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ONTARIO MINING AND TORONTO'S GLOBAL REACH 2025

Production - Exploration - Finance - International Projects
ESG - Engineering & Consulting - Critical Minerals - AI - Innovation

Dear Readers,

With over 60 countries heading to the polls and nearly half of the world's population voting, 2024 stood out as a historic year of elections. The air is thick with uncertainty, as new administrations recalculate their approach to Canadian mining companies operating on their soil and Canada braces for a potential trade war with its closest ally, the US.

On the other hand, this uncertainty has contributed to record-breaking gold prices, as investors rush to invest in gold to hedge against mounting concerns over global economic stability. This has been a massive boon for Ontario, as around half of its active mines primarily produce gold. Moreover, two new large mines, Côté Gold and Greenstone Gold, reached commercial production last year, and a wave of expansion projects is sweeping across the province as majors rush to take advantage of sky-high gold prices.

Ontario's push to become a leader in critical minerals is moving forward despite a dip in battery metals prices. In addition, the rapidly changing geopolitical landscape has seen changes to the Investment Canada Act, which has clamped down on Chinese involvement in Canada's domestic critical mineral space at a time when many project developers need all the funding they can get. Nevertheless, the provincial government remains committed to its Critical Minerals Strategy, investing millions in subsidies and grants to support exploration, infrastructure and downstream development. As Canada turns away from China, new doors have opened and Ontario has brokered agreements with South Korea and Japan, paving the way for partnerships between miners and OEMs to bring much needed critical mineral projects to fruition.

GBR's *Ontario Mining and Toronto's Global Reach 2025* takes an in-depth look at the sector through insights from over 130 industry leaders, offering a platform for executives, government officials and investors to discuss the future of Ontario's mining sector and highlight its greatest success stories.

We want to thank everyone who contributed their expertise and insights to this report. A special thank you goes to our partners at the Toronto Stock Exchange and TSX Venture Exchange (TMX Group), the Ontario Mining Association (OMA), and the Prospectors & Developers Association of Canada (PDAC) for their continued support.

Alfonso Tejerina
Director and General Manager
Global Business Reports

ONTARIO MINING AND TORONTO'S GLOBAL REACH 2025
GBR SERIES

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Introduction

Gold Production and Exploration

Finance

Critical Minerals

Toronto's Global Reach

Services

Equipment and Innovation

Interviews for the report were conducted between September 2024 and January 2025

INTRODUCTION

"These are exciting times for mining despite the situation in the wider world, and we are well-positioned in Ontario to weather the storms that may be on the horizon."

George Pirie
Minister of Mines
GOVERNMENT OF ONTARIO

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Image courtesy of First Mining Gold

Image courtesy of Sasan Hezarkhani at Unsplash

Regulations and Risks

The fine line between growth and governance

2024 has been a transitional year for Ontario's mining sector, marked by further regulatory developments and record commodity prices. However, the industry continues to grapple with the complexities of securing financing, particularly for juniors, amid a volatile global economic landscape and the US elections. Additionally, Ontario's miners and explorers face the ongoing challenges of navigating stringent environmental regulations, addressing labor shortages, and enhancing their ESG performance to meet the increasing demands for sustainable and responsible mining practices.

The regulations of the 2023 Building More Mines Act came into effect on April 1st, 2024, amending the existing Mining Act and consolidating the Ministry's powers over exploration and mine closures. The Ministry is not done yet, however, with further improvements in the pipeline to streamline and simplify the permitting process in Ontario. In his interview with GBR, Ontario's Minister of Mines George Pirie shared details: "We continue to make improvements and enhancements to the regulatory framework, with further amendments set to be released in November 2024. These new changes will be incorporated into the Red Tape Reduction Bill, aiming to streamline the mine approval and permitting process. Our largest policy initiative currently is the 'One Project, One Process' initiative, which aims to break down the confusion and delays Indigenous communities and mining companies encounter."

Further efforts to streamline the permitting process in Ontario will come as a relief to many, given that building a mine in the province can take up to 20 years in some cases. "A common theme we hear from mining clients is that regulations are complex and duplicative. Acquiring permits, even for the simplest of projects, takes years, and removing some layers of regulations whilst maintaining commitments to environmental concerns will help many young mines flourish. The Building More Mines Act was a great first step in streamlining the process, but more must be done," said Bliss Baker, vice chair, Sussex Strategy Group.

In a globalized world, where giant mining multinationals can pick and choose their mining destinations, the regulatory framework in place is playing a more important role than ever. "I believe that Canada's regulatory frameworks are well intended but need to be streamlined to remain competitive. There are currently some real disruptors in the mining game, such as Argentina and Saudi Arabia, that are aggressively attracting new capital into their space," said Rob McEwen, chairman and chief owner, McEwen Mining.

Canadian mine developers have always had to contend with the interests of many different groups – from the Ministry of the Environment, Conservation and Parks (MECP) to Indigenous communities. With so many parties to consider, passing new legislation to streamline regulations always comes at the risk of silencing important voices. "From what we see, Canada at the federal and provincial level has invested significant thinking into a thoughtful and committed plan. The issue remains in finding ways to execute on that plan, given the number of stakeholders, as well as the competing federal and provincial jurisdiction," said Michael Pickersgill, head of mining and metals, Torys LLP.

As part of the 2024 federal budget, the government announced the Indigenous Loan Guarantee Program to facilitate Indigenous communities' equity ownership in major natural resource and energy projects with up to C$5 billion in loan guarantees. The news was welcomed by many, as giving Indigenous communities a stake in mining will likely strengthen the social license to operate and provide communities with a sense of ownership for projects occurring on their lands. Raymond Goldie, president of the Prospectors & Developers Association of Canada (PDAC), shared his thoughts: "PDAC is urging the government to accelerate the development of a one-window access point for the Indigenous Loan Guarantee Program. This, along with other government initiatives, would enhance Indigenous participation in the mineral industry, fostering economic growth and building capacity within Indigenous communities."

The effects of a sluggish permitting process reverberate throughout the mining sector, impacting not just the explorers and developers. "The shift from exploration towards permitting and development can make raising capital more challenging due to extended timelines and costs. Further, the increased risk associated with permitting has mitigated M&A activity, as larger companies are reluctant to acquire juniors without secured permits," said Gavin McOuat, senior MD, head of mining & metals at investment bank Raymond James.

Ontario has been balancing the urgent need to speed up mine development, while also maintaining its relatively robust environmental regulations. The Ontario government has updated the Mine Rehabilitation Code, requiring that post-mining land conditions be comparable to or better than their pre-mining state, with a particular emphasis on water management. As a result, Ontario's environmental and engineering firms have reported an uptick in demand for water management-related services. "The mining industry is evolving, and we are observing changing trends where mining companies are making a conscious effort to be better environmental stewards. There is an increasing focus on sustainability, water collection and treatment practices, as well as general environmental responsibility," said Derek Koziol, senior associate, mining market chief, senior civil engineer at J.L. Richards & Associates.

Following an MoU in 2023 signed by Premier Doug Ford and Nevada Governor Joe Lombardo to strengthen the economic relationship between their respective jurisdictions, MineConnect, now the largest Canadian mining supply and services association in Canada, has also continued its efforts to connect its members to Nevada's vast mining market. Marla Tremblay, MineConnect's executive director, outlined how the partnerships between her organization and the Nevada Governor's Office of Economic Development (GOED) and the Northeastern Nevada Regional Development Authority (NNRDA) have evolved: "This partnership has been mutually beneficial, allowing our members to expand their services into a thriving US mining market, filling various gaps within the Nevada mining industry supply chain. In December 2023, NNRDA launched its 'Silver Link' program designed to identify and recruit specific mining supply and service providers to enhance northeastern Nevada's supply chain. As part of this initiative, the 'Master Links' element facilitates partnerships with trade organizations to streamline recruitment efforts, and once designated as a Master Link, companies can enjoy various benefits, including insider access to request for proposals (RFPs). MineConnect was the first organization to join the program as a Master Link, and our members will have the first right of refusal to bid on RFPs for 30 days."

NORCAT, a leading non-profit mining training, technology and innovation center headquartered in Sudbury, has also made inroads in the US state, thanks in part to the foundations laid by MineConnect and the government of Ontario. "Our partnership with Great Basin College originated from introductions made by MineConnect a few years ago and has grown strong since. Expanding into the US market, particularly in Nevada, aligns with our mission, given the geographical and cultural similarities. There is a significant demand for training in the US mining sector, and we are working closely with Great Basin College to establish our leadership in that region," said Don Duval, CEO, NORCAT.

However, with a new Trump administration in power, Canada is having to contend with the threat of tariffs and a potential reduction in funding coming from the US. On the other hand, President Trump has signaled strong support for domestic mining and potential reductions in red tape, which could push Canadian leaders to follow suit. "The announcement from the US is a positive step, although it is possibly more aggressive than what Canada can consider. Speeding up permits is not about cutting corners but rather contributing responsibly to helping mines get going," said Kris Homer, senior VP for minerals and metals, west, Wood.

With Canada also expecting a change in leadership soon, Ontario's mining ecosystem is holding its breath to see what legislative changes are yet to come. The Trudeau administration has made several impactful decisions over the years. Some have been well received by the sector, such as agreements with South Korea to enhance collaboration on critical minerals, while others like changes to the Alternative Minimum Tax rules, have been more controversial. One thing is for sure – the inherent stability of having the same government in power for 10 years is soon coming to an end. "Ontario, and Canada in general, has stable government policies, which is important for the mining sector. The process from exploration to mine operation can take 10 to 15 years, so stability in policy is crucial for explorers and advanced-stage companies," said Michael Hoffman, CFO, Actlabs. ■

Ontario's Mineral Advantage

C$15.7 B
in mineral production in 2023

C$952 M
Spent in 2023 on **~400 mineral exploration projects**

50%+
of Ontario's universities and colleges
offer world-class mining, earth and environmental sciences, and engineering programs

36%
of all global mining equity capital
raised in the past 5 years came from the TSX and TSX-V

31,000
Direct mining jobs

+

47,000
Indirect jobs created

380,000+
Active mining claims in good standing
(as of December 31, 2023)

~40%
of the world's public mining companies
were listed on the TSX and TSX-V in 2023

Source: Invest Ontario

George Pirie

Minister of Mines

GOVERNMENT OF ONTARIO

> "Our largest policy initiative currently is the 'One Project, One Process' initiative, which aims to break down the confusion and delays Indigenous communities and mining companies encounter."

What have been some highlights during 2024?

The regulations of the Building More Mines Act came into force on April 1st, 2024, and we continue to make improvements and enhancements to the regulatory framework. These new changes will be incorporated into the Red Tape Reduction Bill, aiming to streamline the mine approval and permitting process. Our largest policy initiative currently is the 'One Project, One Process' initiative, which aims to break down the confusion and delays Indigenous communities and mining companies encounter. We are making great progress and should have remarkable success with the new format going forward. At PDAC 2024, we had some insightful conversations with the Canadian Minister of Energy and Natural Resources concerning building our mines faster for the benefit of national security. This is associated with the ongoing global geopolitical tensions and aligns with our goals at the Ministry.

Ontario welcomed two new producing mines in the summer of 2024 as IAMGOLD's Côté Gold and Equinox Gold's Greenstone Gold mines started production. The province has also seen great exploration success, with Ontario being ranked the number one jurisdiction in 2023 for junior exploration spending in Canada. We continue to discover new rare earth metals across the province, including cesium north of Timmins, which is vital for national security and the movement to clean energy. There is currently no global production, and all the stockpiles are in China, meaning if we can harness this resource, it will not only boost the economy in Ontario but be of strategic importance to the West.

How do you balance the Building More Mines Act with First Nations' concerns?

Our lands are not only critical to Canada but to all Western Democracies. Whilst our motivation for the production of critical minerals is clean energy, it is clear from our trips to Washington D.C. that the US views these resources through the lens of national security as they simply do not have the deposits of critical minerals that Ontario possesses. For example, America's only nickel deposit is processed here in Sudbury. The West does not want nickel from Indonesia, as it is funded by China, fueled by coal, and has poor tailings management, but here in Ontario, we have nickel to replace the Indonesian supply. There has been momentum and urgency over the last year, with Washington D.C. realizing the importance of critical minerals from a security standpoint.

We have excellent relations with the Indigenous Peoples and communities across Ontario, and a few months ago, we received a presentation from the Chiefs of Ontario regarding their concerns. The Ministry has delivered a response, and a large part of this was in consultation with Mineral Development Advisors that are employed by the First Nations. Our support also involves educational programs, codifying requirements clearly for Indigenous groups to help us execute our strategy and help supply skilled labor for these projects.

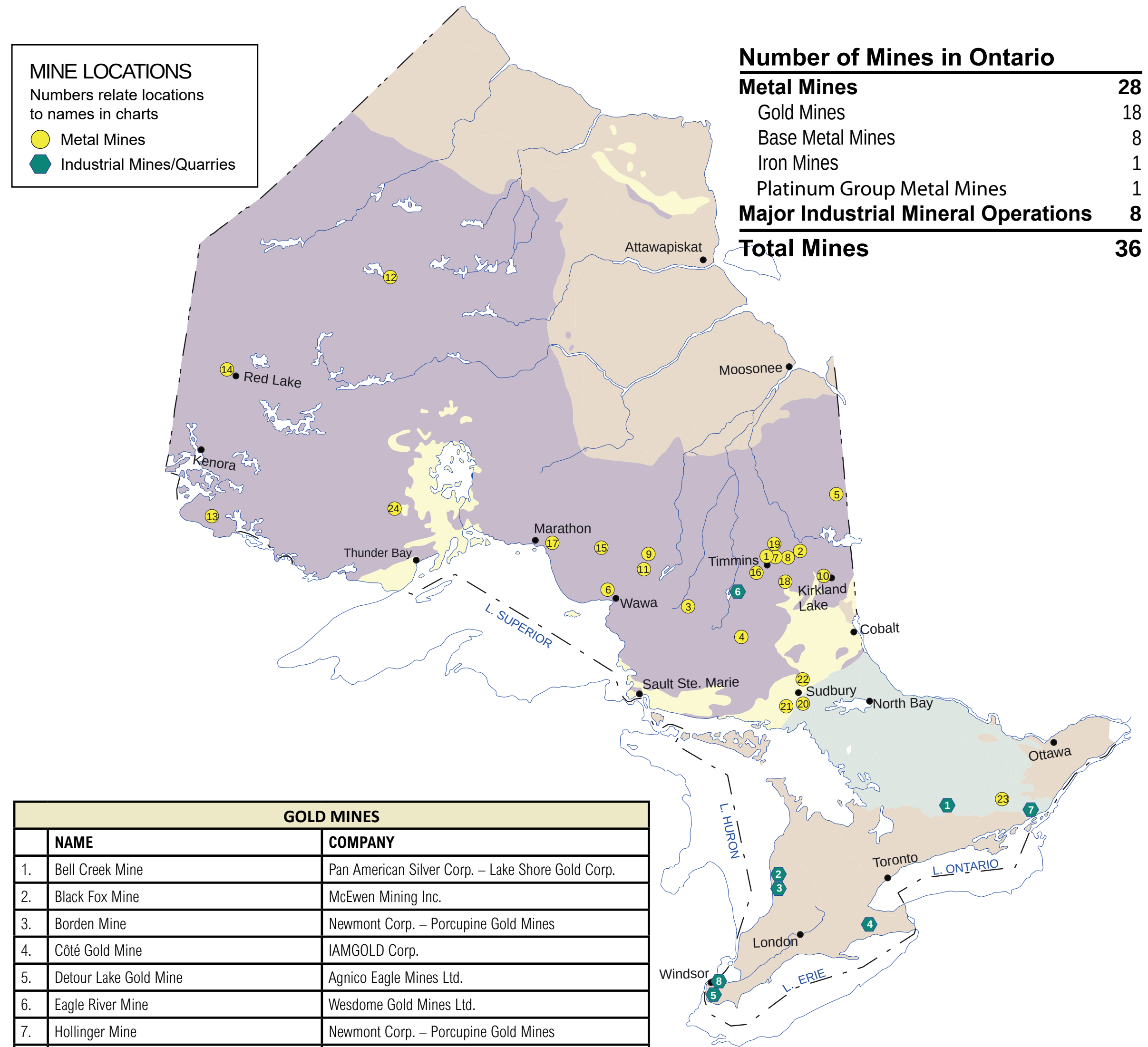
Could you comment on the ongoing issues juniors have with financing?

The Premier of Ontario and the Minister of Finance are aware of this issue, and we have an active file to address financing concerns in the junior sector. WA1 Resources, a junior company that recently discovered low-grade niobium in Australia, managed to increase its stock price by 150% in the last year, helped by the regulators there. Juniors must gain financial backing to explore, build infrastructure and create jobs, and this can only be done through the markets. We are watching the example of Australia and its successful junior sector closely.

What is next for Ontario's Ministry of Mines in 2025?

Our primary focus will be introducing the 'One Project, One Process' initiative. The current price of gold is a direct reflection of geopolitical tensions, with China being the largest producer and consumer in the world. This ties into the sense of urgency we have for critical and rare earth minerals. Whilst the Canadian federal government has restricted investment from China into mining, the market has opened up for Australia and the US, who are financing and aiding projects across Ontario. We are in exciting times for mining despite the situation in the wider world, and we are well-positioned in Ontario to weather the storms that may be on the horizon. ■

Ontario Mining Operations in 2024



GOLD MINES		
	NAME	COMPANY
1.	Bell Creek Mine	Pan American Silver Corp. – Lake Shore Gold Corp.
2.	Black Fox Mine	McEwen Mining Inc.
3.	Borden Mine	Newmont Corp. – Porcupine Gold Mines
4.	Côté Gold Mine	IAMGOLD Corp.
5.	Detour Lake Gold Mine	Agnico Eagle Mines Ltd.
6.	Eagle River Mine	Wesdome Gold Mines Ltd.
7.	Hollinger Mine	Newmont Corp. – Porcupine Gold Mines
8.	Hoyle Pond Mine	Newmont Corp. – Porcupine Gold Mines
9.	Island Gold Mine	Alamos Gold Inc.
10.	Macassa Mine	Agnico Eagle Mines Ltd.
11.	Magino Mine	Alamos Gold Inc.
12.	Musselwhite Mine	Newmont Corp.
13.	Rainy River Mine	New Gold Inc.
14.	Red Lake Mine	Evolution Mining Ltd. – Red Lake Gold Mines
15.	Sugar Zone Mine	Silver Lake Resources Ltd.
16.	Timmins West Mine	Pan American Silver Corp. – Lake Shore Gold Corp.
17.	Williams Mine	Barrick Gold Corp.
18.	Young – Davidson Mine	Alamos Gold Inc.
BASE METAL MINES		
	NAME	COMPANY
19.	Kidd Creek Mine	Glencore PLC – Glencore Canada Corp.
20.	Sudbury Operations: McCreedy West Mine	KGHM Polska Miedz S.A. - KGHM International Ltd.
21.	Sudbury Operations: Coleman Mine, Copper Cliff Complex, Creighton Mine, Garson Mine, Totten Mine	Vale S.A. – Vale Canada Limited
22.	Fraser Mine	Glencore PLC – Sudbury Integrated Nickel Operations

IRON MINES		
	NAME	COMPANY
23.	Tomclid Iron Mine	Ferromin Inc.
PLATINUM GROUP METAL MINES		
	NAME	COMPANY
24.	Lac des Iles Mine	Impala Platinum Holdings Ltd. – Impala Canada Ltd.
MAJOR INDUSTRIAL MINERAL OPERATIONS		
1.	Blue Mountain Operations (nepheline syenite)	Covia Canada Ltd.
2.	Goderich Brine Field (salt)	Compass Minerals Canada Corp.
3.	Goderich Mine (salt)	Compass Minerals Canada Corp.
4.	Hagersville Mine (gypsum)	CGC Inc.
5.	Ojibway Mine (salt)	K+S Windsor Salt Ltd.
6.	Penhorwood Mine (talc)	Magris Talc Canada Inc.
7.	St. Lawrence Mine (wollastonite)	Canadian Wollastonite
8.	Windsor Brine Field (salt)	K+S Windsor Salt Ltd.

Source: 2024 Ontario Mining and Exploration Directory and Resource Guide

Priya Tandon

President

ONTARIO MINING ASSOCIATION (OMA)

> "We remain committed to improving Ontario's competitiveness, particularly in energy, labor and critical minerals, while advocating for certainty and long-term prosperity."

Can you share the Ontario Mining Association's accomplishments in 2024 and its areas of focus?

Shortly after I became President, we hosted our annual 'Meet the Miners' event attended by Premier Ford. This was an opportunity to showcase the province's commitment to the mining sector, with discussions on issues like leadership, immigration and talent recruitment.

The OMA focuses on solutions-oriented advocacy through engaged discussions within specific committees where our members, as subject matter experts, contribute important perspectives. Health and safety is our top priority. Additionally, we are focused on growing domestic processing to strengthen the local supply chain. We advocate for fair, predictable energy pricing, as competitive energy costs are critical to attracting capital investment and fostering innovation, particularly in clean technologies.

Our work extends to Indigenous relations, with a dedicated committee focused on creating meaningful economic development opportunities. We support the expansion of resource revenue-sharing agreements across the province. I believe Ontario should be recognized as a leader in this area. Furthermore, the OMA advocates for a skilled labor force and monitors government initiatives like 'One Project, One Process' which aims to streamline project approvals while balancing environmental stewardship with timely decision-making.

What are your plans for the OMA?

The OMA has a strong legacy as a neutral advocate for the mining industry, and I aim to build on that foundation. My focus is to contribute to the development of public policy by offering innovative solutions to challenges like access to reliable, competitively priced energy supply. My goal is to ensure that mining is considered early in the policy process, drawing on my experience in government.

The OMA advocates primarily at the provincial level, where we have strong partnerships, but we also collaborate closely with the Mining Association of Canada on federal issues, as well as other provincial and territorial partners and industry organizations.

How can your members overcome current market challenges?

Mining companies must evolve their business models, as they have in the past, to create value in new ways. Geopolitical instability, high inflation and climate change concerns necessitate innovation. To help weather these challenges, companies should continue to prioritize sustainability practices, community engagement—especially with Indigenous communities—and invest in workforce development. Addressing supply chain vulnerabilities by establishing local suppliers is also crucial to mitigating international risks.

What are the latest developments at the OMA's 'This Is Mine Life' campaign?

One of the OMA's members' top concerns is the labor shortage. A study we commissioned revealed that 37% of Ontario youth, roughly 1.1 million, would consider a career in mining. These data help us target youth in the 16-24 age range to shift perceptions of mining. We seek to inspire more young Ontarians to consider careers in mining by highlighting the sector's technological advancements, relationships with Indigenous communities, commitment to safety and high compensation. It is a multi-year, collaborative effort involving government, industry, labor, schools, and Indigenous communities.

The campaign includes initiatives like a labor assessment study and an information campaign with digital resources like the TalentEgg Career Hub. Recently, we participated in Level Up! career fairs, organized by the Ministry of Labor, Immigration, Training, and Skills Development, where ambassadors from our member companies connected with students to share their educational and career paths. Attracting underrepresented groups is crucial – we try to empower young women, Indigenous youth and new Canadians to see themselves in the mining industry by showcasing leadership roles and providing relatable role models.

Additionally, the campaign features an award-winning podcast exploring stories of human transformation connected to mining. We also partner with Mining Matters and other organizations to facilitate mining education tours, effectively engaging educators and offering them valuable insights into the industry. We have garnered a lot of attention, not only from the youth we are targeting, but from teachers, guidance counsellors, other mining associations and organizations linked to various levels of government that want to build on the success of This is Mine Life.

Can you discuss your priorities for 2025?

Health and safety will remain a top priority. We will collect and analyze the latest data to inform our strategies and advocacy, updating key studies. We remain committed to improving Ontario's competitiveness, particularly in energy, labor and critical minerals, while advocating for certainty and long-term prosperity. ■

Marla Tremblay

Executive Director

MINECONNECT

What have been the main developments at MineConnect over the past year?

MineConnect has grown to nearly 300 members, making it the largest mining supply and services association in Canada. MineConnect has decided to expand and represent suppliers across the entire Ontario province, instead of just northern Ontario.

At the 2024 CIM Connect Convention, MineConnect partnered with the Mining Suppliers Association of British Columbia, Saskatchewan Trade and Export Partnership and 48e Nord International of Québec to host a panel of mine operators from the respective provinces, discussing their projects and how they can engage suppliers. We have also made inroads with different regions internationally - including the DRC's Lualaba province, which is experiencing tremendous growth. MineConnect will continue to host and attend events, build initiatives, and foster partnerships with other provinces, domestically and internationally, to connect our suppliers with various mining industries and help them grow their businesses.

MineConnect also supports and partners with 'Women in Mining' chapters, and because we have a significant network of members, we can help bring their message that diversity should be looked at as an opportunity to more industry players.

Can you share how MineConnect's partnership with the Nevada Governor's Office of Economic Development (GOED) and the Northeastern Nevada Regional Development Authority (NNRDA) has evolved?

This partnership has been mutually beneficial, allowing our members to expand their services into a thriving US mining market, filling various gaps within the Nevada mining industry supply chain. In December 2023, NNRDA launched its "Silver Link" program designed to identify and recruit specific mining supply and service providers to enhance northeastern Nevada's supply chain. As part of this initiative, the "Master Links" element facilitates partnerships with trade organizations to streamline recruitment efforts, and once designated as a Master Link, companies can enjoy various benefits, including insider access to request for proposals (RFPs). ■

Raymond Goldie

President

PROSPECTORS & DEVELOPERS ASSOCIATION OF CANADA (PDAC)

What are PDAC's recent developments in 2024 and key initiatives?

In 2024, PDAC reached significant milestones, including a 10% increase in membership, bringing the total to over 8,000 members worldwide. Another key achievement was securing a one-year renewal of the Mineral Exploration Tax Credit (METC). PDAC is now focused on advocating for a five-year extension of this vital incentive to provide greater financial stability for the industry.

Where have PDAC's advocacy efforts been focused in 2024?

PDAC has been actively engaging with policymakers on critical issues throughout the year, including the Clean Technology Manufacturing Tax Credit, biodiversity conservation, and emissions targets. A key focus of PDAC's advocacy is expanding the eligibility and improving the tax treatment of flow-through shares (FTS) to attract more private investment in early-stage exploration projects. By including activities such as feasibility studies and environmental assessments, FTS could help advance projects beyond the discovery phase and ensure a steady flow of capital into the sector.

What challenges are PDAC members facing in Ontario's mineral exploration sector?

Ontario's mineral exploration sector faces significant challenges despite raising C$8.4 billion in equity on the TSX and the TSXV in the first nine months of 2024. Nearly 80% of these funds were raised by only 50 companies, with 30% coming from just three large deals, leaving the many smaller exploration companies struggling to secure capital. This threatens the pipeline of future discoveries and highlights the need for equitable access to financing, a critical priority for PDAC.

Access to prospective land, capital and skilled talent remains a perennial challenge in Ontario, as it does across Canada. While initiatives like Ontario's 2022 Critical Mineral Strategy and continued funding of the Ontario Junior Exploration Program (OJEP) are competitive advantages, they have yet to reverse the decade-long decline in the production of minerals and metals in the province. ■

Mind the Talent Gap

Ontario's workforce woes

The Covid pandemic and associated lockdowns changed people's relationships with work. As companies introduced hybrid and work-from-home schemes, many professionals became accustomed to the new lifestyle, so that many institutions —from tech to finance— still struggle to get their offices back to pre-pandemic attendance levels. The realization that many jobs can be done from anywhere has led many professionals, particularly young ones, to be increasingly selective about where they work. For the mining sector, this poses difficulties, as many roles require staff to be on-site, often in remote locations with few amenities or a harsh climate. "The industry has struggled to attract young talent, and Covid has exacerbated this issue. By 2030, we will need 80,000-110,000 new workers to replace retirees and support the expansion of critical mineral operations," said Natasha Faucher, mining market sector lead, Arcadis Canada.

The Ontario Mining Association (OMA) has risen to the challenge, launching the 'This is Mine Life' campaign in collaboration with its members and the government to attract youth to the sector. A study commissioned by the OMA revealed that only 37% of Ontario youth, roughly 1.1 million, would consider a career in mining. With this data, the OMA is targeting youth in the 16-24 age range to shift perceptions of mining. "We seek to inspire more young Ontarians to consider careers in mining by highlighting the sector's technological advancements, relationships with Indigenous communities, commitment to safety and high compensation. It is a multi-year, collaborative effort involving government, industry, labor, schools and Indigenous communities," shared Priya Tandon, the OMA's president.

Initiatives are underway to broaden the industry's horizons and look beyond the typical mining profiles, but more efforts are needed if the industry is to fix the talent shortage. "Talent retention is a significant challenge for the industry. There is also a need for greater diversity in our field; bringing in women and immigrants can significantly support the growth being experienced throughout the broader industry," said Saverio Parrotta, president and CEO, J.L. Richards & Associates.

The lack of gender diversity is prevalent in many STEM-related fields, but it is particularly prevalent in mining. Companies will have to tackle the issue soon, otherwise, shareholders may take a more forceful approach. "The main proxy advisory firms, ISS and Glass Lewis, are advising companies that if they do not achieve diversity in certain areas, they are going to ask their shareholders to withhold votes or vote against the governance head. Pressures are being applied on mining companies by different forces, but gender diversity is still an issue with underrepresentation at the board and senior levels, but much of it has to do with not enough diversity entering the sector," said Frank Galati, managing partner at the Bedford Group TRANSEARCH, an executive search and professional services firm catering to the mining sector.

The issue will have to be addressed from the bottom up and not the top down. It will be hard to diversify boards and C-level roles in the future without seeing more diversity at entry-level positions and among graduates. "This is not an easy task, as in a recent executive search Bedford did for a Canadian client, out of the pool of 200 candidates, 93% were male and 7% female," shared Mauricio Montano, client partner & Latin American mining practice leader, the Bedford Group TRANSEARCH.

Although the skilled labor shortage is particularly acute in North America, with many academic institutions reporting declining enrollment in mining-related and earth science courses, a globalized and English-speaking jurisdiction like Ontario has relatively lower barriers for entry for aspiring mining professionals. "Mining is a global industry, and finding talent that has great education, experience and exceptional skills outside of Canada is not as difficult as sometimes assumed. There are certain countries we could look to, such as Italy and Spain, that are not facing the same issues with low enrollment in mining-related courses, have smaller mining industries than Canada's, and therefore a surplus of young mining talent," said Claudia Mueller, program director, academic, global metals and minerals management, Schulich School of Business, York University.

Stephen Gravel
Manager, Centre for Smart Mining
CAMBRIAN COLLEGE

> "Industry-academic partnerships offer multiple benefits. Beyond research results like new IP, products, and problem-solving at their sites, companies gain access to a talent pool they would not normally reach."

Barriers to entry can be lowered by providing more flexibility through a wider range of study options. This would cater to the aspiring mining sector participants who have the will but lack the time or budget to realize their ambitions. Stephen Gravel, manager of Cambrian College's Centre for Smart Mining, explained how this strategy helped them buck the broader trend in declining enrollment across the region: "This surge is promising, given that when we launched the training two years ago, the sector was not fully ready for it. Additionally, our mining engineering program has shifted from a three-year to a two-year format, which has boosted enrollment. This shorter program is more appealing to those who cannot commit to a four-year degree."

Although the long-term trend undoubtedly points towards a decrease in enrollment for mining-related courses in much of the West, enrollment is often stated to be cyclical, much like the sector itself. With the unprecedented gold bull run over the last couple of years, it is expected that more young people will be attracted to the sector driven by higher compensation, a result of record commodity prices. Sebastian Goodfellow, associate chair, professional programs at the University of Toronto's Department of Civil & Mineral Engineering, reported that their Mineral Engineering program experienced significant growth last year, with first-year student numbers rising from 26 in 2023 to 54 in 2024, perhaps driven in part by Ontario's gold boom: "Historically, enrollment in mining programs has followed the cyclical nature of the industry. Still, current increases may also reflect a growing recognition of mining's critical role in addressing global challenges, such as supporting the energy transition, whilst ensuring environmental and social outcomes are positive."

The problem runs deeper, however. Boosting student numbers at the college and university level will require greater exposure to mining and mineral exploration from a young age. "One of the challenges we have in Ontario is that geology is not taught in high school as a subject area, so many students are not exposed to the field prior to university," said Peter Hollings, director – CESME, Lakehead University.

Sudbury-based contractor Technica Mining is attempting to address the issue by hosting the two-week 'Electrifying the Future Summer Camp' for children between the ages of 9 and 14. "While we can see clear benefits of immersing students in the industry, we need to do more to reach them before they enter post-secondary. As an industry, we must find ways to create memorable and exciting experiences for children to foster early interest, as these initial impressions are crucial for attracting the skilled talent that we will need in the future," said Technica Mining's CEO Mario Grossi.

The lack of awareness of the mining sector among Canada's young risks excluding talent that may have been keen to work in the sector, had they known early enough to align their studies for a career in mining. "We host recruiting events where grade twelve students visit campus to learn about programs like mining engineering. However, many are hearing about mining for the first time, which is often too late in the process for them to consider a new career path. This highlights the need for earlier outreach to ensure students are informed about the industry and its opportunities," shared Lesley Warren, director, Mining Futures Initiative, University of Toronto.

The talent crunch extends beyond graduates to vocational skills and trades. Canada is one of the most educat-

Bridging the Talent Gap

"Canada's post-secondary landscape has been disrupted due to the recent IRCC changes. However, Cambrian College is well-positioned to navigate these challenges, with strong domestic enrolment numbers."

Mike Commito, Director of Research & Innovation
CAMBRIAN COLLEGE

"A key challenge is the 'bottleneck' in training, as certain fields require apprenticeships with a one-on-one ratio of apprentices to trainers, limiting the number of people companies can support at a time."

Mitch Dumas, President and CEO
NORTHERN COLLEGE

"There is a need for greater diversity in our field—bringing in women and immigrants can significantly support the growth being experienced throughout the broader industry."

Saverio Parrotta, President and CEO
J.L. RICHARDS & ASSOCIATES

ed nations in the world, with a 2022 OECD report ranking Canada first worldwide in the percentage of adults having tertiary education, with over 56% of Canadian adults having attained at least an undergraduate college or university degree. As more and more young Canadians enter tertiary education, many miners are having trouble filling positions for welders, millwrights, electricians and truck drivers, for example. "We need to change the perception that everyone must go to university. A rewarding career can be built through a college diploma in fields like technology or mining. This begins with educating parents and communities about the value of college education," said Mitch Dumas, president and CEO of Northern College.

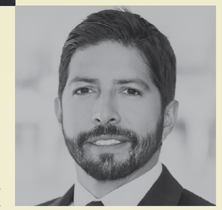
The problem has reached a point where mine owners are taking issues into their own hands. Agnico Eagle ran a targeted immigration pilot program in 2024, bringing a dozen Mexican workers from a closed mine in Mexico to their Kirkland Lake operations in Ontario. However, this is a short-term fix. To address the issue at its root, Agnico Eagle has partnered with First Nations and the provincial government, receiving C$10 million from the Skill Development Fund to develop a skilled workforce in northern Ontario. "We aim to address the demographic shifts in northern Ontario, where an aging population has created an increased demand for skilled workers, by investing in training local youth. We see a clear business case for training programs that emphasize on-the-job learning, which will help us build a capable workforce tailored to meet the operational needs of our projects," shared Andre Leite, vice president – Ontario operations, Agnico Eagle.

Northern College, whose campus in Timmins is just a few miles from Agnico Eagle's Kirkland Lake operations, is looking to join the initiative: "We have approached companies like Agnico Eagle for various initiatives, and they recently received government funding for the Skills Development Fund. A key challenge is the bottleneck in training, as certain fields require apprenticeships with a one-on-one ratio of apprentices to trainers, limiting the number of people companies can support at a time," said Dumas.

Initiatives like these, which bring together mine owners, the government, First Nations and educational institutions, may be Ontario's best bet for addressing the talent crunch. It may be a long road ahead, however, at a time when universities and colleges' finances are being pressured by a federal cap on international student enrolment and a freeze on tuition fees in Ontario. "Despite these challenges, I believe there is a win-win opportunity for the mining industry and the Ontario college system to collaborate on developing the skilled workforce needed in mining," said Douglas Clark, dean of sciences, Northern College.

As demand for new mines to supply the minerals for the energy transition grows stronger, Ontario will have to act fast, as global markets cannot wait for mine owners to achieve their goals of developing a sufficiently large local workforce. "Filling the talent gap is a challenge, especially when the pool of Canadian graduate students, with the necessary skills, is limited. Companies may have to recruit professionals internationally from regions like Peru or West Africa. While we hope Canadian students step into these roles, the gap will be filled regardless, and it is unclear whether it will be with Canadian talent," said Ross Sherlock, director of MERC and Metal Earth, chair in exploration targeting, Laurentian University. ■

FG



MM

"The more technology and innovation you can introduce into mining, the more attractive it will become to young people."

Frank Galati and Mauricio Montano

FG: Managing Partner
MM: Client Partner & Latin American Mining Practice Leader
THE BEDFORD GROUP TRANSEARCH

How has demand been for The Bedford Group TRANSEARCH's services in the mining sector?
FG: The Bedford Group TRANSEARCH's (Bedford) business has been fairly consistent year over year, but the number of participants in the sector has shrunk. Our annual compensation study demonstrates that out of 320 client companies in 2023, 60 have been consolidated, and due to a lack of capital, we have seen many juniors being acquired by intermediates and majors.

MM: Although there has been an uptick in consolidations and M&A activity, Bedford has continued to see an increase in business year over year, and in 2024, we saw a rise in demand for our compensation advisory services. Juniors are still having challenges raising funds, and we have had a few clients that engage us and have started searches, but then postponed till next year as they may want to allocate more capital or want to focus their current capital in other areas and wait for hires until next year. However, the mining industry continues to experience a talent shortage and there is still a push for inclusion and diversity in the industry. We sponsor the annual CIM–Bedford Canadian Young Mining Leaders Awards, which recognize the outstanding achievements and potential of young mining leaders and accelerate the development of the next generation of mining professionals.

Can you elaborate on Bedford's annual compensation reports?
FG: For two decades, Bedford has routinely conducted industry-specific surveys of compensation awards and practices to provide insights into executive and management compensation for the global mining sector. These studies generally look at approximately 350 companies and 4,000 executives and directors and have become a critical piece of decision-making around governance and compensation for mining companies. Bedford's compensation practice is currently the fastest-growing area of our business.

Mining seems to be a highly compensated area in Canada, but a big piece of compensation within public mining companies is through equity - two-thirds of the average mining executive's compensation is based on their bonus – so when the equity markets are down, everyone is making less money.

What measures can mining companies take to attract talent to their operations?
FG: Younger generations often perceive mining as dirty and harmful to the environment, so educating young people about the necessity of responsible mining for a greener future is critical. Offering a proper work-life balance where people have a decent workplace with decent facilities and also sufficient time off can assist in making a career within the mining industry more appealing. The more technology and innovation you can introduce into mining, the more attractive it will become to young people.

What are the most challenging aspects of finding a good mining executive to join a company?
FG: The mining sector is particularly volatile, and many things happening in the sector are beyond executives' control. For example, some countries are politically unstable and are revoking licenses, and commodity prices are volatile so one quarter may be profitable and the next one not. Having so many uncontrollable factors can sometimes make it hard to show that they have a good track record.

In terms of diversity and inclusion, how does the mining sector compare to other sectors?
FG: Pressures are being put on mining companies by different forces, but gender diversity is still an issue with underrepresentation at the board and senior levels, but much of it has to do with not enough diversity entering the sector. Gender diversity remains a challenge in all STEM-related fields, but it seems that the issue is still the largest within the mining industry, and industries like oil and gas have made significantly more progress.

MM: In a recent executive search by Bedford for a Canadian mining client, only 7% of 200 candidates were women. Organizations like the International Council on Mining and Metals (ICMM) and Women in Mining (WIM) are advancing initiatives to attract and retain diverse talent, with many companies setting ambitious goals for female representation in leadership and technical roles.

Compared to sectors like technology and finance, mining lags in implementing diversity frameworks, but its unique challenges demand systemic changes, including revamped recruitment strategies and investment in education and training. ■

LW

SG

> U of T Mining focuses on innovative solutions to extract, process, and reuse resources as sustainably as possible, as well as a robust and diversified talent pipeline that can support sector transformation.

Lesley Warren and Sebastian Goodfellow

LW: Director, Mining Futures Initiative
SG: Associate Chair, Professional Programs, Department of Civil & Mineral Engineering

UNIVERSITY OF TORONTO

Can you provide an update on the University of Toronto's mining portfolio?

LW: In lockstep with the industry's ongoing transformation to meet the net zero transition, the University of Toronto has streamlined its mining portfolio of talent development and multi-disciplinary research to increase the pace of climate-positive innovation and generate the skilled workforce required to lead that transition. We have rebranded as U of T Mining. U of T Mining focuses on the development of innovative solutions to extract, process, and reuse resources as sustainably as possible, as well as a robust and diversified talent pipeline that can support sector transformation.

SG: The University of Toronto's undergraduate Lassonde Mineral Engineering program experienced significant enrollment growth this year, with first-year student numbers rising from 26 in 2023 to 54 in 2024. This positive trend reflects a broader increase across mining programs nationwide. Historically, enrollment in mining programs has followed the cyclical nature of the industry. Still, current increases may also reflect a growing recognition of mining's critical role in addressing global challenges, such as supporting the energy transition, whilst ensuring environmental and social outcomes are positive. To sustain this momentum and enhance student retention, we are continually updating our curriculum to better align with the existing and future landscape of mining, ensuring our graduates are well-prepared to contribute effectively to the evolving demands of the mining sector.

What will be important areas of focus for Mining Futures?

LW: Mining Futures is a research-intensive initiative that grew out of extensive industry consultation to address the need for new innovative strategies and technologies that improve environmental and social outcomes, as well as expanded workforce skills, competencies, and diversity required for sector transformation. This values-driven approach resonates with students who are passionate about climate-positive solutions, fostering greater interest in our mining programming.

How does the University of Toronto attract people to mining?

SG: Mining has a compelling story to tell, particularly its vital role in building a sustainable future. We host recruiting events where grade twelve students visit campus to learn about programs like mining engineering. However, many are hearing about mining for the first time, which is often too late in the process for them to consider a new career path. This highlights the need for earlier outreach to ensure students are informed about the industry and its opportunities. Additionally, mining is not just for those beginning their academic journeys—it is also an accessible path for individuals transitioning from careers in other fields. To support this, we have developed the Mining Industry Management Program, a series of industry-led online courses designed to help professionals transition into the mining sector and support the continuing education needs of mining professionals.

LW: Mining has an important role in helping to decarbonize our economies and support the energy transition through responsibly sourced critical minerals and metals. This story, which highlights the sector's growing commitment to sustainability and participation in solutions development, appeals to the strong moral compass of our students.

What is the government doing to help boost enrollment for mining courses?

LW: Governments drive policy that supports the well-being of their constituents across economic, environmental, and social dimensions. Currently, the global wake-up to the need for critical minerals and metals has revealed several global, national, and provincial tensions concerning responsible sourcing, resilient production, and robust supply chains. The recognition that mining must play a central role has shone a spotlight on the sector, highlighting its importance to broader society.

What is next for the University of Toronto's mining department in 2025?

SG: In 2025, we will continue strengthening partnerships with industry to enhance experiential learning opportunities for our students. Building on initiatives such as field trips and collaborative projects, we aim to provide even greater exposure to real-world mining operations, further enriching their understanding of the sector.

LW: At Mining Futures, we are driven to solve mining's grand challenge to balance greater production of critical minerals and metals whilst radically transforming environmental performance, and rights-holders and community partnerships. ■

Ross Sherlock

Director of MERC and Metal Earth, Chair in Exploration Targeting

LAURENTIAN UNIVERSITY

What are your thoughts on the state of industry-academia collaboration in Canadian mining?

Industry-academia partnerships are crucial for advancing research and development. Our Macassa project, for instance, involves a partnership with Agnico Eagle and is funded through NSERC with a 2:1 matching for every dollar they contribute. This model is highly effective in leveraging industry funds for research, making Canada competitive globally. Additionally, the overhead from these projects goes directly to the university, reducing the financial burden on our research grants.

How well do new undergraduates understand the mining sector?

There is a lack of exposure to geology and mining careers at the high school level, despite the fact it is such a significant industry in the Canadian economy. At the Harquail School of Earth Sciences, we reach out to elementary and secondary school students through various initiatives, promoting mining as a viable and rewarding career. Unlike other sciences, such as physics or biology, there is no direct high school pathway into geology. ■

Claudia Mueller

Program Director, Academic, Global Metals and Minerals Management, Schulich School of Business

YORK UNIVERSITY

Can you introduce the Schulich School of Business and give an overview of the courses you offer to aspiring mining industry participants?

I lead the Global Metals and Minerals Management (GMM) program, which is focused on developing responsible leaders for the metals and minerals industry by providing an in-depth understanding of management complexities and strategic opportunities industry leaders face today. We have recently expanded our offering to include a graduate diploma designed to address the needs of the entire metals and minerals value chain.

What role do academia-industry partnerships play in addressing the skill shortage the industry is facing?

Academia-industry partnerships are essential, and the nature of university funding in Canada is such that academic programs will not survive in the long run unless we have support from industry. This support can take different forms, such as the provision of scholarships, having industry experts talk to students, and industry showing hiring interest in graduates from the programs. ■

Peter Hollings

Director – CESME

LAKEHEAD UNIVERSITY

Can you introduce Lakehead University?

Lakehead University has two campuses in Thunder Bay and Orillia, Ontario, and we have a strong focus on mining-related research through a network of research centers here in northwestern Ontario.

Lakehead has a strong geology Master's program, in which most students are industry-focused and sponsored. We are always keen to partner with mining companies when they have research questions. We are collaborating with the likes of Wyloo, Goldshore Resources, Impala Canada, Evolution, STLLR Gold and Wesdome Gold Mines. These partnerships provide a way for students to get industry experience and give the companies access to future skilled workforce.

What is the importance of academia and industry partnerships to address Ontario's talent shortage?

We are encouraged to see industry mindsets shifting and companies wanting to foster longer-term partnerships to maintain a steady supply of the next generation of geology talent. Collaboratively, academia and industry must work towards overcoming negative stereotypes and educating society as to the importance of mining to the green transition. ■

GOLD PRODUCTION AND EXPLORATION

> “Ontario’s supportive government and strong track record of permitting major projects like Magino and Greenstone provide a solid foundation for progress.”

Dan Wilton
CEO
FIRST MINING GOLD

GBR Series • ONTARIO MINING AND TORONTO'S GLOBAL REACH 2025

Image courtesy of IAMGOLD

Gold Production

Image courtesy of IAMGOLD

Ontario's gold shines bright

2024 was a fantastic year for Ontario's gold producers, with gold at all-time highs and major expansion projects underway. With C$6.5 billion worth of gold production in 2023, Ontario maintained its position as the leading gold-producing Canadian province, responsible for 43% of Canada's total gold production – up from 41% the year prior. "Ontario welcomed two new producing mines in the summer of 2024 as IAMGOLD's Côté Gold and Equinox Gold's Greenstone Gold mines started production. The province has also seen great exploration success, with Ontario being ranked the number one jurisdiction in 2023 for junior exploration spending in Canada," shared George Pirie, Ontario's Minister of Mines.

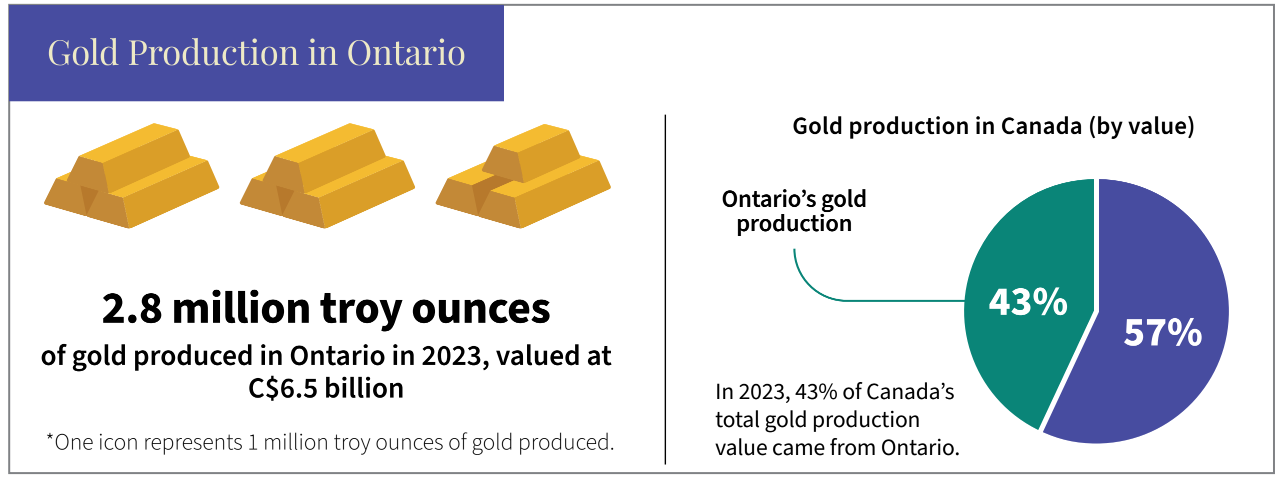
While specific production figures for 2024 are not yet available, Ontario remains a leading contributor to Canada's gold output and gold remains the backbone of the province's mining sector. 2025 is also shaping up to be another exciting year, with many new mines continuing to ramp up and the potential for yet more mines to come online, namely West Red Lake Gold's past-producing Madsen mine.

As in recent years, the overarching focus for Ontario's gold miners has been keeping a handle on rising costs and focusing on operational efficiency. Boosting recovery and milling rates has been a key focus for many, keeping in mind the fact that sky-high gold prices may not last forever. "As companies progress through planning, they are not betting on the gold price staying where it is at the moment. Most companies we work with are remaining pragmatic around new investments in gold whilst still enjoying the benefits of rising prices," said Ben Charles, partner, Bain & Company.

In Gogama, just north of Sudbury, Côté Gold has the potential to become the largest gold mine in Canada, and with most of the main technical challenges solved, IAMGOLD's focus is now on optimizing operations. "When online in December, the plant averaged 1,593 t/h, or effectively 106% of nameplate, with a record daily throughput of 42,635 t/d. In November and December, Côté produced 37,000 oz (100%) per month," shared Renaud Adams, president and CEO, IAMGOLD.

Now that Côté Gold is back on track, IAMGOLD believes there is potential to double production rates in 2025. Additionally, the company will be looking to aggressively drill and infill the neighboring Gosselin zone to incorporate it into a larger mine plan in 2026. "Côté Gold is already among the largest gold deposits in production in Canada and has the potential for further expansion. Our focus is on organic growth; the resource base at Côté Gold has nearly doubled since we started construction, and we are now sitting on a resource of nearly 20 million oz. Our priority is to continue delineating and expanding our resources rather than seeking acquisitions elsewhere," continued Adams.

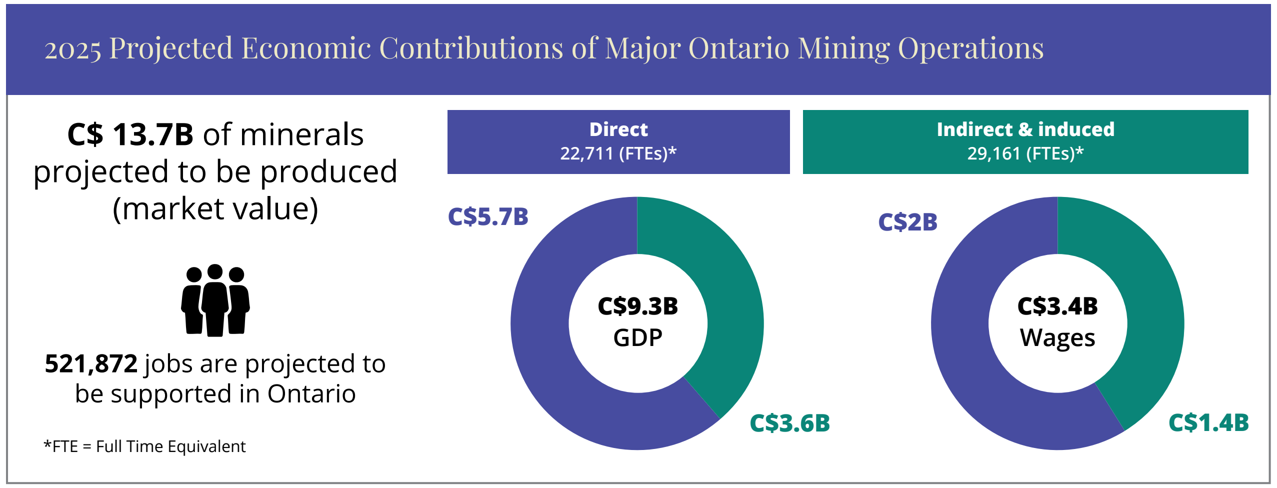
Ontario's newest gold mine, Equinox Gold's Greenstone Gold, achieved commercial production in October 2024. The new mine pushed Equinox to have a record year, reporting its highest quarterly and yearly production in Q4. "Looking ahead, our priority for the first half of 2025 is to continue increasing mining rates and throughput at Greenstone to reach the mill's design capacity. With gold production estimated to average 390,000 oz/y for the first five years, Greenstone is our biggest mine, our lowest-cost operation, and boasts the longest mine life at 15 years, making it a cornerstone asset for Equinox Gold," said Greg Smith, president and CEO, Equinox Gold.



Source: Natural Resources Canada and the Ministry of Mines

Equinox is all-in on Greenstone Gold, executing the largest deal in the company's history by acquiring the remaining 40% of the project in May for US$955 million. "This transaction was financed roughly 50/50 through equity and debt. We issued shares for the equity portion and took on a US$500 million three-year term loan for the debt portion. Greenstone itself is a cash flow powerhouse, especially at current gold prices, and cash flow from Greenstone will help us pay down the debt incurred for this acquisition, as well as the original construction financing," continued Smith.

While Ontario's producers reap the rewards of a US$2,700+ /oz gold price, they are focusing their attention on managing costs across their operations. With the price of materials, labor and equipment rising sharply since the Covid pandemic, majors are placing increasing emphasis on capital discipline, prioritizing operational ef-



Source: OMA Industry Survey, Statistics Canada, S&P Global Market Intelligence

ficiency at their existing projects rather than embarking on new greenfield projects. For Agnico Eagle, Ontario's largest gold mining company by market cap, taking advantage of the economies of scale and expanding the mill-constrained Macassa mine is the strategy taken to reach its 2025 target of 300,000 oz/y at the site. Rather than building a whole new plant from scratch at great cost, Agnico Eagle invested in improving milling rates at its existing mill to overcome the bottleneck. "Our focus must remain on cost control and optimization, as we cannot influence gold prices but can manage our operational costs effectively," shared Andre Leite, vice president – Ontario operations, Agnico Eagle.

Agnico Eagle also has high ambitions for its other producing asset in Ontario – Detour Lake. Despite already being the largest gold mine in Canada with 677,466 oz of gold produced in 2023, Agnico Eagle still sees an opportunity for expansion and has the ambitious goal of eventually boosting gold production to 1 million oz/y by 2030. "One of the challenges at Detour Lake is advancing the exploration work quickly, particularly to the west, where we have observed promising results. While the current NI 43-101 report offers a snapshot of the asset, we believe there is significant untapped potential that has not been identified. We are beginning to excavate an exploration ramp to access the ore body at depth and establish underground drilling platforms by late 2026 or early 2027, which will help us understand the potential of this world-class deposit," continued Leite.

Like Agnico Eagle, Alamos Gold has also enjoyed a very successful period seeing its valuation increase by 50% over the past year. A major contributor to this growth was the acquisition of Argonaut Gold and its Magino mine in Ontario, which neighbors Alamos Gold's Island Gold mine. John McCluskey, Alamos Gold's president and CEO, shared the strategy behind the acquisition: "Historically, we have only made acquisitions when gold prices were low. However, the Argonaut acquisition was an exception, with its share price declining even as gold prices rose. This decline presented a rare opportunity, as Argonaut had over 4 million oz of reserves and about C$1 billion of capital invested in Magino. We acquired Argonaut for an enterprise value of US$727 million and identified US$515 million in total synergies."

The addition of Magino contributed to Alamos Gold raising its 2024 production guidance by 20% and the company has not wasted any time integrating the mine into its existing Island Gold operations. In acquiring and expanding the Magino mill, Alamos has been able to boost efficiency at both sites by handling ore from both the Magino and Island Gold mines. "The integration has been less challenging than expected. This is likely because our operations are located side by side in a remote area, with a shared local workforce. Many of the employees at Magino and Island Gold are neighbors, and in some cases, family. It has been a smooth process overall, and the community aspect has made integration easier," continued McCluskey.

In the furthest northwestern reaches of Ontario, Australian major Evolution Mining has also been focused on efficiency and cost reduction at its Red Lake complex. Since acquiring it from Newmont in 2020, Evolution Mining has faced growing pains and struggled to get the mine to produce reliably due to seismic-related issues, among others. However, the first half of 2024 saw massive operational changes at the mine that allowed it to reach its second consecutive quarter of positive cash flow in Q4 2024. "The first step will be to reach 150,000 oz/y, with 2024 guidance placed at 125,000 oz/y to 145,000 oz/y. Once we achieve consistency and reliability in the operation, we will then consider options to increase production and lower overall unit operating costs," said Lawrie Conway, managing director and CEO, Evolution Mining.

Although Ontario is relatively similar to Australia as a mining jurisdiction, Evolution Mining has demonstrated its ability to run a mine on the other side of the globe, and its success at Red Lake exemplifies Ontario's appeal to miners everywhere. "We are now four and a half years into our ownership of Red Lake, and we have found working with the local community and various governmental organizations to be smooth and reliable. We have learned a lot about how to operate in the region, and similarly, people have learned how Evolution Mining operates, especially from a safety and environmental standpoint," continued Conway.

In Ontario's far west, near the Manitoba border, New Gold spent 2024 stabilizing production at its Rainy River operations: "In 2024 we made excellent progress in the development of the Underground Main Zone, which contains the majority of underground mineral reserves and will be an important source of higher-grade production in the coming years to supplement mill feed from the open pit and the Intrepid Underground Zone. The Underground Main project is on track to commence stoping in the first half of 2025 and ramp up to an underground production rate of approximately 5,500 t/d by 2027," shared Patrick Godin, New Gold's president and CEO.

With its two key assets, Rainy River and New Afton in BC, now running smoothly, Godin revealed the company's next move will likely be a measured one, despite the ongoing spree of acquisitions in the gold space: "A company that has three or four assets that are generating cash flow and with good financial ratios can put in place healthy debt, use part of their cash flow, and have other financing mechanisms such as a revolving credit facility to minimize dilution and ensure that shareholders' investments are not the last money out. Ideally, for the mine building scenario to work, you need to have more than two producing assets."

Rising labor and energy costs have been putting pressure on smaller miners to remain profitable and are pushing the industry toward consolidation to leverage economies of scale. Recent deals such as Alamos' acquisition of Argonaut Gold may become more prevalent in 2025, especially with global uncertainty around the US election now settled. This is true for near-producing projects as well, which have to contend with unfavorable equity markets and lower valuations despite record gold prices. "M&A activity has been high throughout 2024. We continue to see strong interest in acquisitions, particularly for projects that are capital-constrained or are so far from production that they cannot otherwise easily finance," said Ian Mitchell, partner and leader, national mining group, Gowling WLG.

Although the US election has been settled, some uncertainty remains regarding the new Trump administration's stance on Canada and its natural resources. Moreover, Canada is expecting a federal election in 2025, which could have further ramifications for the regulatory and financial climate in Ontario. "CEOs today are more cautious than ever before. Companies want to grow but they are now doing it responsibly driven by heightened expectations for mine and workplace safety. In line with broader market trends, there is also a greater emphasis on long-term value creation and shareholder returns. Companies are looking for the right opportunities with minimal risk to expand," said Wes Hall, chairman and CEO, Kingsdale Advisors.

Despite global uncertainty, Ontario's gold miners are in a strong position. The annual survey of mining companies by the Fraser Institute ranked Ontario in the top 10 out of 86 jurisdictions globally in its 'Investment Attractiveness Index'. Additionally, Mining Journal Intelligence's 2024 World Risk Report ranked Ontario as the lowest-risk jurisdiction globally, a major vote of confidence from investors in a world that is seeing increasing conflicts and geopolitical tensions. "We are in exciting times for mining despite the situation in the wider world, and we are well-positioned in Ontario to weather the storms that may be on the horizon," said Minister Pirie. ■

John McCluskey

President and CEO

ALAMOS GOLD

"We are not only replacing reserves as we mine but expanding them, which is rare in the industry."

Can you summarize Alamos Gold's 2024 performance?

2024 has been a very successful year for Alamos Gold, as we have met our objectives across the board. The Argonaut acquisition was not something we initially planned for, but as neighbors, we would keep a close eye on their progress. In early 2024 Argonaut Gold's chairman approached me with an acquisition idea, believing they could benefit from joining Alamos. We seized the opportunity, raising our annual production guidance by 20%. Historically, we have only made acquisitions when gold prices were low. However, the Argonaut Gold acquisition was an exception, with its share price declining even as gold prices rose. This decline presented a rare opportunity, as Argonaut had over 4 million oz of reserves and about C$1 billion of capital invested in Magino. We acquired Argonaut for an enterprise value of US$727 million and identified US$515 million in total synergies. This acquisition uniquely benefited Alamos because of our proximity to their operations, allowing us to capitalize on the opportunity in a way no other company could.

Additionally, with the rise in gold prices, we are seeing record cash flows and earnings, all while maintaining our operating costs across our three main mines.

What factors contributed to Alamos Gold's performance in 2024?

We have seen considerable interest in Alamos Gold shares, and I believe this is because of a few key factors that investors value. First, we have projects in highly stable jurisdictions, particularly Canada, where regulatory and tax environments are more favorable. Additionally, we have heavily invested in exploration, achieving tremendous mineral reserve and resource growth, a standout in an industry typically facing depletion challenges.

Could you elaborate on Alamos Gold's mineral reserve growth and exploration efforts?

In early 2024, we shared a reserve and resource update, revealing significant increases. We have continued with a strong focus on exploration, investing over US$60 million in 2024, and that has been paying off with excellent results. I am confident that our next resource update will show further growth. We are not only replacing reserves as we mine but expanding them, which is rare in the industry.

How are your other major growth projects progressing, especially in Mexico?

At our PDA project in Mexico, reserves have expanded to 1 million oz, and we are advancing with permitting to enable construction next year. At Island Gold, our Phase 3+ expansion has been underway since 2022. We have reached a depth of over 800 m on the new shaft sink, and by early 2025, we will surpass 1,000 m. The target depth of 1,373 m should be reached by mid-2025, keeping us on track to start production from the shaft in 2026.

Can you discuss the recent acquisition of the Magino mill and its role in the Island Gold expansion?

Acquiring the Magino mill, a 10,000 t/d facility and integrating Magino into our Island Gold expansion plan enables us to handle ore from both Island Gold and Magino in a single facility. Instead of upgrading the older Island Gold mill, we are expanding the Magino mill initially to 11,200 t/d and eventually to 12,400 t/d. This will accommodate all the underground ore from Island Gold and the open-pit ore from the Magino mine, simplifying operations and consolidating production in one streamlined facility.

Initially, we expected to produce around 400,000 oz/y from the Island Gold District, but this is just a stepping-stone. We anticipate that the Island Gold District will ultimately produce well over 500,000 oz/y.

Can you expand on Alamos Gold's approach to cost management?

Between 2015 and 2017, we made three acquisitions that have driven much of Alamos' growth. Back in 2015, when merging with AuRico, we had a market cap of C$1 billion, which has now grown to around C$12 billion. With each acquisition, we invested in exploration to increase reserves and resources, as well as capital investments to reduce production costs. Our development projects are lower cost, and the Island Gold Phase 3+ expansion and the development of Lynn Lake are set to drive costs down further, thereby expanding margins as gold prices rise. ■

"Our high-quality assets, Detour Lake and Macassa, and organic pipeline projects establish Ontario as a core operating region for Agnico Eagle's future growth."

Andre Leite

Vice President – Ontario Operations

AGNICO EAGLE

Can you update us on the performance of the Detour Lake and Macassa mines?

The Detour Lake and Macassa mines continue to perform well and contribute to driving Agnico Eagle's position as a global leader in gold production. At Detour Lake, an updated NI 43-101 report was completed in July 2024, which included an underground project. The report showed a pathway to increase annual gold production to 1 million oz/y by 2030, which could bring Detour Lake among the top three gold mines globally. We plan to commence an exploration ramp to gain a deeper understanding of the ore body at depth.

At Macassa, we are focused on optimizing our existing mill. This approach allows us to enhance the mine's performance and potentially increase production with limited investments. In 2024 we implemented relatively minor adjustments and investments that have already improved milling rates. By enhancing the efficiency of our current operations, we expect gold production to reach around 300,000 oz/y this year.

How has Agnico Eagle managed to control costs amid recent inflationary pressures?

Agnico Eagle has established a culture of continuous improvement and cost optimization, exemplified by our successful increase in production at Detour Lake, aiding in cost control through higher volumes. An important aspect of our strategy involves internalizing our workforce to reduce reliance on contractors, which has enhanced operational efficiency.

Can you outline Agnico Eagle's partnership with the government on the Skills Development Fund?

Our partnership with the provincial government on the Skills Development Fund marks a significant advancement in our efforts to reduce reliance on contractors and strengthen our internal workforce. This proactive approach, arising from productive discussions with government officials, including Minister Pirie, showcases our commitment to workforce sustainability and fostering community growth. We aim to address the demographic shifts in northern Ontario by investing in training local youth. We see a clear business case for training programs that emphasize on-the-job learning, which will help us build a capable workforce tailored to meet the operational needs of our projects.

While training and skills development requires time and consistent effort, it is vital for the future success of our projects, which are projected to generate approximately 1,400 direct, well-paying jobs.

Are there plans for acquisitions in the near future?

Agnico Eagle has a strong track record in making strategic investments in projects with high geological potential. Our corporate development, project evaluation and exploration teams help us identify, assess and monitor market opportunities. We approach acquisitions with discipline, ensuring that any potential investments are balanced and aligned with our overall strategy. Although the current gold price environment presents an opportunity to consider expanding our portfolio, we remain committed to making prudent investment decisions. We prioritize our portfolio of high-quality internal projects and complement these with strategic toehold positions in prospective opportunities. Our focus is on projects that provide strong risk-adjusted returns.

Can you provide an update on Agnico Eagle's ESG goals and emission reduction targets for 2030?

Agnico Eagle is recognized as a leader in sustainability within the gold industry, with one of the lowest GHG emissions intensities. Our operations in Québec and Ontario benefit from access to clean energy. We have targets to reduce our absolute scope 1 and 2 carbon emissions by 30% by 2030 and to be net-zero by 2050. We have a comprehensive vision and actionable plans to achieve our emissions reduction targets. While we have made substantial progress, we acknowledge that much work remains ahead and we are actively preparing to adapt our strategies to meet these targets.

What is Agnico Eagle's strategy in Ontario going forward?

We want to reassure our shareholders of our commitment to disciplined capital allocation, emphasizing cost control and optimization, which are essential for the sustainability of our business in the long term. As part of our strategy, we are advancing two significant projects in Ontario, including a US$300 million investment over the next three years for the exploration ramp at Detour Lake and the exploration ramp and shaft at Upper Beaver. These two projects have the potential to grow our gold production in Ontario by approximately 50% by 2030 when compared to today's production level. Our high-quality assets, Detour Lake and Macassa, and organic pipeline projects establish Ontario as a core operating region for Agnico Eagle's future growth. ■

"Open pit mining activities are expected to be relatively stable through the year, as our autonomous fleet continues to perform beyond our expectations."

Renaud Adams

President and CEO

IAMGOLD

Can you provide an update on Côté Gold and its performance in 2024?
At the start of 2024, we set goals to achieve initial production in March, commercial production in the third quarter, and exit the year at 90% throughput. We were able to hit the first two of these milestones, with total production at Côté from March 31st, 2024 onwards of 199,000 oz. In September, we completed a comprehensive mill shutdown to deploy key improvements to stabilize the crushing circuit and attend to areas of high wear in the plant.

Ramp-up progress continued to gain positive momentum through the year. In December, the plant averaged 1,593 t/h, or effectively 106% of nameplate, with a record daily throughput of 42,635 t/d. In November and December, Côté produced 37,000 oz per month.

As we see continuous improvements at Côté, we are confident in the capability of the mine to potentially double the gold production in 2025, towards the target of achieving the steady-state nameplate throughput rate of 36,000 t/d by the end of this year.

On a whole, IAMGOLD is positioned for a very strong 2025, as the Company is rapidly moving closer to the goal of becoming a leading, modern Canadian gold producer while strengthening its balance sheet with assets that are poised to generate significant value for our stakeholders and partners. We will investigate options to bring into the mine plan the full resource base estimate of the Côté and Gosselin zones - which combine for over 16.5 million oz of measured and indicated and 4.2 million oz of inferred resources - to define Côté Gold among Canada's top gold mines for years to come.

What is the outlook for Côté Gold in 2025?
Côté Gold is expected to nearly double production this year to 360,000 to 400,000 oz/y. Open pit mining activities are expected to be relatively stable through the year, as our autonomous fleet continues to perform beyond our expectations. We have now commissioned 21 autonomous haul trucks, and we are seeing imprvoements to operating efficiencies and safety.

Meanwhile we will be aggressively drilling and infilling the Gosselin zone in 2025, as we look to incorporate Gosselin into a larger, more robust, mine plan in 2026.

What is IAMGOLD's philosophy regarding acquisitions and portfolio diversification?
Our strategy centers around maximizing the potential of our existing gold assets, particularly in Ontario and Québec, where we have significant resources.

What innovations are you implementing in your operations?
We are extremely proud of the autonomous haulage strategy we have implemented from day one, which is performing exceptionally well. Additionally, we have introduced automation around drilling, a practice less common in the industry but with significant health and safety advantages. We see AI as an opportunity rather than a threat, and I believe many interesting advancements could enhance our mining operations, making them more dynamic in decision-making and planning.

What is your relationship like with the Ontario government?
Working in Ontario has been a pleasure as the province recognizes the importance of mining. We feel welcomed and are actively engaged in conversations that support mining development. Our relationship with First Nations partners has also been very positive, allowing us to benefit from collaboration and mutual understanding.

How have security challenges affected your operations in Burkina Faso, and what is the outlook for the region?
Over the past 15 months, we have avoided disruptions in our supply chain despite ongoing security challenges in Burkina Faso, primarily focusing on ensuring the safe delivery of supplies to the mine site through close collaboration with the government. While this approach has proven effective, it has increased the cost environment for operating in the country with enhanced security measures. Looking ahead, we acknowledge the security situation; however, our strong relationship with the government and solid social license to operate provide us with a foundation to manage these challenges.

Have the challenges in West Africa influenced your strategic direction?
The challenges in West Africa and investor sentiment of the region have been a consideration in our pivot towards Canada. The sale of our West African exploration assets was largely driven by financial needs rather than solely by the current security landscape. ■

Lawrie Conway

Managing Director and CEO

EVOLUTION MINING

"The priority at Red Lake is to achieve consistency and generate positive cash flow with a margin on every ounce."

Could you provide an update on Evolution mining and the activity at the Red Lake gold mine?
2024 was a year of consolidation at Evolution Mining. We acquired the Nothparkes copper and gold mine located in NSW, Australia, in December 2023, and throughout the year, we produced record profits, margins and cash flows. The first half of 2024 was difficult at Red Lake due to several operational issues, but then, through the second half, reliability and consistency increased, augmenting production and reducing costs. It has been a tricky start for us at Red Lake despite our faith in the operation, and this belief in what we are doing has paid off, as we are seeing quarter-on-quarter improvements. Coupled with a rising gold price, Red Lake is well-positioned to keep improving in the future.

What are your priorities for the Red Lake gold mine moving forward?
The priority at Red Lake is to achieve consistency and generate positive cash flow with a margin on every ounce. The first step will be to reach 150,000 oz/y, with 2024 guidance placed at 125,000 oz/y to 145,000 oz/y. Once we achieve consistency and reliability in the operation, we will then consider options to increase production and lower overall unit operating costs. By taking the pressure of this goal away from our workforce, they have become more efficient, and it has given us a good base to move forward with.

How do your experiences working in Canada compare to those in Australia?
We are now four and a half years into our ownership of Red Lake, and we have found working with the local community and various governmental organizations to be smooth and reliable. We have learned a lot about how to operate in the region, and similarly, people have learned how Evolution operates, especially from a safety and environmental standpoint. Doing business in Canada does not differ much from Australia, although there are some regulatory differences we have had to navigate. At Evolution Mining, we seek to evaluate the minimum requirement of each regulation and then compare this with our company philosophy. We then implement whichever is most comprehensive to protect our workers and the surrounding community.

Are there updates from your Lake St. Joseph and October gold projects?
Our discovery team remains focused on these two projects, allowing us to implement drilling programs with great opportunities to expand in Ontario. We will make decisions as to where we take both projects at the end of the financial year. Accompanying our investment in these projects will be significant on-the-ground research before an eventual exploration if we see fit.

What advice do you have for junior companies looking to move forward with their projects?
I feel for junior companies as it has been a difficult market these last few years, especially to attract the necessary funding. With rising interest rates, many have struggled to access debt financing and equity. In my experience, many juniors do not want to become producers themselves and thrive in the exploration and discovery stages. My advice is to be open to working with mid-tier and major companies that want to build and operate their assets and remain open to taking equity stakes in such projects. There have been examples of such activity occurring despite the rising gold price, creating some apprehension among juniors to hold on to equity in their projects. If they were able to embrace a partnership early on, it would benefit the asset more.

Do you have plans for further expansion in the near future?
At Evolution Mining, we have always said we will have up to eight assets in tier-1 jurisdictions. We are targeting early-entry-stage projects that may be available for us to acquire over the next few years. Some projects are being sold that are not a great fit for our portfolio right now but may become of interest as the consolidation of the mining industry continues. We have a great track record of dealing with such assets, but right now, our main focus is the suite of assets we currently own, with the possibility of mine-life or area extensions at the forefront of our philosophy. ■

Greg Smith

President and CEO

EQUINOX GOLD

Can you provide an update on Equinox Gold's 2024 activities?

The Greenstone Gold mine has been our focus during 2024. In April 2024, we processed first ore through the mill and on May 22, we poured first gold. From there, it was a process of ramping up production capacity until achieving commercial production at the end of October.

Also in May, we acquired the remaining 40% of Greenstone to consolidate 100% ownership into Equinox Gold. This nearly billion-dollar transaction was the largest in Equinox Gold's history. With gold production estimated to average 390,000 oz/y for the first five years, Greenstone is our biggest mine, our lowest-cost operation, and boasts the longest mine life at 15 years, making it a cornerstone asset for Equinox Gold.

What challenges have you faced during Greenstone's ramp-up?

We are very satisfied with how the mine and plant are performing overall. The local municipality of Greenstone, the town of Geraldton, surrounding First Nations communities, and the provincial government have all been incredibly supportive, and Ontario's mining ecosystem has made it a fantastic place to operate.

On the mining side, pioneering the initial pit was complex, as we had to manage historic soil and tailings from prior mining activities and use clean waste from the pit to construct our tailings facility. In addition, hiring and training haul truck operators proved challenging due to the tight labor market in Ontario.

How will the consolidation of Greenstone impact Equinox Gold's finances?

This transaction was financed roughly 50/50 through equity and debt. We issued shares for the equity portion and took on a US$500 million three-year term loan for the debt portion. Greenstone itself is a cash flow powerhouse, especially at current gold prices, and cash flow from Greenstone will help us pay down the debt incurred for this acquisition, as well as the original construction financing. ■

Patrick Godin

President and CEO

NEW GOLD

What have been the latest developments at New Gold in 2024?

The biggest milestone at New Afton was the commissioning of the gyratory crusher and conveyor system, setting up the C-Zone for high capacity, low-cost, low-emission ore transportation for the life of mine. Construction of the C-Zone cave footprint has also reached the targeted 18 draw bells for hydraulic radius for self-cave propagation, which is considered commercial production, and we will take advantage of the existing excess processing capacity at our mill to ultimately process 16,000 t/d from C-Zone. These two milestones will positively impact our unit operating costs and facilitate a ramp-up in processing rates.

Over the last eight quarters, New Gold has focused on stabilizing operations at Rainy River in Ontario, and delivered consistent results. In 2024 we made excellent progress in development of the Underground Main zone, which contains the majority of underground reserves and will be an important source of higher-grade production in the coming years to supplement mill feed from the open pit and the Intrepid underground zone. The Underground Main project is on track to commence stoping in the first half of 2025 and ramp up to an underground production rate of approximately 5,500 t/d by 2027. We have also improved the predictive maintenance and mill availability, leading to increased recovery rates over prior years as Rainy River becomes a stable operation.

Is New Gold considering any acquisitions?

A company that has three or four assets that are generating cash flow and have good financial ratios can put in place healthy debt, use part of their cash flow, and have other financing mechanisms such as a revolving credit facility to minimize dilution and ensure that shareholders' investments are not the last money out. Ideally, for the mine building scenario to work, you need to have more than two producing assets. ■

Gold Exploration

Image courtesy of New Gold

Golden opportunities in the Heartland Province

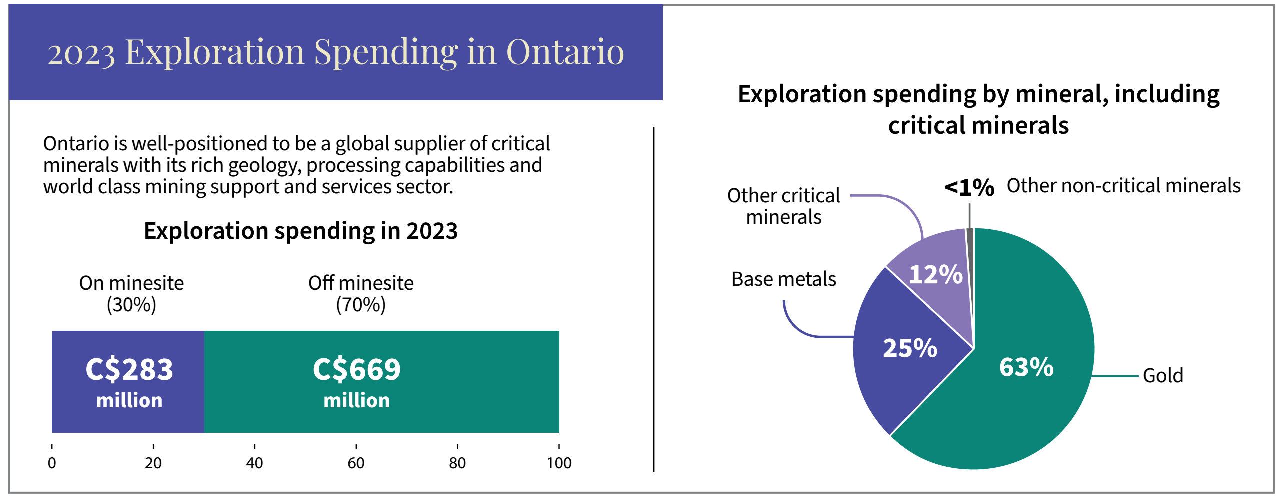
In 2023, Ontario spent C$952 million on mineral exploration, slightly less than the C$990 million spent in 2022, representing 19% of exploration spending in Canada. "The province has seen great exploration success, with Ontario being ranked the number one jurisdiction in 2023 for junior exploration spending in Canada. We continue to discover new rare earth metals across the province, including cesium north of Timmins, vital for national security and the movement to clean energy," noted Minister Pirie.

Gold was responsible for 63% of the province's total exploration spending in 2023, with companies such as First Class Metals (FCM) carrying the momentum into 2024 and reporting a fruitful field season: "FCM has extended the North Hemlo property by 34.5 km² in executing a purchase agreement with OnGold Invest Corp. Lake sediment sampling conducted last winter indicated significant gold anomalies in the new area. Further lake sediment sampling in the center of the North Hemlo claim block obtained clusters of very anomalous gold. Our focus to date has been on the Dead Otter trend which produced the highest grab sample ever on the property and the 'north limb' at just under 20 g/t," shared FCM's CEO Marc Sale.

Market conditions have shifted the focus of FCM back towards gold exploration at the North Hemlo project located next to Barrick Gold's Hemlo mine and the Sunbeam property near Agnico Eagle's Hammond Reef deposit. Building good relations with the First Nations has been key for FCM, allowing it to gain six exploration permits in just 18 months. The company is currently focused heavily on Ontario, with the potential to move elsewhere if opportunities arise. Flush with a loan of £700,000 and a conditional £2.18 million strategic equity funding from the Seventy Ninth Group, FCM can now decide which of its many projects to focus on for the 2025 field season. "Whilst it is presently our intention to concentrate within the province, the alliance with the Seventy Ninth Group could mean we expand our horizons," continued Sale.

Near Timmins, Mayfair Gold is concentrating on converting its Fenn-Gib Gold project into a producing mine in the next five years. The land was previously owned by Pan American Silver and Barrick Gold, with an Indicated resource base of 4.3 million oz. "While the mine has the potential to support a larger scale project, we are considering the initial development of a 4,800 tpd open pit mining operation, allowing the company to proceed with a provincial permitting path and reducing the initial capital cost to advance the project to production. This development path reflects our goal of advancing the Fenn-Gibb gold project expeditiously to achieve production during the current gold cycle,"said Nicholas Campbell, CEO, Mayfair Gold.

In 2025, Mayfair Gold is aiming to release a PFS for Fenn-Gib alongside achieving other de-risking and permitting milestones. The company is looking at producing a smaller-scale mine to become a producer faster, acknowledging the future potential for a larger-scale project on the land at some point in the future. "What helps Mayfair Gold is our proximity to Timmins. This allows us to develop and operate a mine without needing to build our own camp. We also have excellent access to the mine, with the highway running directly through to our deposit, with grid power available within 10 km of the project," continued Campbell.



Source: Natural Resources Canada and the Ontario Ministry of Mines

The major highlight for First Mining Gold in 2024 was the release of the Environmental Assessment/Environmental Impact Statement, the culmination of 14 years of work. Alongside this, other important steps were taken at its Springpole asset to bring it into development. "Recently, we passed the federal conformity review, and the federal comment period has begun. This is a significant achievement, as we are one of a couple of large gold projects in Canada that are undergoing such a combined federal and provincial environmental assessment process," explained Dan Wilton, CEO of First Mining Gold.

Additionally, an advanced FS is expected in 2026. "Ontario's supportive government and strong track record of permitting major projects like Magino and Greenstone provide a solid foundation for progress," continued Wilton.

A company that enjoyed a transformative 2024 is Goldshore Resources, which is conducting a PEA with G Mining Services for its flagship Moss Gold project, located just off the Trans-Canada Highway, 110 km outside of Thunder Bay, with the potential to become one of Canada's largest gold mines. Under new management, the company has planned a 15 km winter drilling program, focused on the top 200 m of rock, with basic exploration still needed to uncover the true capacity of Moss Gold owing to 23 km of prospective structural corridors. "The main reason for this program is that the deposit has not been fully drilled yet, so we are not upgrading resources from inferred to indicated. Instead, we are focused on converting waste into ore by filling in some drill spacing gaps," highlighted Michael Henrichsen, CEO of Goldshore Resources.

Moving into 2025, the company is looking for new deposits, eyeing a completed infill drill program and finalized environmental work to begin permitting in 2027.

Another company under new leadership is Red Pine Exploration, which updated the resource estimate on their Wawa project to 1.5 million oz, a 150% increase since 2019. The company is exploring more opportunities to expand in Ontario, targeting new land or looking to collaborate on other projects surrounding its current holdings. "We have launched a fully funded 25,000 m drilling program through July 2025, targeting new prospects and extending known deposits. This program amounts to approximately 3,500 m of drill core monthly that will provide regular news updates. This ambitious initiative includes step-out drilling to expand the gold system and wildcat drilling to explore high-potential new targets identified during 2024 prospecting," stated Michael Michaud, president and CEO of Red Pine Exploration.

Located on the Mishibishu Lake Greenstone Belt, a region that has seen great success for Alamos Gold and Wesdome Gold Mines, Angus Gold holds a promising 290 km² land package through its 100%-owned Golden Sky project. "The land we hold has not been systematically explored for the past 30 years, as it was primarily in the hands of smaller prospectors or companies with limited landholdings, preventing meaningful and systematic exploration," explained president and CEO Breanne Beh.

2024 was the busiest year yet for the company, shifting focus to the Banded Iron Formation (BIF) Zone. "Our primary focus has been on the BIF Zone, which we have been developing, but Dorset has consistently delivered better-than-expected results, making it an increasingly important priority. During 2025, the new high-grade discovery along Dorset's western extension will become a prime focus of the project," elaborated Beh.

The new deposit yielded results of 7 g/t over 12.4 m, and the company is looking to expand westwards once again in 2025, preparing more grassroots areas for exploration.

While producers have the advantage of cash flow from the ore coming out of the ground to invest in exploration initiatives, juniors are reliant on investor sentiment to finance their projects. With challenging equity markets, Ontario's are leveraging their expertise and resources to explore more with less. "We share resources, like using the same drilling company as Wesdome Gold Mines, which allows us to save on transport fees. There is a strong workforce in the area, available power, and infrastructure that junior companies in remote regions cannot always access," shared Beh.

With inflationary pressures and the ever rising cost of mining, majors have been placing emphasis on growing their operations, focusing on leveraging the economies of scale to maintain profitability. This has meant that larger projects, like the recently developed Côté Gold, are becoming all the more attractive. "Springpole's large size makes it worthwhile for majors and opens doors for partnerships, as seen with Osisko's Windfall project. Just 50% of the production at Springpole could be significantly larger than some producing mines in the Red Lake region," said Wilton.

For more advanced projects nearing FID, juniors are having to grapple with inflationary pressures in the aftermath of the pandemic. While prices for certain construction materials like steel have settled, labor prices remain high. "The biggest challenge for maintaining costs is people. Irrespective of the size of our project, we are competing with every other company in the region to access the best people to run the mine," said Campbell.

On the other hand, the US$700/oz increase in gold prices over the past year means that old resource estimates based on significantly lower gold prices do not reflect the current economic reality, opening the door for projects to have lower cutoff grades and expanded profitability. "This pricing shift allows for a large portion of our resources to be potentially mined as an open pit, which was previously not feasible and may be more profitable than using underground mining methods for the near surface gold mineralization," said Michaud.

Furthermore, for juniors with major gold producers as shareholders, the boost in their cashflow will hopefully translate into increased spending on prospective projects adjacent to their mines: "Nowadays, a 70,000 oz/y producer can generate roughly C$275 million in revenue, creating an opportunity to develop assets that would previously not have been economically viable," continued Campbell.

Ontario's explorers are blessed with generous government support in the form of the OJEP and Flow-through shares scheme, among others, however, ultimately the capital markets dictate which projects turn into mines, and which will never break ground. "The Premier of Ontario and the Minister of Finance are aware of this issue, and we have an active file to address financing concerns in the junior sector. Juniors must gain financial backing to explore, build infrastructure and create jobs, and this can only be done through the markets," said Minister Pirie.

The reality for Ontario's juniors is that there are many factors beyond their control. Gold prices may change dramatically again, or a new government might overhaul the permitting process overnight. All they can do is focus on the project and prove to investors that their project stands above the rest. "For juniors, a compelling exploration story is vital. There is no substitute for making meaningful discoveries when it comes to success," said Trevor Turnbull, managing director - global mining & metals, banking, National Bank Financial. ■

Dan Wilton

CEO

FIRST MINING GOLD

> "Springpole's large size makes it worthwhile for majors and opens doors for partnerships, as seen with Osisko's Windfall project."

What have been the main developments your Springpole project in 2024?

The main development in 2024 was the completion and submission of the final Environmental Assessment/Environmental Impact Statement (EA/EIS), a milestone that reflects 14 years of work, including environmental studies and baseline data. Recently, we passed the federal conformity review, and the federal comment period has begun. This is a significant achievement, as we are one of a couple of large gold projects in Canada that are undergoing such a combined federal and provincial environmental assessment process. We expect a decision by the federal regulators at the end of 2025, and we expect to significantly advance our Feasibility Study in 2026.

How has Ontario's permitting regime impacted the project's process?

Ontario's regulatory environment is comprehensive, but also evolving, with recent legislation like the Building More Mines Act being a step in the right direction. However, challenges persist, especially due to the extensive data collection required today. This is crucial to better understand environmental impacts, so there is no shortcut to this step. Streamlining could occur through clearer baseline data requirements, helping companies collect data earlier. One key lesson for the industry is the importance of early and transparent engagement with stakeholders, especially Indigenous communities, and understanding baseline data requirements from the outset. This approach significantly streamlines the permitting process and ensures better project outcomes through modern, data-driven environmental assessments.

How can mine developers improve engagement with Indigenous communities?

Engagement with Indigenous communities is a critical area for improvement, and it should begin earlier in the development process. We have recognized the need for more proactive engagement, but community capacity constraints have been a challenge. Companies can streamline the process by ensuring communities understand the incentives of a project and have sufficient resources to engage in the process. Stage gates for early agreements could help. Ontario's supportive government and strong track record of permitting major projects like Magino and Greenstone provide a solid foundation for progress.

How has the recent rise in gold prices impacted Springpole's economics and what is your outlook on gold prices?

The recent rise in gold prices has significantly boosted Springpole's economics. With gold above US$2,600/oz, the project's after-tax NPV has increased by about US$1.5 billion based on our 2021 PFS. Every US$100 increase in gold prices adds roughly US$150 million to the after-tax NPV. This is a great environment for gold projects, and I expect gold prices could rise further, potentially reaching US$3,000-4,000/oz, especially given global economic trends like US debt accumulation and protectionism. This would make Springpole highly profitable, provided cost inflation remains manageable.

We are refining Springpole's design based on feedback from Indigenous communities and regulators, with a final feasibility study to be completed after receiving environmental assessment approval. Unlike many projects that are earlier in stage, Springpole is very advanced and well-positioned to meet the industry's future needs by 2030 by filling a gap in production capacity. Its size and location in Ontario provide significant advantages, making it one of the few large-scale gold projects of its kind.

What is First Mining Gold's partnership and financing strategy for Springpole?

Over the past four years we have generated over C$60 million of cash from monetization on non-core assets, which has supported project advancements at our flagship assets without shareholder dilution. Recently, we closed a C$15 million financing and are exploring strategic partnerships to help fund and advance Springpole. Springpole's large size makes it worthwhile for majors and opens doors for partnerships, as seen with Osisko's Windfall project. Just 50% of the production at Springpole could be significantly larger than some producing mines in the Red Lake region.

What can we expect from First Mining Gold in 2025?

As Springpole approaches a construction decision, we will rely on the feasibility study to guide financing decisions, including partnerships that provide operational expertise and financial backing.

As we progress through the EA process in 2025, there are several critical milestones to achieve, which will continue to generate positive news flow and momentum. Additionally, we are continuing exploration at both Springpole and Duparquet in Québec, which are proving to have excellent potential for growth and reinforcing their status as globally significant projects. Overall, 2025 will be a pivotal year for advancing our projects and maintaining strong momentum. ■

Nicholas Campbell

CEO

MAYFAIR GOLD

What are the main focuses of Mayfair Gold's Fenn-Gib project?

2025 will be the year Mayfair Gold shifts focus on the Fenn-Gibb Gold project in Ontario from exploration to development and production. Mayfair Gold purchased the property in 2020. Since the acquisition, we have significantly expanded the resource base, which now hosts a 4.3 million oz indicated gold resource. The project has excellent access and infrastructure with highway access to the site, proximal grid power access and the skilled labor and mine services pool located in the Timmins area of Ontario. The Apitipi Anicinapek First Nation are our neighbors, and the Fenn-Gibb Gold project lies within their territories. We have begun discussions with the Apitipi Anicinapek First Nation, and we look forward to developing a collaborative relationship with the nation as we advance the Fenn-Gibb project.

The excellent access and infrastructure provide Mayfair Gold with the opportunity to advance the Fenn-Gibb Gold project quickly by focusing on a small-scale operation to start. While the mine has the potential to support a larger scale project, we are considering the initial development of a 4,800 t/d open pit mining operation, allowing the company to proceed with a provincial permitting path and reducing the initial capital cost to advance the project to production. Fenn-Gibb also has a higher-grade near surface zone of mineralization to begin operations, which should improve the grade profile at the start of the mine life and help support project economics. This development path reflects our goal of advancing the Fenn-Gibb gold project expeditiously to achieve production during the current gold cycle. By focusing on a smaller scale, provincially permitted open pit development at the Fenn-Gibb Project, we see a pathway forward to potentially begin producing gold at Fenn-Gibb within the next five years. ■

Michael Henrichsen

CEO

GOLDSHORE RESOURCES

What is the latest news from Goldshore Resources?

2024 was a transformative year for Goldshore Resources, marked by the update of our mineral resource estimate, the development of a strategic plan to drive growth, and the engagement of key consultants to guide our economic study and permitting efforts, which have all played a role in positioning the company for success in the development of our 100% owned Moss Gold Asset. A significant boost came from the strategic backing we received in November 2023 from Brian Paes-Braga and members of the SAF Group, which helped enable us to complete a US$13.9 million capital raise this October. This funding will help us expand our resource base, with our current 6.7 million oz of gold in indicated and inferred categories, and allow us to conduct exploration to identify new discoveries. We have also begun a PEA with G Mining Services to provide economic performance guidance for our investors.

What's the key to your success in the challenging junior mining market?

I believe the foundation of our success lies in the asset itself. We have a large-scale gold deposit located just off the Trans-Canada Highway, 110 km from Thunder Bay. If you were to choose a site for a bulk-tonnage gold deposit, this would be an ideal location. We are confident that Moss Gold could potentially become one of Canada's top 10 gold mines. We are currently well capitalized and fully funded for our winter exploration program and through the publishing of our PEA with approximately C$19 million in the company treasury at the start of December 2024.

What is Goldshore Resources' outlook for 2025 and beyond?

Our goal is to complete the infill drill program and finish all environmental work so that we can begin the permitting process. We also plan to work closely with First Nations communities, moving towards the Impact Benefits Agreements (IBAs). ■

Michael Michaud

President and CEO

RED PINE EXPLORATION

How has 2024 been for Red Pine Exploration?

With new leadership, we refocused on delivering value by leveraging drilling data accumulated over five years. By fully integrating this data, we updated our resource estimate, increasing our gold resource to 1.8 million oz—a 150% growth since 2019. This includes both open-pit and underground mining options, broadening our development possibilities. The C$11 million raised from investors such as Alamos Gold, underscores market confidence. Our priority now is to explore the untapped potential of this large gold system while advancing our resource development.

How do you assess Ontario as a jurisdiction for junior mining?

Ontario is supportive of junior mining, with tools like flow-through financing contributing C$8 million to our C$11 million raise. Programs like OJEP have also been valuable in the past. However, Ontario could also adopt incentives similar to Québec where they provide a 50% exploration expenditure credit to further boost competitiveness. Streamlining First Nations partnerships by reducing the government's involvement as a middleman could also simplify development. ■

Marc Sale

CEO

FIRST CLASS METALS

What have been the main developments at First Class Metals over the past year?

First Class Metals (FCM) concluded 2023 with a successful drilling programme at our Zigzag hard rock lithium project, delivering exceptional results. Given market conditions our focus has shifted to gold and the North Hemlo flagship property covering over 100 km². The second focus is the Sunbeam property, covering over 70 km².

Lake sediment sampling conducted last winter indicated significant gold anomalies on the new area. Further lake sediment sampling in the central of the North Hemlo claim block, obtained clusters of very anomalous gold. Our focus to date has been on the Dead Otter trend which produced the highest grab sample ever on the property and the 'north limb' at just under 20 g/t.

How is FCM navigating the difficult financing environment juniors are experiencing?

Our primary strategy is to fund the advancement of core assets by selling non-core properties. We have proven our model of discovering and selling projects. ■

Breanne Beh

President and CEO

ANGUS GOLD

Could you introduce Angus Gold and your projects?

Angus Gold is a junior exploration company that is primarily focused on our Golden Sky project in the Wawa district of Ontario. We have successfully assembled a substantial land package of about 290 km² of largely unexplored ground.

Can you update us on the progress of the Golden Sky project?

One of the most exciting developments has been the discovery of a high-grade zone on the western side of the Dorset Zone of 7g/t over 12.4 m. This opens new potential as we see the structure moving westward and interacting with different rock types, which could lead to larger quartz veins and higher-grade gold mineralization.

After the winter drilling, we shifted focus to the banded iron formation (BIF), a new bulk-tonnage target that spans 1 km in strike length and currently extends to 250 m in depth. Now, our focus is on systematically drilling the Dorset West area. During 2025, the new high-grade discovery along Dorset's western extension will become a focus of the project. ■

FINANCE

> The interest rate cuts by Canada, Europe and now the US, as well as increasing commodity prices, have given the mining sector reasons to be optimistic going forward.

Dean McPherson
Head, Business Development – Global Mining
TORONTO STOCK EXCHANGE (TSX) AND TSX VENTURE EXCHANGE (TSXV)

GBR Series • ONTARIO MINING AND TORONTO'S GLOBAL REACH 2025

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Mining Finance and Investment

Image courtesy of Tyler Prahm at Unsplash

Ontario's ore-some investment opportunities

Some of the financing woes Ontario's juniors felt in 2023 continued into 2024, with many of them reporting that the equity markets are not favorable despite record metal and mineral prices. There are a myriad of reasons for this, with a federal government clampdown on Chinese foreign investment, uncertainty from US presidential elections and a sheepish retail investor base being just some of the factors behind Ontario juniors' financing woes.

The issue is particularly pronounced with critical minerals-focused companies, many of which have not enjoyed the favorable prices currently experienced by precious metals companies. In a recent survey by the Canadian Climate Institute, 87% of respondents agreed that the current level of investments is "insufficient" to grow Canada's critical minerals value chain. Despite government efforts to spur investments through grants and subsidies, the lack of private capital entering Canada's mining sector is making it difficult to close the financing gap. "Unfortunately, over the last few years we have not seen as much capital flow into institutional investor funds in Canada focused on metals and mining as we used to, so Canada's relevance as a source of institutional investor dollars in this space has been negatively impacted," said Ilan Bahar, managing director and co-head, global metals & mining, BMO Capital Markets.

Of the institutional investors that still have an appetite for junior exploration stocks, ETFs are becoming the preferred option. As investors shy away from the risk of picking individual stocks, many juniors not included in certain ETFs miss out on crucial funding. "The challenge lies in how many institutional investors have shifted to directly investing in commodities, favoring ETFs and using quantitative management over individual stock picking," said Trevor Turnbull, managing director - global mining & metals, banking, National Bank Financial.

For the smaller juniors that do not meet the requirements to be included in dominant ETFs, like the VanEck Junior Gold Miners ETF (GDXJ), equity financing is made all the more difficult. "Among intermediate and junior players, inclusion in the GDXJ ETF remains a key differentiator. However, the absence of specialty funds focused on creating value beyond the GDXJ limits growth opportunities for small-cap juniors. Nevertheless, a market shift could emerge to exploit the distortion between intrinsic and market value for these companies," said Alejandro Hoyos, VP, metals & mining investment banking, Stifel Canada.

While many of Ontario's gold majors have seen their share prices rise steadily to reflect the rising price of the gold they are producing, many juniors feel they are unfairly undervalued and investors eyes are elsewhere. Although the GDXJ has generally lagged behind the rising gold price over the past year, there have been some signs of hope: "Just before the US elections, the GDXJ started to cross the line of the GDX, narrowing the gap with the GDX and suggesting that there was interest coming back into that space. However, challenges persist in Canada, particularly regarding Indigenous community issues, which continue to delay project advancement. Governments must address this challenge as quickly as possible," said Rob McEwen, chairman and chief owner, McEwen Mining.

Uncertainty concerning project timelines has undoubtably pushed some investors away from Ontario's junior mining space. Additionally, in the case of critical minerals, many feel that government support through initiatives like the CMIF have focused too much on downstream battery plants and surrounding infrastructure, rather than putting money in the ground for actual exploration. "The challenge is that the funds earmarked by the government and the investment of various interest groups tend to be focused on the pieces of the mining industry that are not extractive. People are hesitant to invest in the extraction process and would rather be involved in building infrastructure, so there is not as much support for the upstream sector," said Michael Pickersgill, head of mining and metals, Torys LLP.

Ontario's mining sector continues to struggle to tempt the new profiles of institutional investors with a sufficient appetite for riskier early-stage exploration plays. "Pension funds are not investing in exploration, so resource funds continue to be the primary capital source, despite weak inflows. There has not been a noticeable trend of new investor types, and sovereign wealth funds show only sporadic interest. Private equity is more active now compared to 15-20 years ago, but its impact on the sector remains limited," said Craig Stanley, director - precious metals, Raymond James.

Toronto's financial institutions are having to provide new forms of financing to fill the gap, especially for juniors who feel their trading multiples are too low for traditional equity raising. "We are increasingly being asked to help by lending or through creative solutions like At-The-Market financings (ATMs), which allow companies to raise funds steadily throughout the year without impacting share prices as traditional deals might. Prepaids, where some future production is sold upfront, have also gained in popularity," said Turnbull.

The inability of Canada to attract more generalist investors to its mining sector has a knock-on effect on resource funds, which typically have technical backgrounds and are more inclined to look at higher-risk exploration opportunities. "Liquidity, which is typically driven by generalist retail investors, can suffer when market attention is attracted to other sectors, for example technology," said Stefan Ioannou, base metals analyst, institutional equity research, Cormark Securities.

There are signs of improvement, however, with the mining and exploration companies listed on the TSX and TSXV collectively raising C$6.8 billion in equity capital in H1 2024, a 62% gain compared to the same period in 2023, and First Quantum closing a C$1 billion equity bought deal, the largest in Canada's history. "The pandemic, geopolitical tensions, and a high inflationary environment had a great impact on the global mining sector and the financing market has not yet returned to the levels we saw in 2021, but the upward trend we have experienced in 2024 thus far has been encouraging, and the interest rate cuts by Canada, Europe and now the US, as well as increasing commodity prices, have given the mining sector reasons to again be optimistic," said Dean McPherson, head, business development – global mining, Toronto Stock Exchange and TSX Venture Exchange.

Investment Canada Act

A recent overhaul to the Investment Canada Act (ICA) has been a hot topic of conversation on Bay Street. The changes represent the most significant update to the national security provisions of the ICA since they were first adopted in 2009, and all point towards increased scrutiny of foreign investment in Canadian critical minerals projects – particularly from China. The changes have seen new surtaxes and tariffs on Chinese imports and it is likely that more cases of Chinese investments into Canadian mining companies will become unfeasible or outright refused, as evidenced by Solaris Resources recently scrapping its plan to sell a minority stake to Zinjin Mining Group. "Companies that were previously relying on foreign investments to raise capital now face challenges. The problem is further compounded when a significant portion of production and processing, especially for critical minerals, is happening in countries like China, and therefore some of the natural investors are foreign investors seeking feedstock," said Denis Frawley, partner, Momentum Law LLP.

The controversial changes have been met by resistance from small-cap Canadian explorers to the CEO of the TMX group. The matter is further complicated by the fact that many mining companies are headquartered in Canada and listed on Canadian exchanges, but have projects abroad. "All Canadians would agree with the intent to protect our national interest in the critical minerals supply chain. The execution however has only served to create confusion with its lack of clarity and consistency, with many of the cases involving projects which are located outside of Canada. We have already seen companies taking steps to protect themselves from the Canadian government by redomiciling, while keeping their TSX/V listing," continued McPherson.

Beyond the immediate financing challenges caused by Canada's hawkish stance towards China, the ICA changes also risk hampering Canadian prospectors' and miners' chances at developing projects abroad in the long term. "Canada is a global mining leader and is setting a benchmark for how other countries conduct themselves in the mining space. Therefore, the government must not make arbitrary decisions about who can and cannot invest in mining operations, as we run the risk that it will get turned around on us. Many of Canada's leading mining companies rely on foreign countries being receptive to them operating in their jurisdictions. Canada should set a positive tone in terms of international mining investment," said Paul Brink, president and CEO, Franco-Nevada Corporation.

Although the Canadian government is turning its back on China, it has looked to build stronger relationships with other nations to fill the gap,

49 >>

> By the end of August 2024, we already had 30 new listings, a significant increase from the 20 we saw throughout 2023.

Dean McPherson

Head, Business Development – Global Mining

TORONTO STOCK EXCHANGE (TSX) AND TSX VENTURE EXCHANGE (TSXV)

How have the TSX and TSXV performed over the past year?

2022 was an extremely difficult year in terms of financing activity and new listings, but the equity capital markets started to improve by the end of 2023, and 2024 kicked off on an upward trend with First Quantum closing a C$1 billion equity bought deal, the largest in Canada's history. This was followed by continued improvement in the mining financing space, particularly amongst the larger issuers, and, as the year progressed, we started to see the increased activity spread to the junior, early-stage mining companies. By the end of August 2024, we already had 30 new listings, a significant increase from the 20 we saw throughout 2023, and an incredible achievement considering our nearest competitor has only seen 15 new listings so far in 2024. The pandemic, geopolitical tensions, and a high inflationary environment had a great impact on the global mining sector and the financing market has not yet returned to the levels we saw in 2021, but the upward trend we have experienced in 2024 thus far has been encouraging, and the interest rate cuts by Canada, Europe and now the US, as well as increasing commodity prices, have given the mining sector reasons to be optimistic going forward.

What is the TMX Group's stance on the Canadian government's decisions to restrict certain foreign investments into its domestic mining sector?

The government's restrictions on investments by foreign SOEs are a major concern, especially because of the opaque and unilateral manner in which the federal government has been operating in this regard. All Canadians would agree with the intent to protect our national interest in the critical minerals supply chain. The execution, however, has only served to create confusion with its lack of clarity and consistency, with many of the cases involving projects that are located outside of Canada. We have already seen companies taking steps to protect themselves from the Canadian government by redomiciling, while keeping their TSX/V listing. We continue our lobbying efforts with the government in trying to protect our leadership position in the mining sector and for the betterment of Canadian capital markets.

What opportunities do you see for the TSX globally, and where will you be focusing your efforts moving forward?

TSX has one of the largest portfolios of international clients of any exchange globally. Our strategy has always been global, to the extent that we have hired full-time boots-on-the-ground representatives in several global markets to engage with existing clients and meet potential new clients. We are seeing significant traction from Australia in particular, as more Australian-based mining companies are diversifying and growing their projects into the Americas.

Recently, some exchanges have reported more delistings than IPOs - is this a trend the TSX/TSXV is experiencing?

No, we have not observed such a trend of more delistings than new listings. There has certainly been a shortage of large IPOs over the past three years. Fortunately, we see more new listings with 30 new listings so far in 2024. The majority of these new listings are junior companies.

Was the mining sector well represented in the 2024 TSX30 list?

In 2024, there was an increased focus on certain commodities, particularly uranium with one of the outstanding companies being Cameco. Other trends on the list included other critical minerals focused companies. With record gold prices, precious metals companies stood out as well.

Do you have a final message?

TSX continues to enjoy leadership in the mining sector, and although it has been a challenging year, especially for junior mining companies; we are encouraged by the observed increased financing activities and improving macroeconomic environment. The market is now starting to step out of many of the challenges it was facing, and we are doing as much as we can to help our existing and prospective clients stay in front of investors and prepare themselves for the opportunities we expect in the coming months. 2025 will be a pivotal year and everything is lining up for the mining sector to outperform. ■

Ilan Bahar

Managing Director and Co-Head, Global Metals & Mining

BMO CAPITAL MARKETS

How has BMO Capital Markets' metals and mining practice developed?

Over the last few years, the environment for precious and base metals has been relatively robust, although there has been some weakness in critical minerals such as lithium, nickel and graphite, and investor interest has been impacted accordingly. Nevertheless, the backdrop remains constructive, leading to high levels of capital markets activity.

Since the start of 2023, we have advised on more metals and mining M&A transactions, both in terms of the number of transactions and transaction value, than any other investment bank globally. Additionally, we have raised more equity for metals and mining companies globally than any other bank.

How would you assess the current mining finance climate in Canada?

There is no country in the world that has a deeper set of executive talent surrounded by a world class ecosystem of institutional and retail investors, analysts, investment bankers, lawyers, accountants and regulators, which allows for effective diligence and ultimately sophisticated presentation of mining companies to the investor community.

Unfortunately, recently we have not seen as much capital flow into institutional investor funds in Canada focused on metals and mining as we used to, so Canada's relevance as a source of institutional investor dollars in this space has been negatively impacted.

Do you expect increased M&A activity to continue?

I believe we are in a consolidation phase. We have seen M&A activity across the sector, with both large-scale consolidation and consolidation across the junior space. As funding for the junior space has been challenged, fewer new companies are being created, which has led to a smaller opportunity set. Given the strong commodity price backdrop and healthy valuations, we expect continued consolidation as larger companies seek to secure assets before the opportunity set dwindles even further. ■

Trevor Turnbull

Managing Director - Global Mining & Metals, Banking

NATIONAL BANK FINANCIAL

Can you provide an overview of National Bank Financial's mining and metals practice?

We play a leading role in corporate lending, project financing, equity financing and advisory work, including M&A and non-core asset sales. Other services include hedging and pre-paid metal sales. In Ontario, we work with all the major players and many operating mines in key districts like Geraldton and Timmins. While we operate globally and across Canada, Ontario, with its significant mining presence, is always a focus for us.

What recent trends have you noticed across your various services in the mining sector?

Clients still need financing, but equity raising can be less attractive than in the past due to lower trading multiples. Thus we are increasingly being asked to help by lending or through creative solutions like At-The-Market financings (ATMs), which allow companies to raise funds steadily throughout the year without impacting share prices as traditional deals might. Prepaids, where some future production is sold upfront, have also gained in popularity. We also can broker streaming and royalty deals to provide alternative financing options beyond traditional equity.

How can Canada improve mining financing, and what is your advice for juniors given the current challenges?

Canada continues to be one of the best mining finance environments globally in part due to flow-through shares and mineral exploration tax credits The challenge lies in how many institutional investors have shifted to directly investing in commodities, favoring ETFs and using quantitative management over individual stock picking. For juniors, a compelling exploration story is vital. There is no substitute for making meaningful discoveries when it comes to success. Recent standout examples include Filo Corp in Argentina, Reunion Gold in Guyana and Snowline Gold in The Yukon. ■

INTERVIEW

Alejandro Hoyos

VP, Metals & Mining Investment Banking

STIFEL CANADA

What have been the main recent developments at Stifel Canada?

Given the limitations in current equity markets, Stifel has prioritized supporting companies in M&A and strategic repositioning.

Have you noticed any trends in the profiles of investors who are interested in Canadian small-cap juniors?

The Canadian mining equity market faces capital disadvantages compared to markets like Australia, where pension funds play a significant role. For now, large-cap mining companies dominate investor interest, driven by the recent outperformance of precious metals prices. Among intermediate and junior players, inclusion in the GDXJ ETF remains a key differentiator. However, the absence of specialty funds focused on creating value beyond the GDXJ limits growth opportunities for small-cap juniors. Nevertheless, a market shift could emerge to exploit the distortion between intrinsic and market value for these companies.

What are Stifel's priorities?

A top priority is helping companies demonstrate responsible capital allocation, a key factor in attracting investor confidence. Stifel focuses on advising companies with strong management teams, robust asset bases and sound strategic judgment. ■

GM

CS

Gavin McOuat and Craig Stanley

GM: Senior MD, Head of Mining & Metals

CS: Director - Precious Metals

RAYMOND JAMES

Could you share insights on recent trends in Ontario's mining sector?

CS: Institutional investors are increasingly focusing on larger companies rather than exploration-focused firms. Geopolitical risk is a concern for all investors, and it is a factor that shapes investment decisions significantly.

Why are junior miners struggling to benefit from high gold prices?

GM: The increased risk, complexity and expense involved with the permitting process making it difficult to attract investors during this phase of development. Earlier-stage companies can often see a share price bump from an exciting discovery, but the increased risk associated with permitting has mitigated M&A activity, as larger companies are reluctant to acquire juniors without secured permits.

Which types of institutional investors are showing interest in Ontario's mining sector?

GM: Resource funds have dominated this space, with generalist investors largely absent. Institutional investors are currently less aggressive, creating a gap that streamers and private equity are filling, though not sufficiently. ■

Stefan Ioannou

Base Metals Analyst, Institutional Equity Research

CORMARK SECURITIES

What trends are you seeing with regards to mining investment and finance?

M&A activity has become a larger portion of our business. In general, juniors often do not have the balance sheet to develop their projects, and so at some point require the help of a major. We are also seeing said majors take steps to grow organically, however, these organic opportunities are finite and we anticipate established producers will inevitably have to look to acquisitions for growth, as many of the larger scale projects capable of 'moving the needle' for a major are in fact held by juniors.

Have you noticed any recent changes in the Canadian government's stance on foreign investment?

The government is definitely becoming more protective, albeit via measures that seemingly require greater clarity and consideration. It is understandable that the government looks to safe harbor projects in Canada from certain foreign investment, but the treatment of projects owned by Canadian-listed companies that are located outside the country is controversial, raising concern that companies may look to listings outside of Canada to facilitate foreign investment. ■

> In the current gold price environment, when operators have the capital to spend on putting new mines into production and expanding existing mines, there is tremendous organic growth.

Paul Brink

President and CEO

FRANCO-NEVADA CORPORATION

How has Franco-Nevada grown its portfolio, and how did it perform in 2024?

2024 has been an exciting year, with several of our royalties and streams on new mines starting, including Equinox Gold's Greenstone mine and Argonaut Gold's Magino mine in Ontario. We are also benefitting from expansions on our portfolio of assets, for example, one of the larger royalties Franco-Nevada has in Ontario is on Agnico Eagles' Detour Lake mine, which has recently expanded the resource base with plans to increase production to over 1 million oz/y. Another large growth driver for the company has been the Tocantinzinho project in Brazil, which has recently achieved commercial production.

In terms of Franco-Nevada's stock performance, we still have the shadow of what happened at Cobre Panama in November 2023 hanging over us when the government of Panama, on the back of protests, decided to shut down the mine. Since then, there have been elections in Panama, and the new President has indicated a willingness to talk about reopening the mine. Those talks will hopefully happen in early 2025.

Has the closure of Cobre Panama influenced Franco-Nevada's strategy in terms of jurisdictional risk?

The main takeaway from the Cobre Panama incident is that we need to keep our portfolio diversified and not put too many eggs in any one basket. We are also focusing our attention on jurisdictions with a strong domestic mining industry rather than countries where the domestic mining industry is still being developed, and therefore, many issues still need to be ironed out.

Is Argentina of interest to Franco-Nevada?

Argentina has had a difficult history in terms of foreign investment, but the current course the government is on is extremely positive. There is terrific geology in Argentina, much of which is undeveloped, and having the RIGI investment regime in place will help unlock investment in the mining sector. Franco-Nevada has royalties on assets in Argentina, including the Cerro Moro mine and Taca Taca, and we would like to participate in more opportunities in this jurisdiction moving forward.

Does the strength of the streaming and royalty model still hold up in the current gold bull market?

The streaming market is currently active. We are still at a period where rates and the cost of debt are high, and despite the run on commodity prices, equity is still fairly limited. For many players, the cheapest cost of financing is streaming.

The streaming and royalty model benefits most from organic growth, as opposed to acquisitions, as you are getting incremental ounces without the upfront capital cost. In the current gold price environment, when operators have the capital to spend on putting new mines into production and expanding existing mines, there is tremendous organic growth.

When the gold price increases sharply, investors look for who has the most leverage over the gold price, which is often an operator rather than a royalty and streaming company. However, it is typically at the back end of a strong gold price run when the royalty and streaming companies outperform, and I expect this to happen again as we get longer into the cycle.

Does Franco-Nevada fund Junior Exploration?

The real value in mining is created with the drill bit, and Franco-Nevada does invest in earlier-stage projects. We have recently financed Westhaven, who has attained great results on their Shovelnose property, and Scottie Resources on their namesake property in the Golden Triangle.

What are your thoughts on the current stance of the Canadian government towards foreign investment?

Considering the energy transition, Canada will require tremendous investment, including foreign investment, to be a leader in critical minerals. The government should do all it can to attract this investment into the sector and needs to think carefully about how they ensure we are not arbitrary in fending off foreign investment. In addition, Canada is a global mining leader and is setting a benchmark for how other countries conduct themselves in the mining space. Therefore, the government must not make arbitrary decisions about who can and cannot invest in mining operations, as we run the risk that it will get turned around on us. Many of Canada's leading mining companies rely on foreign countries being receptive to them operating in their jurisdictions. Canada should set a positive tone in terms of international mining investment. ■

> With certain companies having less available financing than they were anticipating, there is an opportunity for streaming and royalty companies.

Sheldon Vanderkooy

CEO

TRIPLE FLAG PRECIOUS METALS

How did Triple Flag Precious Metals perform in 2024?

Two key factors contributed to our success in 2024— record sales from our assets and record gold prices now over US$2,700/oz.

Are the financing challenges that juniors are facing creating opportunities for Triple Flag?

With certain companies having less available financing than they were anticipating, there is an opportunity for streaming and royalty companies like Triple Flag to come in, look at the intrinsic value of the company's assets and then provide financing on competitive terms to help them accomplish their goals. When we started Triple Flag, the bulk of our capital focused on producing or near producing assets. That being said, there is room in our portfolio for earlier stage opportunities that usually require smaller capital deployment. The majority of our portfolio value remains within producing assets and we also have a significant portion of near-producing assets that we expect to come online within five years.

Which key assets have driven growth for Triple Flag in 2024?

The star of the year is undoubtedly Evolution Mining's Northparkes copper-gold mine in Australia. Entering 2024, we knew that Northparkes would show a real step-up in gold volumes, which we will continue to benefit from well into 2025. The mine has decades of mine life ahead of it and the people at site speak of its potential as a hundred year mine.

Nexa Resources' Cerro Lindo zinc-copper-lead-silver mine in Peru also had a strong year, contributing greatly to our cash flow per share. Recently, we have also seen positive news flow on other assets such as Montage Gold's Koné project in Côte d'Ivoire and Skeena Resources' Eskay Creek project in BC, which we anticipate will significantly boost our cash flow per share in the near future.

Does Triple Flag have plans to increase its exposure to non-precious metals commodities?

Triple Flag has always been precious metals focused, and we aim to maintain 80-90% at a minimum of our NAV in precious metals. Currently, around 93% of our NAV is in gold and silver. If we were to see an opportunity in another commodity like copper or lithium, and it ticked all our boxes, we would deploy some capital but not to the point of changing the company's core focus on gold and silver.

For instance, we recently announced the acquisition of a 0.5% GOR royalty on the Tres Quebradas project for US$28 million from Lithium Royalty Corp. This transaction was a unique, counter-cyclical opportunity to deploy capital and gain exposure to a high-grade lithium brine asset operated by Zijin with a multi-decade reserve life, attractive cost profile, expansion optionality and significant resource upside.

Is it getting harder to find new assets due to competition from other streaming and royalty companies?

Competition is great and healthy, and Triple Flag competes with a select few established large streaming and royalty companies. I would say the level of competition we face has not increased significantly since our inception in 2016. Mines deplete over time, and there will always be a need for capital to finance greenfield projects. Given a finite pool of capital available, there is a never-ending demand for financing from companies like Triple Flag. Additionally, we see an increasing number of projects catering to the green energy transition. Triple Flag is also able to support these projects – by underwriting by-product gold and silver streams on base metal projects, for example. There have been a number of smaller streaming and royalty companies that have started in recent years, but most do not compete directly for the financing of large projects but instead focus on accumulating existing royalties.

Do you have a final message?

Triple Flag is seeing record performance from our portfolio, and gold and silver prices remain very high. We have embedded organic growth in the portfolio and expect to achieve 135,000 to 145,000 gold equivalent ounces in 2028. This would be a significant step up from our guidance of 105,000-115,000 gold equivalent ounces in 2024. Additionally, we will continue to make new external investments and grow our portfolio. We are still in the early innings and the best is yet to come. ■

David Awram

Co-Founder and Senior Executive VP

SANDSTORM GOLD ROYALTIES

Considering the financing woes that many juniors are currently facing, does it present an opportunity for streaming and royalty companies to invest in earlier-stage projects?

The capital markets for exploration and single-asset development companies have almost swung too far to a point where there is almost no equity available for them. As a royalty and streaming company, we find that we do not have enough capital to support the entire mining industry, and additionally, you have to be conservative as you do not want the royalties and streams to be too large or overbearing, making the project uneconomical. We want to ensure that we are creating a royalty or stream that will be appealing to future equity investors in the project.

The difficult financing environment certainly creates opportunities for royalty and streaming companies, and we now have the ability to pick and choose the projects we want to invest in. Even while Sandstorm's primary focus of capital allocation is deleveraging, on a corporate development front, we continue to establish relationships with exquisite smaller projects that have effectively been orphaned from the capital markets, as we know that at some point the markets will heat up again.

What can we expect from Sandstorm over the coming year?

2025 will be an important year for Sandstorm as we continue to pay down debt and shrink our share float with our buyback program. We will also see material projects ramp-up and move into production, such as the Greenstone gold mine in Ontario and the Platreef mine in South Africa—both assets we purchased as part of the transactions in 2022. We also expect to get more clarity on Glencore's MARA project and SSR Mining's Hod Maden project, both of which are significant growth assets for Sandstorm. 2025 will be another steppingstone toward doubling our current production in 2029. ■

Ernie Ortiz

President and CEO

LITHIUM ROYALTY CORP

What have been the main developments at Lithium Royalty Corp in 2024?

Sector-wise, lithium prices have remained challenging and have continued to decline in 2024. This has put pressure on companies within the industry, Lithium Royalty Corp (LRC) included. At the company level, LRC's portfolio has matured, our key development assets are closer to production, and we expect to receive additional revenue from three new mines in the near term – Zijin Mining's Tres Quebradas mine and Ganfeng's Mariana mine, both located in Argentina, and Atlas Lithium's Neves mine in Brazil. In 2024, LRC also completed a deal with the largest lithium land-holding company in Brazil, and many of our portfolio companies have been de-risking their operations throughout the year. Most recently, Winsome Resources announced a major scoping study at Adina, which they estimate will generate over US$300 million in cash flow to LRC over the mine's life, with additional room for growth.

With juniors experiencing financing challenges, is this creating opportunities for LRC to add less mature assets to its portfolio?

At this point, we are prioritizing near-term cash-flowing assets or highly strategic royalties to acquire. While there currently is a substantial number of opportunities on the exploration and development side, there are also ample opportunities on the near-term cash flow side, which we are prioritizing.

Have changes in EV adoption influenced the demand for lithium in recent years?

Due to a slowdown in EV adoption in recent years, there has been a delayed appetite from OEMs to invest in upstream lithium projects. However, with the demand outlook for lithium being robust, interest in the market remains high. Significant transactions such as Rio Tinto's US$6.7 billion acquisition of Arcadium Lithium continue to take place. We are noticing more consolidation in the industry as a result of an attractive long-term risk-reward profile on lithium. ■

Brendan Yurik
CEO
ELECTRIC ROYALTIES

> "It seems that investor sentiment for battery metals is low now, with short-term focus prevailing over the long-term outlook."

Brett Heath
CEO
METALLA ROYALTY & STREAMING

> "Investing into a junior trying to put a new mine into production is probably too high risk for a royalty company like Metalla. The market has had trouble fully being able to value the optionality piece of this business."

<< 42

at least in the critical minerals space. For Green Technology Metals (GT1), an Australian company looking to become Ontario's first lithium producer, this has opened new avenues for partnerships and financing, evidenced by its investment from Korean battery maker EcoPro: "Canada's restrictive stance on Chinese financing has made things easier for us. Canada has been actively strengthening relationships with South Korea and Japan, particularly in critical minerals and infrastructure development. During my recent trip to Korea, I met with the Canadian Trade Commissioner, who is helping facilitate partnerships between Korean investors and Canadian projects," shared GT1's managing director Cameron Henry.

Similarly, Frontier Lithium entered a JV with Japanese carmaker Mitsubishi and Canada Nickel received a significant investment from Korean conglomerate Samsung SDI. "The Canadian government is actively supporting these relationships under objectives of achieving carbon neutrality and economic security, and intending to strengthen coordination between Canada and Japan to build sustainable and reliable global battery supply chains from upstream to downstream. While Chinese partnerships have historically been significant, we are confident that growing support from other global leaders will strengthen the foundation for a secure and sustainable supply chain in Canada and the US," said Trevor Walker, president and CEO, Frontier Lithium.

However, investment from Korean and Japanese multinationals into Ontario's junior space appear to be limited to select commodities used in EV and battery manufacturing. For gold-focused juniors, who are far more numerous in Ontario, such partnerships are unlikely to be an option.

Capital gains and AMT

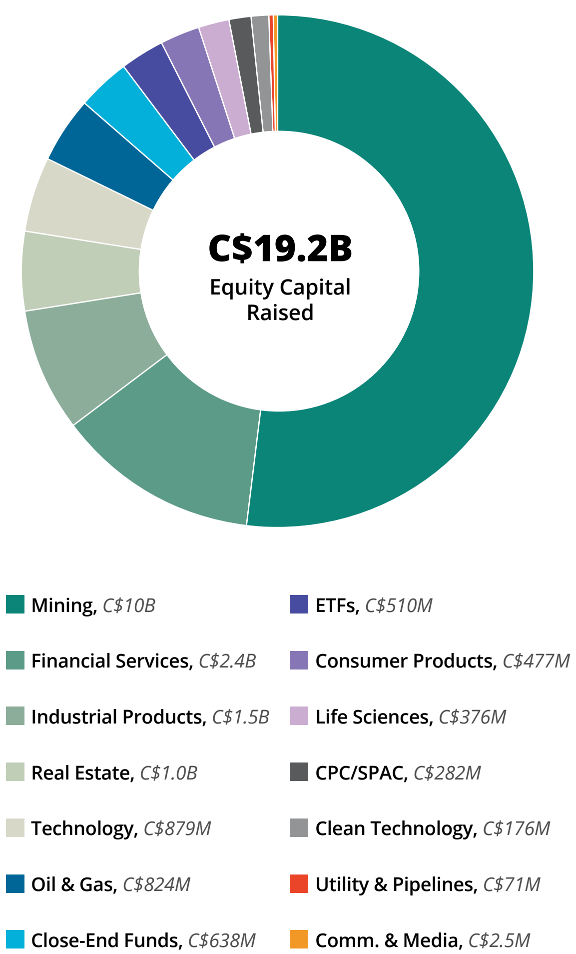
Canada's 2024 Budget announced increases to the capital gains inclusion rate. This, alongside changes to the Alternative Minimum Tax (AMT), were a major blow to Canadian exploration capital. In 2023, 83% of all exploration capital raised on Canadian exchanges was financed through flow-through shares (FTS), with 89% of that being charity flow-throughs. The changes were expected to effectively eliminate about a third of all FTS investment, coming as a major blow to Canada's explorers, which have relied on the FTS model since its inception in the 1970s.

In anticipation of the changes in April 2024, investors and donors rushed to take advantage of the existing regime before changes were enacted, leading to some deal-makers such as WEALTH Group (WCPD) reporting record deal-flows. "WCPD was extremely busy after the budget announcement as the government gave 60 days for people to sell assets, buy more tax reduction strategies, buy more charity flow, etc. so that they could collect more tax, and it worked for them as they collected approximately C$4 billion more in income tax than they would have in just two months. By 25 June 2024, when the capital gains went up, we had reached the equivalent of December 31, 2023, which was phenomenal," said Peter Nicholson, WCPD's president and founder.

The changes were opposed by swift lobbying from industry associations, donors, issuers and the financial firms that facilitate FTS deals to amend the AMT and restore the strength of the FTS model. The calls were heard by the government, and the requested changes have been put forth in a draft legislation that is hoped to be enacted soon. "I do not believe that the government understood the impact these changes would have on exploration risk capital, and as critical mineral exploration is a huge priority for the government, they have since advanced measures to reverse some of the changes that were compromising exploration capital," said David LeClaire, Oberon Capital's president and founder.

With Canada expecting federal elections in 2025, there is still uncertainty on how a new government would approach capital gains and the AMT, but FTS stakeholders have considered this in their lobbying efforts: "As part of lobbying activities, we are speaking to members on all sides of government in an effort to inform individuals on the connection between tax policy and mineral policy. Regardless of who wins power in the next election, we are hopeful that a new administration will be ready to hit the ground running, understanding the issues and concerns of the mineral exploration industry," said Kendra Johnston, managing director, PearTree Securities.

Equity Capital Raised by Sector, YTD Nov 2024



Source: TSX November 2024 MiG report

Wes Hall
Chairman and CEO
KINGSDALE ADVISORS

> "Executive teams are significantly more cautious around taking risks, and the sector is certainly less aggressive and active in deal-making activities than in the early 2000s."

It is hoped that the attention around the capital gains changes will elevate the importance of the FTS model to Canadian voters. At a time when juniors need all the financing they can get, the uniquely Canadian FTS model is more important than ever to Ontario's exploration success. "With charity flow-through today being a dominant part of the financing landscape for Ontario's mineral explorers, the model has become more understood, and the industry realizes the significant upside of minimizing dilution by raising funds through charity FTS," said Lisa Davis, CEO, PearTree Securities.

Alternative financing

Given the difficulty faced by issuers raising funds traditionally through equity, the attractiveness of alternative financing methods are becoming increasingly hard to ignore. Additionally, for the juniors that are pushed towards more exotic and complex financing packages, there are risks that a company's leadership may not be aware of, due to their novelty. "My advice to junior development companies based on the challenges we have seen in financings is two-fold. First, understand that these new alternative finance providers, while replacing equity, are not wearing an equity hat and will require additional protections that look very much like debt arrangements. Second, a financing plan should have a well thought out plan for shortfalls and timing delays, as these investors will be looking for some cost protection as well as some outside timing protection," said Michael Pickersgill, head of mining and metals, Torys LLP.

While most alternative forms of financing continue to have a limited impact on the overall financing landscape, the fallout of the commodity downturn in 2014/2015 forced many issuers towards streams and royalties, leading to the model's remarkable growth over the past 10 years, particularly in gold and silver, to the point where it is almost always considered as part of almost any major mining financing

Capital Gains & Alternative Minimum Tax

"The capital gains changes have reduced the value of taking risk, and consequently decreased investor risk appetite, with many disposing of assets before the changes were implemented."

David LeClaire, President and Founder
OBERON CAPITAL

"The general public was quite passionate about the capital gains increase when it was announced, and people will be looking for this information in the platform documents from all of the political parties."

Kendra Johnston, Managing Director
PEARTREE SECURITIES

"In the 2024 Budget delivered in April, it was announced that the capital gains inclusion rate was set to increase at the end of June. This significantly accelerated deal flow as the impact on FTS capital raises was unknown."

Lisa Davis, CEO
PEARTREE SECURITIES

package. However, this mode of financing is unlikely to help early-stage explorers who are feeling the financing pinch the most, as streaming and royalty companies typically prefer producing mines or advanced near-production projects. "Making a material investment into a junior trying to put a new mine into production is probably too high risk for a royalty company such as Metalla. The market has had trouble fully being able to value the optionality piece of this business," said Brett Heath, CEO, Metalla Royalty & Streaming.

Moreover, although the lackluster equity markets present opportunities for streaming and royalties to invest further left on the Lassonde curve, only a select few earlier-stage projects will stand out in a sea of thousands of development projects globally. "The capital markets for exploration and single-asset development companies have almost swung too far to a point where there is almost no equity available for them. As a royalty and streaming industry, we find that we do not have enough capital to support the entire mining industry, and additionally, you have to be conservative as you do not want the royalties and streams to be too large or overbearing, making the project uneconomical," said David Awram, co-founder and senior executive VP, Sandstorm Gold Royalties.

Many of Canada's biggest streaming and royalty companies are focused on precious metals, with no plans to branch out to other commodities. However, in recent years a number of financiers, such as Electric Royalties and Lithium Royalty Corp, have been attempting to pioneer the model in the energy transition metal space. Moreover, developers of such projects and traditional precious metals streaming and royalty companies are able to find creative workarounds: "Given a finite pool of capital available, there is a never-ending demand for financing from companies like Triple Flag. Additionally, we see an increasing number of projects catering to the green energy transition. Triple Flag is also able to support these projects – by underwriting by-product gold and silver streams on base metal projects, for example," said Sheldon Vanderkooy, CEO, Triple Flag Precious Metals.

Nonetheless, Ontario's juniors are continuing to find creative ways of financing their projects, particularly those in the critical minerals space. With EV and battery manufacturers scrambling to secure locally-sourced materials, we can expect to see them show increased interest in Ontario's upstream in the years to come, providing a new financial lifeline for many project developers. "OEMs continue to expand into the mining space to gain access to commodities. We have seen toehold investments to full-blown JV partnerships this past year. It has been a learning curve for both OEMs and mining companies as they try to collaborate effectively to bring products to the market," said Alexander Pizale, partner, Cassels Brock & Blackwell LLP. ■

Peter Nicholson

Founder and President
WEALTH GROUP (WCPD)

"Overall, 2024 was an excellent year, headlined by our record-breaking C$100 million deal with Skeena Resources in June, the largest Structured Flow-Through deal in our sector's history."

What have been the main developments at WEALTH Group (WCPD) over the past year?

WEALTH Group (WCPD) experienced a tremendous end to 2023 due to our Structured (or Charity) Flow-Through business and an equally strong liquidity provider base. Unfortunately, in 2022, we finished the year with approximately C$50 million on our waitlist, comprised of about 100 clients all searching for front-end products. At the time, we did not have enough liquidity providers, and the issuers were reluctant to raise much money at two or three-year market lows.

Our business is dependent on having strong liquidity providers and mining companies being happy with their stock; it has been a long time since there have been high spirits about stock prices, as we have been in a terrible bear market since 2011. Fortunately, December 2023 was fantastic, and we managed to essentially eliminate our waitlist. It was a similar situation for 2024. Overall, it was an excellent year, headlined by our record-breaking C$100 million deal with Skeena Resources in June, the largest Structured Flow-Through deal in our sector's history. We now look forward to an even busier 2025.

How have changes to the capital gains inclusion rate and the Alternative Minimum Tax (AMT) impacted WEALTH Group?

The first quarter of 2024 was average. Then, we were shell-shocked by the Federal Budget in April, proposing an increase in the capital gains inclusion rate and the AMT rate. AMT is the maximum you can buy of Flow-Through Shares, the maximum you can donate, or the maximum of interest deductibility. It is imposed on the wealthy so that they cannot get their taxes down to zero. In 2021, we could shelter 40 cents of every dollar of salary. But when the 30% Critical Mineral Exploration Tax Credit was introduced in 2022, the credit wore down the AMT. Although the government gave extra tax incentives, it decreased what we could shelter and how much someone could buy due to the nuances of the tax code. Therefore, this development reduced the volume our clients can buy to 30% of their salary.

The new AMT announced in April 2024 decreased this even further to approximately 19%, which is a huge difference from the 40% in 2021. This meant that we have had to find twice as many clients. On the one hand, the government gave all these tax credits, but on the other, they were turning off the tap for Charity Flow-Through opportunities.

WEALTH Group and Peartree Securities took the lead in entering into discussions with the government to explain the hit the Flow-Through sector will take. They were completely unaware of the pain they were inflicting. Once they realized the unintended consequences, they were willing to review and amend the AMT rules and suggested changes so that we are again able to shelter 30% of every dollar of salary.

WEALTH Group was extremely busy after the budget announcement as the government gave 60 days for people to sell assets and buy more tax reduction strategies, such as Charity Flow-Through.

Fortunately, early 2025 has brought more good news. With Parliament prorogued, and the Liberals seeking a new leader, it appears the proposed changes to the capital gains tax may not come into effect. This belief is further supported by the Conservatives publicly stating they will not pass it into law, should they form the next government of Canada.

Can you comment on WCPD's record charity flow-through deal with Skeena Resources?

WEALTH Group made history by closing a C$100 million deal to aid in the development of Skeena Resources' mining operations, the largest Structured Flow-Through deal in our sector's history. We had been working on this deal for two years, and it was the impending capital gain increase that was going to affect the corporate buyers that allowed us to collect 90 corporate clients to buy C$100 million in Charity Flow-Through. This financing was raised under a complete cone of silence to not influence Skeena's stock. ■

Denis Frawley

Partner

MOMENTUM LAW LLP

> "Unless and until processing is available in other locations, there will be a natural collision between the concerns over foreign control by Canadian governments and the fact that the customer and source of investment capital is outside Canada."

Can you update us on Momentum Law LLP and the state of the Canadian mining sector?

We have recently rebranded from Ormston List Frawley LLP to Momentum Law LLP to better reflect how we practice, and the value we bring to clients. There have been some positive trends for minerals like uranium but overall the landscape remains highly unpredictable. Unfortunately, this uncertainty aligns with the general state of the world. Overall, the difficulties juniors faced in 2023 have persisted into 2024, with no clear turnaround in sight. Uncertainty in the market persists, making it hard for exploration companies to anticipate any positive changes.

Despite record gold prices, for our clients we have not seen a substantial shift towards precious metals in their focus. This may change.

What are some recent court decisions involving First Nations rights that might impact mineral exploration and mining?

The Supreme Court of Canada's recent decision in Ontario (Attorney General) v. Restoule is a significant recent decision that reaffirms that First Nations are entitled to have their Treaty rights protected. The case relates to the historic breach of the Robinson-Huron and Robinson-Superior Treaties between the Crown, or Canadian governments, and the Anishinaabe peoples living on the lands north of Lakes Huron and Superior. I believe it will have long-reaching consequences. The court in that case recognized that the Treaty rights of Indigenous communities around Lake Huron had been ignored. Since 1898, the Government of Canada failed to update the compensation owed under the Treaties. In reviewing how Treaty payments had been arbitrarily frozen for 150 years, the Supreme Court's decision gave a scathing assessment of the Government's behavior.

The dollar amount of the damages that will have to be paid to affected First Nations, or to their members, remains to be determined. However, the Supreme Court ruled that it will step in and set the amount if the parties cannot reach a negotiated settlement by early 2025.

The decision is significant for the mineral resource industry because it recognizes the strength of the Canadian government's Treaty obligations to Canada's Indigenous communities, where treaties were reached.

I see the decision as another example of how important it is for the rights and interests of Indigenous communities to be recognized wherever mineral resource exploration and development intersects with the interests of those communities.

Can you discuss the impact of the new rules on Canadian and foreign ownership or critical minerals?

These rules are part of a broader trend where Canada is increasing its scrutiny of foreign investment in critical sectors, including investments in critical minerals and resources like uranium. The government's approach reflects a desire to retain control over strategically significant sectors. Directives like these are a measure to try to ensure that control over key resources stays within Canadian hands, which ties into national security concerns and aligns with the push for Western self-sufficiency in critical resources. It is indicative of a larger movement in Canada's policy landscape, which prioritizes geopolitical concerns because control over key inputs is seen as a fundamental lever for economic development. More recent developments between Canada and the US may lead to an increased emphasis on Canadian control or influence, if the trend away from an open international economic system persists and Canada determines that it is in the country's interests to identify and use key sectors as leverage.

Have Toronto's equity markets become less competitive than other markets like London?

The issue is not due to a heavier regulatory burden in Canada, in my opinion. Listing in places like the UK or the US is not necessarily easier. In fact, being a public company in the US, or in the UK, gives rise to higher compliance costs and regulatory burden than in Canada, or at least that is my experience. While Canadian markets have seen a decline in their relative importance, I think this is more due to increased capital availability elsewhere rather than listing or regulatory barriers.

I would also point out that the time it takes for a company to get listed in Canada is similar to, and often shorter than, the time needed in places like the US or the UK. ■

Ian Mitchell

Partner and Leader, National Mining Group

GOWLING WLG

Can you summarize Gowling WLG's mining practice in 2024 and trends in mining finance?

In 2024, capital markets activity in the mining space faced both challenges and opportunities. Financing remained slow, much like 2023, and although reports suggest an increase in funds raised over 2024, this is mainly due to a smaller number of larger transactions. That said, as we enter Q4 2024 we are seeing signs of recovery, which bodes well for future financing activity. Notwithstanding the slower financing activity, M&A activity has been high throughout 2024.

What are Ontario and the federal government's strengths and gaps in developing a critical mineral supply chain?

For Canada to build a critical mineral supply chain, accelerating infrastructure development is essential. Canada must turn its commitment to critical minerals into actionable steps to maintain investor confidence. Canadian governments should be thinking about to provide enough incentive to get projects built without needing the government and taxpayers to bear all of the risk. ■

Alexander Pizale

Partner

CASSELS BROCK & BLACKWELL LLP

Can you update us on Cassels Brock & Blackwell LLP's activity over the last year?

M&A has been very popular this past year. We see consolidation in the mining industry, with companies competing for talent, resources and financing.

What are the current trends and challenges in partnerships between OEMs and mining companies?

OEMs continue to expand into the mining space to gain access to commodities. We have seen toehold investments to full-blown JV partnerships this past year. It has been a learning curve for both OEMs and mining companies as they try to collaborate effectively to bring products to the market. It will be interesting to see how these relationships and vertical integration change the mining industry.

Have there been significant regulatory developments in the past year?

A big topic continues to be Investment Canada's approach to critical minerals and foreign investment, which has been seen as disrupting foreign investment, especially for junior companies. ■

Michael Pickersgill

Head of Mining and Metals

TORYS LLP

Where is Canada going wrong, and right, in pursuing its critical mineral strategy?

From what we see, Canada at the federal and provincial level has invested significant thinking into a thoughtful and committed plan. The issue remains in finding ways to execute on that plan, given the number of stakeholders, as well as the competing federal and provincial jurisdiction. There does not appear to be coordinated engagement at different levels of government and with key stakeholders, including, critically, Indigenous communities.

Another challenge is that the funds available for critical mineral projects, such as the C$1.5 billion from the CMIF, have not been allocated. Canada wants projects built, but we are not using the funds available in a way that can expand the development of mining in Canada. Interestingly, a significant amount of the money that has been earmarked to the critical minerals fund at a federal level has now been outsourced to expertise outside of the government to try and achieve the deployment of that capital, and I believe this is something that the government is doing right. ■

CRITICAL MINERALS

> We cannot afford to be hesitant in our funding of the critical minerals space as competitors in other countries are progressing rapidly.

Pierre Julien
Executive Vice President
DRA GLOBAL

Image courtesy of Vale Base Metals

Critical Minerals

Image courtesy of Green Technology Metals

The bedrock of a sustainable future

Recognizing the growing demand for critical minerals, the federal government announced up to C$8.4 million in conditionally approved CMIF funding for five critical mineral infrastructure development projects in the Sudbury and Timmins regions. This funding is crucial, as many critical mineral focused juniors are not enjoying the luxury of steadily rising commodity prices, unlike their gold-focused counterparts. "Raising capital for certain critical minerals like lithium, graphite and nickel has become challenging due to slower-than-expected EV adoption and a drop in the prices of those commodities," said Theo Yameogo, EY Canada & EY Americas mining and metals leader, Ernst & Young.

Despite the poor outlook for the short-term, the long-term fundamentals remain solid; climate change continues, and the world will have no choice but to make the switch to green energy. "It seems that investor sentiment for battery metals is low now, with a short-term focus prevailing over the long-term outlook. Battery metals are vital not only for electric vehicles but also for energy storage and renewable energy infrastructure, and applications that could drive demand even more than electric vehicles," said Brendan Yurik, CEO, Electric Royalties.

The pace of adoption and innovation in the EV and green energy sector is being mirrored in the upstream, with critical mineral miners pioneering novel extractive techniques and processing technologies every year. The financing crunch and competition from miners in jurisdictions with lower operating costs is perhaps another contributor to the sometimes-radical approaches Ontario's critical mineral miners are taking. "In Ontario, we have seen a significant demand for out-of-the-box thinking, particularly in the critical minerals space. One example of this is helping Generation Mining realize approximately C$89 million in capital savings on a project. We are also working with Vale Base Metals to de-bottleneck the Salobo mine and implement coarse particle flotation. This demand for cost-effective, fit-for-purpose solutions is high," shared Zimi Meka, co-founder and CEO, Ausenco.

Nickel

Nickel prices have experienced significant volatility in recent years, with prices declining steeply from the highs observed in 2022, primarily due to an oversupply driven by Indonesia's rapid production expansion. For Ontario's miners and prospectors, these developments present both challenges and opportunities. The global oversupply and subsequent price decline have pressured profit margins, leading to operational adjustments. However, potential production cuts in Indonesia could stabilize prices, offering some relief, and a large pipeline of multi-billion dollar EV battery plants in Southern Ontario could offer new sources of demand for locally sourced, more sustainable nickel.

In 2023, 62,501 t of nickel shipments valued at over C$2.5 billion were produced in Ontario, totalling 59% of Canada's nickel production by value, and the province is likely to retain its position at the top in 2024. The Brazilian mining giant Vale, alongside Glencore, is the nation's dominant nickel producer and recently spun off its base metal business, Vale Base Metals (VBM), into a standalone entity. Unlike many producers in the region, VBM retains significant smelting and refining capacity, even milling and smelting ore for other producing mines in the region, such as KGHM International's McCreedy West. "VBM has a significant mining complex in Sudbury and will be ramping up its US$2.94 billion expansion at Voisey's Bay through 2026. We are also looking at investing in a nickel sulphate facility in Bécancour, Québec, with JV partners to meet the needs of our customers. When you have the vertically integrated platform, as we do, it allows us to offer a wider variety of products to our diverse client base," said Shaun Usmar, CEO, Vale Base Metals.

With new leadership and a restructuring underway, VBM is focused on optimizing its significant asset portfolio and highlighting the value of its copper and nickel endowments, which were previously overshadowed by Vale S.A.'s giant iron ore business. "As for an IPO, we are using a notional three-year time frame. There is discipline that comes with being prepared for a possible IPO. There is no guarantee we will do one, but giving ourselves a three-year time frame to revitalize the business will allow us to revisit the idea with our two primary owners, Vale S.A. and Manara Minerals," continued Usmar.

The provincial Ontario government also recently committed over C$7 million to 17 projects focused on advancing critical mineral research and development. One of which is EV Nickel, which received C$223,552 to advance bioleaching technology and design a pilot plant in Timmins to produce clean, high-grade nickel. By taking this approach, EV Nickel hopes to avoid the middleman and directly supply future battery plants in Southern Ontario. "Traditional nickel mining in Ontario involves sending ore to external smelters and refiners, which adds significant costs and reduces margins. In contrast, bioleaching allows us to achieve better recoveries, lower milling costs, and produce end-products tailored to the battery supply industry, such as mixed hydroxide precipitate (MHP) or nickel sulfate," said Paul Davis, VP exploration, EV Nickel.

Fully funded for 2025, EV Nickel has an ambitious drilling program planned for its Shaw Dome project. With carmakers such as Honda and Volkswagen already breaking ground at their Ontario EV battery production facilities, juniors like EV Nickel are racing to capitalize on the impending boom in demand for locally sourced nickel. "Given the timeline for battery plant production in Ontario, we aim to secure partners to fast-track these projects and integrate them into the North American supply chain. We are seeking partners with the expertise to permit, construct and operate mines," said John Paterson, EV Nickel's Interim CEO.

EV and battery makers have been showing increasing interest in Ontario's nickel mining sector, pouring in money and taking an involved role in the upstream to secure future supply. However, the government's clampdown on Chinese investment in Canadian critical minerals has limited Canadian nickel miners' ability to raise funds. "The bulk of the battery supply chain that is not Chinese is being supplied by various Korean companies, and there is a natural opportunity for strengthening ties between Korean manufacturers and Canadian raw material suppliers in terms of becoming strategic partners for those companies," said Mark Selby, CEO, Canada Nickel.

Kristan Straub
CEO Canada
WYLOO

> "Currently, there is uncertainty about where the nickel produced in Canada will be directed and, as it stands, Canadian manufacturers will need to import nickel to support their battery production."

Canada Nickel has been developing its large Crawford Nickel project near Timmins. Now in the second stage of the federal permitting process, the company is finalizing its front-end engineering design to position itself for an FID in late 2025. To achieve this, the company secured investment from Agnico Eagle and Samsung SDI, bringing in expertise from both upstream and downstream players. "Samsung SDI came in not only as a shareholder but with the option to buy 10% of the project for US$100 million. Having one of the world's largest battery makers partner with us is a great endorsement of the work we are doing," continued Selby.

In the Sudbury basin, Ontario's main nickel production hub, Magna Mining recently acquired a portfolio of past producing mines and assets from KGHM International, including the producing McCreedy West copper mine. "These assets have been on our radar for a long time, and our team has extensive experience with them. The acquisition complements our Crean Hill and Shakespeare projects," shared Jason Jessup, Magna Mining's CEO.

To fund the development of its massively expanded asset portfolio, Magna Mining recently closed a C$22 million private placement, positioning the company well to develop its other projects in the Sudbury basin: "This financing will help us close the acquisition, and we expect to generate cash flow from McCreedy West. Our focus will be on reinvesting in McCreedy to increase production. While we may consider royalties or streams to fund Levack or Crean Hill, we are not looking at off-take agreements or bringing in partners at this time," continued Jessup.

Free of its non—core assets, KGHM International (KGHM) can now focus its attention on advancing its flagship Victoria project in Sudbury. "The Victoria project in Sudbury is particularly important for KGHM due to the unique mining ecosystem the region offers. Sudbury fosters strong synergies between companies such as Vale, Glencore and KGHM, which enables collaboration in production, shared infrastructure, and broader industry benefits. These partnerships significantly enhance the sustainability and efficiency of our operations, making Sudbury an ideal location for advancing the Victoria mine," said Steven Dunlop, general manager - Canada, KGHM International.

Over the next few years, KGHM will focus on obtaining the necessary approvals and progressing with shaft sinking operations. The mine plan includes incorporating new technologies, including BEVs, to produce more sustainable nickel sulfides. "Mining camps in Sudbury are continually seeking efficient methods of metal extraction to maintain competitiveness on the global stage. Domestic production must focus on innovation and sustainability to counter the competition posed by low-cost nickel producers such as those in Indonesia," continued Dunlop.

In Ontario's remote north, the 'Ring of Fire' has long been touted as the next major mining destination, but bringing a project to production has remained elusive for a number of reasons, ranging from Indigenous and environmental concerns to a lack of road infrastructure. Nevertheless, the region continues to attract explorers from across the world, with Australian major Wyloo making progress on a feasibility study for its Eagle's Nest nickel project. "This study will be crucial in determining whether we move forward into detailed engineering and subsequent phases. Our primary focus will be on engaging with First Nations, ensuring they are kept informed and involved throughout the feasibility process and beyond," said Kristan Straub, CEO Canada, Wyloo.

Lithium & PGMs

On the shores of Lake Superior, Generation Mining continues to advance its Marathon palladium-copper project. In 2024 the company managed to secure the final federal permits required to move forward with construction and is awaiting the final three provincial permits. "The Marathon project is currently one of the only advanced, permitted, critical mineral development projects in North America. It is on the cusp of being the only copper-PGM mine that can commence construction in the next 12 months," shared Jamie Levy, president and CEO, Generation Mining.

Further west on Superior's shoreline, Clean Air Metals is advancing its flagship Thunder Bay North (TBN) PGE and copper project, having completed a successful 1,700 m drilling program over the summer. Mike Garbutt, Clean Air Metals' president and CEO, outlined the company's next steps: "Our strategy is to continue down the development path and to derisk the project over the next year by moving to advanced exploration using our available cash with a goal to be in the position to execute a bulk sample in 2026. We will be restarting some studies and will hopefully put out a PEA in 2025."

Another contender vying to be Ontario's next critical mineral mine is Green Technology Metals (GT1) with its flagship Seymour lithium project, aiming for an FID in 2025. The company has plans to add value to the project by constructing a lithium

64 >>

Shaun Usmar

CEO

VALE BASE METALS

"I am excited about the value VBM can unlock as a whole, and I believe the role it will play in North American supply chains is highly under-appreciated."

Can you outline notable developments at Vale Base Metals (VBM)?

VBM plays a crucial role ensuring security of supply of nickel and copper with its significant critical mineral endowment in Canada and across the world. However, the value of our portfolio is not reflected in the share price of our parent company, Vale S.A. Recognizing this, Vale S.A. carved out the Base Metals business last year into a standalone entity, bringing in Saudi-owned mining investment company Manara Minerals as an investor (10% stake) in VBM. We are now focused on unlocking and showcasing the significant value of our endowment before considering a potential IPO.

What are the biggest challenges facing VBM?

In Brazil, we have about 30 million tons of copper reserves. To unlock the value there, we need to be as cost competitive as possible. The world needs more copper. We see the supply side struggling to meet demand with cost overruns and delays. We have district scale deposits in Brazil that are sources of significant copper growth potential. The challenge is to get our costs in a good place and buck the sector-wide trend of cost overruns and delays.

More broadly, we cannot overburden our operating assets, so we have initiated meaningful restructuring at VBM. I want to focus on reconnecting with the operations and invoke an owner-operator model, with an emphasis on decentralization, cost competitiveness and agility.

What advantages has VBM's vertical integration brought, and will this be a focus going forward?

VBM has a significant mining complex in Sudbury and will be ramping up its US$2.94 billion expansion at Voisey's Bay through 2026. We are also looking at investing in a nickel sulphate facility in the future in Bécancour, Québec, with JV partners to meet the needs of our customers. When you have the vertically integrated platform, as we do, it allows us to offer a wider variety of products to our diverse client base.

Does the current landscape in Canada present opportunity for M&A?

Currently, we do not have the multiple and the currency to go on offence and acquire assets. The best way to create value for investors at the moment is by unlocking the value potential in our mineral endowment and our organic pipeline. However, we will always keep an eye out for opportunities in the M&A space. Whether we are an acquirer or acquiree, the focus must always be on creating value for investors. If, for example, we were to be a potential target for an acquisition, the reality is that there is so little visibility of the true value of our mineral endowment, by virtue of being overshadowed by Vale S.A.'s giant iron ore business. Of the institutions that analyze and model Vale S.A., few build out the value potential that exists within VBM. This is one of the best kept secrets in the sector at present. We need to both unlock our value potential while showcasing it to the world.

What are your priorities in 2025 and is VBM anticipating an IPO in the future?

Our first priority is completing the restructuring to make VBM as competitive as possible and allow us to handle whatever the commodity cycle and price environment throws our way. Our second priority is to optimize our portfolio and run our assets as competitively as possible. Our overarching goal is to aggressively pursue growth and value through our copper endowments in Brazil.

As for an IPO, we are using a notional three-year time frame. There is discipline that comes with being prepared for a possible IPO. There is no guarantee we will do one, but giving ourselves a three-year time frame to revitalize the business will allow us to revisit the idea with our two primary owners, Vale S.A. and Manara Minerals.

We have a challenging capital allocation puzzle to solve to get the business in shape as global supply chains shift rapidly. I am excited about the value VBM can unlock as a whole, and I believe the role it will play in North American supply chains is highly under-appreciated. ■

Steven Dunlop

General Manager - Canada

KGHM INTERNATIONAL

Can you highlight KGHM International's recent activities in Canada?

KGHM International (KGHM) continues to make significant investments in Ontario, focusing heavily on advancing the Victoria project in Sudbury. We have now commissioned our wastewater treatment plant, hoist house, and substation and have advanced down past the 600 m station in the shaft. We have also mined copper, nickel, platinum, palladium, cobalt and silver from the McCreedy West deposit, culminating in a sales purchase agreement with Magna Mining. Simultaneously, we have funded exploration opportunities both in the Sudbury Basin and in northern Ontario where we hold greenfield properties with potential gold-producing sites. We have also engaged with Azimut Exploration in an option agreement for exploration of non-ferrous and precious metals in the very prosperous James Bay region in northern Québec, and we have already made the first finding.

Where is McCreedy West ore processed and refined?

The ore from McCreedy West is processed and refined in Ontario under long-standing agreements. The ore is mined and delivered for milling and smelting to facilities operated by Vale. We also collaborate with Glencore for nickel mining, ensuring that all processing remains within Ontario. From there, the supply chain is managed by companies like Vale and Glencore or other distributors.

What are the plans and key milestones for the Victoria Mine's future?

With key environmental and energy mitigations in place, alongside strong community partnerships, the project is well-positioned to meet its long-term objectives. Over the next few years, a major priority is obtaining approvals and progressing with shaft sinking operations, with a target of reaching around 750 m by the end of 2024. This will enable advanced exploration drilling as part of a multi-year development plan extending into 2025 and beyond. ■

Jason Jessup

CEO

MAGNA MINING

Could you outline the news of your recent acquisition and updates from your other projects?

In September 2024, we announced the acquisition of eight properties in Sudbury from KGHM International. The most notable of which is the producing McCreedy West mine, along with the Levack and Podolsky mines, both of which are currently on care and maintenance, plus five other exploration properties. These assets have been on our radar for a long time, and our team has extensive experience with them. The acquisition complements our Crean Hill and Shakespeare projects, and we plan to close the deal in Q1 2025.

We have agreements to sell ore from Crean Hill to Vale's Clarabelle mill and have already processed bulk samples through Glencore's mill. McCreedy West also has agreements with both Vale and Glencore. Even though we have permits to build a mill and produce our own concentrate at the Shakespeare project, we are deferring that construction until we have sufficient cash flow from other operations, and we will likely revisit it around 2027. For the time being, we will rely on the two existing mills in Sudbury.

What is your strategy for securing funding, considering the challenging financing environment?

We secured two debt facilities with Desjardins Capital Markets: a 3-year term debt facility for C$10 million and a C$10 million letter of credit for closure liabilities. This financing will help us close the acquisition, and we expect to generate cash flow from McCreedy West. While we may consider royalties or streams to fund Levack or Crean Hill, we are not looking at off-take agreements or bringing in partners at this time.

What message do you have for shareholders or potential investors regarding 2025?

2025 is going to be an exciting year for us. We will become a producing company primarily focused on copper, with significant nickel and precious metal by-products. ■

Mark Selby

CEO

CANADA NICKEL

What have been the main highlights of 2024 at Canada Nickel?

Canada Nickel started 2024 with two significant cornerstone investments from Agnico Eagle and Samsung SDI. Agnico Eagle provided the backstop for C$35 million of exploration funding, which allowed us to successfully execute testing on our 20-plus regional properties, and we expect to publish seven additional resources to our flagship Crawford nickel sulphide project by the spring of 2025. Samsung SDI came in not only as a shareholder but with the option to buy 10% of the project for US$100 million. Having one of the world's largest battery makers partner with us is a great endorsement.

In 2024, Canada Nickel also announced the receipt of a Letter of Interest from Export Development Canada for US$500 and another leading financial institution that provided a Support Letter for approximately C$500 million in potential debt financing. We launched our front-end engineering design process, which will position us to move towards a construction decision. We also completed the second stage of the federal permitting process with the filing of our environmental impact statement at the end of November 2024. ■

Jamie Levy

President and CEO

GENERATION MINING

How was 2024 for Generation Mining?

It has been an interesting year here at Generation Mining, and we have been receiving a steady stream of construction permits and approvals for our Marathon project, so that we now have all the federal permits and approvals required to move forward with construction. During the summer of 2024, we conducted some exploration around our existing project and undertook an optimization study for the design and operation. The Marathon project is on the cusp of being the only copper-PGM mine that can commence construction in the next 12 months.

What challenges have you faced through your journey?

Permitting was a challenge, but manageable with time and resources. We have excellent relations with local communities, including Biigtigong Nishnaabeg, but these relationships also take time and resources to nurture and develop, and it takes so long for new mineral projects to be developed that we must constantly ensure we maintain a social license for development. The other challenge which cannot be ignored is sourcing development capital. ■

Mike Garbutt

President and CEO

CLEAN AIR METALS

What have been the main recent developments for Clean Air Metals?

The markets have been tough for juniors over the past years, but fortunately, Clean Air Metals has a capable internal team and we have been de-risking our flagship Thunder Bay North (TBN) critical minerals project with the intent to meaningfully advance the project in anticipation of the upcoming market recovery. Our updated mineral resource statement published in June 2023 outlined a 14 million t indicated platinum-palladium-copper-nickel resource with approximately 2.4 million oz of platinum Eq, making TBN one of the rare primary platinum assets outside of South Africa.

What are the next steps to advance the TBN project?

Our strategy is to advance exploration using our available cash with a goal to execute a bulk sample in 2026, and will hopefully put out a PEA in 2025. We are excited to make meaningful advancements in moving the project ahead and position ourselves to take advantage of improved market conditions for PGEs in the very near future. ■

Trevor Walker

President and CEO

FRONTIER LITHIUM

Can you provide an update on the key developments at Frontier Lithium over the past year?

The past year has been transformative for Frontier Lithium, highlighted by our JV with Mitsubishi Corporation, which aligns with Ontario and Canada's critical mineral strategies and strengthens our role in advancing the PAK lithium-project. We have made significant strides in Phase One of the Definitive Feasibility Study (DFS), focusing on mine and mill development through infill drilling and site work, with the DFS on track for delivery in Q1 2025. Additionally, we secured C$6.1 million from the CMIF for pre-construction activities, including engineering, consultations with First Nation communities, and developing a 56 km access road.

How are Canada and Ontario's critical mineral strategies progressing and how can they be improved?

The strong alignment with both provincial and federal governments has been crucial to our success, with Ontario's critical minerals strategy providing a clear framework for projects like ours. Our JV partner reflects international confidence in the PAK lithium project and the region, while the government demonstrated a long-term commitment to northern Ontario's economic and social development. initiatives, especially through the CMIF, have fostered a supportive ecosystem for growth in the critical minerals sector, though most subsidies have focused on downstream manufacturing. We are confident that upstream investments will follow, and infrastructure investments are already benefiting our project by securing feedstock for lithium chemical production and de-risking the project. For upstream mining and refining, there is room for more targeted funding. Closing the supply chain loop requires addressing market failures by ensuring support for mining operations, and I am optimistic that this will be realized as the strategy evolves.

What are the main priorities for Frontier Lithium in 2025?

Frontier Lithium is focused on completing the DFS by Q1 2025, progressing permitting, and building partnerships with northern Indigenous communities and government stakeholders to secure a social license. ■

<< 60

conversion facility in Thunder Bay, aligning with Ontario's critical minerals strategy of building up a made-in-Ontario supply chain for EVs and battery manufacturing. "We recently secured nearly C$6 million in conditional funding from Ontario's Critical Minerals Infrastructure Fund (CMIF) to upgrade infrastructure for the Seymour project. We have been in close contact with agencies like Natural Resources Canada and the Strategic Innovation Fund, which are eager to support upstream development. While much of the initial funding has gone toward midstream and EV manufacturing, we are seeing a shift in focus to mining production, especially in northwestern Ontario," said GT1's managing director Cameron Henry.

In addition to the CMIF funding, GT1 received a further C$100 million from Export Development Canada to advance Seymour and, much like Canada Nickel, signed an agreement with a Korean battery maker to bring in financing and expertise. "Our partnership with EcoPro gives them the right to purchase up to 35% of Seymour and Root, providing a cornerstone for funding. We are also working on a PFS for a lithium conversion facility, with a potential JV with EcoPro, sharing a 60/40 split in their favor. These efforts are supported by discussions on syndicated debt with government agencies and commercial banks," shared Henry.

Thunder Bay will serve as an ideal location for future projects like GT1's lithium conversion plant, as it is home to Canada's furthest inland port. The Port of Thunder Bay's CEO Chris Heikkinen shared how the port is preparing itself for an anticipated uptake in demand from the many development projects in the region: "We received C$6.7 million in federal funding aimed at enhancing asset offerings and services. We are expanding our lay-down area, investing in several additional acres of exterior storage and staging areas for cargo. This is an area of high interest to the mining industry as it provides flexibility for companies importing equipment and infrastructure, allowing them to be held in the Port of Thunder Bay until they are needed at the mine site."

Like GT1, Frontier Lithium has also taken the vertically integrated approach with its PAK lithium project and chemical plant. Having secured CMIF funding from the government, Frontier Lithium also relied on the Canadian government's good relations with Japan to secure a JV with carmaker Mitsubishi on the Seymour project, which is slated to deliver a definitive FS in Q1 2025. "Partnerships with global players bring both financial investment and expertise, helping scale operations and integrate into global supply chains. These collaborations validate Canada's strategy of reducing dependency on traditional markets like China, and advancing toward a robust and competitive critical minerals ecosystem," said Trevor Walker, president and CEO, Frontier Lithium.

In just the last four years, Ontario has attracted over C$45 billion in new investments from global automakers, parts suppliers and EV battery manufacturers. If even a fraction of these projects come to fruition, the province's critical mineral miners need not look far to find willing buyers. ■

> "I anticipate greater support for North American supply chains. For example, Ontario is investing over C$40 billion in midstream and downstream EV development."

Cameron Henry

Managing Director

GREEN TECHNOLOGY METALS

What have been the key highlights and developments for Green Technology Metals in 2024?

It has been a challenging year, especially with lithium prices dropping, but we have managed to advance key projects, notably Seymour. We have made significant progress in permitting and studies for Seymour, and a major highlight was securing a framework agreement and strategic investment with EcoPro, a large Korean battery materials company. This partnership is crucial to developing an integrated supply chain for lithium chemicals in Ontario. We have also advanced drilling and resource expansion at our Seymour and Root projects and will soon begin drilling at the Junior lithium project.

What is your strategy for raising funds amid the challenging financing environment for lithium developers?

Financing has been tough with lithium prices down, but we have crafted a strategy to minimize risk. Seymour is our first project, and the goal is to get it into production efficiently with a low-cost approach. We are engaging with government export credit agencies and infrastructure banks, particularly in Korea, and we see strong interest in critical minerals projects. Our partnership with EcoPro gives them the right to purchase up to 35% of Seymour and Root, providing a cornerstone for funding. We are also working on a PFS for a lithium Conversion facility, with a potential JV with EcoPro, sharing a 60/40 split in their favor. These efforts are supported by discussions on syndicated debt with government agencies and commercial banks.

Has Canada's restrictive stance on foreign investments, particularly from China, impacted your financing efforts?

Canada's restrictive stance on Chinese financing has made things easier for us. Canada has been actively strengthening relationships with South Korea and Japan, particularly in critical minerals and infrastructure development.

What impact will China's dominance in EV manufacturing have on the global lithium market, particularly for emerging producers in Canada?

As Chinese companies capture more market share, Western automakers in Korea, Japan, and the US are increasingly concerned. To counter this trend, I anticipate greater support for North American supply chains. For example, Ontario is investing over C$40 billion in midstream and downstream EV development, but sourcing lithium hydroxide locally remains a challenge, as it is still imported from China and other regions.

Has the Canadian government's support of critical minerals continued into 2024?

The momentum from both federal and provincial governments is still very strong. We recently secured nearly C$6 million in conditional funding from Ontario's Critical Minerals Infrastructure Fund (CMIF) to upgrade infrastructure for the Seymour project. We have been in close contact with agencies like Natural Resources Canada and the Strategic Innovation Fund, which are eager to support upstream development. While much of the initial funding has gone toward midstream and EV manufacturing, we are seeing a shift in focus to mining production, especially in northwestern Ontario, which holds incredible mineral potential.

Do you foresee challenges in supplying the future lithium conversion plant in Thunder Bay?

I do not view feeding the conversion plant in Thunder Bay as a challenge. However, building and operating chemical facilities is complex, necessitating a highly experienced team and robust financial support; without these elements, many projects may fail to materialize. If we engage the right partners—particularly those with the required expertise—I believe the Thunder Bay facility will have sufficient feedstock.

Can you discuss the significance of scaling chemical facilities and EcoPro's role in this process?

Scaling chemical facilities effectively is essential, requiring discipline to start with manageable capacities before expanding. Some companies in Western Australia have rushed into large-scale capacities, which has led to challenges. At GT1, we are considering a staged development approach for our projects, and EcoPro is an excellent partner in this regard. They have multiple chemical trains and facilities successfully operating in Korea, having scaled at a steady and appropriate pace. EcoPro's expertise is invaluable; they are among the few integrated battery chemical suppliers of their size globally, handling everything from lithium hydroxide production to battery recycling and wastewater treatment.

What are your goals for 2025?

Green Technology Metals is focusing on expanding mineral resources at the Eastern and Western Hubs, with significant growth expected over the next year. We are also working on securing funding from export credit agencies and government bodies to prepare to read a positive FID by mid-2025. ■

TORONTO'S GLOBAL REACH

“Toronto is a true global center of excellence for the mining industry, especially from a financial standpoint.”

Rudi Fronk
Chairman and CEO
SEABRIDGE GOLD

GBR Series • ONTARIO MINING AND TORONTO'S GLOBAL REACH 2025

Image courtesy of Mwangi Gatheca at Unsplash

Toronto's Global Reach

Ontario's miners go global

The closure of Canadian major First Quantum Minerals' Cobre Panama open-pit mine in November 2023 shook the global mining sector. Cobre Panama was responsible for 1.5% of the world's copper supply and contributed around 5% of Panama's GDP. Since coming into operation in 2019, the mine has been marred by protests and legal issues, that cascaded into a Supreme Court decision to halt operations at the mine. In the fallout, Toronto-based streaming and royalty company Franco-Nevada suffered a 30% dip in its share price as it held significant long-term streams in the mine.

The incident has undoubtedly made many of Ontario's mining companies reconsider their approach to jurisdictional risk. "The main takeaway from the Cobre Panama incident is that we need to keep our portfolio diversified and not put too many eggs in any one basket. We are also focusing our attention on jurisdictions with a strong domestic mining industry rather than countries where the domestic mining industry is still being developed, and therefore, many issues still need to be ironed out," said Paul Brink, Franco-Nevada's president and CEO.

Argentina

The uncertainty around the Panama Cobre debacle was compounded by a Panamanian presidential election in May 2024. 2024 has been dubbed the biggest election year in human history by the UN, with half of the world's population having the chance to go to the polls. This has serious repercussions for the Canadian mining sector's approach to jurisdictional risk when developing projects abroad. New governments can also mean new opportunities, however, as seems to be the case in Argentina with the Milei government's efforts to deregulate its mining sector and attract foreign investment to turn Argentina into a major copper player, like its neighbor Chile. "Argentina has had a difficult history in terms of foreign investment, but the current course the government is on is extremely positive. There is terrific geology in Argentina, much of which is undeveloped, and having the Incentive Regime for Large Investments (RIGI) in place will help unlock investment in the mining sector," continued Brink.

This comes as good news to many of Ontario's players, such as TSX-listed Lithium Royalty Corp (LRC), which has royalties on Zijin Mining's Tres Quebradas and Ganfeng's Mariana mines in Argentina that are expected to soon generate new revenue streams for the firm. "In the hard rock space, we want to grow our portfolio in what we call the ABCs of hard rock - Australia, Brazil and Canada – and in the lithium brine space, we will be looking for opportunities in Argentina. Argentina's mining industry is becoming increasingly attractive with pro-business and pro-market reforms, which makes it an even more compelling region for LRC," said LRC's president and CEO Ernie Ortiz.

In August 2024, Argentina inked a deal with the US to draw more investment and trade in critical-minerals mining, bolstering investor confidence with foreign investment into the country's exploration sector to reach US$493.4 million by year-end, a 15.7% increase from 2023. Looking to tap into Argentina's RIGI scheme, Ontario's McEwen Mining is seeking to advance its renewable-powered Los Azules project in San Juan province through its 'McEwen Copper' subsidiary. Emboldened by falling inflation rates, reduced taxes and sweeping fiscal reforms, McEwen Copper is devoting up to US$2.5 billion to advance Los Azules, with construction slated for as early as 2026. "The new legislation is attracting large foreign capital, as evidenced by Rio Tinto acquiring Arcadium Lithium for US$6.7 billion and BHP closing a US$4.4 billion deal with Lundin Mining, and I believe this is just the beginning. We are seeing many positive measures enacted by the government," shared Rob McEwen, chairman and chief owner, McEwen Mining.

With environmental permits secured, the next step for the project is to complete a Feasibility Study in the first half of 2025. Thereafter, McEwen Copper may have to return its focus to Toronto's Bay Street to secure the funding for the gargantuan project: "Once these milestones are achieved, we plan to proceed with an IPO on the TSX, provided that market conditions are right," continued McEwen.

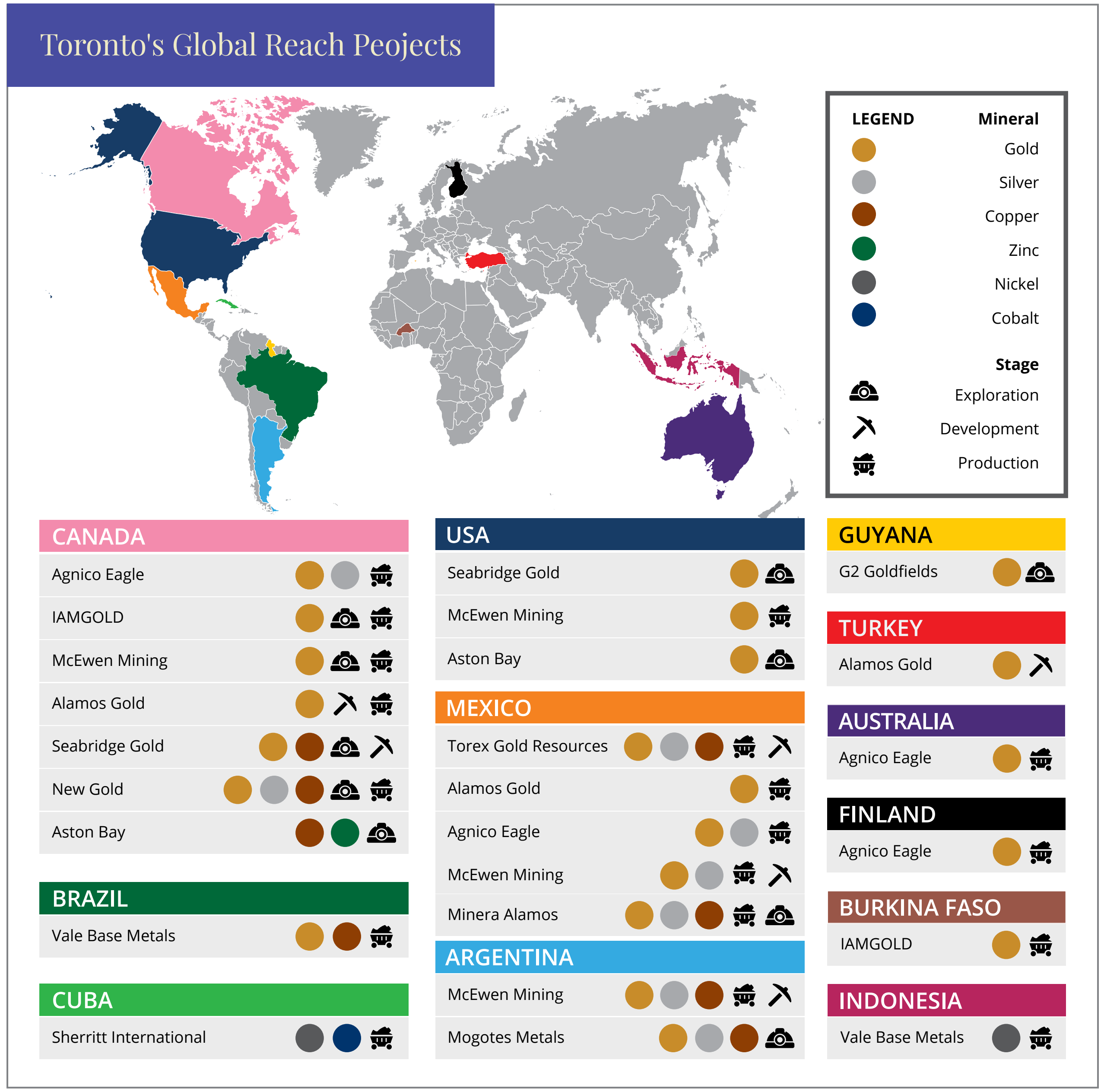
Spurred on by positive signals from the Milei government and large investments into the country by big players such BHP, the newly TSXV-listed exploration company Mogotes Metals is hoping to discover the next big copper-gold deposit at its Filo Sur project in the Vicuña district, near the Argentina-Chile border. Despite the challenging Andean terrain, exploration activity is booming. "While working in high-altitude environments presents challenges, we have been fortunate with excellent infrastructure, including road access, a reliable water supply for drilling and camp operations, and minimal logistical hurdles to date. Looking ahead, larger companies are expected to develop mines in the region before us, and their infrastructure developments will provide advanced support systems that will benefit our future operations," said Allen Sabet, CEO, Mogotes Metals.

When questioned on the prospects of Argentina's mining potential, almost all interviewees featured in this report were extremely bullish – from equipment suppliers seeking to expand abroad to leading financiers. "The Vicuña District is clearly positioned to become one of the world's next key sources of copper in a market facing a significant medium- to longer-term supply deficit," said Stefan Ioannou, base metals analyst, institutional equity research, Cormark Securities.

Mexico

Mexico is another Latin American nation that has seen a change in leadership in the past year with President Claudia Sheinbaum taking over from Andrés Obrador. This change has

71 >>



This infographic showcases Toronto-headquartered companies featured in this report with operations outside of Ontario.

EDITORIAL

Jody Kuzenko

President and CEO

TOREX GOLD RESOURCES

> "The free cash flow potential of Morelos is unparalleled – US$400 million a year at today's spot prices, part of which we will reinvest in exploration as we have only just scratched the surface there."

How did Torex Gold Resources' growth strategy progress in 2024?

We have had excellent success in 2024, a year that saw our share price outperform and grow by more than 100% as we have executed with excellence against our plan. It is the year we built Media Luna and added 10 years to our mine life at Morelos. Construction will be substantially complete in February 2025, when we will transition into tie-ins, commissioning and ramp up, with first copper concentrate production expected by the end of the first quarter. It is also the year that we added EPO into the mine plan, which sees us arrive at our goal of producing 450,000 oz per year through to at least 2034. Morelos is the foundational asset for Torex and we can now say with 100% confidence that the asset will be a cornerstone for the company's growth as we continue to look for opportunities to diversify in other jurisdictions.

How has Torex maintained a handle on costs at its operations?

The world has become a more expensive place to live and to work, and it is not just unique to mining that the cost of consumables and services has increased. Unequivocally, Torex is committed to running a profitable business in any metals price cycle. Commodity prices have historically been cyclical, but what is different moving forward is that with the geopolitical environment we are in, the predictability of metal price cycles is, to my mind, somewhat diminished. Torex's goal is to build a business that is profitable in any price cycle.

To reach this goal, we are creating a uniform mindset about spending from the top of the house to our team on the front lines, centered around the fact that although gold is trading at record highs, it does not mean that there is money to waste. We are focused on permeating a mindset of productivity, efficiency, and waste reduction throughout the organization - run your area of the business in the same cost-disciplined way you would run your household.

What is Torex's stance on the change in government in Mexico, and do you foresee any impacts on your Mexico operations?

I am personally encouraged and inspired that Mexico has elected a female president. There is cautious optimism around the Sheinbaum administration and we have already seen a willingness for key decision makers to engage in dialogue around relevant policy issues. Notwithstanding the changes in the political environment, our operations are well established, and we have the relationships, the reputation, and the quality of permit applications to be able to move our business forward in Mexico as we have planned.

Early impressions are that President Sheinbaum is principled, capable, and willing to listen and enter into dialogue with people who share in aspects of her vision. When you have this alignment between a government administration and industry, it creates the platform for success, and we are busy building relationships and having discussions to align the best interests of the country, our business and the mining industry in Mexico more broadly.

What can the mining industry do better to improve its public perception?

Communication, through various channels, with those who have preconceived ideas about mining that do not reflect today's reality is critical. The World Gold Council is doing a tremendous job in getting the message out about the importance of the mining sector for socio-economic development, the clean energy transition, and the criticality of responsibly producing the metals the world needs in order to function.

What are Torex's priorities for growth in 2025 and beyond?

Torex's future could not be brighter as the massive task of completing a US$950 million project will be behind us. 2025 will be a pivotal year as we conclude Media Luna and start building out EPO, and pivot back to generating positive free cash flow in mid-2025 which we can then apply to different uses. The cash flow potential of Morelos is unparalleled, and at today's spot prices, we will be generating US$400 million a year of free cash, part of which we will reinvest in exploration at Morelos as we have only just scratched the surface there. We will also return capital to shareholders, and we will look at opportunities for growth beyond Morelos. Torex has always said we want to look at the potential of M&A from a position of strength – and now that we have arrived at that position of strength, 2025 will be a year of expansion and growth, as we create 'Torex 3.0'. ■

<< 69

many Canadian miners holding their breath, as the jurisdiction was clouded in uncertainty for years with a defacto ban on permitting for open-pit mines. Fresh off the acquisition of Sabre Gold Mines, Toronto-headquartered Minera Alamos is looking to permit its Cerro de Orro mine in Zacatecas State so as to commence production in 2026. "The same party and coalition are in power, just with a different head, and investors have not received all the comfort and clarity they are seeking. In taking over leadership, President Sheinbaum wants to protect her predecessor's legacy whilst still charting her own path," said Minera Alamos' president Doug Ramshaw.

Underground projects, such as Alamos Gold's Puerto Del Aire (PDA) project, adjacent to its producing Mulatos mine in Sonora State, are more likely to pass the permitting process. Alamos Gold seems confident in the project, having recently announced positive drilling results that could potentially triple the mine life of the Mulatos district. "At our PDA project in Mexico, reserves have expanded to over 1 million oz, and we are advancing with permitting to enable construction in 2025," said Alamos Gold's president and CEO John McCluskey.

While Alamos' PDA project nears construction, Mexico's newest mine, Torex Gold Resources' (Torex) Media Luna, commenced production in February 2025. The nearly US$1 billion project is expected to generate positive free cash flow in mid-2025 and add 10 years of mine life to the Morelos property. This new cash flow will be critical in the coming years, as Torex has set its sights on developing another major project at Morelos – the EPO deposit. "The cash flow potential of Morelos is unparalleled, and at today's spot prices, we will be generating US$400 million a year of free cash, part of which we will reinvest in exploration at Morelos as we have only just scratched the surface there. We will also return capital to shareholders, and we will look at opportunities for growth beyond Morelos," shared Jody Kuzenko, Torex's president and CEO.

Despite the permitting obstacles in getting new mining projects going in Mexico, for those that succeed, mine owners in Mexico can reap the benefits of lower labor costs, proximity to Canadian and American markets, and abundant mineral reserves.

Cuba & Guyana

Unlike Argentina and Mexico, Cuba's one-party communist system and strained US relations make it a far less common jurisdiction to find Canadian mining operations. Nonetheless, the near-century-old Canadian company Sherritt International has operated the Moa mine and nickel upgrade facility in the island nation, where it has been involved in a JV for 30 years. While the longstanding US embargo on Cuba has certainly made operating in the country more challenging, efforts to mitigate China's dominance in critical mineral supply chains could potentially provide an avenue for Cuba to play a larger role in North American nickel and cobalt markets, given its strategic geographic location. "This shift away from Chinese and Russian supply chains creates an opportunity for Cuba to become a key supplier for North America, much like Indonesia's relationship with China. Sherritt is one of the few players with technical expertise to develop refining capabilities outside of China, making our

73 >>

Rob McEwen

Chairman and Chief Owner

MCEWEN MINING

What have been the main developments for McEwen Mining?

McEwen Mining saw a big change in its bottom line and went from a loss in 2022 to achieving net income in 2023, as our production increased and costs started coming down. We have been financing McEwen Copper independently and successfully raised US$450 million over the past two years, with a significant amount of funds being allocated to exploration, which will result in a resource update in the new year. Additionally, we have been outlining growth plans for our Fox Complex and Gold Bar assets. While increased production at the Fox Complex reduced unit costs, the main driver behind our increased profitability was the high gold price, rather than cost cutting measures.

What impact has the new Milei government had on Canadian miners' operations in Argentina?

President Milei's administration is focused on economic growth and attracting large foreign investments by implementing aggressive fiscal and monetary reforms. Significant for the mining sector is that the tax rate has been reduced from 35% to 25%, taxes on dividends and exports have been reduced, and they are trying to speed up the importation of capital goods. These positive changes could potentially increase our After-Tax NPV (8%) at Los Azules from US$2.9 billion to approximately US$3.8 billion at a copper price of US$3.75/lb.

The new legislation is attracting large foreign capital, as evidenced by Rio Tinto acquiring Arcadium Lithium and BHP closing a US$4.4 billion deal with Lundin Mining, and I believe this is just the beginning.

What is your strategy to finance the McEwen Copper, and are you considering an IPO in the future?

McEwen Copper aims to complete the feasibility study in the first half of 2025, alongside securing an environmental permit. Once these milestones are achieved, we plan to proceed with an IPO on the TSX, provided that market conditions are right. ■

Doug Ramshaw

President
MINERA ALAMOS

Dan Noone

CEO
G2 GOLDFIELDS

Leon Binedell

President and CEO
SHERRITT INTERNATIONAL

What have been the main developments at Minera Alamos over the past year?
With the majority of issues behind us, we are again ramping up operations at Santana. Minera Alamos has also been applying for permits at our Cerro do Oro project, and we expect to obtain these permits in the first half of 2025, start construction in the second half of 2025, and be in production by 2026. These two developments are a step change in our production and cash-generative capabilities and should allow people to forget the negative sentiment that has seemingly beset Mexico over the last few years.

Can you outline the strategy behind your recent acquisition of Sabre Gold Mines?
Sabre Gold's Copperstone mine has always been viewed by our team as a complementary, low-capital, operation that provides incremental production growth, resource enhancement and blends a second jurisdiction to our foundations in Mexico. It presents a strong likelihood of a dual track development with Cerro de Oro during the second half of 2025. ■

Can you summarize the key developments for G2 Goldfields in 2024?
The year commenced with a major endorsement from AngloGold Ashanti, who made a substantial investment in the company, validating our assets and providing share price stability. This was followed by an updated MRE in March, which revealed a resource exceeding 2 million oz, driven largely by the 2023 Ghanie Zone discovery.

This past summer, G2 raised C$29 million from a European fund, and AngloGold Ashanti's participation brought the total financing to C$42 million. This has provided a significant runway to focus on exploration.

Why invest in Guyana?
As an English-speaking country with a judicial system based on British law, it offers a stable and familiar environment for international investors. The presence of major mining companies signals strong confidence in Guyana's potential as a prime destination for exploration funding, with its largely unexplored gold belt and established deposits. Guyana is quickly becoming a hotspot for gold exploration. ■

Can you give a brief introduction to Sherritt International?
Our current operations include the Moa mine and nickel upgrade facility in Cuba. In Alberta, we refine metals such as nickel and cobalt, guiding production in 2024 to 30,000-32,000 t of nickel and 3,100-3,400 t of cobalt. We also have a significant fertilizer business in Alberta, recycling waste streams from our metals processing combined with ammonia. In Cuba, we also operate two natural gas power plants, representing about 10% of the national grid.

What is Sherritt's focus on technology and refining within the battery supply chain?
We have developed a process flow sheet that converts intermediates via midstream processing to produce high-purity nickel and cobalt sulfates, two fundamental feedstock materials for the EV supply chain. With this flow sheet, we have also focused on addressing a key environmental challenge, specifically reducing the production and disposal of sodium sulfate effluent, which has been a barrier in metals refining and precursor manufacturing. ■

<< 71

Cuban mine a key asset in the energy transition and supply chain diversification in North America," said Leon Binedell, president and CEO, Sherritt International.

This adaptability of Canadian miners is also evident in South America, where the resource boom in Guyana has drawn significant attention from investors. With its major oil discoveries driving the highest GDP growth globally, Guyana has become a hotspot for mineral exploration, particularly in the untapped Guiana Shield. TSX-listed G2 Goldfields (G2), for example, managed to raise C$42 million in the summer of 2024 to fund an ambitious drilling program in the Oko area. Having recently spun out some non-core assets through its 'G3 Goldfields' subsidiary, G2 is now focused on releasing an MRE for its core OKO project. G2's CEO Dan Noone already has ideas for the company's next potential move: "We are monitoring our neighbor, who is approximately 12 months ahead in their environmental and regulatory approvals and is targeting permits by mid-2025. There are potential synergies between our projects, and there may be an opportunity to align our operations, with the next six months being crucial in determining how these elements come together."

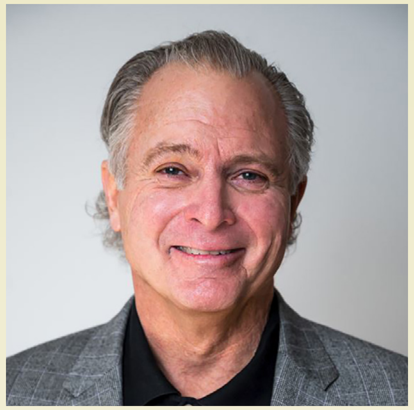
Canadian exploration
Closer to home, Ontario's explorers continue to make discoveries from the rugged coastal mountains of BC to the harsh arctic tundra of Nunavut. One such is Aston Bay, which has been advancing its flagship Storm Copper project in a JV with Australia-based American West Metals. The two companies are devising ways to navigate the challenging and remote geography and hope to release a PFS in early 2025 to then commence the permitting process. "Although we have thousands of tons of copper at the surface, it holds no value unless we can efficiently bring it to market. Our partner, American West Metals, understands this and planning is underway to use innovative methods to economically extract, process and ship the high-grade ore, moving away from traditional methods that may not work well in the Arctic environment," shared Thomas Ullrich, CEO, Aston Bay.

As climate change continues to thaw Arctic ice creating new shipping lanes, analysts predict that the region will play an increasingly important role in global geopolitics, which could lead to increased infrastructural investments and governmental support for projects in Canada's far north. "The US government has expressed interest in our strategic location near the Northwest Passage. This area is crucial for North American sovereignty and a source of critical metals, leading to grants from US entities for companies developing critical mineral mines in the region," continued Ullrich.

In BC, Seabridge Gold's gargantuan Kerr-Sulphurets-Mitchell (KSM) gold and copper project obtained its "Substantially Started" designation, meaning its permits are no longer at risk of expiring in 2026. This de-risking gives Seabridge Gold a clearer path to completing a JV with a major mining company that can help bring the financial and technical muscle to develop the world's largest undeveloped gold and copper project (by resources). Rudi Fronk, Seabridge Gold's chairman and CEO, shared some of the challenges of undertaking the project: "Permitting a massive project like KSM costs more and takes longer than exploring to find it. The major companies are scouring the globe for potential new projects, especially in critical metals like copper, and before they spend the effort to evaluate the technical merits of a project, they want to know if it has a reasonable path to permits."

With close to a billion dollars invested in KSM since acquiring it in 2001, Seabridge Gold is being very selective with who it partners to complete the project. "Our JV partner must have a track record of building and operating mines of a similar scale to KSM. In addition, our partners will need to have a strong enough balance sheet to raise the capital externally or sufficient cash flow from operations to internally fund the development of KSM. From a social perspective, we are looking for a proven track record in dealing with ESG matters," continued Fronk.

Like Seabridge Gold, New Gold has also invested significantly in BC – commissioning its C-zone development at its New Afton property. Despite early challenges brought about by the Covid pandemic, the project was delivered ahead of schedule, announcing commercial production in October 2024, pushing the mine to outperform its guidance for the year. "The biggest milestone at New Afton was the commissioning of the gyratory crusher and conveyor system eight weeks ahead of schedule in October 2024, setting up the C-Zone for high capacity, low-cost, low-emission ore transportation for the life of the mine. We will take advantage of the existing excess processing capacity at our mill to ultimately process 16,000 t/d from C-Zone," shared New Gold's president and CEO Patrick Godin.
Despite the global uncertainty brought about by a record number of elections and ongoing conflicts, Toronto's reach continues to extend across the globe. ■



> Permitting a massive project like KSM costs more and takes longer than exploring to find it.

Rudi Fronk

Chairman and CEO

SEABRIDGE GOLD

Can you update us on Seabridge Gold's activity through 2024?
Our most important achievement was obtaining the 'Substantially Started' designation at our KSM megaproject in BC. This designation means our permits, which would have expired in 2026, are now permanent. This de-risking now gives us a clear path to completing a JV with a major mining company.

The second major accomplishment in 2024 was exploration success at our Iskut project, also located in BC. We think we may have found another billion+ tonne gold-copper deposit. Since we launched the Company in 1999, we have made our name by identifying and buying early-stage exploration opportunities at low valuations and then growing them through exploration.

What is the advantage of being headquartered in Toronto, given your major projects are in BC?
Toronto is a true global center of excellence for the mining industry, especially from a financial standpoint. The big banks have their HQs here with dedicated mining divisions, bankers and analysts who set the market for evaluating projects and moving them to production. So, having a presence in Toronto is key. We maintain a strong operating presence in the provinces in which we operate, namely BC, the Northwest Territories, and, more recently, the Yukon. In each of the jurisdictions, we strive to maintain strong relationships with the regulators and, more importantly, with our Indigenous neighbors.

What is your experience with the permitting process for projects?
Permitting a massive project like KSM costs more and takes longer than exploring to find it. The major companies are scouring the globe for potential new projects, especially in critical metals like copper, and before they spend the effort to evaluate the technical merits of a project, they want to know if it has a reasonable path to permits.

No matter where you operate, permitting mining projects is challenging. At Seabridge Gold, before we enter the permitting process, we strive to get Indigenous and local communities onside by investing in social license. Whatever the rules are, you can be sure that the underlying issue is whether you have proved you are a good partner to local communities. This takes years of concerted effort. Social license aids regulators in making their decisions, and support, especially from Indigenous partners, carries a lot of weight when applying for permits. Without support from First Nations and other nearby communities, you are unlikely to get permit approvals.

How important is divestiture for Seabridge Gold?
Divestiture only comes into play for us when we determine that a project can no longer drive additional value to our shareholders. At that point, we look to sell such assets and then reinvest proceeds in projects we believe can continue to drive shareholder value.

What is your opinion on the junior mining market in 2024?
Over the past couple of years, the junior market has been starved of capital. Without additional funding soon, many companies may die on the vine. Even with gold prices at all-time highs, gold mining equities are very cheap relative to gold on a historical basis. Western investors are holding very little exposure to gold, while Eastern investors continue to buy physical gold regardless of price. We believe that Western investors will soon return to the gold space, and when they do, we will start to see a better correlation between the gold price and gold mining equities.

What criteria are important when selecting a JV partner for the KSM project?
Our JV partner must have a track record of building and operating mines of a similar scale to KSM and will need to have a strong enough balance sheet to raise the capital externally or sufficient cash flow from operations to internally fund the development of KSM.

What is Seabridge Gold looking to accomplish in the coming years?
The most important objective is to secure a JV partner for KSM willing to complete a Bankable Feasibility Study and then commit to constructing the project. When built, KSM is projected to be one of the largest gold and copper mines in the world. During the initial 33 years of mine life, we expect to produce more than 1 million oz/y plus nearly 200 million lb/y of copper. ■

> Managing costs in Nunavut involves adapting to harsh geography and weather.

Thomas Ullrich

CEO

ASTON BAY

What is Aston Bay's current focus?
Aston Bay's focus is advancing the high-grade Storm copper project in Nunavut toward development with partner American West Metals. The company is free carried for all expenditures at the project until a bankable feasibility study and decision to mine. Aston Bay is also looking to replicate the success of Storm with its Epworth copper project, also located in Nunavut, where surface samples have yielded up to 61% copper with 5,600 g/t silver as well as cobalt, zinc and gold.

What are the key aspects of the Storm copper project?
The Storm copper project consists of two main components: the discovery potential for large, high-grade "Copperbelt-style" deposits and the substantial amount of copper already identified at the surface. Although we have thousands of tons of copper at the surface, it holds no value unless we can efficiently bring it to market. Our partner, American West Metals, understands this and planning is underway to use innovative methods to economically extract, process and ship the high-grade ore, moving away from traditional methods that may not work well in the Arctic environment.

Since partnering with American West Metals, we have significantly advanced the development of the Storm Project. They have worked aggressively and smartly to enhance the project, successfully completing a drill program that has totaled over 22,500 m in 2024 alone. This program has expanded the known zone of mineralization to calculate the maiden resource for the deposit in late 2024 while also making new discoveries.

We anticipate that our CIM-compliant maiden resource estimate will be released in 2024, followed by a PFS in early 2025. This will allow us to begin the permitting process, which we estimate will take about 18-24 months.

How does the cost of exploration in Nunavut compare to other regions?
Managing costs in Nunavut involves adapting to harsh geography and weather. The exploration phase is shortened by limited daylight and weather in winter, but 24-hour daylight boosts efficiency in summer. During exploration helicopters are critical for crew and equipment moves and bad weather can impede work. We are heading into the development phase, however, where trucks will replace helicopters, reducing delays. For example, the nearby Polaris mine operated year-round under similar conditions. Our island location also aids shipping, the cheapest transport method. Recently, we delivered C$4 million in materials via sealift, slashing costs compared to air transport. The flat terrain allows easy access from the coast, simplifying logistics further.

Due to the Arctic's growing geopolitical significance, do you foresee the Canadian government being more supportive of mining in the region?
I can share that the US government has expressed interest in our strategic location near the Northwest Passage. This area is crucial for North American sovereignty and a source of critical metals, leading to grants from US entities for companies developing critical mineral mines in the region. Canada has contributed to these efforts as well, and we expect their participation to increase. The Nunavut government has also been supportive, recently awarding us grants for drilling.

Residents of Resolute Bay, though not originally from the area, are familiar with mining due to the nearby Polaris mine, which operated successfully for 20 years. Exemplary reclamation efforts by previous operators have fostered a supportive mining culture. We aim to build on this by engaging local communities and ensuring they benefit from job opportunities tied to our project.

What is Aston Bay's approach to navigating the current challenging financing market?
Aston Bay has faced significant challenges in financing over the last year. However, we have successfully raised funds, including over C$2 million in October 2023 and an additional C$4 million in April 2024. We are fortunate to partner with American West Metals. Since they are a fellow junior exploration company, our goals and values are aligned.

What are the anticipated costs and environmental considerations for the Storm project?
The CapEx for the proposed mine is projected to be around C$50 million. We are implementing innovative ore-sorting techniques that are environmentally friendly. The ore-sorting process is dry, which means no water is consumed, and in the jigging process, any water used will be recycled. This approach will result in no effluent and no sulfide tailings, contributing to a small environmental footprint. ■

SERVICES

> "Ontario is a fantastic mining market with a lot of experienced professionals. The projects here are substantial and world-class, and the overall business environment is very positive."

Zimi Meka
Co-Founder and CEO
AUSENCO

Image courtesy of Cementation

Image courtesy of Green Technology Metals

Greener Mines, Stronger Communities

Ontario's ESG story

ESG as a principle developed around the world alongside climate consciousness in the late stages of the 20th century, and mining, as one of the most environmentally harmful industries at the time, immediately came under its scrutiny. However, over the last 40 years, advances in technology, partnerships with Indigenous groups, and changes in management techniques have enabled the industry to increasingly avoid the negative impacts of their operations.

Global initiatives such as Towards Sustainable Mining (TSM), The Copper Mark, the Initiative for Responsible Mining Assurance (IRMA), the International Council on Mining & Metals (ICMM), and the World Gold Council's Responsible Gold Mining Principles (RGMPs) have been developed to ensure mining companies are held to a high standard in their ESG reporting and actions. These worldwide initiatives have been supported by programs within Canada, for example, the Mining Association of Canada's Towards Sustainable Mining program and the Prospectors and Developers Association of Canada's Driving Responsible Exploration (DRE) resources.

Within the industry, there has been a shift to adopting nature-positive policies rather than merely those of no harm, something which has been commonplace in Ontario for the best part of 30 years. C$1 billion was spent in the early 1990s on sulfur dioxide abatement programs in Sudbury, and in 2018, Vale finalized its $1-billion Clean AER project, marking one of the most significant environmental investments in Ontario's history.

According to the Ontario Mining Association (OMA), the province's mining companies adopt clean technologies 138% above the industry average. Furthermore, Vale and Glencore worked with the government on the regreening program in Sudbury, planting 10 million trees and roughly 2 hectares of forest floor. The OMA's 'Industry Survey' also highlighted how 75% of mining companies in Ontario have implemented carbon pricing schemes, with 40% establishing long-term net-zero targets. According to Priya Tandon, president of the OMA: "Ontario has a great reputation for ESG excellence. Maintaining and enhancing this reputation is critical."

Annually, EY releases their report entitled 'EY's Top 10 risks and opportunities for mining and metals companies.' ESG factors feature repeatedly, and in the 2025 edition, 'Environmental Stewardship' was placed second, with 'License to Operate' and 'Climate Change' in fifth and seventh respectively.

The Port of Thunder Bay is the furthest inland port in Canada, serving the logistics and transport sector of the mining industry. The environmental advantages of using inland ports such as Thunder Bay are numerous, particularly when transporting oversized cargo. Bypassing rail and road traffic is not only more efficient but also has huge benefits for the climate. "As the conversation around environmental impact continues to shift towards sustainable transportation, ports are well-positioned to benefit as maritime and rail shipping remain the most environmentally friendly ways to transport large equipment and infrastructure," said Chris Heikkinen, CEO of the Port of Thunder Bay.

Other businesses serving the mining industry are also benefitting from an increased focus on the environment. One example of this is CIMA+, an engineering and project management firm that is collaborating with public utility companies in Canada, integrating electricity access to mine sites. Timothée Lescop, senior VP of resources and industry, explained: "The mining industry has become more crucial in recent years, particularly with the shift towards green energy, which has increased the demand for resources. While the industry has evolved positively, it still faces significant challenges, especially around ESG and environmental standards."

Deloitte, one of the largest consulting firms in the world, has seen ESG become central to their clients' strategies moving forward and has developed specialist capabilities recently to help deal with these demands. "From a sustainability perspective, there continues to be pressure to adopt sustainable practices and reduce carbon emissions, with regulations and shareholder expectations pushing companies to invest in greener technologies and practices," said Van Ramsay, partner, national leader, mining & metals at Deloitte Canada.

Despite the obvious appetite and necessity for adopting and implementing ESG policies for a more sustainable future, industry experts still believe that more must be done before mining companies can fully achieve their goals. "Green technologies are not cheap, and so asking mining companies to implement these on their own can be difficult. Governments need to step in more and contribute funding to make the energy transition successful," said Kris Homer, senior VP for minerals and metals, west for Wood engineering consultants.

In KPMG's 'Digging deep: Risks and opportunities in mining' survey, ESG once again was a key talking point. According to Heather Cheeseman, partner, national mining leader for KPMG Canada: "The majority of operators told us that investors' ESG expectations are not clearly understood or even consistent across the market."

As well as inconsistent investor expectations and expensive implementation costs, competition from less environmentally conscious markets abroad is impacting the Canadian mining sector. Demand for Indonesian nickel remains high, and Canadian producers struggle to produce cleaner nickel at an attractive price. Theo Yameogo, EY Canada & EY Americas mining and metals leader, commented: "Raising capital for certain critical minerals like lithium, graphite and nickel has become challenging due to slower-than-expected EV adoption and a drop in the prices of those commodities."

To counter this, the Ontario Ministry of Mines is promoting the province as a responsible and sustainable source of nickel. "The West does not want nickel from Indonesia, as it is funded by China, fueled by coal, and has poor tailings management. Here in Ontario, we have nickel to replace the Indonesian supply. There has been momentum and urgency over the last year, with Washington D.C. realizing the importance of critical minerals from a security standpoint," claimed George Pirie, Minister of mines, Government of Ontario.

To further emphasize the importance of ESG in Ontario's critical minerals production, the 'Building More Mines Act' aligns with UN Sustainable development goals, supporting climate objectives and infrastructure.

Complementing companies' ESG policies, the provincial and federal governments continue introducing new legislation and disclosure standards to improve companies' operations. In May 2023, the Fighting Forced Labor and Child Labor in Supply Chains Act was introduced nationally, and already 46% of mining companies disclose how they are addressing the issues of modern slavery in their operations and supply chain, according to PwC's 'ESG Reporting Insights Analysis' report. KPMG estimates that soon, 90% of companies will meet the act's requirements, demonstrating how mining is committed to being a world leader on this issue.

The Corporate Sustainability Reporting Directive (CSRD) and the C-59 greenwashing bill both aim to ensure that companies' promises surrounding ESG are not empty and are practically implemented in operations. Thorn Associates was awarded the 2025 Canada's Clean50 award, which acknowledges its national impact on sustainability. Emily Thorn Corthay, founder and CEO of the company said: "We are observing clients advance in their Scope 3 maturity, guided by the International Council on Mining and Metals' framework. Climate risk assessment is now moving toward quantitative risk evaluations, with financial values assigned to potential risks."

Strict regulations and reporting standards ensure that

83 >>

> Raising capital has become the number one concern in the sector.

Theo Yameogo

EY Canada & EY Americas Mining and Metals Leader

ERNST & YOUNG

How has the Canadian mining sector evolved in 2024?

The mining sector experienced significant uncertainty in 2024 due to political shifts, including the US presidential election and elections in major economies such as India, Brazil, France and the UK. This, coupled with the global nature of the commodity cycle, had a direct impact on Canadian metals and mining companies operating worldwide. However, as 2024 concludes, the environment is becoming more predictable. Looking ahead to 2025, downward trends in interest rates and increased stimulation of the OECD economies are expected to drive growth in areas for which minerals and metals are essential.

What are the key changes in EY's 2025 'Top 10 risks and opportunities for mining and metals companies' report compared to prior years?

The key change is that raising capital has become the number one concern in the sector. While it has always been a focus, it now dominates the agenda. The recent movements in the deals environment highlight the seriousness with which companies are reevaluating their portfolios. JVs, as we predicted in previous reports, are also increasing as companies look for collaborative ways to strengthen their positions.

Raising capital for certain critical minerals like lithium, graphite and nickel has become challenging due to slower-than-expected EV adoption and a drop in the prices of those commodities. Additionally, cheaper yet less environmentally friendly nickel production in Indonesia has impacted global prices. Despite these challenges, copper remains a strong performer with consistent demand and successful capital raising, while uranium is seeing a resurgence due to increased demand for nuclear reactors, boosting its stock prices and production activities.

How can Ontario's mining sector tackle funding challenges for juniors?

The financing challenges that juniors are facing stem in part from an oversupply of projects, which dilutes focus from top-tier opportunities. While large-scale projects consistently secure funding, political barriers often hinder investment into smaller projects. Issues such as strained relations between countries and restrictive governmental systems prevent the free flow of capital, even when funds are available. Companies have recently considered relocation in order to access financing, but such decisions are temporary and unsustainable. Resolving political conflicts and improving international collaboration could help restore investment flow. Countries like India and China hold potential for significant investment growth in Canada's mining and metals sector.

To attract retail investors and pension funds, the sector needs to address long, inefficient permitting processes and regulatory uncertainties that deter investment. One potential solution is restructuring business models so that exploration projects are tied to producing assets, enabling earlier returns. Additionally, government support, such as tax incentives and minority stakes in critical mineral projects, can build confidence. For instance, if the government were to take a 25% stake in Canadian lithium mines, it could demonstrate commitment, attract investors, and help secure off-take agreements. Such measures could potentially bolster the junior mining sector and make it more competitive.

Is cybersecurity a significant concern for Canadian mining companies?

Cybersecurity remains a significant threat to the sector, especially as companies increasingly adopt various types of technology and automation in their operations. Digitization of operations exposes companies to potential cyberattacks on automated systems such as ventilation, asset management and mine processes. These threats are not limited to ransom attacks but extend to state-sponsored actors who could compromise critical infrastructure like tailings dams, potentially causing environmental disasters and damaging the credibility of the companies. Cybersecurity is becoming an integral part of health safety, and environmental (HSE) considerations due to its potential to impact these areas directly.

As the sector advances technologically, the integration of automation, AI and remote systems heightens the need for robust cybersecurity postures. This growing reliance on digital systems will likely push cybersecurity back to the top of risk rankings.

What are your priorities for 2025?

The mining industry thrives on trust, with professionals often maintaining connections for decades; I personally still work with clients and colleagues from over 20 years ago. In 2025, our focus will be on helping clients strengthen trust in markets, people and the predictability of their performance. By staying client-focused and committed to enhancing their businesses, we deliver on our mandates to help drive their growth and success to the next level. ■

Van Ramsay

Partner, National Leader Mining & Metals

DELOITTE CANADA

What are the key highlights from the 2024 'Tracking the Trends' report?

Deloitte's annual 'Tracking the Trends' report delves into the critical issues affecting the global mining and metals industry. Our 2024 report highlights several trends shaping the industry, with a particular focus on the growing significance of labor. Labor and productivity challenges in Canada are increasingly recognized as limiting factors for economic growth.

What is your view on Ontario's regulatory landscape and its impact on mining companies?

The permitting process in Ontario and across Canada remains a significant issue despite new funds and programs aimed at supporting companies. While efforts like exploration investment credits and funding for critical minerals are helpful, the slow progress in streamlining permitting is hindering investment and development.

What are your plans for Deloitte in the mining and metals department by 2025?

Deloitte will continue to focus on areas such as AI, sustainability, cost reduction, and performance improvements to shape our clients' strategies. ■

Heather Cheeseman

Partner, National Mining Leader

KPMG IN CANADA

What regulatory changes have impacted KPMG in Canada's mining clients in 2024?

There have been positive changes concerning incentives and tax credits for investments needed in the energy transition space. Canada is also unique in having a flow-through share mechanism to raise funds for exploration and development, addressing the challenges many junior mining companies face in the capital markets. I believe we will continue to see tax-friendly mechanisms being fostered in Canada.

What have been the key findings of KPMG in Canada's recent 'Digging deep: Risks and opportunities in mining' survey?

The latest annual survey confirmed that the timeline toward development is a significant challenge, both in Canada and abroad. Despite this, executives generally had a positive outlook for the industry and its growth prospects, with high commodity prices, increased demand forecasts and the need for critical minerals. Compared to our previous surveys, we have seen more investment in technology to improve operational efficiency, reduce costs, and improve worker health and safety. ■

Ben Charles

Partner

BAIN & COMPANY

Where do you foresee the mining industry heading in the upcoming years?

Gold is always difficult to forecast, but the excitement around the price is hard to ignore. As companies progress through planning, they are not betting on the gold price staying where it is at the moment. Most companies we work with are remaining pragmatic around new investments in gold whilst still enjoying the benefits of rising prices. Copper prices are not the best right now, but most feel like there will be a supply shortfall, meaning some are bullish on copper from a pricing standpoint.

How does Bain plan to grow going forward?

We see Toronto as a core element of our mining practice going forward, and Canada will be an important player in the mining sector for years to come. For Bain, the work we do is centered around driving value for our clients, and this will be a continued engine of growth. There is also the question of technology and how to deploy this into mining. We have a passion for driving full potential in both the asset base and in capital, and this will be key for us in the future, too. ■

"It is vital to maintain a well-funded decarbonization budget and ensure that climate considerations are embedded across the entire business."

Emily Thorn Corthay

Founder and CEO

THORN ASSOCIATES

How has 2024 been for Thorn Associates in terms of growth and performance?

2024 has been busy and rewarding for us at Thorn Associates. We received the 2025 Canada's Clean50 award, which acknowledges our national impact on sustainability, being recognized for our work in developing decarbonization roadmaps.

We have been working with clients on Scope 3 greenhouse gas emission assessments. We are observing clients advance in their Scope 3 maturity, guided by the International Council on Mining and Metals' framework. Climate risk assessment is now moving toward quantitative risk evaluations, with financial values assigned to potential risks. Additionally, we are running training programs for industry, collaborating with the Canadian Institute for Energy Training. This training covers topics like carbon pricing, renewable energy credits, and Ontario's new energy and emissions regulations.

Can you explain the new International Financial Reporting Standards?

The new International Financial Reporting Standards (IFRS) cover general sustainability and climate-related disclosures. Although they are finalized globally, they are not mandatory in Canada yet. The Canadian Securities Administration (CSA) will decide when they will apply to publicly traded companies here. Currently, Canada's sustainability disclosure standards are in draft, closely aligned with the IFRS standards but offering temporary relief for Scope 3 emissions.

Compared to Europe, Canada is behind in sustainability disclosures. The US finalized its SEC climate rules in 2024, but legal challenges have delayed enforcement, and their rules exclude Scope 3 emissions.

What common qualities do your most ambitious clients with strong climate and sustainability goals share?

First and foremost, they have strong support from the C-suite, which is essential. Buy-in from the top sets the foundation for everything else. Secondly, they are well-staffed, meaning they employ an entire sustainability team. In mining, you need a team of individuals who are focused not only on compliance but also on advancing sustainability initiatives. Lastly, successful companies either hire individuals with a strong environmental background or train existing staff on sustainability and climate specifics. This ensures the team truly understands the nuances and importance of sustainability.

What initial steps should large companies take to reduce Scope 3 emissions?

The first step to effectively reduce Scope 3 emissions is measurement. Companies should start with a high-level screening to pinpoint emissions hotspots without committing to a detailed inventory initially. This allows them to identify major sources of emissions more efficiently.

From there, companies can focus on primary suppliers within key Scope 3 categories. Companies can further consider options like switching to lower-emission suppliers where feasible. Additionally, there are "quick wins" that can make an immediate impact. For example, implementing policies for carbon offsets on business flights or encouraging train travel where possible.

What upcoming developments do you foresee for Thorn Associates over the next few years?

The mandatory standards in Canada will push all companies to comply with the new regulations. One of the primary growth areas I see is in land-use emissions. Canada has recently updated its land-use emissions projections, and this is essential since a significant portion of emissions in mining comes from land use. For example, one exploration-phase company issued its first ESG report, covering only Scope 1 and 2 emissions. About 95% of their scope 1 and 2 emissions were from land use changes. This underscores the complexity and importance of accurately accounting for land-use emissions in the industry.

How do you view the impact of EU legislation?

European legislation like the Carbon Border Adjustment Mechanism and the new European Sustainability Reporting Standards are having a global impact beyond Europe. As more companies, particularly those with European operations, adopt these standards, we are seeing momentum build on a global scale. We have historically focused on Canadian-based companies, but as we grow, Europe represents a new and strategic opportunity for us to explore.

Do you have a final message for mining companies?

I encourage mining companies to stay committed to their GHG reduction targets, even though M&A activity can complicate these goals. It is vital to maintain a well-funded decarbonization budget and ensure that climate considerations are embedded across the entire business. This should not just be limited to the environmental department; it should influence strategic areas like exploration and investment decisions. ■

<< 79

Canadian mines are developed, maintained, and closed down with the environment and First Nations influencing every decision made. However, this means that the permitting process has become even more lengthy, with some environmental permits taking a year to obtain as companies have to account for seasonality. "Ontario is a leading mining jurisdiction due to its rich mineral resources and a regulatory framework that ensures environmental and community responsibility. However, the same regulations can also create challenges, such as delays in project timelines and added complexity, particularly around permitting, financing and labor shortages. Ontario's Ministry of Mines is actively working to streamline these processes without compromising safety or environmental standards," highlighted Natasha Faucher, mining market sector lead at Arcadis Canada.

A new regulation was recently introduced to streamline mine waste reprocessing, reducing the burden on companies while upholding environmental standards.

Recently, another trend service providers have noticed is a focus on tailings and water management, particularly following the Brumadinho dam disaster in 2019. A recent EY report highlights that over 50% of mining companies consider water stewardship a leading risk, drawing significant investor attention. This encompasses regulations such as MMER, CEPA and provincial standards in British Columbia, Ontario and Québec.

SRK Consulting is working on several gold projects and operating mines in northern Ontario, in particular on tailings management. "Globally, there has been a strong demand for tailings management following the tailings failures in Brazil. The demand for tailings engineering was high before but has increased significantly, with companies ensuring they are actively managing and monitoring their tailings facilities," explained James Siddorn, president (Canada) and executive chair (North America) at SRK Consulting.

Arcadis Canada is a global sustainable transformation partner, tackling challenges such as climate change, resil-

Servicing the Green Transition

"Science and testing are critical for building investor trust and clarifying investment potential. We have experienced increased demand for environmental services, particularly in acid rock drainage work."

Marissa Reckmann, CEO
AGAT LABORATORIES

"Transitioning from diesel to electric vehicles at a certain depth is a common request from our clients and this comes with certain hurdles. Switching these fleets from diesel necessitates significant engineering work."

Patrick Pilon, General Manager
BLACK ROCK ENGINEERING

"Brownfield projects in regions like Sudbury are gaining momentum as older mines are updated to meet modern environmental and sustainability standards, addressing the impacts of legacy mining while promoting sustainable practices."

Rich Schmidt, VP Mining Sector
BLUMETRIC

"The permitting process under the Building More Mines Act requires more time, particularly for water-related permits, which are still taking longer than expected. On the other hand, closure planning has become more efficient, with greater responsibility placed on qualified professionals."

Byron O'Connor, VP Mining
PINCHIN

ient infrastructure, and livable cities. Over 2024, their mining practice used real-time satellite technology for environmental monitoring in the remediation of eight abandoned mines in Canada. Natasha Faucher, mining market sector lead for Arcadis Canada said: "Client demands have also evolved significantly, with a sharp focus on addressing environmental challenges. Water management has become critical, driven by regulatory shifts and sustainability goals."

BluMetric, headquartered in Ottawa, helps the mining industry address challenges in potable water treatment and wastewater management. Tightening government regulations and incidents like those in Brazil highlighted a need for better tailings safety. By working with companies like Vale Base Metals in Sudbury, BluMetric introduced a permeable reactive barrier to address groundwater contamination. "In the past decade, the mining industry in Ontario has increasingly focused on remediating legacy properties and inactive sites, many of which are over a century old. This shift and ongoing compliance efforts in active operations reflect a growing demand for sustainable, low-maintenance solutions like permeable reactive barriers," noted Rich Schmidt, VP mining sector for BluMetric.

At J.L. Richards & Associates, they have noticed how discussions with mining clients are increasingly surrounding ESG policy, not only to be more sustainable but also to aid in their reputation outside the industry. "Over the last few years, the focus on water management has grown significantly among mining clients. The handling of water and understanding its environmental impacts have moved to the forefront of project discussions," explained Saverio Parrotta, president and CEO of the company.

Similarly, Pinchin's VP of mining, Byron O'Connor, discussed how a major challenge in northern Ontario mining projects is managing abundant surface water without impacting local resources. The company works closely with its clients to develop creative strategies that benefit all stakeholders. "For major developers, a significant portion of our work is focused on water-related projects, including groundwater hydrology assessments, evaluating water conditions, and conducting remediation for both active and closed sites," said O'Connor.

Companies are also increasingly focused on the 'S' in ESG, looking at how their operations impact local communities, in particular First Nations, who have stewarded their traditional lands for centuries. To further highlight the issues of community relations, issues overseas in countries such as Panama and Mali exemplify the need for proper attention to be paid to community relations. Mining companies in Ontario are beginning to realize how each community has unique needs and, while legislation from the government is a positive step, it may not acknowledge the nuances of each community's situation. According to Natural Resources Canada, as of 2020, there are 142 active agreements in place between Indigenous communities and mining companies across Ontario, and in 2019, Ontario's mining industry employed nearly 3,000 Indigenous community members, contributing almost C$60 million to Indigenous governments and communities.

The Indigenous Relations and Strategic Communications practice at Sussex Strategy Group has doubled over the past couple of years, reflecting an increase in demand from mining clients. "Despite investing millions of dollars into a region and creating jobs, the nature of mining can be disruptive to those who live in those regions and have ancestral claims to the land," said Bliss Baker, vice chair of the company.

Legend Mining Contracting recently became the fifth company in the Z'gamok group, creating a collaborative partnership between Indigenous businesses and a Sudbury-based contractor. "We recently teamed up with Kenjgewin Teg, a leading training institute, and ran our first Common Core Introduction to Mining course. It had 12 participants, and we will be visiting again in March. While this partnership is still new, we are very excited about it and look forward to it growing in the future," commented Scott Rienguette, general manager of Legend Mining Contracting.

Another Sudbury contractor championing Indigenous causes is Technica Mining. "Technica Mining (Technica) has had the privilege of forming Aki-eh Dibinwewziwin Limited Partnership (ADLP), a collaboration between Atikameksheng Anishnawbek, Wahnapitae First Nation, and Technica," explained Mario Grossi, CEO of Technica.

The partnership aims to support First Nation communities, aiding in their economic sovereignty to help counter the historic neglect of mining companies and the entire industry. "For companies considering partnerships with First Nations, my advice is simple: just do it. It is encouraging to see that many companies in Ontario are already on the right path," continued Grossi. ■

ZM

YJ

> "We are positioning ourselves to service clients across a broad geographical range, from Northern Ontario to Peru and Chile, where critical minerals are central to the economy."

Zimi Meka and Yan Jin

ZM: Co-Founder and CEO
YJ: Vice President, Minerals and Metals, GTA
AUSENCO

Can you provide an update on how 2024 has been for Ausenco globally?

ZM: A key highlight for Ausenco was completing a major project in South America for Capstone Copper, which went very well. Despite some concerns raised by the drop in lithium prices, it was still a solid year, and I am optimistic about 2025.

YJ: In Ontario, was a very busy start to the year. We have been involved in a variety of projects across commodities including lithium and nickel, and have been doing quite a lot of work in permitting and studies. The demand for optimization and cost reduction has been significant. A key milestone was the full commissioning of the Magino project in 2023. Delivering that project during the pandemic was challenging, but we are proud of our role in the process plant design, installation, commissioning, and ramp-up. We have also worked on several studies including a PEA for Probe Gold, Crawford Nickel's FS, and a PFS for NexGold.

How does working in Ontario compare to your projects in South America?

ZM: Ontario is a fantastic mining market with a lot of experienced professionals, making it easier to find the right technical and project delivery skills. The projects here are substantial and world-class, and the overall business environment is very positive. The strong work practices with unions and other stakeholders make Ontario an ideal place for us to operate.

How important are university partnerships for Ausenco's future?

ZM: We collaborate with universities globally, running programs related to research, scholarships, and student assistance. These partnerships allow us to connect with graduates early on, developing long-term relationships. It also helps us ensure the curriculum aligns with industry needs, making it easier to recruit top talent for internships and careers at Ausenco.

What challenges do you see in the Ontario mining sector?

YJ: The primary issues in Ontario stem from a combination of factors, including a shift in how clients approach project planning, with more rigor applied. A shortage of skilled labor and rising costs have also contributed to delays and overruns.

Can you discuss how Ausenco approaches dealing with gold versus critical minerals companies?

YJ: At Ausenco, we recognize that every project is unique, so we tailor bespoke, fit-for-purpose solutions to meet their specific needs. Whether it is a gold project or a critical minerals study, our first step is to understand the project's objectives. We then analyze key parameters and develop a clear plan to achieve those goals—whether that is an NI 43-101-compliant study for a critical mineral project or the construction of a gold processing plant. With a diverse and highly skilled talent pool, we support our clients in successfully developing and delivering their projects.

How is Canada positioned to move forward in the critical minerals space, considering recent global strategies and elections?

ZM: Canada is fortunate to have abundant resources, and there is growing investment in critical minerals, particularly in downstream processes. I am optimistic about the country's position in this space, especially with the ongoing developments globally. While I cannot predict the exact outcomes of the political changes happening, I believe government actions will lead to more opportunities for projects in the critical minerals sector.

What are your plans for 2025 at Ausenco?

YJ: For 2025, I am focused on continuing to serve our existing clients in both the gold and critical minerals sectors and look to build strong partnerships with new clients. I am excited about the robust backlog of projects we have and looking forward to further development in innovation and digitization, including a partnership with Queen's University working on microwaving technology for ore sorting, and I am eager to explore more in this space.

ZM: I am very excited about the future, especially with the ongoing energy transformation. There is a lot to look forward to in terms of technological developments, particularly in nuclear energy and lithium production. In the next two to five years, I believe we will see significant changes in how we produce critical minerals. We are continuously positioning ourselves to service clients across a broad geographical range, from Northern Ontario to Peru and Chile, where critical minerals are central to the economy. ■

James Siddorn

President (Canada) and Executive Chair (North America)

SRK CONSULTING

> "Across mining as a whole, digitalization has become important, from underground operational control rooms to data handling and the onset of machine learning and AI."

Can you update us on recent projects SRK Consulting has undertaken, particularly in Ontario?

We are assisting with resource, reserves and engineering support with our expertise from our Toronto and Sudbury offices. We are working on several gold projects and operating mines in northern Ontario, including a range of services, in particular on tailings management.

What changes have you seen in the mining industry recently?

There has been a strong demand in tailings management following the tailings failures globally. The demand for tailings engineering was high before but has increased significantly, with companies ensuring they are actively managing and monitoring their tailings facilities.

Across mining as a whole, digitalization has become important, from underground operational control rooms to data handling and the onset of machine learning and AI. Combined with this, companies are trying to improve their internal practices and make positive changes, which is not easy due to the long history of certain established customs within operating mines.

How are you seeing AI impact exploration?

I think we are taking baby steps as an industry at the moment and many people still do not truly understand how machine learning should be applied to their work. Companies have realized it is difficult to deal with the amount of data they collect and are using AI to help them visualize and understand this, but outcomes can be influenced by the algorithms and weights used in the process. In geology, the process is advancing, and companies are gaining traction, but engineering has not quite caught up. Whilst it may be a hot topic, the implementation of AI in the mining sector remains in the early stages.

How does SRK reconcile its consulting interests with its software development activities?

Philosophically, SRK is a professional services consultancy not a software company, as we believe this creates a conflict of interest. Having said this, we have produced a lot of software over the years, including Leapfrog Geo. We now offer ventilation products focused on underground modelling and management, and we just launched HiveMap, a new digital mapping software solution. Our philosophy is based around creating solutions for the industry and partnering with the right people to deliver them.

Could you give an assessment of the strength of the Ontario mining sector?

From an operational standpoint, Ontario is very well placed. The gold price versus the production cost has left producers in very good shape. The only real challenge is their equity is not matching the value they are producing. This has slightly improved for certain companies in the past year but demonstrating shareholder value remains difficult. Combine this with the stable nickel market that is helping development in areas like Sudbury and expansion for certain operations gives Ontario a competitive advantage for years to come.

What is more of a concern in the province is the state of the junior market, who have yet to see sufficient investment from institutions. We hear it is very difficult to raise funds here in Ontario, with other hubs such as Australia becoming major competitors, in part due to the strength of the lithium market there. Anything we can do as an industry to improve the junior market and the liquidity of funds available is important. With the right team, quality projects, and a proven track record, this becomes less of an issue, but the TSX and the entire Toronto market do have challenges in this area.

How important is collaboration in the mining industry?

At SRK, we conduct projects that require multi-office solutions, whether that be due to geographical or disciplinary variation. The world's green transition presents a unique opportunity for the mining sector to come together and promote the industry. However, I think we are missing an opportunity due to a lack of collaboration. When you look at other industries facing similar challenges there is a spirit of community and collaboration, something which the mining industry could engage in more often. Certain companies have institutional rivalries where they are unwilling to share information, and this impacts the sector's relationship with the public as well as its overall progress. If we could develop some way to bring more large mining companies together to promote mining to the wider public, it would be beneficial at all levels. ■

Navin Gangadin

Executive VP, Central Canada Operations

BBA CONSULTANTS

> "Many clients prefer partners who are familiar with their specific environments, so we aim to support them directly from where they operate, and we are currently opening a new office in Thunder Bay."

What are some key trends and needs you are noticing from your mining clients?

For our major clients, the main focus is on managing declining ore grades and maximizing value from existing operations, especially given the lack of new exploration opportunities. We provide onsite expertise to optimize operations and support expansions. For junior companies, challenges include regulatory compliance, addressing social issues and building credibility with investors. We address these needs by offering end-to-end solutions that help navigate market complexities, which is crucial for securing financing.

I foresee more activity in extending mine life and a rise in M&A in the coming years. With current gold prices, many major companies are looking to acquire junior companies rather than start their own exploration projects. However, junior companies still face financing challenges, reflecting a broader trust issue within the industry, despite favourable commodity prices. Financing remains a crucial hurdle, and addressing this will be key moving forward. Addressing this reputational challenge requires operators and engineering firms to work together to rebuild trust and improve the overall perception of the sector, ultimately benefitting all stakeholders in the long run.

What is the importance of BBA Consultants' presence in Ontario?

At BBA Consultants (BBA), we prioritize being physically close to our clients to build strong partnerships. This proximity helps us gain a deeper understanding of their specific site challenges and operational needs. By expanding our presence here, we can offer tailored solutions that address local concerns. While Toronto serves as a central hub, many clients prefer partners who are familiar with their specific environments. So, we aim to support them directly from where they operate. We are currently in the process of opening a new office in Thunder Bay.

How is the mining sector in Ontario approaching ESG and decarbonization?

The initial perception of ESG practices as a financial burden is shifting as more firms incorporate them into their operations. Many leading companies are adopting advanced technologies, such as battery electric vehicles (BEVs) and exploring new energy storage solutions, setting a high standard for the industry. These early adopters are redefining sustainability in mining and serving as role models.

Over the past decade, the focus has shifted from merely adopting new technologies to rethinking operational strategies to reduce carbon footprints. By enhancing operational efficiency, companies can significantly lower their energy consumption. Decarbonization is now viewed not as a series of isolated solutions but as comprehensive strategies that reimagine how mining operations are run.

What role do technological advancements play in consulting for mining?

Technology is transforming traditional practices such as physical surveys. While we have been using scanning technology for over a decade, drones now allow us to cover larger areas more thoroughly, delivering higher-quality data from previously inaccessible angles. However, in more complex consulting scenarios, the effectiveness of technology depends heavily on the quality of the available data. Without accurate data, even advanced tools like machine learning offer limited value. Although these technologies will continue to evolve and make inroads, their role in specialized consulting is still developing.

Are your mining clients effectively collecting and managing their data?

Mining companies have historically excelled at collecting data but have struggled to use it effectively due to insufficient models and computing power. However, recent advancements in technology and analytics now offer new opportunities for these companies to leverage data as a strategic asset. I believe that forward-thinking companies will begin to use their data more effectively. While data collection may seem straightforward, ensuring accuracy and keeping data current is complex and costly, which has made companies somewhat hesitant to invest in it. This is another area where we can learn from the power utility market, where understanding the operation and performance of every asset is critical, and apply that level of data management to our mining clients.

What are BBA's upcoming priorities and expansion plans?

Our primary focus is on regional expansion to better support clients, especially in Ontario. This careful and gradual approach ensures we preserve our brand, culture and reputation. Rapid growth can dilute the qualities that contribute to our success, as we have seen with other firms. Our ambitious expansion plans will always be rooted in our commitment to being a specialized consulting firm. ■

Pierre Julien

Executive Vice President

DRA GLOBAL

"With the help of AI, we can conduct PEAs faster and 'data mine' internal and external databases to reduce timelines."

What has activity been like in Canada for DRA Global recently?

We have continued to be very busy in Canada in 2024. Our sophisticated and systematic approach to opportunity identification and pursuit means we are constantly monitoring asset development projects across the country. Copper and gold projects have remained very active due to the positive market conditions and, whilst lithium continues to be active, the drop in price over recent years has slowed down the frenzied pace at which it was once progressing. This is unfortunate because, despite the number of analysts and predictors of demand for lithium, we are still at the behest of short-term pricing both in terms of production and financing. After many years of studies and discussions, Canada only has one producing lithium mine.

We have seen great support from Minister Pirie and also the federal government for critical minerals particularly in upstream sectors. Federal funding downstream is present but not at the rate needed to align with projected battery supply, nor for Ontario to become a green energy and EV hub. We cannot afford to be hesitant in our funding of the critical minerals space as competitors in other countries are progressing rapidly towards being the global suppliers and processors of lithium due to their higher levels of foresight and persistence.

Are issues with meeting project deadlines and budgets particularly prevalent in Ontario?

The failure of projects due to going over budget or failure to execute on schedule is a global issue and not unique to Ontario or Canada. Companies in Ontario admittedly have struggled to reach nameplate capacity on budget or on time which continues to make raising capital a challenge. The methodology mining companies follow to develop their assets from planning and studies to financing is a concern due to its repeated failings, but this is why at DRA Global we participated in the forming of the CIM Capital Projects Symposium to bring technical professionals, the legal sector, finance companies, and construction and project management companies together to discuss, debate and develop solutions to poor project performance. Hopefully we can address failures to invest properly during the project development phase leading to a snowball that inhibits reaching on-schedule start-ups and nameplate capacity.

What is the goal of the Capital Projects Symposium?

One area we are focusing on is the contracting models. As an industry we need to develop contracting models that drive collaboration and align the interests of the mining company and the contractors. Currently, a primary risk mitigation tactic has been to try and transfer the risk from mine owners to contractors through legal contracts. At the end of the day, the owner owns the risk and paper-based risk mitigation has not led to better outcomes. With these traditional contracts, when a problem arose, the contractor would manage the project to the written agreement rather than solve the problem effectively, especially in EPC fixed-price contracts. Often, this would end up with blame shifting from party to party ending in litigation that is harmful and expensive to all involved. What we at DRA are trying to achieve is an integrated team approach with an agreement between everyone involved in the mine under one project manager. Ultimately, this will improve collaboration and aid mines in solving their issues quicker and more efficiently. As an industry, if we want to move to improve things such as ESG and decarbonization, an important first step is collaboration and trust.

What impact will digitization have on mining in the coming years?

It seems very popular to believe digitization is what will save mining, however, as an example, Rosemount Instrumentation introduced their first digital transmitter in 1985, meaning as an industry we have been going digital for almost 40 years. It is not a lack of digitization killing projects but that is not to say it will not help. One area for significant impact is in the production of early-stage studies where with the help of AI, we can conduct PEAs faster and "data mine" our internal and external databases to reduce timelines. Digitalization will not ultimately save the day; the correct people and equipment working efficiently will. ■

Natasha Faucher

Mining Market Sector Lead

ARCADIS CANADA

Can you introduce Arcadis Canada and outline its services to Ontario's mining sector?

Arcadis is a global sustainable transformation partner, delivering intelligent products and solutions to tackle challenges such as climate change, resilient infrastructure, and livable cities. In Canada, we provide data-driven insights to help co-create environments that reflect stakeholder needs.

In our mining practice, a standout project involves using real-time satellite technology for environmental monitoring during the remediation of eight abandoned mines in northern Canada. These remote sites pose significant challenges, from harsh conditions to high operating costs. To overcome this, we have deployed solar-powered remote monitoring stations equipped with robust sensors and satellite connectivity. This approach ensures reliable, high-quality data collection without the need for frequent, resource-intensive in-person site visits. It improves safety, reduces costs, and reduces scope 1 emissions.

What is Arcadis Canada's growth strategy in the mining space?

We aim to strengthen our mining presence in Canada, leveraging expertise in renewable energy policy, contaminated site remediation and lifecycle services from permitting to mine closure. ■

Kris Homer

Senior VP, Minerals and Metals, West

WOOD

Can you introduce Wood's work in Canada?

In Canada, we have four minerals and metals hubs that have delivered over 2,000 projects, 180 of which are in Ontario. We completed several studies and disclosures on Vale's Victor-Capre mine, Generation Mining's Marathon project, and a PEA on McEwen Mining's Grey Fox complex, to name a few. Wood has also completed projects across other provinces in Canada, including Saskatchewan and BC.

What challenges are impacting Wood in the current market?

Fluctuations in commodity markets, particularly the lithium price, have affected our work. This has caused mines to be delayed or canceled. From a geopolitical perspective, the threat of tariffs from the US and a potential reduction in funding for critical minerals is something we are watching closely. Permitting continues to be an issue. This impacts our work at Wood as projects can be sidelined while awaiting permits.

How can companies become more efficient?

Mining companies tend to be conservative when it comes to electrification; they need to become bolder when it comes to embracing technology and innovation. They should celebrate digitization, energy efficiency and decarbonization. ■

Gene Tucker

Regional Manager - Canada

AMC CONSULTANTS

What services have been in demand in 2024?

A key trend is strategy optimization and operational excellence. Our approach applies at both the site and company levels, helping clients identify and remove roadblocks to success. By using a data-driven approach, we help organizations streamline operations, optimize workflows and align strategic goals with execution.

Which issues are most common among mine operators?

Mine operators face challenges affecting productivity, cost efficiency and sustainability. Inefficiencies like equipment downtime, poor planning and suboptimal drilling and blasting create bottlenecks and raise costs. Rising expenses, ore grade dilution and supply chain disruptions strain profitability, making cost management critical. Strong market conditions for gold and critical minerals add pressure to boost production, but scaling efficiently is difficult. Many operators struggle to expand without compromising efficiency.

Where do you see technology being applied in mining?

For over 40 years, AMC Consultants has been accumulating knowledge from site visits and our benchmarking work. Each site has its own definitions of costs and productivity, making direct comparisons challenging. However, by normalizing large datasets, we can compare costs and productivity across various operations globally. This process enables faster identification of issues and helps reassure clients about how their performance compares to similar operations. ■

Digging Together

Image courtesy of Redpath Mining

Contracting and collaboration

Ontario's mine owners are facing a dilemma: whether to rely on experienced contractors to build and operate their mines and pay a premium or develop their own in-house talent pool to rely on. The reliance on contractors and service providers is complicated by the sector's cyclical nature and the fact that projects like Agnico Eagle's Detour Lake can reach gargantuan sizes, requiring thousands of skilled laborers from an already stretched talent pool. "I have observed a significant shortage of expertise in the industry, which is not a revelation but rather a recognized issue over the past several years. Clients are increasingly asking contractors like Redpath Mining to take a more involved role in their projects instead of merely handing off a scope of work," said Paul Healy, president Americas, Redpath Mining.

Indeed, as mining projects continue to grow in sophistication and complexity, there is increasing pressure on service providers to cater to the growing list of challenges that need solving. Being able to cater to many, or all, of a client's demands can provide a downward pressure on costs and simplify clients' logistical and administrative burdens as they can deal with a smaller number of contractors can consultancies. "One of the trends we are seeing at Sussex is providing clients with a whole suite of services because the reality of being a mining company has changed. Gone are the days when the industry was simply extracting minerals from the ground – things have become far more complex," said Bliss Baker, vice chair, Sussex Strategy Group.

Marz Kord, president of BESTECH, a Sudbury-based engineering project management consultancy, concurred: "BESTECH has seen a shift in demand from clients looking for more comprehensive mining project support. Clients increasingly prefer to work with a single consultant from start to finish, which fosters accountability and ensures projects stay on track."

Ontario's rich ecosystem of mining contractors and engineers has a long history of delivering the most technically challenging projects. Contractors and consultancies are now being challenged with minimizing costs for clients while having to adhere to new safety regulations, such as the seismic risk management regulations introduced in 2023 by Ontario's Ministry of Labour, Immigration, Training and Skills Development. This has forced contractors to implement cost-saving measures in order to remain competitive in Ontario's highly competitive mining services sector. "The mining industry's emphasis on cost reduction and productivity has significantly affected the drilling sector. To stay competitive, we have adopted cost-effective strategies such as performing in-house rebuilds on critical spare parts like rotational heads, pumps and motors, and sourcing parts locally," said Mark Fulcher, general manager, Andean Drilling Services.

Julie Zulich
President and CEO
TESC CONTRACTING COMPANY

"Collaborative cooperation in the mining space is critical, especially in today's environment where it can be challenging to get projects off the ground due to financing and changing supply chains."

However, cost control is not the only priority for mine owners and is being balanced with the need to keep up with Ontario's rapidly evolving regulatory requirements. "While cost is an important factor, I would say it is the speed of turnaround to assist with projects that is very important. With the Ministry of Mines cracking down on different things in the health and safety space, more paperwork and inspections are needed that require help from engineers and thus a quick turnaround is important," shared Patrick Pilon, general manager of Black Rock Engineering.

As the cost of mining continues to rise, with elevated labor costs being a main driver, mine owners must think carefully about how they approach contracting, particularly given recent global events such as the war in Ukraine and the Covid pandemic, which de-stabilized supply chains and derailed project plans. "When risks do materialize, we maintain open communication with our clients to determine the best approach for addressing them. Although this ap-

Michael Hoffman
CFO
ACTLABS

> A major challenge laboratories face, especially during the surge in demand in recent years, has been the depleted labor market in Canada, with low unemployment and high job vacancy rates. Laboratories, being labor-intensive, struggled to scale up effectively.

Scott Riengeutte
General Manager
LEGEND MINING CONTRACTING

> The contractors of the past were often brought in to do jobs that mining companies felt were unsafe or at higher risk. More and more, companies are leaning on one contractor or engineer from start to finish.

proach may involve difficult conversations early on, it ultimately proves more effective than scrambling to resolve issues mid-project," said Eric Smith, managing director, Cementation Americas.

Ontario's slow permitting process and the uncertain macroeconomic environment mean a project's scope and feasibility can change significantly even after a contractor is engaged on a project. Managing risk appropriately from the get-go is paramount, especially when the pressure on mine owners to reduce costs is mounting, making the unrealistically low bids from contractors all the more attractive. With large mining projects requiring dozens of contractors and sub-contractors, ensuring all stakeholders are on the same page from the get-go is paramount. "We need to work together as creating sustainability and predictability in a pipeline of projects, especially in an environment where the industry is faced with talent shortages, is extremely important. There has to be an open dialog between mining companies, design engineers, and contractors to build trusting relationships," said Julie Zulich, president and CEO, TESC Contracting Company.

Some of Ontario ecosystems have adopted integrated approaches to their work, looking not just at their KPIs, but focusing on integrating their own teams with other contractors working on a shared project. Chris Dougherty, president and chairman of Nordmin Engineering, shared how his firm approached collaboration on large scale project in Arizona with contractors such as Redpath Mining and their client South32: "The traditional adversarial project approach, where clients view others with suspicion, is no longer successful. Given the industry's challenges, including cost increases and procurement delays, working as a team is essential. Open communication allows us to address issues in real time and find reasonable solutions that work for everyone. Many overruns occur because the focus is on accounting rather than actual project management."

Bliss Baker
Vice Chair
SUSSEX STRATEGY GROUP

> In Ontario, the 'Duty to Consult' with First Nations is a particularly pressing issue, mostly due to its relative infancy, which leaves definitions, regulations and requirements vague.

Dustin Angelo
CEO and Co-Founder
NOVAMERA

> Collaboration could ultimately lead to a more integrated, data-driven approach to mining that optimizes every stage of the process.

Furthermore, the nature of mining means there are always uncontrollable unknowns such as unexpected geology, freak workplace accidents or rapid fluctuations in material and equipment availability that can derail a project at any given moment. When things go wrong – disputes can arise. Mine owners and contractors can often end up facing off in court, particularly in the case of EPC fixed-price contracts, leading to further delays and steep legal fees for both parties. "As an industry, we need to develop contracting models that drive collaboration and align the interests of the mining company and the contractors. Currently, a primary risk mitigation tactic has been to try and transfer the risk from mine owners to contractors through legal contracts. At the end of the day, the owner owns the risk and paper-based risk mitigation has not led to better outcomes," said Pierre Julien, executive vice president at DRA Global.

DRA Global participated in the Canadian Institute of Mining, Metallurgy and Petroleum's 'Capital Projects Symposium' in Toronto, which brought together technical professionals, the legal sector, financiers and contractors to collaborate and develop solutions to this problem. Collaborative initiatives like these will be crucial for Ontario's sector to overcome issues with project execution, talent acquisition and perhaps most importantly, the public perception of mining. "I think we are missing an opportunity due to a lack of collaboration. When you look at other industries facing similar challenges there is a spirit of community and collaboration,

95 >>

Given the industry's challenges, including cost increases and procurement delays, working as a team is essential.

Chris Dougherty

President and Chairman

NORDMIN ENGINEERING

Can you give us an update on what has been happening at Nordmin Engineering in 2024?
2024 was an extremely busy year for Nordmin Engineering and the mining industry as a whole. The focus has increasingly shifted toward critical minerals, particularly lithium and copper, and we have been actively supporting numerous projects globally. We have seen a surge in gold-related projects. We have been involved in several leading efforts toward larger-scale projects in this space. Our expertise in underground access for deep mines and processing capabilities continues to be in high demand, and we are fortunate that our service offerings align well with industry needs.

In Ontario, we have been actively engaged in the Red Lake and Kirkland Lake camps. Our efforts there include expanding existing capacity, improving operational efficiency, and introducing new production facilities. We are also assisting companies in the lithium sector, including our long-standing partner Green Technology Metals, and continuing our relationship with Frontier Lithium. Outside of Ontario, we have been working extensively with South32 on the Hermosa project in Arizona for about two years. Partnering with Redpath Mining, we have made significant progress, with the first of two shafts well underway and the second set to begin soon.

What trends in demand have you noticed for Nordmin Engineering offers?
The market has shifted, and the number of providers in our space has declined. This is not unusual, as we see fluctuations in companies' capacities over time. We work extensively in the shaft and hoisting space for deep mine access, from small mines to very large facilities. In addition, our energy group also plays a significant role, integrating renewable energy potential where possible.

Our processing group, which handles water management and mineral processing, has been extremely busy and we continue to expand our efforts in this regard, offering full design, procurement and construction management services for mineral processing facilities in all commodities.

What challenges has Nordmin Engineering faced in 2024?
Talent shortages have been a major challenge, especially post-COVID. Over the past 20 years, there have been cycles where economic shifts cause experienced professionals to leave the industry. At the same time, fewer young people are entering the industry, which is a serious issue. Industry and educational institutions have not done enough to promote mining as a viable career. There must be a refocus on education and industry outreach to attract talent. This shortage is driving up costs, with labor expenses rising 30-50% over the past decade. As multiple large-scale projects demand the same talent pool, labor constraints are leading to cost overruns.

What are the benefits of collaboration between Nordmin Engineering and Redpath Mining?
The traditional adversarial project approach, where clients view others with suspicion, is no longer successful. Given the industry's challenges, including cost increases and procurement delays, working as a team is essential. Open communication allows us to address issues in real time and find reasonable solutions that work for everyone. Many overruns occur because the focus is on accounting rather than actual project management. You cannot micromanage a project by only looking at KPIs. You need to take a holistic view, understand the goals and objectives, and focus on specific efforts to ensure success. An integrated approach—where we operate with transparency and teamwork—has proven to be much more effective. It ensures that everyone is satisfied with the process and the outcome.

How has dealing with the Ontario government been for Nordmin Engineering?
Premier Ford and Minister Pirie have been fantastic in supporting the mining industry. They have a very positive outlook on developing mining in Ontario and see it as an essential part of the value chain and industrial integration.

What are your plans for Nordmin Engineering in 2025?
It is our 20th anniversary this year, and while we will mark the occasion with an internal celebration, our main priority is expanding our team. We have also recently moved our Salt Lake City office to a bigger location with the intent of further expansion, especially as we are very busy in the American West. Additionally, this office will serve as a launch point for our efforts in Latin America, where we are currently working on a few significant projects. ■

Marz Kord

President

BESTECH

Can you introduce BESTECH and provide some recent highlights?
BESTECH is a leading engineering project management consultancy based in Sudbury, specializing in the mining industry. While our primary focus remains mining, BESTECH has expanded its services to sectors such as power generation and alternative energy.

Which of BESTECH's services have been most in demand with clients in Ontario?
BESTECH has seen a shift in demand from clients looking for more comprehensive mining project support. This includes everything from initial concept design and budgeting to detailed engineering and post-production monitoring. Clients increasingly prefer to work with a single consultant from start to finish, which fosters accountability and ensures projects stay on track. As part of our strategic expansions, BESTECH continues to collaborate with our sister company, FROSKR, to provide our clients with more comprehensive environmental services.

Have there been challenges since you joined BESTECH in November 2024?
Like the wider mining industry, BESTECH has faced challenges, particularly in terms of investment in junior mining companies. Many development-stage companies are delaying progress on projects as they await funding, which impacts engineering timelines. However, we have not seen the same decline in work from our larger clients, and we remain optimistic about the industry's future. I believe that in 2025 and beyond, as investments begin to flow again, there will be a resurgence in project development.

What is next for BESTECH in the coming years?
In 2025, we will begin our growth phase, increasing our workforce to better meet the needs of our clients. This will involve adding talent to deepen our expertise in both mining and other engineering divisions. Over the next five years, we aim to double our workforce, building on our 30 years of experience and our reputation for excellence, as we continue to expand. ■

<< 93

something which the mining industry could engage in more often. Certain companies have institutional rivalries where they are unwilling to share information, and this impacts the sector's relationship with the public as well as its overall progress," said James Siddorn, president (Canada) and executive chair (North America), SRK Consulting.

Reluctance to collaborate sometimes stems from stringent rules around confidentiality or to prevent giving competitors a leg up. However, when companies across the mining value chain come together, they can have an outsized impact on their industry's public perception, as seen recently with the World Gold Council's documentary 'GOLD: A Journey with Idris Elba' which garnered millions of views on YouTube.

Mine owners are inherently more inclined to share data in cases of a successful operation or project, thus enabling the industry to learn from their success. However, data is often tightly restrained in cases of failure, making it harder for third parties to avoid making the same mistakes. This lack of collaboration can be particularly problematic, particularly for safety-critical applications. "Mine owners are inherently more resistant to sharing geotechnical failures. However, while not all details can be shared publicly, communicating engineering lessons is extremely beneficial to the industry. The key is to ensure that we frame information in a way that conveys lessons learned without revealing sensitive details," shared Kathy Kalenchuk, president and principal consultant, RockEng.

Furthermore, as miner owners rely on increasingly data-hungry technologies and solutions, the sharing of data will begin to play an even more important role in their success. "Future success in mining and other industries will rely on collaboration, as few companies can offer complete solutions on their own. As AI and machine learning evolve, data sharing will become even more crucial for innovation, and companies must embrace collaboration for comprehensive solutions," said Rey Boucher, president, Jannatec Technologies.

However, as contractors and consultants take more active and involved roles in projects, there are signs that this could naturally lead to more collaboration by sharing of data and clarity on project timelines and scope from the onset: "The contractors of the past were often brought in to do jobs that mining companies felt were unsafe or at higher risk. Now there seems to be a more measured focus on larger projects involving a contractor right through the process of moving from feasibility to execution. More and more, companies are

Kathy Kalenchuk
President and Principal Consultant
ROCKENG

> "While not all details can be shared publicly, communicating engineering lessons is extremely beneficial to the industry. The key is to ensure that we frame information in a way that conveys lessons learned without revealing sensitive details."

leaning on one contractor or engineer from start to finish," said Scott Rienguette, general manager, Legend Mining Contracting.

Ontario's mining sector is perhaps missing an opportunity to highlight its role in the energy transition via critical minerals such as lithium and copper. In 2023, Canada's energy sector accounted for 10.3% of the nation's GDP – double that of the mining sector – making it an obvious choice for public outreach initiatives. "Achieving net-zero targets relies on the mineral sector, which is crucial for sourcing minerals for renewable technologies. Yet the mining industry faces challenges in securing public approval and stakeholder acceptance. This highlights the need for better education and collaboration among industries to inform the public about the relationship between mining and sustainability, ultimately aligning goals with actionable pathways," said Marissa Reckmann, CEO, AGAT Laboratories.

Collaboration can extend beyond industry and into academia, allowing aspiring mining professionals to get hands-on experience. For example, Lakehead University was able to give its students a taste of the region's geology with field trips to Generation Mining's Marathon project and has been conducting industry-focused research supported through the Natural Sciences and Engineering Research Council's (NSERC's) Alliance grants, which match industry contributions two-for-one. "Stable relationships with industry partners are critical, and we are encouraged to see industry mindsets shifting and companies wanting to foster longer-term partnerships to maintain a steady supply of the next generation of geology talent," said Peter Hollings, director – CESME, Lakehead University.

The synergies unlocked by longer-term partnerships like these transcend the immediate benefits of having aspiring graduates help solve a company's challenges: "These partnerships allow us to connect with graduates early on, developing long-term relationships. It also helps us ensure the curriculum aligns with industry needs, making it easier to recruit top talent for internships and careers at Ausenco," said Yan Jin, vice president, minerals and metals, GTA, Ausenco.

Laurentian University is another institution that has taken advantage of NSERC's two-for-one grants, in partnership with Agnico Eagle, allowing researchers to study the geochemical, structural and stratigraphic footprint of the Macassa mine and the Kirkland Lake gold camp, to the benefit of both parties. "This model is highly effective in leveraging industry funds for research, making Canada competitive globally as many jurisdictions do not have such favorable conditions for industry-government collaboration. Additionally, the overhead from these projects goes directly to the university, reducing the financial burden on our research grants," shared Ross Sherlock, director of MERC and Metal Earth, chair in exploration targeting, Laurentian University.

In addition to contributing to boosting talent development and research, industry-academia partnerships offer an opportunity to give back to their surrounding communities, as recently seen with Vale's C$750,000 donation to Cambrian College in Sudbury. "The Vale Electric Vehicle lab, in the Glencore Centre for Innovation, highlights the collaboration between major mining companies and our institution. Ongoing projects include converting a diesel-powered vehicle to fully electric, offering students hands-on experience," shared Mike Commito, director of research & innovation at Cambrian College.

Daniel Pop, chair of Outliers Mining Solutions, a consultancy specializing in using data to boost mine productivity, explained that the problem of insufficient knowledge sharing can even impact an organization internally: "A common challenge we see across the industry is capturing and transferring knowledge from one generation of leaders and mining professionals to the next. The systems we promote help facilitate this knowledge transfer, as much of the essential expertise may already exist within organizations but is not effectively utilized."

This is particularly pertinent in Ontario today, given the 'grey tsunami' afflicting the sector. "There is a growing number of new supervisors, first-time superintendents, and first-time managers in the industry, especially as many experienced senior professionals are starting to retire," said Adam Hewitt, co-founder and CGO, Outliers Mining Solutions.

Rey Boucher
President
JANNATEC TECHNOLOGIES

> "Collaboration is vital in the mining industry, as no single company can address all operational needs. Mining companies often use equipment from various suppliers, which can create barriers to sharing technology."

Competition breeds innovation and pushes companies to improve or get left behind. However, challenges like the talent shortage impact the entire regional sector, while others like climate change and sustainability are a global problem. Some battles may be too great for one individual, organization, or even sector to fight alone. ■

> This is an exciting time for Redpath Mining as we explore the opportunities created by the RUC acquisition and continue to expand our reach in the mining sector.

Paul Healy

President Americas

REDPATH MINING

Can you provide an update on Redpath Mining?

2024 was a remarkable year for Redpath, and 2025 looks just as bright. The acquisition of RUC Mining Contractors significantly contributes to our success, alongside a notable increase in traditional Redpath Mining work. Historically, the Americas represented about 60% of our volume, but with the RUC acquisition, Australia has increased its share. In the Americas division, we just finalized the commissioning of a material handling system at Vale's Voisey's Bay mine in Labrador, which includes several kilometers of conveyor systems and associated infrastructure. This project is particularly significant, as we began underground development, transitioning the mine from an open pit six years ago.

What are some current projects in Canada that you would like to highlight?

In Canada, we are sinking two shafts: one for Agnico Eagle at the Odyssey mine and another for Alamos Gold at the Island Gold mine. Both projects are progressing well, with the shafts already halfway down. Additionally, in the US, we have seen a significant increase in business activity. We are involved in the design and construction of two shafts and associated hoisting plants at South32's Hermosa project. Furthermore, we have initiated development and production at Rio Tinto's Kennecott mine in Utah, which ventures underground to access satellite zones from the long-standing Bingham Canyon open pit.

Can you elaborate on the strategic significance of the RUC acquisition?

The acquisition of RUC by our sister company, Redpath Australia, is a strategic move that enhances our presence in Western Australia. RUC is based in Perth, while Redpath Australia operates out of Brisbane, which allows us to strengthen our presence on both sides of the country. This acquisition is also beneficial for our operations in Indonesia, where both RUC and Redpath Mining have a substantial presence at Freeport. We are currently working on integrating the operations to optimize our effectiveness in the region.

What trends have you noticed recently regarding the contracting sector?

I have observed a significant shortage of expertise in the industry, which is not a revelation but rather a recognized issue over the past several years. Clients are increasingly asking contractors like Redpath Mining to take a more involved role in their projects instead of merely handing off a scope of work. Critical mineral initiatives are also driving expansion across existing and greenfield projects. For instance, at South32's Hermosa project, we are seeing a design-build approach where clients reach out to contractors earlier in the process. Locally, in Ontario, we are witnessing increased opportunities in the gold sector with companies like Agnico Eagle, Kinross and Newmont.

How has the labor shortage affected Redpath Mining?

A couple of years ago, we experienced a significant shift in our workforce, leading us to develop new staffing strategies. We have implemented training programs and invested in internal training initiatives. We have onboarded dedicated trainers to prepare new hires for various roles in underground mining. This approach has been extremely successful in staffing our projects and supporting continued growth.

Are there any specific markets that Redpath Mining is looking to expand into?

We aim to establish a more significant presence in Latin America. It is essential to identify the right products and approaches for these markets, as experiences from North America do not always apply elsewhere. Understanding local cultures, laws and regulations is critical. We have succeeded by collaborating with North American companies expanding into regions like Peru and Mexico, often with a local partner. There are numerous opportunities in these mature markets, and to succeed, we must determine how we can contribute to their ongoing success.

What does the future look like for Redpath Mining?

The future looks promising for Redpath Mining. We are exploring new projects, including the Great Bear project with Kinross and the Windfall project in northern Québec, where they await necessary permits and approvals. Additionally, we are involved in the Resolution project, a JV between Rio Tinto and BHP in Superior, Arizona, where there is optimism about its potential. ■

Eric Smith

Managing Director

CEMENTATION AMERICAS

> Inflation has undoubtedly impacted mining costs across North America, especially in terms of labor and materials.

How has Cementation Americas performed in 2024?

In 2024, Cementation Americas had an excellent year, maintaining a strong safety record and exceeding revenue and profitability targets. Ontario continues to be a robust market, and we have held solid projects there, with several exciting developments in the pipeline. Despite the positive trajectory, we are still not seeing the expected volume of greenfield project offerings. While commodity prices are favorable, which typically drives mining investments, market uncertainty remains. We are hopeful that the market will stabilize post-election, allowing companies to plan their capital expenditures more confidently.

We recently completed a major shaft project in Ontario, which was the deepest ever in the Sudbury Basin. This project was technically challenging and required extensive engineering. Additionally, we wrapped up a major development project in the Western US, which we were involved in for over 11 years.

Developing an increasingly skilled local workforce remains a priority for us, benefiting both the client and the community even after our work concludes. We are also excited to be back in Nevada after about five years, working on a new project for a large client, and we are optimistic about future opportunities in that region.

What challenges are contractors facing in 2024, and how does Cementation Americas manage risk?

At Cementation, we prioritize building meaningful and lasting partnerships rather than transactional relationships with clients. This approach allows us to adopt a truly collaborative approach to project planning, inevitable challenge mitigation, and proactive risk management. Together, we develop a comprehensive risk budget that covers both time and money to prepare for contingencies, particularly in complex projects such as underground excavation.

What are some of the key factors driving the rising cost of mining?

Inflation has undoubtedly impacted mining costs across North America, especially in terms of labor and materials. Skilled employees are crucial to nearly everything we offer clients, so we prioritize paying competitive wages and benefits while being mindful of project budgets. We aim to be an employer of choice and maintain a progressive outlook on the employee experience and strive to support it with with competitive pay structures, including project retention payouts, a unique benefit that rewards employees for their commitment to long-term projects, and leading-edge benefits packages.

On the materials side, it is challenging since we have less control over these costs. We attempt to mitigate these pressures by ordering materials in bulk whenever it is feasible.

How is Cementation Americas implementing data and digitization to improve project efficiency?

We have partnered with a software provider in California to develop customized reporting and data-tracking solutions central to our short-interval control system. We estimate labor, materials, equipment needs, and expected productivity when budgeting. As work progresses, we track performance against these estimates, allowing us to pinpoint areas for improvement quickly. This data-driven insight helps us address potential issues before they impact the entire project schedule. Tablets are available on every piece of equipment, and employees use them to log activities, downtime, and task durations and more. This data is uploaded in real time, enabling us to take swift action. Happily, underground internet connectivity, once rare, is becoming increasingly common, facilitating data flow and timely responses.

We have also started using autonomous equipment. While the machines make more autonomous decisions, each one still operates under human supervision for accountability and safety. This setup eliminates exposure to dangerous energy and significantly reduces downtime, leading to increased utilization and productivity rates.

How do you intend to grow in Ontario and Western US markets?

This year will likely be more challenging than the last in terms of keeping our project pipeline full and securing revenue. However, we are optimistic about long-term opportunities in both Ontario and the Western US. Our strategy centers around developing and maintaining capacity and preparing for when these projects start flowing in. While it is tempting in lean times to cut costs or accept lower-margin projects, we will remain focused on sustainable pricing to avoid long-term issues. We are also working diligently improve efficiency and cost-effectiveness while taking this time to further develop our employees—something difficult to focus on during nonstop projects. ■

> I see strong potential for enhancing the way long-term planning is approached, particularly when companies rely on external engineering firms for project management.

Mario Grossi

CEO

TECHNICA MINING

Can you summarize the key developments at Technica Mining over the past two years?

Technica Mining (Technica) has had the privilege of forming Aki-eh Dibinwewziwin Limited Partnership (ADLP), a collaboration between Atikameksheng Anishnawbek, Wahnapitae First Nation, and Technica. ADLP was established as a means to provide First Nation communities an opportunity for meaningful participation within the local mining industry. The aim is economic sovereignty for these communities who, for years, have seen mining companies extract wealth from their traditional and territorial lands with no economic benefit.

From an operational perspective, we have procured our first large-diameter raise bore rig, which is expected to arrive from Finland in Q1 of 2025. With Ontario's recent legislative changes limiting diesel particulate emissions, clients are increasingly opting for raised boring and drilling over traditional Alimak mining methods.

What advice do you have for companies in Ontario seeking partnerships with First Nations?

It is about creating a safe space for open, honest conversations, genuinely listening to their experiences and concerns, and building an authentic relationship. There cannot be a fixed timeline; sometimes connections happen quickly, but other times they need time to develop. Entering these relationships must be done with zero expectations and a willingness to unlearn past misconceptions. Those who truly want to make a difference and do the right thing need to embrace this approach.

What recent client trends and challenges has Technica Mining faced?

Recently, our clients have been increasingly focused on maximizing economic value by shifting from price-based procurement to evaluating the total cost of a project, encompassing all phases from design and engineering to commissioning and execution. This approach allows us to provide a lower overall cost with the opportunity to identify efficiencies and reduce redundancies throughout the life of the project.

As for challenges, one of the most pressing issues we face at Technica – and one affecting the entire mining industry – is the shortage of skilled labor. As a contractor, this presents a unique obstacle as we strive to ensure our employees arrive job-ready at client sites. To address this, we have implemented several strategic measures to mitigate the impact, creating a path forward that enables us to attract, train and retain talent while maintaining our high standards of expertise.

How does Technica Mining help achieve effective project outcomes?

I see strong potential for enhancing the way long-term planning is approached, particularly in cases where companies rely on external engineering firms for project management. At Technica Mining, we recognize the many variables that impact timelines and costs, such as the diverse skill sets and experience levels within the team. This level of detailed knowledge is essential for accurate planning, yet it can be challenging to communicate such granular insights to companies looking for projections several years ahead. I believe the key to success is ensuring a truly collaborative approach involving contractors early in the project planning stages. Working together from the beginning improves accuracy in project expectations and minimizes unexpected issues down the road.

What were the outcomes of Technica Mining's summer student program?

We have seen remarkable results from our summer student program, which was inspired by a dear friend and our past COO, who believed in the importance of integrating students into our company. Many of our current leaders began their journey with us as students, and in 2024 alone, we welcomed over a dozen interns over the summer months. Given the skilled labor shortage, we know the importance of attracting young talent more effectively. While we can see clear benefits of immersing students in the industry, we need to do more to reach them before they enter post-secondary. As an industry, we must find ways to create memorable and exciting experiences for children to foster early interest, as these initial impressions are crucial for attracting the skilled talent that we will need in the future.

What is Technica Mining's focus for the next few years?

In the coming years, Technica Mining will remain focused on continuously enhancing our core service offerings. With the addition of our new Raise Boring division and the growth of our Surface Mining division, we will continue to expand our value-added services.

Additionally, we will continue to work closely with our Indigenous partners, actively supporting them as they carve their path toward economic sovereignty. ■

Tim Bremner

CEO

FORACO INTERNATIONAL

> There is no question that automation and remote-controlled drill rig operations are resulting in safer operations and a better working environment for field crews.

What have been the main developments at Foraco International in 2024?

Foraco International (Foraco) has transitioned from non-essential markets, such as Russia and parts of West Africa, and intentionally pivoted into more stable jurisdictions. Another major development was establishing a permanent presence in the US, where we have hired a high-quality management team. We also successfully deployed our New Generation rotary drill (NGBF 800), which is remote-controlled and has completely hands-free automation. It has a much smaller footprint even though the rig has significantly more capacity than competitive rigs, and it received the Australian Drilling Industry Association (ADIA) 2024 Safety Innovation of the Year award. This is a great achievement as deploying a new type of equipment into a market as sophisticated as Australia can be challenging. We are currently in the process of deploying the next three, which will bring it to a total of five rigs in that region.

Moving forward, what are Foraco's priorities when it comes to developing new technologies?

There is no question that automation and remote-controlled drill rig operations are resulting in safer operations and a better working environment for field crews. Ever since the first remote rigs were deployed in 2015, we have continued to reap the benefit by adopting this technology which only continues to improve in terms of function and reliability. Automating certain rig functions is within reach, and will improve performance further while being widely accepted by our increasingly diversified field crews.

Do your junior and major customers approach drilling differently?

Juniors are predominantly engaged in green fields exploration and often have a limited drilling budget especially when the capital markets are challenging as they are presently. These initial, often first pass drilling programs covering a large area or target and drill holes are often designed to provide the maximum amount of geological information in terms of rock types and structure. With success, additional funds may be raised to fund a more extensive and concentrated drilling campaign.

While senior mining companies also conduct green fields exploration, most are engaged in advanced exploration or feasibility studies. These projects are much larger in scope, requiring many rigs drilling closely controlled holes designed to define the orebody in an efficient and timely manner. As such drilling services are considered an integral part of the project and subject to stringent HSE, environmental and regulatory requirements that demand state-of-the-art equipment, operating procedures and crews.

How have inflationary pressures impacted the cost of drilling in recent years?

Inflation has impacted the cost of drilling in recent years as it has all aspects of the mining industry. The industry-wide labour shortage resulted in steep increases in labour costs, which are the biggest cost of drilling services. Similarly raw and finished material costs increased dramatically, driving up costs even further all contributing to an increase in drilling rates to offset these costs.

As inflation pressures ease, drilling costs have stabilized and are subject to market fluctuations depending on how competitive these markets are. Junior exploration activity plays a big role especially in mature regions like Canada that are well serviced by numerous service providers resulting in discounted drilling services when market conditions are tight, as they are today.

Which markets will be of particular focus for Foraco in 2025 and beyond?

Key markets for Foraco include North and South America as well as Australia. Not only are these stable and well financed jurisdictions, but they also have tremendous potential for prime commodities such as copper, nickel and gold, which are the main drivers for our business. Underpinning these commodities is the water business associated with mining activities for all commodities, which is also a focus market for Foraco. This does not prevent Foraco from entering into new markets as our customers require, providing it makes sense for the business and our employees. ■

EQUIPMENT AND INNOVATION

“There has been a dramatic improvement in mining safety, particularly in regions such as Ontario, where the mining industry has worked very hard to reduce or eliminate lost-time injuries and fatalities.”

Kent Armstrong
Global Business Development Manager, Segment Mining
DRÄGER

Image courtesy of Technica Mining

Mining's Next Frontier

Ontario bets big on mining innovation

The world of technology is advancing exponentially, with Ontario leading the way in mining innovation. The industry is on the verge of major change. However, accompanying this immense opportunity is an equally large risk, and companies should proceed with caution when looking to implement technology in their operations.

The government of Ontario announced in May 2024 that it will be extending the Critical Minerals Innovation Fund (CMIF) for another three years, investing an additional C$15 million in projects across the province. From 2022 up to the announcement, 12 projects had received grants from the fund, aiming to bolster Ontario's wider critical minerals strategy and help Canada become a leader in sustainable mining and the low-carbon energy transition.

"This shift is accompanied by increased provincial, federal and venture capital investment in mining tech across Canada, highlighting significant growth opportunities. As these technologies are integrated into operations, they not only create new jobs but also prepare the next generation of workers in the industry," said Don Duval, CEO of NORCAT.

NORCAT operates its Underground Centre out of Sudbury, aimed at increasing skills training and testing new technologies in the real world. Throughout 2024, the organization saw an increase in the use of augmented and virtual reality training technologies, run by the Studio NORCAT division, signaling a bright future for such technologies in mining.

Next Generation Manufacturing Canada (Ngen) is a not-for-profit innovation fund that looks to provide funding for projects in sectors changing the world as we know it, from medicine to housing and mining. In late 2023, the organization launched its Moonshot 4 Mining, Minerals and Manufacturing (M4M3) initiative. The C$5 million program is aimed at bolstering Canadian industry and hopes to position the country at the forefront of innovation in both terrestrial and lunar mining environments.

Destiny Copper aims to bring a low-energy, low-cost copper extraction technology to the market and has received several grants for their work to aid in development, including a C$909,000 grant from Ngen and a C$250,000 grant from the CMIF. "We are receiving tremendous backing and support from the federal and provincial governments," said founder and CEO Greg Hanna.

Ontario is recognized around the world as one of the best places for start-ups aiding in the low-carbon energy transition, and Destiny Copper is just one example of a global success that began in the province. "Destiny Copper has been selected into the World Economic Forum's 3-year cohort program, made up of only 13 cleantech mining companies globally, following hundreds of applications internationally," shared Hanna.

This support extends to companies across the province, including Wabi Iron & Steel Corp (Wabi) based in New Liskeard. Darryl Gutscher, president, shared his experience: "Government support for Wabi has been spectacular. Provincial and federal governments have recognized the benefit of having a foundry located where we are, leading to them being very supportive and interested in what we do. The Federal Economic Development Agency for Northern Ontario (FedNor) is actively and organically promoting Wabi."

The Centre for Excellence in Mining Innovation (CEMI) is an organization established in 2007 looking to bring more investment to innovation in Ontario. The Mining Innovation Commercialization Accelerator (MICA) program associated with CEMI triggered a tranche of C$2.5 million spread across 10 companies in 2024. Throughout the year, CEMI has increasingly looked to take Canadian innovations and spread them to other key mining jurisdictions. "We facilitated B2B engagements in South Africa, Chile and Mexico, bringing Canadian SMEs with innovative solutions to meet local counterparts. In Chile, for instance, we proposed 15 projects, and they selected 10 for local collaboration. This process yielded dynamic, active engagements and commercial opportunities and we plan to replicate this in future events - such as in Peru, where there is strong interest in innovation," said Doug Morrison, CEMI's president and CEO.

This demonstrates how both private and government entities support Canadian companies at the heart of innovation.

The uptake of technology in mining is clearly gaining traction. "The mining industry has been great at adopting new technology and trialing systems and equipment to discover whether we can carry out day-to-day operations in a greener and more efficient manner," noted Hugh McDermid, VP product and business development at Miller Technology.

Aaron Lambert
CEO and Founder
RIINO INC.

> "It does seem no one wants to be first, but everybody is happy to be second. Developing a mine takes years, and incorporating untested technology is risky."

However, McDermid admitted that there has been a mixed reception to implementing fleets of EVs in mining operations, suggesting there is still work to do before the electrification of mining is complete.

Automation and technology are gaining traction as new developments are released to the market. One of the prominent global drilling companies, Foraco International, is putting innovations such as automated and remote-control drill rigs to use in Ontario and overseas. "Ever since the first remote rigs were deployed in 2015, we have continued to reap the benefits by adopting this technology, which only continues to improve in terms of function and reliability," said Tim Bremner, CEO of Foraco International.

The size of a mining operation is not a determining factor as to whether technology is adopted in the project. "Whether it is a major player or a smaller exploration company, they look for solutions to optimize their existing processes, and we help develop these improvements," explained Benjamin St-Onge, regional manager, Canada for Axis Mining Technology.

In 2022, Axis Mining Technology was acquired by Australian company Orica Digital Solutions. The combination of Orica Digital Solutions' suite of digital solutions with Axis Mining Technology's geospatial tools and instruments provides an example to the rest of mining as to how technology and manufacturing can cooperate to produce better outcomes for the industry as a whole, bringing a better understanding of ore bodies.

Ash Agarwal, CEO of SymX.AI, believes that technology companies need to bring more of their innovations into mining: "Mining companies have indeed faced challenges in adopting technology, but this is not entirely their fault. There is a common stereotype that mining companies are old-fashioned, focusing mainly on geology and finance while neglecting technology. However, our interactions indicate that this is changing."

Raffi Jabrayan, VP business development and commercial sales at Exyn Technologies agreed with McDermid and Agarwal, observing: "I have seen significant evolution in the mining industry over the past five years. While many companies were initially slow to adopt new technologies, those that prioritize safety and value their workforce are now more open to change," he said.

In 2024, Exyn Technologies released a new line of products, the Nexys and the Nexys Pro. These allow previously drone-based solutions to be applied to more portable units, such as backpacks and handheld devices. "The most substantial ESG benefit of our technology is the drastic reduction in the time required for underground operations. Traditional methods might take hours to scan a certain area, while we can accomplish this in minutes," continued Jabrayan.

No magic switch

To meet the demands of new regulations surrounding net zero, as well as improve the safety and efficiency of the workforce, mining operations are turning to autonomous and electric technology to help bring ore out of the ground. However, despite clear indications of change, readiness to adopt new technologies has not been a universal experience, and there is still caution within the industry surrounding innovation.

Riino Inc. is developing an electric rail system to electrify and increase the safety of haulage at mine sites. Despite support from companies like Agnico Eagle, Vale and Rio Tinto, Riino Inc. has observed hurdles in getting widespread support for their start-up. "Mining companies are often conservative, and many are hesitant to adopt new technology without a proven track record. No one wants to be first, but everybody is happy to be second," according to Aaron Lambert, CEO and founder of Riino Inc.

Novamera's CEO and co-founder, Dustin Angelo, shared Lambert's experiences, finding that getting initial interest in a technology is the most challenging stage for a company. "As a start-up, building credibility and attracting the first customers is typically the biggest challenge. In the past year, we have turned a corner, adding early adopter customers and executing projects. It is because we have case studies, completed projects, and recently began using surgical mining planning software in our sales process."

Kevin Dagenais
CEO
CASCADIA SCIENTIFIC

> "Electrification is a major trend, but fully replacing diesel haul trucks will take decades. Some companies are delaying truck purchases until electrified options become more accessible."

Reasons for this hesitancy vary from company to company, depending on the stage of an operation and the challenges the mining company is facing. "I think it is a combination of the current challenges in the market with funding and a perception that the technology is not quite where it needs to be. In early-stage projects looking ahead at future development operations, the reluctance is mostly around capital," said Jennifer Berger, VP North America, Normet Canada.

Capital is not the only restricting factor around the implementation of technology. Some companies still require a shift in culture and understanding for the full benefit of Ontario's innovations to be realized. "We often find that many companies lack the internal expertise, or in some cases, the expertise from vendors, to realize the true return on investment from these technologies," said Daniel Pop, chair of Outliers Mining Solutions.

Implementing swathes of new technologies may not be right for all companies in the current market, and some will need to work on their projects to ensure the correct procedures are in place beforehand. "While we strive for more advanced technology, many companies do not have the infrastructure to effectively harness it. In some cases, advanced technology becomes a burden rather than a benefit. On the other hand, for some organizations, it is a significant advantage," said Chad Tolonen, president of Timmins Mechanical Solutions.

Kevin Dagenais, CEO of Cascadia Scientific, which focuses on data analytics and machine learning solutions for the mining industry, highlighted how companies need to work alongside technology for it to be fully effective: "The biggest challenge is that our solutions are not quick fixes; they require effort and commitment. We collect data, identify opportunities, and collaborate with customers to implement changes. Success hinges on the customer's willingness to act on our recommendations, as there are no 'magic beans' to solve their problems." ■

Don Duval
CEO
NORCAT

Can you provide an overview of the main highlights at NORCAT in 2024?

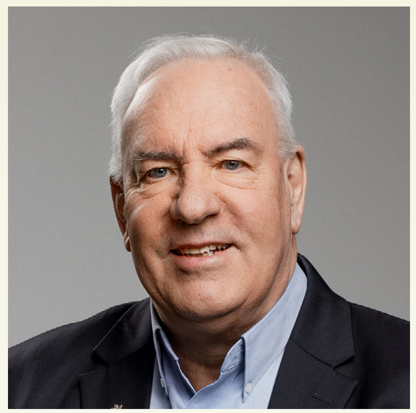
One of our strategic priorities is to be the global leader in skilled labor training for mining. Over the past year, we continued to see rapid adoption of augmented and virtual reality training technologies, particularly through our Studio NORCAT division. This signals a strong demand for hands-on experiential learning with these technologies, which enhance the confidence and skills of workers to better navigate potentially hazardous environments. Additionally, we opened a new office in Elko, Nevada, in partnership with Great Basin College, to further penetrate the US mining market, and we are already seeing results exceeding expectations.

Can you provide insight into the role of the NORCAT Underground Centre?

The mining industry does not suffer from a lack of technological innovation; rather, it struggles with effective adoption. Operators need confidence that a prospective technology works in a real mining setting. The role of the Underground Center is to provide a place where technology companies can develop, test and demonstrate emerging technologies in an operating mine. The NORCAT Underground Center serves as an all-important first reference customer for many of our clients, enabling them to build a marketing narrative to garner the attention of a producing mine keen to potentially adopt the technology within their operations. At the simplest level, the Underground Center is a place to de-risk emerging technologies with the intent to expedite downstream adoption in the mining industry.

What technology excites you the most and is gaining traction coming in 2025?

I am very excited about a variety of emerging technologies. Companies like Ideon are advancing sophisticated exploration and characterization tools that are impressive in their deployments. Automation is another significant area, with companies like TesMan developing remote operation technologies and moving towards autonomy to enhance worker safety underground. ■



Doug Morrison
President and CEO
CENTRE FOR EXCELLENCE IN MINING INNOVATION (CEMI)

What has been the focus at CEMI over the past year?

In 2024, Innovation, Science and Economic Development Canada (ISED) was able to provide a small tranche of about C$2.5 million for another 10 projects, as part of a 15-month extension beyond the current program. This would increase our total number of projects funded under the Mining Innovation Commercialization Accelerator (MICA) program to 60, continuing across the same four themes of productivity, energy and GHG reduction, autonomation, and environmental impact of tailings. Our CM-focused program will add three more. Half of the earlier projects now have commercial partners, and we are expecting final results from 12 projects in Q1 this year, and this will help with future funding submissions. We are refining MICA's business-to-business engagement process, as an effective way to connect new SME innovations with potential markets.

Can you elaborate on the B2B engagement activities?

We facilitated B2B engagements in South Africa, Chile and Mexico, bringing Canadian SMEs with innovative solutions to meet local counterparts. In Chile, for instance, we proposed 15 projects, and they selected 10 for local collaboration. This process yielded dynamic, active engagements and commercial opportunities. MICA now collaborates with local R&D organizations that have established cooperative agreements with us. This model effectively connects SME companies with new commercially viable products and services and helps tailor them to local markets.

How is the growing focus on mining technology and innovation influencing funding for SMEs?

Although industry surveys suggest innovation has recently increased in importance for executives, I still do not think it is high enough on the agenda of many of them. This is unfortunate because the industry urgently needs to change its operating practices, especially regarding social and environmental issues. Mining's social landscape is changing quickly, but mining companies are not adapting fast enough. ■

Jacob Lachapelle

CEO-in-Training
MAESTRO DIGITAL MINE

> The current status quo is focusing on how we mechanize mines to maintain or increase productivity, while getting people out of the mines into safer working environments.

What have been the main developments for Maestro Digital Mine, and how has the company performed in 2024?
Maestro has continued to experience rapid growth in 2024, and we have been internally improving our systems to take advantage of that growth and reallocate it back into new innovations. Our focus has been the release of Duetto Analytics, an on-premises software that addresses the maintenance elements for mining equipment to keep up with efficiency, productivity, and safety standards. Duetto Analytics acts as a bridge between Industrial Internet of Things (IIoT) devices and critical decision-making processes addressing the health of the underground devices without going underground. Utilizing proactive and predictive maintenance strategies ensures that only accurate and relevant data informs maintenance schedules and operational decisions, and the proactive approach minimizes unplanned downtimes, extends equipment life, and enhances overall efficiency. We expect to officially launch the Duetto Analytics product in Q1 2025; whereafter we will focus on designing new sensor technologies to extend the life and accuracy for the hostile underground environment.

Have you seen any cases where AI is successfully being used in the mining sector, and is Maestro considering incorporating AI into its products?
AI presents great opportunities, especially in the analytics space, as when you train a model, it can provide significant value. The challenge is obtaining wide sets of data since the process control network (PCN) is isolated from the business network for security reasons. This network segregation reduces the opportunity to deploy cloud-based solutions from multiple mines without the full cooperation of mining companies. Duetto Analytics solves this concern by sitting on the PCN and will use a smaller, more focused dataset from a single mining company, thereby still providing AI actionable insights in addition to real-time diagnostic functions.

What have been the impacts of the DPM limits introduced in 2023, and what role does ventilation play in ESG compliance?
Diesel Particulate Matter (DPM) is an environmental toxicant known to be a carcinogen. Recent studies have confirmed that DPM will enter your bloodstream and react at the cellular level. From a technical measurement perspective, diesel particulate monitoring is difficult as these are extremely small particles, less than 1 μm in diameter or the equivalent of 1/70th the diameter of a human hair. The current underground monitors, using optical particle counters, will not accurately measure these particle sizes and will not differentiate a diesel particle from any other particle type. The sensor technology simply has not kept up with the regulatory changes, making continuous monitoring of DPM a challenge. Ontario's allowable level of exposure to diesel particulates in underground mines will now be the most protective in North America, and we now have the challenge of developing more practical solutions to identify the hazardous particles with the main goal of keeping underground miners safe.

Has the electrification trend increased or slowed down over the past few years?
On the one side, some people understand the challenges of going electric and are trying to make diesel utilization safer and more efficient, and on the other side, people are exploring full electrification. The current status quo is focusing on how we mechanize mines to maintain or increase productivity while getting people out of the mines into safer working environments.

What are the benefits clients can expect when implementing Maestro's products and solutions?
Maestro's products deliver worker safety, energy savings, and productivity improvements. Higher production rates are achieved by allowing safer and quicker re-entry times after blasting, and with many mines being ventilation-constrained, our products allow for directing ventilation air to the areas that require it and reducing it to the areas without miners or operating equipment. Mine ventilation is the second largest consumer of electricity after comminution, so improving ventilation systems can help reduce energy use and carbon emissions.

What is Maestro's growth strategy moving forward?
Maestro has recently established a distribution network in Kazakhstan, and we are also looking to expand our footprint into Turkey and throughout Europe and Latin America.

Maestro will focus on commercially launching our Duetto Analytics system and then incorporating additional capabilities into our existing product lines so that they can support Duetto in being an overarching predictive and preventative maintenance system. ■

> There is industry interest in the BEV market, but also a hesitance to invest in this space. The adoption rate has not been nearly as quick as we might have anticipated several years ago.

Jennifer Berger

Vice President – North America
NORMET CANADA

How has Normet performed over the past year?
The company's overall performance continues to be strong and during MinExpo 2024, we unveiled our new Scamec LC Thor 135 T and Charmec LF 1105 DA machines, and our innovative Xquick coupler system, all engineered to elevate efficiency, safety, reliability and productivity in the underground mining space.

Normet's Charmec vehicle range makes the underground charging process productive and safe whether you are using emulsion or ANFO explosives. The Charmec Revo technology allows for automated explosives charging where a remote-controlled robotic arm places the initiating system into the borehole and, in conjunction with the emulsion kit, dispenses emulsion, allowing the operator to remain under supported ground.

Normet continues to expand our Xrock product portfolio of tool attachments related to rock-breaking technologies, with Xquick being our most recent innovation. Xquick is a quick coupler system that features automated, cabin-controlled tool changes, reducing the need for manual labor and minimizing the risk of injuries.

In August 2024, Normet announced the acquisition of Lekatech, a pioneer in electric hammering technologies. Another strategic partnership development is our recently signed collaboration agreement with Enaex, a leading blasting services provider for the mining industry, to pilot innovative solutions in underground mining and introduce teleoperated technologies into the market by leveraging Normet's equipment experience and Enaex's advancements in explosives and initiation systems.

How will the industry's emphasis on productivity influence Normet's R&D and product offering in the future?
With an emphasis on both productivity and sustainability, Normet has seen increased global demand for our low-emission, ElectroDynamic 1100 XL Agitator vehicles. We continue to do significant R&D with respect to our ground control and construction chemical business, and we have several patents already in place and some in the works. We are also working in partnership with a local university on ground support technologies and have developed a new range of concrete setting accelerators for low-carbon concrete mixes. There is also increased interest in the digital connectivity and analytics areas.

Have you seen increased interest in BEV adoption?
There is still industry interest in the BEV market, but also a hesitance and reluctance to invest in this space, and the adoption rate has not been nearly as quick as we might have anticipated several years ago. That being said, we have had significant success with the Normet SmartDrive equipment, with fleets out in the field having gained a considerable amount of operating hours at this point, the technology has been proven safe and reliable and is resulting in increased productivity. Considering the nervousness amongst the industry to be early adopters, demonstrating success certainly helps to ease concerns.

Why do you believe BEV adoption is slower than anticipated?
I think it is a combination of the current challenges in the market with funding, and a perception that the technology is not quite where it needs to be. Adoption can also depend on the stage of a project – if you are in full production, the infrastructure and the capacity for adopting change play a role in determining whether or not a BEV piece of equipment is the right option; and in early stage projects looking ahead at future development operations, the reluctance is mostly around capital.

What can the mining industry do to increase female participation in the workforce?
Exposure to other women in mining is extremely important. For example, over 15 years ago, I left an organization that had very few women in leadership roles and joined FNX Mining where Catharine Farrow was their VP of Exploration. I could see that the opportunity for female advancement existed in that organization, it was very impactful and inspiring. Showcasing women in various roles in an organization promotes the availability of opportunity.

What are Normet's priorities to maintain success and growth in the Canadian mining industry?
Normet's immediate priority is to continue defining the future of the underground mining space, and we are constantly looking for new technologies and opportunities to make mines safer, more efficient, more productive and more sustainable. Demand continues to grow as mines are going deeper and fleets in existing mines age, and we are looking forward to expanding our footprint in North America in the near future. ■

Andre Bertrand

Acting General Manager

EPIROC CANADA

Can you explain the recent acquisitions and the integration process Epiroc has adopted?

Epiroc has transformed from an equipment-focused company to also becoming a comprehensive mining solutions provider. This strategic shift aims to position Epiroc as a leader in digital technology and electrification within the mining industry, creating new global divisions designed for market integration in Canada. The acquisition of RCT, an Australian company specializing in radio controls and autonomous operations, enables Epiroc to offer agnostic solutions that allow clients to implement Epiroc's technology across different equipment brands. Additionally, 3D-P, based in Calgary, focuses on communication infrastructure within mines, providing services such as the design and implementation of Wi-Fi systems and beacon technology. Fordia, another Canadian acquisition, specializes in the exploration segment, providing essential tools for identifying ore bodies.

Another acquisition was Québec based Meglab, a technology integrator offering electrification and telecommunications infrastructure solutions, such as system design, substations, switchgears, and automation systems for mine electrification, equipment charging and digital operations.

YieldPoint, our most recent acquisition, will not be integrated immediately. Not all acquisitions are fully integrated; for instance, Stanley will maintain its name whilst being under the Epiroc umbrella, recognizing that strong brands can and should remain in the market.

To further enhance its electrification efforts, Epiroc has established a new division called Epiroc Electrification Solutions (EES). This division, which employs over 200 people in Canada, provides innovative electrification solutions, including battery chargers for mining operations.

How have market conditions affected demand for Epiroc's services?

Recently, we have observed a shift in purchasing behavior: instead of acquiring one or two machines, customers are now tendering for fleets, with requests for 20- 40 machines. Currently, there are around 7-8 major projects in the tender process that involve large equipment orders, indicating a healthy market where customers seek our expertise in resource extraction. ■

Tom Di Francesco

General Manager

B&D MANUFACTURING

Can you give an update on B&D Manufacturing in 2024?

2024 has been a record year, with demand for our in-house OEM products growing in Ontario. We have seen growth across our product line, from our original portable line-boring machine, which has been in production for 45 years, to our EJ200 Evolution Jack and our Multi-Handler. Sales are increasing year-on-year due to growing safety concerns in mining. There is a movement away from a single-cylinder jack toward our remote-control option because of safety and efficiency. Truck sales are increasing as the mining industry accelerates production, particularly in open-pit mines.

Where have you spent the federal funding that you recently received?

We recently started a second shift and invested in robotic welding, a new shear, and a new brake. We updated our welding machines to modernize them, allowing us to improve our aluminum welding, which makes up a large part of our manufacturing. One of our largest projects was introducing a second Toshiba CNC Horizontal boring machine, one of the largest in Sudbury, along with a five-axis CNC machine to increase our capacity and production speed.

What type of R&D is B&D Manufacturing focused on?

All our OEM equipment runs very efficiently with diesel engines, but we have clients curious as to what we can offer in the battery-operated space, something that our team has been working on for roughly six months. The option was available on our multi-handler, and we are in the process of upgrading it to a more current battery technology. We are also looking at manufacturing some lighter products.

Is there a final message you have for our audience?

Our future growth will be based on having inventory available for immediate sale and shipping, cutting our lead times for products such as our align-boring machines. ■

Image courtesy of IAMGOLD

Historical Companies, Modern Opportunities

Combining rich tradition with modern solutions

Mining in Ontario dates back centuries to the First Nations, who originally occupied the land, and the subsequent generations of settlers in the province, with the Marmora Iron Works being established in 1820. Over the years, Canada, in particular Ontario, has led the way in manufacturing mining equipment and being at the cutting edge of contemporary innovations. Many historic equipment providers have stood the test of time and continue thriving to this day, in some cases after a century of operations in the heartland province. These companies strive to innovate and evolve, keeping pace with the modern standards that companies need to run successful, safe and environmentally responsible projects.

For example, the TAKRAF Group has roots stretching back to 1725. After establishing its brand in the oil sands market, today the company manufactures semi-mobile crushing plants and large-capacity conveyors. To keep up with the natural fluctuations of mining, the company is altering the way it operates. "A project-based business model can create periods of intense activity followed by quieter times, making it hard to maintain steady revenue and keep a consistent team. To counter this, we have focused on building a more stable revenue stream by expanding our service offerings and aftermarket support," said Aidan Mitchell, president of TAKRAF Group Canada.

Epiroc, an OEM founded in Sweden in 1873, has recently conducted a string of acquisitions in Canada, including Meglab, RCT, Fordia and 3D-P. According to Andre Bertrand, acting general manager of Epiroc Canada: "This strategic shift aims to position Epiroc as a leader in digital technology and electrification within the mining industry, creating new global divisions designed for market integration in Canada. We are developing automated bit changers utilizing the longer-lasting Powerbit X diamond bit, which will facilitate uninterrupted autonomous long-hole drilling. This innovation in automation allows personnel to operate remotely from an office." It may be a company with historical ties to Europe, but Epiroc is showing its faith in Ontario's mining industry, acquiring companies as it looks to secure its future as a leader in the province. "Canada is fortunate to have a robust mining industry with abundant resources. Additionally, the emergence of the battery revolution is driving demand for new products, aligning well with Canada's rich resource base," continued Bertrand.

NETZSCH is a 150-year-old family-owned German company that expanded into Ontario with their brand NETZSCH Pumps & Systems Canada in 2010, offering Progressing Cavity Pumps, Rotary Lobe Pumps, Peristaltic Pumps, Multiple Screw Pumps, Grinders and Macerators to the mining sector. In 2025, the company is looking to increase its footprint in Canada, taking advantage of industry trends and strong commodity markets. "Our focus for 2025 spans multiple regions and commodities, with significant activity in Ontario's gold, copper and nickel sectors, ongoing investments in Québec, and promising potential in BC. Many mining activities across Canada are either new developments or expansions, with clients aiming to improve processes, reduce downtime and enhance the total cost of ownership," explained Jason Balcerczyk, president of NETZSCH Pumps & Systems Canada.

For over 140 years, FLS has been aiding companies with full flowsheet technology, expanding into a global manufacturing company from local roots. John Davidson, VP, head of capital sales North America, highlighted: "We have realigned our strategy to concentrate on our core competencies and proprietary equipment and additionally focus on our client-centric services. This approach helps us operate more efficiently and strengthens our position in the industry."

As Ontario's gold producers continue to find success, multinational companies such as FLS are increasingly attracted to the province as it provides reliable and profitable relationships for them. Davidson continued: "FLS has played a key role in all of the prominent new mining projects in Ontario, providing capital equipment to all of the recently commissioned gold projects and supporting their ramp-up to nameplate production."

Manufacturing companies are also looking beyond their products to change the face of mining. Dräger introduced one of the first closed-circuit mine rescue apparatus in the US in the early 20th century. Now, the company is investing in new initiatives to promote a diverse future for the mining industry. "Through sponsorship and active participation, Dräger helps develop student programs that equip future mining engineers and managers with practical experience and certifications, enhancing their readiness to address industry challenges. Additionally, Dräger supports diverse initiatives such as the 'Diamonds in the Rough' program, an all-female mine rescue team that competes internationally," explained Kent Armstrong, global business development manager, segment mining for Dräger.

As Ontario continues to lead the way in mine safety, it is bolstering its position as a tier-one jurisdiction and enhancing its appeal to global manufacturers. "There has been a dramatic improvement in mining safety, particularly in regions such as Ontario, where the mining industry has worked very hard to reduce or eliminate lost-time injuries and fatalities. Other industrial activities now report more injuries per man-hour worked than mining," continued Armstrong, showing how Ontario's safety record makes it more desirable not only for investors but for companies looking to enter the Canadian and North American markets.

Another company adapting to the modern modes of mining is Haver & Boecker Niagara, which has had a presence in Ontario since 1930. The company produces processing and sieving equipment for the industry, including the new generation F-Class vibrating screen that has adapted to wider industry trends, particularly for companies looking to save on capital and prevent unplanned downtime. "We are particularly focused on developing predictive and preventative maintenance technologies for vibrating screens and related equipment," said Karen Thompson, the company's president.

By focusing on the need for longer-lasting equipment Haver & Boecker Niagara alleviates some of the pressure on mining companies caused by the talent drought by allowing them to train technicians on equipment they have experience in operating.

HF Sinclair began as the Holly Corporation in 1947 and acquired the Petro-Canada Lubricants brand in 2017. The company has noticed a rise in demand for renewable products and services. "We are seeing a growing demand for environmentally friendly products, such as renewable diesel, as our clients increasingly seek solutions that improve uptime, reduce operational costs and support their sustainability goals," said Matthew Joyce, corporate senior VP and president, lubricants & specialties at HF Sinclair. "The customer trial for PRODURO TO4+ UHP showed great results, with increased equipment life and cost savings. This success highlighted how we can deliver sustainable solutions using hydrocarbon-based technologies, reducing waste in the long term," he continued.

M&A activity has been on the rise in mining over recent years, and that is not limited to producers and juniors. Pilot & Co. was formed by a partnership of Pilot Diamond Tools, Premier Mining Products and Drillware Tools, uniting three established brands in the Ontario market. "Our flagship brand, Pilot Diamond Tools, boasts a legacy of 55 years of bringing optimal performance and productivity to the market," said Hélène Coulombe, VP sales and marketing.

To keep up with modern standards, these brands are expanding and bettering their product range, to ensure efficiency and safety are at the heart of modern mining. "We are developing innovative in-the-hole solutions. For instance, we recently developed a multi-use plug that you can install through the diamond bit, eliminating unnecessary drill rod removal as was traditionally done," explained Pilot & Co.'s president Renzo Silveri.

Sudbury OEM B&D Manufacturing fabricates mining equipment maintenance products for both open-pit and underground mines. The company began in 1980 and is constantly focused on R&D to keep pace with modern standards and procedures. "We have seen growth across our product line, from our original portable line-boring machine, which has been in production for 45 years, to our EJ200 Evolution Jack and our Multi-Handler. Sales are increasing year-on-year due to growing safety concerns in mining. There is a movement away from a single-cylinder jack toward our remote-control option because of safety and efficiency," said general manager Tom Di Francesco.

Ontario has often been at the forefront of innovation right across the value chain, from OEM's such as Epiroc and B&D manufacturing to surveying companies helping to discover and give a better understanding of deposits. Quantec Geoscience began life in Timmins in 1986 and, in 2000, had a technical breakthrough pioneering the transition from analog to digital recording systems. Oliver Kuhn, president and CEO, noted: "Generally speaking, the big scientific breakthroughs have been achieved, and so a lot of our R&D focuses on incremental improvements, which add up over the years to significant advances."

Today, Quantec Geoscience uses its TITAN, ORION 3D and SPARTAN MT to provide omnidirectional measurements of the subsurface in 1D, 2D and 3D to help companies gain a better understanding of geology, structure, and mineral systems.

Ionic Technology Group recently celebrated its 25th Anniversary and demonstrates the adaptations Ontario companies are making to meet market demand. Christina Visser, CEO, has noticed three recent trends in demand for their services. "First is the rise in demand for improved safety systems, especially our safety-rated truck loading systems. Second, there has been an increase in uranium drumming due to the rising interest in the metal. Lastly, there is significant interest in our new tools designed to enhance safety by removing people from dangerous workspaces."

Made up of several companies, the group manufactures copper stripping systems and uranium drumming systems through Ionic Mechatronics, supplies underground truck loading systems globally with Variant Mining Technologies, and focuses on tank house ventilation and environmental improvements in challenging environments thanks to the acquisition of Desom.

These innovators demonstrate how Ontario's mining industry is constantly competing to be at the cutting edge of mining technology. By combining a wealth of knowledge and tradition with innovative R&D and new technologies, equipment providers are converting their established bases in the province into future success. ■

> We observe a rising demand for sophisticated approaches to screening that achieve the optimal balance of productivity and equipment longevity.

Karen Thompson

President

HAVER & BOECKER NIAGARA

Can you provide an overview of Haver & Boecker Niagara's operations in Ontario?

Haver & Boecker Niagara, located in St. Catharines, Ontario, has a rich history dating back to 1872 and became part of the Haver & Boecker Group in 1998. Since our inception, we have maintained a strong commitment to mineral processing and high-quality equipment production. Our Ontario facility has been operational since 1930, fostering robust relationships in the mining sector across Canada and the US. Recently, we unveiled our new generation F-Class Vibrating Screen, developed through the collaboration of our teams in Brazil, Germany and Canada. This innovative machine has a robust huck-bolted design and user-friendly maintenance features, which are increasingly in demand as producers look for longevity and efficiency from their equipment.

Haver & Boecker Niagara holds a unique position as one of the few stationary equipment manufacturers of its type in Canada. This distinction allows us to offer significant advantages, such as eliminating complexities related to the US exchange rate for our Canadian customers. We take pride in our role in the mining sector and our ability to deliver tailored solutions to our customers.

What trends in demand are you observing for your services in Ontario?

In Ontario, we are seeing a significant trend towards the demand for diagnostics and monitoring equipment. Producers are increasingly interested in AI-driven technologies to facilitate preventative maintenance and reduce unplanned downtime.

Additionally, there is a growing need for longer lasting screen media. This focus on durability reflects the mining sector's broader trend of maximizing operational efficiency while minimizing costs, as downtime can have substantial financial implications.

Optimizing the screening process is a central focus for us as we strive to enhance productivity and efficiency. We observe a rising demand for sophisticated approaches to screening that achieve the optimal balance of productivity and equipment longevity. By improving these processes, we help our customers maximize production output while minimizing operational costs, ultimately aligning with broader industry goals of efficiency and sustainability. Haver & Boecker Niagara supports this shift by providing technical expertise, training and services that emphasize predictive maintenance and performance optimization.

How has the skilled labor shortage affected Haver & Boecker Niagara and its operations?

The skilled labor shortage has become a pressing challenge but also an opportunity for Haver & Boecker Niagara, largely due to a generational gap where experienced professionals are retiring without enough younger workers to replace them. This shortage allows us to step up our involvement with customers, offering more hands-on support and technical assistance to fill the void. While we face the same labor challenges as our global counterparts, our Ontario manufacturing base allows us to address North American customer needs effectively. Being local enables us to provide tailored solutions and strengthen customer relationships while adapting to regional demands.

We actively engage with local universities and colleges to support mining engineering programs and technical training initiatives. By partnering with educational institutions, we help cultivate a skilled workforce to meet future industry needs.

What is the benefit of being located in Ontario?

Being based in Ontario specifically allows us to serve North American customers as a true local provider. This eliminates reliance on overseas sourcing, reducing shipping costs, lead times and other complications. Moreover, our local operations support Ontario-based supply chains and community initiatives. Our proximity enables us to respond quickly to customer needs and regulatory compliance, ultimately improving satisfaction and operational efficiency.

Our global footprint allows us to diversify our operations and better serve various markets, as each location addresses distinct geographical demands dictated by regional mining activities and regulatory requirements.

What kind of R&D work is happening at Haver & Boecker Niagara?

Our research and development efforts are concentrated on advancing diagnostic tools essential for the future of mining and manufacturing. We are particularly focused on developing predictive and preventative maintenance technologies for vibrating screens and related equipment. In addition to diagnostics, we are exploring innovative solutions for emerging rare minerals and striving to reduce CO_2 emissions in production processes. Our R&D initiatives aim to align with sustainability goals while enhancing operational efficiency across our product offerings.

Our holistic approach encompasses everything from equipment diagnostics to resource optimization, ensuring we are well-positioned to address evolving industry demands and challenges. ■

Market Impact on Mining Tech

Image courtesy of Miller Technology

"Exploration market swings are high, creating a major challenge for suppliers focused on this industry, and we need to develop a resilient model on how we develop our factories to ensure that we can create more jobs."

Hélène Coulombe, Vice President Sales and Marketing
PILOT & CO.

"Other industries are often more advanced in implementing monitoring systems and improving recovery rates during processing, which the mining sector could adopt to reduce waste and improve efficiency."

Timothée Lescop, Senior VP, Resources and Industry
CIMA+

"In the last year there has been a lot more focus from the mining industry on rebuilding and maintaining old equipment rather than buying new gear."

Darryl Gutscher, President
WABI IRON & STEEL CORP.

"Due to the cost of our equipment, a complete repair process is often cost-prohibitive, meaning that we have not noticed many companies prioritizing maintenance as they would with larger pieces of equipment they may have on site."

Hugh McDermid, Vice President, Product & Business Development
MILLER TECHNOLOGY

"Generally, production mining tends to have a steady output, while exploration companies experience more fluctuations depending on the market. Some projects that were planned for early 2023 were delayed, pushing drilling activities later into the summer."

Benjamin St-Onge, Regional Manager, Canada
AXIS MINING TECHNOLOGY

"The rapid rise in mining costs has pushed major companies to adopt more cost-conscious and efficient operational strategies, influencing their approach to acquiring and maintaining equipment and fleets."

Chad Tolonen, President
TIMMINS MECHANICAL SOLUTIONS

> By working together, we will find solutions to make mining safer and more productive.

Christina Visser

CEO

IONIC TECHNOLOGY GROUP

Could you give us an update on the various companies that make up the Ionic Technology Group?
We are celebrating our 25th anniversary, which has meant lots of activity. Ionic Mechatronics has been busy with copper stripping systems, uranium drumming systems, and creating tools to improve safety in mining operations. Variant Mining Technologies has been focused on supplying underground truck loading systems globally, and we have seen some exciting work in Mongolia and Mexico. Black Rock Engineering is engaged in multiple projects for notable customers, and Safe Box has grown in recent years. We have also acquired Desom, which focuses on tank house ventilation and environmental improvements in challenging environments. Lastly, Ionic Automation is involved in the automotive and medical sectors, with projects like a syringe assembly machine and fuel cell equipment.

Are there any specific services that are popular among your customers right now?
Three key trends stand out right now. First is the rise in demand for improved safety systems, especially our safety-rated truck loading systems and SafeBox automated safety isolation systems. Second, there has been an increase in uranium drumming due to the rising interest in the metal. Lastly, there is significant interest in our new tools designed to enhance safety by removing people from dangerous workspaces, like our remote reamer cutter that allows for safer operations when drill rods get stuck.

Can you share examples of collaboration within the Ionic Technology Group and with external partners?
Collaboration has always been at the core of what we do at the Ionic Technology Group. One of our major product lines, Variant's truck-loading system, was a result of collaboration with Vale's Creighton mine during Ionic's early days. Over the past 25 years, we have introduced many enhancements, and it is now the most advanced truck loading system in the world.

Within the Ionic Technology Group, we often share personnel between companies when needed, whether it is for extra capacity or leveraging expertise. Every project involves some form of collaboration, both internally and externally.

Recently, we had a mine operator, a mobile equipment company, and our engineers working together to kick off a new project. The mine operator had specific needs, and the mobile equipment company needed our help with the customizations. By working together, we will find solutions to make mining safer and more productive.

What are your thoughts on increasing female representation in mining and leadership roles?
I was involved in founding the Sudbury chapter of Women in Science and Engineering (WISE) about 25 years ago. Back then, we were excited to know there were 20 female engineers in Sudbury; now, there are many more, which is encouraging. Although women are still in the minority, I am seeing more young women enter the field, which is wonderful to see.

I am also pleased that there are more female CEOs in mining these days. We are trying to arrange a get-together.

Which markets are you currently focusing on?
We are expanding more in areas like uranium, where we have seen growing demand for our drumming systems. We initially thought uranium drumming would be a one-off, but we have now completed several of these systems. We are seeing repeat orders of our SafeBox systems, and we are excited about that. Additionally, we are looking into new ways to complement our tank house infrastructure work, thanks to our acquisition of Desom. Our R&D efforts are very customer-driven, often stemming from a customer's problem that we aim to solve.

Our geographical focus shifts over time. Right now, we are heavily involved in Mongolia, and we are also working in Mexico, the southern US, South America, and parts of Africa. Europe is not active for us right now, but that could change quickly. We are always open to new opportunities, often driven by customer requests.

What does the future look like for the Ionic Technology Group?
Our future is centered around solving difficult problems for our customers. We continue to focus on expanding our reach within areas like uranium, tankhouse infrastructure, and mining automation and safety. Our approach has always been collaborative, and we intend to keep working closely with our customers to provide solutions that meet their unique needs. ■

John Davidson

VP, Head of Capital Sales North America

FLS

Can you provide an update on FLS' activities in Canada?
We recently simplified our brand from FLSmidth to FLS, aligning with what our clients have been calling us for years. In 2023, FLSmidth acquired Morse Rubber, an Iowa-based company specializing in heavy-duty rubber products, particularly for mineral processing. Morse Rubber added advanced molding capabilities for rubber and composite mill liners, as well as screen media and various rubber and rubber ceramic wear components, to the existing FLSmidth service offerings.

FLS has expanded our service capabilities by opening a new Service Centre in Wabush, Newfoundland. This is in addition to the existing Canadian Service Centres in Timmins, Ontario, and Edmonton, Alberta. These Service Centres are designed to enhance the customer experience by offering rapid service and support.

What are your priorities for 2025?
We prioritize hiring locally to ensure our employees are close to where our operators work, which allows us to better serve our clients and engage with the communities. ■

Aidan Mitchell

President

TAKRAF GROUP CANADA

What challenges has TAKRAF Canada faced?
This project-based business model can create periods of intense activity followed by quieter times, making it hard to maintain steady revenue and keep a consistent team. To counter this, we have focused on building a more stable revenue stream by expanding our service offerings and aftermarket support. Further to this, the addition of the DELKOR liquid/solid separation range of equipment has also expanded our solution offering. This shift has led to smaller, consistent projects, providing a steady workflow, even though the timing of these projects can be unpredictable. When larger projects arise, we scale up by leveraging our design centers and subcontractors, enabling us to handle increased workloads without overextending ourselves during quieter periods.

What are the main goals for TAKRAF Canada going forward?
Our priority is balancing large projects with a strong emphasis on aftermarket services and smaller yet still high-value projects. We also continue to push and make significant inroads with our DELKOR minerals processing equipment. ■

Kent Armstrong

Global Business Development Manager Segment Mining

DRÄGER

Could you provide an overview of Dräger's work in the mining industry?
Our expertise spans a wide range of solutions, including breathing apparatus, gas detection systems, and life support systems for underground environments.

What trends are emerging in mining, particularly in Ontario?
Mining companies are moving into deeper zones, creating new risks such as ventilation and ground control issues and challenges related to getting personnel underground safely and back to the surface. Our motto at Dräger remains that the most important thing to emerge from a mine is the miner.

How does Dräger support educational institutions and student programs in mining?
Dräger actively collaborates with universities and mining schools across Canada to advance mine rescue training and emergency preparedness. Additionally, Dräger supports diverse initiatives such as the Diamonds in the Rough program, which sponsors an all-female mine rescue team that competes internationally, exemplifying inclusion and excellence in mine safety. ■

Image courtesy of Piyaphorn at Adobe Stock

Smart Skies and Smarter Mines

How AI and drone technologies will change the face of mining in Ontario

The Ontario Ministry of Mines 'Recommendations for Exploration 2023-2024' dedicated a chapter to the advantages of drone use, specifically in the Timmins district. The report cited a 2019 study by Dai et al. that found a magnetic survey drone can cover 150 - 200 survey-line kilometers per day. Traditional airborne surveying methods such as airplanes and helicopters have been used since the 1930s. With improvements in battery efficiency, range and size, it may be that the time has come for drones to replace their forefathers. As drones become the new standard in geophysical surveys of mine sites, their higher resolution and automation ensure clearer, more consistent images and data are gathered for mining companies to exploit.

The Global Data Mine Site Survey 2022 found that 65% of projects use drones in some capacity, with 32% of these projects indicating they had either made a significant investment in drones or had fully invested in the technology, demonstrating the faith mine operators have in drone-based tech. Surveying and mapping are the most common uses of unmanned aerial technologies, with 83% of respondents using drones for this purpose.

Recently, Volatus Aerospace merged with Drone Delivery Canada, opening new doors for the company in the emerging unmanned flight sector in mining. Glen Lynch, CEO of Volatus Aerospace, outlined how drones benefit mining companies looking to meet their ESG goals. "Beyond environmental benefits, drones contribute to the social aspect of ESG by reducing the risk to human workers... Dangerous tasks can be completed remotely, improving safety and work-life balance."

Expert Geophysics highlighted the importance of Ontario to the company in the development of the technologies used for their geophysical surveys. Soon, the company is looking to expand its headquarters in Ontario to a new facility in Newmarket, three times larger than its current location. Andrei Bagrianski, president and founder, stated: "Our Ontario headquarters is vital to our operations, housing our 30-member engineering and R&D team. While our MobileMTd technology is currently operational in Australia, and our office there is expanding, Ontario remains central to our company's growth. The drone industry as a whole is enjoying increased success. There has been a lot of interest from various companies across Ontario and the world, with word of mouth and improving technologies being driving factors for more drone-led geophysics projects."

Other sectors in the value chain are also realizing the value of drone-based technology in their work, for example, in consulting. "While we have been using scanning technology for over a decade, drones now allow us to cover larger areas more thoroughly, delivering higher-quality data from previously inaccessible angles," said Navin Gangadin, executive VP, central Canada operations, BBA Consultants.

As a hub for innovation in mining, Ontario is leading the way in the adoption of drone technology. However, despite the recognition of the importance of drone technology, the Ontario government can do more to encourage the use of this safer, more efficient method of surveying. Being able to operate beyond the visual line of sight requires navigating lots of red tape and can grind survey work to a halt.

One of the key advantages of drones is the vast amount of data they can collect. Cameron Chell, CEO and co-founder of Draganfly, a company that offers drone solutions and UAV services to the mining industry, explained how new radar technologies are being incorporated to expand the usefulness of drones in mining: "LiDAR is increasingly used to measure overburden, while multi-spectral cameras provide valuable data. When combined with magnetometer readings, these sensors offer comprehensive insights, giving companies a more complete understanding of their operations. The more sensors, the more data, and the more a drone is designed to be a collector of data, then more unique data can be captured and new insights created."

It is no secret that finding new deposits is becoming increasingly harder, particularly in historically successful mining jurisdictions such as Ontario. According to Daniel Wallace, CRO of Seequent, this leaves companies pioneering drone technology in a unique position to benefit: "Considering that the easy-to-find deposits have already been found, exploration is being pushed into geographically more complex and challenging environments, and our technology is focused on helping our clients make their workflow more economical and efficient in these difficult environments,"

By aiming to reduce the amount of time surveying and collecting data, companies such as Seequent are aiming to help geologists stay in the field conducting their work for longer, improving the overall quality of deposits and in turn helping mining companies produce better results. For this new data to be useful, companies must harness the true power of technology. A recent article by McKinsey & Company titled 'Beyond the hype: New opportunities for gen AI in energy and materials' posited that mining is uniquely well-positioned to benefit from generative AI. They suggested that the minerals industry relies heavily on data for its processes and that years of data that have been stored could be harnessed with a clear vision toward the future.

However, companies must proceed with caution as risks associated with machine learning and AI could prove fatal. With years of data in sensor historians and databases, as well as OEM and troubleshooting manuals being physically stored, accuracy, security and privacy should all be kept in mind when implementing such technologies. Rey Boucher, president of Jannatec Technologies, recognized how cybersecurity can be a major issue for mining companies, as seen in the ransomware attack on Evolution Mining in August 2024: "AI can improve processes and enable autonomy, but it also requires strict security to prevent uncontrolled operation. People sometimes underestimate AI's risks, especially regarding data and operational security."

Maestro Digital Mine produces detection devices and last-mile digital networks for the underground mining sector and has applied AI successfully on several projects. Jacob Lachapelle, CEO-in-training, said: "AI presents great opportunities, especially in the analytics space, as when you train a model, it can provide significant value. The challenge is obtaining wide sets of data since the process control network (PCN) is isolated from the business network for security reasons."

There is still much to be done until AI and machine learning become part of everyday operations in mining, and more collaboration within the industry will be required. "Not all of our clients are willing to share their data. We are still figuring out how to overcome data security issues when leveraging AI," said Russell Vance, regional manager for North America at Deswik.

Vance's views demonstrate that despite the clear advantages of adopting AI, there is still progress to be made before companies across the value chain are ready to put their trust in the technology.

The hesitancy of adopting AI is particularly acute in Ontario, whereby GenAI models cannot replicate the centuries of experience and knowledge possessed by mine workers and consultants. "While AI is a growing topic and making strides, it cannot replace the deep operational experience our team brings. Technology like AI requires the expertise of experienced professionals to interpret and apply it effectively to specific mining projects," said Gene Tucker, regional manager – Canada, AMC Consultants.

In preparation for the AI adoption boom, mining could learn lessons from other industries' data management practices. Particularly, the energy sector, which is a leader in the field. "The energy sector has always been ahead of the game, particularly when it comes to seizing data management opportunities. The mining sector tends to act a bit more conservatively, and the slow rate of technology adoption is surprising considering how long we have known that there is a gap in the data management space," highlighted Janina Elliott, segment director – mining for Seequent.

In the years to come, mining and technology companies must follow suit if they are to take advantage of the opportunities presented to them through the vast influx of data that improved drone technologies will bring. ■

Greg Hanna
Founder and CEO
DESTINY COPPER

> "Ontario is the best place in the world for a startup in the cleantech mining space, and we are receiving tremendous backing and support from both the federal and provincial governments."

> The entire industry is heading in the direction of guided workflows and data management.

Russell Vance

Regional Manager – North America
DESWIK

How does Deswik serve Ontario's mining industry?

Deswik is a global company that delivers engineering efficiency to the mining industry through customized software, consulting and training solutions. We are a team of mine planners that build mine planning software, empowering mining professionals to work smarter and faster, consequently driving down costs and increasing asset value.

The company has seen tremendous growth since its establishment, employing more than 400 people globally, and having a user base of approximately 25,000 licenses at 900 operations worldwide. In 2023, we acquired Polymathian Industrial Mathematics, an advanced provider of mine optimization software. Sudbury is our largest office in North America, with a team of approximately 20 engineers and consultants. We serve the majority of Ontario's mining market, with almost all underground hard rock mines in the region using our solutions in some way.

Which of Deswik's solutions is garnering the most attention from Ontario's mining market?

Data management is becoming a bigger conversation, and we are engaging with many customers about our mining database management tool, Deswik.MDM, which enables standardization, one version of the truth, and mine planning efficiency. The entire industry is heading in the direction of guided workflows and data management.

The short interval control (SIC) space is also receiving significant attention. Operators are ensuring they have access to real-time data in the control room and on mobile devices, instead of waiting for information to flow up to a control room at the end of shift. In underground mines specifically, SIC is a great opportunity to add more value and efficiency, and our operations planning and control solution, Deswik.OPS, enables this through collaborative short-term operations planning and shift execution, activity monitoring, schedule integration, and management of compliance to plan. We are experiencing significant demand for this product, with some customers reporting up to 10% improvement in the efficiency of their operations.

We are also seeing great demand for automated decision-making solutions, and our ORB operations and dispatch software from Polymathian allows for automated equipment scheduling and dispatching.

Can you comment on Deswik's approach to R&D, and is the company incorporating AI into its solutions?

Deswik has a culture of innovation, and approximately 34% of the company's turnover from our software solutions is invested back into R&D projects. This translates to about 40% of our developers' time spent on innovation and enhancements. We added approximately 300 developments and enhanced functionalities to our existing product base in 2023.

Deswik is focusing its innovation on open-pit planning tools and making them more usable. We are also looking at the optimization engines we have through Polymathian and evaluating where we can integrate them into our other tools to automate and improve the decision-making process.

Under Sandvik, Deswik forms part of the Digital Mining Technologies division (Digitec) which focuses on the automation and optimization of mining equipment and operations. Sandvik Digitec brings together the strengths of Deswik's mine planning solutions, Sandvik's automated equipment, Newtrax's collision avoidance technology, and Polymathian's mine optimization software to contribute to creating the mines of the future.

On the topic of AI, our developers can use AI to improve their productivity, but the challenge with this is data security; we cannot put our code base into a public AI database like ChatGPT. Another opportunity is utilizing AI in mine planning to predict mine design steps based on historical commands, prompting the user to follow a certain workflow that was taken in the past and thus making the planning process quicker. AI can also potentially be leveraged to solve mine planning problems, for instance, by having the AI look at topography and auto-determining all the haul network options instantaneously. A key challenge is that AI requires substantial datasets for training, however not all of our clients are willing to share their data. We are still figuring out how to overcome data security issues when leveraging AI.

What are Deswik's key priorities and growth strategy moving forward?

Deswik will continue along the data management journey with our clients and will persist in improving data integrity with our Deswik.MDM solution. We will also keep working to grow our footprint in the SIC space, and are staffing up to continue to deliver in this area with our OPS product. ■

Unmanned Flight

Image courtesy of tongpatong at Adobe Stock

"We are very excited about the commercial drone-based surveys beginning in Australia for the MobileMTd technology and are planning to bring this to Canada in 2025. Our time-domain systems operating at low base frequencies are currently flying in the US, Kazakhstan, and Australia, and some test ranges will be flown with TargetEM here in Ontario."

Andrei Bagrianski, President and Founder
EXPERT GEOPHYSICS

"Currently gold and copper are driving demand for our surveys. Copper companies see benefits in using our deep SPARTAN MT surveys, especially around active and abandoned mines because the easy-to-find near surface deposits have mostly been found already. Recently we have participated in several government-funded deep regional studies designed to stimulate activity and investment."

Oliver Kuhn, President and CEO
QUANTEC GEOSCIENCE

"Drone-based security is growing rapidly, especially in regions with heightened security concerns. We can deploy autonomous drone stations, which operate off-grid or through local power systems. These are equipped with weather stations, security cameras and communication systems, allowing drones to be dispatched remotely. It is possible to monitor mining sites in South Africa or Peru from our Toronto operations center."

Glen Lynch, CEO
VOLATUS AEROSPACE

"Given the defence and energy applications of our drones and our client base dealing in critical minerals, there is definitely a possibility of us working alongside governments. One of our partners, First Atlantic Nickel, deals with strategic minerals, and a key piece of their business model revolves around working with governments and/or strategic industry participants."

Cameron Chell, CEO and Co-Founder
DRAGANFLY

Raffi Jabrayan

VP Business Development & Commercial Sales
EXYN TECHNOLOGIES

What updates can you share from Exyn Technologies?
2024 was marked by the launch of our new product line, the Nexys and Nexys Pro. Their key innovation is modularity, allowing a shift from our previous drone-based applications to standalone units that can be worn on backpacks, handheld, or mounted on various vehicles and robots. We have also upgraded sensor quality.

How do you attract young people to the mining industry?
We are shifting our approach to recruitment by showing surveyors that they will be flying drones instead of spending five or six hours underground. This makes our work more attractive to both young and experienced potential employees.

What are your views on the societal perception of mining?
I believe companies like ours serve as models for STEM programs worldwide, which is exciting. Engaging with young people in these programs means we are creating opportunities for the future workforce at Exyn Technologies as well as in mining companies. ■

Matthew Joyce

Corporate Senior Vice President and President, Lubricants & Specialties
HF SINCLAIR

Can you tell us about the trends in demand you are seeing from your mining clients?
We are seeing a growing demand for environmentally friendly products, such as renewable diesel, as our clients increasingly seek solutions that improve uptime, reduce operational costs, and support their sustainability goals. Although lubricants represent a small portion of their overall spend, they have a significant impact on the success of mining operations, particularly in terms of uptime and reliability.

What can Ontario's mining sector expect from Petro-Canada Lubricants in 2025?
One of the main things for 2025 is our continued commitment to service and supply. In addition, we continue to focus on the development of next-generation technology. This includes working directly with mine operators, OEMs and other industry stakeholders to incorporate new chemistries into our product line. Our goal is to provide solutions that offer higher performance, longer drain intervals, and more sustainable operations at a competitive cost. ■

DW

JE

Daniel Wallace and Janina Elliott

DW: CRO
JE: Segment Director - Mining
SEEQUENT

What have been the main developments at Seequent over the past year?
DW: Considering that the easy-to-find and mine deposits have already been found, exploration is being pushed into geographically more complex and challenging environments, and our technology is focused on helping our clients make their workflow more economical and efficient in these difficult environments.

JE: There is now a widespread acceptance for AI. Seequent anticipated this trend and integrated our first machine learning (ML) capability into our Imago software, to which clients have responded quite favorably. Imago is designed to manage high-quality core imagery and as such represents an essential component in capturing exploratory data. We have big ideas around how we can revolutionize the early exploratory data analytical process.

How do you attract employees?
DW: Seequent has a global initiative to call on the younger generation to consider a career in geosciences and therefore, Seequent has launched the Visible Geology platform, a free education tool for teaching the fundamental concepts of geology. ■

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Thank you!

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