

28 November 2023

Mavis Lake Beneficiation and Optimisation Studies to be Bolstered by Ore Sorting Test Work

Highlights

- Studies have commenced into the potential of incorporating both **waste ore sorting** and **direct spodumene sorting** technologies into the development configuration for the Mavis Lake Lithium Project in Canada.
- The studies form part of Critical Resources' dual-track strategy of delivering resource growth in parallel with rapidly advancing the project's development pathway.
- Ore sorting test-work builds on successful scoping-level test-work completed earlier in 2023, which produced a **5.98% Li₂O spodumene concentrate** at **87.3% lithia recovery**.
- Saskatchewan Research Council has been engaged to conduct waste ore sorting test-work, seeking to separate pegmatite from waste rock.
- STARK Resources, in partnership with Optimum Sorting, has been engaged to conduct direct spodumene ore sorting test-work to separate spodumene from unmineralized pegmatite.
- The test-work program has commenced, with the outcomes set to inform a feasibility level metallurgical test-work program planned for 2024.
- Ore sorting technologies have the potential to provide greater beneficiation efficiency through pre-concentration of ore, prior to conventional DMS/flotation.

Lithium exploration and project development company Critical Resources Limited **ASX:CRR** ("Critical Resources" or "the Company") is pleased to provide an update on ongoing development activities at its flagship Mavis Lake Lithium Project in Ontario, Canada.

The Company is building on its successful scoping-level metallurgical test-work program completed in H1 2023, where combined heavy liquid separation (HLS) and flotation test-work produced a spodumene concentrate of 5.98% Li₂O at 87.3% lithia recovery¹.

Ore Sorting Test-work Overview

Critical Resources has engaged Saskatchewan Research Council (SRC) and STARK Resources to conduct a collaborative test-work program to assess the amenability of Mavis Lake ore to concentration by coarse, dry ore sorting.

¹ Refer ASX announcement of 3 April 2023.



A total of 150kg of Mavis Lake drill core was recently delivered to SRC Saskatoon. The sample suite encompasses the full range of ore and rock types exhibited at Mavis Lake, including waste rock, unmineralised pegmatite, contact zone ore, high-grade ore and low-grade ore.

SRC will conduct a thorough mineralogical assessment of the rock and ore types as part of the test-work program. This will establish the various mineral assemblages, associations and liberation characteristics. This will proceed to an X-ray Transmission (XRT) based amenability study to assess the viability of pre-concentrating ore by rejecting coarse waste rock.

Figure 1 below shows typical waste rock that hosts the spodumene-bearing pegmatite.



Figure 1 – Section of core from drill-hole MF22-121 showing waste rock (dark) and pegmatite (white).

SRC and STARK will work collaboratively to prepare core samples for an ultra-violet (UV) laser-based amenability study with STARK's technology partner (Optimum Sorting).

This innovative technology detects spodumene directly and offers unique opportunities in the production of spodumene concentrate by separating spodumene from the unmineralised host pegmatite.

The results and insights from these studies will inform the design of the feasibility-level metallurgical test-work program planned for 2024.

Ore Sorting Benefits

Ore sorting has become increasingly prevalent within the hard-rock lithium industry as a pre-concentration stage to complement Dense Media Separation (DMS) and flotation.

The removal of mined waste rock and gangue minerals in the coarse, dry beneficiation stage offers a range of potential operational benefits including:



- Increased mineable tonnes;
- Reduced haulage costs and associated emissions;
- Reduced energy and water consumption;
- Reduced grinding and milling capacity requirements and associated reductions in CAPEX;
- Improved consistency of feed grades;
- Increased process plant productivity; and
- Reduced tailings.



Figure 2 – Section of core from drill-hole MF22-107 showing the UV response of spodumene (orange) within pegmatite.

Future Work

Building on the positive results from the scoping level metallurgical test-work program completed in H1 2023, the Company is planning a comprehensive feasibility-level metallurgical test work program for execution in 2024.

In addition to mineralogy, DMS and flotation feasibility test-work, the program scope will also provide parameters for front-end engineering and plant design works. The drilling campaign for the metallurgical test-work program has been completed and samples are currently being prepared to support workstreams commencing in early 2024.

Commenting on the benefits of this phase of test-work, Critical Resources' Managing Director, Alex Cheeseman, said:

"The metallurgical test-work completed to date has shown that the Mavis Lake Resource is amenable to a range of processing flowsheets – and we have previously been very successful in generating a high-grade, low-impurity spodumene concentrate with compelling metallurgical recoveries.

"As part of our commitment to optimizing and enhancing the Project from the outset, we want to further our understanding of the potential economic and operating benefits that new and innovative processing opportunities like ore sorting can offer.



“Incorporating ore sorting into the processing flowsheet has the potential to improve the consistency and quality of our spodumene concentrate product, while also offering potential operational benefits including widening the feed envelope (to include multiple sources of raw material) as well as possible reductions in both the project footprint and its environmental impact.”

This announcement has been approved for release by the Board of Directors.

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ABOUT CRITICAL RESOURCES LIMITED Critical Resources is advancing and developing critical metals projects for a decarbonised future. The Company holds a suite of lithium prospects across Ontario, Canada, including Mavis Lake, Graphic Lake, Plaid and Whiteloon Lake. The Company's other projects include a copper project in Oman, and a base metals project in Halls Peak NSW, Australia.

The Company's primary focus is the rapid development of its flagship Mavis Lake Lithium Project. Mavis Lake is an advanced exploration project with near-term development potential. The Company completed over 19,500m of drilling in 2022 and has commenced another significant drilling program in 2023. In early 2023, Critical Resources released its maiden JORC Code 2012 Compliant Inferred Mineral Resource Estimate (MRE) for Mavis Lake with 8.0Mt at 1.107% Li₂O – making Critical Resources just one of two ASX-listed companies with a JORC Code 2012 compliant mineral resource in Ontario. In parallel with continued Resource growth, the Company has also commenced initial studies that will underpin the transition from explorer to developer.

ABOUT SASKATCHEWAN RESEARCH COUNCIL The Saskatchewan Research Council (SRC) is Canada's second largest research and technology organization. SRC's Mining and Energy Division provides applied research, development and demonstration to exploration and mining companies. The Mineral Processing Business Unit provides leading-edge solutions to mining and mineral clients. Services focus on RD&D for uranium, potash, rare earths, lithium, diamonds, gold, base metals, industrial minerals (mineral sands, quartz, feldspars) and other priority minerals.

ABOUT STARK RESOURCES STARK Resources is a specialised, privately held engineering group, with a global mining footprint. STARK focusses on fast-tracked design and construction of minerals processing plants, delivering projects in developing countries and Tier-1 jurisdictions. STARK's expertise bridges the understanding of in-ground ore deposits with tailored recovery solutions, ensuring a compelling and economically viable proposition across the entire mining value chain, from Greenfield exploration projects to active production mines, including the implementation of the world's first UV laser technology.

COMPLIANCE STATEMENT This announcement contains information relating to Exploration Results in respect of the Mavis Lake project extracted from ASX market announcements dated 24 October 2022, 31 October 2022, 23 January 2023 and 3 April 2023 and reported in accordance with the 2012 JORC Code and available for viewing at criticalresources.com.au. The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the original market announcement continue to apply and have not materially changed.

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