Resources Policy 102 (2025) 105493

Contents lists available at ScienceDirect

Resources Policy

journal homepage: www.elsevier.com/locate/resourpol

How costly is a community benefit agreement for a private project developer?

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1. Introduction

Community benefit agreements (CBAs), also referred to as impact and benefit agreements, are common resource governance tools that are negotiated across the globe between private project developers and local, often Indigenous, communities whose land must be accessed or disturbed for major extractive resource projects (O'Faircheallaigh, 2013). A relatively recent body of scholarship has focused on the benefits received by local communities from CBAs and their associated natural resource development projects. According to the literature, CBAs have the potential to help facilitate economic and social development of Indigenous and non-Indigenous communities by providing revenue benefits (Adebayo and Werker, 2021; Agbaitoro, 2018; Alcantara and Morden, 2019; Bocoum et al., 2012), employment and training opportunities (Adebayo and Werker, 2021; Agbaitoro, 2018; Fidler and Hitch, 2007; V. Gibson, 2008; O'Faircheallaigh, 2006), contracting opportunities for local businesses (Adebayo and Werker, 2021; O'Faircheallaigh, 2010a; Shanks and Lopes, 2006; Wanvik, 2016), new community infrastructure (Agbaitoro, 2018; Cameron and Levitan, 2014; Glasson, 2017; O'Faircheallaigh, 2006), and impact mitigation measures (Craik et al., 2017; Fitzpatrick, 2007; Kielland, 2015; O'Faircheallaigh, 2010b, 2017). A smaller group of studies have focused on the benefits of negotiating CBAs for project developers, including increasing project certainty and reducing the potential for conflict by securing consent from local Indigenous communities (Bruckner, 2015; Dorobantu & Odziemkowska, 2017, 2017, 2017; Fidler, 2010; Henisz et al., 2014; Prno and Slocombe, 2012). There is a need, however, for research that focuses on the costs of negotiating CBAs for project developers.

To the best of our knowledge, this is the first study to date to estimate the cost of a CBA for a private project developer, estimating the cost of the Mary River Inuit Impact and Benefit Agreement (IIBA) for a project developer, Baffinland Iron Mines Corporation (Baffinland), that was a CBA negotiated with the Qikiqtani Inuit Association (QIA) regarding the Mary River Iron Mine.[1] This case study has received some attention in the past with studies analyzing community benefits from the IIBA (Adebayo and Werker, 2021; Loxley, 2019) and the economic viability of the mine (Loxley, 2019; West and Lépiz, 2021). These previous studies, however, do not analyze the impact of the IIBA on Baffinland. In addition to estimating the cost of the IIBA, this study estimates the impact of the IIBA on the economic viability of the mine and evaluates the cost of the IIBA relative to total after-tax project cash costs and relative to a hypothetical cost of conflict. Conflict is prevalent in extractive natural resource development industries and CBAs are believed to help reduce conflict (Agbaitoro, 2018; Dorobantu and Odziemkowska, 2017; Dyck, 2013; Haggerty et al., 2023; Le Meur et al., 2013; O'Faircheallaigh, 2017; Sternberg et al., 2020).

CBAs negotiated in Canada are legally binding through contract law and set out obligations for project developers and local communities (Browne and Robertson, 2009; Cameron and Levitan, 2014; Fidler, 2008; G. Gibson and O'Faircheallaigh, 2010). Although CBAs are only legally required in certain regions in northern Canada in accordance with lands claim agreements (Coppes, 2016), CBAs are negotiated for virtually every major extractive resource project developed in Canada and are becoming increasingly common all around the world (O'Faircheallaigh, 2013). Some attribute the prevalence of CBAs to private developers recognizing the right of communities to free, prior, and informed consent as affirmed by the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) (Cascadden, 2018; Mahanty and McDermott, 2013; Papillon and Rodon, 2017) while others attribute the prevalence of CBAs to project developers managing social risk and attempting to satisfy consultation and accommodation requirements to obtain approval (Caine and Krogman, 2010; Cameron and Levitan, 2014; Grégoire, 2013). Ultimately, federal and provincial governments have a legal duty to consult and accommodate local Indigenous communities but some aspects of this duty can be delegated to private project developers (Newman, 2014; Peach, 2016). While the Canadian

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[1] In this paper, we use the term CBA when referring to community-investor agreements in general, and IIBA when referring to specific agreements between Inuit organizations and project proponents in Canada's North.

https://doi.org/10.1016/j.resourpol.2025.105493
Received 21 November 2024; Accepted 24 January 2025
Available online 25 February 2025

government has taken steps to recognize UNDRIP, legislation does not require consent from local Indigenous communities in order for consultation and accommodation requirements to be satisfied and for projects to be approved (Bankes, 2020).

Theoretically, CBAs have the potential to build mutually beneficial relationships between private project developers and (our focus here) Indigenous communities and to facilitate sustainable community development. The benefits provided to a community from a CBA are likely to be influenced by a number of factors including the fiscal mechanisms used (e.g., profit-based or volumetric royalty), the size of the project, the profitability of the project, the predicted adverse impacts of the project, the bargaining power held by each party, and, ultimately, the objectives of each party (Dale, 2020; Dorobantu and Odziemkowska, 2017; Gunton et al., 2021; Gunton and Markey, 2021; Odziemkowska and Dorobantu, 2021; O'Faircheallaigh, 1998, 2021). While CBAs can benefit communities and project developers, the benefits provided to communities, and the reduction in the likelihood of conflicts, often come at a cost to project developers (Dorobantu and Odziemkowska, 2017; Odziemkowska and Dorobantu, 2021).

In Section 2, we outline the theoretical framing for this study. In Section 3, we introduce the case study and summarize our methodology. Then, we present our assessment of which provisions of the IIBA generate incremental costs and which do not and present the to-date realized costs of the IIBA, which help inform the assumptions of our case study analysis. Next, we present the results of our analysis, estimating the incremental costs of the IIBA over the project's lifetime. We then discuss the significance of the results in Section 4 and present conclusions in Section 5. While our case focus is on the Canadian North, we hope that the theoretically-informed study finds resonance with other jurisdictions host to CBAs.

2. Theoretical framing

2.1. Decision-making theory

CBAs are negotiated for virtually every new major natural resource project in Canada. However, there is no formal requirement around the magnitude of benefits that must be paid to a community. Therefore, project developers must decide what magnitude of costs they are willing to incur when negotiating CBAs with communities. Fig. 1 presents a simplified decision tree that outlines a project developer's options regarding whether to provide a consent-seeking CBA offer (i.e., one with benefits that are perceived by the community as equitable and as adequately compensating for the costs to the community associated with the project, and that will result in consent from the community) or a notional CBA offer (i.e., one with benefits that satisfy legal consultation and accommodation requirements but at best will result in a begrudging acquiescence from the community). The cost of the CBA (Y) includes all costs that can be directly attributed to the CBA and that would not be imposed on the developer in its absence.

The decision tree includes three possible outcomes. The project net present value (NPV) (X), which is referenced in all possible outcomes, is an estimate of the present value of all future cash flows (i.e., gross revenue less capital expenditures, operating expenditures, taxes, payments to other stakeholders, etc.) and indicates the economic viability of a project. If the project developer provides a consent-seeking CBA offer, the NPV of the project is reduced by the cost of the consent-seeking CBA $(X - Y_1)$. If, however, the project developer elects to provide a notional CBA offer, this could result in either no conflict or conflict. In the no conflict outcome, which has a probability of q, the project NPV is reduced by the cost of the notional CBA $(X - Y_2)$. In the conflict outcome, which has a probability of $1 - q$, the NPV of the project is reduced by the cost of the conflict and the notional CBA $(X - (C + Y_2))$[2]. We do not model any potential for conflict with a consent-seeking offer, a simplifying assumption that may not be true in practice as we consider in the discussion section.

Conflict surrounding natural resource projects is ubiquitous and is especially prominent in the mining sector (Scheidel et al., 2020). Recent examples of conflict over natural resource projects in Canada such as the protests and blockades of the Coastal GasLink Pipeline illustrate how the costs of conflict can negatively affect project developers, Indigenous communities, and senior levels of government (Forester, 2023). Conflict may result in delayed operations, lost productivity, theft or damage of infrastructure, or increased transaction costs to resolve the conflict (Davis and Franks, 2014; Franks et al., 2014; Scheidel et al., 2020). A community's bargaining power—which is likely to be higher for communities with strong property rights, history of institutional action, and history of political mobilization—and the predicted level of adverse impacts are likely to influence the probability of conflict, the cost of conflict, and the cost of the CBA (Dorobantu and Odziemkowska, 2017; O'Faircheallaigh, 2016, 2021). In our model, these outcomes correspond to the variables.

A project developer's decision on whether to offer a consent-seeking CBA or a notional CBA will depend on the project developer's objectives. In theory, private project developers aim to maximize economic profits and only undertake projects that are estimated to have positive NPVs (Barney, 2018). Resource-based theory posits that private firms seek to generate profits through possessing resources that are rare, inimitable, and non-substitutable (Barney, 2018; Salmon, 2023). Within resource-based theory are two theories, shareholder theory and

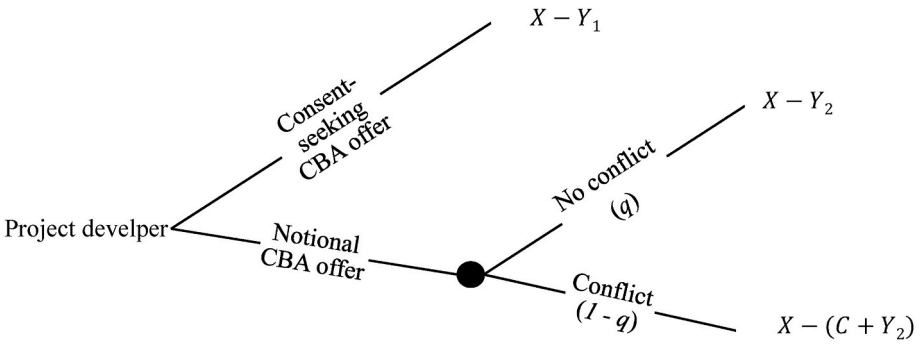

Fig. 1. Project developer decision tree for CBAs[1]

[1]The project developer decision tree for CBAs is inspired by a decision tree that focused on the community's decision to negotiate CBAs that was included in an earlier circulated, but unpublished, version of Adebayo and Werker (2021). The probabilities of conflict and no conflict are conditional on a notional offer.

[2] The cost of conflict includes any CBA costs above Y_2 that are required to reach agreement.

stakeholder theory, with contrasting perspectives on project developers' objectives concerning economic rent distribution (Barney, 2018). Shareholder theory posits that private project developers have the responsibility to maximize returns for shareholders (Barney, 2018; Dorobantu and Odziemkowska, 2017; Freeman, 2010; Garcia-Castro and Aguilera, 2015; Odziemkowska and Dorobantu, 2021; Salmon, 2023). When applied to the decision tree, shareholder theory suggests that a project developer would make a consent-seeking CBA offer if the value of the project with a consent-seeking CBA is higher than the expected value of the project with a notional CBA (i.e., if $X-Y_1 > q(X-Y_2)+(1-q)(X-(C+Y_2)))$. As seen in Table 1, this equation is simplified to the decision rule $Y_1 < (1-q)C+Y_2$.

The decision rule under shareholder theory is illustrated in Fig. 2. For the graphical representation, we plot the expected cost of conflict (the cost of conflict times the probability of conflict plus the cost of a notional CBA) on the horizontal axis and the cost of the consent-seeking CBA on the vertical axis. To be clear, this graph does not reveal the optimal offers of Y_1 or Y_2, since those are determined by community and resource extraction characteristics and the bargaining outcome, but rather it displays the range of values that support consent-seeking and notional CBA offers by the project proponent.

The area in green corresponds to the values of the expected cost of conflict and the cost of a consent-seeking IBA that sustain a consent-seeking offer. For high expected costs of conflict and lower costs of achieving consent, developers will seek consent. The area in yellow corresponds to the values of the expected cost of conflict and the cost of a consent-seeking IBA that sustain a notional CBA offer. Here, lower expected costs of conflict and higher costs of achieving consent lead the developer to risk conflict and to make a notional offer. Finally, the area in white in the top right corner contains the values under which the project is not viable, given either a project NPV less than the cost of achieving consent (the horizontal dashed line) or less than the expected expense of a notional offer and the accompanying probability and cost of conflict (the vertical dashed line).

One way to think of these three colour zones is through a more simplified set of terms: buy, force, and drop or lobby. When the chance of conflict is higher and the community more amenable to living with a project, the proponent *buys* consent through a transfer of value from the resource project to the community. If there is little chance of damaging conflict, or the price of consent is too high, the proponent optimally *forces* acquiescence using non-consensual tactics, which may be perfectly legal but do not respect community preferences (Lehr and Smith, 2010). Finally, if the project's rents are not sufficient to buy consent or force acquiescence, then it is abandoned. It may be silently *dropped* (e.g., fracking resources under a wealthy suburb) *or* the proponent may complain that having to work with communities to achieve consent is too costly and *lobby* government for a change to the licensing regime to reduce community bargaining power (e.g., a pipeline project that traverses multiple communities with strong property rights).

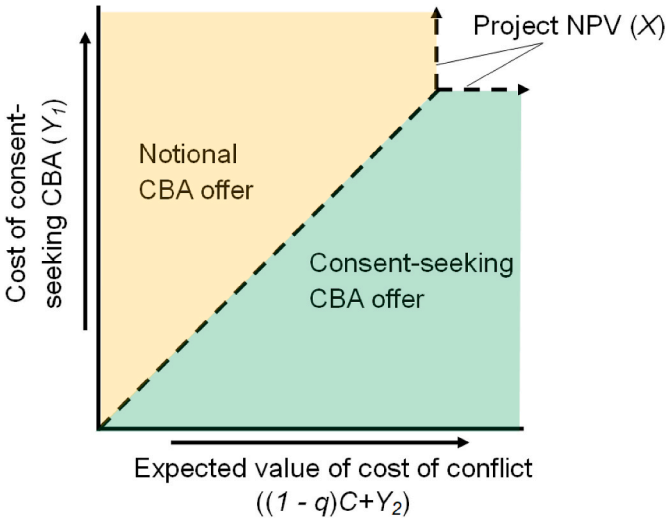

Fig. 2. Graphical representation of CBA decision rule under shareholder theory.

Stakeholder theory posits that project developers are accountable to all parties affected by the project (Barney, 2018; Dorobantu and Odziemkowska, 2017; Freeman, 2010; Henisz et al., 2014; Odziemkowska and Dorobantu, 2021; Prno and Slocombe, 2012). According to stakeholder theory, project developers must negotiate agreements with communities for natural resource projects that are site-specific and that have the potential for negative externalities (Dorobantu and Odziemkowska, 2017; Odziemkowska and Dorobantu, 2021; Prno and Slocombe, 2012; Salmon, 2023; Williamson, 1985). In the context of stakeholder theory, CBAs are necessary to make projects incentive compatible for all stakeholders (Dorobantu and Odziemkowska, 2017; MacPhail et al., 2023). Consequently, stakeholder theory suggests that the project developer will never elect to provide a notional CBA offer. As seen in Table 1, a stakeholder theory lens suggests that the project developer will elect to provide a consent-seeking CBA offer on the condition that the project is economically viable with the consent-seeking CBA ($X - Y_1 > 0$), suggesting the following decision rule: $Y_1 < X$. The decision rule under stakeholder theory is illustrated in Fig. 3. The green area in Fig. 3 corresponds to the values that would result in a consent-seeking CBA offer.

Through a case study analysis, this study seeks to estimate the cost of a consent-seeking CBA for a project developer (Y_1). We then compare

Table 1
CBA decision making through alternative theoretical lenses.

Project developer's decision rule	Shareholder theory	Stakeholder theory
Provide consent-seeking CBA offer if …	$Y_1 < (1-q)C+Y_2$[a]	$Y_1 < X$
Provide notional CBA offer if …	$Y_1 > (1-q)C+Y_2$	–
Project is likely considered non-viable if …	$Y_1 < (1-q)C+Y_2$ And $Y_1 > X$ **Or** $Y_1 > (1-q)C+Y_2$ And $(1-q)C+Y_2 > X$	$Y_1 > X$

[a] This equation assumes that the project developer is risk neutral and does not use weighting to adjust either option.

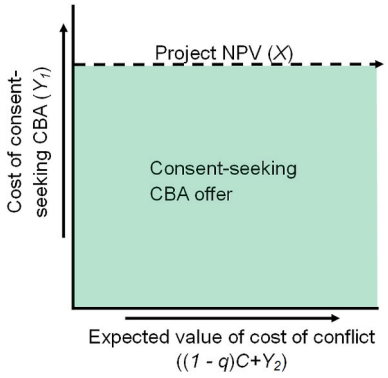

Fig. 3. Graphical representation of CBA decision rule under stakeholder theory.

this cost relative to: (i) the project's total after-tax cash costs, indicating its economic magnitude; (ii) the estimated NPV and internal rate of return (IRR) of a project (X), indicating its impact on economic viability; and (iii) a hypothetical cost of conflict (C), which determines a shareholder-motivated project developer's decision to make a consent-seeking CBA offer or a notional CBA offer.

2.2. Benefit-cost analysis theory

This study relies on theory and principles associated with benefit-cost analysis, which involves estimating the net impacts of alternative projects or policies from the perspective of society as a whole (Boardman et al., 2017; Hanley, 2001; Pearce, 1998; Pearce et al., 2006). A key principle of benefit-cost analysis is that estimating the net impact of a project or policy must include a comparison between the proposed intervention and the baseline, indicating the incremental benefit or cost (i.e., comparing between scenarios with and without the project or policy) (Boardman et al., 2017; Shaffer, 2010). This principle is applicable to this study in that a crucial distinction must be made between which CBA costs are incremental and which are not. The key question in determining if a cost is incremental is whether it is likely to occur in the absence of a project or policy (Gillespie and Bennett, 2015; Shaffer, 2010; Winter et al., 2021). In the context of this study, incremental costs of a CBA refer to those that can be directly attributed to the CBA and that would not be imposed on the project developer in the absence of the CBA. It is possible that some aspects of a CBA may also generate incremental benefits by reducing costs, thereby reducing the total incremental cost of the CBA.

3. Case study analysis

3.1. Methodology

In our case study analysis, we estimate the incremental cost of a CBA for a project developer over the lifetime of a project. We believe that the Mary River IIBA represents an appropriate case study because the benefits provided by the IIBA appear to be on the high end of absolute CBA benefits for communities at the time of the agreement (Adebayo and Werker, 2021; Loxley, 2019) and is therefore likely to be on the high end of absolute costs for project developers. Consequently, we believe that the Mary River IIBA is a conservative case study in that the IIBA is likely to have a higher cost and a greater impact on project viability compared to other CBAs. The Qikiqtani Inuit Association (QIA), the organization that negotiated the IIBA, has relatively strong bargaining power compared to other communities that have negotiated CBAs in Canada due to QIA's proven and recognized rights and title, further supporting the assumption that the absolute costs of the IIBA are higher than other CBAs. Another key factor in selecting the Mary River IIBA as a case study topic is that much of the information that is necessary for this study's analysis is publicly available. The details of CBAs are often kept confidential (Agbaitoro, 2018; Alcantara and Morden, 2019; Fidler and Hitch, 2007; G. Gibson and O'Faircheallaigh, 2010; Hira and Busumtwi-Sam, 2018; Howard-Wagner, 2010), so the fact that the Mary River IIBA is publicly available, along with much of the information required for the analysis, makes this a pragmatic case study topic.

For our case study analysis, we use a discounted cash flow model to estimate the NPV and the IRR of the after-tax revenue of the mine under three scenarios: one that includes the consent-seeking IIBA (and no conflict), one that includes conflict (and a notional IIBA), and a counterfactual scenario that includes a notional IIBA and no conflict. We conduct the analysis from the perspective of 2013, the year in which the IIBA was first negotiated, but we report values in real 2023 Canadian dollars (CAD) and with some benefit of hindsight, as we detail later in this subsection. For the purpose of this study, we assume that the Mary River IIBA is a consent-seeking CBA due to QIA's relatively high bargaining power and due to the IIBA achieving consent at the time it was negotiated. We estimate the incremental cost of the IIBA and the hypothetical cost of conflict by comparing the respective scenarios to the counterfactual scenario. We use a real (inflation-adjusted) discount rate of 8%, a rate that is common for assessing the economic viability of private mine projects and was used in other financial analyses of the Mary River Mine (Baffinland Iron Mines Corporation, 2018; Loxley, 2019; West and Lépiz, 2021). Also, when estimating the NPV of the project's after-tax revenue, we assume that the project is unlevered (i.e., financed with 100% equity) which likely results in a lower NPV estimate than if the project was funded with a mix of debt and equity, further indicating that our estimates are relatively conservative and represent the high end of CBA costs in terms of impact on economic viability.

As discussed, a notional CBA offer is one that satisfies the legal consultation and accommodation requirements but does not result in a community providing consent. It is possible that some payments would be made to a community above those required to satisfy legal consultation and accommodation obligations due to expectations and precedent surrounding corporate social responsibility and social license to operate (Adebayo and Werker, 2021). However, in our analysis, we assume that any benefits provided by a notional IIBA are ones that would still be required in the absence of the IIBA (e.g., through the impact assessment process) or ones that do not generate incremental costs to the project developer. Therefore, in our analysis, we assume that the incremental cost of a notional IIBA is zero. This assumption further supports our belief that this case study represents the upper bound of CBA costs for project developers.

We base our assumptions and inputs for the case study analysis on information obtained from publicly available sources that indicate the realized outcomes of the IIBA including socio-economic reports for the Mary River project (Baffinland Iron Mines Corporation, 2020, 2021, 2022, 2023; Prno, 2017, 2018, 2019), the Mary River IIBA document (Qikiqtani Inuit Association & Baffinland Iron Mines Corporation, 2018), QIA annual reports (Qikiqtani Inuit Association, 2016, 2017, 2018, 2019, 2020, 2021, 2022), the project certificate issued by the Nunavut Impact and Review Board (NIRB) (Nunavut Impact Review Board, 2014), the Nunavut Land Claim Agreement (NLCA) (Indian and Northern Affairs Canada, 2018), research reports (Beach, 2003; Davis and Franks, 2014; Impact Economics, 2021; Loxley, 2019; West and Lépiz, 2021; Winter et al., 2021), and academic literature (Adebayo and Werker, 2021). As part of the case study analysis, we review and evaluate the provisions of the IIBA using benefit-cost analysis principles to identify which provisions are likely to generate incremental costs for Baffinland. We then use the results of this evaluation to inform the assumptions used to estimate the incremental costs of the IIBA. Additionally, we utilize information on the realized outcomes of the IIBA (up to 2022) from the sources listed above to inform some of the assumptions and inputs used in the discounted cash flow analysis, including the costs to Baffinland associated with employment and training, local procurement, IIBA implementation, and the Ilagiiktunut Community Wellness Fund.

3.2. Case context: Mary River Iron Mine and Inuit impact and benefit agreement

The Mary River Mine is an open pit iron ore operation located on Baffin Island, Nunavut, Canada. The mine produces high-grade iron ore at approximately 67% iron content and is shipped to international markets (Mining Technology, 2015). Baffinland initially received approval for the mine from the NIRB in 2012 for a production plan of 18 million tons per annum (MTA) (Loxley, 2019; Mining Technology, 2015). The original plan for the mine was to transport ore via rail to a port located in Steensby Inlet, south of the mine site. In 2014, Baffinland submitted an application for an "early revenue phase" with a production of up to 4.2 million MTA, proposing to use trucks to transport ore to a port located north of the mine site in Milne Inlet (Loxley, 2019; Mining Technology, 2015). Baffinland received approval for the early revenue

phase and began shipping ore from the mine in 2015, approximately two years after construction began (Loxley, 2019; Mining Technology, 2015). At the time of writing, the Mary River mine was operating at a production level of approximately 6 MTA and had been doing so since 2018 under a temporary "sustaining operations" approval (Loxley, 2019; West and Lépiz, 2021).

Baffinland negotiated an IIBA with the QIA in 2013. The QIA represents 13 communities and approximately 16,000 Inuit residents located in the Qikiqtani region of Nunavut (Qikiqtani Inuit Association, 2023). The Qikiqtani Inuit, represented by the QIA, have proven Indigenous rights and title to their territory as defined by the NLCA (Indian and Northern Affairs Canada, 2018). The NLCA requires project proponents to negotiate IIBAs with the relevant Inuit organization, which in the case of the Mary River Mine is the QIA (Indian and Northern Affairs Canada, 2018). This is an important distinction from CBAs negotiated elsewhere in Canada, as the regions in which Inuit have surface rights and subsurface rights are clearly defined by the NLCA, giving QIA relatively strong bargaining power for CBA negotiations compared to other Indigenous groups in Canada.

As stated in Article 26.3.3 of the NLCA, IIBA payments to Inuit communities are not intended to impose an "excessive burden on the proponent and undermine the viability of the project" (Indian and Northern Affairs Canada, 2018, p.197). What constitutes an "excessive burden" on the economic viability of a project is not explicitly defined in the NLCA. Conceivably, one might consider an IIBA to have an excessive financial burden if the IIBA results in the project being economically unviable based on two common indicators: NPV and IRR. A project is considered economically viable if its estimated NPV is non-negative, assuming an appropriate developer discount rate, and/or if its estimated IRR is higher than an appropriate discount rate (De Marco, 2018).

The Mary River IIBA contains provisions that are intended to generate benefits for the QIA including royalty payments, advance payments, Inuit employment and training, Inuit procurement, implementation funding, and contributions to the Ilagiiktunut community wellness fund. The IIBA was amended in 2018 with the objective of increasing Inuit training and employment benefits. A second agreement, the Inuit Certainty Agreement, was negotiated in 2020 and was intended to be implemented in conjunction with Baffinland's proposed mine expansion. In 2018, Baffinland submitted an application for the "Phase 2" expansion which proposed an increase in production of up to 12 MTA and the development of a railway connecting the mine site to the Milne Inlet port. The Phase 2 expansion was rejected by the NIRB and the federal government in 2022 due to concerns that the expansion would result in significant adverse impacts to the environment (Nunavut Impact Review Board, 2022). Most of the Inuit Certainty Agreement provisions no longer apply due to the rejection of Phase 2 (Qikiqtani Inuit Association & Baffinland Iron Mines Corporation, 2020).

3.3. Incremental vs non-incremental costs of the IIBA

As discussed, benefit-cost analysis principles outline the need to distinguish between incremental and non-incremental benefits and costs when estimating the consequences of a project (Gillespie and Bennett, 2015; Shaffer, 2010; Winter et al., 2021). Generally, the provisions of CBAs that have the potential to generate costs for project developers include those relating to revenue sharing (including royalties and/or milestone payments), local employment, local procurement, adverse impact mitigation and monitoring measures, and CBA implementation funding. Below, in Table 2 and in the subsequent text, we evaluate which provisions of the IIBA are likely to generate incremental costs for Baffinland. We then use the results of our evaluation to inform the assumptions and model inputs used to estimate the incremental cost of the IIBA for Baffinland. A general assumption that we make regarding these provisions is that direct IIBA expenditures—including royalty payments, advance payments, infrastructure payments, business capacity fund payments, and Ilagiiktunut Community Wellness Fund payments—are tax deductible and the costs associated with these provisions are offset to some degree by lower corporate income tax (CIT) payments.

Table 2
Summary of Mary River IIBA provisions and cost evaluations.

IIBA Provision	Evaluation
Royalty payments	Incremental cost
Advance payments	Incremental cost
Infrastructure payments	Incremental cost
Inuit employment	
• Inuit job turnover	Incremental cost
• Inuit training and education	Incremental cost
• Local employment versus FIFO employment	Incremental benefit (reduces incremental cost)
Inuit procurement	
• Contracts	Non-incremental cost
• Business capacity fund	Incremental cost
Ilagiiktunut Community Wellness Fund	Incremental cost
Wildlife compensation and monitoring	Non-incremental cost
Tax deductibility of direct IIBA payments (For federal and territorial CIT)	Incremental benefit (reduces incremental cost)

3.3.1. Royalty payments

The Mary River IIBA royalty payments are based on the revenue of the Mary River Mine (1.19% of net sales revenue). We assume that royalty payments would not be made by Baffinland in the absence of the IIBA and therefore we assume that the royalty payments generate an incremental cost for Baffinland. By assuming no royalty payments in the absence of the IIBA, we err on the site of overestimating the cost of a consent-seeking CBA.

3.3.2. Advance payments

The IIBA outlines various milestone fixed payments that Baffinland is required to pay to QIA. These payments would not be made by Baffinland in the absence of the IIBA and therefore we assume that they generate an incremental cost for Baffinland.

3.3.3. IIBA implementation payments

Baffinland is required to make annual IIBA implementation payments to QIA to support management of the IIBA including operating costs of the various committees and salaries for QIA employees. These are direct costs that are required to operationalize the IIBA and therefore we assume that they generate an incremental cost for Baffinland.

3.3.4. Infrastructure payments

In the revised IIBA (Qikiqtani Inuit Association and Baffinland Iron Mines Corporation, 2018), Baffinland commits $10 million towards developing a regional training centre in Pond Inlet. In the absence of the IIBA, it is unlikely that this project would be funded by Baffinland and therefore we assume that this payment generates an incremental cost for Baffinland.

3.3.5. Inuit employment

When estimating the incremental cost of the IIBA's Inuit employment provisions, the cost of Inuit employees must be compared to the cost of non-Inuit employees that would replace the Inuit employees. That cost is a function of the relative costs of the two groups from turnover, training, and transportation to the mine site.

Inuit turnover: The average annual turnover rate for Inuit project employees has been marginally higher than the average turnover of non-Inuit employees from 2013 to 2022 (30% vs 25%, respectively) (Baffinland Iron Mines Corporation, 2020, 2021, 2022, 2023; Prno, 2017, 2018, 2019). For unskilled and semi-skilled mining jobs, we assume that the cost of turnover is approximately 30% of the salary for each position being replaced, which accounts for separation costs, recruitment costs, training costs, and lower productivity of new workers (Beach, 2003).

Inuit training: Inuit workers employed by the mine receive more training than non-Inuit workers per full-time equivalent (FTE). In the original IIBA, Baffinland commits to providing $2 million upfront (in the first two years following negotiations) and $250,000 annually for Inuit training programs. This was revised in the 2018 renegotiation, in which Baffinland commits to providing $2 million per year from 2018 to 2021 and $1.5 million annually from 2021 to 2031. In the absence of the IIBA, we assume that the non-Inuit replacement workers would still receive training, an estimated average of 42% of the amount of training received by Inuit workers (per FTE), based on information available in Baffinland's socio-economic reports.

Fly-in fly-out (FIFO) workers: In the absence of the IIBA, we assume that replacement workers would come from elsewhere in Canada and would require additional flights (paid for by Baffinland) to and from Iqaluit. Currently, FIFO workers take commercial flights to and from Montreal and the flights between Montreal and Iqaluit are privately chartered by Baffinland. Additional costs associated with more FIFO workers, such as hotel and food expenses en route, are excluded as we assume that these would be approximately offset by the additional cost of regional flights (over and above the cost of flights from Iqaluit) for Inuit workers to and from the mine from surrounding communities such as Arctic Bay, Clyde River, Pond Inlet, Igloolik, and Sanirajak.

3.3.6. Inuit procurement

We assume that the only provision related to Inuit procurement that generates an incremental cost is the business capacity fund. Baffinland makes annual contributions to the fund, which is managed by the QIA. Although the IIBA outlines obligations concerning the provision of contracts to Inuit-owned businesses, nothing in the IIBA requires that Inuit-owned businesses would get paid more than other contractors (e.g., a provision that requires Inuit bids to be favoured up to 5% or 10% above the value of the lowest bid by another contractor). In situations where no Inuit-owned businesses express interest in a given contract or if negotiations are unsuccessful (e.g., if Baffinland believes that it is unable to get fair value based on bids from Inuit-owned businesses), Baffinland can tender contracts through a competitive bid process (Qikiqtani Inuit Association & Baffinland Iron Mines Corporation, 2018). While contractors that commit to maximizing Inuit benefits are favoured in the bidding process, we have not modelled this as an incremental cost to Baffinland.

3.3.7. Ilagiiktunut Community Wellness Fund

The Ilagiiktunut Community Wellness Fund is intended to build community capacity and promote community wellbeing over the lifetime of the mine. In the IIBA, Baffinland commits to matching payments to this fund made by QIA (up to $375,000 from 2013 to 2018 and up to $550,000 from 2019 onwards). We assume that these payments would not be made by Baffinland in the absence of the IIBA and therefore we consider the payments to be an incremental cost.

3.3.8. Wildlife compensation and monitoring

In the Mary River IIBA, Baffinland commits to making various payments related to wildlife compensation and monitoring, including funding the Wildlife Compensation Fund, funding the Harvesters Enabling Program, funding the Wildlife Monitoring Program, and purchasing marine research equipment. While these payments are outlined as provisions in the IIBA, compensation for wildlife loss and provision of monitoring activities are required by the project certificate issued by the NIRB and by the NLCA. We assume that even in the absence of the IIBA these payments would still be required of Baffinland by the NIRB project certificate and NLCA and therefore funding for wildlife compensation and monitoring is not considered an incremental cost of the IIBA. Also, concerning the Wildlife Monitoring Program, we assume that monitoring activities undertaken by local communities would substitute for monitoring activities that Baffinland would be required to conduct in the absence of the IIBA.

3.4. Realized costs of the Mary River IIBA (2013–2022)

We estimate the realized outcomes of the IIBA from 2013 to 2022 using information from Baffinland's publicly available socio-economic reports and impact assessment application documents (Table 3). These estimates inform some of the assumptions and inputs of this study's discounted cash flow analysis in which we estimate the costs of the IIBA to Baffinland over the lifetime of the mine. Our estimates are divided into two time periods to account for the increase in production and the revision of the IIBA, both of which occurred in 2018. In addition to the estimates presented in the table, Baffinland provided a total of $37,421,000 (2023 CAD) in advance payments to QIA. These payments were made upfront during the construction phase and therefore are not included as annual averages in Table 3.

Our estimates of the realized outcomes of the IIBA indicate that there are incremental costs to Baffinland associated with royalty payments, advance payments, and Inuit procurement (business capacity fund). Additionally, our estimates indicate that there is an incremental benefit to Baffinland due to cost savings associated with employing Inuit workers, as replacing these workers with FIFO workers (from elsewhere in Canada) would result in higher overall costs to Baffinland due to the high cost of transporting workers to the mine site, even when accounting for the higher turnover costs and training costs associated with Inuit labour. Since this study only focuses on the cost of a CBA to a project developer, the only potential sources of incremental benefits in the analysis are CBA provisions that result in cost savings. Conceivably, negotiating a CBA can benefit a project developer in other ways including creating a competitive advantage, improving reputation and legitimacy, increasing share prices, and increasing the magnitude of benefits generated and distributed by a project (Dorobantu and Odziemkowska, 2017; Kurucz et al., 2008; Prno and Slocombe, 2012).

Table 3
Realized outcomes of Mary River IIBA (2013–2022).

Provision	Average Annual (2013–2017) (2023 CAD)	Average Annual (2018–2022) (2023 CAD)
Mine production	4.2 MTA	6 MTA
Royalty payments	$1,968,699	$9,607,209
Inuit employees (actual, Baffinland- excluding contractors)	92 (FTE)	166 (FTE)
Total employees (actual, Baffinland- excluding contractors)	561 (FTE)	1098 (FTE)
Incremental cost of Inuit employment (per Inuit FTE)	-$19,970	-$17,255
Incremental cost of Inuit employment (total)	-$1,835,062	-$2,867,757
Incremental cost of Inuit procurement (business capacity fund)	$320,000	$320,000
Incremental cost of IIBA implementation	$862,631	$2,652,828
Incremental cost of Ilagiiktunut Community Wellness Fund	$243,271	$455,274

These benefits, however, are not estimated in this study.

3.5. Incremental cost of the Mary River IIBA to Baffinland (2013–2038)

We estimate the incremental cost of the Mary River IIBA over the lifetime of the mine,[3] estimate the impact of the IIBA on the economic viability of the mine, and compare the cost relative to the mine's total after-tax cash costs and relative to a hypothetical cost of conflict that could occur if a consent-seeking CBA offer was not provided. Table 4 outlines the three scenarios evaluated in this analysis, all of which are represented in the decision tree presented in Fig. 1, above. As discussed, we assume that the incremental cost of a notional IIBA is zero because the benefits it provides would be necessary for project approval. This analysis utilizes a simple hypothetical conflict scenario in which project operations, and profits, are delayed. For the purpose of modeling the cost of conflict and comparing it to the incremental costs of the IIBA, we calibrate the cost of conflict by considering the financial consequence on project economics per year of delay. Of course, delays can occur for a variety of reasons, including many that have nothing to do with signing a CBA, and can result in a range of costs not modelled in this study.

3.5.1. Results

3.5.1.1. Incremental cost of Mary River IIBA. The incremental cost of the Mary River IIBA is estimated to have a present value in 2023 dollars of $95 million (at a real discount rate of 8%), a cost which represents just over 2% of the mine's total after-tax cash costs, which we estimate to be approximately $4.5 billion. A breakdown of the costs of the Mary River IIBA is presented in Table 5. The highest cost provisions of the IIBA are royalty payments, advance payments, and implementation payments. The incremental cost of procurement is relatively small since it only includes the cost associated with the business capacity fund, as contracts awarded to Inuit-owned businesses are assumed not to be any more costly than contracts with non-Inuit businesses and therefore do not generate incremental costs for Baffinland. Interestingly, there is an incremental benefit from the cost savings associated with Inuit employment due to the cost of FIFO workers being higher than the cost of Inuit workers. The incremental cost of the IIBA is further decreased by the tax deductibility of direct IIBA expenditures, resulting in a decrease of $28 million for federal and territorial CIT payments.

3.5.1.2. Cost of Mary River IIBA relative to economic viability of project and relative to cost of conflict. The incremental cost of the Mary River IIBA is evaluated relative to the mine's economic viability, which is indicated by the NPV and IRR of the after-tax returns of the mine in the counterfactual scenario (see Table 6). The cost of the Mary River IIBA decreases the project NPV, which is estimated to be approximately $1.3 billion, by $95 million and decreases the project IRR, which is estimated to be 22.7%, by 1.4 percentage points. The 22.7% IRR that we estimated for the mine is higher than the discount rates used by Baffinland for its financial analyses, which are 7%, 8%, and 10% (Baffinland Iron Mines Corporation, 2018). Comparing the incremental cost of the Mary River IIBA to the NPV of the mine and to Baffinland's discount rates for the mine, the results indicate that the cost of the IIBA has a relatively marginal impact on the economic viability of the mine.

The incremental cost of the Mary River IIBA is also evaluated relative to the cost of conflict, which is represented in the analysis by a delay in operations. The results indicate that the incremental cost of a single year of delay is higher than the incremental cost of the IIBA. For a delay that occurs prior to construction, the project NPV is decreased by $102 million and the IRR is decreased by 0.5 percentage points, per year of delay. If the delay occurs mid-construction, the project NPV is decreased by $135 million and the IRR is decreased by 2.4 percentage points, per year of delay.[4] A delay that occurs mid-construction has a higher cost than a delay that occurs prior to construction due to the earlier capital expenditures. A delay that occurs prior to construction has a relatively minimal impact on project IRR compared to a delay that occurs mid-construction since a minimal amount of capital is invested at the time the delay occurs. A delay that occurs prior to construction, however, still has a significant impact on the project's NPV due to project revenues being delayed by one year.

4. Discussion

The results of the case study analysis provide some important insights concerning a project developer's decision regarding a CBA offer. As discussed, shareholder theory and stakeholder theory have different interpretations of project developers' objectives regarding CBAs and benefit distribution. Stakeholder theory recognizes that CBAs must be negotiated with Indigenous communities to gain access to resources, which is integral to generating profits. Therefore, in terms of the decision tree, stakeholder theory suggests that a project developer will negotiate a CBA if the cost of the consent-seeking CBA (Y_1) is less than the NPV of the project without the CBA (X), which is estimated to be $1294 million (Table 7). That is, the project developer is theoretically willing to buy the community's consent at a price up to the project's NPV, past which it would drop the project. The results of the analysis indicate that the stakeholder theory decision rule is met and would still be met if the cost of the IIBA was increased significantly up to the NPV of the mine.

Shareholder theory, on the other hand, suggests that the project developer offers a consent-seeking CBA and buys consent from the community if it provides a net benefit to project NPV, that is if the cost of the consent-seeking CBA (Y_1) is lower than the expected value of the cost of conflict ($(1-q)C$) plus the cost of a notional CBA offer (Y_2) (Table 7). If, however, the expected cost of conflict was believed to have a lower cost than the cost of a consent-seeking CBA, the project developer would likely force acquiescence up to the project's NPV, past which it would drop the project or lobby government to intervene.

While not all variables were estimated in the case study, some insights can still be distilled from the results. The results indicate that the incremental cost of the IIBA is of the same order of magnitude as the cost per year of delay. If we assume that the probability of conflict is 100% if a consent-seeking IIBA offer is not provided by Baffinland (which is a reasonable assumption given that IIBAs are legally required in Nunavut), then the costs of conflict that we estimate, $102 million and $135 million (depending on the type of delay), represent the expected values of the costs per year of conflict. Under this assumption, the results would indicate that the incremental cost of the IIBA is less than the expected value of the cost of conflict per year, indicating that the shareholder theory decision rule is also met. The cost of conflict that was estimated in the case study, however, is not necessarily representative of the full cost of conflict. For example, a cost that this analysis does not explicitly consider is the opportunity cost if the mine is not developed. Theoretically, if the Mary River Mine was not developed due to conflict, then the cost of conflict would be $1.3 billion, the NPV of the mine, which is an

[3] For modeling purposes, we assume a 21-year operational life of mine. However, the mine life may last well beyond that, particularly if mine production remains stuck at 6MTA. As a robustness test (available from the authors upon request) we extend the mine life by an additional 10 years, by which point a discounted dollar is worth just 8.5 cents. While estimated NPV figures for most categories in Tables 5 and 6 increase somewhat compared to the reported results (i.e. by less than one quarter), the share of mine value or expenditures associated with the IIBA decreases due to the presence of front-loaded community payments in the IIBA, and the impact on IRRs is negligible.

[4] Multiplying the number of years of delay by these amounts would only generate a rough estimate of the cost of a multi-year conflict; discounted cash flow modelling would be required to get precise estimates.

Table 4
Case study analysis scenarios.

	Notional IIBA	Consent-seeking IIBA
No conflict	**Counterfactual Scenario:** Notional IIBA is provided and there is no conflict.	**Scenario 1:** Consent-seeking IIBA is negotiated and there is no conflict.
Conflict	**Scenario 2:** Notional IIBA is provided and there is conflict. **2a:** Delay occurs prior to construction. **2b:** Delay occurs mid-construction.	

Table 5
Breakdown of costs of Mary River IIBA.

Provision	Cost (Present values in 2013, Millions of 2023 CAD)
Royalty	$66
Advance payments	$49
Infrastructure payments	$7
Employment	-$26
Procurement	$4
IIBA Implementation	$20
Ilagiiktunut Community Wellness Fund	$4
Decrease in CIT expenses	*-$28*
IIBA Cost	**$95**[a]
Total project cash costs (including tax and IIBA payments)	**$4554**

[a] Individual costs do not equal total CBA cost when added up due to rounding.

Table 6
Cost of Mary River IIBA relative to economic viability of project and relative to cost of conflict.

Scenario (decision tree variable)		(Millions of 2023 CAD)
Counterfactual ($\boldsymbol{X}+\boldsymbol{Y_2}$) (Notional IIBA, no conflict)	**After-tax revenue NPV**	**$1294**
	After-tax revenue IRR	22.7%
1. Incremental cost of consent-seeking IIBA ($\boldsymbol{Y_1}$)	**Cost** (present value)	**$95**
	IRR impact (Percentage points)	−1.4%
2a. Cost of delay prior to construction (***C per year***)	**Cost** (present value)	**$102**
	IRR impact (Percentage points)	−0.5%
2b. Cost of delay mid-construction (***C per year***)	**Cost** (present value)	**$135**
	IRR impact (Percentage points)	−2.4%

Table 7
Case study results applied to CBA negotiation theory.

	Shareholder theory	Stakeholder theory
Decision rule: Offer consent-seeking CBA if	$Y_1 < (1-q)C + Y_2$	$Y_1 < X$
Case study results (Millions of 2023 CAD)	$\$95 < (1-q)\$102 \times$ *number of years*[a] Or $\$95 < (1-q)\$135 \times$ *number of years*	$\$95 < \$1,294$

[a] The NPV of the cost of the delay per year will decrease the longer the delay occurs due to discounting. The equation is presented in a simplified manner for illustrative purposes.

exorbitant cost relative to the cost of the IIBA.

Our decision to omit the potential for conflict from a consent-seeking CBA represents a simplifying assumption to this illustrative model that may not be true in practice. For instance, the distribution of mining rents has become a driver of conflict at the community-project level in the Peruvian context (e.g. Arellano-Yanguas, 2011), and stronger corporate social responsibility commitments at the company level are associated with more local social conflict across a sample of Latin American mines (Haslam et al., 2019).[5] To the extent that CBAs increase the flow of rents to communities affected by natural resource extraction, they might introduce new sources of tension that shifts the nature of conflict from environmental (e.g. Martinez-Alier, 2002) to distributional (Orihuela et al., 2022).

Another interpretation of this omission is that true consent-seeking CBAs only exist in theory. In reality, consent is determined by a complex process involving heterogeneous preferences of community members as well as evolving expectations for what is a "fair share." In the case of the Mary River Mine, the 1.19% royalty payments negotiated in the 2013 IIBA were subsequently negotiated upward in the 2020 Inuit Certainty Agreement that would have seen rates reach 3% (Qikiqtani Inuit Association & Baffinland Iron Mines Corporation, 2020). However, as noted in section 3.2, this expanded proposal was rejected due to environmental concerns. Yet even tripling the cost to the investor would only increase the cost of consent modeled in this paper to just over 20% of after-tax NPV, leaving the Indigenous community with a much smaller share of the rents than either the company or the government, and well below the potential amount that is predicted by the theory. This is consistent with Salmon (2023), who finds limited value capture by Indigenous communities with CBAs in a panel data setting. A more generalized model might include a distribution of conflict outcomes for each possible decision, and a dynamic—or negotiated—cost of consent.

From a practical perspective, when analyzing Baffinland's costs associated with the IIBA, the results of this study emphasize the importance of distinguishing between incremental and non-incremental costs. Interestingly, provisions relating to employment and local procurement, which are often key components of CBAs, do not appear to impose significant incremental costs on the project developer. In fact, the results of the case study show that there is potential for an incremental benefit to project developers in the form of cost savings from hiring local labour. This finding suggests that employment, training, and local procurement provisions are in essence the "low-hanging fruit" of CBAs. Recognizing which CBA provisions are associated with incremental costs and which are not can help project developers and Indigenous communities identify overlapping objectives, such as low costs for project developers and high benefits for communities, and potentially enable both groups to allocate time and resources more efficiently during the negotiation process.

5. Conclusion

The objectives of this study are to estimate the cost of a CBA for a project developer, estimate the impact of a CBA on the economic viability of a project, and evaluate the cost of a CBA relative to total project cash costs and relative to the cost of conflict. To address these objectives, we conducted a case study analysis of the Mary River Iron Mine and the Mary River IIBA. The results of the analysis reveal that while the provisions relating to payments to QIA result in incremental costs to Baffinland, the local procurement provision results in a minimal incremental cost, the wildlife compensation and monitoring provisions result in no incremental costs, and the Inuit employment provision results in an incremental benefit for Baffinland. The results also reveal that

[5] We thank an anonymous reviewer for this observation.

the incremental cost of the Mary River IIBA for Baffinland has a 2013 present value of approximately $95 million in 2023 dollars, which is a relatively low cost compared to the present value of the mine's total after-tax cash costs of $4.5 billion and to the project NPV of $1.3 billion. Regarding the impact of the IIBA, the results indicate that the IIBA has a relatively marginal impact on the economic viability of the mine, reducing the project NPV by $95 million and reducing project IRR by 1.4 percentage points from a projected IRR of 22.7%. Additionally, the results indicate that the cost of the IIBA is lower than the cost per year of delay in project operations, which has a cost of approximately $102 million per year for a delay that occurs prior to construction and $135 million for a delay that occurs mid-construction. The results of the study suggest that negotiating an equitable CBA is likely to be in the financial interest of project developers, even if a more stringent theory of rent distribution, shareholder theory, is utilized. This study has important implications for project developers, Indigenous communities, and senior levels of government involved in the negotiation and regulation of CBAs.

CRediT authorship contribution statement

Cameron Gunton: Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing, Visualization. **Eric Werker:** Conceptualization, Formal analysis, Methodology, Writing – review & editing, Validation, Visualization. **Mark A. Moore:** Conceptualization, Formal analysis, Methodology, Validation, Visualization, Writing – review & editing. **Sean Markey:** Conceptualization, Writing – review & editing.

Declaration of competing interest

Sean Markey declares no conflicts of interest. Cameron Gunton, at the time of writing, had no conflicts of interest; he currently is employed at the Firelight Group, which has done consulting work for the Qikiqtani Inuit Association (QIA). Eric Werker and Mark Moore have previously worked jointly on an economic analysis contract with the QIA that related to the Mary River project. Eric Werker currently consults on economic analysis for the QIA unrelated to the Mary River project.

Acknowledgement

We thank the Qikiqtani Inuit Association (QIA) for input into this research project, which builds on prior economic modelling collaboration by two of the co-authors with the QIA.

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