



Honourable Bruce Ralston
Minister of Energy, Mines & Petroleum
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Dear Minister Ralston:

Giga Metals Corporation is pleased to have been able to review the Interim Report on Phase 2 of the Comprehensive Review of BC Hydro. We appreciate that the Ministry is taking the time to thoroughly consult stakeholders as it moves down this important, strategic path. Thank you for considering our input.

Giga Metals owns the Turnagain nickel deposit near Dease Lake in northern BC, one of the world's largest undeveloped nickel-cobalt sulphide deposits, hosting 2.4 million tonnes of nickel in Measured and Indicated Resources, and a further 2.5 million tonnes of nickel in Inferred Resources.

As the world heads down a path of decarbonization, nickel and cobalt are key ingredients for the electrification of the world's transport fleets as the key energy metals in leading lithium-ion batteries such as the nickel-cobalt-aluminum (NCA) batteries favoured by Tesla, and the nickel-manganese-cobalt (NMC) batteries favoured by most other electric vehicle manufacturers.

The expected rates of EV adoption will lead the world into significant shortfalls of nickel and cobalt by 2030, requiring investment in large new nickel-cobalt mines. We believe that BC can lead the way, with commercial development of the Turnagain deposit helping advance global goals of decarbonization and responsible mineral development, while helping BC's economic development and reconciliation with northwest BC indigenous groups. Turnagain is capable of becoming a world-scale base metals mine providing hundreds of jobs and hundreds of millions of much-needed dollars to the BC economy for more than 30 years.

Turnagain will be a very large power consumer, and very sensitive to electricity prices and infrastructure buildout to the northwest. We are keenly interested in the review of BC Hydro's mandate and believe that BC Hydro can play a key role in BC's economic development, clean growth, and reconciliation agendas.

We are prepared to provide more insight on the global growth prospects for the new energy metals, nickel and cobalt, the advantages and challenges of Turnagain as a new nickel-cobalt source, and the role that regulatory development and direction of BC Hydro can play in incenting responsible resource development in British Columbia.

Sincerely,



Recoverable Signature

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A handwritten signature in black ink, appearing to read "Lyle Trytten".

Lyle Trytten
Manager of Development
Signed by: 9cc23266-5d35-4433-9766-e7eacb35f398

Lyle Trytten
Manager of Development
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cc: Dave Nikolejsin, Deputy Minister, Energy Mines and Petroleum Resources (dave.nikolejsin@gov.bc.ca);
Keith Anderson, Vice-President Customer Service, BC Hydro (keith.anderson@bchydro.com)
Mark Jarvis, CEO, Giga Metals (mjarvis@gigametals.com)
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Comprehensive Review of BC Hydro – Phase 2 Interim Report March 6, 2020

Comments from Giga Metals Corp

Summary

[Giga Metals Corp.](#) has the following primary comments on the Report.

- BC Hydro electricity is a critical tool for competitive economic development. Significant global metals mining investment will arise from the path to decarbonization, particularly for nickel, cobalt, and copper. BC Hydro is positioned to help the Government of British Columbia achieve its economic development goals by creating an *economic development rate for energy-intensive low-carbon industries*, including nickel mines.
- Economic development rates must consider the total provincial benefit from a given project, including resource extraction revenues, employment benefits, and the marginal impact of power pricing to the project.
- Preferential rates should not be extended to projects which offer low net benefits to BC.
- BC Hydro can further these goals by developing the most attractive rates for the replacement of fossil fuel in traditional mining practices. Special incentive pricing could encourage the adoption of trolley-assist, battery electric (BEV), or fuel-cell electric (FCEV) haul trucks, once the technology is proven.
 - Until a proven substitute technology is in place, these usage categories should be exempted from carbon tax to promote investment and discourage carbon leakage.
- Indigenous communities should be supported by BC Hydro to engage in reconciliation opportunities through electricity infrastructure investment.

Introduction

The next 20 years will see significantly increasing demands for specific metals as part of the global decarbonization drive, in conjunction with increasing pressure on sustainability of supply chains (responsible sourcing). Of the metals expected to be in high demand due to decarbonization, copper, nickel, and cobalt are all required for increased electrification, whether for increased distribution or use in vehicles and grid storage systems.

All three of these metals are found in BC – the province is already a significant copper producer. Cobalt is a leading critical metal to the governments of Canada-USA-EU for security of supply, and to electric vehicle producers due to significant concerns over global ESG practices. Nickel supply is also of significant concern due to the very long project lead times, high capital costs associated with Class 1 (pure) nickel production required for batteries, and the dominance of Asian production growth over the last decade. The ability to achieve the projected 100%+ increase in global Class 1 nickel and cobalt production is likely to pose significant constraints on global decarbonization. *BC is poised to be a significant contributor to decarbonization.*

Giga Metals owns the Turnagain deposit, a world-scale nickel and cobalt resource near Dease Lake in northern British Columbia that could help address the projected significant shortfall in global Class 1 nickel supplies. The world is very short of good nickel projects, especially in recognized responsible jurisdictions. BC's leading role in advancing reconciliation and clean energy profile make it a compelling jurisdiction from an ESG perspective. Unfortunately, the relatively high capital and operating costs and the extremely uncertain and long timelines for permitting in northern Canada make this a less-desired jurisdiction. *Obtaining investment with an uncertain regulatory process requires compelling economics.*

Supporting B.C.'s Energy and Economic Development Goals through CleanBC

Electricity's Role in Economic Development

Giga Metals appreciates BC Hydro's desire to grow industrial load, identified in the report as resource extraction based. Reliable, affordable electricity is critical to economic development. Low-carbon electricity is particularly important for operations supporting global decarbonization through mining and processing of copper, nickel, and cobalt ores.

Competitive mining jurisdictions have used electricity pricing as an economic development agent, and Giga Metals expects that this will be a significant factor in the viability of low-grade nickel resources such as Turnagain vs competing similar projects in Quebec and Ontario. For low-grade projects like Turnagain, electricity is the largest single cost item, and investment will more readily flow to locations with more competitive electricity prices. Highly competitive electricity prices for large resource extraction base load will significantly affect economic development in BC. *Large base metal mines can provide thousands of jobs and hundreds of millions of dollars in direct economic returns for many decades of operation.*

Establishing a competitive pricing regime for the most *price-sensitive* resource extraction consumers would ensure that existing operations remain viable and that new operations are brought to the province.

Giga Metals requests that *industrial pricing of power be considered in light of the full range of benefits achieved by BC from qualifying projects*, including resource extraction revenues, taxes, contracting opportunities, and the quantity and quality of jobs created for BC residents.

British Columbia would not be well-served by extending preferential rates to energy consumers which provide no significant provincial economic benefit, such as cloud server banks and cryptocurrency farms. Although perhaps necessary in today's technology-dependent world, in an age focusing on decarbonization and electrification, Giga Metals considers these as *lowest-tier consumers* in an evolved energy marketplace; Alberta's experience of building incremental fossil-fuel power generation to support cryptocurrency operations should not be repeated in B.C.

Clean BC – GHG Reduction through Increased Electrification

Giga Metals acknowledges that increased grid-supplied electrification is key to achieving Clean BC goals. We would like to draw attention to one specific aspect. For major mining operations, ore and waste haulage is typically by diesel-fueled trucks, therefore use of BEV or FCEV haul trucks is a significant GHG-reducing opportunity. This technology is now in the developmental stages; BEV for smaller mining equipment is already available¹², and testing of FCEV haul trucks is ongoing internationally³, featuring fuel cells by a leading BC company, Ballard Power Systems⁴.

For remote mine sites, hauled fuel represents a significant cost and GHG burden due to both the direct consumption and the transportation. For large mining operations, it may be attractive to generate hydrogen at site using clean hydroelectric power, if the power cost were low enough; investment in renewable hydrogen is already advancing in some countries⁵ due to low solar power costs.

Giga Metals suggests that BC Hydro examine special rates for local hydrogen production or haul truck battery recharging as *economic development for energy-intensive low-carbon industries*, most critically for remote locations requiring long fuel haul distances. This would have an ancillary benefit in risk reduction on BC highways due to reduced haulage of flammable materials in large loads, and in furthering economic prosperity through British Columbia's own Ballard Power Systems' leading global position.

¹ <https://im-mining.com/2019/09/16/eminig-looks-retain-battery-powered-haul-truck-lead/>

² <https://macleanengineering.com/products/mining/electric-vehicle-series>

³ <https://www.greencarcongress.com/2020/02/20200211-waeaa.html>

⁴ <https://www.greencarcongress.com/2019/10/20191029-ballard.html>

⁵ <https://www.bloomberg.com/news/articles/2019-10-08/siemens-backs-mega-green-power-hydrogen-project-in-australia>

For a large remote operation like Turnagain, hydrogen generation on-site could be a significant contributor to stabilizing power draw, and therefore stabilizing the grid. Power demand for electrolysis is extremely responsive, and could be adjusted to maintain steady site power draw, or alternatively with sufficient on-site hydrogen storage, could be run opportunistically when BC Hydro has excess capacity. This could help manage power variability which could result from operating large, low-power-factor equipment.

Tariff Supplements

Although Giga Metals is a supporter of the Northwest Transmission Line (NTL), we believe that Tariff Supplement 37 is an impediment to economic development, and recommends it be removed. This will increase the likelihood of extending the NTL further into north-west BC, increasing economic development and reduction in diesel use for communities along the route. Ultimately, Giga Metals is supportive of a strong interconnected grid to the Yukon and Alaska allowing cost optimization.

Giga Metals strongly supports removing Tariff Supplement 6. With a potential power demand slightly above the range of the threshold, this particular supplement is a barrier to Giga Metals implementing full electrification at the Turnagain site and achieving maximum GHG reductions. We believe that Tariff Supplement 6 can lead to perverse incentives increasing GHG emissions.

Intermittent Electrical Use

Giga Metals understands the challenges placed on BC Hydro by increasing rates of intermittent self-generation. Giga personnel have experience in other jurisdictions including the Alberta electricity market which has seen massive growth in behind-the-fence generation, resulting in significant challenges to manage the physical and economic stability of the grid. Giga Metals believes that a priority should be placed on base load power users, with intermittently self-supplied consumers paying a premium price for the intermittent portion of their demand as an added service that they receive from the utility. This is markedly different from the intermittent draw for hydrogen production that could be incentivized between the consumer and BC Hydro to optimize consumption patterns.

Giga Metals is supportive of innovative new rate designs for intermittent loads to allow better system utilization. Systems such as peak rate pricing should not be applied to steady industrial loads as they have the potential to cause unanticipated outcomes, such as increasing reliance on self-generation. Giga Metals is supportive of the language in the report around EITE industries.

Carbon Tax Implications

Where mining as an EITE industry is not in position to achieve full electrification (i.e. non-grid-connected operations and mining haul fleets, whether BEV or FCEV), Giga Metals believes that imposed carbon taxes represents a straight tax on business, not an incentive to reduce emissions. Only when there is a proven viable alternative, such as BEV/FCEV for the haulage duty, should carbon taxes be imposed.

Response to Specific Questions:

What factors are important to consider when looking at optional rates to support electrification?

- *Critical factors include economic development potential including full economic return to the province and supporting economic development in all regions of the province.*

How can competitiveness for business and industry be prioritized in an electrified future?

- *Complete full economic reviews to understand full benefit generation and the relative importance of power supply costs to project economics.*

How can BC Hydro reduce barriers to electrification for existing and new customers?

- *Remove tariffs that may unintentionally provide perverse incentives*
- *Remove tariffs that discourage connection to the existing BC Hydro grid*

What are key considerations for programs to reduce reliance on diesel for non-integrated communities?

- *Ensuring that BC Hydro-spurred economic development occurs in the vicinity of non-integrated communities supports grid build out and connection of these communities to the full grid.*

Are there new types of community projects or education programs that should be considered as part of an offering for new services either at or behind the meter?

- *No comments*

How should BC Hydro use a value for greenhouse gas emission reductions (for example, a carbon price) in its evaluation of investments?

- *No comments*

Thriving in an Evolving Electricity Sector

Giga Metals re-iterates the consideration of responsive pricing to be only applied where demand can reasonably be managed; for example the generation of hydrogen as a fuel at a mine site (through over-investment in the electrolysis circuits) but not the continuous mineral processing use for crushing and grinding.

Giga Metals supports the use of all clean energy resources available to BC Hydro, and the abolition of the self-sufficiency clause. BC Hydro should be mandated to provide the lowest-cost, low-carbon power to BC residents and industry, regardless of jurisdictional source.

Response to specific questions:

What are important considerations to empower BC Hydro to make the most cost-effective decisions on resource options, under the oversight of the BCUC, with respect to clean electricity?

- *Remove the self-sufficiency clause*

What should BC Hydro be aware of when considering partnerships for behind the meter services?

- *No comments*

Other jurisdictions, including Ontario and Quebec, invest in research and development in the electricity space to expand their customer offerings. How can BC Hydro best position itself to drive innovation?

- *True innovation may be disruptive to existing BC Hydro facilities and business practices. Therefore, an innovation program should be separately administered to ensure that it focuses on achieving provincial goals, not BC Hydro goals, as these may conflict.*

What is the best way to fund these efforts?

- *As a provincially managed effort, this should be funded out of BC general revenues.*

Leveraging Our Strengths

No comments.

Response to specific questions:

What are important considerations for a 100% clean electricity energy standard for BC Hydro's integrated system?

- *No comments*

What factors should be considered if BC Hydro looks to expand its business interests including considering new opportunities outside of B.C. via Powerex or a new subsidiary?

- *No comments*

Opportunities for Indigenous and Local Communities

Giga Metals is strongly supportive of BC Hydro working to accommodate reconciliation through economic development for Indigenous communities. In particular, Giga Metals supports the ability of Indigenous communities to participate in the ownership and operation of electrical generation and transmission facilities. We look forward to helping local Indigenous communities improve their economic situation through equity participation in energy infrastructure.

Response to specific questions:

What emerging issues and trends will BC Hydro need to address in the Phase 2 Review and beyond?

- *Indigenous communities are historically disadvantaged. Recognizing this, along with an increased push for better ESG practices especially in the BEV supply chain, Giga Metals believes that BC Hydro is in a unique position to accomplish both reconciliation and economic development goals through an integrated set of actions. Companies subject to global ESG oversight programs can benefit from BC Hydro's leading actions, enabling more responsible economic development in BC.*

What are the key issues and trends for Indigenous and non-Indigenous communities related to electricity and BC Hydro?

- *Energy reliability and affordability for remote Indigenous and Non Indigenous communities continues as a key issue in British Columbia, particularly when these communities are trying to improve living standards through growth, in return allowing future generations to remain in the communities versus migration to larger centers.*

Conclusion

Giga Metals thanks BC Hydro for considering stakeholder input into the Comprehensive Review and is willing and available to discuss any of these points at greater length.