

CRITICAL minerals

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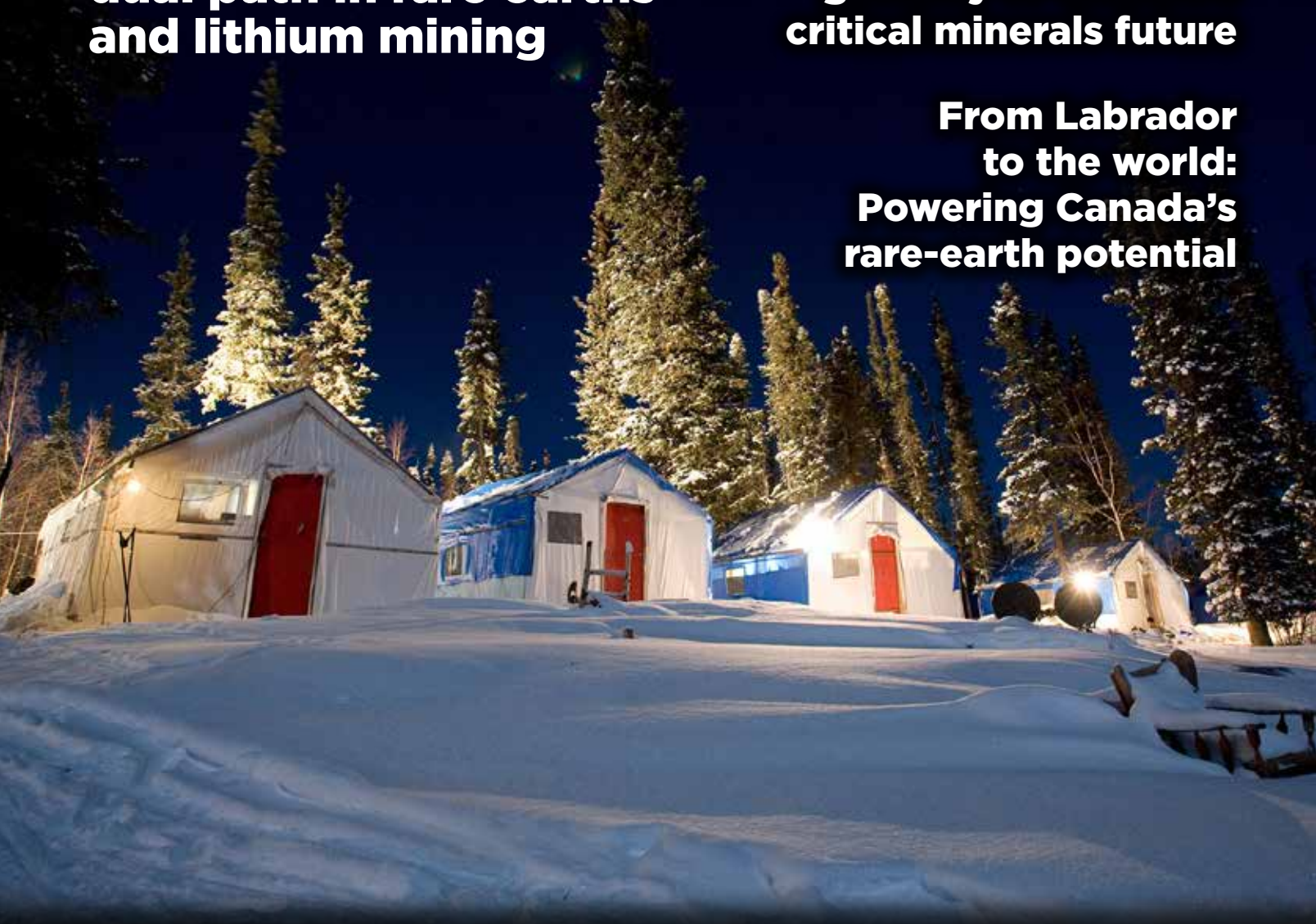
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ISSUE 2

**Avalon Advanced
Materials Inc. has a
dual path in rare earths
and lithium mining**

**Record Ridge is a
gateway to Canada's
critical minerals future**

**From Labrador
to the world:
Powering Canada's
rare-earth potential**



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CRITICAL minerals REVIEW

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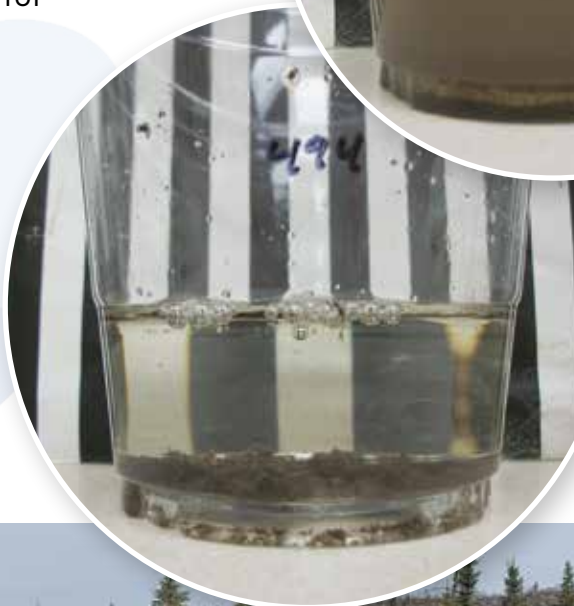
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Above: ER1 sample before GEL treatment.



ER1 sample after treatment with 494 GEL.

GFR1000 inline treatment at Cote Gold.



MESSAGE FROM THE EDITOR

Shayna Wiwierski



Canada's critical minerals landscape is evolving faster than ever—and with it, the narrative of how we source, process, and secure the materials that power modern life.

As global supply chains realign and governments race to strengthen domestic production, the companies featured in this issue of the *Critical Minerals Review* represent the new face of strategic resource development in North America.

Avalon Advanced Materials Inc. is one of those stories of forward-thinking commitment and strategic execution. A Canadian leader in critical minerals and rare earths, Avalon is advancing a diverse portfolio of lithium and REE projects that collectively reinforce North America's mineral supply chain resilience. With a management team seasoned in mining, capital markets, and project development, Avalon is positioned to help deliver two of the fastest-growing materials of the coming decades—rare earths and lithium—for the technologies driving electrification, clean energy, and industrial transformation.

Another standout this issue is West High Yield (WHY) Resources Ltd. and its Record Ridge project in British Columbia. Once considered a geological curiosity, Record Ridge is now a shovel-ready, provincially permitted critical-minerals project with a substantial and independently verified resource base. Its partnership framework with Indigenous communities and alignment with national policies on critical minerals make it a project that checks every box: environmental readiness, economic scale, and social value.

Search Minerals Inc. also exemplifies the tenacity and innovation defining this sector. For more than 15 years, Search has been developing a 64-kilometre district of rare earth element mineralization along Labrador's southeastern coast. It's not only advancing one of Canada's most significant REE discoveries—the company is also positioning itself as a cornerstone supplier for the magnet materials essential to electric vehicles, wind turbines, and next-generation electronics. As global competition for REEs intensifies, Search Minerals continues to show what it means to build a responsible and sustainable rare earth business in Canada.

In addition to these remarkable stories, this issue continues our regular feature, Highlighting Canada's Critical Minerals Usages, exploring the next six minerals on the federal list. The feature unpacks their applications and their economic importance across Canada.

Our mission at the *Critical Minerals Review* is to connect readers with the people, projects, and policies shaping the critical minerals frontier. Explore this issue and access our full archive of past editions at criticalmineralsreview.com.

As always, thank you for joining us in spotlighting the innovators building the foundation of a more secure, electrified future.

I hope you enjoy this issue!

Shayna Wiwierski

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MESSAGE FROM THE PREMIER OF SASKATCHEWAN

The Honourable Scott Moe

Saskatchewan is rich in resources and opportunities. Our province is the world's largest producer of potash, home to the largest high-grade uranium deposits globally, and continues to grow as Canada's leading producer of helium. We also have occurrences of 27 of the 34 commodities listed on the Canadian Critical Mineral List. These strong industries have contributed to Saskatchewan maintaining a reputation as a leading global mining hub.

In 2023 we introduced *Securing the Future: Saskatchewan's Critical Mineral Strategy*, designed to harness the province's strengths and expertise in resource exploration, extraction, and processing to drive growth and diversification of the sector. With four goals set for 2030, we are already seeing strong results and early successes that demonstrate Saskatchewan's leadership in responsible and sustainable resource development.

Our strategy set a target to increase Saskatchewan's share of Canadian exploration spending to 15 per cent by 2030. To support this goal, we enhanced the Saskatchewan Mineral Exploration Tax Credit and the Targeted Mineral Exploration Incentive in 2023 and are on track to achieve that target this year. Exploration investment in Saskatchewan is expected to reach \$408 million in 2025, a five per cent increase compared to 2024 and a 40 per cent increase since 2022. This growth is driven by interest in uranium, as well as other minerals such as helium, lithium, and potash.

The strategy's second goal is to double the number of critical minerals produced in the province to six. Saskatchewan is a key producer of critical minerals, with 10 potash mines, three uranium mines with two mills, and nine helium purification facilities. Several advanced-stage projects in emerging minerals are also underway and nearing production. These include the McIlvenna Bay copper and zinc project, which will be Saskatchewan's first major base metal operation in decades and the advancement of the Prairie Lithium project, with plans to install a commercial-scale direct lithium extraction unit in the months ahead. With these projects expected to come online over the next year, and numerous others at earlier stages of development, we are making excellent progress towards this Critical Minerals Strategy goal.

The third goal is to grow Saskatchewan's production of potash, uranium, and helium. We are the world's top potash producer, accounting for approximately one-third of the global supply. In 2024, potash production reached a record 24.7 million tonnes, representing an eight per cent increase from 2023. Saskatchewan is also the world's second-largest uranium producer, reaching record levels in sales and production last year, at \$2.6 billion and 16,700 tonnes, respectively. The province expects further growth in both industries with new mines and expansion projects in the years ahead. Helium production has grown significantly from 2021 to 2024, now accounting for approximately three per cent of the global supply, or about five million cubic metres annually. This growth is driven by the addition of more production wells, with 28 active and four more capable, as well as nine helium purification facilities.

Finally, the strategy aims to establish Saskatchewan as a hub for rare earth elements (REE). The Government of Saskatchewan has invested \$93 million in the construction of the Saskatchewan Research Council's first-of-its-kind in North America, minerals-to-metals rare earth processing facility. In June 2024, SRC began manufacturing rare earth metals on a commercial scale, the first organization outside of China to do so. The facility is expected to be commissioned in phases beginning in 2026 and moving into full operations in 2027.

With the strong progress being made by SRC, we're leveraging the organization's expertise, together with our targeted incentive and geoscience programs, to encourage private sector growth in exploration to manufacturing of magnets and other REE products. Saskatchewan is also actively pursuing partnerships with other governments to ensure a stable, secure supply of REE for the global supply chain. With many countries looking for independent, sustainable sources of REE for clean technology and national security, Saskatchewan is well-positioned to be a key player.

Saskatchewan's Critical Minerals Strategy is succeeding, with record-breaking production and innovative projects advancing our economy and securing a sustainable future. Our government remains committed to building on this growth and supplying the critical minerals the world needs now and in the years ahead. ✕

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MESSAGE FROM THE ONTARIO MINISTER OF ENERGY AND MINES

The Honourable Stephen Lecce

Ontario stands at the forefront of a global transformation. As the world accelerates its shift towards clean energy and advanced technologies, the demand for critical minerals has never been greater. And Ontario is uniquely positioned to lead this charge. But it's not just what we have underground; it's how we're unlocking that potential that sets Ontario apart.

Ontario is home to an abundance of critical minerals — lithium, graphite, nickel, and rare earth elements — that are the building blocks of electric vehicles, high-tech devices, and renewable energy systems. At the heart of this opportunity lies the Ring of Fire, a vast region in Northern Ontario spanning approximately 8,000 square kilometres. This area holds one of the most significant untapped mineral reserves in the country and represents one of the most promising mineral development opportunities in the world.

To harness this potential, our government is taking bold action with our new One Project, One Process framework. For too long, Ontario had a reputation for being difficult to get a mine built. That era is over. This framework streamlines the permitting process, reducing government approval timelines for critical projects like those in the Ring of Fire. One Project, One Process transforms Ontario from one of the slowest permitting jurisdictions in the OECD to one of the fastest in the G7. This framework ensures that exploration and mine development projects move forward with speed and certainty. Our goal is simple: to cut government permitting timelines in half for the highest-impact projects, while maintaining Ontario's world-class environmental protections and our duty to consult with Indigenous communities.

We won't stop there, though. We also want to ensure that every aspect of Ontario's mineral potential is fully utilized. This year, our government introduced the new Recovery of Minerals regulation, a first of its kind, to ensure that valuable minerals from the by-products of

mining are effectively utilized rather than wasted. This regulation allows companies to capture greater value from these previously untapped sources.

Our commitment extends beyond extraction. We're building the entire value chain right here at home. Our government's 2025 Budget launched the Critical Minerals Processing Fund, a \$500 million commitment to accelerate made-in-Ontario processing capacity. This historic investment will help upgrade existing facilities and build new ones, ensuring that the minerals mined in Ontario are refined and turned into high-value products here, creating jobs and economic growth that stays local.

Exploration remains the first step in every success story. That is why our government continues to strengthen the Ontario Junior Exploration Program, with an additional \$10 million invested this year to support the junior companies that take on the high-risk, early-stage work of discovering the mines of the future.

We also know that success depends on innovation. That's why through the Critical Minerals Innovation Fund, we are backing Ontario-based projects that are developing the next generation of mining and processing technologies that will strengthen our global competitiveness. By supporting research, partnerships, and commercialization, we are ensuring Ontario doesn't just keep pace with change — we set the pace.

The world is watching, and Ontario is ready. Ready to cut red tape. Ready to process and manufacture our own resources. Ready to train the next generation of skilled workers who will power our future. Ready to lead the global charge in critical minerals.

Together with Indigenous partners, industry, and communities in our province, we will seize this moment. We will protect our assets, unleash our potential, and cement Ontario's position as a global leader in responsible resource development. ✕



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MESSAGE FROM THE MINISTER OF MINING AND CRITICAL MINERALS

The Honourable Jagrup Brar

It is my pleasure, on behalf of the Province of British Columbia, to share how we approach resource development, foster cooperation with industry and First Nations, and uphold our strong commitment to environmental stewardship – as we work to unlock the tremendous opportunities that lie beneath our feet for the benefit of all British Columbians.

We are living in an extraordinary era for mining – one defined by technological innovation, bright ideas, and global partnerships. Sharing updates and insights through digital platforms such as this allows us to stay connected with industry partners, investors, and everyone who shares our passion for mining and mineral exploration, a sector so fundamental to our shared future.

Year after year, we proudly reaffirm that British Columbia is geologically rich and globally significant, producing 54 per cent of Canada's copper and standing as Canada's sole producer of molybdenum. Our province is home to more than half of the critical minerals on Canada's critical minerals list and hosts advanced exploration and development projects with copper, nickel, molybdenum, zinc, REEs, and others.

In our ministry, we are deeply committed to strengthening British Columbia's position as a leader in critical minerals development – a

sector that is essential to advancing national security, supporting clean technologies, and protecting our coastal environment. To achieve this, we continue to foster strong economic partnerships and attract new investment through competitive fiscal incentives, such as the BC Mining Exploration Tax Credit, the Mining Flow-through Share Tax Credit, and the New Mine Allowance. These initiatives are vital to maintaining our competitiveness and making B.C. one of the most attractive jurisdictions in the world for critical minerals exploration and development, driving sustainable economic growth while supporting Canada's transition to a secure, low-carbon future. Today, approximately 1,000 mining and mineral exploration companies are proudly headquartered in our province – a reflection of the confidence investors place in our resources, people, and regulatory stability.

Earlier this year, Anglo American and Teck Resources announced their proposed merger, which will create one of the largest copper producers in the world. Their decision to establish Vancouver as their global headquarters is a resounding vote for our stable regulatory framework, strong partnerships with First Nations, and highly skilled workforce. This decision means more investment, opportunities, and good jobs for people here at home.

In September, I attended the Beaver

Creek Precious Metals Summit where I met with companies, investors, workers, and First Nations leaders from around the world. The strong interest in B.C.'s mining sector was clear, driven by our commitment to economic opportunity, environmental sustainability, and reconciliation with First Nations. These principles, reflected in our world-class ESG standards and clean-technology leadership, continue to make B.C. a trusted destination for responsible investment in mining and critical minerals.

We are equally focused on making the regulatory process clear, predictable, and efficient. Since 2019, we have reduced Major Mine application review timelines by over 35 per cent and we processed 25 per cent more mineral exploration permits in time for the 2025 field season compared to last year. Over the past two years, we have also cut our regional permitting backlog by 66 per cent for mineral exploration and by 67 per cent for sand and gravel.

As I shared in the previous edition, in 2025 we are focusing on four major mine projects: Eskay Creek Gold/Silver project; Highland Valley Copper expansion; Red Chris expansion; and Mount Milligan expansion – ensuring that government processes do not hold up decision timelines. Our approach is working: this summer the Highland Valley Copper expansion received its Environmental Assessment Certificate and all required permits.

Since 2019, we have reduced Major Mine application review timelines by over 35 per cent and we processed 25 per cent more mineral exploration permits in time for the 2025 field season compared to last year.

Teck Resources Ltd. approved an investment of up to \$2.4 billion to extend the mine's life by nearly 18 years, creating 200 new operational jobs and expanding the workforce to 1,500.

Across the sector, regulators are aligning processes, reducing duplication, and improving review timelines while maintaining technical rigour and our obligations to Indigenous right holders – with no changes to B.C.'s robust health, safety, and environmental standards. Through coordinated environmental assessment and permitting, companies can submit a single,

streamlined application, or – if filing separately – benefit from tight inter-agency coordination that minimizes duplication.

This integrated approach now guides all our priority projects which, collectively, have the potential to inject \$5.3 billion into our economy and create up to 4,500 jobs. Moving forward, we will continue to ensure robust review with First Nations partners, while getting to permit decisions as quickly as possible.

Our mineral exploration and mining industry plays a vital role in the economic development of British Columbia, providing approximately

40,000 jobs for people in communities across the province. Last year, mineral exploration expenditures amounted to \$552.1 million, the fourth-highest amount on record. And mining production was valued at \$16.5 billion.

We have the chance to seize a tremendous opportunity. The resources under our feet aren't just minerals, they're the essential building blocks for our schools, roads, bridges, and other critical infrastructure. They enable the services that all British Columbians rely on.

I am looking forward to seeing what we can achieve together. ✕

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The advertisement is a collage of images showing various mining equipment and vehicles. On the left, a large yellow mining machine is being loaded onto a white truck. In the center, a yellow mining vehicle is shown. On the right, a red and black mining vehicle is shown. The background is a dark, rocky mine environment.

CRITICAL MINERALS USES

The next six

Highlighting Canada's critical minerals usages

Lithium to nickel:

Fueling clean energy and resilient industries

Canada's critical minerals continue to power the technologies, infrastructure, and solutions driving a sustainable future. With abundant resources and growing capacity for value-added processing, Canada is well positioned to play a leading role in the global shift toward electrification and clean energy.

In this third installment of our alphabetical series for the *Critical Minerals Review*, we explore the next six critical minerals after indium—lithium, magnesium, manganese, molybdenum, nickel, and niobium. These materials are central to energy storage, manufacturing, and renewable technologies, underscoring Canada's strategic advantage in the global critical minerals landscape.

Canada's **lithium** potential, particularly in Quebec, Ontario, and Manitoba, is expanding through exploration and advanced processing projects that aim to supply North America's growing battery supply chain.

Canada's **magnesium** projects aim to support domestic and global supply chains for lightweight alloys used in vehicles, aircraft, and consumer electronics.

Canadian projects in New Brunswick and Quebec are positioning the country as a sustainable supplier of battery-grade **manganese**, aligning with national net-zero goals while revitalizing local economies.

In Canada, **molybdenum** is often mined as a byproduct of copper operations, adding value to established resource networks.

Canada's **nickel** production—centered in Ontario, Manitoba, and Newfoundland and Labrador—plays a pivotal role in global supply chains for electrification.

Niobium is essential for jet engines, high-pressure pipelines, and infrastructure designed for extreme conditions.

LITHIUM: POWERING THE BATTERY REVOLUTION

Lithium lies at the heart of today's clean energy transition.

A key component of lithium-ion batteries, it powers electric vehicles, consumer electronics, and grid-scale energy storage systems. Canada's lithium potential, particularly in Quebec, Ontario, and Manitoba, is expanding through exploration and advanced processing projects that aim to supply North America's growing battery supply chain.

With the EV market booming, lithium demand is projected to surge for decades. Beyond batteries, lithium compounds are used in air treatment systems, ceramics, and lubricants, demonstrating this mineral's versatility in advancing modern life.

MAGNESIUM: LIGHTWEIGHT STRENGTH FOR MODERN MANUFACTURING

Magnesium, one of the lightest structural metals, combines low density with high strength, making it ideal for automotive, aerospace, and defense applications where weight reduction enhances energy efficiency and performance. Canada's magnesium projects aim to support domestic and global supply chains for lightweight alloys used in vehicles, aircraft, and consumer electronics.

The mineral's use in steelmaking and aluminum alloys also strengthens Canada's manufacturing competitiveness, enabling producers to meet emission-reduction targets while maintaining high performance standards.



MANGANESE: VITAL FOR BATTERIES AND STEEL

Manganese plays a dual role in Canada's industrial and clean energy strategies. Traditionally used to harden steel, it now underpins the next generation of battery chemistries. High-purity manganese sulphate is emerging as a key precursor for electric vehicle batteries, particularly in nickel-manganese-cobalt (NMC) and lithium-manganese-iron-phosphate (LMFP) cathodes.

Canadian projects in New Brunswick and Quebec are positioning the country as a sustainable supplier of battery-grade manganese, aligning with national net-zero goals while revitalizing local economies.

NICKEL: THE CORNERSTONE OF CLEAN ENERGY INFRASTRUCTURE

Nickel is essential for both stainless-steel production and advanced battery materials. High-purity nickel sulphate is critical for the cathodes used in electric vehicle batteries, offering high energy density and longer driving range. Canada's nickel production—centered in Ontario, Manitoba, and Newfoundland and Labrador—plays a pivotal role in global supply chains for electrification.

Beyond batteries, nickel's durability makes it indispensable in construction, water treatment, and aerospace applications. As demand rises for low-carbon, ethically sourced nickel, Canada is leveraging its strong environmental and social standards to secure its place in global energy transition partnerships.

MOLYBDENUM: STRENGTHENING ALLOYS AND ENERGY SYSTEMS

Molybdenum enhances the strength, corrosion resistance, and heat tolerance of steel and superalloys used in pipelines, turbines, and chemical plants. In Canada, molybdenum is often mined as a byproduct of copper

operations, adding value to established resource networks.

Its role extends to clean technologies as well—molybdenum-based catalysts improve hydrogen production and environmental remediation processes, supporting the evolving hydrogen economy.

NIOBIUM: SUPERCHARGING STRENGTH AND CONDUCTIVITY

Niobium, produced primarily from deposits in Quebec, is used to strengthen steel and superalloys, giving them superior resistance to heat and corrosion. These properties make niobium essential for jet engines, high-pressure pipelines, and infrastructure designed for extreme conditions.

Niobium's growing importance extends into emerging technologies such as superconductors, quantum computing, and next-generation electronics, where its electrical properties support innovation and miniaturization.

From lithium's role in electrification to niobium's contribution to advanced manufacturing, these six minerals exemplify Canada's capacity to lead in responsible resource development. Together, they form the building blocks of new energy systems, sustainable infrastructure, and high-performance technologies shaping the future. ✕

Dual path in rare earths and lithium mining: *Avalon Advanced Materials Inc.*



How a Canadian critical minerals company has positioned itself at the heart of the global shift toward establishing more secure critical minerals supply chains

Avalon Advanced Materials Inc. is a Canadian critical minerals and rare earth company strategically advancing a portfolio of projects in North America.

As the global race for critical minerals intensifies, Canada stands at a defining moment in shaping the next generation of rare earth materials. The demand for lithium, rare earth elements, and other advanced metals continues to grow—driven by electric vehicles, renewable energy storage, and the technologies that power modern life.

At the centre of this transformation is Avalon Advanced Materials Inc., a Canadian critical minerals and rare earth company strategically advancing a portfolio of projects in North America. Avalon is focused on building a resilient, domestic supply chain that serves among the two fastest-growing critical minerals in the decades to come: rare earths and lithium. Guided by a management team with decades of experience in mining, capital markets, and project development, Avalon is advancing a diverse portfolio of projects across Canada, including lithium and rare earths

assets, that collectively strengthen North America's critical minerals resilience and the ability to produce the materials essential for electrification, decarbonization, and economic security.

Avalon's two flagship projects in focus are the planned Lake Superior Lithium Inc. (LSLi) lithium refinery in Thunder Bay, Ont., and the Nechalacho Rare Earth Elements (REEs) and Zirconium Project in the Northwest Territories.

ADVANCING DOMESTIC LITHIUM PROCESSING

Lake Superior Lithium Inc. represents a major step forward in Canada's clean energy infrastructure. The project will convert spodumene concentrate into battery-grade lithium hydroxide, directly supporting the growing demand from electric vehicle and battery manufacturers across North America.



Avalon's two flagship projects in focus are the planned Lake Superior Lithium Inc. (LSLi) lithium refinery in Thunder Bay, Ont., and the Nechalacho Rare Earth Elements (REEs) and Zirconium Project in the Northwest Territories (seen here).

The development of this facility underscores Avalon's commitment to domestic processing and value creation—keeping more of the supply chain within Canada and reducing reliance on foreign refineries. It also reflects the company's dedication to innovation and sustainability through its collaboration with Metso, a global leader in mineral processing technology.

In September 2025, Avalon's VP of corporate development, Dr. Andrew Ramcharan, and consultant for LSLi, Mark Ashcroft, traveled to Finland whereby the Metso team, successfully produced lithium hydroxide and analcime using Metso's alkaline leach process. This achievement marks a significant technical milestone, validating the process that will be applied at the Thunder Bay facility and demonstrating Canada's capacity to develop and refine its own resources.

The operation will not only produce a high-quality lithium hydroxide product but also generate analcime, an inert byproduct with potential applications as a sustainable additive in the construction sector.



In September 2025, Avalon's VP of corporate development, Dr. Andrew Ramcharan (left), and consultant for LSLi, Mark Ashcroft (right), traveled to Finland whereby the Metso team successfully produced lithium hydroxide and analcime using Metso's alkaline leach process.



Analcime is an inert byproduct with potential applications as a sustainable additive in the construction sector.

Avalon is continuing research into repurposing this material, advancing a low-waste, circular production model that aligns with the company's vision for responsible resource management.

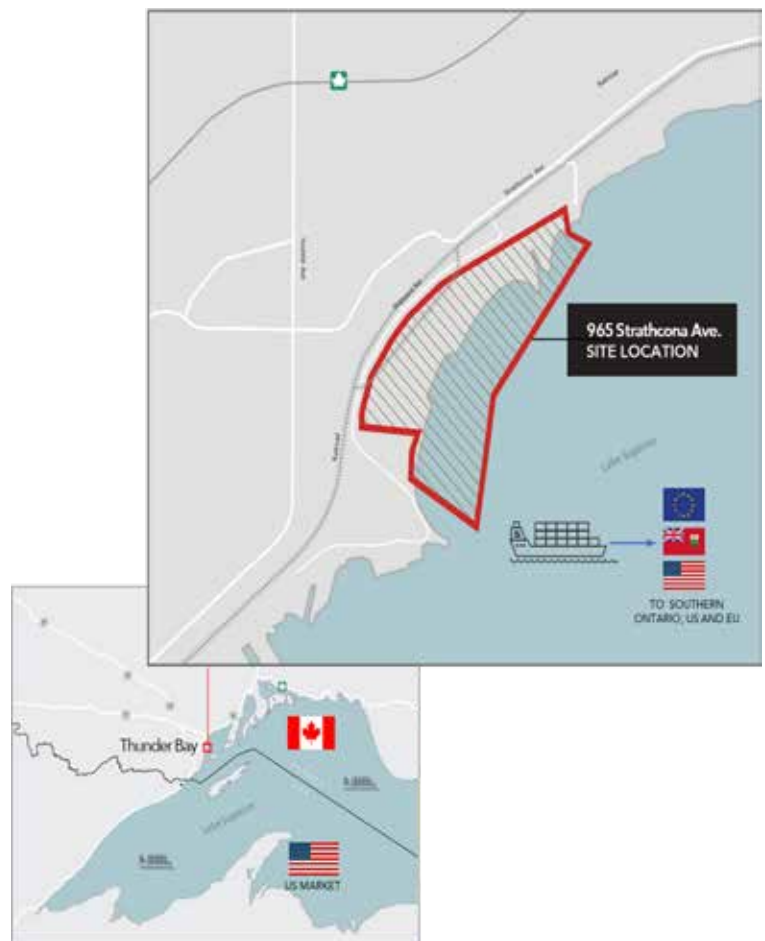
To further strengthen the innovation framework for the facility, Avalon has signed a memorandum of understanding (MOU) with Qualcomm Technologies Inc., focused on integrating advanced digital and edge solutions into its operations. The collaboration will leverage Qualcomm's Industrial and AI-enabled Internet of Things (IoT) technologies to enhance connectivity, predictive maintenance, and real-time process optimization at the Thunder Bay facility. Together, the companies are developing a roadmap for smart, data-driven infrastructure that will improve efficiency, environmental performance, and operational reliability. This initiative also aims to strengthen Ontario's role as a technology hub in mining, engaging local small and medium-sized enterprises (SMEs), and Canada's highly skilled workforce to drive innovation and create a more sustainable and resilient mining sector.

NECHALACHO: A STRATEGIC RARE EARTHS RESOURCE

While lithium powers energy storage, REEs are the building blocks of the technologies that move, connect, and protect us—from electric motors and wind turbines to defense, aerospace, and high-tech manufacturing. Avalon's Nechalacho REE & Zirconium Project, located in the Northwest Territories, is one of the most abundant and strategically significant rare earth deposits in North America.

The project hosts a full suite of light and heavy rare earths—including neodymium, praseodymium, dysprosium, terbium, and gadolinium—alongside zirconium, tantalum, and niobium. This unique resource base positions Avalon to supply the critical materials needed for permanent magnets and other advanced technologies.

But Nechalacho's importance extends far beyond its geology. As one of the only North American deposits containing both light and heavy rare earths, it offers a strategic pathway toward supply chain independence, reducing reliance on offshore markets, particularly those dominated by China. With its combination of essential elements, Nechalacho has the potential to become a cornerstone of a secure, transparent, and self-sufficient North American rare earths supply network, supporting technologies vital to clean energy, defense, national security, and advanced manufacturing.



INNOVATION, COLLABORATION, AND CANADA'S CLEAN ENERGY FUTURE

Across its portfolio, Avalon is pursuing a clear vision: to advance innovation-driven, environmentally responsible processing of critical minerals in Canada. Through collaboration with technology leaders, engineering firms, and research institutions, Avalon is helping shape a modern model for mineral development—one that integrates sustainability, digital transformation, and community engagement.

Through LSLi, Nechalacho, and its broader suite of projects, Avalon is building the foundation for a secure, transparent, and competitive Canadian critical minerals ecosystem. These projects not only strengthen the national economy but also reinforce North America's ability to produce and process the materials that sustain everyday life and protect our shared future.

As demand for clean energy materials continues to rise, Avalon's work represents more than a business opportunity—it's a blueprint for how Canada can lead the world by responsibly developing its own resources, securing strategic supply chains, and powering the technologies that define the modern age. ✕

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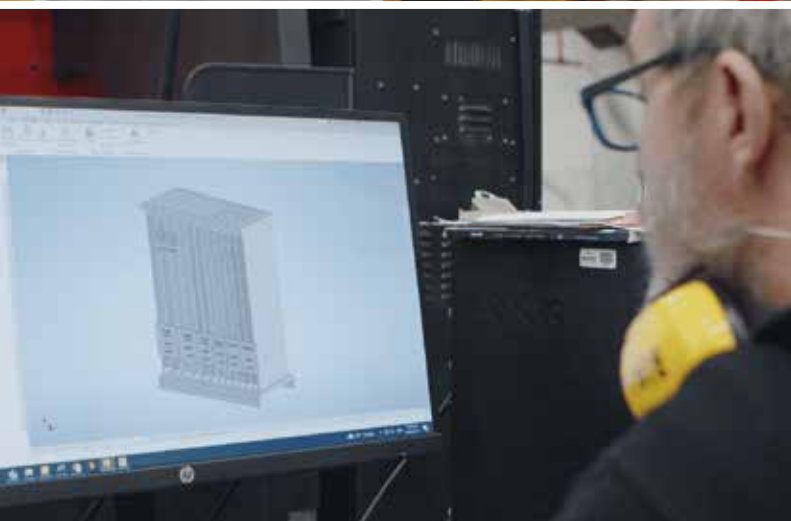
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How a Manitoba rad shop reverse-engineered a radiator for an Ontario mine



A West End Radiators engineer uses a 3D scanner to scan a leaking heat exchanger so it can be rebuilt with custom improvements.



Left: A West End Radiators technician reviews a 3D rendering of a custom rad at their Winnipeg, Man. core manufacturing plant — the only of its kind in Western Canada.

Here's the behind-the-scenes look at how West End Rad helped an Ontario mine save thousands with a long-lasting, reverse-engineered heat exchanger.

MINING CONDITIONS DEMAND MORE THAN OEM RADIATORS

Like most mines, this mine's haul truck was operating around the clock in a harsh environment. The radiator was constantly exposed to engine heat, dust, and debris.

But the OEM Komatsu radiator couldn't keep up. It was constantly clogged, cracked, and leaking, all issues that can take critical equipment, like haul trucks, out of service if not dealt with properly.

So, when the company realized their OEM radiator couldn't handle the extreme environment anymore, the Ontario mine turned to West End Rad to custom manufacture a new aftermarket one that could.

"This is a perfect example of why mining equipment needs custom-built rads," says Jason Hinds, shop foreman at West End Radiators. "OEM parts can work for light or moderate conditions, but mines operate at a completely different level."

Mining operations know, a single day of equipment downtime can cost \$5,000 to \$10,000 or more in lost production.

But when equipment is running nonstop in extreme environments, heat exchangers are constantly bombarded with dust, debris, and vibration. All of which can push original equipment manufacturer (OEM) radiators past their limits.

West End Radiators (West End Rad | WER), a Manitoba heat exchanger repair, rebuild, and manufacturing company, has seen first-hand how reverse engineering heat exchangers helps them hold up in extreme industrial environments.

So, when a Komatsu radiator kept failing at one of Ontario's largest gold mines, the company couldn't afford extended downtime. The WER team knew the mine needed a custom solution that would prevent future breakdowns and reduce the mine's downtime.

After thorough inspection at WER's Winnipeg shop, their technicians determined the Komatsu radiator required a complete rebuild to withstand the rigorous demands of Ontario's mining conditions.

BEHIND-THE-SCENES OF A RADIATOR REVERSE-ENGINEER FOR MAXIMUM DURABILITY

The reverse engineering process began by West End Rad's technicians taking precise measurements of the old radiator. This ensured the newly manufactured rad would fit seamlessly into the haul truck.

Then, using advanced 3D scanning technology, the team scanned and captured every detail of the existing part, creating a comprehensive digital model of the radiator.

Once the part was fully scanned, WER engineers analyzed the model to identify and apply necessary adjustments. Their goal: strengthen the heat exchanger so it can handle the extreme working conditions of heavy-duty mining.

"This sets our shop apart," says Hinds. "Most places don't have the ability to scan and reverse engineer parts. Our investment in this technology makes it not only possible, but way faster."

After WER's engineers completed the new mining radiator

design, the shop's technicians got to work manufacturing the new heat exchanger to match the exact specifications required for the mine's equipment.

Then it was time for a series of checks for leaks and cracks.

"We never send out a rad without doing multiple pressure checks to ensure it's 100 per cent leak-free. It's our guarantee and especially important for mining equipment," says Hinds.

Once the new custom radiator was confirmed to be leak-free, it was off to the shipping department for a quick delivery back to Ontario.

STRONGER THAN ITS ORIGINAL BUILD

Within two weeks, the haul truck was back to operating at full capacity. The client said this was half the time they had anticipated.

West End Rad says they've heard great feedback from the mine since. The new, custom-built heat exchanger is performing better than the original radiator, staying cooler throughout the workday and resisting plugging in dusty conditions.

West End Radiators services mines across Canada. Learn more on their website at westendrad.ca. ✕



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How should the U.S. create a potash advantage?

By Josh Mayfield



I said that potash should be a critical mineral for the United States (U.S.) when I published my story about it in the Hallgarten + Company Growth Minerals Sector Review in April 2025. Naysayers were bearish on the news about potash becoming a U.S. critical mineral at the time. However, global potash market concentration is the dominant theme for the sector, and so there should be more investments in the junior potash mining space going forward, especially in the U.S. market.

Sage Potash aims to become the second producer of muriate of potash (MOP) in the U.S. One of the

standout aspects of Sage Potash is the production cost advantage that it has at the Sage Plain Potash Project. The transportation from mine to market will provide a valuable domestic source of MOP for the U.S. agriculture community.

The company is developing a potash mine in the Paradox Basin of Utah, where a new MOP source of 300,000 mts per year is going to help U.S. farmers access a reliable domestic source of potash and reduce their reliance on potash imports. Given the Sage Plain Potash Project's proximity to the U.S. domestic market, there

is a USD \$100-150/mt logistical cost advantage compared with peer MOP competitors located in Canada, Germany, Israel, and Jordan. Producers in Russia and Belarus also are key suppliers of MOP to the global fertilizer market.

As a junior potash developer in the U.S., Sage Potash is dedicated to supplying U.S. farmers and other agricultural producers with a reliable, cost-effective potash supply. For example, the Sage Plain project uses proven solution mining techniques, as opposed to conventional mining operations that install vertical underground shafts into deep potash seams for extraction and processing. The latter also has a more complicated separation process whereby potash ores must be separated from salt and clay seams that have occurred in the potash bearing formations over time.

Sage Potash will inject a brine into the underground layers of potassium to extract the potassium minerals from underground and bring them to surface. Mechanical evaporation will be used to process the brine, which has significant water saving and production advantages. While solar evaporation processes are currently trending in the junior potash mining space, potash extraction using the mechanical evaporation process will mean a more

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efficient potash production capacity for the long term.

Economic prospects for production capacity expansions will be considered once the company begins its Phase 1 production of 300,000 mts per year from the Sage Plain mine. At the initial development stage, approval for the large mine operation (LMO) permit will allow Sage Potash to begin work at the ready-to-produce plant that is constructed and ready in the Netherlands. This will give Sage Potash a significant capex advantage due to the company's lower construction costs compared with other junior potash developers.

Sage Potash is a TSX-Venture listed company (TSX-V: SAGE). The preliminary economic assessment

(PEA) released by Sage Potash in September 2025 declared that the initial capex requirements will be USD \$155 million, with an average operating cost of USD \$144/mt of potash production. The Sage Plain Potash Project has a resource base of 298 million mts, at 118 million mts of potassium chloride (KCl) with a KCl content of 46.1 per cent in the upper bed potash seams. The company's strategy is to become the first choice of U.S. farmers for their potash needs, while providing a domestic source of potash at lower costs than competitors in the U.S. market.

In conclusion, the U.S. must invest in more domestic potash sources to compete on prices for fertilizer procurement in the future. Potash

producers in Russia and Belarus are likely to form an oligopoly that captures market share in the East of Suez, where emerging growth markets for MOP supplies will be needed to boost production of palm oil for biofuel demand and rice for food security. Reducing U.S. potash imports will depend on the successes of junior potash explorers and developers to bring new sources to market. There are also known potash reserves within the states of New Mexico, Arizona, and Michigan.

Joshua Mayfield is a growth minerals and sector analyst with Hallgarten + Company Ltd., specializing in fertilizers, mining projects, and emerging market trends in the resource sector. ✕

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From Labrador to the world: *Powering Canada's rare earth potential*



It is another beautiful fall October morning in St. Lewis, a small community of less than 200 people nestled within Fox Harbour on the southeast coast of Labrador. The weather is calling for little wind, clear skies, and 12 degrees. The Search Minerals (SMY-V) exploration crew, led by Dr. Randy Miller, is preparing their equipment and tools for a full day of channel cutting on the company's Fox Meadow rare earth element prospect.

For nearly 16 years, Search Minerals Inc. has been unlocking one of Canada's most significant critical-mineral discoveries – a 64-kilometre district-scale belt of rare earth element (REE) mineralized prospects stretching from St. Lewis to Port Hope Simpson on the southeastern coast of Labrador. Search is at the forefront in the planning and development of Canada's next REE mining project as the world races to secure the critical minerals and materials needed to support the energy transition. The company has a proven resource base to become the upstream provider of the REE critically needed for magnet production and downstream use in electric vehicle motors, wind turbines, and electronics.

A FOUNDATION OF DISCOVERY

At the heart of this story is Dr. Randy Miller, Search Minerals' vice-president of exploration and chief geologist, and one of Canada's foremost experts

on rare earth geology. His early fieldwork, mapping, and interpretation defined what is now known as the Port Hope Simpson – St. Lewis REE Belt (Fox Harbour Domain), establishing southeast Labrador as a globally recognized rare-earth element district. From the Foxtrot, Deep Fox, and Fox Meadow discoveries, Dr. Miller's disciplined approach to geoscience revealed a rare combination of simple mineralogy, predictable geological continuity, and unique geochemistry.

"After we had initially mapped and explored this belt, we realized the Fox Harbour volcanic rocks contained an almost continuous zone of REE-mineralized rocks unlike anything else worldwide," says Dr. Miller. "The consistency of grade, structure, and mineralogy means we can develop it efficiently and responsibly, and that's something else that makes it a unique project."

FROM EXPLORATION TO ECONOMICS

Search engaged SLR Consulting (Canada) Ltd. who completed the 2022 preliminary economic assessment (PEA), validating years of geological and metallurgical work. The study outlines a robust open-pit mining scenario centered on the Deep Fox and Foxtrot deposits with a view to producing a high-grade concentrate rich in the magnet associated elements



Dr. Miller at the Deep Fox Deposit.

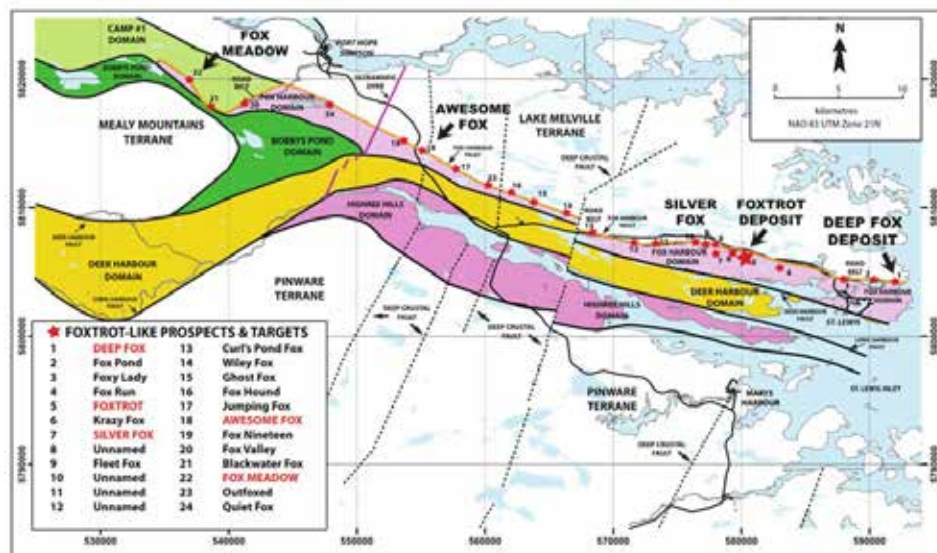


Dr. Randy Miller, chief geologist (left), provides core and channel library tour to Mayor Helen Poole, Mayor Alton Rumbolt, and Kayla Beales, NCC, environmental analyst.

neodymium (Nd), praseodymium (Pr), dysprosium (Dy), and terbium (Tb).

Highlights from the report note that the Deep Fox Deposit includes 5.1 million tonnes (Mt) indicated resource at average grades of 394 ppm Pr, 1,469 ppm Nd, 202 ppm Dy, 34 ppm Tb, and 3.3 Mt tonnes inferred resource at average grades of 366 ppm Pr, 1,381 ppm Nd, 198 ppm Dy, and 33 ppm Tb. The Foxtrot Deposit includes 10.0 Mt tonnes indicated resource at average grades of 366 ppm Pr, 1,368 ppm Nd, 176 ppm Dy, 30 ppm Tb, and 3.0 Mt tonnes inferred resource at average grades of 371 ppm Pr, 1,384 ppm Nd, 177 ppm Dy, and 30 ppm Tb.

"Our focus from the beginning is a culture of disciplined execution," says Joseph Lanzon, CEO and director



of Search Minerals. "After 16 years of exploration and testing, we're now moving on to environmental assessment, permitting and detailed engineering, and supports. This project is more than building the mine, it is an important market opportunity and paramount in building out Canada's rare earth element market and supply chain, and to support its clean energy future."

A PARTNERSHIP ROOTED IN RESPECT FOR THE COMMUNITY

Search Minerals' approach to development has always recognized that lasting success in Labrador must include Indigenous and local voices. Its partnership with the NunatuKavut Community Council (NCC), an organization representing the Southern Inuit of Labrador is more than symbolic. NCC is an equity partner in the company, with a board seat, and a key part of the company's project oversight, environmental planning, and community engagement and benefits.

"Our partnership with Search Minerals is grounded in trust and transparency," says Diane Poole, NCC member and company director. "This is about building opportunities for NunatuKavut communities, ensuring responsible development, and securing a future

where our people share directly in the benefits of the resources from our lands."

Search Minerals and NCC have established a community-company coordination committee (C4) to facilitate communication, provide a framework to plan and co-manage the environmental work, and ensure the integration of community priorities into the overall mine development process. As employment, training, and procurement opportunities advance, so will strong and regular collaboration with St. Lewis, Port Hope Simpson, and Mary's Harbour, the three municipalities within the project area that the company depends on to anchor local opportunities to participate.

On October 8 to 9, 2025, Search Minerals Inc. was honoured to host Mayor Helen Poole of St. Lewis and Mayor Alton Rumbolt of Mary's Harbour at our headquarters in St. Lewis during a series of management and staff meetings. Their participation provided an invaluable opportunity to exchange perspectives on the local impact and long-term benefits of our Critical Rare Earth Element (CREE) projects. The two mayors noted, "Our towns recognize the potential of this project to create

lasting economic and social benefits for our region. We appreciate Search's openness and ongoing engagement, and we look forward to working together to ensure that residents and businesses are part of this opportunity as the projects move forward."

ADVANCING WITH CONFIDENCE

Following a comprehensive restructuring and successful TSX-V reinstatement in June 2025, Search Minerals has re-emerged with strengthened governance, renewed investor confidence and a clear path forward. The company is balancing science and traditional knowledge, community engagement, and practical local support to advance Canada's critical minerals strategy and REE prospects.

ABOUT SEARCH MINERALS INC.

Search Minerals (TSX-V: SMY | OTCQB: SHCMF) is a Canadian-based rare earth element exploration and development company advancing its Deep Fox and Foxtrot projects in Labrador's 64-kilometre REE district. The company's focus is on producing a high-value REE concentrate for the magnet metals essential to the clean-energy transition, guided by its partnership with the NunatuKavut Community Council and the local communities of St. Lewis, Port Hope Simpson, and Mary's Harbour. For further information, please visit www.seaerchminerals.ca and join our mailing list at info@searchminerals.ca.

Neither the TSX Venture Exchange nor its regulation services provider (as that term is defined in the policies of the TSX Venture Exchange) accepts responsibility for the adequacy or accuracy of this release. ✕



Record Ridge: A mine permitted, shovel-ready gateway to Canada's critical minerals future

Record Ridge is an advanced, shovel-ready, provincially permitted critical-minerals project with a substantial resource base, an Indigenous partnership framework, and strategic alignment with British Columbia and Canada's push to onshore refining and midstream capacity.

Record Ridge, developed by West High Yield (WHY) Resources Ltd. is no longer just a geological curiosity. It is an advanced, shovel-ready, provincially permitted critical-minerals project with a substantial resource base, an Indigenous partnership framework, and strategic alignment with British Columbia and Canada's push to onshore refining and midstream capacity. For investors looking to back projects that align with the government's policy, deliver tangible tonnes of critical minerals feedstock, and advance reconciliation and local benefits, Record Ridge is a flagship project to support.

Record Ridge's size and grade are explicit and material. The project's NI 43-101 PEA and company disclosures

describe roughly 43 million tonnes (Mt) of ore grading about 24.6 per cent magnesium, which equates to 10.6 million tonnes of contained magnesium. The same resource also contains approximately 18.9 million tonnes of silica (SiO_2), plus meaningful nickel and iron by-products. Those are not exploratory back-of-the-envelope figures — they are grounded in an independently prepared PEA and company technical reporting. For the onshore magnesium market, a 10.6 Mt contained inventory places Record Ridge in the top tier investable deposits in North America.

What separates junior projects that languish from those that advance is the completed heavy lift of mine acts permitting, baseline studies,

and Indigenous engagement. Record Ridge has crossed many of those hurdles: environmental and compliance documentation are complete; baseline and engineering studies have been delivered through the PEA process; and the project, through a rigorous review, has received Mines Act permitting that authorizes construction and operation. Those outcomes materially reduce the "permit overhang" that often discounts junior valuations and accelerate the point at which capital can be directed to engineering, procurement, and construction.

Canada's federal strategy has shifted from encouraging exploration to actively enabling the domestic processing and refining of critical minerals. Recent federal moves —



Record Ridge sits at the convergence of resource scale, de-risking milestones and national industrial strategy. Inset: Record Ridge's execution readiness benefits from regional infrastructure: roads, nearby rail corridors, and grid access, practical advantages that reduce capital intensity versus remote greenfield projects.

including new investment programs, strategic partnerships, and explicit political statements favouring domestic refining – signal that the government wants feedstock and value-added capacity to stay in Canada. The provincial and federal Critical Minerals Strategy and recent budget measures (including sovereign investment tools and incentives for midstream projects) mean projects that can supply domestic refineries or attract downstream capital are suddenly more investable. Record Ridge's combination of scale, location, and permitting status positions it as a natural candidate to feed that nascent domestic value chain.

A major and distinguishing attribute of Record Ridge is the Indigenous

partnership built into development plans. West High Yield has established collaborative relationships with the Osoyoos Indian Band (OIB) through Skemxist Solutions – an Indigenous-led partnership aimed at delivering Indigenous leadership in environmental management, contracting, and long-term economic participation. That partnership has already produced joint site visits, collaborative baseline work (including archaeology and cultural assessments), and a contracting framework intended to ensure Indigenous businesses and workers share in construction and operations opportunities. For investors and lenders demanding a durable social licence and high ESG standards, this formal Indigenous partnership that embeds governance, training, and

procurement pathways is a meaningful de-risking factor.

Magnesium and Silica are key critical minerals in support of a decarbonizing world. Magnesium is used in lightweight alloys, specialty chemicals, and a range of clean-tech and defence applications – from EV components and aerospace to magnesium-based battery chemistries under development. Silica has broad industrial uses, from technology glass, computer chips, specialty silica products, fiber optics, to construction, and certain battery materials. Record Ridge's combined magnesium and silica output positions the project to serve multiple customer verticals and revenue streams, including early off-take agreements, while midstream refining capacity

is established domestically. That optionality — sell ore for early cash flow and feed a Canadian refinery later — is a practical investor advantage.

Beyond permits and partnerships, Record Ridge's execution readiness benefits from regional infrastructure: roads, nearby rail corridors, and grid access, practical advantages that reduce capital intensity versus remote greenfield projects. The PEA and follow-up engineering work provide a roadmap for phased development — allowing the company to target staged cash flows and lower up-front capital needs while scaling into higher-value refining ambitions. These practical, on-the-ground advantages materially shorten the timeline from permit to construction and mining to product refinement.

Now, with market and policy tailwinds is the time to consider investment in

WHY Resources Record Ridge, as the project is now permit de-risked and has the scale and optionality given the size of the resource to serve multiple verticals and phase production. The OIB/Skemxist collaboration strengthens social licence, provides local sourcing and training pathways, and improves the project's attractiveness to ESG-focused financiers. Ottawa's explicit prioritization of domestic refining, sovereign investment vehicles, and tax/incentive changes increases the probability that downstream processing projects will attract financing or strategic partners — creating a demand pipeline for Record Ridge's feedstock.

Record Ridge sits at the convergence of resource scale, de-risking milestones and national industrial strategy. It offers a rare combination — a materially sized contained magnesium inventory

(≈10.6 Mt), substantial silica (≈18.9 Mt), completed permitting pathways, and a structured Indigenous partnership designed to anchor long-term benefits locally. With provincial and federal policy explicitly favouring domestic refining and midstream capacity, the time to evaluate exposure to projects that can supply Canadian processing — and do so with social licence and permitting in hand — is now. For investors who want exposure to critical minerals in a jurisdiction that is moving from raw export toward value-added production, Record Ridge and West High Yield Resources Ltd. present an investable, strategically aligned proposition worth serious due diligence.

West High Yield (WHY) Resources Ltd. is a Canadian public company listed on the TSXV (TSXV: WHY) and Frankfurt (FSE: W0H) exchanges. ✕



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Trilogy Metals announces strategic investment by U.S. Federal Government



Trilogy Metals Inc. (NYSE American / TSX: TMQ) is pleased to announce that the company, South32 Limited (ASX, LSE, JSE: S32; ADR: SOUHY) and Ambler Metals LLC have entered into a binding letter of intent with the U.S. Department of War (DOW), led by the Office of the Undersecretary of Defense for Acquisitions and Sustainment (OUSDA(A&S)) and the Office of Strategic Capital (OSC), for an investment to advance exploration and development of the company's Upper Kobuk Mineral Projects (UKMP). The UKMP are held by Ambler Metals – the company's 50/50 joint venture with South32.

The DOW is to invest approximately \$35.6 million for the development of critical mineral resources at the UKMP in transactions with Trilogy Metals and South32.

The DOW will hold approximately 10 per cent of Trilogy Metals.

The DOW intends to invest approximately \$17.8 million in Trilogy Metals in exchange for 8,215,570 units at a price of \$2.17 per unit, with each unit comprising of one common share of Trilogy Metals and 3/4 of a 10-year warrant. Each full warrant would be exercisable following completion of construction of the Ambler Access Project (or Ambler Road) at an exercise price of \$0.01 to acquire one common share of Trilogy.

The DOW intends to pay approximately \$17.8 million to South32 in exchange for 8,215,570 common shares of Trilogy Metals that South32 currently holds and a 10-year call option to acquire an additional 6,161,678 shares of Trilogy Metals from South32 at a price of \$0.01 per share, exercisable following completion of construction of the Ambler Road, the entire proceeds of which will be reinvested in Ambler Metals.

Trilogy Metals and South32 commit to use the funds to advance the exploration and development of the UKMP. DOW shall have the right to appoint one independent third-party director to the board of directors of Trilogy Metals for a period of three years. From the date hereof until January 1, 2029, Trilogy Metals agrees to not incur obligations with respect to third-party indebtedness for borrowed money in excess of \$1 billion in the aggregate without the prior written approval of DOW.

The proposed transaction also contemplates that Ambler Metals, South32, Trilogy Metals, the U.S. Government and other interested parties, as applicable, will discuss in good faith a framework agreement to establish the basis on which the Ambler Road can be permitted, financed, and constructed—unlocking the development of Arctic, Bornite, and any other mineral projects identified through Ambler Metals exploration efforts. DOW will work in good faith to help facilitate financing required for the construction of the Ambler Road in coordination with the State of Alaska. The parties are also committed to work

A large, close-up photograph of a person's eyes, which are light green and looking directly at the camera. The image is used as a background for a promotional banner.

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collaboratively in good faith to include future UKMP permit applications in the FAST-41 process to assist with expediting the mine permitting process.

Any transaction is subject to the receipt of all regulatory and stock exchange approvals and the parties expect to negotiate definitive documentation reflecting the terms of the transaction. The company intends to rely on the Exemptions for Eligible Interlisted Issuer in accordance with section 602.1 of the TSX company manual. The parties intend to close the transaction promptly following the reauthorization of the Defense Production Act by the United States Congress and the completion by the U.S. Government of its Foreign Ownership, Control, or Influence (FOCI) review; provided however, that if these conditions have not occurred prior to March 31, 2026, the letter of intent will terminate.

The Ambler Access Project or Ambler Road is a proposed 211-mile, industrial-use-only road from the Ambler Mining District to the Dalton Highway that would enable the advancement of exploration and development of the company's mineral projects in Northwest Alaska. The Ambler Road is held by the Alaska Industrial Development and Export Authority (AIDEA), a public corporation of the State of Alaska.

"This proposed partnership with the U.S. Government represents a significant milestone for Trilogy Metals and for the development of a secure, domestic supply of critical minerals for America in Alaska. The Department of War's interest underscores the strategic importance of the Upper Kobuk Mineral Projects in supporting U.S. energy, technology, and national security priorities. We look forward to working with our partners at South32,

federal and state agencies, and Alaska Native communities to advance this world-class district responsibly and collaboratively," said Tony Giardini, president and chief executive officer of Trilogy Metals.

The proposed offer and sale of the securities as described above are being made in a transaction not involving a public offering and the securities have not been registered under the Securities Act of 1933, as amended, and may not be reoffered or resold in the United States except pursuant to an effective registration statement or an applicable exemption from the registration requirements.

ABOUT TRILOGY METALS

Trilogy Metals Inc. is a metal exploration and development company holding a 50 per cent interest in Ambler Metals LLC, which has a 100 per cent interest in the Upper Kobuk Mineral Projects (UKMP) in northwestern Alaska. On December 19, 2019, South32, a globally diversified mining and metals company, exercised its option to form a 50/50 joint venture with Trilogy. The UKMP is located within

the Ambler Mining District, which is one of the richest and most-prospective known copper-dominant districts in the world. It hosts world-class polymetallic volcanogenic massive sulphide (VMS) deposits that contain copper, zinc, lead, gold and silver, and carbonate replacement deposits which have been found to host high-grade copper and cobalt mineralization. Exploration efforts have been focused on two deposits in the Ambler Mining District – the Arctic VMS deposit and the Bornite carbonate replacement deposit. Both deposits are located within a land package that spans approximately 190,929 hectares. Ambler Metals has an agreement with NANA Regional Corporation, Inc., an Alaska Native Corporation that provides a framework for the exploration and potential development of the Ambler Mining District in cooperation with local communities. Trilogy's vision is to develop the Ambler Mining District into a premier North American copper producer while protecting and respecting subsistence livelihoods. ✕

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From initial planning to reclamation

Navigating the environmental lifecycle of a mine

In the Yukon, EDI is leading ecology studies and providing regulatory support for several exploration projects involving critical minerals.

Modern mining projects are complex undertakings that demand a strong commitment to environmental stewardship and social responsibility. From the earliest planning stages through to final reclamation, success depends on fostering lasting benefits for both people and the environment. By engaging the right environmental partner, mine proponents gain integrated, practical support across the full project lifecycle. This approach not only helps manage environmental risks effectively, but also builds trust, supports reconciliation, and contributes to lasting social and environmental value.

A central part of social responsibility in mining is establishing and maintaining meaningful, long-term relationships with Indigenous Nations. Genuine engagement and partnership

help projects reflect community priorities and cultural values, while also strengthening environmental outcomes.

In addition to early engagement with Indigenous Nations, the exploration, planning, and early permitting phases are among the most critical in the life of a mine, as they shape both technical feasibility and community alignment. At this stage, proponents need to establish a clear regulatory pathway and conduct comprehensive baseline studies. These studies form the foundation for project design, effects assessment, and regulatory applications.

This is where an environmental consulting company like EDI Environmental Dynamics Inc. (EDI) provides foundational support.

Working collaboratively with clients, EDI identifies provincial and federal regulatory requirements and designs programs that capture the information needed to advance projects. A well-structured baseline program not only de-risks environmental assessment and permitting, it also supports defensible technical studies, reduces costly delays, and contributes to better project outcomes.

By focusing on clear, defensible work, EDI helps advance complex projects through key regulatory milestones. For example, EDI is leading the vegetation and wildlife components of the amendment application for the Environmental Assessment Certificate and related Mines Act and Environmental Management Act permits for the Red Chris Mine: Block Cave Project in northern



EDI has also conducted aquatic studies along the North Canol Road, an essential access route to several critical mineral projects in the region.

British Columbia. In the Yukon, EDI is leading ecology studies and providing regulatory support for several exploration projects involving critical minerals. EDI has also conducted aquatic studies along the North Canol Road, an essential access route to several critical mineral projects in the region.

As a project moves into the construction and operation phases, environmental support is essential for managing risks and keeping the project moving forward responsibly. This often involves creating and implementing Environmental Management Plans to limit effects of construction activities. On-the-ground tasks may include erosion and sediment control, monitoring for sensitive fish and wildlife before disturbance, and

carrying out regular inspections to confirm regulatory requirements are being met. Since 2021, EDI has participated in vegetation and wildlife monitoring at the Red Chris Mine. These efforts provide important data to guide operational decisions, maintain compliance, and reduce environmental impacts over the life of the critical mineral mine.

The final stages of a mine's life—closure and reclamation—are vital for leaving a positive environmental legacy. The objective is to return disturbed areas to a safe, stable, and productive state that supports long-term land use. Achieving this outcome requires planning that begins early in the mine's development and is refined throughout operations and into closure. Environmental specialists, including those at EDI,

contribute expertise in designing and carrying out reclamation and restoration programs, including habitat recovery and offsetting measures, closing the loop on responsible resource development.

Mining will continue to play a central role in Canada's economic future, particularly in the supply of critical minerals. The industry's success depends on more than production—it rests on how projects are planned, built, operated, and reclaimed. By approaching each stage of the lifecycle with foresight, collaboration, and respect for both people and the environment, proponents can deliver projects that leave lasting value.

This article was prepared in partnership with EDI Environmental Dynamics Inc. ✕

Engineering cleaner transfers

The case for complete conveyor sealing in dust control

By Richwood



Left: Material and dust containment. Below: Material containment with dust control.



In the mining and aggregate industries, dust control is not just a matter of regulatory compliance, it's a critical factor in operational efficiency, equipment longevity, and worker safety. Whether moving potash,

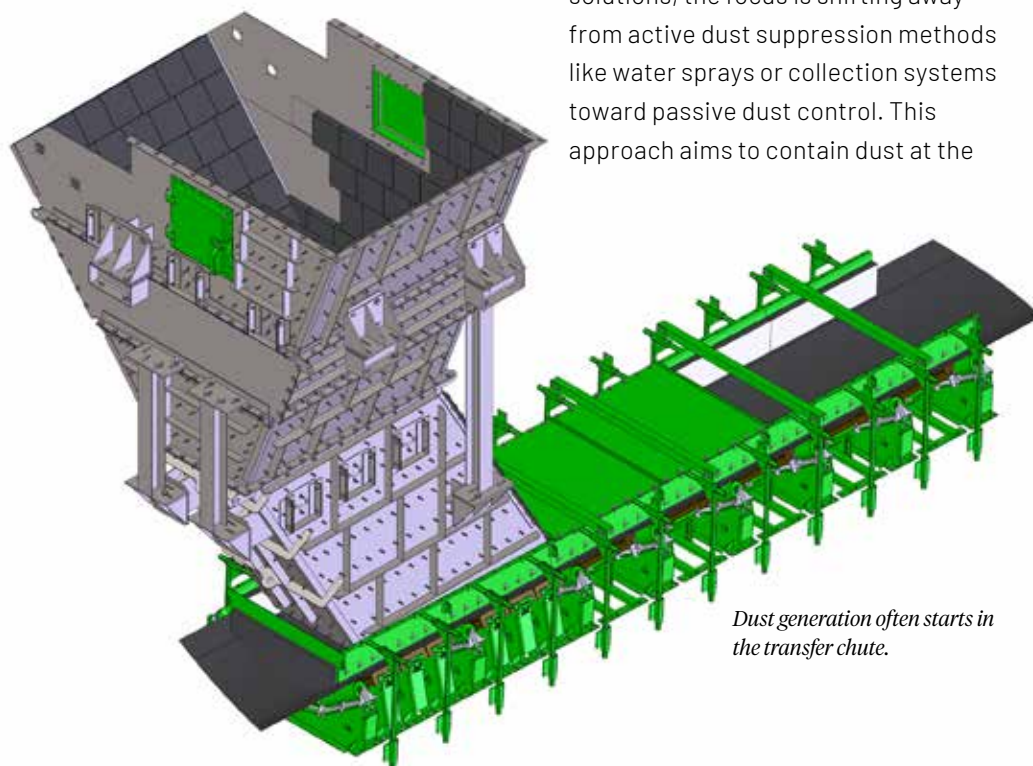
coal, or crushed rock, transfer points on conveyors are often the biggest contributors to fugitive dust on site.

As more operations look for sustainable, low-maintenance solutions, the focus is shifting away from active dust suppression methods like water sprays or collection systems toward passive dust control. This approach aims to contain dust at the

source through smarter engineering and better system integration. The key? A fully sealed conveyor transfer point that begins with proper transfer chute design and ends with effective belt sealing without relying on chemicals or mechanical filtration.

Passive dust control is based on the principle of managing airflow and material movement within a sealed environment. Instead of capturing airborne dust after it's been generated, this method prevents dust from escaping in the first place. And in sectors like coal and potash where dust can be combustible, corrosive, or extremely fine, preventing release at the source is not only safer, but also more cost-effective in the long term.

Dust generation often starts in the transfer chute. Poorly designed or undersized chutes create turbulence, unpredictable material flow, and uncontrolled impact forces. These



Dust generation often starts in the transfer chute.

conditions pulverize material, bounce fines into the air, and increase wear throughout the system.

A properly engineered transfer chute must be tailored to the application. By controlling the trajectory and energy of the falling material, properly designed chutes reduce both spillage and airborne particles from the outset.

Too often, discussions about dust control jump straight to sealing components like skirting or curtains. But those solutions can only be effective if the conveyor belt itself is properly supported. If the belt is sagging between idlers or has any vertical movement while being loaded, efforts to seal fines and dust will typically fail.

In fact, trying to seal against a moving unstable belt creates gaps and

pressure inconsistencies that actively promote dust escape. Proper belt support is fundamental. This is usually best accomplished using engineered impact beds or cradles. It provides a stable consistent surface that allows sealing components to function as designed. Without it, every other dust control measure is compromised.

THE FIVE PILLARS OF PASSIVE DUST CONTAINMENT

A high-performance passive dust control system integrates several interdependent components. These include:

1. Controlled material flow

The geometry of the transfer chute should guide material smoothly and centrally onto the belt, minimizing bounce and degradation that leads to fine dust creation.



2. Energy dissipation and belt support

Engineered belt support systems—like impact saddles or idlers—absorb the shock of material drop, protect belt integrity, and ensure the belt remains flat and steady, enabling effective sealing.



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3. Full transfer enclosure

Effective containment requires more than just basic skirting. It demands a sealed system—including rugged wear liners, properly design skirting, skirtboards, and proper sealing rubber—to prevent escape paths for dust-laden air.

4. Air velocity reduction

Turbulent air is one of the primary causes of dust becoming airborne. Passive systems use baffled stilling zones and dust curtains to slow air movement, allowing fine particles to settle back onto the belt.

5. Pressure equalization

A sealed enclosure must allow for pressure relief to prevent sudden air bursts that force dust out. Passive systems incorporate venting,

chimneys, and extended containment zones based on CEMA 575 principles, allowing dust to settle naturally without needing active suppression.

Across North America and globally, mining operations are proving the value of this passive approach. Companies like Richwood have delivered complete transfer point solutions that significantly reduce dust without water, filters, or moving parts.

In one coal facility example, implementing a full Richwood passive dust system reduced visible dust emissions to near-zero while cutting cleanup time and improving conveyor belt life. In potash handling, systems have maintained long-term performance in highly corrosive, fine dust environments. And in aggregates, they've proven successful under heavy impact from high-tonnage

loads, reducing spillage and airborne particulate.

In addition to improved worker safety and actual system performance, passive dust control is far less maintenance intensive than active dust control methods like misting systems or baghouses. Its long-term impact on safety, production, and worker morale is significant.

ABOUT RICHWOOD

Richwood engineers complete conveyor solutions for the mining and bulk material handling industries, specializing in dust containment, impact protection, and belt support. With almost 50 years of field experience, Richwood products are trusted worldwide for durability and performance. Learn more at www.richwood.com. **x**



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Fifty years of craftsmanship and community

Porcupine Opportunities Program's legacy in core box production



Far left: What began as a woodworking shop making wishing wells and planter boxes has evolved into a professional production facility supplying the mining and exploration industry with NQ, PQ, and HQ core boxes, as well as custom-sized boxes to meet specialized sampling and transport needs. Centre: In recent years, POP expanded its operations to include dunnage production for the lumber industry and custom woodworking projects for private clients. Left: POP's success in business directly supports its broader mission: creating opportunities for people experiencing disability to learn skills, earn income, and find belonging.

In the heart of Porcupine Plain, Sask., a small not-for-profit agency has quietly supported both its community and Canada's mining sector for half a century. The Porcupine Opportunities Program (POP) celebrated its 50th anniversary in 2024—a milestone marking five decades of providing meaningful employment for individuals experiencing disability, while building a reputation for quality, reliability, and craftsmanship in core box production.

Established in 1974 by a group of parents seeking opportunities for their children to live and work close to home, POP has grown from humble beginnings in a converted two-room schoolhouse to a fully equipped workshop serving clients across Western Canada. What began as a woodworking shop making wishing wells and planter boxes has evolved into a professional production facility supplying the mining and exploration industry with NQ, PQ, and HQ core boxes, as well as custom-sized boxes to meet specialized sampling and transport needs.

The first shipment of core boxes left the POP workshop in 1989, marking the beginning of a partnership with the mining industry that has endured for more than 35 years.

"Our workshop team takes tremendous pride in their work," says Lenard

Pelletier, POP's production manager. "We know our customers rely on us for quality and consistency, and we treat every shipment like it's our reputation going out the door."

One of the most recognizable faces in the workshop is Byron Jamieson, who joined POP just one year after its founding. At 68, Jamieson continues to work full-time in the shop, leading the finishing and shipping side of the operation.

"Byron is a hard-working farm boy," says Pelletier. "He has a job, and he gets it done." His dedication represents the spirit of POP—commitment, capability, and community.

In recent years, POP expanded its operations to include dunnage production for the lumber industry and custom woodworking projects for private clients. The team remains open to special requests—from unique wood product designs to limited-run items for commercial or industrial use. This flexibility, combined with a deep sense of purpose, has helped POP maintain long-standing relationships with some of Saskatchewan's most respected mining and drilling companies.

The agency's success in business directly supports its broader mission: creating opportunities for people

experiencing disability to learn skills, earn income, and find belonging.

"When industry partners order from us, they're not just purchasing a product—they're investing in inclusion," says Ruth Howes, executive director of POP. "Each box that leaves our shop represents someone's pride and purpose."

Today, POP employs over 60 staff supporting 30 individuals across residential, vocational, and community-based programs in Porcupine Plain and Hudson Bay. The workshop remains at the heart of it all—linking the organization's roots in woodworking with its role in serving Canada's resource industries.

As POP celebrates 50 years, its message to the mining sector is simple:

If you need it built from wood, we're ready to build it—reliably, skillfully, and with purpose.

For more information or to discuss special orders, contact:

Porcupine Opportunities Program Inc. (POP)

Porcupine Plain, Saskatchewan

• (306) 278-3017 / popine@sasktel.net
-Attn: Amber Kiehn or Ruth Howes
ruth.howes@sasktel.net

• www.porcupineopportunities.ca ✕

UPLift 2025: An unforgettable inaugural gathering for the future of uranium, potash, and lithium



Left: Day one opened with a series of fireside conversations with the executives of all the major mining companies. Centre: A standout moment came with the address by Honourable Colleen Young, Saskatchewan's Minister of Energy and Resources of the Government of Saskatchewan, who emphasized the province's commitment to sustainable resource development and innovation. Right: The UPLift Fireside Collaboration for the Energy Transition the Role of the Global Institute for Energy Minerals and Society.

Held from September 8 to 11, 2025, at the Sheraton Cavalier Saskatoon Hotel, the Uranium, Potash, and Lithium International Conference (UPLift 2025) brought together global leaders, innovators, and technical experts to explore the evolving landscape of these three critical minerals. Organized in partnership with the Hydrometallurgy Section of the Metallurgy and Materials Society and the SK/MB Chapter of Canadian Mineral Processors Society, with the support of the Saskatchewan Mining Association, the event built on the

success of the Fourth International Conference on Uranium in 2020, expanding its scope to include potash and lithium—three pillars of Saskatchewan's mineral economy.

The conference featured focused sessions that fostered deep technical exchange and meaningful networking. With dedicated tracks for each mineral, attendees engaged in specialized discussions led by invited speakers and industry veterans.

Day one opened with a series of fireside conversations with the

executives of all the major mining companies, moderated by leaders from the Saskatchewan Mining Association, Pam Schwann and Brad Sigurdson, and honorary chair Engin Özberk. These sessions explored the past, present, and future of mineral production in the province. Speakers included Brian Reilly (Cameco), Jim Corman (Orano Canada), Sam Farris (K+S Potash), Karina Gistelinck (BHP), Lawrence Berthelet (Mosaic), James Hatley (Uranium Energy Corp.), Gary Haywood (Paladin Canada), Adam Engdahl (NexGen Energy Ltd.), and

A standout moment came with the address by the Honourable Colleen Young, Saskatchewan's Minister of Energy and Resources of the Government of Saskatchewan, who emphasized the province's commitment to sustainable resource development and innovation.



Left: On Wednesday, attendees gathered at the Western Development Museum for a lively social event. Below: Beyond the sessions, UPLift 2025 offered rich opportunities for connection.

Cory Belyk (CanAlaska Uranium). Their insights highlighted Saskatchewan's global leadership in uranium and potash, and the growing potential of lithium.

A standout moment came with the address by the Honourable Colleen Young, Saskatchewan's Minister of Energy and Resources of the Government of Saskatchewan, who emphasized the province's commitment to sustainable resource development and innovation.

Day two featured a panel discussion on the Global Institute for Energy, Minerals, and Society (GIEMS)—a partnership between the University of Regina, University of Saskatchewan, and Saskatchewan Polytechnic. The panel was led by Tom Kishchuk, executive director, and included experts Prof. Greg Poelzer, Dr. Graeme Drysdale, and Assist. Prof. Joyce McBeth. This panel discussion explored how GIEMS will foster collaboration across academia, government, and industry to address the opportunities and challenges presented by uranium, potash, and lithium development.

Keynote presentations followed, each offering a deep dive into the technical and economic dimensions of the featured minerals. Biman Bharadwaj (Cameco) spoke on uranium's resurgence in mining, milling, and innovation. Paul Labbe (MICA) spoke on the historical perspective of growing potash production in Saskatchewan. Dr. Norman Chow (Kemetic Research) provided a comprehensive review of lithium's journey: from innovation to global dominance – technical, economic, and Canadian involvement.

Beyond the sessions, UPLift 2025 offered rich opportunities for connection. On Wednesday, attendees gathered at the Western Development Museum for a lively social event sponsored by the Saskatchewan Research Council (SRC), Peter Lucas Project Management, and RESPEC. On Friday, participants enjoyed an exclusive behind-the-scenes tour of two cutting-edge research facilities hosted by the SRC. These experiences deepened attendees' understanding of local innovation and fostered collaboration.

UPLift 2025 succeeded in creating a collaborative space for industry, academia, and government to align on the future of these three critical minerals. With high engagement, expert-led sessions, and strategic conversations, the conference reinforced Saskatchewan's position as a hub for sustainable mineral innovation.

Thank you to our conference organizing committee: honorary chair: Engin Özberk, chair historical metallurgy; co-chairs: Jeff Adams (Hatch), Todd Steen (Hatch) and Greg Miller (Hatch); MetSoc liaison: Dimitrios Filippou (Rio Tinto Iron & Titanium); CMP liaison: Rayneth Law (Molycop); advisors: Thomas Specht (Hatch) and Brad Sigurdson (Saskatchewan Mining Association); sponsorship leads: Skyler Dillman (AESSEAL) and Matthew Kemp (Peter Lucas Inc.); and proceedings chair: Rashid Bashir (York University).

Special thanks to all sponsors, especially HATCH, NexGen Energy Ltd., and Cameco, whose generous support helped make UPLift 2025 a success. ✕

Saskatchewan's strategic edge in global potash

By Tabetta Stirrett, RESPEC's Vice-President of Mining & Energy



Global potash demands now exceed 70 million tonnes annually, yet production remains concentrated in just a few jurisdictions. Canada, Russia, and Belarus dominate supply, and disruptions in Eastern Europe have shifted attention toward Canada as the most reliable long-term source.

With sanctions curbing Belarusian exports and geopolitical instability complicating Russian output, Saskatchewan has emerged as the anchor of global supply chains. This reliability matters for import reliant regions in Asia and Latin America

because long supply routes mean transportation costs, which can make or break competitiveness.

From geology to workforce readiness, the province's strengths demonstrate why Saskatchewan remains the backbone of global potash production.

A GEOLOGICAL FOUNDATION FOR GROWTH

Saskatchewan's position rests on geology. The Prairie Evaporite Formation hosts laterally continuous, flat-lying seams grading 18 to 25 per cent K₂O and low insolubles.

These conditions are ideal for both conventional underground and solution mining. Thickness and uniformity reduce operating risk, while favourable mineralogy enables cost-efficient extraction at scale.

Decades of operational data confirm that ore-grade consistency and seam continuity have allowed producers to maintain cost stability, even amid shifting global demand.

By contrast, the peripheral extensions into Manitoba, Canada, and North Dakota, United States, lose continuity,

thin out, and introduce carnallite and other non-potash minerals that complicate processing. North Dakota's deposits lie at depths of approximately 2,700 metres, where high creep rates present additional challenges despite favourable solution-mining temperatures.

Elsewhere in Canada, New Brunswick mines once contributed to national output but were ultimately undermined by water-prone deposits, geologic complexity, and higher operating costs. Closures in these mines highlight the comparative advantage of Saskatchewan's thicker, purer reserves.

COMPARATIVE BASIN INSIGHTS

Across North America, basin characteristics vary significantly. Mining of Michigan's Borgen Bed, with impressive grades reaching 35 per cent K₂O, was paused in 2013 as Mosaic shifted focus to assets with more favourable economics. Today, Michigan Potash & Salt Company is actively advancing the project, supported by its United States strategic mineral designation. Utah and Arizona also host known deposits, although development is shaped by water availability, regulatory considerations, and mineral complexity.

Globally, similar factors influence progress. Spain's seams present lower grades and require careful management of insolubles and structural features. Brazil's emerging projects are navigating early-stage development, focusing on infrastructure and mineral composition. In Southeast Asia, shallow deposits in Thailand and Laos are being evaluated with a focus on managing water inflow during shaft construction.

The Danakil Basin in Ethiopia and Eritrea offers potential, but development planning must account for geology and regional stability. Morocco's shallow deposits provide logistical advantages, while ongoing efforts address ore grade and regulatory processes.

Together, these examples show how Saskatchewan's basin stands out for its favourable geology, infrastructure readiness, and operational stability, making it a resilient asset in a dynamic market.

MINING METHODS: PROVEN AND EVOLVING

Saskatchewan producers rely primarily on two proven methods: conventional underground mining and solution mining. Conventional mines involve shafts sunk 800 to 1,100 metres, with specialized cutting equipment extracting the ore. While reliable, these projects carry multi-billion-dollar capital costs and exposure to water-inflow risk.

Solution mining, pioneered commercially at Belle Plaine, has become a strong alternative for deeper deposits. By injecting water to dissolve potash in place and pumping brine to the surface, operators bypass the need for large shafts. Industry experience over the past two decades shows that solution mining can deliver steady output with lower labour intensity, smaller surface footprints, and limited tailings.

The sector continues to advance selective solution mining, which is an approach adapted from oil and gas thermal extraction. By selectively targeting potassium dissolution with sodium-chloride-rich brine, this method reduces salt tailings, environmental disturbance, and capital

intensity. For mid-tier and emerging players, this approach offers them a path to economic viability in a market dominated by majors.

BALANCING COSTS, COMMUNITIES, AND CONTINUITY

Saskatchewan's advantages are clear, but investors still weigh risk. Market exposure is influenced by shipping costs from a landlocked jurisdiction. Environmental and social considerations remain in focus as sustainability pressures grow. These factors prompt greater attention to water stewardship, tailings management, and community relationships.

Workforce renewal is another priority. With a significant portion of the skilled labour pool nearing retirement age, training and recruitment are central to sustaining productivity. Operational continuity depends as much on knowledge transfer and workforce adaptability as on ore quality.

THE NEXT ERA OF SASKATCHEWAN POTASH

In a market defined by geopolitical uncertainty and growing food demand, Saskatchewan's potash sector remains resilient and indispensable. The province combines high-grade reserves, a proven operating record, and regulatory stability. These advantages make Saskatchewan the world's most reliable and scalable potash investment environment.

Sustaining this position will depend on continued innovation in extraction technologies and the next generation of technical professionals to carry it forward. If geology built Saskatchewan's potash industry, technology and talent will shape its future. ✕

PDAC announces 2026 Awards recipients

The Prospectors & Developers Association of Canada (PDAC) is pleased to announce the recipients of the 2026 PDAC Awards, celebrating the people and partnerships driving discovery, development, and sustainable growth in the mineral industry.

"The 2026 recipients demonstrate how passion and teamwork can turn ideas into achievement," said Karen Rees, PDAC president. "Their work reflects the determination, resourcefulness, and shared commitment that keep our industry moving forward."

Since 1977, the PDAC Awards have recognized the dedication and ingenuity that drive advancement in communities across Canada and around the world.

The 2026 recipients will be honoured during the PDAC 2026 Convention at the Awards Celebration & Nite Cap on March 3, 2026, at the Fairmont Royal York Hotel in Toronto. One of the convention's most anticipated evenings, this event features a cocktail reception, three-course dinner, and the presentation of PDAC's five prestigious awards, followed by the Nite Cap reception. It offers a unique opportunity to celebrate achievement, connect with industry leaders, and enjoy an evening of networking and inspiration.

2026 PDAC AWARDS RECIPIENTS

Bill Dennis Award: For a Canadian discovery or prospecting success

Canadian Royalties Exploration Team – For the discovery of the Inukshuk Deposit in Nunavik, Que., Canada.

Skookum Jim Award: For Indigenous achievement in the mineral industry

Des Nedhe Group – For advancing Indigenous entrepreneurship and community-led economic development across the mineral industry in Sask., Canada.

Sustainability Award: For outstanding leadership in environmental protection and/or good community relations



Blue Lagoon Resources – For commitment to sustainable development and Indigenous partnership at the Dome Mountain Gold Project, B.C., Canada.

Thayer Lindsley Award: For an international mineral discovery

AngloGold Ashanti, Renaissance Gold, and Callinan Royalties – For the discovery of the Silicon and Merlin gold-silver deposits (Expanded Silicon Project, now Arthur Project), near Beatty, Nevada, U.S.

Viola R. MacMillan Award: For leadership in management and finance for the exploration and/or development of mineral resources

Equinox Gold – For the acquisition, financing, and development of the Greenstone Mine in Geraldton, Ont., Canada.

AWARDS SELECTION PROCESS

PDAC's Board of Directors select award recipients based on recommendations of the association's Awards Committee/ Awards Celebration & Nite Cap ticket sales open on PDAC's website in December. Sign up to be notified when tickets become available.

ABOUT PDAC

The Prospectors & Developers Association of Canada (PDAC) is the leading voice of the mineral exploration and development community, an industry that employs more than 724,000 individuals, and contributed \$156 billion to Canada's GDP in 2024 (Natural Resources Canada, February 2025). Currently representing over 8,200 members around the world, PDAC's work centres on supporting a competitive, responsible, and sustainable mineral sector.

PDAC 2026, our 94th annual convention, will take place in person in Toronto, Canada from March 1-4. Please visit pdac.ca for more information. ✕

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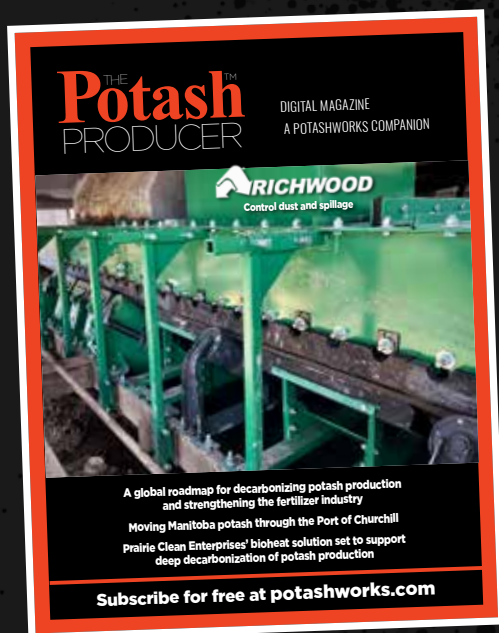
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