

ASX Release

3rd March 2025

MTM Completes Key Engineering Phase for Technology Demonstration Plant, Advancing Towards Commercialisation

- **Process Design Completed on Schedule:** MTM has finalised the **process design** for its **1-ton-per-day (1 TPD) Flash Joule Heating (FJH) Demonstration Plant** — a major step towards commercialisation.
- **Key Blueprint:** The process design has been finalised including:
 - Key process parameters, including flow rates, material balances, and operating conditions.
 - Final equipment selection, enabling procurement of critical components.
 - Regulatory readiness, supporting permitting and site selection.
- **Procurement of long-lead equipment**, including gas clean-up systems and other critical components, **is now in progress** to meet the **end-of-year 2025 operational target**.
- **On Schedule:** First feedstock processing is targeted for **end-of-year 2025**, reinforcing MTM's commitment to delivering this innovative technology on time.
- The plant **will validate the technology at scale, paving the way for larger modular units and strategic partnerships**.
- **KnightHawk Engineering** has reinforced its commitment by aligning commercial terms with project milestones, **converting a portion of deferred fees into equity in MTM**, demonstrating confidence in the technology & execution.
- **Site Selection Advancing:** Strong engagement with **industrial partners and economic development agencies in Texas & other potential states** to secure a **pre-permitted site**, accelerating approvals and reducing timeline risks.

MTM Critical Metals Limited (“MTM” or the “Company”) (ASX: **MTM**; OTCQB: **MTMCF**) has achieved a major milestone with the on-time completion of the process design for its 1-tonne-per-day (1TPD) Flash Joule Heating (FJH) Demonstration Plant. This step locks in the technical blueprint for our innovative metal recovery technology, bringing MTM closer to revolutionising how critical metals like gallium, germanium and rare earths are processed. With procurement of key equipment already underway, the Company is on track to start operations by the end of 2025, paving the way for larger-scale production and game-changing industry partnerships going forward.

MTM's design partner KnightHawk Engineering has successfully completed the FJH 1TPD process design, leveraging established engineering principles, industry best practices, and insights gained from extensive prototype testing over the past several months. This milestone defines the core operational framework for the plant. Through the procurement and fabrication stages, there will be ongoing refinements to ensure seamless integration with commercially available “off-the-shelf” equipment. Based on the current timeline, final commissioning is anticipated by Q4 2025, aligning with the finalisation of feedstock supply and offtake agreements to support future commercial operations.

The Company is actively engaging with technology parks and economic development authorities across Texas and Louisiana, to secure a pre-permitted site. This strategic focus leverages the region's pro-business environment, skilled workforce, and world-class infrastructure, ensuring rapid deployment of this USA-invented technology.

MTM Managing Director & CEO, Michael Walshe, commented: *“Finalising the process design marks a major step in bringing our FJH technology to market. It provides us with a clear technical roadmap for the 1TPD Plant and ensures we can advance with procurement, permitting, and site selection on schedule. With our long-lead equipment procurement now in progress and strong engagement from industrial premises owners in Texas and Louisiana, we remain firmly on track to begin operations by the end of 2025. The facility will generate critical operational data to optimise full-scale deployment and support future offtake agreements with industrial partners.*”

This project is not just about demonstrating the commercial viability of our technology — it's about reshoring critical metals production to the USA and strengthening America's supply chain for strategic materials like gallium, germanium, and rare earths. By doing so, we're positioning MTM as a leader in sustainable innovation for a resource-secure future.”

Process Design and Process Design Criteria for 1TPD Demonstration Plant

The process design and associated process design criteria for MTM's 1 tonne per day Demonstration Plant **represent the most critical engineering milestone**, establishing the operational framework for scaling the Company's proprietary technology for metal recovery and mineral processing. This defines the sequence of unit operations, material flows, equipment selection, and process control strategies necessary to efficiently extract and refine target metals at the 1TPD of incoming feedstock, scale. It ensures that the technology operates within optimised safety, energy, and material efficiency parameters, delivering consistent, high-purity metal outputs while validating its commercial scalability.

KEY ELEMENTS OF THE PROCESS DESIGN:

- **Material Feed Handling** – Preparing and introducing feedstock (e.g., metal-bearing waste, mineral concentrates) into the FJH system.
- **Proprietary Reactor Design** – Optimising energy input, residence time, and reaction kinetics to achieve selective phase transformation and impurity removal.
- **Gas and Byproduct Management** – Managing emissions, capturing valuable off-gases, and ensuring environmental compliance.
- **Metal Recovery and Refining** – Separation of targeted metal chlorides or oxides or metals, followed by further post-processing (if required) to produce a saleable product.
- **Process Integration & Scalability** – Designing modular systems for potential scale-up to commercial production utilising off-the-shelf material where possible to complement MTM's proprietary design components.
- **Process Control & Automation Philosophy** – Implementing real-time monitoring for key process parameters such as temperature, energy usage, reaction time, and gas composition.

KEY PROCESS DESIGN CRITERIA:

- **Throughput Capacity** – 1 tonne per day of feedstock processed through the FJH plant.
- **Feedstock Composition** – Mineral concentrates or secondary feedstocks containing REEs, Gallium, Indium, Germanium, and other critical metals with defined impurity levels.
- **Reaction Efficiency** – Optimisation of FJH pulse parameters to maximise impurity removal and enhance metal recovery rates.
- **Chlorination & Carbochlorination Efficiency** – Carefully controlled reactions to convert target metals into recoverable products.
- **Operating Conditions** – Defined temperature, energy, reaction duration, catalysts, additives and atmosphere composition for optimal processing.
- **Product Quality Specifications** – Purity and phase composition of recovered metals or metal chlorides, ensuring alignment with downstream processing requirements.
- **Emissions & Waste Management** – Compliance with environmental regulations for gas emissions, byproduct disposal, and reagent recycling.
- **Instrumentation & Control Systems strategy** – Real-time data acquisition for process monitoring, safety interlocks, and automation integration.
- **Safety systems, hazard identification, and risk mitigation strategies.**

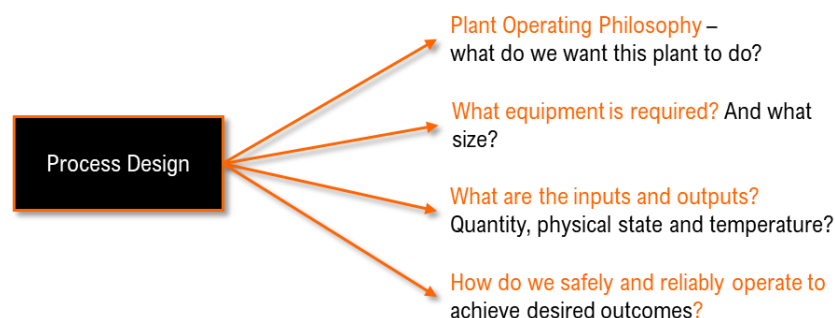


Fig 1. Criticality of the Process Design

Strategic Commitment & Alignment from Engineering Partner KnightHawk

MTM's long-standing partnership with **KnightHawk Engineering (KHE)** continues to strengthen, with KHE demonstrating its commitment to the successful execution of the 1TPD Demonstration Plant. As a key engineering partner, KHE has supported MTM with favourable commercial terms tied to milestone achievements, reinforcing confidence in the project's trajectory.

Further aligning interests, KHE proposed converting a portion of its deferred success fees into equity in MTM, reflecting its belief in the potential from the FJH technology and the project's long-term success. This strategic initiative enhances collaboration and ensures that engineering efforts remain closely aligned with MTM's objectives with a commitment from KHE to additional investment into the Company through on-market purchases in non-blackout periods.

KHE has been engaged to assist in scaling up and commercialising MTM's FJH technology, as well as designing and supplying the 1TPD Demonstration Plant. The design and supply contract included a success component, representing 15% of the total engineering fee, payable at completion of various milestones, the first being upon design sign-off. KHE has offered to discount this success fee by 50% as their commitment to the relationship, and accept the remaining deferred success fee amount in equity, based on the OTCQB (MTMCF) share price at the end of 2024 (equivalent to A\$0.275 per share). To satisfy this equity consideration, the Company will allot 345,012 MTM shares to KHE under its existing 7.1 capacity.

KnightHawk CEO and Chief Engineer Cliff Knight commented: *"KnightHawk Engineering is proud to support MTM in scaling FJH technology for metal recovery. We see this as a truly disruptive innovation with game-changing potential across multiple industries. Our decision to take part of our fees in equity reflects our confidence in the technology, the MTM team, and the commercial pathway ahead."*

MTM Non-Executive Chairman, John Hannaford, stated: *"We are grateful for the commitment that KHE has shown to the development of the FJH pilot plant. They have demonstrated an extremely high level of professionalism and have been very helpful to MTM in providing their engineering services and expertise."*

"Along with foregoing 50% of their deferred success fee and conversion of the remainder to equity, KHE has provided the Company with dedicated office space at their facility for when the MTM executives are at their premises. Their investment in the Company is a testament to their belief in the technology and commitment to its success."

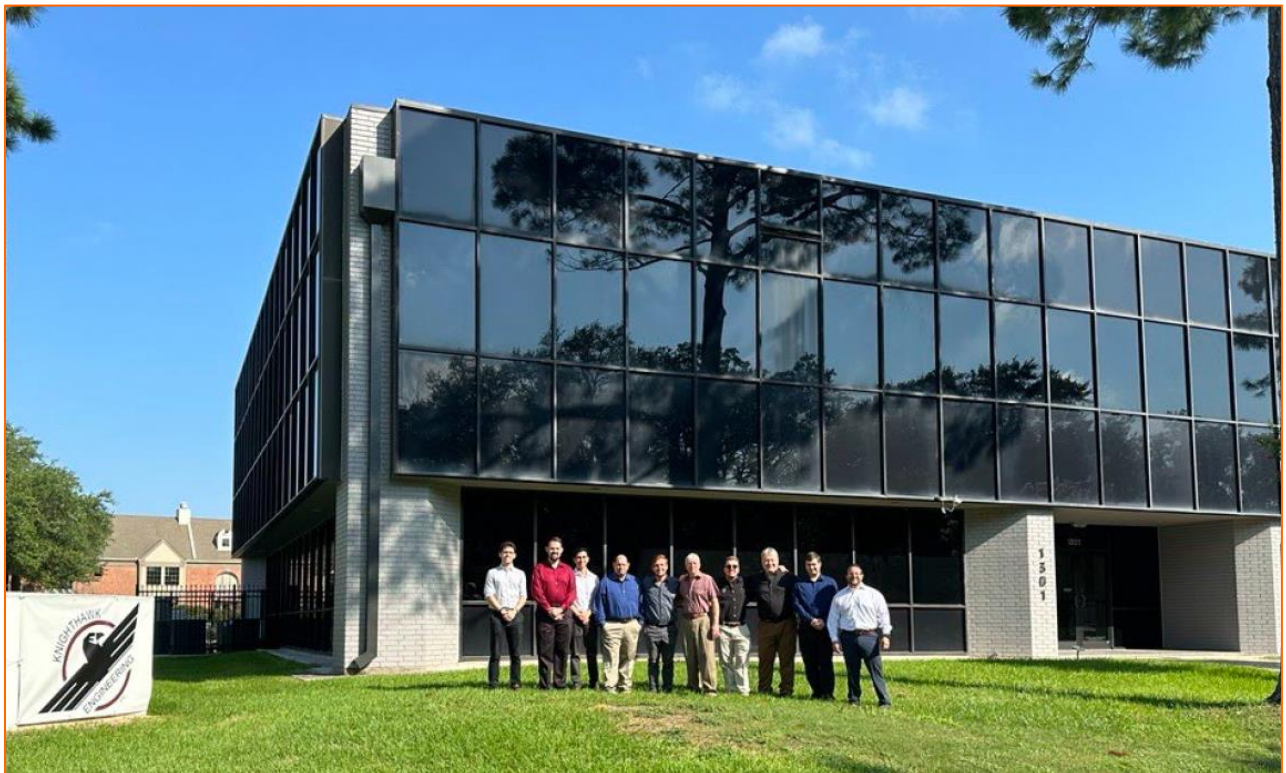


Figure 2: KnightHawk Engineering, FJH Team, Houston Texas

Site Selection & Engagement with Industrial Partners

MTM is advancing site selection efforts, prioritising Texas and Louisiana due to their significant industrial infrastructure and services, business-friendly policies, and streamlined permitting processes. The opportunity for MTM to tap into America's industrial heartland is significant, and it provides an opportunity to speed up deployment and access to key industrial supply chains.

Engagement with technology parks and economic development agencies is ongoing to secure a pre-permitted site, expediting deployment and reducing timeline risks. The design specifications will enable the Company to take advantage of "Permit by Rule" regulations which provide a streamlined permitting process for industrial facilities that are built in certain parts of Texas. A final site selection decision is expected in Q2 2025.

Advancing Towards Commercialisation

The 1TPD Demonstration Plant is a key step in MTM's commercialisation roadmap, validating the scalability of FJH technology for processing high-value metal-bearing feedstocks. The facility will generate critical operational data to optimise full-scale deployment and support future offtake agreements with industrial partners. This milestone brings MTM closer to unlocking the full potential of FJH, transforming how critical metals are sourced and supplied globally.

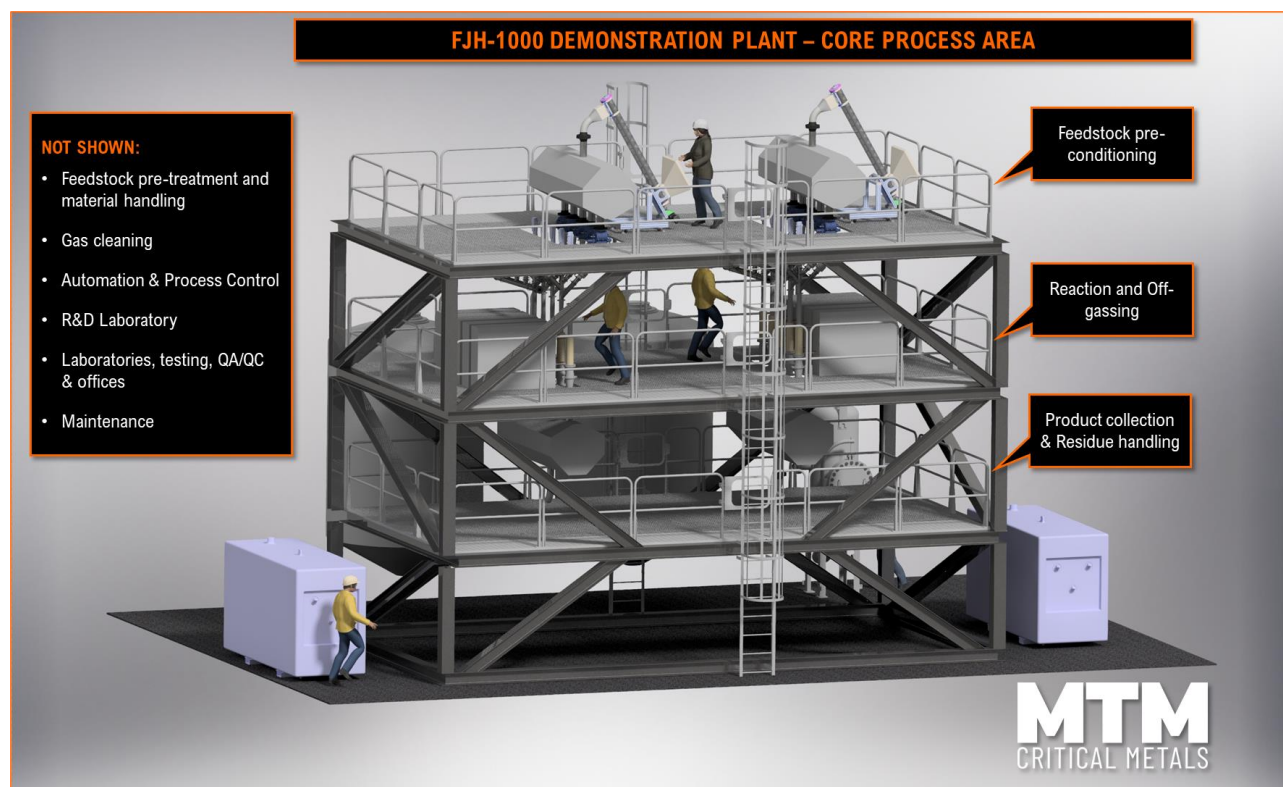


Fig 3. Conceptual artist's impression of the Core Process Area of the FJH-1000 Demonstration Plant

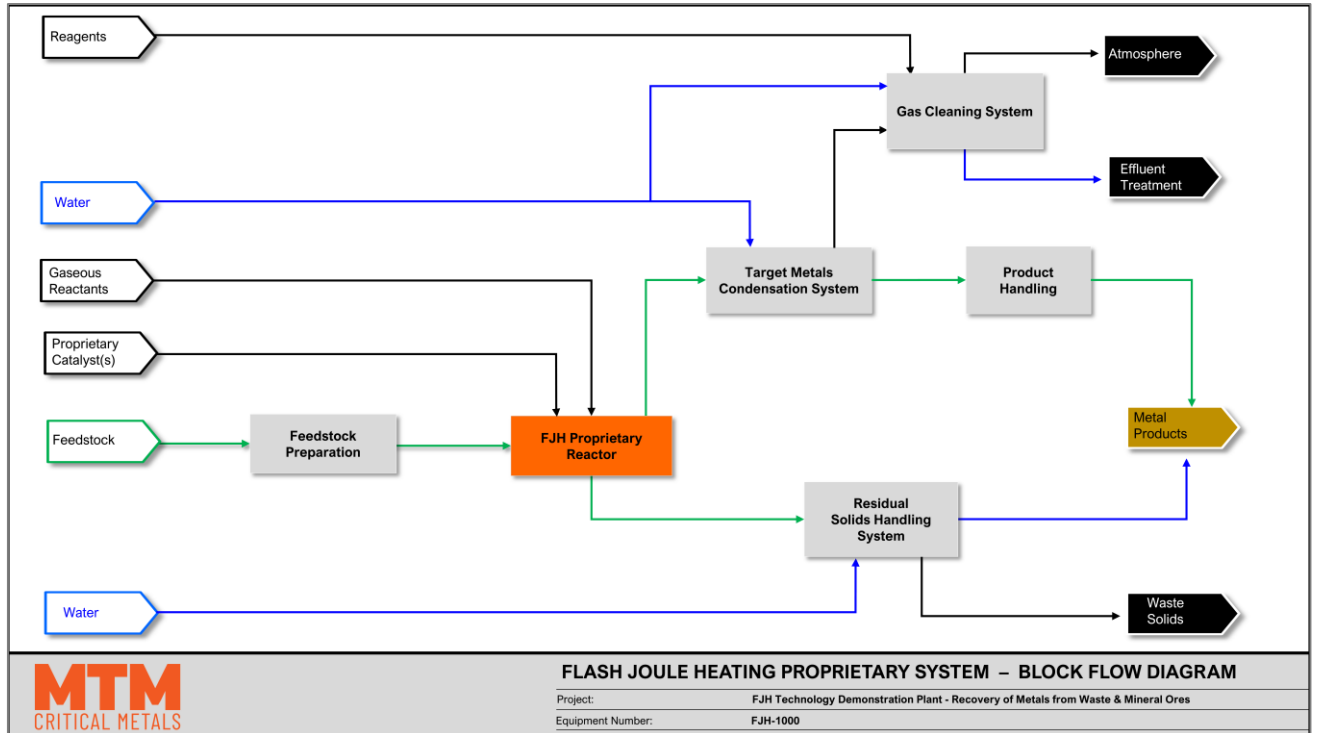


Fig 4. FJH-1000 Demonstration Plant – Block Flow Diagram

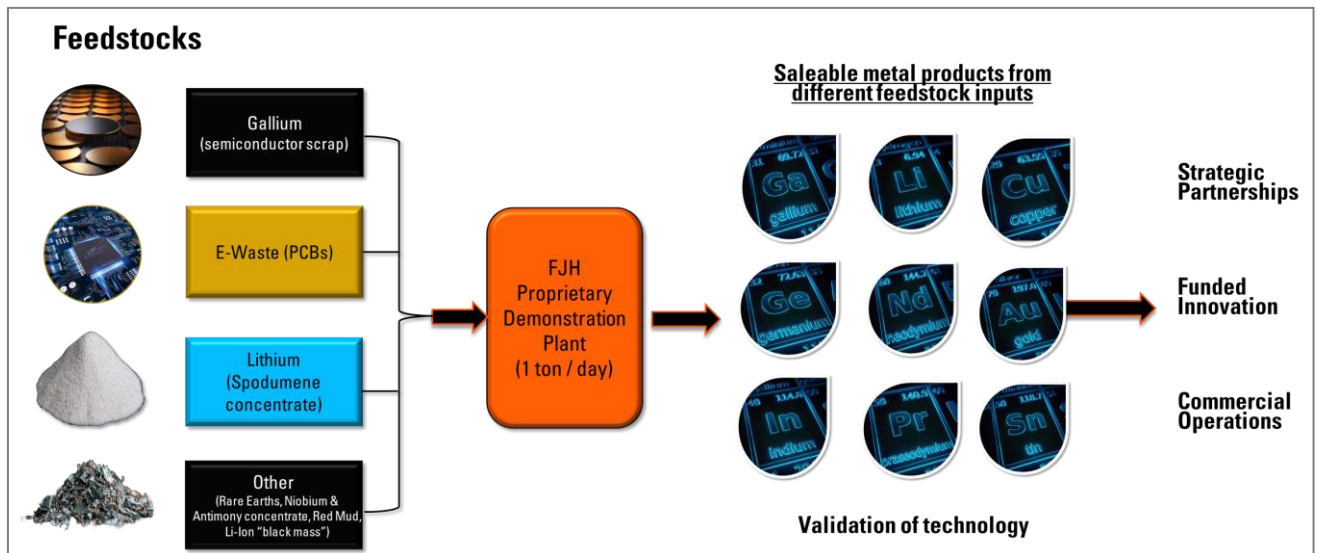


Fig 5. FJH-1000 Demonstration Plant – Primary Purpose

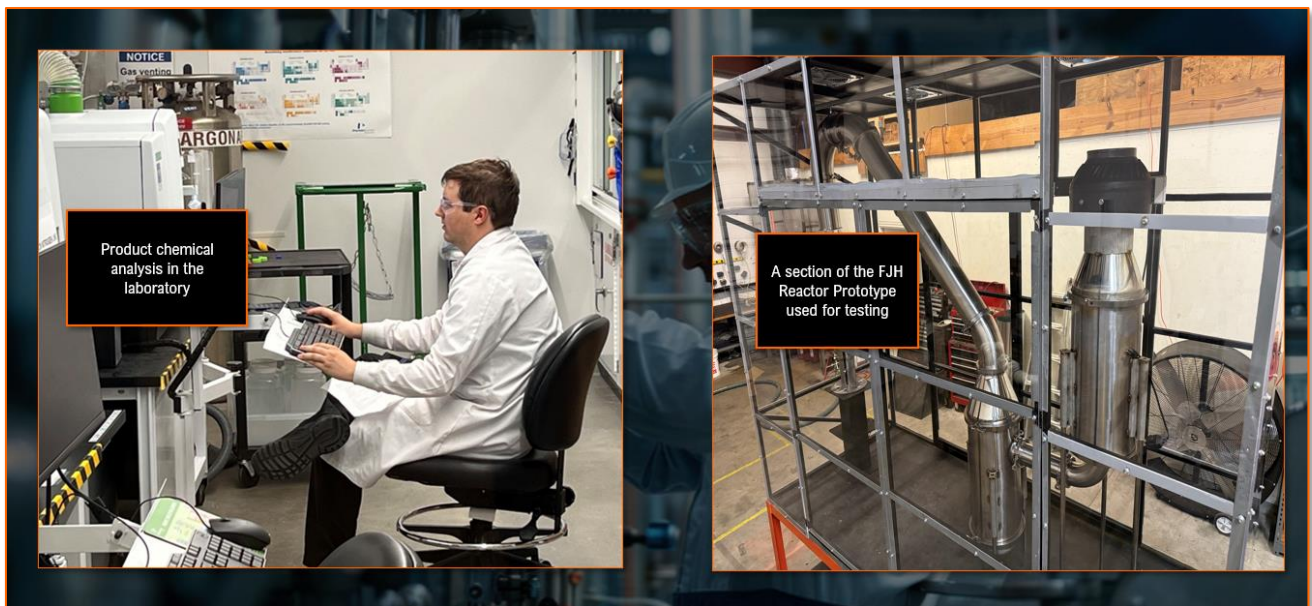


Fig 6. Prototype testing – (L) product chemical analysis & (R) a section of the prototype reactor test rig.

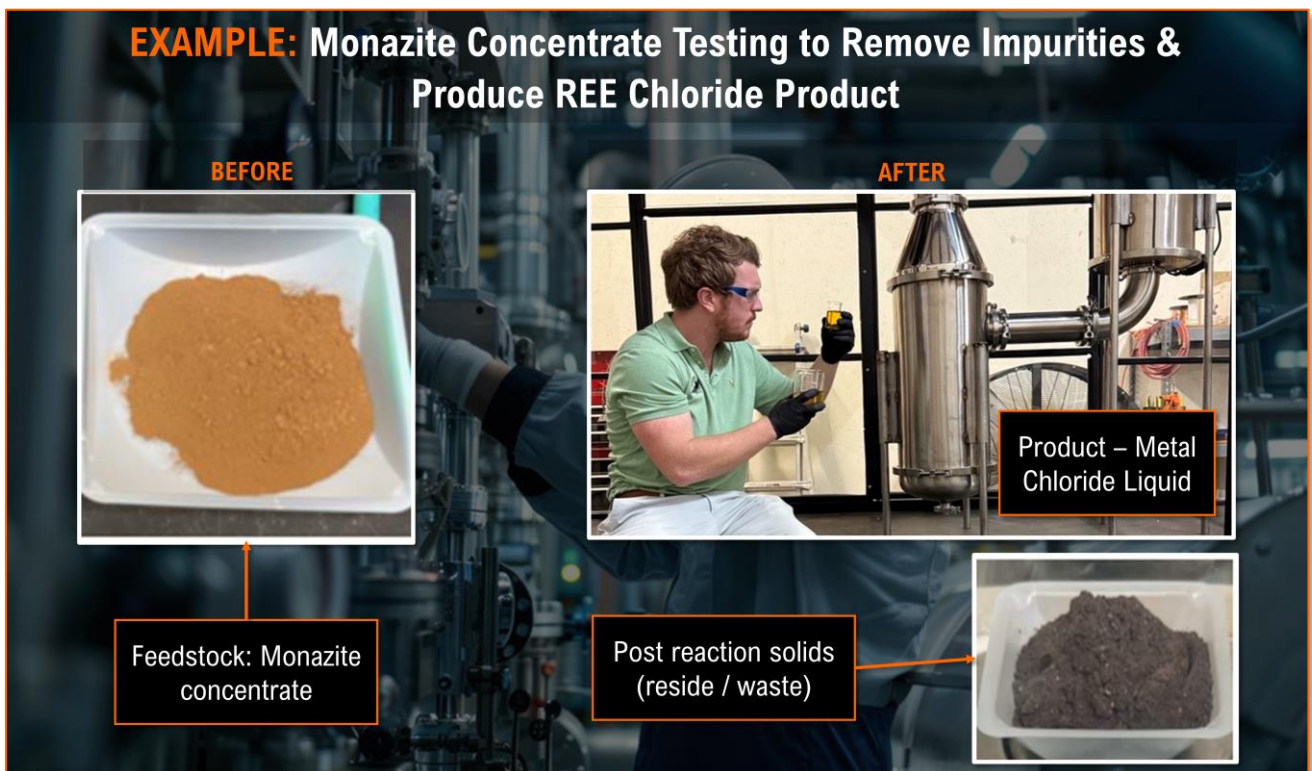


Fig 7. Example: Prototype testing of REE Concentrate – (L) raw monazite rich feedstock & (R) product (liquid metal chlorides) & residue solids waste.

Figure 7 above illustrates one of many feedstocks tested using the Company's prototype FJH reaction system. In this case, the process extracts impurities (iron, aluminium, and other elements) from a rare earth element (REE)-rich feedstock (monazite concentrate) while converting the REEs into chlorides. The resulting REE chlorides are highly water-soluble, enabling easy recovery through water-washing of the residual solids¹.

¹ Reference; AX: MTM announcement dated 08/01/2025, 'Further Breakthrough Efficiency Gains in REE Processing'.

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

Interested in partnering or investing? Reach out to us to discuss opportunities:

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ABOUT MTM CRITICAL METALS LIMITED

MTM Critical Metals Limited (ABN 27 645 885 463), is an ASX & OTCQB-listed company with management teams in Perth, Western Australia, and Texas, USA, and specialises in advanced metal recovery technologies. MTM's 100%-owned USA subsidiary **Flash Metals USA Inc** is based in Texas, USA. MTM possess exclusive licensing rights to the innovative *Flash Joule Heating technology*, a cutting-edge metal recovery and mineral processing method developed by esteemed researchers at Rice University, USA. Additionally, MTM holds exploration assets prospective for niobium (Nb), rare earth elements (REE), and gold, strategically located in Western Australia and Québec.

- Flash Joule Heating (FJH) is an advanced electrothermal process that enhances metal recovery and mineral processing compared to traditional methods. By rapidly heating materials in a controlled atmosphere, FJH efficiently extracts metals like lithium from spodumene, gallium from scrap, and gold from e-waste, among others. This technology has the potential to revolutionise metal recovery by reducing energy consumption, reagent use, and waste, offering a more economical and environmentally friendly alternative.
- MTM's West Arunta Nb-REE exploration assets are situated in one of Australia's premier exploration hotspots, where over \$60 million has been invested by ASX-listed companies such as WA1 Resources, Encounter Resources, Rio Tinto (in JV with Tali Resources), and IGO Limited. MTM also holds tenements in other key mineral regions across Western Australia, including the Mukinbudin Nb-REE Project, East Laverton Gold & Base Metals Project, and Mt Monger Gold Project. In Québec, the Pomme Project is a highly promising carbonatite intrusion rich in REE and niobium, located near the world-class Montviel deposit.

To learn more, visit:

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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 www.mtmcriticalmetals.com.au and the ASX website www.asx.com.au.

Date	Description
29 January 2025	Excellent Progress on US-Based Technology Demonstration Plant
30 October 2024	Progress Update on 1 TPD Demonstration Plant

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