



ASX ANNOUNCEMENT | 15 MAY 2024

DOWNSTREAM TESTWORK DEMONSTRATES HIGH QUALITY GRAPHITE FOR LITHIUM-ION BATTERIES

- Spherical Purified Graphite (SPG) with world-leading specifications successfully produced from Kasiya
- Kasiya's spherical graphite purification demonstrated exceptionally low levels of residual impurities achieving a 99.99% loss-on-ignition (LOI)
- Kasiya SPG demonstrated all required parameters within industry standards with spheronisation yields of up to 68% with further scope to optimise in future testwork
- Testwork was undertaken as part of the Company's graphite strategy to qualify and commercialise graphite concentrate for use in the lithium-ion battery sector

Sovereign Metals Limited (ASX:SVM; AIM:SVML) (the **Company** or **Sovereign**) is pleased to announce the results of downstream testwork conducted at leading, independent consultancy ProGraphite GmbH (**ProGraphite**) in Germany.

Sovereign provided Kasiya graphite concentrate to ProGraphite to produce and characterise coated spherical purified graphite (**CSPG**) active anode material for lithium-ion batteries. The overall program includes shaping and purification to produce SPG, coating of the material to produce CSPG and evaluation of the electrochemical performance of Kasiya CSPG in a battery. The initial steps of shaping and purification to produce SPG have now been completed with the results showing Kasiya SPG has world-leading specifications.

This SPG material is now undergoing coating and electrochemical testing to characterise CSPG active anode material for lithium-ion batteries.

Table 1: Spherical Graphite Purification Results			
	SVM Spherical graphite <180 µm concentrate	SVM Spherical graphite >180 µm concentrate	Chinese Standard ¹
LOI Purity (%)	99.99%	99.99%	>99.95%
Fe	4.4 ppm	3.3 ppm	<30 ppm
Na	<1.0 ppm	<1.1 ppm	<10 ppm
Cr	1.1 ppm	0.4 ppm	<10 ppm
Cu	0.7 ppm	0.2 ppm	<10 ppm
Ni	<0.3 ppm	<0.4 ppm	<10 ppm
Al	6.6 ppm	8.8 ppm	<10 ppm
Mo	<0.3 ppm	<0.3 ppm	<10 ppm
Si	7 ppm	10 ppm	<30 ppm
Ca	4.3 ppm	8.4 ppm	<10 ppm

1. National Standard of China – Spherical Graphite (GB/T 38887-2020)

The micronisation and spheronisation of Kasiya graphite concentrates achieved excellent yields to spherical graphite for the coarse concentrate and typical yields to spherical graphite for the fines concentrate, with room for further optimisation. The spherical graphite from the fine graphite concentrate in particular exhibited a narrow particle size distribution (D90/D10) ratio and both spherical graphite have reasonable Tap Density and typical BET for uncoated graphite. Coating of the graphite is expected to improve (increase) the tap density and improve (lower) the BET specific surface area.

Table 2: Concentrate Shaping into Spherical Graphite Results		
	Kasiya Concentrate (<180 µm)	Kasiya Concentrate (>180 µm)
D50 (microns)	16.53	17.74
D90/D10 Ratio	2.29	2.96
Yield to Spherical Graphite	40%	68%
Tap Density (g/cm ³)	0.93	0.93
BET Specific Surface Area (m ² /g)	7.73	6.72

The spherical graphite products were purified with commercially proven acids purification and achieved excellent results with an exceptionally high LOI purity of 99.99%. Assays on key trace elements (Fe, Na, Cr, Cu, Al, Mo) show very low levels.

Further, the low Si and Ca results highlight that high quality Kasiya graphite is well-suited to single stage acids purification. Aggressive dosing in acids purification can result in elevated Ca levels due to precipitation of CaF₂, necessitating multiple stages of purification to reduce both Si and Ca impurities. These initial purification results indicate that a single purification stage is sufficient for Kasiya graphite concentrate.

The SPG samples will undergo coating and electrochemical tests to provide baseline data for offtake discussions. The results of these tests are expected in the coming weeks.

Managing Director Frank Eagar commented: *“These results clearly demonstrate that Kasiya has the potential to disrupt the China dominated graphite supply chain as a long term, secure source of high quality graphite ex-China. We believe Kasiya graphite will have industry low operating costs and is also one of the largest graphite resources globally holding a significant advantage over its graphite peers. We are very pleased to achieve these outstanding results at this stage of the program and will continue fast tracking our graphite product development and qualification campaign.”*

ENQUIRIES

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Competent Person Statement

The information in this report that relates to Metallurgical Testwork is based on information compiled by Dr Surinder Ghag, PhD., B. Eng, MBA, M.Sc., who is a Member of the Australasian Institute of Mining and Metallurgy (MAusIMM). Dr Ghag is engaged as a consultant by Sovereign Metals Limited. Dr Ghag has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking, 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 Ghag 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 report that relates to Exploration Results is based on information compiled by Mr Samuel Moyle, a Competent Person who is a member of The Australasian Institute of Mining and Metallurgy (AusIMM). Mr Moyle is the Exploration Manager of Sovereign Metals Limited and a holder of ordinary shares and unlisted performance rights in Sovereign Metals Limited. Mr Moyle 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'. Mr Moyle consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

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 announcement has been approved and authorised for release by the Company's Managing Director & CEO, Frank Eagar.

APPENDIX 1: JORC CODE, 2012 EDITION – TABLE 1

SECTION 1 - SAMPLING TECHNIQUES AND DATA

Criteria	JORC Code explanation	Commentary
Sampling Techniques	<i>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.</i>	<p>Metallurgical Composite Sample:</p> <p>The sample was a composite of 24 Hand Auger (HA) and Push Tube (PT) holes drilled in 2022 in the Kingfisher pit.</p> <p>All drilling samples within the pit shell were added to the composite resulting in a sample of 2,498kg.</p> <p>Specifically, the composite sample consisted of selected rutile mineralised zones from holes, NSHA0009, 0010, 0056, 0060, 0061, 0074, 0119, 0311, 0343, 0344, 0345, 0350 and NSPT 0011, 0013, 0014, 0015, 0017, 0020, 0021, 0023, 0024, 0025, 0026, 0027.</p> <p>The following workflow was used to generate a pre-concentrate graphite feed at AML:</p> <ul style="list-style-type: none"> • Wet screen at 2mm to remove oversize • Two stage cyclone separation at a cut size of 45µm to remove -45µm material • Pass +45µm -2mm (sand) fraction through Up Current Classifier (UCC) • Pass UCC O/F through cyclone at cut point of 45µm • Pass UCC O/F cyclone U/F (fine) over MG12 Mineral Technologies Spiral • Pass UCC U/F (coarse) over MG12 Mineral Technologies Spiral • Spiral cons are combined for further processing. <p>Fine and coarse gravity tailing samples contain approximately 75%-80% of the graphite present in the feed sample. The majority of the graphite lost is contained in the -45µm fines.</p>
	<i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i>	<p>Placer Consulting (Placer) Resource Geologists have reviewed Standard Operating Procedures (SOPs) for the collection of HA and PT drill samples and found them to be fit for purpose.</p> <p>Drilling and sampling activities are supervised by a suitably qualified Company geologist who is present at all times. All bulk 1-metre drill samples are geologically logged by the geologist at the drill site.</p> <p>The primary metallurgical composite sample is considered representative for this style of mineralisation.</p>
	<i>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 disclosure of detailed information.</i>	<p>HA drilling was used to obtain 1-metre samples. The bulk metallurgical sample was a composite of selected samples from routine resource drilling.</p> <p>Existing rutile and graphite exploration results were used to determine the 1-metre intervals suitable to contribute to the two bulk sample composites.</p>
Drilling Techniques	<i>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).</i>	<p>Hand-auger drilling is completed with 75mm diameter enclosed spiral bits with 1-metre long steel rods. Each 1m of drill sample is collected into separate sample bags and set aside. The auger bits and flights are cleaned between each metre of sampling to avoid contamination.</p> <p>Placer has reviewed SOPs for hand-auger drilling and found them to be fit for purpose and support the resource classifications as applied to the MRE.</p>
Drill Sample Recovery	<i>Method of recording and assessing core and chip sample recoveries and results assessed.</i>	<p>The configuration of drilling and nature of materials encountered results in negligible sample loss or contamination.</p> <p>Samples are assessed visually for recoveries. Overall, recovery is good. Drilling is ceased when recoveries become poor generally once the water table has been encountered.</p> <p>Auger drilling samples are actively assessed by the geologist onsite for recoveries and contamination.</p>

Criteria	JORC Code explanation	Commentary
	<i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i>	The Company's trained geologists supervise auger drilling on a 1 team 1 geologist basis and are responsible for monitoring all aspects of the drilling and sampling process.
	<i>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.</i>	No bias related to preferential loss or gain of different materials has occurred.
Logging	<i>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation mining studies and metallurgical studies.</i>	All individual 1-metre auger intervals are geologically logged, recording relevant data to a set template using company codes.
	<i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.</i>	All logging includes lithological features and estimates of basic mineralogy. Logging is generally qualitative.
	<i>The total length and percentage of the relevant intersection logged</i>	100% of samples are geologically logged.
Sub-sampling techniques and sample preparation	<i>If core, whether cut or sawn and whether quarter, half or all core taken.</i>	Not applicable – no core drilling conducted.
	<i>If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.</i>	Primary individual 1-metre samples from all HA and PT holes drilled are sun dried, homogenised and riffle split.
	<i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i>	<p>Metallurgical Composite Sample:</p> <p>1-metre intervals selected for the 2,498kg metallurgical sample were divided into weathering units.</p> <p>MOTT and PSAP material were combined and homogenised in preparation for dispatch to Australian laboratory Intertek for TGC assay.</p> <p>Per Australian import quarantine requirements the contributing SOIL/FERP material from within 2m of surface was kept separate to undergo quarantine heat treatment at Intertek Laboratory on arrival into Australia.</p> <p>The two sub samples (SOIL/FERP and MOTT/PSAP) were then dispatched from Intertek to AML Laboratory (AML). AML sub-sampled and assayed the individual lithologies prior to combining and homogenising the sample in preparation for test-work.</p>
	<i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i>	The sample preparation techniques and QA/QC protocols are considered appropriate for the nature of this test-work.
	<i>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.</i>	The sampling best represents the material in situ.
	<i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i>	The sample size is considered appropriate for the nature of the test-work.
Quality of assay data and laboratory tests	<i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i>	<p>Metallurgical Composite Sample:</p> <p>The following workflow was used to generate a graphite product;</p> <ul style="list-style-type: none"> ○ Coarse and fine rougher graphite flotation ○ Polishing grind of coarse and fine rougher graphite concentrate ○ Cleaner flotation of coarse and fine graphite ○ Cleaner concentrate sizing at 180µm ○ Regrind of separate +180µm/-180µm fractions ○ Three stage recleaner flotation of +180µm/-180µm fractions
	<i>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.</i>	Acceptable levels of accuracy and precision have been established. No handheld methods are used for quantitative determination.
	<i>Nature of quality control procedures adopted (e.g. standards, blanks, duplicate, external laboratory checks) and whether acceptable levels of</i>	Acceptable levels of accuracy and precision have been established in the preparation of the bulk sample composites.

Criteria	JORC Code explanation	Commentary
	<i>accuracy (i.e. lack of bias) and precision have been established.</i>	
Verification of sampling & assaying	<i>The verification of significant intersections by either independent or alternative company personnel.</i>	No drilling intersections are being reported.
	<i>The use of twinned holes.</i>	No twin holes completed in this program.
	<i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i>	All data was collected initially on paper logging sheets and codified to the Company's templates. This data was hand entered to spreadsheets and validated by Company geologists.
	<i>Discuss any adjustment to assay data.</i>	No adjustment to assay data has been made.
Location of data points	<i>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.</i>	A Trimble R2 Differential GPS is used to pick up the collars. Daily capture at a registered reference marker ensures equipment remains in calibration. No downhole surveying is completed. Given the vertical nature and shallow depths of the holes, drill hole deviation is not considered to significantly affect the downhole location of samples.
	<i>Specification of the grid system used.</i>	WGS84 UTM Zone 36 South.
	<i>Quality and adequacy of topographic control.</i>	DGPS pickups are considered to be high quality topographic control measures.
Data spacing & distribution	<i>Data spacing for reporting of Exploration Results.</i>	Metallurgical Composite Sample: The hand-auger holes contributing to this metallurgical were selected from pit area Kingfisher and broadly represent early years of mining as contemplated in the PFS (Approximately the first three years). It is deemed that these holes should be broadly representative of the mineralisation style in the general area.
	<i>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.</i>	Not applicable, no Mineral Resource or Ore Reserve estimations are covered by new data in this report.
	<i>Whether sample compositing has been applied.</i>	Metallurgical Composite Sample: The sample was composited as described under Sampling Techniques in this Table.
Orientation of data in relation to geological structure	<i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known considering the deposit type</i>	No bias attributable to orientation of sampling has been identified.
	<i>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.</i>	All holes were drilled vertically as the nature of the mineralisation is horizontal. No bias attributable to orientation of drilling has been identified.
Sample security	<i>The measures taken to ensure sample security</i>	Samples are stored in secure storage from the time of drilling, through gathering, compositing and analysis. The samples are sealed as soon as site preparation is complete. A reputable international transport company with shipment tracking enables a chain of custody to be maintained while the samples move from Malawi to Australia or Malawi to Johannesburg. Samples are again securely stored once they arrive and are processed at Australian laboratories. A reputable domestic courier company manages the movement of samples within Perth, Australia. At each point of the sample workflow the samples are inspected by a company representative to monitor sample condition. Each laboratory confirms the integrity of the samples upon receipt.
Audits or reviews	<i>The results of any audits or reviews of sampling techniques and data</i>	It is considered by the Company that industry best practice methods have been employed at all stages of the exploration. Malawi Field and Laboratory visits have been completed by Richard Stockwell in May 2022. A high standard of operation, procedure and personnel was observed and reported.

SECTION 2 - REPORTING OF EXPLORATION RESULTS

Criteria	Explanation	Commentary
Mineral tenement & land tenure status	<i>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environment settings.</i>	<p>The Company owns 100% of the following Exploration Licences (ELs) under the Mines and Minerals Act 2019 (Malawi), held in the Company's wholly-owned, Malawi-registered subsidiaries: EL0609, EL0582, EL0492, EL0528, EL0545, EL0561, EL0657 and EL0710.</p> <p>A 5% royalty is payable to the government upon mining and a 2% of net profit royalty is payable to the original project vendor.</p> <p>No significant native vegetation or reserves exist in the area. The region is intensively cultivated for agricultural crops.</p>
	<i>The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.</i>	The tenements are in good standing and no known impediments to exploration or mining exist.
Exploration done by other parties	<i>Acknowledgement and appraisal of exploration by other parties.</i>	Sovereign Metals Ltd is a first-mover in the discovery and definition of residual rutile and graphite deposits in Malawi.
Geology	<i>Deposit type, geological setting and style of mineralisation</i>	<p>The rutile deposit type is considered a residual placer formed by the intense weathering of rutile-rich basement paragneisses and variable enrichment by eluvial processes.</p> <p>Rutile occurs in a mostly topographically flat area west of Malawi's capital, known as the Lilongwe Plain, where a deep tropical weathering profile is preserved. A typical profile from top to base is generally soil ("SOIL" 0-1m) ferruginous pedolith ("FERP", 1-4m), mottled zone ("MOTT", 4-7m), pallid saprolite ("PSAP", 7-9m), saprolite ("SAPL", 9-25m), saprock ("SAPR", 25-35m) and fresh rock ("FRESH" >35m).</p> <p>The low-grade graphite mineralisation occurs as multiple bands of graphite gneisses, hosted within a broader Proterozoic paragneiss package. In the Kasiya areas specifically, the preserved weathering profile hosts significant vertical thicknesses from near surface of graphite mineralisation.</p>
Drill hole information	<i>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: easting and northings of the drill hole collar; elevation or RL (Reduced Level-elevation above sea level in metres of the drill hole collar); dip and azimuth of the hole; down hole length and interception depth; and hole length</i>	<p>All intercepts relating to the Kasiya Deposit have been included in public releases during each phase of exploration and in this report. Releases included all collar and composite data and these can be viewed on the Company website.</p> <p>There are no further drill hole results that are considered material to the understanding of the exploration results. Identification of the broad zone of mineralisation is made via multiple intersections of drill holes and to list them all would not give the reader any further clarification of the distribution of mineralisation throughout the deposit.</p>
	<i>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</i>	No information has been excluded.
Data aggregation methods	<i>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.</i>	No data aggregation was required.
	<i>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.</i>	No data aggregation was required.
	<i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i>	Not applicable
Relationship between mineralisation widths & intercept lengths	<i>These relationships are particularly important in the reporting of Exploration Results.</i>	<p>The mineralisation has been released by weathering of the underlying, layered gneissic bedrock that broadly trends NE-SW at Kasiya North and N-S at Kasiya South. It lies in a laterally extensive superficial blanket with high-grade zones reflecting the broad bedrock strike orientation of ~045° in the North of Kasiya and 360° in the South of Kasiya.</p> <p>No drilling intercepts are being reported.</p>

Criteria	Explanation	Commentary
	<i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i>	The mineralisation is laterally extensive where the entire weathering profile is preserved and not significantly eroded. Minor removal of the mineralised profile has occurred where alluvial channels cut the surface of the deposit. These areas are adequately defined by the drilling pattern and topographical control for the resource estimate.
	<i>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').</i>	No drilling intercepts are being reported.
Diagrams	<i>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 the drill collar locations and appropriate sectional views.</i>	Refer to figures in previous releases. These are accessible on the Company's webpage.
Balanced reporting	<i>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.</i>	All results are included in this report and in previous releases. These are accessible on the Company's webpage.
Other substantive exploration data	<i>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.</i>	Limited lateritic duricrust has been variably developed at Kasiya, as is customary in tropical highland areas subjected to seasonal wet/dry cycles. Lithological logs record drilling refusal in just under 2% of the HA/PT drill database. No drilling refusal was recorded above the saprock interface by AC drilling. Sample quality (representivity) is established by geostatistical analysis of comparable sample intervals.
Further work	<i>The nature and scale of planned further work (e.g. test for lateral extensions or depth extensions or large-scale step-out drilling).</i>	The Company is currently in a project optimisation phase with various work programs underway.
	<i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i>	Refer to diagrams in previous releases. These are accessible on the Company's webpage.