

**ASX RELEASE**

31 May 2024

**GLOBAL LICENCE AGREEMENT SECURED FOR FLASH JOULE HEATING TECHNOLOGY WITH RICE UNIVERSITY****Flash Joule Heating Process has the potential to disrupt traditional extraction and recovery of critical metals****Highlights:**

- MTM has secured the exclusive global rights to the patented Flash Joule Heating (FJH) technology for use in the recovery of Rare Earth Elements (REE), Critical Metals, and Metallic Compounds from Ores, Industrial Wastes, E-scrap, Batteries and a broad range of high intrinsic value raw materials, as developed by Dr. James Tour and his team at the prestigious Rice University in Houston, Texas.
- The licensed technology has the potential to disrupt traditional treatment processes for a range of materials which could significantly enhance recovery rates and the economics of metal extraction.
- The collaboration between Rice University and the Company remains ongoing with enhancements to the existing technology available to MTM as part of the license agreement.
- The Company will engage with government agencies, targeting critical minerals extraction efficiencies, to help secure supply and reduce reliance on imported materials and technology from non-aligned nations.
- Testing and prototype optimisation continues to progress well with Knighthawk Engineering in Houston.
- Testing of sample mineral concentrates from the Company's REE projects is being progressed.
- Testing of third party mineral concentrates (including spodumene) using the FJH technology to compare recoveries with traditional methods is under way.

**MTM Critical Metals Limited (ASX:MTM) (MTM or the Company) has executed a licence agreement with Rice University (Rice) to secure the exclusive global rights to Flash Joule Heating (FJH) technology for the processing of a broad range of materials. The license agreement gives MTM the right to the proprietary technology under the associated patents for recovery of rare earth elements (REE) and other critical metals and metallic compounds from industrial waste (including coal fly ash and bauxite residue), ores, electronic waste (e-Waste) and end-of-life batteries. Rice will receive consideration comprising of fees, royalties (based on revenue generated directly from the license) and milestone development payments, as well as an equity payment in the form of unlisted options.**

**MTM Chairman, Mr John Hannaford** said: *"Signing of the license agreement with Rice University for exclusive worldwide rights to develop and utilise the FJH technology is a significant milestone for the Company. It provides the foundation for MTM to scale the commercialisation of a world-leading REE extraction process. The licence also provides for the continued development of the existing flash joule heating technology for use*

*in additional applications. The Company can now progress several non-dilutive funding opportunities for the FJH technology, including potential government grants and collaborations with commercial partners who could benefit from integrating the technology in their existing processes. Our priority is to identify the highest-value applications to generate commercial opportunities, including using the technology on our own mineral assets in Australia and Canada.”*

**Flash Metals USA President, Mr Steve Ragiel** said: *“We are very pleased to have worked with Dr James Tour and the Rice University team to finalise this global licence agreement as there is real need for this type of innovation. The mining sector is looking for ways to optimise resource recovery rates, reduce the use of chemical and waste and improve its ESG credentials in tangible ways – and FJH has the potential to address all these areas based on testing at bench scale. FJH can dramatically increase the leaching recovery of metals from waste materials that are otherwise very difficult to treat while using lower volumes of acid than traditional methods<sup>1</sup>. Applications will include REE and other critical metals and metallic compounds from industrial waste such as coal fly ash and bauxite residue, ores, electric waste (e-Waste) and end-of-life batteries. MTM is commencing commercialisation of the FJH technology with a focus on defining the best opportunities for scaling the technology through sub-licensing and technology transfer agreements.”*

### **The Opportunity for FJH**

Successful laboratory and prototype testing (refer MTM ASX release 6 May 2024) of the FJH technology has provided MTM confidence that, when commercialised, the FJH technology could disrupt the existing extraction processes for REE's and other minerals with the potential for higher recovery rates, lower costs and more efficient flow sheets for metal extraction. The collaboration between Rice and MTM in this field will be ongoing and enhancements in the technology by Rice are likely to flow through to MTM which will add to the capabilities of the processes that are being commercialised.

Flash Joule Heating (FJH) technology offers several commercial opportunities in the extraction of metals due to its potential efficiency, cost-effectiveness and environmental benefits. MTM will pursue a range of work streams to:

1. Progress the scaling up of the pilot plant to handle increased volume of feed stock;
2. Identify the highest value feed stock supplies in terms of metal concentrations, availability and extraction effectiveness using the FJH technology to deliver the highest returns and determine where economic deposits of this material are located;
3. Secure funding for commercial scale prototype processing plant development that will result in the supply of critical minerals from recycled material and mineral ores that are susceptible to supply constraints to the USA and its allies;
4. Continue early-stage negotiations with a number of commercial and government agencies to secure agreements that will deliver near term value from the technology licensing;
5. Identify commercialisation opportunities with corporate partners and customers through sub-licensing and royalty arrangements from the technology being used to process waste material e.g.: coal fly ash or bauxite residue (red mud) deposits, e-waste and battery recycling;
6. Pursue commercialisation opportunities in the mineral recycling sector (inquiries are already being followed up with potential corporate and government parties in USA and Australia).

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<sup>1</sup> Refer test results published by MTM in ASX announcement dated 6 May 2024.

Along with the above work streams, MTM is currently progressing the testing of the FJH process on sample mineralisation and concentrates from its own REE projects in Quebec, Canada (Pomme REE-Nb carbonatite project) and Western Australia (East Laverton REE clay project). The Company will also carry out testing of spodumene concentrates to test the effectiveness of the FJH process on lithium extraction compared to traditional methods. Other third-party ores and waste streams are being sought for testing to assess efficiencies compared with existing processing methods.

Further development and optimisation of the FJH commercial scale plant will continue with KnightHawk Engineering (a speciality high technology engineering firm located in Houston, USA) where plans are well advanced for the design of a larger scale FJH pilot plant. The work with KnightHawk builds on the significant multi million dollars of investment that have been made by Rice University and FJ Processing to get the technology and original bench scale modules built to prove the FJH technology.

### **Flash Joule Heating (FJH) Technology**

Flash Joule Heating (FJH) is a technique that utilises an intense short burst electrical current to generate high levels of heat within a sample medium. This method has numerous applications including the extraction of rare earth elements (REE) and other critical metals.

Flash Joule Heating (FJH) technology is significantly more advanced than previous Joule Heating technologies used for metal extraction. It incorporates several key innovations and advantages, including the ability to heat materials to extremely high temperatures (up to 3000°C) in a matter of milliseconds. This rapid heating enables the processing of large quantities of material quickly, thereby improving overall throughput and efficiency in metal extraction.

The brief duration of the heating process in FJH potentially translates to lower overall energy consumption. Traditional Joule Heating methods often require prolonged periods of sustained heating, leading to higher energy usage. FJH can be fine-tuned to selectively heat and extract specific metals from complex mixtures. This selectivity may also improve the purity of the recovered metals.

The technology can be adapted to extract different types of metals by adjusting the heating parameters, making it a versatile tool for various metal recovery processes.

The primary objective of the flash process is to either evaporate the valuable metals and collect them in a cold trap, typically performed under vacuum conditions, or to transform the materials composition to enhance the effectiveness of traditional acid leaching methods, resulting in a significantly higher yield of REE and other metals compared to other traditional extraction methodologies.

By performing the FJH process, many chemically resistant compounds are transformed and the REE and other metals are converted into pure forms or oxides that are significantly more susceptible to acid leaching, improving recovery yields for many elements.

### **FJH Licence Agreement**

The FJH technology licensed to MTM uses proprietary intellectual property in the flash process enabling the extraction of various metals including REE's, lithium and other valuable precious and industrial metals. The FJH technology incorporates a range of patent protected processes around the material preparation, energy application and vaporised component separation and collection which can be scaled due to the precise control that the FJH prototype module provides.

MTM has been granted a world-wide exclusive license under the agreement to use the Rice patents which relate to (i) *Ultrafast synthesis of carbide, corundum nanoparticles, and precious metal recovery from waste by a flashing joule heating process*; (ii) *Removal of heavy metals from waste* and (iii) *Recycling of spent batteries by Flash Joule Heating*; and a non-exclusive right to use the Rice Patent which relates to *Recovery and reuse of conductive additives for Flash Joule Heating*.

Equity in the form of 15 million options to acquire shares in MTM at an exercise price of A\$0.20 with an expiry date that is 5-years from the date of issue are to be allotted as part of the License agreement.

MTM will pay Rice up-front fees of US\$300,000 within 90 days of signing the License agreement. Further annual Maintenance Fees (US\$10,000 per annum) are payable until the first commercial sales are recorded. Three Milestone Commercialisation Fees (totalling US\$275,000) are payable upon reaching certain funding and revenue targets as follows:

<b>Commercialisation Milestone</b>
Receiving US\$7,500,000 in funding for the development and commercialization of Rice Licensed Products
Achieving US\$15,000,000 in cumulative worldwide Adjusted Gross Sales of Rice Licensed Products by Licensee, Affiliates, and Sublicensees
Achieving US\$50,000,000 in cumulative worldwide Adjusted Gross Sales of Rice Licensed Products by Licensee, Affiliates, and Sublicensees

Once commercial sales commence, Rice will earn a royalty of 1.5% of the Adjusted Gross Sales<sup>2</sup> (**Note:** this will not burden a mineral extraction project that MTM may license the technology to with a royalty over the revenue that it generates from metal sales but rather a royalty is paid by MTM based on income that is received from any activities that may use the technology that has been licensed from Rice). Annual minimum royalties apply of between US\$10,000 per year (years 1-2) and US\$30,000 per year after year 5 of the license term.

Under the agreement, MTM is required to engaged in research, development, manufacturing, marketing, or sublicensing activity appropriate to achieving the following commercialisation milestones:

<b>Milestone Events</b>	<b>Milestone Deadline</b>
Optimization of Bench-scale Unit	31-Dec-2024
Optimization of Semi-Commercial-scale Unit	31-May-2025
Optimization of Commercial-scale Unit	31-Dec-2025
First startup of Commercial-scale Unit	31-May-2026
First commercial sale of RLP	31-Dec-2026

The agreement defines the fields of use for the FJH technology as:

- i. recovery of rare earth elements (“REE”) and other metals and metallic compounds from industrial waste, whereby for the purpose of the Agreement industrial waste is defined as by-product of an industrial manufacturing process limited to mining tailings, coal fly ash and bauxite residue;
- ii. recovery of REE and other metals and metallic compounds from ores, or bitumen, or coal;
- iii. use of purified industrial waste in reinforcement of building materials including cementitious materials;

<sup>2</sup> **Adjusted Gross Sales** - means the cash consideration or fair market value of any non-cash consideration attributable to the sale of any Rice Licensed Product(s), less qualifying costs directly attributable to such sale and actually identified on the invoice and borne by the seller.

- iv. recovery of REE and other metals, metallic compounds from electronic waste (“E-Waste”), which includes all types of old, end-of-life or discarded electrical and electronic equipment, such as office equipment, entertainment and consumer electronic equipment, electric and electronic tools, printed circuit boards, computer processors, electronic waste plastics, computers, smartphones, electronic devices and displays; and
- v. recovery of metals, metal compounds, and other commercially valuable materials from all types of old, end-of-life or discarded batteries (“Battery Waste”).

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

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### About MTM Critical Metals Limited

MTM Critical Metals Limited is an exploration company which is focused on searching for niobium (Nb) and rare earth elements (REE) in Western Australia and Québec. Additionally, the Company has acquired the licencing rights to an early-stage processing technology for REE and precious metals known as Flash Joule Heating, which has been developed by researchers at Rice University, USA. MTM's West Arunta Nb-REE licences lie within one of Australia's critical metal exploration hotspots where over \$60m in exploration expenditure has been collectively invested in the district by a number of ASX companies including WA1 Resources Limited (ASX:WA1), Encounter Resources Limited (ASX:ENR), Rio Tinto Limited (JV with Tali Resources Pty Ltd) (ASX:RIO), CGN Resources Limited (ASX:CGR), and IGO Limited (ASX:IGO). The Company also holds tenements in other prolific and highly prospective mineral regions in Western Australia. The Mukinbudin Nb-REE Project comprises two exploration licences located 250km northeast of Perth in the South West Mineral Field of Western Australia. The East Laverton Projects is made up of a regionally extensive package of underexplored tenements prospective for REE, gold and base metals. The Mt Monger Gold Project comprises an area containing known gold deposits and occurrences in the Mt Monger area, located ~70km SE of Kalgoorlie and immediately adjacent to the Randalls gold mill operated by Silver Lake Resources Limited. In Québec, the Pomme Project is a known carbonatite intrusion that is enriched in REE and niobium and is considered to be an extremely prospective exploration target adjacent to a world class REE resource (Montviel deposit). The Company has an experienced Board and management team which is focused on discovery to increase value for shareholders.

### Previous Disclosure

The information in this announcement is based on the following MTM Critical Metals Limited ASX announcements, which are all available from the MTM Critical Metals Limited [website](#) and the ASX [website](#).

Date	Description
13/03/2024	MTM formally exercises its option for global licence agreement over Flash Joule Heating
21/05/2024	License agreement progresses with Rice University

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original ASX announcements and that all material assumptions and technical parameters underpinning the relevant ASX announcements continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are represented have not been materially modified from the original ASX announcements.

### Cautionary Statement Regarding Values & Forward-Looking Information

The figures, valuations, forecasts, estimates, opinions and projections contained herein involve elements of subjective judgment and analysis and assumption. MTM Critical Metals does not accept any liability in relation to any such matters, or to inform the Recipient of any matter arising or coming to the company's notice after the date of this document which may affect any matter referred to herein. Any opinions expressed in this material are subject to change without notice, including as a result of using different assumptions and criteria. This document may contain forward-looking statements. Forward-looking statements are often, but not always, identified by the use of words such as "seek", "anticipate", "believe", "plan", "expect", and "intend" and statements that an event or result "may", "will", "should", "could", or "might" occur or be achieved and other similar expressions. Forward-looking information is subject to business, legal and economic risks and uncertainties and other factors that could cause actual results to differ materially from those contained in forward-looking statements. Such factors include, among other things, risks relating to property interests, the global economic climate, commodity prices, sovereign and legal risks, and environmental risks. Forward-looking statements are based upon estimates and opinions at the date the statements are made. MTM Critical Metals undertakes no obligation to update these forward-looking statements for events or circumstances that occur subsequent to such dates or to update or keep current any of the information contained herein. The Recipient should not place undue reliance upon forward-looking statements. Any estimates or projections as to events that may occur in the future (including projections of revenue, expense, net income and performance) are based upon the best judgment of MTM Critical Metals from information available as of the date of this document. There is no guarantee that any of these estimates or projections will be achieved. Actual results will vary from the projections and such variations may be material. Nothing contained herein is, or shall be relied upon as, a promise or representation as to the past or future. MTM Critical Metals, its affiliates, directors, employees and/or agents expressly disclaim any and all liability relating or resulting from the use of all or any part of this document or any of the information contained herein.