

HALLGARTEN + COMPANY

Initiation of Coverage

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Quantum Critical Metals

(TSX-V: LEAP | OTCQB: ATOXF | FSE: 86A1)

Strategy: LONG

Price (CAD)	\$0.085
12-Month Target Price (CAD)	\$0.43
Upside to Target	406%
High-low (12 mth)	\$0.025 - \$0.22
Market Cap (CAD mn)	10.19
Shares O/S (mn)	119.90
Warrants O/S (mn)	20.83
Options O/S (mn)	10.80
Fully Diluted (mn)	151.53

Quantum Critical Metals

Carving Out a Niche in Gallium & Rubidium

- + Quantum Critical is in hot pursuit of a slew of critical minerals from its NMX East project in Quebec, amongst them Gallium, Rubidium and Cesium
- + The at-surface pegmatites at NMX East have been shown to be rich in these more obscure minerals which feature in virtually every listing of Critical metals/minerals
- + The technology driving the work to extract critical metals from muscovite, a form of mica, is being developed and enhanced in partnership with the US firm, Nusano
- + The opportunity (and challenge) is to penetrate (and dominate) the formates space which is crucial in the high-pressure gas well workover space
- + The Babine South et al. projects in British Columbia are silver-oriented, with a strong history of past production and would make an attractive candidate to be a SpinCo
- × Pricing in the major target metals of Quantum's endeavours is murky in the case of gallium and downright obscure in the case of Rubidium and Cesium
- × China still has the firepower to cause damage to the Gallium price and market by predatory actions (e.g. on price, relaxing/tightening export controls)
- × Financing of junior explorers is still a hard row to hoe, with a vision/path to production required to attract serious funds

The Alphabet Soup of Critical Minerals

The danger of mining promoters wading into the critical metals/minerals space is that the slew of symbols from the Periodic Table end up confusing the promoters as much as the investors they seek to bamboozle. Indeed, we recall an incident in the first Rare Earth boom when, at a group meeting of investors, we had to point out to one management that their top-drawer consultancy firm had added Thorium into a Rare Earth percentage, and management had not noticed (taking it very badly).

There is no danger of that at Quantum, as management know their critical metals down to the minutiae. What even the most informed of us do not know are several key pieces of this jigsaw. Pricing is a mystery for many "negotiation by appointment" minerals. Then there is the extent to which China is firm in its export bans and there is a suspicion that they cheat (officially and unofficially) on their own bans. And then there is the issue of when the two major current conflicts will end and how much the enthusiasm for critical metals will outlast these wars.

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Amongst other things we shall try to demystify these issues in this Initiation.

Quantum is working to become North America's first primary producer of gallium and rubidium from mica, a mineral that has historically been discarded as waste across mining operations worldwide.

Gallium is conventionally recovered only as a byproduct of bauxite or zinc processing. Quantum is among the first companies to demonstrate direct recovery from mica — an unconventional source that could establish a new North American gallium supply pathway.

In this Initiation of Coverage, we look at the principal project in Quebec, its mineralisation and the technology being used to exploit this opportunity. We also look at the main critical minerals that are being targeted and finally the potential of the company's "other" project, silver in British Columbia, to be the mainstay of a metal specific SpinCo.

NMX East - The (Main) Project

The company's most advanced project is the NMX East project in Quebec. The project is located near Nemaska Lithium's Whabouchi project (hence the NMX reference in project name) and the Nisk-Lion-Tiger polymetallic discoveries of Power Metallic Mines (TSXV: PNP | OTCBB: PNP | Frankfurt: IVV1).

NMX East hosts a visible outcrop of two pegmatites which run parallel to each other. One of the dykes can be visually measured along surface for approximately 300 metres. This property hosts mica-bearing pegmatites containing gallium, rubidium, cesium, tantalum, niobium, and potential for high-purity silica and alumina.

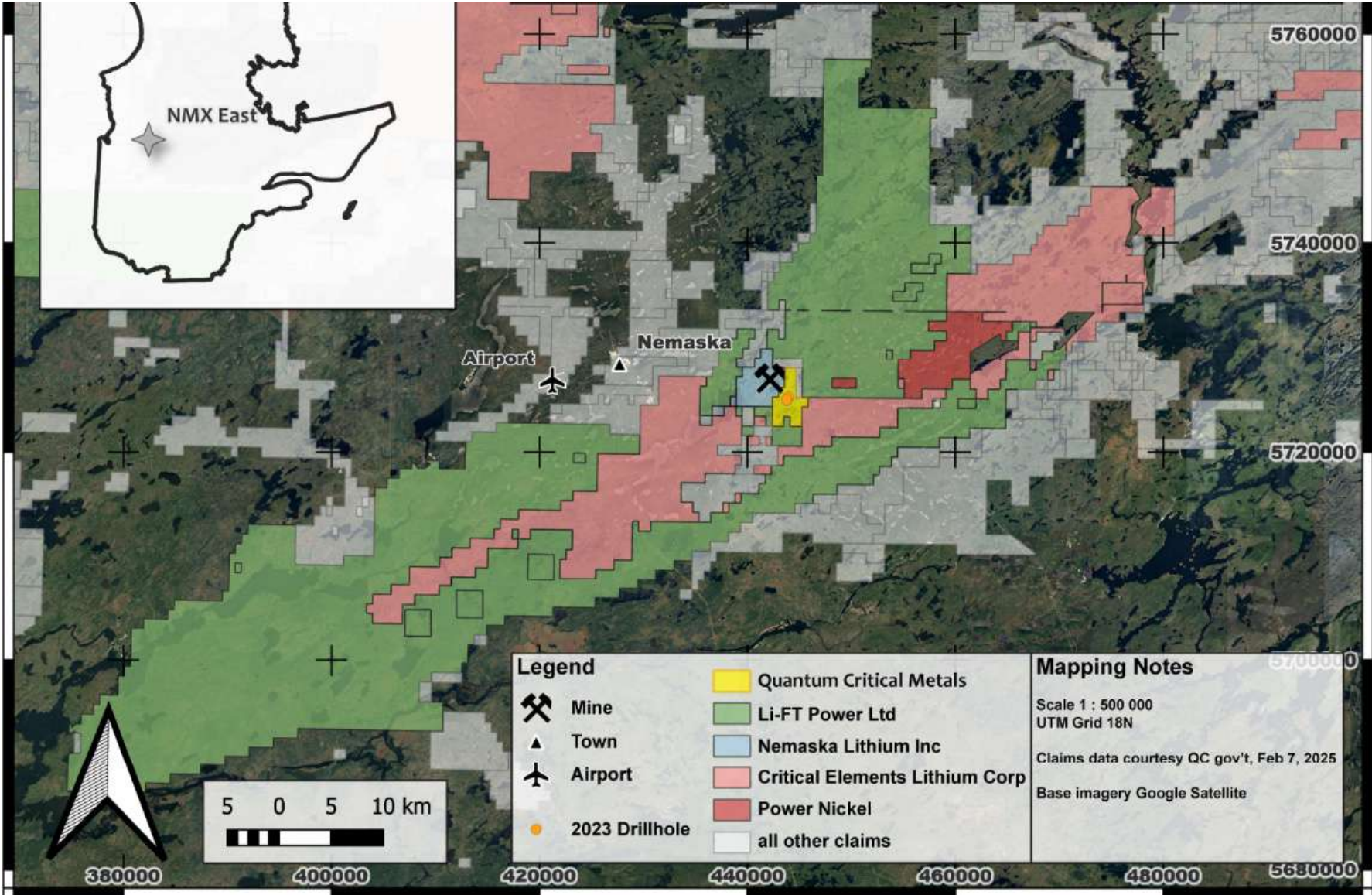
On Mica

Before we indulge in any sweeping statements we would note that there is mica and mica, indeed 37 different types of the material.

Mica refers to a group of naturally occurring silicate minerals known for their perfect basal cleavage, allowing them to easily split into thin, flexible, and often transparent sheets. Because of its unique structure and ability to reflect light, mica has a wide variety of commercial applications ranging from cosmetics to construction.

On Muscovite

Muscovite (also known as common mica, isinglass, or potash mica) is a hydrated phyllosilicate mineral of aluminium and potassium with the formula $KAl_2(AlSi_3O_{10})(F,OH)_2$, or $(KF)_2(Al_2O_3)_3(SiO_2)_6(H_2O)$. While the formula for muscovite is typically given as $KAl_2(AlSi_3O_{10})(F,OH)_2$, but it is common for small amounts of other elements to substitute for the main constituents. Alkali metals such as sodium, rubidium, and cesium may substitute for potassium. This is a salient fact for the material of Quantum Critical at NMX East.



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It has a highly perfect basal cleavage yielding remarkably thin laminae (sheets) which are often highly elastic. Sheets of muscovite 5 by 3 meters (16.4 ft × 9.8 ft) have been found in Nellore, India.

Muscovite can be colorless or tinted through grays, violet or red, and can be transparent or translucent.

Muscovite is the most common form of mica. It is found in granites, pegmatites, gneisses, and schists, and as a contact metamorphic rock or as a secondary mineral resulting from the alteration of topaz, feldspar, kyanite, etc. It is characteristic of peraluminous rock, in which the content of aluminum is relatively high. In pegmatites, it is often found in immense sheets that are commercially valuable.

Muscovite is in demand for the manufacture of fireproofing and insulating materials and to some extent as a lubricant.

Exploration

In 2023, drill intercepts in Hole 3 intersected over 107 metres of 38.85 g/t of Gallium, 701 g/t of Rubidium, 25.7 g/t of Cesium, 26 g/t of Tantalum, 72.5 g/t of Niobium. A mica concentrate processed from this interval resulted in grades of 205 g/t of Gallium, 3260 g/t of Rubidium, 67.6 g/t of Cesium, 51.4 g/t Tantalum, 371 g/t Niobium.

In 2025, muscovite mica concentrate (mica removed from the core) yielded grades of 205 gpt gallium, 3260 gpt rubidium, 67.6 gpt cesium, 51.4 gpt tantalum, 371 gpt niobium.

In early April of 2026, the company received approval from the *Ministère des Ressources naturelles et des Forêts* for a drilling permit authorizing up to 121 diamond drill holes at its NMX East property

The permit enables the Company to undertake systematic exploration drilling across the project area. The planned program will focus on muscovite-rich pegmatite dykes with the objective of delineating mica hosted critical mineralization, including gallium and rubidium. In addition, drilling is planned within an ultramafic rock package on the southern portion of the property to evaluate the potential for nickel polymetallic-mineralization, as previously outlined in the Company's news release on August 14th, 2025.

Quantum is planning a comprehensive, multi-phase drilling program designed to systematically define mineralization across both pegmatite and ultramafic packages.

The 121-drill hole program is expected to be executed in multiple phases over the next two years, allowing the Company to incorporate analytical results from each phase into the design of subsequent campaigns and optimize exploration.

MetWork

In November 2025, the company reported 93% Gallium recovery from preliminary bench-scale hydrometallurgical testing from material sourced at the NMX East project. Quantum, in March of 2026 reported the production of a muscovite concentrate from drill core and used it to complete bench scale metallurgical testing and it yielded a 55% rubidium recovery from mineral into solution.

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This validated the core thesis that this overlooked material can serve as a viable new source of critical metals. Quantum is thus amongst the first companies to demonstrate direct gallium recovery from mica using hydrometallurgy, establishing a potential new North American gallium supply pathway.

Then in late May of 2026 the company initiated advanced metallurgical test work targeting rubidium recovery from its NMX East project. To this end it has engaged the University of British Columbia (UBC) to evaluate a hydrometallurgical flowsheet designed to optimize extraction of rubidium while also assessing the recovery of additional high-value critical elements including gallium and lithium. The UBC work will be supervised by David Dreisinger, Chair Emeritus of the Hydrometallurgy Research Chair and a recognized expert in critical material recovery.

Recent analytical work on representative material from the NMX East project has confirmed significant rubidium enrichment in a mica concentrate, including:

- Up to 3,260 g/t Rb in coarse fractions

With elevated concentrations of:

- Gallium: up to 205 g/t
- Tantalum: up to 51.4 g/t
- Lithium: up to 816 g/t

The metallurgical program is designed to maximize rubidium recovery and advance the development of a refining flowsheet capable of producing marketable products (amongst which Rubidium Formate). From there, the company wants to also enable downstream recovery of strategic by-products including gallium, tantalum and lithium.

The Technology

The company is advancing toward a commercially viable extraction process, supported by a refining partnership with Nusano, a privately-held U.S.-based physics technology company, at a facility in Utah.

Nusano is working to stabilize supply chains, reduce US dependency on foreign supply, and innovate in fields ranging from healthcare to nuclear energy. The company is commercializing platform technologies for radioisotope production, stable isotope enrichment, and advanced separation techniques. Together, these proprietary systems and methods are poised to supply the fight against cancer, fuel the nuclear renaissance, and deliver critical minerals for the modern world.

Under the MOU, Quantum will supply material from its Canadian projects to Nusano's facility in Utah for refining into metals. The target elements include antimony, cesium, gallium, germanium, rubidium, tin, zinc, gadolinium, and other critical elements. The goal here is to move critical metals from Canadian in-ground sources to North American-refined, high-purity product.

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Interacting with the Critical Metals Establishment

In March of 2026, the company confirmed that it had been accepted into the U.S. Defence Industrial Base Consortium (DIBC). The DIBC's mission is “to support a resilient U.S. supply chain and work force capable of responding to national security needs without reliance on foreign sources”. The consortium provides financing opportunities for small and non-traditional businesses to work with the US government while also offering access to research, prototyping and teaming opportunities. DIBC also fosters collaboration among government, industry and academia to help strengthen the defence industrial base. Through this network, members can pursue rapid research initiatives, commercial defence solutions and innovation-driven partnerships.

Then in mid-May the company announced its acceptance into the European Union’s Raw Materials Mechanism under the EU Energy and Raw Materials Platform. This positions Quantum to engage with European investors, industrial partners, and potential offtake counterparties amid increasing focus on securing resilient critical minerals supply chains.

The European Union has identified significant supply gaps across a range of critical minerals essential to its energy transition and advanced manufacturing sectors, underscoring the need for new, reliable sources of supply and strategic international partnerships.

The EU Raw Materials Mechanism is designed to facilitate commercial partnerships between strategic projects, European industrial buyers, and financial stakeholders, supporting project advancement and enhancing supply chain resilience.

First Nations

The project is located in the James Bay - Eeyou Istchee region of northern Québec.

Discovery Project

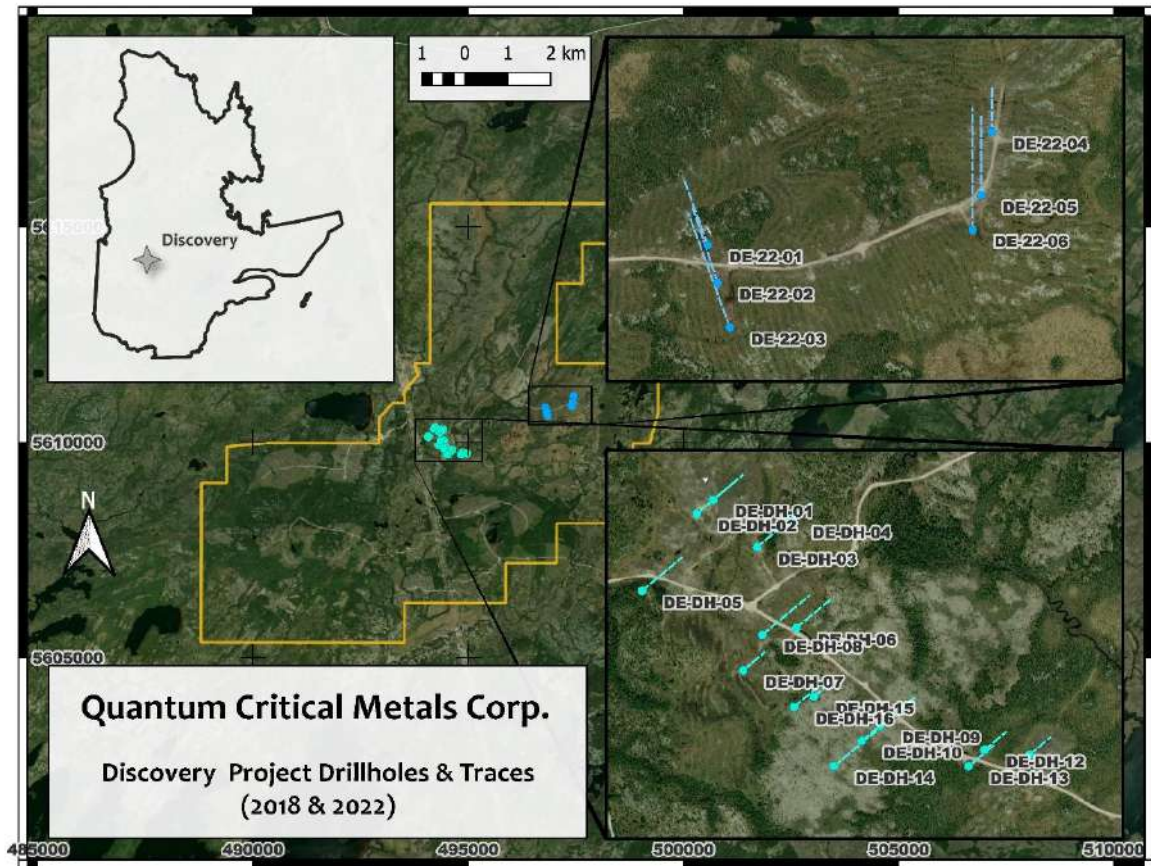
This 100%-owned exploration property is in Quebec. The Discovery Project spans 6,082 hectares and is located southwest of the past producing Troilus gold and copper mine (TSX-TLG), as well as the Moblan lithium deposit.

It is a polymetallic property hosting gallium, rubidium, cesium, REEs elements, gold, zinc, and other metals. The metal suite mirrors NMX East, expanding Quantum's footprint in these supply-constrained metals within the same geological province.

Regional & Project Geology

The Discovery property is situated in the Frotet-Evans Greenstone belt, a volcanic-sedimentary assemblage which contains a central sedimentary basin. The Discovery property is located in the eastern region of the belt. Multiple stages of deformation affected the rocks at Discovery and produced folds with axes of ENE-WSW to EW in orientation and destroy strike slip faults with an E-W trend.

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Exploration at Discovery

Several rounds of geophysical surveys (EM and Mag, AMT, Gravity) and soil geochemistry lines were completed on the Discovery property from 2013 to 2017.

In 2014, an exploration campaign was conducted and returned up to 41.6 gpt and 46.6 gpt Au in channels samples located 36 metres apart. Field mapping was completed in 2022, 2023, and 2024.

Exploratory drilling was completed in 2018 and 2022 to try to locate the source of the gold occurrences at surface. These campaigns totalled approximately 2,432 meters, and 1,696 meters respectively, for a total of 4,128 meters across 22 holes. Those programs were originally initiated for gold exploration, but given recent geopolitical developments regarding critical metals, Quantum revisited the results to investigate any further potential that may exist than what was originally considered in the past.

In April of 2025, the company reported that it had discovered elevated and consistent intervals of the critical minerals. Notably, the intersections included:

- 37gpt gallium, 936gpt rubidium, 72gpt niobium, 8gpt cesium, and 10gpt tantalum over 30

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meters from 9m to 39m

- 38gpt gallium, 694gpt rubidium, 72gpt niobium, 8gpt cesium, 9gpt tantalum over 150 meters from 44 to 194 meters
- 37gpt gallium, 651gpt rubidium, 57gpt niobium, 15gpt cesium, 11gpt tantalum over 73 meters from 17 to 90 meters
- 44gpt gallium, 801gpt rubidium, 66gpt niobium, 16gpt cesium, 36gpt tantalum over 43 meters from 16 to 59 meters

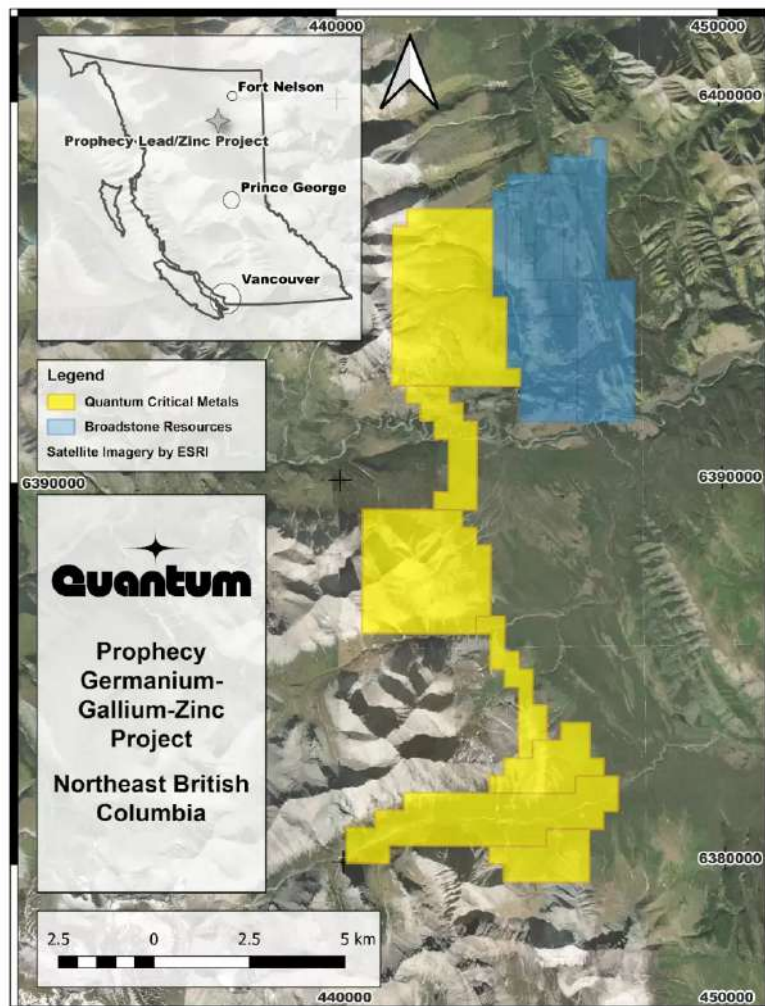
It is still early days here but there are clear parallels with the work and results at NMX East.

Prophecy – Zinc on the Mind

The Prophecy claims consist of seven mineral tenures totalling 4,349 hectares. All claims are located approximately 240 kms northwest of Fort St. John, B.C.

The region around the Prophecy property has been explored since the early 1970s and was optioned by Cominco 1972 to 1973 who completed geological mapping, soil geochemistry, geophysics and drilling. Historic drill hole logs are available which show several intersections of lead and zinc mineralization; however, assays are not available.

In late May of 2026, the company released the assay results of a site visit undertaken by the Quantum exploration team on its wholly owned Prophecy zinc prospect.



The mineralization of the Prophecy claim region is associated with Mississippi Valley-type (MVT) vein

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systems.

Regional Geology

Elevated barium and strontium values associated with anomalous zinc and lead assays are consistent with Mississippi Valley-type (MVT) mineralization. The strong Ba-Sr association possibly reflects barite-bearing hydrothermal fluids and interaction with carbonate host rocks, supporting the interpretation of a basin-brine sourced mineralizing system. The association of the barium and strontium values in addition to the zinc and lead strongly support a MVT-style mineralizing environment rather than isolated zinc enrichment. This is important, as the geochemical signature shares characteristics with the Pine Point, NWT style MVT system, particularly the association of zinc-lead mineralization with elevated barium and strontium values which point to indicators of saline hydrothermal fluid activity.

Exploration at Prophecy

In late 2025, an airborne site visit was undertaken by Quantum, and 16 samples were collected from rock outcrop and float locations. Eight samples returned anomalous zinc results from assays as per Table 1, which indicates the samples associated with anomalous zinc results (ranging from 1,820 parts per million to 22,000 ppm Zn). Anomalous lead ranged from 63 ppm to 5,930 ppm Pb (lead) in the same samples with elevated zinc. Barium (Ba) assays returned 27 to 26,900 ppm and strontium (Sr) returned elevated levels from 58 to 5,910 ppm.

Babine South

This is a silver project with a history dating back to the 1920s, when 94 kilograms of silver was reportedly produced from a trench. Historical records (BC government Minfile summaries and assessment reports) include grab samples assaying up to 835 oz/t Ag (26,000 g/t), and re-assays confirming up to 308 oz/t Ag (9,580 g/t).

Mineralization occurs in quartz-carbonate and quartz brecciated veins within an epithermal system hosting native silver, galena, sphalerite, tetrahedrite, and chalcopyrite.

The 2025 field program returned surface rock silver samples ranging from 10.9 ppm to 1,150 ppm Ag (0.35 oz/t to 36.97 oz/t) with anomalous base metals.

The 2026 program will consist of expanded geological mapping, targeted surface sampling, and IP geophysical survey to define drill targets.

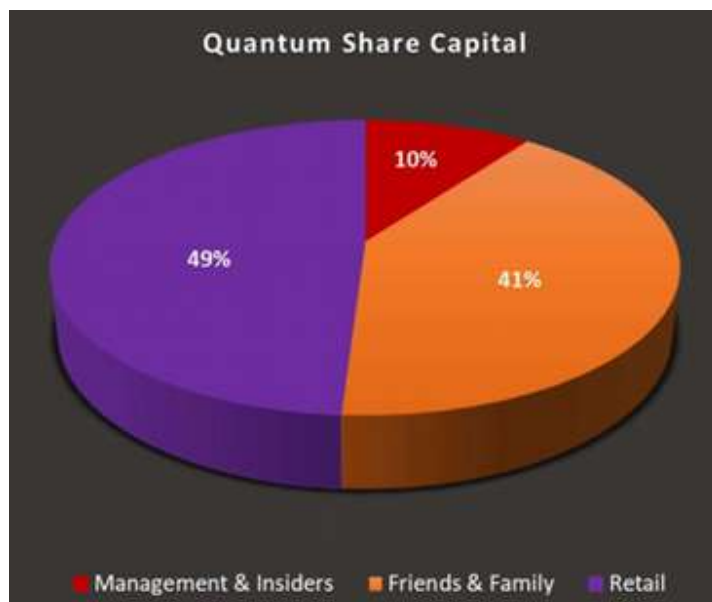
We discuss this project and likely trajectories in **Appendix III**.

Shareholders & Financing

The company is severely economical with its cash and thus has not done financings in recent times. That is not to exlude the possibilitythat one might not happen as exploration ramps up.

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The pie chart below shows the shareholder distribution:



Board & Management

Marcy Kiesman, Chairwoman & Chief Executive Officer, has twenty years of senior leadership in mining and finance. Previously CFO and responsible for overseeing operations at cement additive mine in British Columbia.

Aimee Ward, Director & Chief Financial Officer, has over 20 years of experience in finance, accounting, and business administration. Oversees Quantum's financial reporting, compliance, and corporate governance.

Tracy Hughes, non-executive director, is a founder of InvestorNews and the Critical Minerals Institute; co-founder of REE Stocks PLC. Over 30 years spanning capital markets, investor communications, and global resource development.

Dr. Rob Bowell, Director & Chair of ITAC, is a leading applied geochemist with three decades of international experience across mineral exploration, metallurgy, environmental geochemistry, and strategic resource development across 100+ countries.

Risks

The risks for the Quantum Critical are (or might be):

- ✗ A reduction in global geopolitical instability (i.e. the end of the Trump Administration's more bellicose actions)

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- ✗ A reversal in the critical metals' price trends
- ✗ China manipulating the market in some way to again create distortions in price and trade patterns
- ✗ A tough financing market for junior explorer/developers

Global conflicts (both actual and potential) have played a significant role in spurring critical minerals demand (and perception change) in recent times. We would note that Rb/Cs prices have not marched to a martial beat and that Gallium's "hot" status owes more to jockeying in the semiconductor space than anything to do with munitions or the military industrial complex.

Can prices go down? Absolutely, it has happened before and might happen again, but to what extent the price might retreat and for how long are interesting subjects to consider.

China is not alone in creating scenarios in which prices will move higher (or lower). US tariffs are being used to make non-Chinese production of Gallium more attractive. After having imposed restrictions on so-called dual-use exports of Gallium and Germanium, the Chinese have managed to "juice up" the markets for these more or less not mainstream and in some cases obscure minerals/metals. What has been done can be undone at will. To some extent, the Ga/Ge bans have been somewhat elective with "leakage" of products having damped down expected price surges in these elements. One should not be surprised to see selective easing or nuancing of the dual-use bans as a negotiating token in trade talks with the US.

Likewise, price-signalling has been employed in the larger volume metals, Antimony & Tungsten, to place prices lower, much as be seen over the last 15 years where the Chinese have played the REE space like a fly-fisherman attempting to delude the trout or salmon into submission.

Financing remains difficult and dilutive when it takes place. The only way to harvest the most attractive price on a financing is to be in production and the only way to do that is to finance mine-builds/reactivations. The ease with which those in the Tungsten space have been able to raise funds in the two years (contrasting strongly with the tough times for even producers gleaning funds pre-2024) shows the market's receptiveness to production stories.

Royalties are a means to fund stories that have production in prospect (e.g. Tungsten). This does not exclude more exotic critical metals from joining this trend.

Investment Theses

Maybe we are just a little slow but we had wondered why Quantum had chosen LEAP as its ticker, then the penny dropped. But it seemed appropriate because Quantum's management and technical team are indeed in search of a quantum leap that provides a mined source of rubidium (which currently has no primary mined sources) and production of Gallium that bypasses having to reprocess amassive amounts

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of “red mud” waste from alumina smelters.

Beyond this strategy that meshes with the Zeitgeist of the 2020s there is the silver potential at Babine South and associated concessions which could award shareholders of Quantum with a more immediate payday if it is spun out as a standalone silver play in a market which is somewhat starved for “resh faces” in the silver space that are in jurisdictions with more of a comfort factor than Mexico can provide.

Rating & Target

Will critical metals stay as the main driver in the metals space forever? No. However, will the end of the current two major wars, move these off the front page? We doubt it. Tensions are up. They are likely to stay up. Many countries have woken up to the fallacy of the peace dividend touted after the fall of the Berlin Wall, as the way to fund everything (except defence). The blinkers are off..

Quantum’s strategy on this score is to follow the path less travelled (Gallium and Rb/CS) in the mineralization less spoken of (mica in pegmatites). We would be far less enthusiastic on the prospects if it was pursuing the overcrowded Rare Earths “phenomenon” or the much talked of Tungsten surge (where almost no new production has been seen despite a massive price surge).

Quantum is definitely a stock that is intellectually- and scientifically-driven in a critical metals world that has seen a blizzard of gobbledygook and pseudoscience.

There will clearly be space for serious pursuers of critical metals once we are past the age where “friends in high places” is the only discriminator when it comes to funding, particularly out of Washington. For these reasons, we are initiating Quantum Critical Minerals with a **LONG** rating and a 12-month target price of **CAD\$0.43**.

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APPENDIX I:

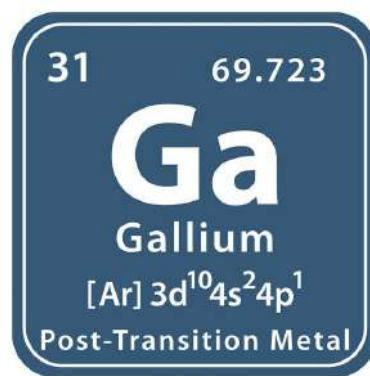
On Gallium

What is it?

Gallium is a chemical element; it has symbol Ga and atomic number 31. Discovered by the French chemist Paul-Émile Lecoq de Boisbaudran in Paris, France, 1875, elemental gallium is a soft, silvery metal at standard temperature and pressure with a complex orthorhombic crystal structure. In its liquid state, it becomes silvery white. If enough force is applied, solid gallium may fracture conchoidally. Gallium does not occur as a free element in nature, but rather as gallium(III) compounds in trace amounts in zinc ores (such as sphalerite) and in bauxite.

The melting point of gallium at 29.7°C (85.5°F) is often used as a temperature reference point as Gallium is one of only four metal elements that is liquid at, or near, normal room temperature, gallium will melt in a person's hands at normal human body temperature of 37 °C (99 °F).

Gallium alloys with low temperatures are used in thermometers as a non-toxic and environmentally friendly alternative to mercury and can withstand higher temperatures than mercury. A melting point of -19 °C (-2 °F), well below the freezing point of water, is claimed for the alloy galinstan (62–95% gallium, 5–22% indium, and 0–16% tin by weight), but that may be the freezing point with the effect of supercooling.



The Applications

It is the utility of Gallium in microchips that has been the main usage that has created the current tensions in the Gallium supply space. Gallium is predominantly used in electronics. Gallium arsenide, the primary chemical compound of gallium in electronics, is used in microwave circuits, high-speed switching circuits, and infrared circuits. Semiconducting gallium nitride and indium gallium nitride produce blue and violet light-emitting diodes and diode lasers. Gallium is also used in the production of

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artificial gadolinium gallium garnet for jewelry. It has no known natural role in biology. Gallium(III) behaves in a similar manner to ferric salts in biological systems and has been used in some medical applications, including pharmaceuticals and radiopharmaceuticals.

The Dual-Use Ban

Gallium became eminently newsworthy in mid-2023 when China decided to turn off the export flows for the metal (and Germanium) from the 1st of August 2023. This move was part of the tit-for-tat over Chinese access to Western semi-conductor output. [Our note on the subject of the ban can be read here:](#)

The Chinese ban spurred a surge in Wikipedia and Google traffic as pundits and journalists scurried to get up to speed on these metals. For us, it was propitious as we had been so recently hot off the press with our thoughts. As for Gallium, we happened to be one of the few that also knew where a primary Gallium deposit was hiding in full sight.... though we were not telling.

Western chipmakers, typically, claimed to have ample supplies of the two minerals in the short term. We did not believe this claim and thought it represented little more than whistling past the cemetery. The supply policy of *Just-in-Time* was their corporate downfall... and may yet be written on their tombstones.

Sources

Peking's action prompted a scramble to secure new sources, which in the case of Gallium in particular, was available potentially just not currently. China at that time accounts for 98% of the Gallium output and it has not been much eroded since the ban was instituted.

At the time, we were bemused to be asked whether Nyrstar/Trafigura would be using Chinese technology to extract Gallium, to which we responded that there is nothing new under the sun in Gallium processing and that in fact the Chinese probably lifted the technology from the West in the first place. As we have seen in the case of Rare Earths the Chinese are cheeky enough to get on their high horse threatening the West on technology that they had purloined in the first place.

Some elementary research (i.e. reading a not so old USGS reports) rewarded us with the information that countries such as Hungary and Kazakhstan (and even Slovakia) have been Gallium producers in the last couple of decades.

The United States has not produced primary (low-purity, unrefined) Gallium since 1987 and had none in its Strategic Reserves.

Someone with a longer memory told us of a Gallium plant near Perth in WA and some sleuthing

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revealed that Rhone Poulenc had a 20-hectare site at Pinjarra being fed material from the aluminium smelter at Kwinana. This plant was put on care & maintenance in 1991 “due to low prices” and this was still around as a viable entity in, at least, 1996.

Then some probing of contacts in the Zinc space revealed the potential of KazZinc and Korea Zinc (re)entering the space for Ga.

APPENDIX II:

On Rubidium

Cesium's Less Well-Known Twin

We discussed this mineral extensively in our [Rubidium Review which can be found here](#). The applications, sources and potential role in challenging Cesium's (currently) stronger position in the pairing are dealt with. We also muse upon how Rubidium can (possibly) shatter the Chinese dominance (via Sinomines) of the formates market for high pressure gasfield workover drilling.

Some Basics

A brief recap though is useful. Rubidium is the chemical element with the symbol Rb and atomic number 37. It is a very soft, whitish-grey solid in the alkali metal group, similar to Potassium and Cesium. It is the second most electropositive of the stable alkali metals and melts at a temperature of 39.3 °C (102.7 °F).

Rubidium is the twenty-third most abundant element in the Earth's crust, roughly as abundant as Zinc and rather more common than Copper. It occurs naturally in the minerals leucite, pollucite, carnallite, and zinnwaldite, which contain as much as 1% Rubidium oxide. Lepidolite contains between 0.3% and 3.5% Rubidium and is the commercial source of the element. Some Potassium minerals and Potassium chlorides also contain the element in commercially significant quantities.

On Earth, natural Rubidium comprises two isotopes: 72% is a stable isotope ^{85}Rb , and 28% is slightly radioactive ^{87}Rb , with a half-life of 48.8 billion years—more than three times as long as the estimated age of the universe.



Like other alkali metals, Rubidium metal reacts violently with water. As with Potassium (which is slightly less reactive) and Cesium (which is slightly more reactive), this reaction is usually vigorous enough to ignite the hydrogen gas it produces. Rubidium has also been reported to ignite spontaneously in air. It forms amalgams with Mercury (Hg) and alloys with gold, iron, Cesium, Sodium, and Potassium.

It does NOT form an amalgam with Lithium (even though Rubidium and Lithium are in the same group).

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Applications

Amongst the usages for Rubidium are atomic clocks, medical imaging (like PET scans), specialty glasses for fiber optics, photocells, and advanced quantum physics research like laser cooling. It also acts as a "getter" to remove leftover gases in vacuum tubes. As an element with no primary mines and only variable by-product sources, end-users have been challenged in evolving applications with an unreliable supply-chain. This we would term the "Scandium Conundrum".

As the twin of Cesium the opportunity clearly is in poaching upon Cesium's dominance of the Cesium Formate space which is used by drillers in the workover of high pressure gas wells. This is a space that was surrendered by the US government in 2020 by allowing China's Sinomines to acquire Cabot Corp's Specialty fluids division (i.e. almost the totality of the global Cesium market). This has failed to solve the fact that the Tanco mine at Bernic Lake in Manitoba is now at its end of life and thus (except for Bikita in Zimbabwe) there is now no mined source of Cesium in the world.

This leaves an open goal for Rubidium to not only force its way into the gas drilling space, but also to break the long-held (and tyrannical) leasing model of Cabot/Sinomines) and effectively oust the Chinese from the formates space.

APPENDIX III:

The Silver Asset

Babine's Feast (of Silver) in BC

Babine North

The Babine North property covers the historic Friday Red copper B.C. Minfile showing, which hosts disseminated chalcopyrite within a unit of volcanic rocks. It is located 90 km east of Hazelton, B.C. The geology consists of volcanic rocks interbedded with mudstones of the Lower Jurassic Telkwa Formation, intruded by a highly magnetic feldspar porphyry dike.

Babine East

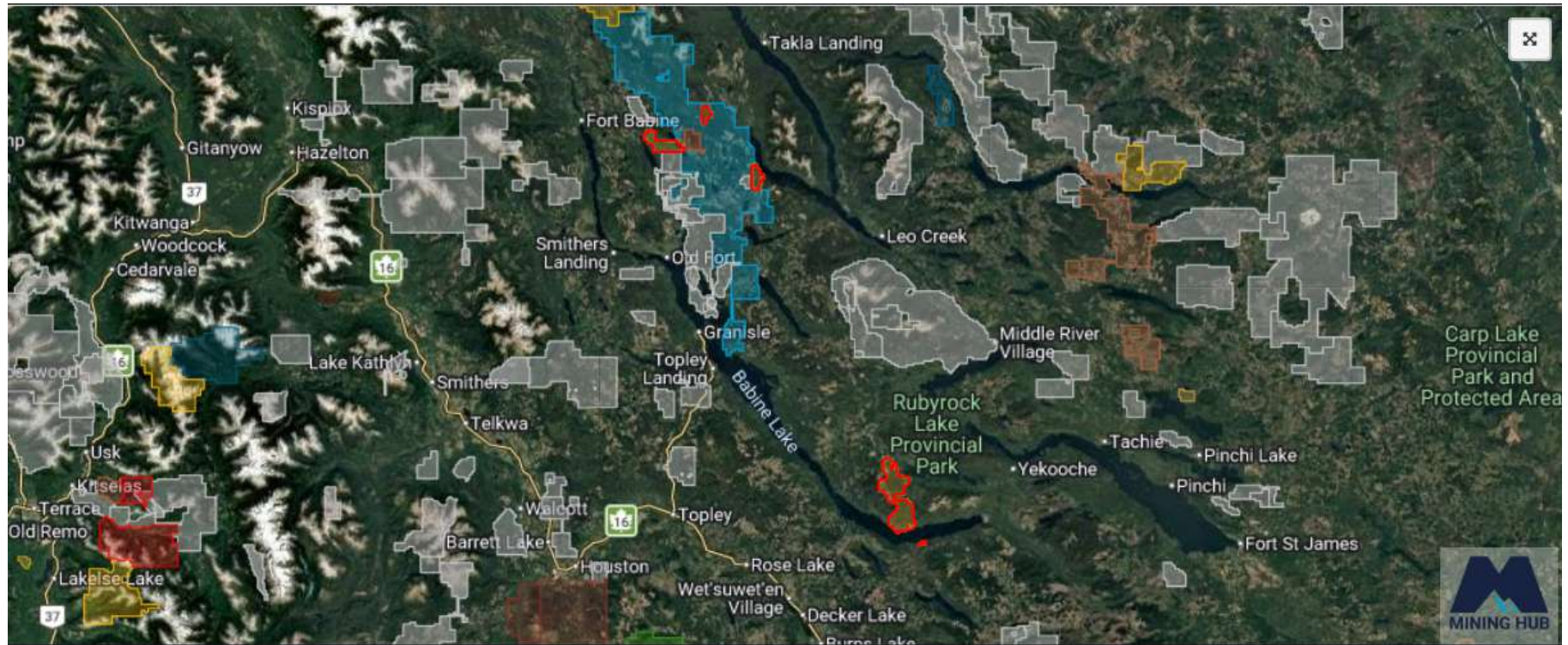
The Babine East package is situated along the western side of the northwest arm of Takla Lake and hosts the Adda B.C. Minfile showing. Historical assays reported 5.49 g/t silver and 10.6% copper from veins of chalcopyrite measuring 5–7.6 cm in width.

Babine South & Swift

The Babine South property covers the B.C. Minfile Bol showing on the north side of Babine Lake, where historical sampling yielded silver values up to 2,790 g/t (99.6 oz/t). The geology is Cache Creek greenstone, with mineralization occurring in quartz-carbonate veins and shears within foliated greenstone, hosting galena, sphalerite, tetrahedrite, chalcopyrite, native silver, pyrrhotite, and pyrite.

A silver project with an exploration history dating back to the 1920s, when 94 kilograms of silver was reportedly produced from a trench. Historical records (BC government Minfile summaries and assessment reports) include grab samples assaying up to 835 oz/t Ag (26,000 g/t), and re-assays confirming up to 308 oz/t Ag (9,580 g/t).

The Babine Swift property covers 487 hectares and hosts a historic Minfile showing with several styles of mineralization. Disseminated chalcopyrite and pyrite are hosted in andesite intermittently over 2 km. Stringer quartz occurs with chalcopyrite, quartz-carbonate veins range from a few centimetres to 1.5 metres wide with hematite and trace chalcopyrite, and massive sulfide boulders are also present. Grab samples returned 0.46–1.28% copper, 11.6–14.8 g/t silver, and 0.13–2.15 g/t gold.



Babine West

The Babine West property covers 2,300 hectares and borders the western side of NAK deposit of American Eagle (TSX-V: AE) and Duke Property of Amarc Resources (TSX-V: AHR). Amarc reported results from its 2024 exploration on this project in mid-March 2025.

The project area is heating up as recent news (in late July of 2026) by American Eagle relayed to the market that it had purchased the ground (Pacific Booker and Eagle Plains) located to the south of the Quantum land position.

Additions to Babine South

In January of this year, Quantum expanded its mineral tenure at the Babine South Silver Project to include a neighbouring adit known as East Sunrise with notable historical silver values.

The acquired claim is contiguous to the existing Babine South property, covering the Boling showing which reports favourable host rocks and historical silver mineralization recorded in BC Minfile 093K 028, including grab samples assaying up to 835 oz/t silver (26,000 g/t Ag), chip samples assaying 1.1 oz/t silver (34.2 g/t Ag), and float returning 417 oz/t silver (13,000 g/t Ag).

The expanded Babine South silver claim group now covers 1,108 hectares, strengthening Quantum's control over a prospective silver-bearing structural corridor defined by multiple historic workings, surface exposures, favorable host lithologies and recent geological interpretation from site visits in 2025.

Regional Geology

The Quaternary stratigraphy of the Babine Lake region is characterized by a Late Wisconsinan succession of advance-phase glaciolacustrine sediments, glaciofluvial deposits, and till. Pollen data from a rare new interglacial site suggest a colder than present Middle Wisconsinan climate. Ice flow during the last glaciation was dominantly southeasterly, but in the Babine Range a regional, westerly ice-flow event occurred. Evidence for westerly flow diminishes eastward of Babine Lake, suggesting that the valley was near the eastward limit of an interior ice divide. Deglacial sediments include ice-marginal debris-flow, glaciofluvial, and glaciolacustrine sediments.

Raised-delta elevations indicate that Glacial Lake Babine extended nearly 150 m above present lake level to 850 m asl, and higher, earlier phases may have existed locally. A variety of Holocene deposits cap the Quaternary succession. Glaciation has important implications for exploration in this copper-producing area. Southeasterly glacial dispersal patterns dominate, despite a regionally complex ice-flow history.

Highly anomalous concentrations of copper occur in tills down-ice of most known bedrock copper occurrences, and a number of similarly anomalous till sites with no known copper sources have been identified in drift-covered areas.

Exploration problems due to the thick and complex surficial cover can be overcome by selective sampling of basal tills, the composition of which clearly reflects the presence of buried mineral deposits.

Friday, August 14, 2026

The effectiveness of till geochemistry as a method for locating buried mineralization in the region will be enhanced by careful selection of sample media and by a clear understanding of the glacial history.

Project Geology

Mineralization occurs in quartz-carbonate and quartz brecciated veins within an epithermal system hosting native silver, galena, sphalerite, tetrahedrite, and chalcopyrite.

A mass of information on the historic production and exploration at the Babine concessions is covered by this document: <https://apps.nrs.gov.bc.ca/pub/aris/Report/15358.pdf>.

Exploration

The 2025 field program returned surface rock silver samples ranging from 10.9 ppm to 1,150 ppm Ag (0.35 to 36.97 oz/t) with anomalous base metals.

The 2026 program consists of expanded geological mapping, targeted surface sampling, and IP geophysical survey to define drill targets.

How This Might Play Out

In line with the mantra of the age of *focus/focus/focus*, investors want pure plays and the silver assets in BC represent an opportunity, and an anomaly, within the Quantum structure. Investors are buying into the critical minerals story and try as they might the silver fans out there have had a difficult time stretching the critical minerals definition to include silver. And frankly, who needs to, with silver at around \$60 per ounce? Silver has more than enough virtues and attractions at this price than it needs at critical minerals designation to give it more tailwind.

So, while the Babine concessions may stay within Quantum, they will ultimately appear anomalous. However good results of work done might be they will inevitably get lost in the noise at NMX East advances.

For us the ideal solution is a SpinCo with a demerger rewarding existing shareholders and management for their perspicacity in backing Quantum's "sideline" in silver. The possibility also exists of some form of royalty deal as a funding mechanism.

As we often say of this type of asset "if you love them, set them free". Pure plays are the way to go in this day and age.

Important disclosures

I, Christopher Ecclestone, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

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