Baffinland Iron Mines LP
Mary River Expansion Stage 3

Definitive Study Report

Section 14 – Operating Costs

2017-05-01	0	Approved for Use	R. Cote	N. Mason	S. Heiner	BIM
Date	Rev.	Status	Prepared By	Checked By	Approved By	Approved By
			HATCH			

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

Disclaimer

This report has been prepared by Hatch Ltd. ("Hatch") for the sole and exclusive benefit of Baffinland Iron Mines Corporation (the "Client") for the sole purpose of assisting the Client to identify potential options to increase production from the Mary River mine, and may not be provided to, used or relied upon by any other party for financing purposes without receipt of a copy of the attached waiver and release executed by such third party.

Any use of this report by the Client is subject to the terms and conditions provided in the ArcelorMittal General Service Agreement, dated November 14, 2014, including the limitations on liability set out therein. Without limiting the foregoing, Hatch explicitly disclaims all responsibility for losses, claims, expenses or damages, if any, suffered by a third party as a result of any reliance on this Report, including for any decisions made or actions made by such a third party and based on this Report ("Claims"), and such third party's use or review of the Report shall constitute its agreement to waive all such Claims and release Hatch in respect thereof.

This report is meant to be read as a whole, and sections should not be read or relied upon out of context. While it is believed that the information contained herein is reliable under the conditions and subject to the limitations set forth herein, this Report is based in part on information not within the control of Hatch and Hatch therefore cannot and does not guarantee the accuracy of such information based in whole or in part on information not within the control of Hatch. The comments in it reflect Hatch's professional judgment in light of the information available to it at the time of preparation.

This report contains the expression of the professional opinion of Hatch, based upon information available at the time of preparation. Hatch has conducted this investigation in accordance with the methodology outlined herein. It is important to note that the methods of evaluation employed, while aimed at minimizing the risk of unidentified problems, cannot guarantee their absence. The quality of the information, conclusions and estimates contained herein is consistent with the intended level of accuracy as set out in this report, as well as the circumstances and constraints under which this report was prepared.

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

Table of Contents

List of Table

List of Figures

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

14. Introduction

This report section summarizes the results and assumptions of the operating cost estimate for the expansion of Baffinland Iron Mine's Mary River mine from a 4.2 Mtpa road haul operation to 12 Mtpa rail haul operation.

The operating cost has been estimated to a level of appropriate for this stage of engineering. This stage II study is intended to produce a capital estimate roughly equivalent to an AACE Class 3 capital spending estimate of +/-15% with 10-15% contingency. This operating cost estimate aims to achieve a similar level of accuracy, and can be considered to have an Canadian Dollar accuracy of -5% to +15%. At the time this report was prepared, the updated Stage II mine plan was not yet complete, therefore the mine plan and associated mining costs are based on the previous Stage III mine plan.

All costs in this section are presented in US Dollars unless otherwise noted, however the majority of the inputs to operating cost estimate are priced in Canadian Dollars. These have been converted using an exchange rate of 0.7355 $US:$C, the live rate quoted on oanda.com around noon on April 26, 2017. All unit costs in this section are presented per wet metric tonne of finished ore unless otherwise noted.

The scope of this estimate includes the following activities:

- Mining, hauling and stockpile of ore and waste from the existing mine at Deposit 1 to the run-of-mine stockpile and waste dump respectively
- Primary crushing and stockpiling at Mary River
- Reclaiming, loading and rail transportation of ore from the Mary River crushed ore stockpiles to the Milne Port crusher feed stockpile
- Reclaiming, secondary crushing and screening at Milne Port
- Stockpiling, reclaiming and shiploading at Milne Port
- Fixed plant and mobile maintenance
- Site services managing provision of catering and charter flights, and the operation of the camp, power plants, and waste and water management facilities
- Functional support or general and administrative costs (G&A) on-site at Mary River and Milne, and off-site at the sealift marshalling area in Valleyfield, the airport and warehouse at Mirabel and the head office in Oakville including the following functional areas:
  - Health, safety, environment and community
  - Supply chain and logistics

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

- Human resources
- Technical services (mining, exploration and information technology)
- Finance
- Marketing and sales

Operating costs are estimated based on the anticipated shift types, production schedule and volume for the rail operation. The includes the following considerations:

- 12 Mtpa of ore mining, rail haulage and shiploading
- Mine stripping ratio (waste:ore) of up to 2.4:1
- Rail operation by a third party contractor
- Year-round, 24 hour operation
- 12 hour shifts, 14 consecutive days for site positions following by 14 days off. Most positions consist of rotating day shift and night shift employees each with a cross shift.
- Shiploading from two berths only during open water (~July 25th to October 15th)

Exclusions

This estimate covers only cash, free-on-board (FOB) operating costs, and excludes the following:

- All marine costs such as tug boats, ore carriers, port fees and other shipping related services
- Non-cash items such as depreciation and amortization
- Value-added tax, territorial mining royalties, income tax, withholding tax (if applicable), and royalties associated with Baffinland's current or future Inuit Impact and Benefits Agreement
- Non-motive diesel fuel rebates
- Financing or equipment leasing
- Expansion, sustaining capital costs or working capital costs
- Operating, management or marketing fees

These costs, where applicable, are considered in financial analysis section of this report. Sustaining capital costs are reported at the end of this section.

14.1 Operating Cost Summary

Life of mine average operating costs are estimated to be $US 16.66/t. The largest components of the cost are labour and services. Services include many labour-heavy

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

contracts, such a rail operations contract, and catering, housekeeping, and security contracts.

Costs are distributed differently than current cost reporting at Baffinland, and therefore are not directly comparable. Maintenance costs are allocated to each functional area rather than reported as a separate cost area, for example mobile maintenance for the mining fleet is included in mine costs. Overhead costs for flights, food and accommodations are also distributed to the different areas based each area's portion of total onsite headcount, as opposed to the current practice of reporting these costs under site services.

Figure 14-1: Average Life of Mine Operating Cost, $US/t

The stripping ratio in the mine is expected to be the only significant driver of cost variation year-over-year. Low in the first four years, the following eight years have relatively high waste volumes and a stripping ratio of 2.4:1.

The cost estimate starts at the beginning of 2019, while ore is still hauled to Milne by ore haul trucks on the tote road. Rail operation is not expected to start until the latter half of 2019. The estimate ends in the fourth quarter of 2041, with reserves almost exhausted and not enough remaining for another full year of operation. Shiploading operations are considered for 2042 to enable shipping of ore stockpiles in the prior year. G&A's Other cost group is negative as it includes an adjustment to bring total corporate costs (i.e. G&A excluding onsite, production related functions) to $C 12 million per year.

14.2 Labour

The labour estimate for the 12 Mt expansion was zero-based. Hatch developed an estimate of the number of positions required for each area with an indicative employee type for each position. By design, this estimate did not make any allowance for absenteeism, turnover,

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

illness or anything else that could lead to less than full employment, however as is typical at any operation, contractors will be used to temporarily backfill operator or maintainer positions that are vacant. To capture the cost of this contract labour, it was assumed that 5% of all operator and maintainer positions are filled by contractors on average throughout each year at a higher cost than employees.

In the table below, 18 Mtpa is representative of 2021 and 2022, 41 Mtpa is representative of maximum waste year. Figures include key contractor positions such as explosives contractors (12), rail operators and maintainers (68), catering and housekeeping staff (80), security services (8), and medical staff (4). Peak numbers are shown which include 50 seasonal shiploading positions and 17 seasonal G&A positions. Refer to Appendix A22-4 for more detail.

Table 14-1: Peak Fulltime Equivalents (FTEs) at Different Mining Volumes

Volume/Location / Department	18 Mtpa Material Moved				41 Mtpa Material Moved			
	Mary River	Milne	Offsite	Total	Mary River	Milne	Offsite	Total
Mine	121	-	-	**121**	161	-	-	**161**
Mary River Process	52	-	-	**52**	52	-	-	**52**
Rail	-	68	-	**68**	-	68	-	**68**
Milne Process	-	89	-	**89**	-	89	-	**89**
Shiploading	-	54	-	**54**	-	54	-	**54**
Mary River Site Services	76	-	-	**76**	82	-	-	**82**
Milne Site Services	-	100	-	**100**	-	102	-	**102**
General & Administration	65	33	34	**132**	69	33	34	**136**
Total	**314**	**344**	**34**	**692**	**364**	**346**	**34**	**744**

The total annual labour cost for each employee type was provided by Baffinland and is summarized in the table below. Costs presented below include salary, benefits, pension, vacation and bonus. Northern allowance for Nunavut resident employees and a uplift for non-Nunavut resident, site based employees are also included.

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

Table 14-2: Total Annual Labour Costs, $C (Source: Baffinland)

Location / Employee Type	Mary River	Milne	Offsite
Executive	457,000	457,000	373,000
Manager or Superintendent	203,000	188,000	157,000
Engineer or Technical	158,000	158,000	108,000
Supervisor	145,000	145,000	109,000
Maintainer	141,000	141,000	n/a
Operator	118,000	118,000	n/a

A rate of $C 95/hour for non-employee hourly contractors was also provided. This corresponds to $C 207,480 year.

14.3 Fuel

All diesel fuel is priced at Baffinland's current inventory price of $C 0.83 per litre. This price includes all applicable federal and territorial taxes and delivery to site. Operations diesel fuel consumption is expected to peak in 2019 at 55 million litres, a year in which the mine operates smaller equipment and ore is hauled for part of the year using ore haul tucks. Detailed equipment-by-equipment, month-by-month fuel consumption estimates can be found in appendix A14-1.

Diesel fuel consumption has been estimated using a combination of Baffinland's internal estimates, equipment supplier data and Hatch benchmarks.

At Baffinland's suggestion, and starting in 2024, power generation fuel consumption has been reduced through the addition of wind power generation. Wind power can be generated at a diesel equivalent of $C 0.78 per litre a direct savings of $C 0.05 per litre plus parts savings of another $C 0.10 per litre. Wind power is estimated to displace 20% of total power plant demand at both Mary River and Milne.

Similar to diesel, Jet A's price has been estimated at Baffinland's current rate of $C 0.64 per litre. Consumption has been estimated assuming use of a 737-200 aircraft for flights from Mirabel, and assuming 12,000 litres are consumed in each return flight to Mirabel airport, 1,750 litres are consumed on average in a return flight to a local community. Summer environmental and exploration campaigns are assumed to consume 200,000 litres each year. Peak consumption is around 3.4 million litres per year.

14.4 Consumables

As with diesel fuel, consumable costs have been estimated using a combination of Baffinland's internal estimates, equipment supplier data and Hatch benchmarks. 40% of consumable costs are incurred in the mine. Detailed equipment-by-equipment, month-by-month consumable cost estimates can be found in appendix A14-1. Costs for large mining equipment are based on estimates received from Toromont CAT found in appendix A14-2.

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

Costs for smaller mobile equipment, generators and buildings are based on Baffinland's internal estimates. Costs for the bulk material handling systems are based industry benchmarks for similar equipment. Costs for the operating of the rail system come from third party rail operator quotes for the project and locomotive suppliers.

14.5 Services and Other

As labour, fuel and consumables form the majority of costs, this section summarizes all remaining costs. Of these, services are the most significant portion. Many costs in this section are based on current Baffinland contracts or estimates. In each area, miscellaneous costs of $C 3,200 per FTE are intended to cover training, travel, safety supplies and other small items.

14.6 Mine Operations

In the mine, the largest non-labour and consumable costs are the explosives supply contract and the laboratory services contract. Explosives costs in the table below exclude explosives fuel consumption, provided free of charge to the explosives supplier. Mining costs per tonne of material moved and excluding overheads allocated in Figure 14-1 are $US 2.00/t.

Table 14-3: Mine Operations Contract and Other Cost Summary for Typical 41 Mt Material Movement Year

Cost Item	Variable Cost, $C/t mat'l moved	Variable Cost, $C '000s	Fixed Cost, $C '000s	Total Cost, $C '000s
Explosives Supply	0.27	11,087	3,396	14,483
Laboratory Service	-	-	1,741	1,741
Consultants	-	-	400	400
Software	-	-	300	300
Misc.	-	-	515	515
Total	**0.27**	**11,087**	**6,352**	**17,439**

14.7 Process

Process operations do not include any key contracts, but include a provision for third party expertise when required. Total cost is estimated to peak at $C2.1 million per year.

14.8 Rail

At the time of writing this report, Baffinland was evaluating the feasibility of contracting with a third party to operate and maintain the rail system. Estimated contract costs are variable at $C 2.02 per tonne of ore plus. Costs of materials, fuel and freight are treated as pass-throughs and not considered in the rail service costs in this estimate. Source information for rail operating costs can be found in appendix A14-4.

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

14.9 Shiploading

Shiploading operations do not include any key contracts, but include a provision for third party expertise when required. Seasonal operating and maintenance labour is included in labour costs. Total services and other costs for shiploading are estimated under $C 500,000.

14.10 Mary River and Milne Site Services

Site services manages and maintains the camps, power plants, and waste and water management facilities at both sites. They are also responsible for managing the return passenger charter flights to Mary River from the local communities (Pond Inlet, Hall Beach, Igloolik, Arctic Bay and Clyde River) and Mirabel airport in Quebec,

Passenger flights from Mirabel currently use a 102 seat Boeing 737-200 aircraft and land on a gravel airstrip at Mary River. Based on the following, with local community rates provided by Baffinland:

- Total site-based headcount for a typical year in which 41 Mt of material is moved is 355 at any one time plus 5% visitors, short term contractors or consultants, or others not included in labour estimates
- By 2023, 50% mine, 35% of camp, 5% or rail and 3% of port personnel travelling to site are from the communities
- 10% of seats are unused on a typical passenger flight
- Passenger flights have capacity for 102 and 11 passengers from Mirabel and the communities respectively

Up to four flights per week will be required from Mirabel. These will be supplemented by up to nine flights per week to the local communities.

In addition to passenger flights, freight flights from Mirabel bring air cargo to site. Each flight carries up to 12,000 kg. It is anticipated that one will be required each week on average.

Cost are estimated at $C 96,275, $C 93,775 and $C 3,370 for passenger flights from Mirabel, freight flights from Mirabel and the average community flight respectively.

Catering and housekeeping operations are based on third party estimates supplied to Baffinland to operate their camp of $C 57 per person housed per day. In addition to these services, $C 30 per person per day has been estimated for provision of food and catering and housekeeping supplies.

Information on these costs can be found in appendices A14-1 and A14-3.

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

14.11 General and Administration

G&A covers the functional areas of Executive, Health, Safety, Environment & Community, Supply Chain & Logistics, Human Resources, Technical Services and Finance. Onsite G&A costs are estimated by Hatch.

Major annual cost items for onsite G&A include the following:

- Up to three sealifts per year at $C 1.75 million each plus $C 400,000 for warehousing, stevedoring and other related costs
- $C 3 million for Inuit owned land lease

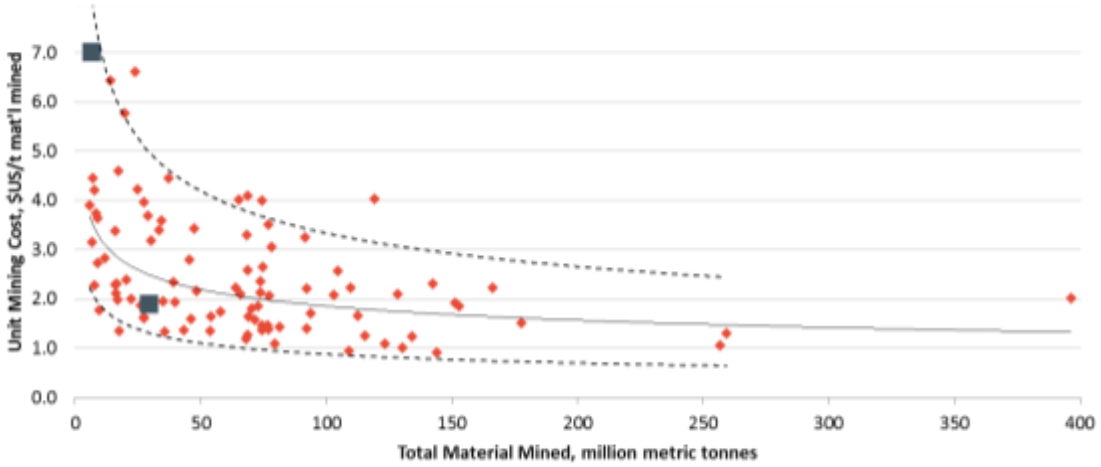
An estimate of $C 12 million per year for offsite corporate G&A costs has been provided by Baffinland. Information on the costs can be found in appendices A14-1 and A14-3.

14.12 Cost Benchmarking

Estimated operating costs for the mine and overall operation have been benchmarked against similar operations. Mine costs have been benchmarking excluding allocated site services costs as this is more representative of the other data points in the set.

Baffinland's current operation is about one standard deviation from the mean at current mining rates (top left square in chart below). A number of changes are anticipated to improve the mine's current cost position following the expansion (lower left square). The increase in mining volume will reduce the unit cost of any fixed in the mine. The expanded operation will also make use of more cost efficient equipment including larger haul trucks and drills, and shovels rather than front end loaders. The mine will also produce a higher proportion of waste which has a shorter haul distance than ore and therefore a lower unit cost to mine.

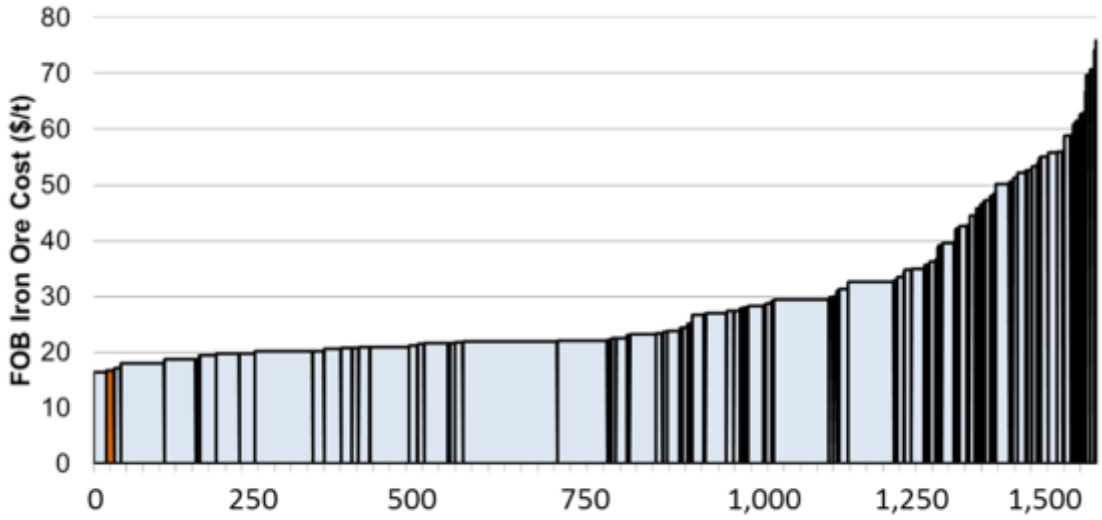
Figure 14-2: Cost Position Relative to Other Open Pit Mines, Source: Hatch



© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

While the Mary River mine's location and weather present cost challenges, the relatively short distance from the mine to the port, lack of beneficiation required to produce a finished product and a maintained favourable exchange rate would all provide an advantage that could place the expanded operation on the lower end of the FOB cost curve.

Figure 14-3: Forecast FOB cost position, Data Source: SNL



14.13 Risks and Opportunities

The following risks and opportunities have been identified during the preparation and review of this operating cost estimate. These are project specific risks and opportunities in addition to standard operating costs risks and opportunities such as fuel price may increase or decrease.

Risks

- The labour quantity estimate used in the preparation of this estimate is lean by design, and contains a smaller functional support team than the existing operation, therefore there is a risk of a labour quantity increase.
- Costs are generally presented in US Dollars but priced in Canadian dollars, therefore changes in exchange rates between the two currencies could present a risk or opportunity.
- If community workforce participation rates are not achieved there is a risk a higher proportion of flights will be from Mirabel. Flights from Mirabel are higher cost than then average community flight.

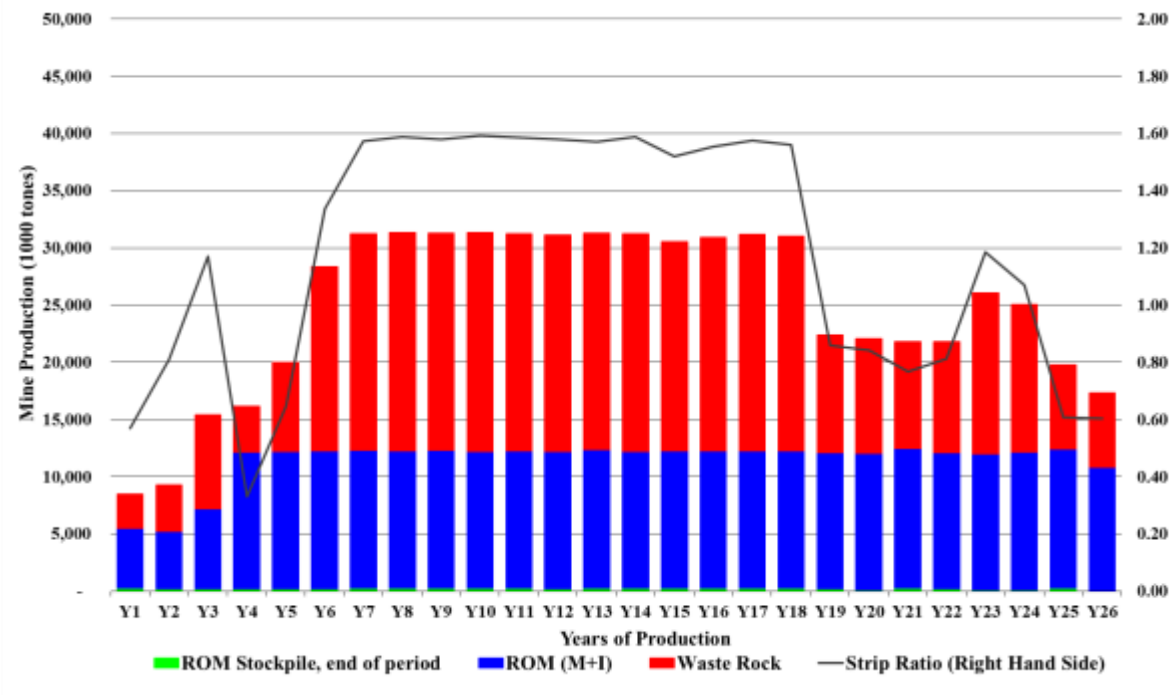
© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

- Labour, material and fuel quantities are based on assumed equipment availability and productivity. Lower than estimated utilization and productivity of equipment risks increasing costs.
- Estimated corporate costs provided by Baffinland are significantly less than those estimated by Hatch and Baffinland's current corporate costs. There is a risk that these head office cost savings will not be achieved and G&A cost will be higher than forecast here.

Opportunities

- Paving the runway at Mary River would enable Baffinland to use more modern, larger, and more fuel efficient aircraft that are not currently available with the gravel kits required to land on the gravel airstrip at Mary River. A trade-off study could be conducted to evaluate the net present value of this opportunity.
- The cost of rail contract operation carried in this estimate is based on quotes received from potential operators, however this cost is above the cost of internal labour considered in the Stage II estimate. It is possible that total cost to operate the railway would be lower if it was operated by Baffinland rather than a third party.
- The final feasibility study mine plan provides a mine plan with a lower peak stripping ratio (1.6 down from 2.4). It is expected that this will reduce mining costs and may fleet size and therefore sustaining capital requirements as well.

Figure 14-4: Final feasibility study mine plan, Source: RPA



© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

14.14 Sustaining Capital

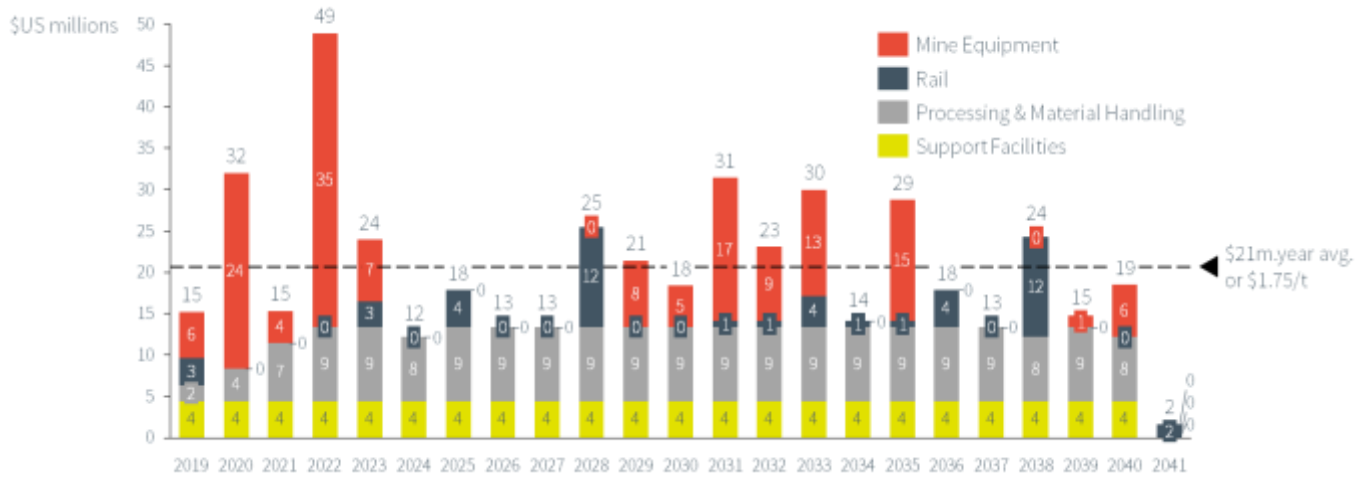
Sustaining capital has been estimated differently for separate areas of the operation.

Mine equipment replacement has been estimate based on expected operating hours in the Stage II mine plan and expected equipment life. Equipment costs include indirects such as freight, and the same contingency as the expansion capital estimate (4.49% for a 75% probability not to exceed). Mine equipment costs are much higher than would typically be expected at the beginning of mine life as more, larger mining equipment is purchased to meet the increased mine production capacity required as the mine reaches 41 million tonnes per year of ore and waste production.

Rail sustaining capital requirements have been estimated by contractors bidding to operate the rail on Baffinland's behalf. In addition to the requirements identified in these bids, an estimate has been made for the cost and frequency to replace mobile equipment used in train loading.

Processing and material handling, and support facility sustaining capital cost have been estimated using fixed annual estimates for key areas, with a ramp up included for newer equipment. In addition to these requirements, an estimate has been made for the cost and frequency to replace mobile equipment used in crusher loading and material handling in the port area. Detailed of this estimate can be found in appendix A14-1.

Figure 14-5: Annual Sustaining Capital Costs



In addition to the costs detailed above, in the financial model section of this report, the cost of producing 15 Mt of waste over the years 2023 to 2031 has been capitalized. This represents an estimate of waste produced in each of these years to reach ore produced in following years. Further mine planning is required to determine the actual amount of costs that can be capitalized.

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.

14.15 Reference Documents

Document Number	Title	Revision	Date	Appendix Number
	Operating Cost Estimate			A14-1
	Mine Equipment Cost Data			A14-2
	Contract Cost Data			A14-3
	Rail Cost Data			A14-4

© Hatch 2017 All rights reserved, including all rights relating to the use of this document or its contents.