	JORC Code explanation	Commentary
		casing. Drilling is carried out using a removable core receiver and HQ diamond crowns (diameter 96 mm), in rare cases, in complex geological conditions, diameter was reduced to NQ size (diameter 76 mm). Water was used as a washing liquid, and polymer solutions were used at absorption sites. All drill holes are vertical. At the completion of a drill hole, downhole survey is carried using a MIR-36 inclinometer with measurements every 20 m.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed. Measures taken to maximise sample recovery and ensure representative nature of the samples. Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	To maximise core recovery, double tube HQ and NQ core drilling was used, with the drilling utilising drillers experienced in drilling difficult ground conditions. Drill penetration rates and water pressure were closely monitored to maximise recovery. During the diamond drilling the length of each drill run and the length of sample recovered was recorded by the driller (driller's recovery). The recovered sample length was cross checked by the geologists logging the drill core and recorded as the final recovery. Average core recoveries are greater than 98%. At present, no relationships between sample recovery and grade bias due
		to loss/gain of fines or washing away of clay material has been identified. It is assumed that the grade of lost material is similar to the grade of the recovered core.
Logging	Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation,	All logging is completed on paper and later transferred to a digital media. The core documentation includes information on the length of the drill



Criteria	JORC Code explanation	Commentary
	mining studies and metallurgical studies. Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography. The total length and percentage of the relevant intersections logged.	runs, drilling diameter, core recovery and sampling intervals. Special attention was paid to the zones of graphitised rocks, lithology, alteration and mineralisation, the orientation of quartz veins and veinlets were studied in detail.
		All drill core is digitally photographed and completed in separate room using a specially designed stand that provides a fixed angle. The camera positioned at the same distance from the stand. The core is photographed in 2 stages before sawing and then after sawing. The most interesting samples are photographed at close distances. A collection of representative samples is used during logging to provide consistency with descriptions
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken. If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry. For all sample types, the nature, quality, and appropriateness of the sample preparation technique. Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling. Whether sample sizes are appropriate to the grain size of the material being sampled.	Quarter HQ diamond drill core was sampled for metallurgical testing. Most core was cut using an electric diamond saw and some more friable intervals were split manually. All core for sampling was pre-marked with the cut line, and only one side of the core was sent for assay to maintain consistency. The core sampling was generally at a 2 m interval, refined to match logged lithology and geological boundaries. A minimum sample length of 0.5 m was used. The quality of sampling is checked by comparing geological documentation and samples.
Quality of assay data	The nature, quality and appropriateness of the assaying and laboratory	The metallurgical test work was conducted at Pro-Graphite laboratory



	Commentary
procedures used and whether the technique is considered partial or total. For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc. Nature of quality control procedures adopted (e.g., standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e., lack of bias) and precision have been established.	in Germany. A master composite sample was blended from stage crushed (<3.35 mm) samples collected from quartered HQ diamond drill. Samples of 0.5 to 1kg were subjected to multiple grinding and flotation stages. The Total Graphitic Carbon (TGC) achieved at this stage was measured by Pro-Graphite as the difference between the Loss on Ignition (LOI) at 920 degrees and the LOI at 400 degrees in a nitrogen atmosphere. Caustic Soda was added to the flotation concentrate which was then roasted at low temperature. The residue was washed with water and leached with weak sulphuric acid. Hydrofluoric acid was not required for the successful alkali roasting result of 99.70% TGC. The TGC grades reported at this step and in subsequent steps is measured as the LOI result at 920 degrees. The volatiles at these high purities are negligible and industry practice is to report the LOI 920 result. Separately, the flotation concentrate was chemically purified with hydrofluoric acid.
The verification of significant intersections by either independent or alternative company personnel.	Visual validation of mineralisation against assay results was undertaken for several holes.
The use of twinned holes. Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	All diamond drill core samples were checked, measured, and marked up before logging in a high level of detail. The diamond drilling, sampling and geological data were recorded on paper into standardised templates and
	technique is considered partial or total. For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc. Nature of quality control procedures adopted (e.g., standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e., lack of bias) and precision have been established.



Criteria	JORC Code explanation	Commentary
		logging/sampling geologists. Geological logs and associated data were cross checked by the supervising Project Geologist.
		Laboratory assay results were individually reviewed by sample batch and the QC results checked before uploading. All geological and assay data were uploaded into Excel. This data was then validated for integrity visually and by running systematic checks for any errors in sample intervals, out of range values and other important variations.
		All drill core was photographed with corrected depth measurements before sampling.
		Mineralisation observed was entirely compatible with reported assays in both drill core.
		No specific twin holes were drilled; however, some recent drill holes were placed and drilled close to the historical holes. Similar grades and distribution were observed in the recent drill holes.
Location of data points	Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation. Specification of the grid system used. Quality and adequacy of topographic control.	Topographic and geodetic works were carried out using modern, high- precision, satellite geodetic equipment — a single-frequency 12-channel GPS Sokia GRX1, represented by a base station and mobile receiver with a GPS antenna. The device at the measurement time has valid calibration certificates.
		For this report the holes were set out using the Sokia instrument and have been picked up by handheld GPS in the interim.
		The grid system used at the deposit is the WGS84 UTM Zone 43 coordinate



Criteria	JORC Code explanation	Commentary
		system, Baltic elevation system.
		Downhole survey was carried out with a gyro instrument. Measurements of the angle and azimuth are carried out every 20 m.
		Control measurements have not revealed any inconsistencies and errors.
		The accuracy of the Sokia GRX1 results in deviations of no more than 10 cm.
Data spacing and distribution	Data spacing for reporting of Exploration Results. Whether the data spacing, and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. Whether sample compositing has been applied.	The density of the drill holes within the estimated limits of the proposed open pit mining area is 40-100 m between the drill holes on each section. The distances between the sections is 250 m, and the depths of the drill holes varies between 60 and 300 m. The grid is sufficient to trace mineralisation zones.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	The spatial position of the graphite zones is confined structurally to the western and southwestern limbs of the Shiyozek fold, complicated by the large curved Sarytoganbai syncline which trends in northeast and east directions. The North zone has a strike length of 2,300 m, a width of between 110 and 500 m, and a depth up to 190 m. The weighted average TGC for drill holes is 32.42% (for 20% cut-off). The average depth is 100 m. The Central zone has a strike length of 2,900 m, a width of between 86 and 114 m on the flanks up to 450 m in the centre, and a depth up to 80 m, with an average of 40 m. The weighted
		an average of 40 m. The weighted average graphite carbon content is 28.12% (for 20% cut-off).



Criteria	JORC Code explanation	Commentary
Sample security	The measures taken to ensure sample security.	Control over the security of samples is carried out throughout the entire process. Each sample is assigned a unique number. The core samples selected after logging are transferred (with the corresponding orders and sample registers) to the sample preparation facilities, which is located in the Ekibastuz city. In the sample preparation laboratory, each sample underwent the entire processing cycle in compliance with all necessary requirements for the preservation of samples and the prevention of their contamination.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	A desktop review of the 2019 sampling techniques and data was carried out by CSA Global. The Competent Person from CSA Global also visited the site and sample preparation laboratory during August 2022. The results of this audit are pending and will be applied to the ongoing drilling and for the planned Mineral Resource upgrade. Visual validation of the drill hole and mineralised intersections was undertaken against hard copy drill sections and provided core photographs.

# Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral	Type, reference name/number, location	The exploration licence 1139-R-TPI
tenement and	and ownership including agreements or	(1139-P-TПИ) was issued to Ushtogan
land tenure	material issues with third parties such as	LLP on 14/08/2018 and confirmed by
status	joint ventures, partnerships, overriding	5406-TPI (5406-TПИ) contract on
	royalties, native title interests, historical	26/10/2018. The contract was extended
	sites, wilderness or national park and	in June 2022 for a further 3 years to
	environmental settings.	June 2025. The exploration concession
	The security of the tenure held at the time	covers 70 km2.
	of reporting along with any known	There are no other mineral deposits



Criteria	JORC Code explanation	Commentary
	impediments to obtaining a licence to operate in the area.	and protected natural areas within the concession area.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	In the period from 1985 to 1987, geological exploration was carried out by the Graphite party of the Karaganda State Regional geological expedition.
		Since 2019, exploration drilling is being carried out by Ushtogan LLP a 100% owned subsidiary of Sarytogan Graphite Limited.
Geology	Deposit type, geological setting, and style of mineralisation.	Structurally, the Sarytogan site is confined to the western and southwestern wing of the Shiyozek fold, complicated by a large curved Sarytoganbai syncline which trends in northeast and east directions.
		In general, the Sarytogan site is a large, over-intrusive zone; the volcanic and sedimentary rocks developed here have undergone extensive contact metamorphism; volcanogenic and terrigenous rocks are transformed into quartz-biotite, quartz-sericite hornfels; carbonaceous rocks are either altered into hornfels, or underwent significant graphitisation, and along contacts with intrusive granite domes, quartz- tourmaline and tourmaline hydrothermal rocks of the greisen type are developed.
		The deposit belongs to the black shale regional-metamorphic type and represents a carbon-bearing conglomerate sequence with a greisen zone with a thickness of more than 80 m in the over-intrusive zone of the granite massif that compose the Sarytoganbai syncline. Host rocks include graphite siltstone and graphite shale.



Criteria	JORC Code explanation	Commentary
Drill hole Information	A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: <ul> <li>easting and northing of the drill hole collar</li> <li>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</li> <li>dip and azimuth of the hole</li> <li>down hole length and interception depth</li> <li>hole length.</li> </ul> If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	Refer to the Prospectus dated 23 February and published on the ASX on 14 July 2022 and ASX Announcements dated 15 August 2022, 19 September 2022, and 8 November 2022 for all drilling results reported to date.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g., cutting of high grades) and cut-off grades are usually Material and should be stated. Where aggregate intercepts incorporate short lengths of high-grade results and longer lengths of low-grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. The assumptions used for any reporting of metal equivalent values should be clearly stated.	Intervals are reported at a 10% TGC cut-off with up to 2m internal dilution. Higher-grade 'inc' zones are reported at a 35% cut-off at a minimum thickness of 4m and with up to 6m internal dilution.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results. If the geometry of the mineralisation with respect to the drill hole angle is known, its	The deposit is hosted in folded meta- sediments that vary in dip angle. The relationship between the drillholes and the meta-sediment dip is shown in the cross sections. Vertical holes are considered appropriate to define the



Criteria	JORC Code explanation	Commentary
	nature should be reported. If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g., 'down hole length, true width not known').	mineralisation envelope at this stage.
Diagrams	Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	Refer to diagrams in the respective drilling results announcements.
Balanced reporting	Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	The metallurgical testwork program has been exploratory in nature, testing several different pathways. The results of the preferred pathway is presented here.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	In 2019, drilling, analytical, metallurgical studies of small bulk samples and petrographic studies have been carried out at the deposit. The Prospectus dated 23 February 2022 available at asx.com.au also details historical metallurgical tests on the Sarytogan Graphite Deposit. Further metallurgical test work is underway and ongoing.
Further work	The nature and scale of planned further work (e.g., tests for lateral extensions or depth extensions or large-scale step-out drilling). Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	A Mineral Resource Estimate upgrade is planned for Q1 2023. Metallurgical testwork is ongoing in Australia and Germany.