

Mary River Project Economics Explained

Brief for the Nunavut Impact Review Board concerning Baffinland's Phase 2 Development Project Proposal

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INTRODUCTION¹

Baffinland Iron Mines Corporation (Baffinland or the Company) has developed a plan to improve the financial viability of the mine and, in doing so, ensure local, regional, and national benefits continue for decades to come through the extraction of iron ore at Mary River.

This document provides important background information that explains why and how the Mary River Project ended up where it is, how Baffinland came to propose changes known as Phase 2 which are currently being considered by the Nunavut Impact Review Board (NIRB or the Board), and what the project represents for the Nunavut economy.

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A BRIEF HISTORY OF THE MARY RIVER PROJECT

Baffinland entered into Nunavut's regulatory process in 2008, receiving approval for the original Steensby Project in December 2012. The approved project included an 18 million tonnes per annum (Mtpa) rate of iron ore production, a railway from the mine site to Steensby Inlet, and a ship loading facility and related infrastructure at Steensby Port.

In the 4+ years that elapsed during the regulatory process for the Steensby Project, the price of iron ore grew from US\$60/tonne to an historic high in February 2011 surpassing US\$187/tonne, before falling back to US\$128/tonne by the end of 2012 (Figure 1). As the Company prepared to construct the approved Project, iron ore prices began falling and investors grew concerned that the price trend would not support the estimated CAD\$5.7 billion Steensby Project cost.

¹ This report has been prepared using financial data from 2013 to 2019 provided by Baffinland Iron Mines Corp.

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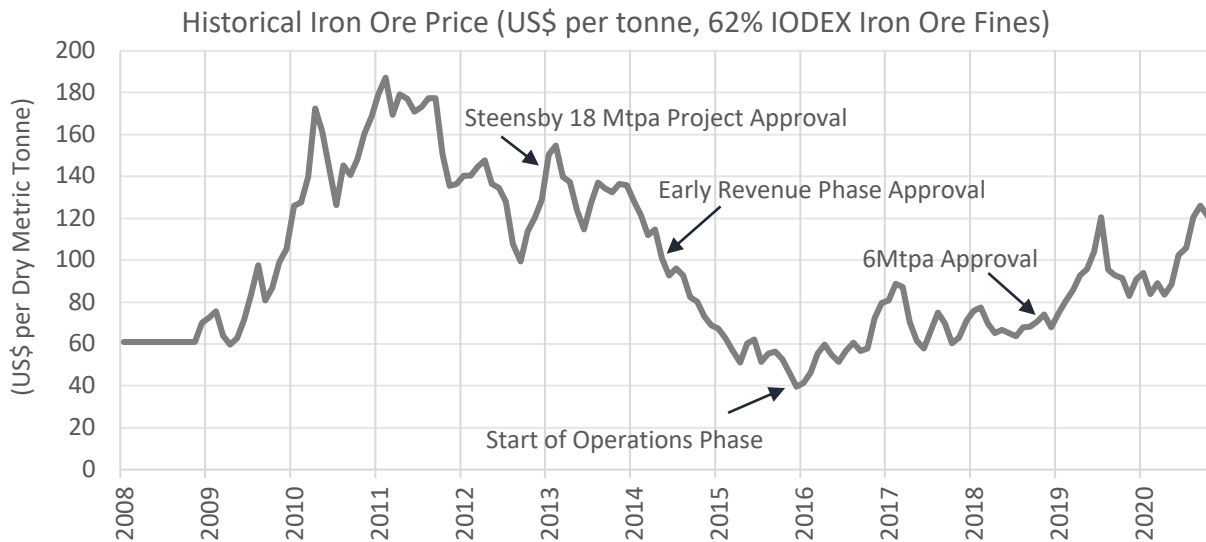


Figure 1: Market Price for Iron Ore, 2008-2019

Source: IMF, yearly to 2008, monthly average thereafter, 62% FE spot (CFR Tianjin Port)

Prepared by: MarketIndex.com.au/iron-ore

Baffinland was compelled to reconsider its Project development plans, which led to the Project Certificate amendment described as the Early Revenue Phase (ERP). The ERP would allow the Company to advance the Project, demonstrate to investors that mining in the North Baffin was possible, and to establish an international market for its high-quality products. This 4.2 Mtpa ERP Project amendment was approved by the Board in May 2014. By that time, the average price of iron ore had fallen to US\$100/tonne.

Over the next 18 months, Baffinland invested US\$735 million in the ERP Project, which included construction at the mine and port sites and improvements to the Tote Road. It is estimated that this Project contributed CDN \$385 million³ to the Baffin Island economy (GDP), creating 1,841 full-time equivalent (FTE) jobs⁴ and 352 FTE jobs for Inuit.⁵ The first shipment of iron ore left Milne Inlet in 2015.

Iron ore prices had been tumbling throughout 2015, finishing below US\$40/tonne that year—its lowest since 2007 and well below what the mine needed to be profitable. Prices recovered only slightly throughout 2016 averaging US\$58/tonne that year. At this price, it was costing the Company more money to operate the mine than it was earning from the sale of iron ore. In 2016, Baffinland had a negative cash

³ Estimated as the direct, indirect, and induced effects on GDP using Statistics Canada's Input-Output tables for the appropriate engineering construction categories for 2014 and 2015. Induced effects were adjusted to reflect the effects of imported labour.

⁴ A full-time equivalent job is equal to one person working full time for an entire year. Two people working for 6 months would be equal to one FTE job, as would four people working for 3 months each. It allows for a comparison of workloads.

⁵ The employment number (352 FTE) includes direct and direct endogenous jobs and excludes additional indirect or induced jobs. Induced employment was estimated to equal 195 FTE jobs.

flow generation of US\$91 million and therefore required further cash inflows in the form of additional debt as well as additional investment dollars from investors.

Baffinland recognized that it had to lower production costs to be sustainable in both the current and any future low-price environment. **A railway to existing infrastructure at Milne Inlet was determined to be the safest and most cost-effective means to achieve that goal.** Baffinland introduced the Phase 2 Proposal to communities, regulators, and the Board in 2014.

Production continued, and over the years 2017 and 2018, Mary River's production grew to represent 20% and then 24% of Nunavut's real GDP (\$559 million in 2017 and \$693 million in 2018)⁶. As production ramped up, so did employment. The number of Inuit working at the Project on an FTE basis has grown every year since operations began and has more than doubled since 2016 (Figure 2).

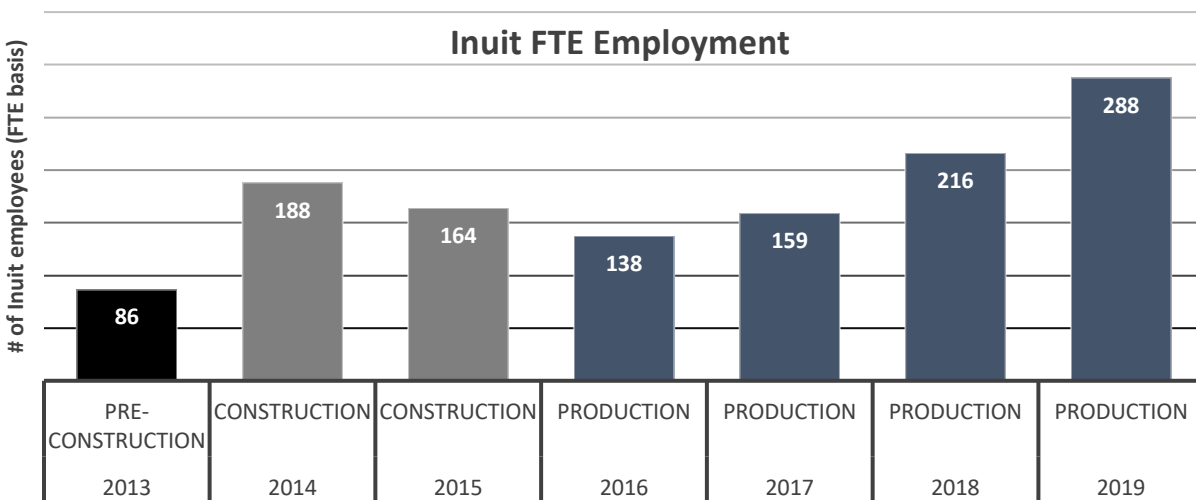


Figure 2: Inuit FTE Employment, 2013 – 2019

This positive and expanding economic contribution has not translated into financial success at the Project. Iron ore prices stabilized around US\$70/tonne between 2017 and 2018 and Baffinland continued to struggle financially. This prompted an application for a production increase to 6 Mtpa as a temporary measure to stem the losses until the assessment of the Phase 2 Proposal was completed.

Financial records for 2019 show record production at 5.86 Mtpa, a higher commodity price averaging US\$92/tonne, and a more favourable exchange rate averaging CDN\$1.327 to US\$1.00. These increases have helped the Project's contribution to Nunavut's GDP grow to CDN\$724 million in 2019,⁷ while Inuit

⁶ Statistics Canada. Table 36-10-0402-01 Gross domestic product (GDP) at basic prices, by industry, provinces and territories (x 1,000,000)

⁷ Statistics Canada. Table 36-10-0402-01 Gross domestic product (GDP) at basic prices, by industry, provinces and territories (x 1,000,000)

FTE employment grew to 288. Despite the improvements and the positive economic contribution, Baffinland will record its fourth consecutive net loss. Financial data provided in Table 1 below reveal the challenges faced by the Project to date, having recorded negative free cash flow over 2016 through 2019 of **US\$310 million**. This has required Baffinland to secure additional financing via additional debt and equity injections beyond the original cost to construct the Project.

	2016	2017	2018	2019
Shipped Tonnage (wet metric tonnes)	2,720,646	4,064,397	5,094,477	5,861,278
Revenue	113,964,000	340,631,000	315,776,000	454,522,000
Less: Direct Operating Costs	98,281,000	195,097,000	159,341,000	225,645,000
Less: Shiploading and Port Management Costs	19,275,000	49,440,000	72,603,000	112,876,000
Less: Royalties	6,034,000	-2,093,000	-	4,892,000
Less: SG&A, Exploration and CSR	14,543,000	23,424,000	35,863,000	35,918,000
Less: Financing Costs	26,907,000	59,315,000	121,658,000	86,652,000
Less: Changes in Working Capital	40,451,000	155,251,000	-49,214,000	-44,231,000
Less: Sustaining Capital Costs	-	20,700,000	23,000,000	43,800,000
Free Cash Flow	-91,527,000	-160,503,000	-47,475,000	-10,503,000

Table 1: Free Cash Flow from Operations

Source: Baffinland Iron Mine Corporation, Confidential Audited Financial Statement.

Notes:

- All figures are presented in US dollars because that is the currency in which iron is sold.
- Revenue is calculated from the base price of iron plus any price premiums received, minus any price penalties, shipping costs, commercial adjustments, ore stocking costs, and marketing fees.
- SG&A, Exploration, and CSR are the corporate costs including selling, general, and administration costs, exploration, and corporate and social responsibility costs that includes the Sustainable Development team, Baffinland Community Liaison Offices, and costs associated with the Inuit Impact Benefit Agreement.
- Financing costs are costs associated with all of the capital that was required for construction, including the cost of leased equipment—essentially the cost of money.
- Working capital includes inventories of ore at various stages of processing, and warehoused consumables such as fuel inventories. These inventories were built up in 2016 and 2017 as the mine produced more than was shipped causing the value of these inventories to grow. In 2018 and 2019, more ore was shipped than was produced, and therefore the mine lowered its inventories causing the value to go down.
- Sustaining capital costs are those incurred at the mine site to meet all regulatory and maintenance requirements. As the site gets older, more maintenance is needed.

It is clear from Table 1 that the mine's ERP, even with an increased 6 Mtpa production rate, is only a temporary measure because of its vulnerability to variable iron ore price markets and high cost of operations.

Looking beyond the near term, where a majority of analysts are predicting a continuation of high prices into the first quarter of 2021^{8,9}, the outlook for iron is far less positive. In its latest long-term projections, the Government of Australia has predicted the price of iron ore will ultimately decline over the next five years based on its assessment of the world's supply and demand conditions.¹⁰

The reality is that iron prices are going to fluctuate over the next 20 years. Baffinland cannot develop a mine plan that will only generate profits when prices are at historic highs. Inuit and investors alike need some level of confidence that the mine will not only prosper in good times but will remain viable in bad times. **The long-term, sustainable solution to this challenge is the proposed Phase 2 North Railway.** This proposed plan meets all necessary conditions:

- Bringing needed efficiencies to the mine production process;
- Lowering the cost of transportation;
- Improving the financial viability of the mine;
- Ensuring long-term benefits to local and regional Inuit; and ultimately
- Achieving sustainability in the Project.

To make this happen, Baffinland must invest more money into the Project, building a railway to replace hauling operations on the Tote Road, adding capacity to its production process, and increasing the shipments of iron ore. However, investors will only fund the investments if a positive financial return can be achieved and financial risks reduced, and the evidence to date proves this will not happen with the current approach and susceptibility of the Project to variable iron ore price markets.

UNDERSTANDING THE BASIS FOR THE PHASE 2 PROJECT PROPOSAL

Going back to 2016 when iron ore prices were suppressed, Baffinland underwent a comprehensive review of its entire Mary River operation in an effort to find a sustainable way forward, knowing that the basic requirements were simple—revenues had to go up and costs (per tonne) had to go down.

The initial review focussed on a detailed assessment of costs. The mine operates with a large fixed-cost burden; that is, costs that do not change regardless of how much ore is mined, crushed, hauled, and shipped. Fixed costs include:

- The cost of operating two self-contained camps, which are really like small towns, each with its own administration, accommodations, heating, power, water treatment, waste disposal, and catering. Approximately 55% of the 2019 workforce (759 FTE jobs) were not directly involved in mining, crushing, or hauling, but were necessary for the Project's operations regardless of production levels.

⁸ Priscilla Barrera, Iron Outlook 2021. January 12, 2021. Published by Investing News, Iron.

<https://investingnews.com/daily/resource-investing/base-metals-investing/iron-investing/iron-outlook/>

⁹ S&P Global Platts, Metals, Platts Iron Ore and Steel Outlook: Iron Ore prices seen staying high in Q1 2021. December 15, 2020. <https://www.spglobal.com/platts/en/market-insights/latest-news/metals/121520-platts-iron-ore-amp-steel-outlook-iron-ore-prices-seen-staying-high-in-q1-2021>

¹⁰ Department of Industry, Science, Energy and Resources, Commonwealth of Australia, Resources and Energy Quarterly March 2020.

- The year-round operation and maintenance of an Aerodrome.
- Many of the costs associated with hauling are also fixed. Approximately 18% of the workforce (256 FTE jobs) were associated with the hauling operation. The cost of these employees is fixed based on the planned production rate. If production drops due to weather or any other unforeseen circumstance, those personnel cannot be sent home for a few days. And despite not physically working, they remain at camp, are fed, and are paid their full wage and benefits.
- The cost of fuel is a huge expense for the mine and is largely a fixed cost. Most of the fuel brought to the mine is used for heating and power generation. The fuel used by the haul trucks is also treated as a fixed cost because operations are running 24-hours a day – 365 days a year.
- Other fixed costs include such things as chartered airplanes where the cost is the same regardless of the number of passengers on board.

There are few if any ways to lower these fixed costs, but fixed costs per tonne can be lowered by increasing production.

Baffinland also investigated each aspect of its operations—mining, crushing, and hauling—to learn if there were any opportunities to lower cost through improved efficiency. The focus quickly turned to ore hauling. Using trucks to move ore over 100 km is terribly inefficient. In 2019, it is estimated that Baffinland’s hauling costs represented 55% of the total site costs. Trucking also has a large carbon footprint and produces a lot of dust along the Tote Road. This direct operating cost doesn’t include the cost of shiploading, port management costs, shipping, royalties, sustainable development, corporate and social responsibility costs, head office support, and financing costs.

The conclusions from the investigation into ore hauling were clear. Increasing the number of trucks in order to increase production and lower the Project’s cost per tonne was neither economically feasible, nor is it environmentally responsible. Increased hauling on the Tote Road would accelerate the wear-and-tear on the road alongside increased costs for new haul trucks and more maintenance. Baffinland’s detailed analysis found that any financial gains from increased production would not cover the added costs associated with increased hauling.

Rail, on the other hand, is the most efficient means of ground transportation in North America.¹¹

- On average, trains are 4 times more fuel efficient;
- Emit up to 75% fewer greenhouse gas emissions, and in the case of the Phase 2 Project,
- Would reduce the amount of dust caused by hauling,
- Lower the overall cost of transportation, and
- Secure Mary River’s long-term economic and financial viability.

¹¹ Association of American Railroad (2017). Freightera (2019) <https://www.freightera.com/blog/train-vs-truck-transportation-efficiency-cost-advantages-disadvantages-infographic/>

From Baffinland's studies, it was clear that switching to a rail system would improve environmental performance (i.e. decrease dust from the Tote Road and lower the amount of fuel consumed), and lower the mine's cost per tonne while at the same time increasing revenues through higher production rates.

ECONOMIC CONTRIBUTION OF THE PROPOSED MINE PLAN

Baffinland's initial search for a new approach to mining and hauling focused on financial viability. Simply put, unless the mine can generate enough revenues to pay for its capital and operating costs and provide a return on the investment, the Project will come to an end and any other measure of success would be irrelevant.

With that said, determining whether Baffinland can proceed with its Phase II proposal to keep Mary River open has significant economic implications for Nunavut that cannot be ignored in the assessment. As stated previously, the Project contributed CDN \$724 million to the territory's GDP in 2019—representing 23% of the entire territorial economy. It must be emphasised that this contribution is being generated entirely from within the private sector. The contribution is in addition to what arrives in the territory through federal government transfers, and is actually new money to Canada entering the economy through the sale of iron ore to international buyers. Importantly, it is economic activity that would not occur otherwise. The long-term benefits from an economy that remains vibrant for multiple generations cannot be overstated, allowing for the accumulation of capital through investments, increased personal savings, and intergenerational wealth transfer (financial and capital assets that can be passed onto future generations). Some of the important economic results include:

- In 2019, Inuit employees earned \$20.2 million in wages and salaries, equal to just over \$70,100 per Inuit employee on an FTE basis,
- In 2019, Inuit firms were awarded contracts worth \$288.8 million,
- In 2019, Inuit labour participated in 44,135 hours of training,
- In 2019, Baffinland paid \$8.7 million in employee payroll tax and \$6.9 million in fuel tax to the Government of Nunavut,
- In 2019, Baffinland also paid out approximately \$12 million in royalty payments and program spending.

The annual economic contribution of the Project is considerable for the North Baffin region given its population of just under 6,400¹², where median employment income is less than \$17,000¹³, and total annual income of all households in 2015 was \$111.3 million.¹⁴

One shouldn't forget that these economic results were generated by a Project that was operating at a financial loss. Benefits in terms of taxes and royalties, financial transfers to communities and Inuit

¹² Nunavut Bureau of Statistics (2018). Population estimates. As cited in Impact Economics (2018). Labour Market Analysis. Technical Supporting Document No. 26, Baffinland Iron Mines Corporation Mary River Project—Phase 2 Proposal.

¹³ Statistics Canada, Income Statistics Division (2019). *Special Tabulation*. Prepared by Nunavut Bureau of Statistics, January 30, 2019.

¹⁴ Statistics Canada (2017). North Baffin community profiles. *2016 Census*. Catalogue no. 98-316-X2016001. November 29, 2017.

organisations, and numerous other benefits will be preserved and, in many cases, grow under a financially-sound operation.

Baffinland has stated publicly its commitment that **no Inuit employee will lose their job as a result of the operation moving from trucking to rail**. Baffinland has also made commitments to increased Inuit training and career development opportunities. It will also offer retraining programs to anyone wishing to transition from a trucking-related job to something else within the mining, hauling, loading, and camp operations. In other words, the new mine plan not only secures the long-term viability of the Project but also preserves, at a minimum, its economic contribution to the North Baffin region that currently represents 288 FTE jobs and approximately 15% of its income-based economy.

CONCLUSION

The Phase 2 Proposal is the future of the Mary River Project. Switching to a rail transportation system and raising production ensures the Project can become financially viable and, in doing so, provides an opportunity for its operations to continue for decades to come, ensuring the continued flow of economic, financial, and non-monetary benefits to Inuit, the North Baffin region, Nunavut, and Canada.

As is evidenced in this report, Inuit participation and benefits have been growing steadily since production began. The same is true for the Project's contribution to Nunavut's overall economy and that of the North Baffin region. The agreements in place between Baffinland and its community and regional Inuit partners ensure the continuation of investments in Inuit labour, families, communities, businesses, and institutions. Based on the recent rise in economic prosperity in the region and on the experience of other mining operations throughout Canada's North, one can be confident that Inuit participation and benefits will only grow in the future.

But it must also be said that the production of a bulk commodity is an expensive endeavour in Canada and even more so in Canada's Arctic. Baffinland has invested over US\$3.5 billion in the project to date, and has seen cash flow losses totaling \$310 million since 2016. The fact that Baffinland and its investors continue to be willing to invest more is a testament to their strong belief in the region, Nunavummiut, the quality of ore, and the long-term viability of the Project. This confidence is not without limits however. Investors will not fund a project that has no clear path to achieving a positive financial return.

Baffinland has determined that the Phase 2 Project offers the next step in long-term Project stability.