



ACTIVE ANODE MATERIALS PLANT (AAMP) PURIFICATION SUCCESS

- More than 500 purification tests conducted by Australia's national science agency, CSIRO, on Skaland and Munglinup graphite concentrates, including optimisation, scale-up and lock-cycle testing
- Process continues to achieve purities of up to 99.98% for Skaland and 99.99% for Munglinup spherical graphite, resulting in high levels of confidence in its robustness
- Battery grades continue to be achieved by CSIRO at increasing scale
- Excellent recoveries (~90%) to purified spherical graphite product
- Data packs being compiled from scale-up testwork to support purification flowsheet and cost estimates update
- Options for larger-scale pilot plant development including micronisation, spheronisation and purification under evaluation
- Samples sent for customer evaluation
- Planning for purification tests on graphite anode material recovered from lithium-ion batteries recycling in progress

Mineral Commodities Limited ("MRC" or "the Company") is pleased to announce that CSIRO has successfully completed the majority of optimisation and scale-up testwork in the Australian Federal Government Cooperative Research Centres Project's ("CRC-P") collaboration with MRC, and Doral Fused Materials ("Doral").

The process under development at CSIRO targets the development of a more environmentally sustainable purification process in comparison to the current practice of purification with toxic hydrofluoric acid, targeting the purification of graphite to minimum purities of 99%, 99.5%, and 99.95% (battery grades).

The collaboration has taken the caustic-based process through eleven stages of testing, comprising 502 tests. It has targeted testing on: different feed sources (Munglinup and Skaland), different feed types (spherical graphite, spheronisation fines and flake graphite), increasing scale, and optimisation of reagents consumption, including 64 tests incorporating reagents recycling (lock-cycle tests). Pleasingly, the process continued to achieve battery grades and high recoveries of feed to purified product.

The process achieved purities of up to 99.98% and 99.99% respectively for Skaland and Munglinup spherical graphite on scale-up from lab to mini-pilot scale, exceeding the battery grade targets of 99.95% and resulting in high levels of confidence in its robustness.

Loss of Ignition (LOI) values and residual impurity elements (by inductively coupled plasma (ICP) on LOI ash) are summarised in Table 1 below, for a sample of spherical graphite produced from Skaland concentrate and a sample of spherical graphite produced from Munglinup concentrate, showing the highest residual metal impurities. All are below the maximum specifications for battery anodes, and many below 1ppm. The variation between samples from a single source represent different test conditions. The residual impurities are particularly low for the Munglinup spherical graphite.

Table 1 Residual metal Impurities of purified spherical graphite (by ICP on LOI ash)

Source	LOI (%)	Residual Impurities by ICP (ppm)						
		Al	Fe	Si	Mg	Ca	Na	Ti
Skaland	99.98	8.6	14.1	13.4	0.2	0.4	12.3	1.0
Skaland	99.98	5.3	10.6	10.9	4.5	1.3	18.6	0.4
Skaland	99.97	0.1	1.1	0.7	3.3	0.7	1.4	0.0
Munglinup	99.99	2.2	3.5	1.8	0.7	0.3	10.1	0.1
Munglinup	99.98	0.0	0.6	0.5	0.0	0.0	1.2	0.0
Munglinup	99.99	0.5	2.2	1.7	0.4	0.2	2.8	0.1

These results are particularly pleasing given that they are from lock-cycle tests where process reagents are recycled to reduce overall reagents consumption, rather than purified with fresh reagents only. Lock-cycle tests are more representative of industrial processes where the build-up of impurities in recycle streams need to be managed to ensure product quality is achieved whilst minimising reagent consumption. Further process optimisation and customer sample generation work is in progress.

Lock-cycle purification tests on the by-product fines from the spheronisation process achieved LOI purities of 99.25% to 99.8% for Skaland (depending on the purification conditions) and 99.51% for Munglinup (under the standard conditions for purifying Munglinup spherical graphite), with silicon the key residual impurity. Typical purity targets for micronized graphite are 99% and 99.5%, showing that the process is capable of meeting both of these targets. Further optimisations are in progress to tailor impurities to customers' requirements.

Using the standard purification conditions to purify -150 micron Skaland flake achieved LOI purities of 99.9%. Further optimisation of the processing conditions for purifying flake graphite is in progress.

The purification program described above consisted of 11 completed sub-stages of the overall CRC-P program since September 2019, with the remaining testwork sub-stages in progress. These consist of further process optimisation and customer samples generation and will be completed in the following months.

This significant body of work allows the Company and CSIRO to tailor the process to different feed material types (spherical graphite, fines and flake) and concentrate sources and to optimise for particular impurities of concern to customers. The purification process results are also being used to optimise the concentrate quality produced at Skaland, to support the

Company's vertically integrated mine-to-downstream materials business.

Given the excellent results for spherical graphite, fines and fine flake, the Company is planning to evaluate the potential of the process to purify graphite anode materials recovered from lithium-ion batteries recycling.

Data packs from the mini-pilot plant testwork are currently being compiled to support:

- Delivery of an updated flowsheet and cost estimate for completion of the CRC-P project in 2021, and
- Construction of a larger scale pilot-plant to further de-risk the process and generate larger customer samples to support qualification prior to commercial AAMP construction.

The Company would like to acknowledge the significant support and effort of its partners, CSIRO and Doral, as well as the Commonwealth Government's financial support for the CRC-P project. In particular, we acknowledge the dedication and focus of the CSIRO research team who have continued to deliver outstanding results in this critical-minerals project throughout the recent COVID-19 pandemic.

Acting Chief Executive Officer Russell Tipper said: *"We are delighted with the progress of this purification project. The excellent research and development work conducted by CSIRO must be commended. The comprehensive program provides a very strong foundation to advance and de-risk the development of the AAMP, which is a cornerstone of value-adding at Skaland. Whilst R&D is patient work, it is essential to de-risk process development in a controlled, staged, and therefore successful, manner. We look forward to completing the development of the larger-scale purification pilot plant and the associated AAMP feasibility study in 2022".*

CSIRO Mineral Resources Group Leader at Waterford, Western Australia Dr Keith Barnard said CSIRO is eager to help Australian companies such as MRC position themselves in the battery metals sector, for both their benefit and for the future benefit of Australia.

"We are pleased to be working with MRC and Doral on our shared journey towards commercial deployment of this more environmentally sustainable purification process." said Dr Barnard.

ENDS

Issued by Mineral Commodities Ltd ACN 008 478 653 www.mineralcommodities.com
Authorised by the Chief Executive Officer and Company Secretary, Mineral Commodities Ltd

For further information, please contact:

INVESTORS & MEDIA**Peter Fox**Investor Relations and Corporate
Development

T: +61 8 6373 8900

investor@mncom.com.au

CORPORATE**Fletcher Hancock**

Company Secretary

T: +61 8 6373 8900

fletcher.hancock@mncom.com.au

About Mineral Commodities Ltd:

Mineral Commodities Ltd (ASX: MRC) is a global mining and development company with a primary focus on the development of high-grade mineral deposits within the mineral sands and battery minerals sectors.

The Company is a leading producer of zircon, rutile, garnet and ilmenite concentrates through its Tormin Mineral Sands Operation, located on the Western Cape of South Africa.

In October 2019, the Company completed the acquisition of Skaland Graphite AS, the world's highest-grade operating flake graphite mine and one of the only producers in Europe. The planned development of the Munglinup Graphite Project, located in Western Australia, builds on the Skaland acquisition and is a further step toward an integrated, downstream value-adding strategy.

MRC's Graphite vision is to be a European supplier of high quality, low emission, sustainably manufactured, natural graphite active anode material to meet the fast-growing demand for sustainably manufactured lithium-ion batteries.

Cautionary Statement

This report may contain forward-looking statements. Any forward-looking statements reflect management's current beliefs based on information currently available to management and are based on what management believes to be reasonable assumptions. It should be noted that several factors could cause actual results or expectations to differ materially from the results expressed or implied in the forward-looking statements.