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ASX Release

13 March 2025

MTM TO PARTNER WITH MAJOR MINING COMPANY VEDANTA ON ALUMINA WASTE RECYCLING

World-First FJH Tech Turns Bauxite Residue into a Major Metal Recovery Opportunity with Further Potential to Decarbonise Cement

- **Strategic Partnership with a Global Giant: Non-binding MOU** with Vedanta Ltd, a US$20B market cap. global metals conglomerate with US$17B in FY2024 revenue, is a leading force in aluminium production and industrial sustainability.
- As part of its commitment to waste recycling, Vedanta, who ranks amongst the top in the S&P Global Corporate Sustainability Assessment, is actively exploring Red Mud (bauxite residue) reprocessing solutions[1].
- With alumina produced in over 20 countries worldwide, this MOU with Vedanta unlocks a vast global opportunity for Red Mud recycling and metal recovery through cutting-edge FJH technology.
- **Massive Market Potential: >4 billion tonnes**[2] of Red Mud are stored in tailings dams worldwide, **representing a vast untapped source of critical metals and construction materials**. MTM aims to unlock value from this immense resource.
- **Red Mud tailings comprise significant above-ground deposits of aluminium, titanium, gallium, scandium, and Rare Earth Elements (REEs)**.
- **Breakthrough:** MTM has efficiently **removed iron and sodium from Red Mud**, **producing saleable ferric chloride ($FeCl_3$),** and creating a pathway to recover high value residual metals like aluminium, titanium, REEs, scandium and gallium.
- **Additional Sustainable Cement Opportunity**: MTM is investigating the use of **low-iron Red Mud**, processed via FJH, as an input in cement production to partially replace clinker—the energy-intensive, nodules of limestone and clay that form the core of traditional cement kilns. Several global alumina companies are actively investigating this application[3].
- **Indian Government Support:** India, the world's No. 2 alumina and cement producer, champions Red Mud's sustainable use, led by Vedanta, the nation's top alumina player[4].

MTM Critical Metals Limited ("MTM" or the "Company") (ASX: MTM; OTCXB: MTMCF) is pleased to announce a landmark Memorandum of Understanding (MOU) with Vedanta Limited ("Vedanta") (NSE: VEDL), a leading global aluminium producer, to apply its proprietary Flash Joule Heating (FJH) technology for Red Mud (RM) recycling — extracting critical metals and investigating its potential in carbon-reduced cement production.

Vedanta, a powerhouse in aluminium, zinc, copper and energy with world-class operations like the Lanjigarh Alumina Refinery in Odisha, India, continues to invest in innovative ways to manage RM[5]. Testing of Vedanta's RM feedstock in MTM's facility in Houston, has shown that the FJH process provides an efficient, single-step process that:

1. Transforms RM's iron oxides into saleable $FeCl_3$, a compound widely used in water treatment and electronics, while also optimising its iron-to-alumina ratio so that it is more amenable to be used as an additive for cement.
2. Concentrates the RM in metals like alumina, titanium & gallium, paving the way for their economic recovery.
3. Reduces environmental risks by neutralizing Red Mud's alkalinity.

Vedanta's Deputy CEO – Red Mud, Sangita Sadafule, remarked: *"Vedanta's primary goal regarding Red Mud is the maximisation of its bulk utilisation using processes that have both positive techno-economic attributes, and the potential to increase net alumina yields from bauxite processing".*

MTM Managing Director & CEO, Michael Walshe, commented: *"This MOU with Vedanta represents a major breakthrough for MTM in the global aluminium industry where no commercially viable recycling solution currently exists for Red Mud. With billions of tonnes of Red Mud stockpiled globally, our FJH technology unlocks its potential — initially producing a product suitable for green cement, with a subsequent "Stage 2" focus on recovering valuable critical metals".*

[1] Vedanta Aluminium 2024, Vedanta Aluminium hosts strategic session on Red Mud utilization in partnership with NITI Aayog, Vedanta Aluminium.
[2] Khanna, R.; Konyukhov, Y.; Zinoveev, D.; Jayasankar, K.; Burmistrov, I.; Kravchenko, M.; Mukherjee, P, 2022, 'Red Mud as a Secondary Resource of Low-Grade Iron: A Global Perspective', Sustainability, vol. 14, issue 1258.
[3] Hindalco Industries Ltd., 2020 'Hindalco to supply 1.2 mn mt of Red Mud to UltraTech', https://www.hindalco.com/media/press-releases/hindalco-to-supply-1-2-mn-mt-of-red-mud-to-ultratech; Alcoa, [n.d.], 'Bauxite residue management'
[4] Business Standard 2019, 'Government asks stakeholders to find lasting solution for Red Mud utilisation', 26 July, LINK
[5] Vedanta Limited 2024, *Annual Report 2023-24*, Vedanta Limited, Mumbai, India.

ABOUT VEDANTA LIMITED

Vedanta Limited is a global resources powerhouse with a market capitalisation of ~US$20 billion and FY2024 revenues of ~US$17 billion. Vedanta is **India's largest aluminium producer and a globally significant company in metals and mining**, with operations spanning aluminium, zinc, copper, iron ore, and oil & gas. The company operates **one of the world's largest alumina refineries in Lanjigarh, Odisha**, and has actively explored **Red Mud (RM) utilisation strategies** as part of its sustainability initiatives.

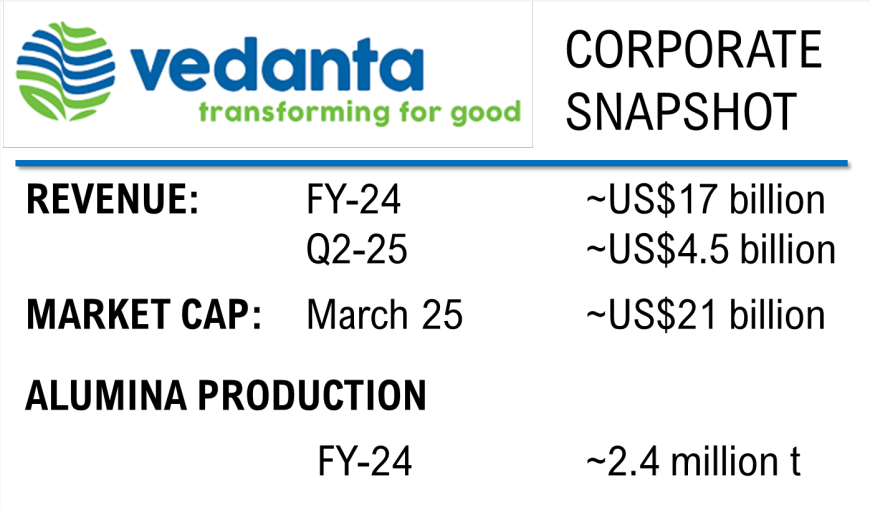

Figure 1: Vedanta Corporate Snapshot - Alumina (Source: Bloomberg 2025)

Beyond its scale, Vedanta is also at the forefront of industrial sustainability, ranking among the top companies in the S&P Global Corporate Sustainability Assessment. The company is committed to pioneering solutions for waste valorisation, circular economy initiatives, and carbon footprint reduction — making it a leader in responsible resource development.

The MOU with Vedanta represents a landmark partnership for MTM, providing a direct pathway to commercialise its FJH technology at scale within the aluminium industry. With Vedanta's vast operational footprint and commitment to sustainable innovation, this collaboration has the potential to redefine how bauxite residue is handled, transforming it into a source of strategic metals and a potential feedstock for 'green' cement.

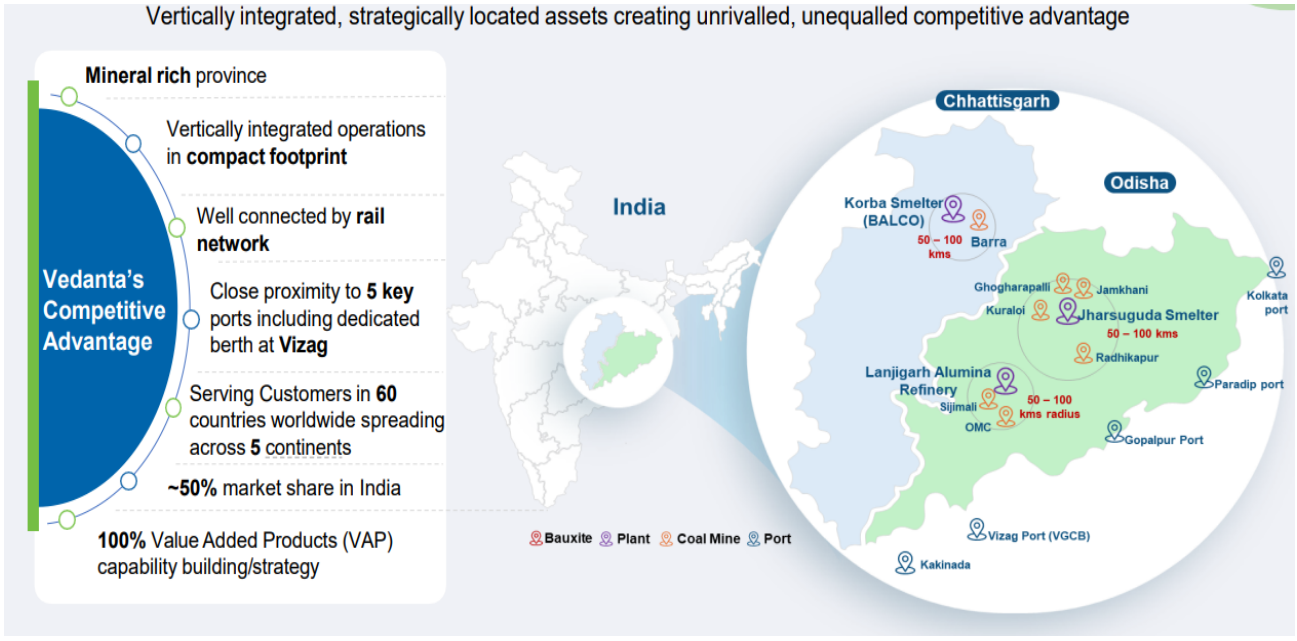

Figure 2: Vedanta's strategically located Indian assets (Source: Vedanta Limited 2024, FII Group Meeting)

MEMORANDUM OF UNDERSTANDING DETAILS – VEDANTA & MTM RED MUD COLLABORATION

Under a non-binding MOU, MTM will collaborate with Vedanta, one of the world's largest aluminium producers, to develop Red Mud (bauxite residue) reprocessing solutions using FJH technology. The partnership aims to recover valuable metals, including iron, alumina, titanium, scandium, and REEs, and repurpose Red Mud for industrial applications such as "green cement". FJH offers a groundbreaking alternative to traditional disposal and reprocessing methods by providing a simplified, efficient solution for iron removal whilst also providing the possibility to recover residual valuable metals.

OBJECTIVES OF THE COLLABORATION

- **Feedstock Supply**: Vedanta will supply bauxite residue (Red Mud) from its alumina operations to MTM.
- **Metal Recovery & Red Mud Repurposing**: MTM will apply its proprietary technology to extract valuable residual products from the feedstock, and examine its potential for reuse in other industrial processes.
- **Future**: the parties intend to negotiate agreements for: the supply Red Mud processing technology; formal processing, supply, and offtake contracts post successful trials; and a potential technology licensing agreement.

ROLES AND RESPONSIBILITIES

MTM: Conduct prototype-scale testing and proof-of-concept trials on Vedanta-supplied Red Mud.
Vedanta : Supply Red Mud feedstock from its alumina operations.

TERM AND TERMINATION

This MOU will remain in effect for 12 months from the signing date unless extended by mutual agreement.

CONSIDERATION

There are no financial obligations or payments stipulated under this non-binding MOU. The collaboration is structured to assess technical feasibility and commercial viability, with potential future agreements to define any financial considerations, including feedstock supply, processing costs, revenue-sharing, and licensing arrangements. There is no material financial impact to MTM from this transaction and all material terms are included in this announcement.

STRATEGIC IMPACT AND MARKET OPPORTUNITY

Red Mud (RM), a byproduct of the Bayer process, is generated at a rate of over 140 million tonnes annually worldwide, with an estimated 4 billion tonnes currently stockpiled — surpassing traditional metal reserves in scale. **This waste material contains up to 50% iron oxides, along with approximately 1.2 billion tonnes of alumina, 690 million tonnes of titanium, and 690,000 tonnes of gallium. However, the recovery of these valuable metals remains economically unviable due to inefficient and costly processing methods**[6]**, until now.**

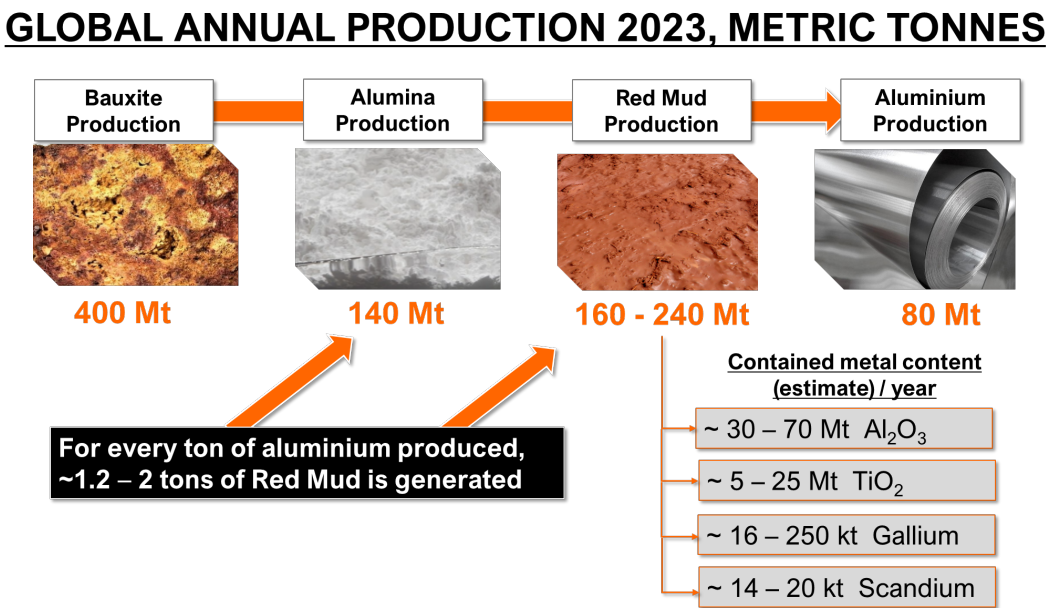

Figure 3: Annual production tonnages of bauxite, alumina, Red Mud & Aluminium metal. Contained metal estimates within Red Mud also shown (Source: USGS 2024; Li *et.al* 2023)

[6] USGS 2024; Li *et.al* 2023; Chemical & Engineering News 2014.

RED MUD (BAUXITE RESIDUE) - A GLOBAL CHALLENGE AND OPPORTUNITY

Red Mud, also known as bauxite residue, is an industrial byproduct generated during the Bayer process, which refines bauxite into alumina for aluminium production. This highly alkaline waste contains a complex mix of oxides and valuable metals, making both its storage and potential reprocessing a significant focus for industry and sustainability efforts.

Globally, an estimated 140–160 million tonnes of Red Mud is produced annually (See *Fig. 3* above), with total stockpiles projected to **exceed 10 billion tonnes by 2050**[7]. The sheer scale of accumulated residue presents both an industrial challenge and a strategic opportunity. Currently, **<1% of Red Mud is reused**[2], with the majority stored in large containment ponds or disposal sites, creating long-term storage risks.

Work is underway to develop commercially viable solutions that both reduce the volume of material in long-term storage and unlock its economic potential. Efforts are increasingly focused on:

1. Extracting critical metals such as iron, alumina, titanium, scandium, rare earth elements (REEs), and gallium, which are vital for high-tech industries, batteries, and aerospace applications.
2. Utilising Red Mud in industrial applications, including green cement production, where it can replace limestone clinker to reduce CO_2 emissions.
3. Advancing innovative processing technologies such as Flash Joule Heating to selectively extract valuable metals while stabilising the remaining residue.

With growing demand for critical minerals and sustainable waste management, Red Mud reprocessing is emerging as a key area for technological breakthroughs and industry partnerships, potentially transforming this waste into a valuable resource for the future.

Figure 4: Example of red mud tailings from a bauxite refinery in Germany. Source: Wikipedia.

[7] International Aluminium Institute (IAI) 2022, https://international-aluminium.org/wp-content/uploads/2022/09/Bauxite-Residue_Final_ENG-1.pdf.

STAGE 1: RED MUD AS A CEMENT ADDITIVE - TECHNICAL CONTEXT AND ADVANTAGES

Red Mud's value in cement lies in its post-Bayer process composition — rich in alumina, silica, and calcium oxides, which supports pozzolanic reactions for cement strength. A pozzolan is a siliceous or aluminous material that, mixed with water and calcium hydroxide, boosts cement durability. This enables Red Mud to partly replace clinker — the kiln-fired limestone-clay core of cement, potentially lowering carbon dioxide intensity and environmental impacts[8].

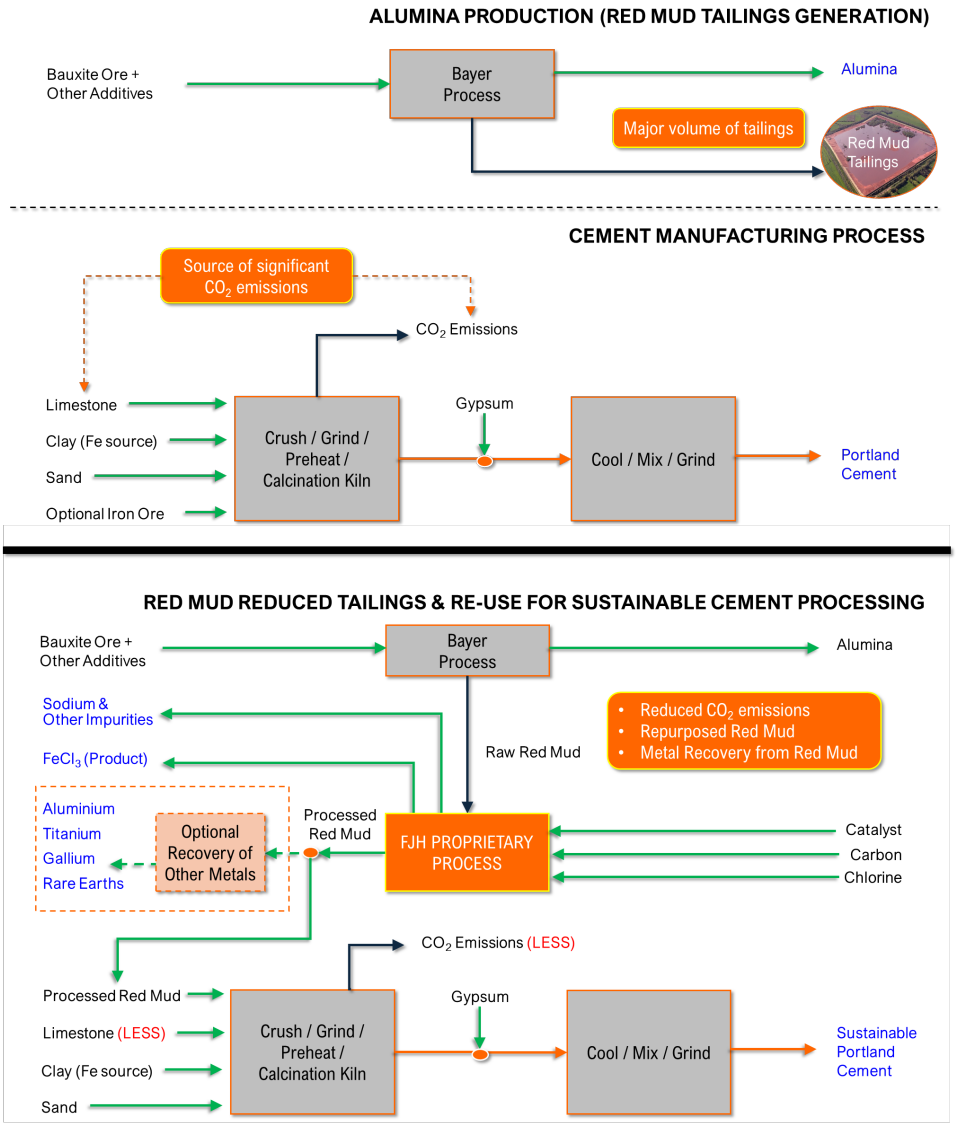

Figure 4: Top: Traditional Alumina & Cement Processes, Bottom: Sustainable handling of RM tailings using FJH

Technical Rationale: Cement needs a 1:1 Fe_2O_3:Al_2O_3 ratio for quality. MTM have successfully utilised FJH to reduce the iron content of Red Mud's (up to 50% Fe_2O_3) and recover the iron as to ferric chloride ($FeCl_3$). Moreover, sodium was removed optimising it for use as a cement additive. Sodium is the primary cause of the Red Mud's causticity and hazardous nature.

Raw unprocessed Red Mud (and raw bauxite ore) issues for use as a "green cement" additive:

- Colour: Excess iron causes a red tint, unfit for grey cement.
- Chemistry: High iron disrupts hardening, weakening concrete and generates other operating issues within the kilns.
- Cannot be used as a "green cement" additive in large volumes due to the high iron content (typically having an approximate 3:1 Fe_2O_3:Al_2O_3 ratio)[4]. The issue is even more pronounced for raw bauxite ore.

Clinker Alternative: **Replacing clinker with iron-reduced Red Mud potentially cuts limestone calcination emissions (which account for a significant ~8% of global CO_2 emissions**[4].

[8] Wu, P., Liu, X., Zhang, Z., Wei, C., Wang, J. and Gu, J., 2024. The harmless and value-added utilization of Red Mud: Recovering iron from Red Mud by pyrometallurgy and preparing cementitious materials with its tailings. *Journal of Industrial and Engineering Chemistry*, 132, pp.50-65. Available at: ScienceDirect

STAGE 1 FJH TEST RESULTS: IRON REDUCTION & GREEN CEMENT SUITABILITY

The Company utilised FJH technology at MTM's lab in Houston, Texas, USA to process Red Mud residue supplied by Vedanta. The FJH process successfully reduced the iron content of the raw feedstock (~ 50% Fe_2O_3; ~ 19% Al_2O_3, 5% TiO_5 by mass) such that the resultant product had an Fe_2O_3:Al_2O_3 ratio of ~1, aligning with the desired target for cement applications, where this ratio optimises both cement chemistry and colour[9]. The ability to fine-tune the composition of Red Mud through FJH presents a significant opportunity to transform this industrial byproduct into a high-value cement additive.

TEST SETUP:

- Chlorination in the presence of proprietary catalysts was performed within the FJH reactor to enhance iron removal.
- The resultant "post-flash" solids had an Fe_2O_3:Al_2O_3 ratio of ~1, aligning cement application requirements.
- See *Appendix* for further information.

Figure 5: Photo of high iron content Red Mud feedstock and resultant low iron & low sodium product

NEXT STEPS - STAGE 2: RECOVERING CRITICAL METALS FROM RED MUD

Following the initial production of a Red Mud product suitable for green cement, our subsequent efforts will focus on optimising the FJH process for complete iron removal and subsequent residual metal recovery. By fully extracting iron, a cleaner feedstock is generated for downstream processing. This paves the way for the targeted extraction of high-value residual metals, including aluminium, titanium, scandium, Rare Earth Elements and gallium.

By refining the process to maximise metal recovery, additional economic value is unlocked while further reducing Red Mud volumes, reinforcing sustainability and critical minerals supply security. With iron removed, the residual alumina content is expected to increase significantly, potentially exceeding 30 – 40%, depending on the initial composition of the Red Mud. This higher alumina content enhances the economic viability of further processing, creating new opportunities for refining and reintroducing alumina into industrial supply chains.

[9] Wu, P., Liu, X., Zhang, Z., Wei, C., Wang, J. and Gu, J., 2024. The harmless and value-added utilization of Red Mud: Recovering iron from Red Mud by pyrometallurgy and preparing cementitious materials with its tailings. *Journal of Industrial and Engineering Chemistry*, 132, pp.50-65. Available at: ScienceDirect

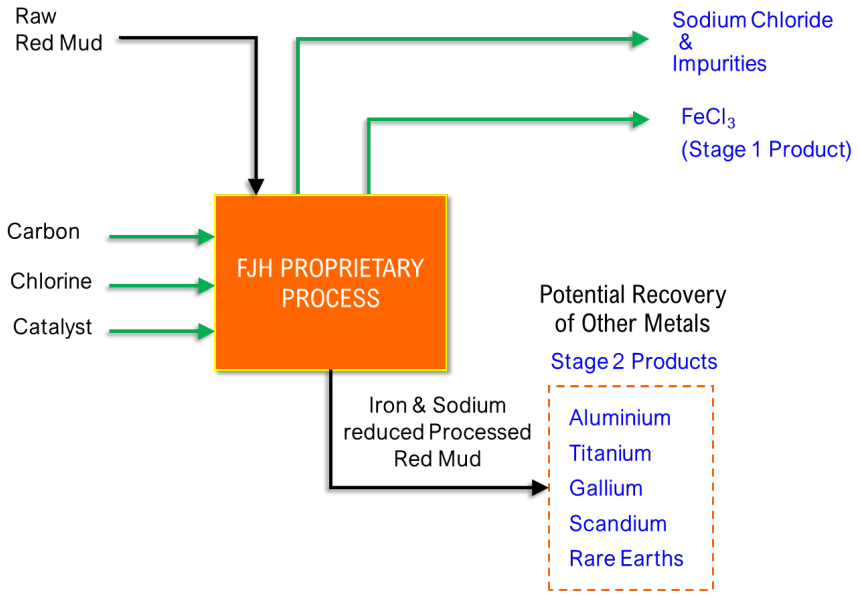

Figure 6: Stage 2 Targets for RM – Recovering Residual Metals

INDIAN GOVERNMENT INITIATIVES

India is the world's second-largest alumina producer, generating approximately 6 million tonnes of alumina annually, which results in a significant Red Mud resource byproduct. With over 15 million tonnes of Red Mud produced each year, the challenge of long term management continues to grow. Simultaneously, India's cement industry, the second-largest globally, produces over 400 million tonnes of cement annually, with demand expected to rise due to rapid urbanisation and infrastructure expansion. By further integrating Red Mud resources into cement production, India has a unique opportunity to reduce reliance on mined raw materials, lower CO_2 emissions, and improve resource efficiency[10].

India's government backs Red Mud reuse to mitigate environmental hazards and promote sustainability. The "Waste to Wealth" initiative, led by NITI Aayog, encourages its use in cement to reduce waste and emissions. While Section 80JJA of the Income Tax Act targets biodegradable waste, broader policies support hazardous waste solutions like Red Mud — deemed hazardous due to alkalinity, fostering a circular economy[11].

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

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WATCH A VIDEO SUMMARY & ENGAGE WITH THIS ANNOUNCEMENT: ***HERE***

[10] Evans, K, 2016, 'The history, challenges, and new developments in the management and use of bauxite residue', Journal of Sustainable Metallurgy, 2(4), pp. 316–331; Indian Ministry of Commerce & Industry, 2023, 'Cement industry report 2023', Government of India, www.commerce.gov.in.
[11] Government of India, 2025, 'India's Government Initiatives on Red Mud Reuse and Circular Economy', NITI Aayog, 'Waste to Wealth Mission', https://www.psa.gov.in/waste-wealth-mission; NITI Aayog, 2021, 'Transitioning from Linear to Circular Economy: An Impetus for India's Aatmanirbhar Bharat Abhiyaan', New Delhi: NITI Aayog; India, Income Tax Act, 1961, Section 80JJA, https://incometaxindia.gov.in.

APPENDIX – SUPPLEMENTARY INFORMATION

TESTWORK ANALYSIS METHODOLOGY:

- Scanning Electron Microscopy with Energy Dispersive Spectroscopy (SEM/EDS): Used to analyse the solids collected from the reactor and downstream systems.
- Inductively Coupled Plasma Mass Spectrometry (ICP-MS): Employed to quantify the metal content in the captured chlorides, co-products, and residual materials.
- Thermogravimetric Analysis (TGA): Used to assess the decomposition and transformation of recovered critical metals.
- TotalQuant Inductively Coupled Plasma Mass Spectrometry (ICP-MS)[12] was used to quantify the metals in the water wash solutions.

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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[12] TotalQuant refers to a mode in ICP-MS where all measurable elements are detected and quantified in a single run without prior specific selection of elements. This is particularly useful for complex samples where a comprehensive elemental profile is required. It is considered qualitative (or semi-quantitative) (±20% accuracy) because, in the TotalQuant mode, it provides a broad overview of the elements present in a sample without the rigorous calibration that would be needed for fully quantitative results & does not account for possible elemental interferences between various metals.