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GLOBAL BUSINESS REPORTS

# Québec Mining 2019

PRE-RELEASE  
EDITION





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## Québec Mining 2019 Pre-Release

**Project Director:** Lina Jafari  
**Journalist:** Ben Cherrington  
**Project Coordinator:** Lucrezia Falcidia  
**Editor:** John V. Bowlus  
**Graphic Designer:** Inanc Duman

**Cover Image:** Courtesy of Stormway Diamonds

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## Dear Readers,

Global Business Reports is delighted to be back in Québec to provide a first-hand account of the current mining landscape in a province with a unique and rich mining tradition. In this edition of our report, GBR investigates the latest developments across the value chain, from the organizations and institutions that provide the sector with financial and regulatory stability and transparency, to the junior explorers, large producers and service-sector companies operating on the ground. GBR's research team will be travelling through Montréal, Québec City and Val-d'Or for three months, conducting face-to-face interviews with key decision makers to provide up-to-date analysis from the figures who will shape the industry in the years ahead.

Since the end of the super cycle in 2012, the global mining industry weathered a storm that has offered sparse opportunities for wealth creation. In recent years, new industries such as cryptocurrencies, blockchain and cannabis have compounded the challenge of sourcing investment from a finite pool.

Yet there are plenty of reasons to be optimistic, as a diverse variety of new metals related to renewable energy, such as vanadium, lithium, cobalt and niobium, have caught the attention of a market looking towards a new, more sustainable energy future. Meanwhile, a Chinese steel market looking to curb pollution has stimulated demand for high-grade iron ore from the Labrador Trough in the northeastern border of the province.

The backbone of Québec's mining industry remains gold production from the Abitibi Greenstone Belt and James Bay. As Eldorado Gold continues construction of its Lamaque mine and Osisko Mining advances development at its Windfall deposit, a host of juniors look for the next discovery of significance, spurred on by the federal government's decision to renew the mineral exploration tax credit (METC) until 2024.

An emphasis on innovation has been key, as mining companies look to reduce costs and optimize efficiency. As the industry 4.0 movement gathers pace, a burgeoning Montréal tech community is collaborating with its international counterparts to develop solutions that are transforming processing technology, allowing companies to identify new deposits, and enhancing mine safety in jurisdictions across the globe.

This Pre-Release is a snapshot of the research conducted so far for GBR's Québec series, ahead of our final Québec Mining 2019 report, which will be released in April 2019 at the CIM Convention in Montréal. We would like to thank all our interviewees who have taken the time to provide their insights into the market. To all our readers, we always welcome your feedback or interest in being interviewed; please feel free to contact us at [ljafari@gbreports.com](mailto:ljafari@gbreports.com).

## Enjoy the read!

Lina Jafari

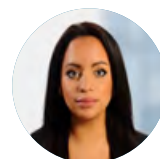
Project Director  
Global Business Reports



Lina Jafari



Ben Cherrington



Lucrezia Falcidia

# Introduction to Québec Mining

## Institutional and financial support sustain a timeless industry

Québec's mining history can be traced back as far as the discovery of North America, when Jacques Cartier discovered quartz and pyrite on the slopes of Cap Diamant. Since the discovery of lead in 1686 in the Abitibi-Témiscamingue region, followed by Québec's first gold rush in the 1840s after the discovery of a gold nugget in the Beauce region by Clothilde Gilbert, mining has been fundamental to the development of 'La Belle Province'.

Today, mining remains the foundation of Québec's economy, and the industry itself, on the back of strong institutional support, remains in an enviable position, not just on a national level, but as a world-class mining jurisdiction. From mining-related associations (QMA and QMEA) to financial organizations stimulating resource development (La Caisse de dépôt et placement du Québec, Ressources Québec, SOQUEM, SIDEX and BMO Capital Markets), Québec has the knowledge, means and geological endowment to prosper as global market conditions improve.

### BALANCING SUSTAINABILITY AND PERMITTING

In 2014 the Québec Mining Association (QMA) entered into an agreement with the Mining Association of Canada (MAC) for a four-year mandate to ensure that all mining installations implement the Towards Sustainable Mining (TSM) initiative – a performance system that helps mining companies evaluate and manage their environmental and social responsibilities. Having already achieved 92% of this target by Q3 2018, Josée Méthot, QMA's president and CEO, spoke of the willingness of the

*"The current green movement in the mining industry is having an impact on Ressources Québec's policies and strategy. The Nemaska Lithium project, for example, has huge potential due to the growing interest in the electric vehicle (EV) market."*

**-Iya Touré,  
Vice President,  
Ressources Québec**



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Québec mining community to demonstrate its commitment to sustainability: “[mining companies] took the challenge head-on, therefore we did not have to implement tactics to influence them, they simply agreed to the process.”

Despite its numerous advantages as a mature and predictable jurisdiction, the challenges of advancing an exploration project to production run deeper than commodity-market dynamics. Lengthy permitting processes at the provincial and federal levels are driving up costs and, in a challenging investment climate, undermining the economic feasibility of a project. Méthot lamented the amount of time it takes for explorers to obtain environmental authorizations, emphasizing the need to streamline the processes: “We need this to be simplified, we need to improve interactions and harmonization between the federal and provincial processes,” she stated.

Mathieu Savard, president of the Québec Mineral Exploration Association (QMEA), echoed this sentiment, suggesting that the number of administrative steps required for permitting be reduced: “The process is vital, but the delay in obtaining these permits wastes shareholders’ and investors’ money.”

In his interview with Global Business Reports at the 2018 Québec Mines + Energy conference, Savard outlined the QMEA’s core priorities for 2019: to maintain and increase access to territory, define the parameters of current and future regulations, and simplify the social-licensing process.

For Hugo-Pierre Gagnon, partner at Osler, Hoskin & Harcourt, new regulations should be introduced incrementally, and major changes in a short period of time should be avoided. Referencing how previous changes to the mining bill had resulted in a lack of clarity, Gagnon maintained that certain regulations have promoted exploration, reduced expenses, and addressed social issues: “It would be prudent that any new regulations should be introduced with the past in mind,” he reflected.

Frank Mariage, former president of the QMEA and partner at Fasken, weighed in on the current exploration climate. Pointing to a drop-off in the investment curve for juniors compared to a more stable curve for mid-tier producers and majors, he explained that although juniors make the majority of discoveries, they often face an uphill battle to raise funds. While recognizing the difficulties that the industry has faced in attracting investment during the downturn, Mariage was more bullish regarding future market dynamics: “the mining industry has gone through a challenging period, particularly with the rise of the cannabis market limiting the flow of investment capital into the junior space. However, the fundamentals of metals are solid, and companies will need to invest to maintain supply,” he said.

Another Montréal-based law firm specializing in mining services is Lavery, which has seen an increase in Australian and Chinese companies seeking to acquire lithium and cobalt assets in Canada to aid in the production of batteries, according to partner René Branchaud. Suggesting that more leeway could be granted to local authorities such as civil servants and mayors to speed up the permitting process, Branchaud also touched on one of the major advantages afforded to mining companies active in Québec – the tax benefits: “If a company is not financed through flow-through shares (FTS) or does not renounce its exploration work to investors, it has access to large amounts of credits and can recover up to 35% of the cost incurred for exploration work,” he explained.

**CAN METALS AND INNOVATION FINANCE THE FUTURE?**

Financial incentives, such as the 30% to 40% tax credit available for exploration activities, make Québec a highly attractive mining destination, but mean little without access to capital. Fortunately, there are plenty eager to invest.

Chad Wells, vice president of Altius Minerals, the royalty, streaming and investment company responsible for financing numerous projects across Canada, commented that Québec had the clout to back up its commitment to the industry: “In Québec, you not only have a jurisdiction that is willing to support mining at a community level, but there is also enough capital to finance the development.” BMO Capital Markets, named by Global Finance as the world’s best metals and mining investment bank for the last nine consecutive years, assists mining clients through the development cycle and helps pair those seeking capital (issuers) with the right sources and structures. Nicolas Brunet, managing director of investment and corporate banking at BMO, highlighted the firm’s recently established new age metals team that targets issuers working in the lithium, cobalt and graphite space. Commenting on how BMO



*“The mining industry has gone through a challenging period, particularly with the rise of the cannabis market limiting the flow of investment capital into the junior space. However, the fundamentals of metals are solid, and companies will need to invest to maintain supply.”*

**-Frank Mariage,  
Partner,  
Fasken**

collaborated with other funds to facilitate the financing for Nemaska Lithium, the largest stand-alone lithium-financing operation to-date, Brunet stated: “it was critical for all financing sources that the financing package be complete, i.e. that the funds raised be sufficient to build the mine and transformation plant. It is highly unlikely that one source alone could have achieved this; cooperation was critical.”

As a subsidiary of Investissement Québec, Ressources Québec is the gateway for companies seeking to invest in the mining and hydrocarbon industries. In collaboration with the government, it has access to C\$1.5 billion to support mining projects in the region. In recent years, the organization has modified its mandate to add renewable energy as one of its focus areas, and has adapted its approach to form partnerships with major producers such as Agnico Eagle, Glencore, IAMGold, and Hecla Mining, in addition to new project development.

Iya Touré, vice president of Ressources Québec, elaborated on the evolution of the organization’s mandate: “The current green movement in the mining industry is having an impact on Ressources Québec’s policies and strategy. The Nemaska Lithium project, for example, has huge potential due to the growing interest in the electric vehicle (EV) market,” he explained, continuing: “The challenge now is to bring the projects to market. Ressources Québec’s credibility relies on these projects and we want to ensure that they are delivered on time. The Québec mining ecosystem also relies on these projects and we believe that their success will attract more investment.”

SOQUEM, a subsidiary of Ressources Québec, works with its partners to develop projects at all stages of the exploration cycle. Innovation has been a key driver for SOQUEM in 2018, illustrated by a big data approach that succeeded in identifying six new exploration targets in partnership with Azimut Exploration, four of which led to discoveries.

The future, however, needs more than just new technology and metals. An advocate of the benefits of responsible mining, Michel Gilbert, president of SOQUEM, emphasized the importance of how geology and economics combine with human resources, community engagement, and environmental sustainability. Explaining SOQUEM’s forward-looking focus, Gilbert elaborated: “We are working not only on what mineral we should be focused on now, but also which metals and minerals will be important ten years from now: we are, after all, an exploration company.”

Another institutional fund to looking to work with innovative, smaller companies is SIDEX, a limited partnership that finances exploration companies and aims to encourage mineral diversification. In 2017, SIDEX financed new entrepreneurs Kintavar and Harfang Resources. Michel Champagne, CEO and general manager of SIDEX, outlined its strategy: “Creating new concepts and techniques within the mining industry can change the playing field and pave the road for more and better discoveries to be made,” he said. “SIDEX has a focus on innovation with the hope to find the next transformational technology or technique for the global mining industry.”



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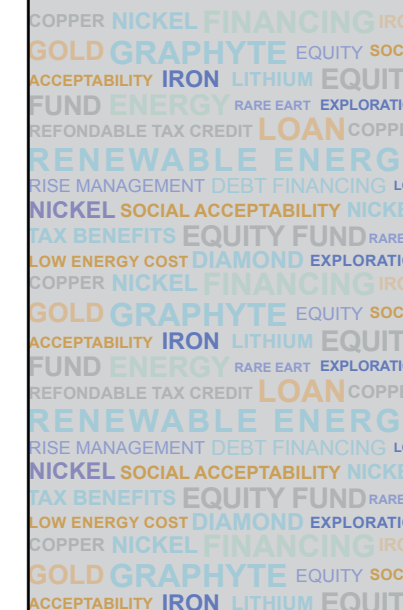

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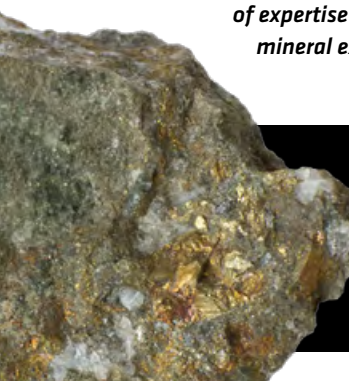


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*The Québec Mineral Exploration Association promotes sustainable and responsible exploration of Québec's mineral resources, and their vital contribution to the economy.*

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## Josée Méthot

President & CEO,  
Québec Mining Association  
(QMA)



## Mathieu Savard

President,  
Québec Mineral Exploration  
Association (QMEA)



### How has the Québec Mining Association (QMA) progressed in its mandate to implement the Towards Sustainable Mining (TSM) initiative?

In 2014 the QMA entered into an agreement with the Mining Association of Canada (MAC) and was given four years to ensure that all mining installations in Québec implemented the Towards Sustainable Mining (TSM) initiative – a performance system that helps mining companies evaluate and manage their environmental and social responsibilities. It is a set of tools and indicators to drive performance and ensure that key mining risks are managed responsibly at participating mining and metallurgical facilities. Mining companies that participate in the TSM initiative demonstrate their strong commitment to responsible mining. We are happy to say that we have achieved 92% of this target so far. For the rest of 2018, the agreed final year for implementation, we are focusing on achieving 100% of this goal. The mining industry has been collaborative and cooperative and has taken the challenge head-on; therefore we did not have to implement tactics to influence them, they simply agreed to the process.

### Can you elaborate on the work QMA does to promote innovation?

The QMA was also involved with COREM in the discussion to propose the CLEER supercluster (Clean, Low-Energy, Effective, Engaged and Remediated) to the federal government. There are many small organizations involved in R&D and innovation in Canada, with mining companies getting endless calls for financing for projects. We believe there is a necessity for more collaboration and a clearer focus on the real needs of the industry.

### What does the QMA hope to achieve in the Québec mining industry by 2020?

We want Québec to be the best mining jurisdiction in the world. To do this, the QMA will continue to make representations and liaise with the government so that Quebec becomes more competitive in attracting investments. The QMA will continue running its new communication campaign through various channels that aim to change the public perception towards mining, to ensure the public understand the benefits of the mining industry and how it positively influences their lives and improve social acceptability. This will be a big focus for 2019, and it is an initiative the QMA is proud to be spearheading.

### Have updates to the mining act in 2013 led to a favorable mining climate?

The new bill is workable and has brought some favorable updates. However, there are still some areas that need work, such as access to territory. There could also be greater support given to new mining municipalities. The truth is that Canada needs a world-class discovery to bring the buzz and activity back. Osisko's Windfall discovery made a tremendous impact and we need to see more activity of this type. We also saw how companies such as Sirios and Azimut in James Bay have used a different model of exploration to great success.

### What can the new provincial government do to improve the industry?

There should be a drive to reduce administrative burdens on companies, such as the various steps for permitting. The process is vital, but the delay in obtaining these permits wastes shareholders' and investors' money.

### How do you see the current financing climate for juniors?

We need investors to see activity as a way of making major discoveries in the region, and then the climate will improve. There have been new players in the market such as marijuana and blockchain companies, and with all the new capital being created, investors are looking for shelters. The Super Flow Through and Tax Credit related to resources available in Québec are a key for that. Investors are more surgical in their approach now when choosing to invest and that is why I think it is best that exploration companies focus their time and effort on a few projects, rather than having a sprawling portfolio.

### What are some of the main challenges facing the industry?

There needs to be more comprehensive training from universities, as we do not have enough people who have the know-how to work on mining projects – from exploration all the way through to the end of the journey. The lack of innovation will disrupt the industry and this is what needs to be considered by educational institutions. However, it is no easy task. I would say that the Canadian and Quebec government should focus on maintaining flow through financing in Quebec and also develop infrastructure in the north. This would enable more resources for drilling and getting results faster.

# Metals and Materials of the Future

## Lithium and vanadium projects attracting substantial investment

Québec's mining industry was built upon gold from the Abitibi Greenstone belt, iron ore from the Labrador Trough, and nickel from the Ungava belt. These metals remain bedrocks of today's industry, but it is the ones that can power and structure emerging technologies that are generating the most attention.

In Québec, it is metals for use in renewable energy and battery technologies – lithium, vanadium, and others – that are attracting significant investment. Nemaska Lithium has managed to raise C\$1.1 billion, including Japan's SoftBank Group's first-ever resource investment, to advance construction at its Whabouchi mine and Shawnigan electrochemical plant to unearth long-term sources of lithium to power electric taxi fleets across Asia. In parallel to this, BlackRock Metals, owners of a vanadium and titanium-bearing magnetite (VTM) and ilmenite deposit, raised US\$890 million to construct the mine and concentrator at its property in Chibougamau. Such vast sums of investment have been supported in part by institutional funds. For instance, Ressources Québec added renewable energy to its mandate and BMO Capital Markets created a new metals team. The global market gives sustenance to these projects, with ferro vanadium prices reaching a 13-year high of US\$123 per kilogram in Europe in December 2018.

In January 2018 a report by Morgan Stanley speculated there would be an oversupply of lithium from low-cost brine producers SQM and Albemarle in Chile that would cause the lithium price to crash in the first half of the year. These forecasts have not, however, come to bear, and the fundamentals for battery metals such as lithium and cobalt appear solid, underpinned by a growing demand from vehicle manufacturers looking to electrify their fleets.

“Volkswagen (VW) has committed to make 30% of their sales electric by 2025, and this alone would require five mines like Whabouchi,” stated Guy Bourassa, president and CEO of Nemaska Lithium. “In 2016, less than 12,000 tons were needed for car batteries, but this figure will rise to 550,000 tons by 2025.”

Another player in the lithium space is Critical Elements, which completed a feasibility study on its Rose Lithium-Tantalum project in September 2017, followed by an environmental impact study in December 2017. The feasibility study indicates a 17-year mine life, and the company is hoping to reach commercial production by 2021, according to CEO Jean-Sébastien Lavallée. It has completed two pilot plants, one to produce lithium carbonate and another lithium hydroxide: “it offers high conversion rates of spodumene to lithium carbonate or hydroxide,” said Lavallée, continuing: “the new battery generation is leading towards lithium hydroxide.”

### VANADIUM: THE KEY TO SUSTAINABLE ENERGY

Prospects for vanadium, the strategic metal used primarily as a strengthening alloy to steel and titanium, boomed in 2018. Vanadium has four oxidation states and can conduct electricity without generating heat. It represents approximately 80% of vanadium redox flow batteries (VRFB), of which the electrolyte within the flow battery is 100% reusable and lasts forever. Adriaan Bakker, president and CEO of VanadiumCorp, elaborated on the benefits of VRFBs: “VRFBs are a mature technology capable of storing an unlimited amount of energy. The batteries also have the unique ability to charge and discharge power at different rates, as vanadium is both the analyte and catholyte of the battery.”

VanadiumCorp has had a transformational year. After evaluating production models worldwide, it came to the conclusion that the techniques used in the vanadium industry for 50 years and in the

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steel industry for 100 years were now obsolete. From this backdrop, VanadiumCorp decided to determine a new process technology, which led them to a partnership with Montréal-based Electrochem Technologies & Materials, that had tested bulk samples from VanadiumCorp's Lac Doré project.

In August 2018, the jointly owned, patented VanadiumCorp-Electrochem Processing Technology (VEPT) was announced, which allows users to process any material that contains vanadium and to recover vanadium, iron and titanium from magnetites of any shape or size. The process utilizes a sulfation technique similar to that used in the titanium pigment production industry, which digests rich vanadium feedstock into concentrated sulfuric acid in 100-cubic meter vessels, Bakker explained.

VanadiumCorp can now focus on VEPT rather than production and transition from a mining company to a technology one. This will also allow the company to become the discriminating customer of feedstock from around the world, according to Bakker. VanadiumCorp's goal is to lease out vanadium electrolytes (VE) that will provide people with free access to battery technology, significantly reducing the cost of energy storage. Discussing the potential of VanadiumCorp's new technology, he concluded: "with VEPT we have a disruptive technology that vastly supersedes any technology before it. We are confident VEPT will revolutionize the cost and sustainable nature of energy storage as well as vanadium, titanium and iron production worldwide."

Another company realizing success in the vanadium space in 2018 is BlackRock Metals, whose project in Chibougamau neighbors

VanadiumCorp's Lac Doré asset. Having raised a staggering US\$890 million to fund construction, which is due to commence in 2019, president and CEO Jean Rainville remains bullish on vanadium's market fundamentals: "There is a global shortage of vanadium mines and not many projects going into development. Even if other existing facilities expand production and the VTM project comes into production, there will still be a global shortage," he stated.

BlackRock Metals is targeting first production in January 2021 and says that the project should create 500 jobs in the community of Chibougamau, according to Rainville.

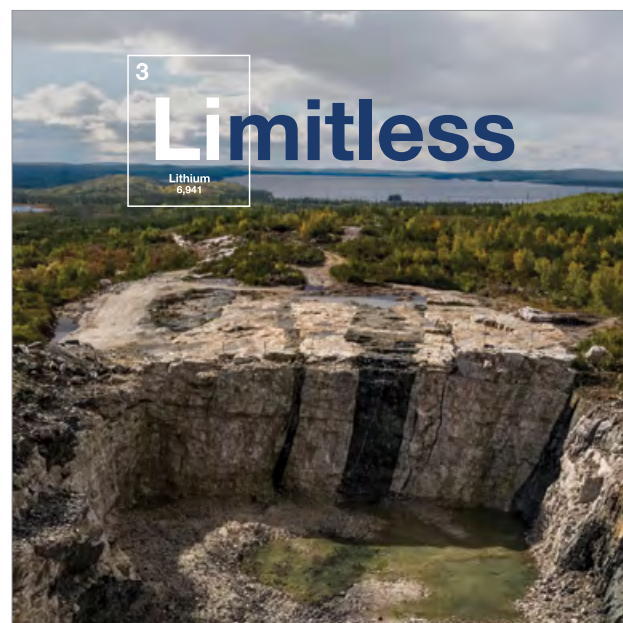
**EXPLOITING THE NICHES: RARE-EARTH ELEMENTS AND SILICON**

Québec is the second-largest niobium producer globally after Brazil, and with global demand appreciating at roughly 10% per annum, companies such as Commerce Resources and Saville Resources believe they are well positioned. Chris Grove, president of Commerce Resources, has observed a fundamental shift in the rare-earth elements (REE) market since 2016, as the global drive to find substitutes for REEs are used for magnets in electric motors proved unsuccessful, and more recently in October 2018, as China announced that imported REE feedstock has now surpassed domestic production. "The Chinese government has been very active in shutting down illegal producers of commodities and projects that pollute heavily inside China. This may provide opportunities for companies such as Commerce Resources," reflected Grove.

Commerce Resources' sister company, Saville Resources, has a 75% earn-in agreement on the Niobium Claim Group Property, and will be responsible for drilling the niobium-rich areas. Meanwhile, Commerce Resources continues to focus on developing its Ashram REE project. The Niobium Claim group property is located within the central Labrador Trough, approximately 130 km south of Kuujuaq, Québec, and covers several prospective niobium-tantalum targets. Mike Hodge, president and CEO of Saville Resources, expanded on the eye-catching exploration results at the property: "Saville Resources currently has the highest grades of ground samples globally. For instance, our grades are at 16%, while others are at 0.6%," he said.

GéoMéga Resources focuses on a lanthanide called neodymium, but has shifted attention from exploration to refining in recent years. Kiril Mugerman, president and CEO of GéoMéga, detailed the reasoning behind this shift in focus: "The biggest bottleneck in the mining industry is not actual mining or scarcity of resources, but rather lack of refining capacity," he explained. GéoMéga has made significant progress in its refining processes, from running tests at 0.003 grams of rare earth per liter in 2014, to over 100 grams per liter in 2018.

When it comes to niche markets, Canadian Metals, as the only junior company in the silicon space, believes it can take advantage of the growing demand for silicon from the solar panel market, which is growing at 30% per year. Silicon does not exist in its pure state and must be extracted from quartz, one of the most abundant minerals of the earth's crust. René Boisvert, president of Canadian Metals, wants to educate the market on the benefits of a material that is not well known: "Without silicon, many of the technologies that we use today would not exist and, to date, no other material has been found that can replace silicon in its application," he revealed.



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# Gold Exploration in Québec

*Time to reinvest and replenish*

In 2014, Osisko sold its Canadian Malartic mine to Yamana Gold and Agnico Eagle for C\$4.3 billion after escaping a hostile takeover attempt by Goldcorp. It has since become the 10th-largest producing gold mine in the world. Despite missing out on Canadian Malartic, Goldcorp reached commercial production at its US\$1.8-billion Éléonore mine in 2015. Since then, gold shipments from Québec have risen steadily, from just under 52 million grams in 2016 to over 59 million grams in 2018.

Yet a lack of new projects coming into production in the years since, combined with a number of gold mines across Canada nearing the end of their mine life, has heightened the need for new, large-scale discoveries. What is on the horizon?

## ELDORADO GOLD AND OSISKO MINING ADVANCE PROGRESS AT QUÉBEC'S NEXT GOLD MINES

Québec's next gold mine belongs to Vancouver-based, multi-asset, mid-tier Eldorado Gold, whose Lamaque mine in Val-d'Or is expected to reach commercial production in Q1 2019. As a

minority shareholder and business partner of Integra Gold since 2015, Eldorado noticed the potential of the Lamaque project first-hand from an early stage, and finalized a friendly acquisition in July 2017. Adding a Canadian asset to a global portfolio that includes mines in Turkey and Greece, and development-stage projects in Romania and Brazil, George Burns, president and CEO of Eldorado Gold, spoke of the potential he sees at Lamaque: "the initial life of mine is estimated at seven years, with an average annual gold production of 117,000 ounces (oz). We believe that is only the beginning and the potential of this district is enormous," he stated.

Eldorado's pre-feasibility 43-101 report released in March 2018 highlighted a current reserve of just under 900,000 oz, with 1.3 million oz of inferred resource potential to convert additional resources into reserves. Burns went on to detail the robust economics of the project, with an after-tax NPV-5% of US\$205 million, an after-tax IRR of 34%, and a payback period of 3.7 years. "We see it as the beginning of a long and valuable future for the surrounding community, the province and ourselves. Lamaque will be a source of employment and opportunity for years to come," concluded Burns.

No other company has performed as much exploration in Québec in recent years as Osisko Mining. Since its restructuring in 2015, Osisko has managed to drill over 800,000 meters in a little over three years. Its flagship asset, the Windfall Lake property located in the Abitibi Greenstone Belt, James Bay, is a large intrusive-related gold deposit with a 3.1 million-oz reserve defined from the Windfall deposit and its contiguous Lynx discovery. The newly discovered

*"Osisko Mining intends to create the next intermediate Canadian mining company, and we believe that Windfall has the potential to be Osisko's cornerstone asset. As we drill out and advance exploration, the project will grow to world-class scale."*

-John Burzynski,  
CEO,  
Osisko Mining



- Leading Gold Exploration in James Bay, Quebec
- 3 High-Grade Gold Assets
- Significant Exploration Planned in 2019; Expanding on Percival & Éléonore South Discoveries



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IMAGE: Courtesy of Québec Precious Metals Corporation (QPM)

Triple 8 zone, located at a depth of 2 km, at Windfall, and a secondary deposit of 510,000 oz at Osborne Bell will be factored into a feasibility study due for completion by the end of 2019, according to Osisko's CEO John Burzynski.

Osisko expects to complete drilling in Q2/Q3 2019, and will apply for permitting with the feasibility study in hand by the end of the year. After permitting, construction at the site will take another 12 months, which will lead to commercial production by late 2021/early 2022. Elaborating on his vision for the Windfall project, Burzynski said: "Osisko Mining intends to create the next intermediate Canadian mining company, and we believe that Windfall has the potential to be Osisko's cornerstone asset."

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As we drill out and advance exploration, the project will grow to world-class scale.”

**GOLDEN OPPORTUNITIES: THE JUNIORS HUNTING FOR THE NEXT MAJOR DEPOSIT**

Since winning discovery of the year at the 2016 Xplor conference for its flagship Cheechoo gold asset, located in James Bay a mere 7 km from Goldcorp’s Éléonore mine, Sirios Resources has continued conducting intense exploration, reaching 50,000 meters of drilling on the property. By the middle of 2019 Sirios will produce its first resource estimate, and capacity at the camp is being increased from 20 to 50 people, with improvements to road access allowing machinery to be transported to the site directly anytime of the year. Dominique Doucet, founder and CEO of Sirios, believes Cheechoo has the potential to host at least 3 million oz of gold, and is bullish on its chances of becoming a significant mine in the future: “I consider the probability of a mine being developed from the project to be greater than 75%, which is remarkably high considering that the probability of a grassroots project moving into production is far below 1%.”

Another junior with ties to Goldcorp in James Bay is Eastmain Resources, which operates three different projects in northern Québec. Eastmain’s flagship asset is the Eau Claire project on the Clearwater property, for which a preliminary economic assessment

(PEA) was issued in May 2018. Eastmain’s second asset, the Éléonore South project, is held in a joint venture agreement with Goldcorp and Azimut. Describing the six targets that the company is currently working on, Claude Lemasson, Eastmain’s president and CEO, said: “We are trenching, stripping and drilling. The vision is to continue work on these targets, leading to further discoveries, and advance the project itself through pre-development,” he said.

Lemasson went on to praise the pro-development business approach of the Cree community in James Bay, and mentioned other benefits that mining brings to the district, including an extensive infrastructure network and the presence of Hydro-Québec, which supplies energy across eastern Canada and the eastern seaboard of the United States.

One of the larger market cap juniors operating in Québec is Probe Metals, formed as a result of the sale of Probe Mines Limited to Goldcorp in March 2015 for over C\$500 million. In 2016, Probe Metals acquired all of the outstanding common shares of Adventure Gold to create a well-funded Québec and Ontario-focused gold explorer and developer. The aim of the acquisition was to attain financing to rapidly advance the Val-d’Or East project, which Probe Metals has realized, with a shareholder base consisting of players such as Goldcorp, La Caisse de dépôt et placement du Québec, and SIDEX, among others. Marco Gagnon, executive VP of Probe Metals, detailed the mineralization found at Val-d’Or East: “We have

already identified numerous gold zones, which are characterised by sulphide-bearing, quartz-tourmaline veins typically associated with mineralized diorite dykes,” he explained.

Market conditions have not favored the junior community since the end of the super cycle, and a collaborative approach that brings together financial resources and expertise is becoming more commonplace. One such case is Québec Precious Metals Corporation (QPM), which was formed in April 2018 as Canada Strategic Metals acquired Sphinx’s three gold projects through an asset purchase, and then teamed up with Matamec Explorations and the Sphinx management team to create the new gold exploration company. Goldcorp invested C\$4 million, and an initial exploration program commenced at the Sakami gold project in Q3 2018. Normand Champigny, CEO of QPM, outlined the reasoning behind this business model: “The industry requires consolidation, as there are currently too many junior companies with too little funding in the market. It is better to offer very high-quality projects that will attract investment and encourage development,” he said.

The changing landscape of junior mining in Québec has also seen companies rebrand to convey a change in focus. In 2017, GFK Resources changed its name to Opus One Resources, as it highlighted a new geological approach and a sharpened focus on its three standout properties. Opus One has properties located above the 49th parallel and therefore qualifies for the Québec Plan Nord, which translates into better tax credits for both flow through investors and the company itself. Louis Morin, CEO and director of Opus One, detailed the upside potential of the assets: “Opus One’s properties are well located, have favorable geology, are under explored, and are in low-cost exploration areas, as at this stage, only shallow drilling is required.”

Toronto-based financial services firm Red Cloud Klondike Strike takes an innovative approach to sourcing investment for mining clients, and its spin-off company, Blue Thunder Mining, will follow suit by adopting innovative solutions to find mineral deposits at its Chibougamau-Chapais property in Québec. Blue Thunder will crowd source for innovative ideas by uploading geologic reports online, according to Chad Williams, Blue Thunder’s chairman. Expanding on the theme of innovation, Williams continued: “we will be using artificial intelligence (AI) and drone-supported geophysics, as we have linked up with a big data/AI firm in Montréal that we will partner with going forward. This methodology should allow us to increase the odds of finding an economic mineral deposit.”

**THE MODERNIZATION OF CENTRAL-AFRICAN GOLD MINING**

Many of the exploration companies based in Canada do not have assets in North America, but use the country as a base, taking advantage of Canadian mining expertise and proximity to money markets.

Canadian Overseas Resources (COR) was created in May 2018 to promote the different activities of its partner companies operating in Cameroon, Gabon, Congo Brazzaville, Central Africa Republic, and the Democratic Republic of Congo (DRC). Through these

*“The land is gold-rich and has huge potential, but to realize it, operations must be modernized.”*



**-Fabrice Ngondi Demtare, President, Canadian Overseas Resources**

African companies, COR holds dozens of artisanal mining sites and 11 research permits covering an area of 4,500 square km. COR’s aim is to leverage Canadian mining knowledge to accelerate the research and prospecting that will help push its African activities into industrial gold mining by 2025. COR will launch the first stage of its drilling campaigns in Cameroon and Congo Republic in 2019. Fabrice Ngondi Demtare, president of COR, is looking to draw on Canadian expertise, technology and investment to advance central-African projects that have previously relied on artisanal mining practices: “The land is gold-rich and has huge potential, but to realize it, operations must be modernized,” he explained. “Sustainable development in the communities in which COR’s partner companies operate is the ultimate goal.”

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# Iron Ore & Base Metals

## Premium-quality iron ore in high demand

The Labrador Trough, an extensive belt of mineralization running through the provinces of Québec and Newfoundland & Labrador, has been producing iron ore since the 1930s. Roughly 500 km south, the port of Sept-Îles – Canada’s largest iron ore export port – ships product for steel production around the world, of which China accounted for 49.2% in 2017.

Although the price of regular-grade iron ore has slumped since 2015, higher-grade iron ore concentrate of 65% Fe and above, with a lower content of alumina, is attracting a price premium, as China looks to reduce its carbon emissions. Tayfun Eldem, president and CEO of Alderon Iron Ore, explained: “China continues to drive the iron ore market, but in recent years, its influence has shifted towards product quality, rather than being solely volume-based, due to the country’s strict policies to curb air pollution.”

Alderon’s advanced-stage, premium-quality Kami Iron Ore project is fully permitted to commence construction. The project will contribute approximately C\$7.6 billion to workers and businesses across Canada during its lifecycle, according to Eldem. The Québec

government’s acquisition of Cliffs Natural Resources has opened up its ore-handling facilities into a multi-user arrangement, which has had implications in terms of access and capital rationalization. “Projects that mine bulk commodities are first and foremost infrastructure projects, and having access to good rail and port infrastructure is critical,” stated Eldem.

While the general market may not yet be fully aware of the different markets for the varying grades of iron ore, the mining investment community has taken note, exemplified by Altius Mineral’s becoming a shareholder in Champion Iron and investing C\$10 million in a convertible debenture to help restart the Bloom Lake mine. Chad Wells, Altius Minerals’ vice president, explained the investment: “Champion Iron is going to play a significant role in the bifurcation story of iron ore, as they are producing a significantly high grade with low impurities,” he responded.

Tata Steel Minerals Canada (TSMC) is the Montréal-based mining arm of the Tata Steel Group, one of the world’s largest steel producers with over 77,000 employees globally. TSMC is developing iron ore deposits

in Québec and Newfoundland & Labrador, and started with a small, direct shipping ore (DSO) operation from a section of its deposit that could be extracted directly from the ground, crushed, and screened. The sinter fines and pellet fines are then shipped to customers. PK Ghose, TSMC’s CEO and MD, commented on how their product has been widely accepted across both Europe and China: “Over the last three years, we have extracted 6 to 7 million tons, with the majority shipped to China and later Tata Steel’s European steel making facilities.”

In 2017, TSMC signed a memorandum of understanding with Société du Plan Nord and Québec Iron Ore for the development and enhancement of the infrastructure facilities at Pointe-Noire in Sept-Îles via the limited partnership Société Ferroviaire et Portuaire de Pointe-Noire (SFPPN). The collaboration will facilitate the development of the Pointe Noire infrastructure to match the anticipated ore delivery needs of its partners. One of TSMC’s partners is New Millennium Iron (NML), which completed a pre-feasibility study in 2016 for its Taconite project, NuTac. Dean Journeaux, director of NML, provided details of the grade at Taconite: “Its concentrate grade is 67% Fe, with very low alumina and other deleterious elements, which commands a premium in the market,” he said.

### JUNIORS RESTRUCTURE TO FOCUS ON BASE METAL EXPLORATION

After selling its gold assets in northern Québec to the newly formed Québec Precious Metals Corporation (QPM), Sphinx Resources chose to focus on zinc in southwestern Québec. Its Calumet-Sud discovery in the Pontiac regional county municipality, in collaboration with SOQUEM, has extensive zinc mineralization on the surface of the ground and rock, according to director Normand Champigny.

Normand also divulged Sphinx’ relationship with Osisko to explore for zinc in the Grenville geological province, characterized by the presence of zinc-rich dolomitic marble. Champigny compared the geology in the region to that of Australia, where half

the world’s zinc has been produced, and explained its benefits: “One advantage of this rock is that it is basic, meaning that there is no acid mine-drainage. Additionally, it is soft and can be used to sell non-zinc material as a fertilizer.”

Another base metal-focused company working in the Grenville geological province is Kintavar, established in March 2017 as part of a transaction between GéoMéga Resources and a private company, and financed to the tune of C\$10 million. Kintavar’s Mitchi property is a stratiform copper-type deposit (SSC), with mineralization from-surface, which means it can be mined as an open-pit and is thus more cost-effective. Kiril Mugerma, Kintavar’s CEO, revealed that results from trenching activities in 2017 did not fit into a traditional skarn model, and shared similar characteristics to sedimentary deposits from the DRC. Despite a decrease in the copper price in 2018 due in part to the tariff war between the US and China,

Mugerma sees strong fundamentals for copper moving forward: “It is now a good time for investors to look at the copper market. The macro picture suggests that the price will increase significantly, as major copper discoveries are rare, but demand is increasing,” he advised.

Galway Metals is one of two spin-off companies from the sale of Galway Resources for US\$340 million in December 2012. In addition to its gold-focused Clarence property, its Estrades property in the northern Abitibi region of western Québec has five metals – gold, silver, zinc, copper and lead. The overall metal content at Estrades has risen by 32%, with tonnes increasing by 47%, according to Louis Morin, CEO of Galway Metals, who elaborated on the features of the resource: “Crossing the Estrades property are two under-explored rhyolite units in which volcanogenic massive sulfide ore deposits are found, usually in clusters,” he said.

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# Innovative Solutions

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Volatile commodity prices and a seven-year downturn forced the mining industry to become resourceful and think outside the box to maintain competitive cost structures, optimize processes and enhance security. Traditional methods become obsolete when they no longer guarantee profit, and the necessity to embrace change has fostered a robust, innovative ecosystem of small and medium-sized enterprises, multinationals and research organisations that are creating and developing technologies that are already transforming global mining operations. Québec is at the forefront of this charge, from its world-renowned artificial intelligence (AI)-research hub in Montréal to a mature service sector in Val-d'Or that constantly adapts to the evolving market.

*“The Canadian mining industry transcends its own borders. The mines and projects in Canada have a very positive effect on the national economy as well as local communities, and decisions taken daily in headquarters across the country have a significant impact on the global mining industry.”*

**-Rob Hardman,  
GM North America,  
Maptek**



Spearheading the development of mining innovation in Québec is COREM, the largest organization in Canada totally devoted to mineral processing research and development (R&D), with six fields

of expertise – comminution, physical separation, flotation, extractive metallurgy/hydrometallurgy, pelletizing/thermal processes, and mineralogy. Based in Québec City, COREM's facilities include 10,000 square meters of offices, labs and pilot plants. A C\$16-million project to build a new hydrometallurgy platform, install new equipment, and modernize COREM's buildings is due to be completed by the summer of 2019.

When asked about the pertinent challenges that the industry must address, COREM's president and CEO Francis Fournier highlighted energy consumption, water use, tailings and environmental issues, and suggested that a value chain-approach is required to maximize the benefits of innovation: “The work done in extraction has an impact on mineral processing as well as on tailings and environment. We cannot continue to develop innovation with a silo approach,” he responded.

This sentiment was echoed by Gianni Bartolacci, director at COREM: “The innovation ecosystem in Canada is fragmented and needs to work together and collaborate in order to fast-track the deployment of the innovation that will bring more value to the industry.”

Réjean Girard, president of IOS Services Géoscientifiques, the independent consulting group servicing Québec's mining

industry for 27 years, sees innovation as a necessity rather than a choice: “We are moving into a time when technology will revolutionize the mining industry. Machines will replace both manual as well as intellectual labor. The industry has no choice other than to adapt and must prepare for the looming technological changes,” he reflected.

## THE TOOLS AND SOFTWARE DEFINING THE MARCH TOWARDS THE DIGITAL MINE

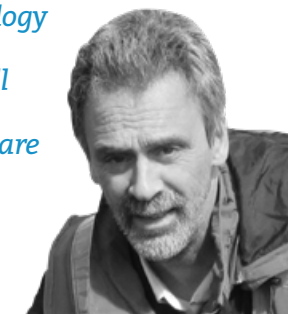
In 2008, Montréal-based Newtrax Technologies decided to focus 100% of its attention on the digitalization of underground metal mines, with the vision of becoming the global leader in wireless Internet of Things (IoT) and the preferred

source of big data for AI, according to Alexandre Cervinka, Newtrax' president and CEO. To produce this big data, Newtrax designs, builds and globally deploys purpose-built devices to monitor machines, people and the environment in which they operate underground. In the last three years,

Newtrax has undergone dramatic growth, from 34 employees in 2016 to 128 today. Newtrax' solutions help companies reduce overhead costs and enhance safety. One example is Agnico Eagle's Goldex mine, which reported significant cost reductions on its tire expenditure and fuel consumption

*“We are moving into a time where technology will revolutionize the mining industry. Machines will replace both manual as well as intellectual labor. The industry has no choice other than to adapt and must prepare for the looming technological changes.”*

**-Réjean Girard,  
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by implementing the Newtrax MET (Mobile Equipment Telemetry) system. Another major to have worked with Newtrax is Goldcorp at its Éléonore mine. After being recognized as the safest mine in Canada in 2016, Goldcorp mandated that its 660 workers wear fully-integrated Newtrax-Enabled Personal Safety Devices.

Elaborating on Newtrax' partnership with the Institute for Data Valorisation (IVADO), whose scientific director Yoshua Bengio is one of the three founders of deep learning, Cervinka explained: "There are three important pillars to deliver value with AI – application knowledge, quality of data, and application of algorithms. In collaboration with IVADO, we have established machine learning pilot projects to test the quality of our datasets to understand if there are any gaps in the way we capture, consolidate and contextualize data."

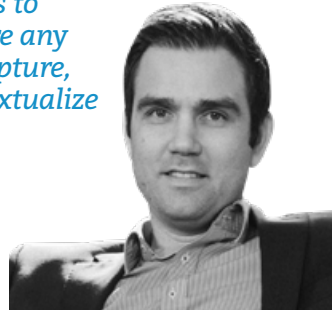
Another innovation-focused technology company to have experienced substantial growth in recent years is Maptek, which opened offices in Montréal and Vancouver in 2017, enhancing its international footprint to 14 offices in nine countries. The company attained 37 new mining clients in North America alone in 2018. Speaking of the importance of the Canadian market in a global context, Rob Hardman, GM of Maptek North America, noted: "The Canadian mining industry transcends its own borders. The mines

and projects in Canada have a very positive effect on the national economy as well as local communities, and decisions taken daily in headquarters across the country have a significant impact on the global mining industry."

Maptek's range of solutions includes BlastLogic, an all-in-one data-management solution that assists with blast implementation

*"There are three important pillars to deliver value with AI – application knowledge, quality of data, and application of algorithms. In collaboration with IVADO, we have established machine learning pilot projects to test the quality of our datasets to understand if there are any gaps in the way we capture, consolidate and contextualize data."*

**-Alexandre Cervinka,  
President and CEO,  
Newtrax**



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decisions; Evolution 5.1 scheduling software, which optimizes net present value using grade cut-off techniques; and PointStudio 8, the latest update of Maptek's I-Site Studio software, a new-generation 3D platform for modelling, analysis and reporting.

The theme of success in the mining software space continues with Promine, a software company that provides geology and engineering-related tools to exploration and development projects as well as engineering companies and producing mines. Promine had a 20% increase in sales in 2018 and with a multi-lingual team, intends to penetrate the Latin American market. Highlighting the adaptability of Promine's service offering as a cost-effective subscription package, Yvan Dionne, founder and president of Promine, said: "If a client needs access to a certain function for their system that they have not signed up for, we can unlock this for them within a matter of minutes."

Montréal is home to numerous French technology companies looking for a North American base – a natural fit due to language, proximity to Europe, and culture. CORALIS, specialists in production planning and monitoring software for the mining industry, has been operating in France for 30 years, and has responded to increasing demand from the North American market by recently opening a Montréal office. Guy Donatini, co-founder and president, is counting on CORALIS' newly developed cloud software to boost business development: "This technology offers our customers better access to our software and their data, and an even more efficient technical customer service...with its monthly payments, the miner's cash flow is improved."

Since its foundation in 1991, Effigis has been pushing the boundaries of innovation, by conducting earth observation (EO) with satellite technology, and is now offering a range of products and solutions that include high-precision mapping from EO data, specialized monitoring tools for electromagnetic leakage, and geospatial data collection. Effigis' EO division works with geospatial data collection, which surveys underground infrastructure, and has provided information to clients such as Osisko, Azimut, and Glencore. Michel Rheault, vice president of geology at Effigis, characterized the company's involvement in mineral discovery: "We first help clients understand the geology of the area they operate in by providing more accurate mineral information and faulting architecture of a mining property, for instance. Effigis steers its customers in the right direction – saving them valuable time and money," he explained.

Instrumentation GDD has been operating since 1977, developing and manufacturing a wide range of electromagnetic and induced-polarization geophysical instruments, including a recently developed tool for detecting conductors that can reach a depth of 3 meters and can read up to 10 times per second, at up to 70 km per hour. Pierre Gaucher, GDD's president, provided some context: "To put this in perspective, a human being can only see 2% of the ground with his or her eyes. GDD's tool, the Beep Mat, makes it possible to scan 40%," he specified.

**SECURITY: THE EVOLVING THREATS THAT MUST BE ADDRESSED**

As software continues to evolve and operations become increasingly reliant on technology, the issue of cybersecurity has become more vital, particularly for heavy industries that have high-risk data that affects global markets and thousands of people. However, the mining industry is still far behind when it comes to cybersecurity, according to Claude Sarrazin, president and CEO of SIRCO, the Montréal-based private investigation firm offering undercover services, computer forensics, and cybersecurity. In a staggering 96% of cases, SIRCO is able to break into its clients' systems when performing penetration testing, which illustrates the pertinent need to tighten security. Security threats have been present long before the digital era, and SIRCO has conducted 21 training sessions related to narcotics over the last three months for companies in the mining sector alone, as more frequent testing for cannabis has seen positive results for other drugs such as methamphetamine and cocaine. In SIRCO's 27 years of experience, it has identified that around 10% of employees are problematic – deliberately breaking or vandalizing equipment, stealing company resources, or benefitting from corruption. "This 10% represents most of a company's legal fees and insurance costs, and can have a huge effect on profit margin and even the culture within an organization," said Sarrazin.

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“Security issues, whether internal or external, do not go away. You need to address them, and although they are not always high on the list of companies’ priorities, it is vital that you stay on top of them before they turn into a major issue,” he concluded.

**ENVIRONMENTAL REGULATIONS DRIVE GROWTH FOR GREEN-TECHNOLOGIES**

The global drive away from higher carbon fossil fuels towards green-energy solutions transcends industries, and in a mining context has seen companies increasingly concerned about the environmental and economic costs of diesel fuel use, especially with government-imposed carbon-reduction legislation on the horizon.

Distributed Gas Solutions Canada (DGSC) is hoping to change this, and offers turnkey liquefied natural gas (LNG) and compressed natural gas (CNG) supply solutions for industrial and transportation end-users in Canada who are not served by pipeline infrastructure. DGSC was established in 2017 in a partnership created by three company partners: Hydromega Services, the Montréal-based renewable energy power producer; Galileo Advanced Solutions, the U.S.-based commodity supply chain arm of manufacturer Galileo Technologies; and Québec City-based Groupe Desgagnés, a marine transportation service company.

In November 2018 diesel fuel rack pricing was approximately C\$21.50/GJ in Montréal, whereas natural gas was approximately C\$5.50/GJ. In addition to the considerable cost benefits, Andrew Wilkins, DGSC’s VP of business development, expanded on the environmental benefits that LNG offers: “CO2 reductions of up to 25%-35% and nitrous oxides (NOX) reductions of over 70% can be achieved. There is a virtual elimination of particulate matter (PM) and sulfur oxides (SOX), which are air pollutants that cause smog and human health problems.”

Another company promoting environmentally responsible practices is Avjet, which offers biodegradable lubricants, mostly used in a mining context as hydraulic oil/fluid and drilling oil/fluid as well as rod grease and anti-seize. André Martineau, from Avjet’s lubricants division, believes every mine could and should use biodegradable lubricants, as mineral-based lubricants can contaminate soil and cause long-term environmental damage if they are not decontaminated. “Biodegradable lubricants turn into carbon dioxide and water within 15 to 30 days with the help of microorganisms in the soil along with air and water, and are not harmful to the environment at all,” affirmed Martineau.

Water management has become paramount in the global mining industry, as companies

*“Security issues, whether internal or external, do not go away. You need to address them, and although they are not always high on the list of companies priorities, it is vital you stay on top of them before they turn into a major issue.”*

**-Claude Sarrazin, President and CEO, SIRCO**



look to protect the environment from degradation while at the same time reducing fresh-water costs. H2Flow acts as an integrator and represents 50 companies, providing water-treatment solutions that comply with the new Metal and Diamond Mining Effluent Regulations (MDMER) that came into effect in June 2018. Eric Lannegrace, H2Flow’s mining market manager, went into further detail about the updated MDMER: “The amendments establish more stringent limits for existing metal mines on arsenic, cyanide, and lead as well as add new limits for unionized ammonia.”

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# Services

## Engineering and consulting

While the innovations dragging the mining industry into the twenty-first century come from companies of all sizes, the movers and shakers in the engineering and consulting space in Québec have a decidedly international footprint.

As service companies in the mining industry go, few have a global reach that compare with SGS, with 14,000 of its 95,000 employees dedicated to the minerals sector, 2,400 offices and laboratories around the world, and operations in 14 locations across Canada. SGS’ newest sample preparation facility opened in Val-d’Or in July 2018, and is being used as a base for its geological consulting services, an area that SGS intends to expand in 2019, according to Daniel Leroux, global business manager from SGS’ Blainville office in Québec.

SGS plans to launch a new service within its geochem business line by March 2019, which will include on-site quick-testing capabilities, providing rapid information feedback to geologists so that they can make quicker decisions. Lawrence Ng, SGS’ vice president of minerals, highlighted the mini flotation pilot plant capabilities that SGS is adding to its existing pilot plant-testing expertise: “Mini flotation pilot plants deliver the same quality of engineering data as a large-scale pilot plant but only require a fraction of the sample volume typically required, saving substantial program costs,” he stated. This service will be completed at any of SGS’ metallurgical facilities in Canada, or at its client’s projects across North America.

A theme of consolidation became apparent in the engineering, procurement and construction management (EPCM) space during the downturn, as companies looked to expand their service offerings through mergers and acquisitions (M&A) activity. One such case was DRA Global’s acquisition of Montréal-based engineering firm Met-Chem in 2016, boosting DRA’s lithium and graphite capabilities and adding a mineral resource and geology group to its portfolio. Daniel Gagnon, senior vice president of mining, geology and Met-Chem operations at DRA Global, had been with Met-Chem for 19 years before the acquisition, and spoke of the smoothness of the transition, due in part to a shared, hands-on philosophy and focus on innovation. DRA Met-Chem is working with Nouveau Monde Graphite on its Saint-Michel-des-Saints project – the first-ever, all-electric, open-pit mine. Gagnon recounted Met-Chem’s early-stage involvement as part of Nouveau Monde’s task force committee: “we discovered that all the required technology and machinery existed, and had been utilized in various other projects, but had not yet been brought together for one operation.” The Saint-Michel-des-Saints graphite project, an important milestone for the global mining industry, is due to enter into production in 2021.

*“Mini flotation pilot plants deliver the same quality of engineering data as a large-scale pilot plant but only require a fraction of the sample volume typically required, saving substantial program costs.”*

**-Lawrence Ng, Vice President Minerals, SGS**



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WHEN YOU NEED TO BE SURE







IMAGE: Courtesy of Fednav

Stantec, the Canadian engineering and environmental services company with 22,000 employees globally, has grown its Québec operations through two acquisitions in recent years, the first being the acquisition of Dessau's engineering assets in 2014, followed by Saguenay-based Cegertec in 2018. Kirk Morrison, Stantec's executive vice president, touched on the benefits of having expertise and experience in a wide range of sectors: "Stantec is well placed to take

advantage of the cross-pollination that is starting to happen between the power and mining industries," he stated.

The Montréal arm of Australian multinational EPCM company Ausenco is moving to a new office in 2019 to accommodate growth in the region. Ausenco's project delivery team in Montréal provides conceptual studies for clients such as Atlantic Gold at its Moose River Consolidated Gold project, an open-pit gold mine located 110 km northeast of Halifax, Nova Scotia. Marie-Andrée Morin, vice president minerals and metals at Ausenco Canada, detailed the scope of the EPC contract that included the delivery of a 2-million tons per year carbon-in-leach gold-processing plant and associated infrastructure: "Working under a very tight schedule, we delivered the first gold pour, on schedule, in October 2017, 16 months after mobilization," she said. Another engineering firm with Australian roots is Primero, which opened its North American headquarters in Montréal in 2017. Having developed a strong relationship with Galaxy Resources by working on its Mt Cattlin lithium mine in Western Australia, Primero was invited to work on Galaxy's James Bay project in northern Québec, and decided it was an opportune moment to establish a North American base. Jaques Parent, GM of Primero Americas, has witnessed the company grow from two employees to 22 in little over a year, and hopes to triple those figures by the end of 2019. When asked to define Primero's business model, Parent responded: "We work from the standpoint of a partnership, and prefer a client and engineer-constructor relationship, rather than a purely financial contracting endeavor."

**LOGISTICS: ALL-SEASON ACCESS TO REMOTE LOCATIONS**

Projects that mine commodities are first and foremost infrastructure projects, and in extreme climates, the logistical components of a mining operation are of fundamental importance. A lack of all-season road access has been a significant barrier to the development of multi-billion dollar deposits, such as the Ring of Fire in Ontario. In Québec and the surrounding provinces, specialized air and sea travel services have become a vital part of the value chain.



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**-Pita Aatami, President and CEO, Air Inuit**

Montréal-based global shipping company Fednav celebrates its 75th anniversary in 2019, and operates a fleet of between 100 and 115 ships. Tom Paterson, Fednav's senior VP, ship owning, arctic and projects, outlined that any mining project that requires shipping needs in-depth planning from an early stage: "new ports close to the mine sites must be designed in harmony with the mining companies' needs, in order to ensure maximum output and cost efficiency," he explained.

Fednav ships approximately 2 million tons of base metal concentrates annually from various mines in remote locations across Canada and Alaska, such as Teck's Red Dog, Vale's Voisey's Bay, Glencore's Raglan and Canadian Royalties' Nunavik Nickel mine. Fednav also supplies these mines with all of their consumable materials, including fuel. For many communities and mining operations in northern Québec, air travel is the only means of transportation, due to a lack of infrastructure and extreme weather conditions that can reach -55 degrees Celsius. One of the airlines providing vital air services to remote communities is Air Inuit, collectively owned by the Inuit of Nunavik through the Makivik Corporation, which has been in operation for 40 years. Air Inuit services an area the size of France, working with mining clients that include Glencore, Canadian Royalties, Tata Steel and the Canadian Government.

Considering the extremity of the environment Air Inuit operates in, safety is paramount, and ensuring it has become the bedrock of the company. Pita Aatami, Air Inuit's president and CEO, assured that his airline consistently looks to improve safety, and its record speaks

for itself: "In 40 years of service at Air Inuit, we are proud to have never suffered any major accidents," he stated.

One of the airlines with a specific focus on the mining industry is Nolinor Aviation, which offers services that include passenger transportation, cargo, a combination of both, hazardous materials, petroleum products, and freight. Nolinor supports a diverse portfolio of mining clients of all sizes and covers all stages of the mining cycle, from exploration and production to mine closure. Nolinor is BARS (Basic Aviation Risk Standard) gold-certified, and one of the only companies to offer real-time tracking of its aircrafts. Underlining its commitment to the mining industry, Marco Prud'Homme, Nolinor's vice president, mentioned some of the airline's key clients: "Nolinor has worked for just about every mining project in the Yellowknife region, with one of our biggest projects being the Agnico Eagle mine and Baffinland Iron mine."

Chrono Aviation began operations six years ago, and has worked with clients such as

Nemaska Lithium, Osisko Mining, Stornoway Diamonds, Goldcorp and Rio Tinto. In 2019 it plans to add two more aircraft to a fleet that includes seven Pilatus PC-12s, two Beechwood 1900Ds, one Super King air 350 exec, one Dash 8, one Falcon 50 EX, and two 737-200s. Vincent Gagnon, president of Chrono Aviation, believes the airline competition in Québec is positive: "our philosophy is that competition is healthy and it means that customers will get the best deals."

Air travel is, of course, not limited to planes, especially for mining companies looking to reach deposits located in rough terrain far away from a landing strip. Québec City-based Gohelico is home to the biggest helicopter hanger in North America and has a fleet of 12 helicopters. Yves Côté, sales director, provided an overview of Gohelico's services for mining clients: "Gohelico services junior exploration companies, mid-tier producers and major mining companies, mostly transporting employees and environmental surveyors to and from sites." •

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# Jonatan Julien

Minister of Energy and  
Natural Resources,  
Government of Québec



**On October 18, 2018, you were appointed Minister of Energy and Natural Resources in Premier François Legault's new government. What are the Ministry's priorities and how does the mining sector feature in its strategy?**

The mining sector plays a vital role in Québec's economy and provides dynamism to our regions. Our government relies on the sector's significant contribution towards building a more sustainable economy, especially with regards to the challenges of the energy transition. Our vision is to have responsible development of our mineral resources for the durable prosperity of Québec. My priorities as minister are to support the economy, be an environmental and social exemplar, nurture innovation, and promote Québec's leadership.

We want to help the industry compete with other jurisdictions by supporting investment, contributing to the financing of structural mining projects, and helping develop the markets.

**Many mining companies have spoken of the challenges of dealing with lengthy and costly permitting. What can be done to address this issue and streamline the process?**

I have already met several industry representatives and understand their concerns well. Our government has defined the objective of achieving increased economic performance, and as part of that, we will prioritize giving administrative support and providing a faster response to the different requests.

We would like the different processes to be more predictable for mining companies, especially in terms of timing, so that they can plan their activities and be ready and in good position whenever market opportunities are optimal. This work has already started and you can be assured that we will pursue this objective diligently to obtain clear results.

We have a close and constructive relationship with the Québec Mining Association and the Québec Mineral Exploration Association, who are active partners in our ministry's committee on administrative simplification. In this context, the improvement of administrative performance will be a reality.

**What can the Ministry do to nurture a more favorable investment climate?**

We will bet on innovation to attract investors to projects that will offer competitive returns, but will also help reduce greenhouse gases, one of our era's greatest challenges.

Prime Minister Legault is resolute about promoting Québec as a leader in energy efficiency. Québec's energy transition offers

several opportunities for synergies between the mining and energy industries. As an example, transportation electrification is an area where Québec is very proactive in terms of R&D. We support initiatives such as Propulsion Québec, an industrial cluster mobilizing all actors in intelligent and electric land transportation around structural projects, especially in the field of lithium-ion batteries. Several mining companies are part of Propulsion Québec.

**How important are initiatives that promote responsible mining, such as the Towards Sustainable Mining (TSM) initiative?**

Initiatives such as TSM showcase the engagement of industry members with implementing the necessary efforts to continuously improve practices. It is a pledge for quality and respect that can help strengthen the industry's credibility. I sincerely believe that the social and environmental norms that we give ourselves as a society will be reflected by the quality and success of our industries in the long term.

**Québec has risen to #6 in the Fraser Institute's ranking of global mining jurisdictions. What makes the province an attractive mining destination?**

Québec is endowed with rich and diversified production, since, on top of our strong position in traditional metals like iron and gold, our territory hosts minerals like lithium, graphite and rare earths, which are highly strategic for the future. From my perspective, what makes Québec a leader is its people, companies, associations, research centers, universities and colleges – we have an expertise recognized worldwide. Québec is ranked 6th and we are here to continue this work and improve that position.

**Do you have a final message for Global Business Reports' readers?**

As shown by different studies, Québec is one of the most attractive jurisdictions for mining investors in the world. As minister, I would like to send a clear message to investors in terms of the stability and business environment here. We will be custodians and promoters of the competitive advantages that make Québec a business destination of choice.

Mining development will play a key role in realizing our sustainable prosperity vision. This will be done by respecting the efforts carried out by project developers, the host communities and the native communities, and the environment and the heritage that we will leave for future generations. •