Quantum Critical Metals Advances Mineralogy and Metallurgy for James Bay Projects

written by Raj Shah | May 30, 2025

May 30, 2025 (Source) – Quantum Critical Metals Corp. (TSX.V: LEAP | OTCQB: ATOXF | FSE: 86A1) ("Quantum" or the "Company") is pleased to announce it has entered into a nondisclosure agreement with a specialized processing and hydrometallurgy laboratory to initiate metallurgical testing for its Discovery and NMX East projects, located in the Eeyou Istchee James Bay region of Québec.

Key Developments:

- **Significant Critical Metals Discoveries**

A detailed reassessment of drill core assays from both Québec projects has confirmed elevated and consistent intervals of **gallium, rubidium, cesium, niobium, and tantalum**. These results support the identification of two distinct gallium-rubidium-cesium mineralized systems within the Company's portfolio.

- **Early Metallurgical Focus to Accelerate Recovery Assessment**

In a strategic move, Quantum is prioritizing mineralogical and metallurgical studies ahead of a formal resource estimate to

evaluate the **economic viability of metal recovery**. This proactive approach aims to fast-track development and position the Company at the forefront of critical metal supply efforts in North America.

- **Innovative Gallium Recovery from Mica**

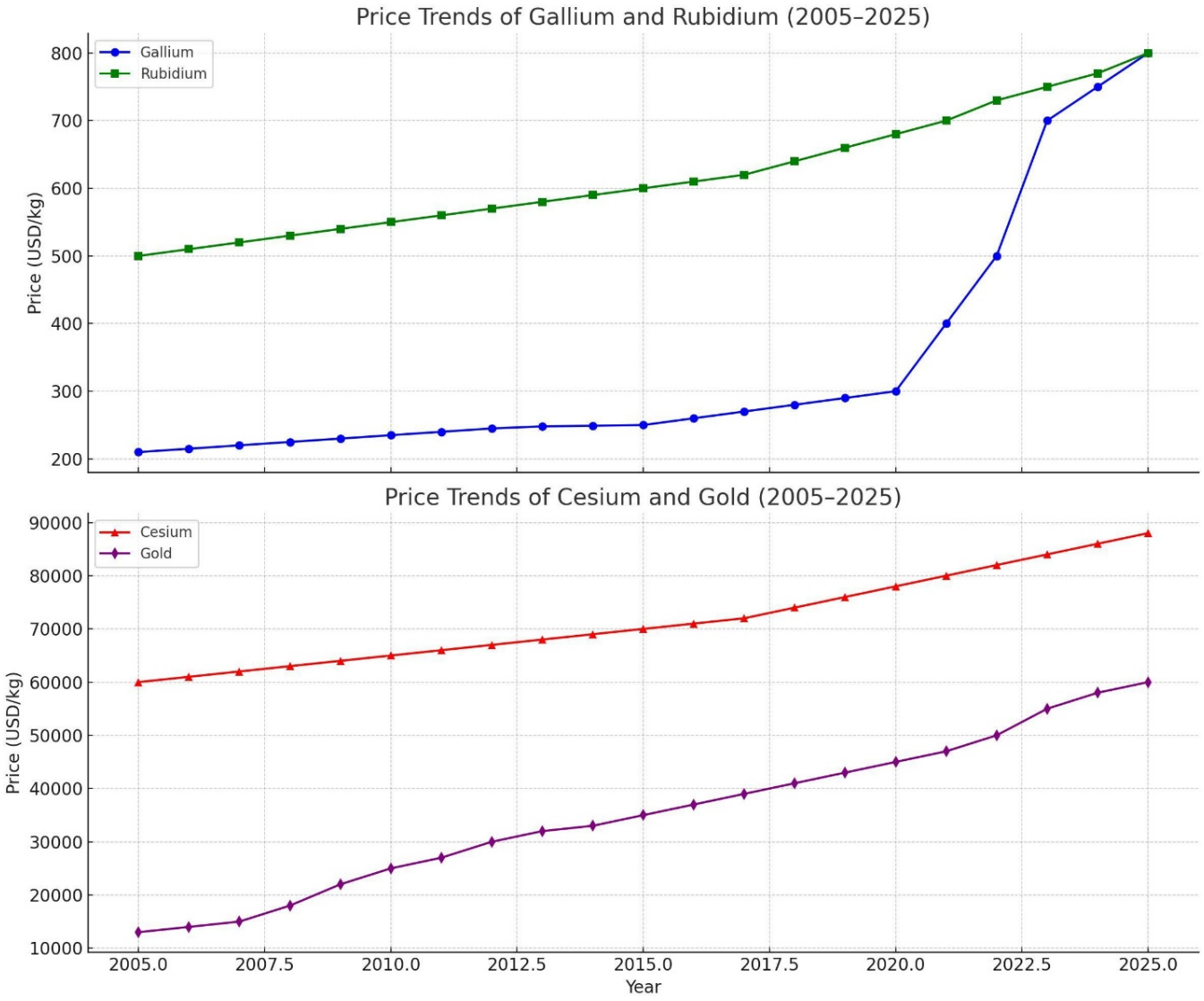
Initial findings suggest gallium may be hosted in **mica**, a non-traditional source. While gallium is typically extracted as a byproduct of bauxite or zinc processing, historical studies show it can be **recovered** from mica using processing methods like **floatation**, followed by hydrometallurgy **acid leaching** techniques. The Company is engaging multiple laboratories to optimize this process.

- **Strengthening Domestic Supply Chains**

In light of **China's December 2024 ban on gallium exports**, Quantum's discoveries represent a timely and strategic opportunity to support **North American critical mineral independence**. These metals are essential for high-tech applications, including semiconductors, telecommunications, defense, and renewable energy.

CEO Marcy Kiesman commented:

"While advancing metallurgy early in a project's life cycle may be historically unconventional, it reflects our urgency and commitment to unlocking domestic sources of critical metals. Gallium and other critical elements are essential to critical next-generation technologies. By tackling the processing challenge now, we aim to help fill the growing global supply gap in addition to the growing price escalations which are competitive with gold."



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Chart disclaimer: *Pre-2015 data for gallium, rubidium, and cesium are* ***estimated*** *for visual representation purposes. These estimates are reasonable approximations based on available secondary sources, adjusted using inflation and known demand trends. **

Next Steps:

The Company will collect larger sample volumes from both sites to send to multiple hydrometallurgy laboratories for **process optimization**. Additional updates will be provided as results

become available.

About Gallium

Gallium, a critical component in semiconductors, telecommunications, renewable energy sectors and may also be considered as a possible heat exchange medium in nuclear reactors. Canada and the USA rely on gallium for telecommunications, defense, and green energy. Gallium is also used in semiconductors, AI circuitry, radar and microchips and could be more critical than previously realized.

Source: https://www.metaltechnews.com/story/2022/09/12/critical-minerals-alliances-2022/gallium-may-be-more-critical-than-realized/1087.html

Gallium Market Size and Growth:

1. *Market Size*

In 2023, global high-purity gallium production was estimated at 320 tonnes, with total primary production capacity reaching 1,100 tonnes per year. Demand for gallium is projected to grow due to its role in semiconductors, 5G technology, and renewable energy applications.

2. *Key Applications:*

- Semiconductors: Gallium arsenide (GaAs) and gallium nitride (GaN) are critical in chips for smartphones, satellite communications, and defense systems.
- Renewable Energy: GaN is used in solar cells and LEDs.
- Emerging Technologies: Gallium is a key component in next-generation technologies such as quantum computing, 5G networks, and advanced radars.

3. *Geopolitical Considerations*:

China has imposed export controls on gallium, exacerbating supply chain challenges for the U.S. and its allies. These restrictions are part of a broader trade conflict over critical technologies. Countries like the USA are ramping up efforts to develop domestic gallium sources and processing capabilities to reduce reliance on China.

Sources: https://pubs.usgs.gov/periodicals/mcs2024/mcs2024-gallium.pdf

https://www.usgs.gov/news/national-news-release/usgs-critical-minerals-study-bans-gallium-and-germanium-exports-could

https://www.metaltechnews.com/story/2024/11/20/tech-metals/tech-metals-bans-could-cost-us-billions/2040.html

About Rubidium

Today most rubidium is obtained as a byproduct of lithium and since it is easily ionized it can be used to propel spacecraft engines (ion). Rubidium's critical role in emerging technologies and its limited supply make it a valuable strategic resource.

1. *Market Size and Growth*:

Rubidium is a niche market, with an estimated global annual consumption of less than 2,000 kilograms, primarily for high-tech applications. Prices for high-purity rubidium compounds are significant, often exceeding $1 million per tonne for rubidium oxide, driven by its rarity and specialized uses.

2. *Applications*:

- Specialty Glass: Used in fiber optics and night-vision technology.

- Telecommunications: Serves as an atomic frequency standard in GPS systems.
- Quantum Computing: Ultra-cold rubidium atoms play a key role in quantum research.
- Batteries: Potential use in sodium-ion batteries, an emerging alternative to lithium-ion technology.

3. *Growth Drivers*:

Advances in quantum computing and demand for robust, low-temperature battery technologies are expected to boost rubidium consumption. The inclusion of rubidium on critical minerals lists highlights its strategic importance, especially as global reliance on China's supply raises supply chain concerns.

4. Geopolitical Factors:

China's dominance in rubidium production and recent export restrictions have prompted countries like the U.S. and Australia to accelerate exploration and development of domestic resources.

Sources: https://www.mordorintelligence.com/industry-reports/rubidium-market

https://www.imarcgroup.com/rubidium-market

https://www.marketresearch.com/OG-Analysis-v3922/Rubidium-Outlook-Size-Shares-Data-36046807

About Cesium

Cesium is a rare, silvery-gold alkali metal known for its high reactivity and unique properties. It plays a critical role in various high-tech applications, including atomic clocks, medical imaging, and oil and gas drilling operations. The global cesium market is experiencing steady growth, driven by its expanding use in these and other advanced technological fields.

1. Market Size and Growth:

The global cesium market was valued at approximately USD 363.58 million in 2024 and is projected to reach nearly USD 601.72 million by 2032, growing at a compound annual growth rate (CAGR) of 6.5% during the forecast period. This growth is driven by increasing demand in various high-tech applications and the element’s strategic importance.

1. Applications:
    - Medical Industry: Cesium isotopes are utilized in cancer treatment, particularly in brachytherapy for targeting specific areas with radiation.
    - Oil and Gas Industry: Cesium formate is employed as a high-density, low-viscosity drilling fluid, enhancing the efficiency of drilling operations.
    - Electronics: Cesium compounds are used in photoelectric cells, enhancing their efficiency and performance.
    - Atomic Clocks: Cesium’s precise frequency standards are fundamental in the operation of atomic clocks, which are critical for GPS systems and telecommunications.
    - Quantum Computing: Cesium atoms are explored for their potential in quantum computing applications, contributing to advancements in this emerging technology.

2. Growth Drivers:

The increasing importance of cesium in cancer treatments and its diversified applications across various industries are significant growth drivers. Additionally, the rising demand for cesium in petroleum extraction and advancements in quantum computing technologies contribute to market expansion.

1. Geopolitical Factors:

China's dominance in the production and supply of cesium has raised concerns about supply chain vulnerabilities. Recent export restrictions by China on critical minerals have prompted other countries to seek alternative sources and develop domestic resources to ensure a stable supply.

Sources:

"Cesium Market Poised for Growth at 6.5% CAGR, Reaching USD 601.72 Million by 2032" – openpr.com

"Cesium Market to Expand by USD 3.57 Billion from 2024-2028, Driven by Growing Role in Cancer Treatment" – prnewswire.com, "China Imposes Export Controls on Medium and Heavy Rare Earth Materials" – hklaw.com

* **Chart Data Sources**

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About Critical Metals

Critical metals are essential components in modern technologies, including renewable energy systems, defense applications, and advanced electronics. Both the United States and Canada have identified specific lists of critical minerals vital to their

economic and national security. The U.S. Geological Survey's 2022 list includes 50 critical minerals, while Canada in 2024 has designated 34 minerals as critical.

Recent geopolitical developments have heightened concerns over the supply chain security of these critical metals. China, which holds a dominant position in the production and processing of several critical minerals, has implemented export bans affecting the West. These actions underscore the strategic importance of diversifying supply chains and developing domestic sources for critical metals to mitigate geo-political risks and ensure the stability of essential industries.

About Quantum Critical Metals Corp.

Quantum Critical Metals Corp. (TSX.V: LEAP) (OTCQB: ATOXF) (FSE: 86A1) is a Canadian mineral exploration company focused on advancing critical metals projects that power next-generation technologies. With a growing portfolio of promising assets—including the NMX East Gallium-Rubidium-Cesium Project in Québec, the Discovery Gallium-Rubidium-Cesium and polymetallic project in Québec, the Victory Antimony Project in British Columbia, and the newly acquired Prophecy Germanium-Gallium-Zinc Project in British Columbia, among others, the Company is strategically positioned to support the West's transition to a secure and sustainable critical metals supply.

To stay updated on Quantum's latest developments, sign up for our mailing list and visit www.quantumcriticalmetals.com and www.sedarplus.com.

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