Using financial assurance to reduce the risk of mine non-remediation:
Considerations for British Columbia and Indigenous governments

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Using financial assurance to reduce the risk of mine non-remediation

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Summary

Mining is an important contributor to British Columbia’s economy. But when mines don’t get cleaned up at the end of their lives — for example, because a company goes bankrupt — they can leave behind a costly environmental and financial legacy. This paper shows how stronger financial assurance requirements can better protect British Columbia’s communities and taxpayers from the risks of mine non-remediation.

The report focuses on both the actions that British Columbia’s provincial government can take as well as the actions available to Indigenous nations. Indigenous nations are increasingly calling for policy change in British Columbia’s mining sector. Implementing the United Nations Declaration on the Rights of Indigenous Peoples — which the provincial government has — will require that the province address Indigenous nations’ calls for change in a way that advances reconciliation and that recognizes Indigenous governance and values.

The risks of mine non-remediation

- The fact that mining companies are liable for the costs of mine remediation (i.e., clean-up) in British Columbia does not guarantee that they will bear its costs. If they go bankrupt, the costs of cleaning them up their mine sites can fall to taxpayers. Until these sites are cleaned up, they pose significant risk to the surrounding environment.

- While mine abandonment is not the problem it once was, it still occurs in British Columbia. For example, the owner of the province’s Yellow Giant Mine went bankrupt in 2016. Remediating the mine will cost the province’s taxpayers at least $500,000.

- Indigenous communities in British Columbia are particularly affected by the risk of mine non-remediation. Environmental harm from unremediated mines can affect the ecosystems that Indigenous people rely on for sustenance and cultural uses. And it can harm the spiritual connections they have to the local land, water, and wildlife.

Stronger “financial assurance” requirements can reduce the risks of non-remediation

- Financial assurance policies require companies to commit funds against the costs of mine remediation. They ensure that funds are available to pay for cleanup regardless of whether a company goes bankrupt. Common instruments include bonds, insurance, or industry funds.

- Currently, British Columbia commonly “phases-in” financial assurance requirements over the life of a mine. This leaves British Columbians exposed to significant risk. If a commodity price downturn led to a wave of mine abandonment in the sector, British Columbians could be left with an environmental legacy whose cleanup cost was in the hundreds of millions of dollars.

- To effectively address the environmental and financial risks of non-remediation, British Columbia will need to implement stronger financial assurance policy.

- Québec illustrates an alternative approach the province can take. The province requires “hard” financial assurance in-full and up-front from mining companies. These requirements ensure that mining companies bear the cost of cleanup. They strengthen the incentives companies have to limit environmental damage at mine sites. And they have not come at the expense of a thriving mining sector in the province.
RECOMMENDATIONS FOR BRITISH COLUMBIA

Strong legislated financial assurance requirements can help British Columbia reduce the risks from mine non-remediation while still allowing the province to benefit from the jobs and income that mining generates.

Main recommendations to British Columbia's provincial government

The province should implement financial assurance policy in line with Québec's current policy approach. Strictly accepting “hard” types of assurance (e.g., bonds) avoids security falling in value before it is needed. And requiring the assurance in-full and up-front ensures that there are sufficient funds to cover remediation even if an operator goes bankrupt early in a mine's life.

This kind of approach would better protect British Columbia communities and taxpayers from the risks of mine non-remediation. Québec's experience demonstrates that this type of stringent policy approach and a thriving mining sector are not at odds.

Main recommendations to British Columbia's Indigenous nations

If the British Columbia government implements less-stringent financial assurance policy than what we recommend above, British Columbia's Indigenous communities should set their own financial assurance requirements by requiring them as a condition of their consent to mining projects. They can do so via the impact benefit agreements (IBAs) that they negotiate with mining companies, via the regulations and engagement processes stemming from the province's pending legislation to implement the United Nations Declaration on the Right of Indigenous Peoples, or both.

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Whatever course the government of British Columbia takes in its reform of mining sector financial assurance, it must deliver a solution that makes sense for all British Columbians. The government's own commitments demand that in doing so, it closely consider the views and priorities of the province's Indigenous nations.
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1. Introduction

Mining is an important contributor to the British Columbia economy. But it also comes with environmental risks. When mines are not remediated (i.e., cleaned up) at the end of their lives, they can contaminate local water supplies, affect ecosystem service provision, and harm local biodiversity (Gorton et al., 2010; Lima et al., 2016).

Historically, mining companies leaving behind unremediated mine sites has been a significant problem in British Columbia. **While mine abandonment is not the problem it once was, it still occurs. When it does, the costs—environmental, financial, or both—fall to British Columbians.**

In 2015, for example, the Yellow Giant Mine in B.C. was shut down for unauthorized effluent discharges and permit violations. Its owner, Banks Island Gold Ltd., filed for bankruptcy in January 2016, leaving behind an unremediated mine site. Until the site is cleaned up, it will pose an ongoing risk to the surrounding environment. The government of British Columbia estimates the cost of remediation at $1 million, while an environmental consultant for the impacted Gitxaala Nation has estimates costs of $1.6 million (Allan, 2016). The province only required the company to post $420,000 in security against cleanup costs, so the remaining costs will fall to British Columbia taxpayers.

Governments have a range of policy tools and options at their disposal for reducing the risk of mine non-remediation. ¹ For example, they can implement rules that clearly establish companies’ legal liability for damages, or require companies to undertake particular remediation or risk-mitigation actions.

This report is organized as follows. Section 2 discusses the impacts that mine non-remediation can have on Indigenous communities as well as the policy solutions available to them as nations. Section 3 discusses the risk of non-remediation in the mining sector and the specific role financial assurance can play. Section 4 describes the government of British Columbia’s current approach to financial assurance policy. Section 5 considers the possibility of requiring security against the cost of mine cleanup both in-full and up-front, as is done in Québec and Alaska. Section 6 presents a number of design details that are critical for ensuring that financial assurance policies operate effectively. Finally, Section 7 offers recommendations to British Columbia’s provincial and Indigenous governments.

British Columbia has indicated that it will release an updated policy for mine reclamation securities before the end of 2019. The information in this report can help inform the implementation of that policy and can also provide guidance to Indigenous nations interested in ensuring that mining is done responsibly.

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¹ Remediation is the act of removing contamination at a mine site, while reclamation involves returning land to its original (or an equivalent) use. Given that this report is focused on environmental damage and risk, we focus throughout on the remediation of mines, rather than on their reclamation. However, reclamation is the ultimate standard by which cleanup efforts should be judged, since it indicates that a mine site has not only been decontaminated but also ecologically restored.
2. Indigenous impacts, rights and governance

Indigenous communities and nations are particularly affected by the risk of mine non-remediation. Mining projects commonly occur on Indigenous lands and territories in British Columbia. There are numerous examples of environmental damages from mines harming Indigenous peoples, through impacts to land, waters and culture, and the Indigenous spiritual connections to the lands, waters and wildlife (Hipwell et al., 2002; Docherty et al., 2010).

Indigenous nations want to see mining being done responsibly and are increasingly calling for legislative change. Legal precedent, international declarations, and pending legislation in British Columbia support Indigenous nations’ right to have a say in resource projects in the province. Numerous court decisions in Canada have confirmed aboriginal title over traditional lands, such as the Supreme Court of Canada’s 2014 Tšilhqot’in Nation ruling. And the United Nations Declaration on the Rights of Indigenous Peoples (UN Declaration) states that Indigenous peoples have the right to own, use and develop the lands, territories and resources that they have traditionally had use over; that States should not make use of these lands without the free, prior and informed consent of Indigenous peoples; and that States must take measures to recognize and protect the exercise of these rights (United Nations, 2007).

At the date of release of this report, the government of British Columbia has introduced enabling legislation to bring provincial laws and policies into harmony with the UN Declaration, following through on a commitment made in its 2019 throne speech (Government of British Columbia, 2019; Curpen et al., 2019). As the British Columbia government moves to implement the UN Declaration, Indigenous nations have the opportunity for an oversight role where resource projects are conducted on or affect their lands.

As Indigenous nations in British Columbia increasingly exercise their inherent rights to self-determination, they are beginning to establish their own protections and requirements. Some are doing so in the context of impact benefit agreements negotiated with mining companies. Others have started implementing their own mining policies (Zimmerling, 2016). For example, the Taku River Tlingit First Nation has a mining policy which comprehensively lays out the conditions under which it will and will not consent to mining projects occurring on its lands (Taku River Tlingit First Nation, 2007).

Implementing the UN Declaration will require that British Columbia address Indigenous nations’ calls for change in a way that advances reconciliation and that recognizes Indigenous governance and values.
3. The risk of non-remediation and how financial assurance can help

Mining processes and infrastructure often pose significant risk to the surrounding environment. Environmental impacts can include local contamination, altered hydrology, habitat loss and fragmentation, reduced biodiversity, and the loss of ecosystem services. When mines are not remediated at the end of their life, these impacts are more likely to become permanent (Lima et al., 2016).

Acid mine drainage (AMD) is of particular concern. When mining wastes that contain sulfur come into contact with both water and air, they can oxidize and turn highly acidic, creating AMD. If water contaminated with AMD flows offsite, it can cause significant environmental damage. Once it is created, AMD presents a perpetual environmental liability, so mines must be carefully monitored and managed in cases where it is a risk. Leaving mines unremediated exacerbates both the risk of creating AMD and the risk of it migrating offsite (Akcil & Koldas, 2006). The Tulsequah Chief mine in British Columbia (which we discuss in Box 1) provides a well-known example of the consequences of AMD.

Importantly, mine non-remediation poses both environmental and financial risks to the public. If a mining company fails to remediate a site (for example, because it has gone bankrupt), governments will typically do the work themselves, either directly or through contractors. Governments incur these costs in order to avoid potential environmental damages from contaminated sites. That is, they incur a financial cost in order to avoid an environmental one. In this way, unremediated mines risk can not only create environmental costs, but costs to taxpayers as well.

Of course, many mining companies in British Columbia honour their remediation obligations in full. Fully one third of the land disturbed by mining in the province—nearly 15,000 hectares—has been successfully reclaimed. For example, the Island Copper Mine on northern Vancouver Island began production in 1971 and was the third largest copper mine in Canada when it was closed in 1995. It is a remediation success story: within two years of remediation, the site’s flooded pit returned was hosting life (including crab and prawn populations) in line with pre-mine conditions.

However, despite these successes, mine non-remediation remains a risk in British Columbia—as the province’s recent experience with the Yellow Giant Mine illustrates. When it comes to addressing the risk of mine non-remediation, governments have three types of policy tools they can use:

- **Regulations**: They can craft rules and requirements that firms adopt particular technologies or practices (or bar them), as well as issue fines or penalties to ensure regulatory compliance.
- **Liability rules**: They can enact legislation that clearly establishes firms’ legal liability for environmental damage from mining operations and from mine non-remediation.
- **Financial assurance**: They can require firms to commit funds against the costs of a mine’s eventual remediation.

Each of these tools has a role to play—they act as complements to each other, rather than as substitutes. When they are applied in a coordinated way, they can help manage risk more effectively and at lower cost than approaches that rely on only a subset of them. In this report, we focus on the role that financial assurance can play.
The Tulsequah Chief mine is a copper mine in northwest British Columbia that operated from 1950 to 1957. Its original operator abandoned it when low metal prices made it economically unviable. No remediation work was undertaken. Since 1957, the mine has been discharging Acid Mine Drainage (AMD) into the Tulsequah River, which feeds into the Taku, a major salmon-bearing river running from British Columbia to the Alaskan coast.

The mine is estimated to be discharging over one million liters of AMD per day. The Taku River Tlingit, other nations and environmental groups in British Columbia and Alaska have long voiced concerns about its environmental impacts, particularly on the Taku River’s salmon population. The mine was specifically mentioned in a letter this year from eight United States senators to British Columbia Premier John Horgan that voiced concerns about pollution from British Columbia mines flowing into the United States via transboundary rivers.

Two companies have tried to resurrect the Tulsequah Chief mine. The most recent, Chieftain Metals, acquired the property in 2010. As a condition of its mining permit, it agreed to address the site’s AMD issues. However, the costs of water treatment significantly exceeded the company’s estimates, so treatment facilities operated for only a few months in 2012. The company entered receivership in 2016.

After the government of British Columbia was not able to find a new buyer for the mine, it issued a request for proposals for its remediation in 2018. Earlier this year, it accepted proposals from two consulting firms, who are currently developing detailed remediation plans for the mine. The costs of Tulsequah Chief’s remediation—whatever they are—will be borne by British Columbia’s taxpayers.

(Sources: Cox, 2019; Hoekstra, 2018; Penner, 2017; O’Neal, 2016; Government of British Columbia, n.d.)
3.1 Financial assurance’s role as a policy tool

Financial assurance ensures that funds are available to pay for a mine’s remediation even if a company fails to honour its cleanup obligations. It backstops the liability rules that hold mining companies responsible for the costs of cleaning up their sites.

The fact that mining companies are liable for the costs of mine remediation in British Columbia does not guarantee that they will bear its costs. Mining companies are focused on maximizing their returns. They invest their capital in areas where it is likely to generate the largest profits. Setting aside funds for remediation has an opportunity cost—the funds could instead be used to invest in, for example, more-efficient production methods and technologies. As a result, a mining company will typically plan to pay for a mine’s remediation with the returns it earns in a project’s later, less capital-intensive phases (i.e., when the opportunity costs of capital are lower). But even where a mining company has every intention of completing remediation at a site, a commodity price downturn, higher-than-expected production costs, or a too-slow return on investment can cause it to go bankrupt and leave behind an unremediated mine site. Under Canadian bankruptcy and insolvency law, the compensation of a company’s creditors is limited by the size of its remaining assets; therefore, if the costs of remediation exceed a mining company’s remaining assets (and if another company does not take over the site), its bankruptcy can leave communities and taxpayers with a costly liability.

The possibility of mining company bankruptcy does not only create financial risks to the public. It can also lead to greater environmental damage from mining. When a mining company knows it will have to eventually clean-up a site, it has a clear economic incentive to reduce its eventual remediation costs by limiting environmental damage. But the possibility of bankruptcy distorts this incentive. Measures that would reduce a mine’s eventual remediation costs may not in fact benefit the company: if it goes bankrupt, these measures would benefit communities and taxpayers instead. This gap in mining company liability can make investments that reduce environmental risk less attractive than they would be otherwise. This can exacerbate environmental risk. When companies know there is a chance that someone else might pay for cleanup, they have less incentive to reduce the scale or severity of environmental damage. Economists call this problem “moral hazard.”

Financial assurance policies address moral hazard by plugging the liability gap that the possibility of bankruptcy creates. Requiring a mining company to allocate funds against the costs of remediation ensures that it will be the one to bear its costs, giving the company a strong economic incentive to limit environmental damage (Strand, 1994; Mackie, 2014; Faure, 2016). Requiring financial assurance against the costs of remediation can both protect British Columbians from costs and reduce environmental damage from mining.

Financial assurance requirements can be implemented by either British Columbia’s provincial government or by Indigenous nations themselves. Indigenous communities are often the ones who will directly deal with environmental harms from mining, and so have a strong interest in ensuring that mining is done responsibly. Indigenous nations can both reduce the risk of environmental harm and ensure that funds are available to pay for cleanup and compensation (should harm occur) by making financial assurance requirements a condition of their consent to mining projects. We discuss the role that Indigenous nations can play in implementing financial assurance requirements in Section 7.

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* In plain language, moral hazard essentially refers to the phenomenon of a person or company taking less care when they know that someone else will pay the cost should things go wrong.
3.2 Financial assurance and policymakers’ goals

Implementing financial assurance is complex in practice because policymakers have three different policy goals that they must balance:

1. **Deterrence**: Policymakers want to provide firms with an incentive to reduce risk to the environment, either by increasing the likelihood of environmental damage, its potential severity, or both.

2. **Compensation**: Policymakers want to ensure that if harm occurs, the responsible firm or an engaged third party bears the costs—rather than society.

3. **Economic activity**: Policymakers want to facilitate production and investment, so that society can benefit from the income and jobs that it generates.

The challenge is that policymakers’ goals can be in conflict. For example, exempting companies from financial assurance requirements when they have strong balance sheets and favourable compliance histories reduces their costs, which can help support economic activity. But it also undermines compensation, since even the most well-capitalized mining companies can go bankrupt (e.g., if there is a sustained commodity price downturn). In contrast, requiring mining companies to pay into an industry fund—as the State of Western Australia has done with its **Mining Rehabilitation Fund**—strongly supports compensation. But it also undermines deterrence: under such an arrangement, companies do not necessarily bear the cost of harm they cause. This can limit their incentive to reduce risk by creating moral hazard.

Of course, the three goals are not the only ones that policymakers might have. In British Columbia, the government also has respect for the UN Declaration and free, prior and informed consent (FPIC) as one of its goals, as illustrated by its recent tabling of the 2019 **Declaration on the Rights of Indigenous Peoples Act**. In this report, we focus on the three policy goals of deterrence, compensation and economic activity because they illustrate the tradeoffs inherent to different financial assurance policy choices. In practice, policymakers will have to balance both these and other goals.

As we discuss in the next sub-section, different financial assurance instruments present different trade-offs across the three goals. None is able to offer strong outcomes across all three.

3.3 Financial assurance types and their effects on goals

A wide range of financial assurance instruments exist. Asset collateral, cash deposits, bonds, insurance and industry funds are just a few examples. Financial assurance instruments can be broken down into five broad categories. Each category has different implications for the three policy goals of deterrence, compensation and economic activity. We discuss the categories in turn below.

1. **“Hard” assurance from firms**

Financial assurance is considered “hard” when firms put up assets that cannot fluctuate in value or suddenly become unavailable. Common types of hard assurance are cash deposits, securities and trusts. Hard assurance is typically held by government or in trust by a third party, and is used when a qualifying liability arises and the firm does not bear the cost. If no liability arises or if the firms bears the costs of its liability, the assurance is returned to the firm (Gerard, 2000; Boyd, 2001; Miller, 2009; Sassoon, 2009).

Box 2 provides a discussion of qualifying liabilities and compensation.

Hard assurance generally supports deterrence and compensation, but its high up-front cost to individual firms can reduce economic activity relative to other instruments.

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3 Western Australia’s **Mining Rehabilitation Fund** is a pooled fund designed to cover the rehabilitation of abandoned mines where the license holder or operator fails to meet their end-of-life obligations. Any firm with reclamation expenses exceeding $50,000 must contribute. The interest generated by the MRF covers its administration costs, with surplus directed toward the rehabilitation of legacy abandoned mine sites throughout the state. The target is to establish a fund of $500 million (Government of Western Australia, 2018).

4 The effects on policy goals that we highlight are ceteris parabus—all else being equal.
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Environmental damage can result in both market and non-market costs. Market environmental costs are measurable in dollar terms using observable data on market prices and quantities, while non-market ones are not. For example, a tailings spill risks contaminating local water bodies. This can reduce tourism and affect commercial fishing incomes (market environmental costs). At the same time, it can also affect recreational use of the water body, local biodiversity, and the food, social and ceremonial uses that are part of Indigenous nations’ cultural connection to lands and waters (non-market costs). While non-market environmental costs are not visible in the same way that market costs are, they nevertheless represent a real — and important — dimension of a harm’s total costs (Hallegatte & Pryzluski, 2010).

In the context of environmental risks from mining, the potential exists for significant non-market environmental, social, and cultural losses, especially given the possibility of irreversible ecosystem damage (e.g., species extinction) and irreversible impacts to an Indigenous nation’s culture and way of life. Therefore, the scope of compensation mechanisms’ coverage is a critical factor in mining sector financial assurance policy. However, in practice, the scope of covered harms tends to be fairly narrow.

In civil litigation, non-market environmental, social and cultural costs are often excluded from firms’ liability because they are difficult to identify, measure, or value monetarily, and because the results of their valuation can be contentious (Monti, 2002). Compensation under financial assurance systems tends to define liability similarly, focusing on directly attributable market costs (and in many cases, only those that fall to crown governments). However, financial assurance does not have to be constrained by the way firm liability is defined in civil courts. Indeed, a critical feature of financial assurance is that it can bypass the need for costly civil litigation (Shavell, 1986; Faure, 2014; Faure, 2016; Arnold, 2017).

Crown governments can set up compensation mechanisms that work in parallel to civil courts. These mechanisms can define the types of harms that are covered, and governments can make both financial assurance and participation in a given compensation mechanism a condition of mine licensing. In the event of harm, redress would be pursued through the compensation mechanism. Compensation would come directly from the responsible company in cases where it was still solvent or from the financial assurance held by government in cases where it was not.

**Box 2: The scope of compensation**

Environmental damage can result in both market and non-market costs. Market environmental costs are measurable in dollar terms using observable data on market prices and quantities, while non-market ones are not. For example, a tailings spill risks contaminating local water bodies. This can reduce tourism and affect commercial fishing incomes (market environmental costs). At the same time, it can also affect recreational use of the water body, local biodiversity, and the food, social and ceremonial uses that are part of Indigenous nations’ cultural connection to lands and waters (non-market costs). While non-market environmental costs are not visible in the same way that market costs are, they nevertheless represent a real — and important — dimension of a harm’s total costs (Hallegatte & Pryzluski, 2010).

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**Having an accessible, fair, and transparent and binding compensation mechanism helps financial assurance systems work better.** First, a strong compensation mechanism helps ensure that a harm’s total costs (i.e., whether market or non-market; environmental, social or cultural) are compensated. Second, it helps improve deterrence, since companies undertake more significant risk mitigation when the financial assurance they provide better reflects the full scope of costs that may arise (for this to hold, however, the scope of financial assurance requirements must be set in line with the scope of the harms covered by the compensation mechanism). Third, by providing clarity on companies’ potential liability for environmental harm (outcomes in civil litigation can, in contrast, be much more uncertain), a strong compensation mechanism helps companies make more informed investment decisions, which supports economic activity.
2. “Soft” assurance from firms

Financial assurance is considered “soft” when its ultimate value is to some degree uncertain. Common types of soft assurance are “self-assurance” (essentially, a pledge to bear the cost of future liabilities), parent company guarantees, and pledges of assets. Under soft assurance requirements, firms usually remain in possession of their capital or assets (Boyd, 2001; Sassoon, 2009; Gorton et al., 2010; Guzman, 2017).

By accepting soft assurance, governments are essentially accepting the strong financial standing, favourable reputation, or general good faith of a company in lieu of more concrete types of security. As such, a given company's financial situation will have important implications for the reliability of its soft assurance. It is therefore common for governments to monitor the financial health of companies that provide soft assurance.

Compared to hard assurance, soft assurance puts less constraints on firms’ capital, which helps support economic activity. However, since the assurance’s value can fluctuate, it also tends to pose a greater financial risk to the public. It also provides significantly weaker incentives for risk-reduction.

3. Third-party assurance

Third-party instruments involve the use of intermediaries; for example, a bank, an insurer, or a capital provider. In the event of a qualifying environmental harm, the third party bears its cost. In exchange for this coverage, the firm pays the third party a regular premium. Common types of third-party assurance include environmental insurance, surety bonds, and letters of credit. By pooling risk, third parties can help firms avoid firms incurring the larger, up-front costs of providing hard assurance.

Third-party coverage can have a disciplining effect on firms (e.g., when insurers require certain risk-mitigation measures as a condition of coverage). This is particularly the case where premiums are “risk-differentiated” (see Box 3 for more information). However, the use of third parties can also create moral hazard, since firms no longer directly bear the cost of their environmental damage. In addition, non-quantifiable or uncertain risks may make third party coverage unavailable (Boyd, 2001; Monti, 2002; UNEP, 2003; Munchmeyer et al., 2009; Gorton et al., 2010; Ben-Shahar & Logue, 2012; Gorey et al., 2014; Boomhower, 2014; Arnold, 2017).

Third-party coverage can help support policymakers’ compensation goals, especially when third parties are large and well-capitalized. And it can also support economic activity by keeping firm costs low. However, the moral hazard that it creates can lead to lesser deterrence than hard, firm-level requirements.

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5 The definition of a qualifying environmental harm and the scope of damages that are compensated for in the event of one are critical design components of any financial assurance mechanism. However, they can be particularly critical in third-party assurance, since third parties have a strong economic incentive to reduce the risk and extent of their potential liability.
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Box 3: Risk differentiation - Making financial assurance work better by making it fair

Premiums collected from firms are ‘risk-differentiated’ when they reflect the actual level of risk posed by an operation: Operations that pose a high level of risk pay more, while low-risk operations pay less. Risk-differentiated premiums ideally reflect all relevant risks—whether environmental, financial, or technological.

Risk-differentiation supports deterrence. Projects with lower risk end up with a financial advantage. This creates a powerful economic incentive for firms to not only select lower-risk projects, but also to innovate and find new ways of reducing proposed projects’ environmental risk. These incentives also extend to existing projects, since when firms can demonstrably reduce risk, they will stand to reduce their expenditure on financial assurance.

Importantly, risk-differentiation is also fair to companies. Collecting premiums equally or based on production levels effectively asks low-risk operations to subsidize high-risk ones, which is unfair to low-risk operators. Collecting premiums based on risk is fair because it ensures that firms bear the cost of environmental damage in proportion to how much they contribute to the risk of it.

Administrators need to effectively monitor risk for risk-differentiation to be effective. Operational-level risk information may in some cases be costly to collect, so administrators need to be careful to ensure that the benefits of risk-differentiation outweigh the cost. Where the cost of collecting this information (or keeping it up-to-date) is too high, administrators can instead use proxies for risk; for example, collecting higher premiums when companies plan to use risky production technologies or tailings storage methods, fail to adhere to a voluntary safety standard, or have a record of non-compliance.

4. Sector-level assurance

Under sector-level assurance, firms in a sector collectively assure against their environmental risks. Common types of sector-level assurance are industry funds or mutual insurance. These instruments typically operate similarly to third-party assurance, collecting regular premiums in exchange for coverage. They leverage the sector’s expertise in its own risks, and can in some cases provide coverage where third-party coverage is not available, or only available at a high cost (Freeman & Kunreuther, 1997; Bennett, 1999; Faure, 2002; Smith, 2012; Dana & Wiseman, 2015).

Third-party assurance schemes share many of the features of third-party coverage in terms of their impact on policy goals. Pooling risk supports compensation and economic activity. But due to the effect of moral hazard, it does so at the expense of stronger deterrence (and thereby, causes greater risk to communities and the environment).
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5. Public assurance

Public assurance operates similarly to third-party and sector-level assurance schemes, with regular premiums collected in exchange for coverage. The key distinction is that under public assurance, the scheme is government-run. In addition, public instruments might pool risk not only across firms in a particular sector, but across entire sectors. Public assurance schemes tend to play a role in cases where neither third parties nor the sector as a whole is able to provide cost-effective coverage, usually due to non-quantifiable risks or the potential for catastrophic costs (Freeman & Kunreuther, 1997; Katzman, 1998; Nguyen, 2013).

Like third-party and sector-level assurance, public assurance instruments collect risk-weighted contributions from firms in exchange for coverage, so their effect on policy goals tends to be similar.

Summarizing instruments’ effect on policy goals

Table 1 provides an overview of the five categories of financial assurance instruments and their effect on the three policy goals. As seen in the figure, each instrument strikes a different balance across policy goals, with none able to deliver strong outcomes across all three.

Table 1: The five types of financial assurance and their effect on policy goals

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Instruments</th>
<th>Effect on policy goals</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reducing risk (deterrence)</td>
</tr>
<tr>
<td>Hard financial assurance from firms</td>
<td>Firms provide assurance that cannot fluctuate in value and is readily available. The assurance is held in trust until the risk subsides.</td>
<td>• Cash</td>
<td>Strong</td>
</tr>
<tr>
<td>Soft financial assurance from firms</td>
<td>Firms agree to cover the cost of a potential harm but retain possession of their assets.</td>
<td>• Self-assurance</td>
<td>Weak</td>
</tr>
<tr>
<td>Third-party assurance</td>
<td>In the event of a qualifying environmental harm, a third party like a bank or insurer covers the cost. In exchange for this coverage, the firm pays a regular premium.</td>
<td>• Bonds</td>
<td>Limited</td>
</tr>
<tr>
<td>Sector-level assurance</td>
<td>All firms in a sector collectively provide coverage. Individual firms pay a regular premium in exchange.</td>
<td>• Industry funds</td>
<td>Limited</td>
</tr>
<tr>
<td>Public assurance</td>
<td>A publicly-administered instrument provides firms with coverage in exchange for a regular premium.</td>
<td>• Public funds</td>
<td>Limited</td>
</tr>
</tbody>
</table>

Source: Canada’s Ecofiscal Commission, 2018
4. British Columbia’s current policy approach

In British Columbia, the Chief Inspector of Mines (whose office is part of the Ministry of Energy, Mines and Petroleum Resources (MEMPR)) has broad authority over financial assurance requirements in the mining sector. The Inspector can require assurance against the direct cost of mine remediation, as well as indirect costs associated with long-term monitoring, perpetual care, and the protection of watercourses or cultural heritage resources. The form of this financial assurance can vary at the Inspector’s discretion; commonly accepted types include cash deposits, surety bonds, letters of credit, and firm collateral (e.g., mining equipment) (AGBC, 2016; Stantec, 2016; Government of British Columbia, 2018; E&Y, 2017).

In practice, the stringency of financial assurance requirements for mine remediation in British Columbia is often limited. The mining sector’s posted financial security is a fraction of its aggregate expected remediation costs: According to the most recent figures, the province holds only $1.36 billion in financial assurance against an estimated $2.79 billion total cleanup liability (MEMPR, 2017). This $1.43 billion gap between estimated costs and total security held is largely due to the province’s practice of phasing-in financial assurance requirements over a mine’s life. This phase-in is called for under the province’s Mines Act (Government of British Columbia, 1996).

While this approach helps keep costs low during mines’ early and mid-life and can help facilitate economic activity, it also carries significant financial and environmental risks. By phasing-in requirements, the province is effectively accepting a mine’s reserves as a form of soft assurance. The thinking is that, should a mine’s owner go out of business in the mine’s early- or mid-operating life, the mine’s remaining reserves will attract a new owner that will use part of the returns it generates to fund the site’s eventual remediation.

The Tulsequah Chief mine, which we discuss in Box 1, exemplifies the risks of phased-in financial assurance. If a mine proves too expensive to operate, if its remaining reserves are of too-poor quality, or if commodity prices make it economically unviable, a new owner may not be able to generate sufficient returns to fund remediation—if a new owner emerges at all. In such cases, the unremediated mine site will become a public liability, as occurred with Tulsequah Chief.

British Columbia’s current approach allows mining companies’ environmental and financial costs to be transferred to the public. For example, in the event a mine is not remediated by its owner, affected Indigenous nations may not have access to the funds necessary to complete the mine’s remediation. This undermines policymakers’ compensation goal, since the costs of environmental damage can end up being borne by these nations, rather than the private companies that caused them. And it undermines policymakers’ deterrence goal, since, by creating moral hazard, it reduces mining companies’ economic incentive to limit environmental damage at mine sites.

In its 2016 Audit of Compliance and Enforcement of the Mining Sector, the Auditor General of British Columbia found serious deficiencies in the provincial government’s policy approach for dealing with the risk of mine non-remediation. It concluded that the government’s approach to financial assurance requirements in the mining sector was leaving British Columbians exposed to significant financial and environmental risks (AGBC, 2016).

In response to the Auditor General’s report, MEMPR and the Chief Inspector of Mines have undertaken a review of the province’s financial assurance policies for mine remediation. In 2016, the government commissioned a report by Stantec Consulting studying how other jurisdictions approach the issue. And in 2017, it commissioned a report by Ernst & Young that recommended policy changes. The government is expected to release its new financial assurance policy for mine remediation later this year.

6 This and other aspects of how mining sector financial assurance is governed in British Columbia may be changing. See Government of British Columbia (2019) for more information.
7 These figures capture the combined estimated costs of mines’ remediation and reclamation.
8 To be clear, the Act also states that the Chief Inspector can impose security requirements in whatever way is deemed necessary (i.e., the Act does not require financial assurance requirements to be phased-in).
9 We should not that in advance of this review, MEMPR was already working to narrow the gap between total estimated cleanup costs and the financial security it holds. Over the last decade, the Ministry has more than quintupled the amount of financial assurance it holds and is expected to collect an additional $400 million over the next six years (E&Y, 2017).
The type of policy change MEMPR and the Chief Inspector of Mines will decide on is still uncertain. However, should it elect to pursue an approach in line with Ernst & Young’s recommendations, many of the problems we identify above will remain.

The Ernst & Young report focuses on ways to improve the province’s existing “risk-based” system. It recommends formalizing the ad-hoc processes under which financial assurance requirements are currently determined. And it recommends setting requirements based on a mine’s life stage and its owner’s financial strength and compliance history. Figure 5 provides an overview of the improved risk-based approach that the report recommends.

* Other non-security assurance and policy considerations that could reduce liability, risk or uncertainty, for example performance/corporate guarantees, insurance policies, significant expenditures such as research and development and capital investments.

* Source: E&Y, 2017

While implementing a more formalized and rigorous version of British Columbia’s current system would represent a step forward, it would not fundamentally resolve the problems associated with the province’s current approach. The risk of costs falling to taxpayers, while better-managed, would remain. Moreover, this possibility would create moral hazard, which exacerbates environmental risks.

Under the approach that Ernst & Young recommends, British Columbia communities and taxpayers would remain exposed to significant risk. The costs of this exposure could potentially be massive. If, for example, a commodity price downturn led to a wave of mine abandonment in the sector, British Columbians could be left with a toxic environmental legacy whose cleanup cost ran in the hundreds of millions of dollars.

To effectively address the environmental and financial risks of non-remediation, British Columbia will need to take a fundamentally new approach to mining sector financial assurance. In the next section, we discuss a policy approach that would more effectively address the issues flagged by the province’s Auditor General.
5. Requiring hard financial assurance in-full and up-front

British Columbia can address the risks of mine non-remediation by requiring “hard” types of financial assurance both in-full and up-front from mining companies. In this section, we discuss the key elements of this kind of policy approach. We examine two prominent mining jurisdictions—Alaska and Québec—that have implemented it. And we discuss the implications such an approach can have for the three policy goals of deterrence, compensation and economic activity.

Such an approach has three critical features. We discuss each in turn.

First, requiring hard financial assurance means only accepting security that cannot fluctuate in value or suddenly become unavailable. This can include cash deposits or investment-grade securities (e.g., government bonds) provided by mining companies themselves. Or it can include insurance, surety bonds or letters of credit provided by reliable third parties. When assurance is “hard,” there is little to no risk that changing market conditions will affect its value. This makes it a more secure and reliable type of financial assurance. Governments, communities and taxpayers can be confident that funds will be available if and when they are needed to cover the costs of a mine’s cleanup.

Second, requiring financial assurance in-full means setting requirements in line with a mine’s total estimated cleanup costs. This is contrasted with, for example, Québec’s policy prior to its 2013 reforms (which we detail below), where the province required mines to post only 70% of a mine’s estimated cleanup cost (MER, 1997). While such an approach helps reduces mining companies’ costs (which helps facilitate production and investment), it also leaves the public exposed to risks since it is virtually guaranteed to absorb costs in the event that a company with an active operation goes bankrupt.

Third, requiring financial assurance up-front means collecting it early in a mine’s operating life. This type of requirement has a strong and a weak version. The strong version sets financial assurance requirements in line with the cost of remediating the eventual, planned disturbance at a mine site. The weak version sets requirements in line with the cost of remediating existing disturbance. Both versions are contrasted with phased-in financial assurance requirements that do not catch up with the cost of remediating disturbance at a mine—planned or existing—until later in a mine’s operating life.

In the following two sub-sections, we explore Alaska and Québec as two jurisdictions that require hard financial assurance in-full and up-front from mining companies.

5.1 Case study #1: Alaska

In Alaska, companies are only permitted to post hard financial assurance against the costs of mine remediation. Accepted instruments include cash deposits; surety bonds; insurance letters of credit; certificates of deposit (i.e., a bank deposit pledged to the government); U.S. Treasury bills, notes, or bonds; and investment-grade securities (i.e., having a AAA or AA designation from a ratings agency). No soft types of assurance (for example, corporate guarantees or equipment collateral) are accepted (BLM, 2014).

The state also has a publicly-run bond pool which allows operators to obtain coverage who would otherwise be unable to access third-party-provided financial assurance (for example, due to financial difficulties). Contributions to the fund are based on the area of land disturbed by a mine. Should a participant be unable to meet its remediation obligations, the pool covers the costs of the site’s remediation (ADNR & BLM, 2003; Kuipers & Carlson, 2000).11

10 Our report focuses on mine remediation because of its implications for environmental risks and costs. However, truly “in-full” financial assurance requirements would include not only the costs of mines’ remediation but also their reclamation.

11 The fact that the bond pool guarantees coverage makes it a “hard” type of assurance. However, if the funds held in the pool are insufficient to cover costs, the U.S. federal government provides backstop coverage. This design feature softens the coverage that the instrument effectively provides (compared to, for example, the industry as a whole providing the backstop coverage).
Alaska requires that financial assurance be provided in-full against a mine’s cleanup costs. The state’s policy is that financial assurance should at no time be less than the amount required for the state to complete reclamation, and that the amount required should be increased if the event the assurance is found to be inadequate (Fredericksen, 2011).

However, while Alaska’s stated policy is to require financial assurance in-full, shortcomings in the implementation of this policy can nevertheless put financial assurance out of line with actual mine cleanup costs. Some commentators have highlighted that methods accepted by the state for costing out mine remediation plans systematically underestimate the costs of cleanup; for example, by omitting certain types of indirect costs, by calculating costs on the basis of what they would cost the company rather than an external contractor, and by not adjusting for the additional risks posed by operations that employ cyanide leaching or other toxic chemicals (Chambers, 2005; Kuipers, 2003; Kuipers & Carlson, 2000). The state has since addressed some of these shortcomings (for example, by calculating costs on the assumption that external contractors are performing them) and in 2015 commissioned a comprehensive analysis of how it can reform its policy to overcome other shortcomings (DOWL HKM, 2015; Fredericksen, 2011). Still, these implementation complexities highlight the importance of getting the details of financial assurance right—a topic we return to in Section 5.

Mining operations in Alaska are required to provide financial assurance against the cost of remediation up-front, but in its weaker form—that is, requirements are set in line with existing disturbance at a site rather than planned eventual disturbance. This philosophy of setting requirements in line with cleanup liability as it presently exists also extends more broadly: As we detail in Box 4, the government also reduces financial assurance requirements when mines are progressively reclaimed during their operating life (BLM, 2014; Fredericksen, 2011).

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12 Specifically, planned site disturbance can be separated into discrete blocks or phases. Financial assurance must be provided before the disturbance associated with a given block commences; but companies do not have to assure against subsequent blocks or phases until they are set to begin.
Alaska encourages mining companies to conduct ongoing cleanup at their mine sites. If companies can demonstrate that parts of their site have been remediated and reclaimed to the state’s standards (i.e., that the site has been “progressively reclaimed”), the state will adjust their financial assurance requirements accordingly. The state will also “roll over” financial assurance by allowing bonds or other financial assurance associated with recently-reclaimed parts of the site to be applied to parts about to be disturbed (BLM, 2014; Fredericksen, 2011).

**Encouraging progressive reclamation using financial assurance requirements delivers on all three of policy makers’ goals:**

- **It supports economic activity.** Companies can reduce their total bonding requirements by undertaking progressive reclamation. This frees up more capital to be invested in production and investment or drives larger returns.
- **It supports compensation.** Because requirements correspond with a site’s actual remediation and reclamation needs, the public does not stand to incur costs in the event that the mining company goes bankrupt (critically, however, this requires proper cost estimation on the part of regulators, ongoing site maintenance to ensure that costs have not risen, and timely adjustment to financial assurance requirements when they have).
- **It supports deterrence.** Adjusting financial assurance requirements when mines are progressively reclaimed gives companies an incentive to structure their operations in a way that minimizes the amount of site disturbance (and thereby, environmental risk) that exists at any given time.

Alaska is not the only jurisdiction to encourage progressive reclamation for these reasons. Neighbouring Yukon has a similar policy (Canada’s Ecofiscal Commission, 2018).

### 5.2 Case study #2: Québec

In 2013, Québec overhauled its *Mining Act* in response to recommendations from the province’s Auditor General. Part of this reform included substantial changes to how the province approaches mining-sector financial assurance. Québec now strictly requires hard types of assurance. And it requires it in-full within two years of a mine commencing operations. These design features give Québec the most stringent mining sector financial assurance regime in Canada (Amyot et al., 2013; Canada’s Ecofiscal Commission, 2017; Gouvernement du Québec, 2016; 2017a; AGQ, 2019).

Québec’s Ministère de l’Énergie et des Ressources naturelles (MERN) accept only hard types of assurance from mining companies. Acceptable instruments include cheques, government guaranteed securities, investment certificates, surety bonds, letters of credit, immovable hypothecs (i.e., a right on immovable property), environmental trusts, and insurance. Discretion is left to MERN as to which of these it accepts from any operation (Gouvernement du Québec, 2017b).
Assurance in Québec is required in-full. This is in contrast to Québec’s pre-2013 policy, which set financial assurance requirements at 70% of a site’s remediation costs. All companies receive the same treatment; no adjustments are made for companies that are well-capitalized or strongly rated by ratings agencies (as is the practice in some other jurisdictions; for example, Ontario).\(^\text{13}\)

The province also makes a significant effort to ensure that financial assurance requirements are calibrated to properly reflect a site's actual remediation and reclamation costs. Collaboration occurs between MERN and province's environment ministry, the Ministère du développement durable, de l'environnement et de la lutte contre les changements climatiques (MDDELCC), to ensure that mines' remediation and reclamation plans and cost estimates accurately reflect the full scale and significance of their expected environmental impacts. This greater ministerial collaboration was a step recommended by the Auditor General and was part of the 2013 overhaul of the Mining Act (Gouvernement du Québec, 2017a; AGQ, 2009).

Mining companies in Québec are required to provide financial assurance up-front. Prior to the province’s 2013 reforms, timelines were more relaxed. Now, companies must assure against 50% of their estimated reclamation costs within 90 days of MERN approving their closure plans. The remaining 50% is due in two installments over the following two years (Gouvernement du Québec, 2017b).

5.3 Implications of this approach for policymakers’ goals

Québec and Alaska’s experience demonstrate that stringent financial assurance policy and a thriving mining sector are not at odds. Requiring hard financial assurance from mining companies in-full and up-front, as both Québec and Alaska do, can help policymakers deliver on their policy goals. Such an approach strongly supports deterrence and compensation. And despite the fact that this kind of stringent policy approach raises costs, it does not appear to have come at a large economic activity trade-off in either jurisdiction. We discuss this approach’s effect on policymakers’ three goals in turn below.

Requiring hard financial assurance in-full and up-front provides strong deterrence. Companies that provide the assurance directly have a strong financial incentive to undertake and complete remediation (i.e., in order to get their capital, which is held in trust, back). And those that assure using third parties (e.g., by using insurance or letters of credit) also have significant deterrence incentives. While deterrence is stronger when firms provide assurance directly, third party instruments can strengthen the deterrence they provide by offering lower premiums whenever companies demonstrably reduce financial or environmental risk at their operations (see Box 3 for more on the importance of “risk-differentiated” premiums).\(^\text{14}\)

This type of policy approach also provides strong support for compensation. First, hard assurance cannot fluctuate in value or suddenly become unavailable. Second, requiring assurance in-full ensures that government will have enough funds on hand to complete remediation if the company is unable to (however, requirements must be well-calibrated and well-enforced for this to hold). Third, requiring assurance up-front safeguards against the risk of companies leaving behind a costly liability for the public in the event they are bankrupted early in a mine’s life.

\(^\text{13}\) Ontario takes a two-track approach to financial assurance. Firms that can pass a corporate financial test (based on the assessments of ratings agencies) are permitted to self-assure against the costs of reclamation. Firms that cannot face more stringent requirements: they are asked to provide full, hard, and timely financial assurance. At the time of writing, no mining companies operating in Ontario qualify for the less-stringent financial assurance treatment.

\(^\text{14}\) Accepting both firm-level and third-party types of hard assurance provides greater compliance flexibility for firms. This can help reduce their costs and support policymakers’ economic activity goal.
While this approach’s stringent requirements do not support economic activity per se (i.e., since they raise companies’ compliance costs), they do not appear to have had a significant impact on mining production or investment in the two jurisdiction we examine. According to the Fraser Institute’s 2018 annual survey of mining companies, both Alaska and Québec rank among the most attractive jurisdictions for mining investment in the world: Alaska ranks fifth out of 83 domestic and international jurisdictions (the second-highest rank among U.S. states), while Québec ranks fourth (the second-highest in Canada, after Saskatchewan). Moreover, Québec’s 2013 policy reforms do not appear to have hurt its ranking, since the province has ranked in the top ten for eight of the last ten years (Stedman & Green, 2018).

The stringency of Québec’s system also does not appear to have put the province at a competitive disadvantage. Investment in the province’s mining sector remains strong relative to other provinces, as seen in Figure 4. Indeed, since 2015—just two years after its policy reforms—the province has led the country in mining sector investment growth.

Figure 7: Evolution of mining investment, main Canadian mining jurisdictions, 2000-2019

(Source: Institut de la statistique Québec, 2019)
Using financial assurance to reduce the risk of mine non-remediation

6. Critical design details

When it comes to implementing meaningful financial assurance policy, the devil is in the details. In this section, we examine two financial assurance design features that are critically important: the treatment of risk and the treatment of perpetual costs. We also inventory other design details that can be significant. As British Columbia moves to strengthen its financial assurance regime, these details should be primary considerations for both the provincial government and for Indigenous nations seeking to understand the adequacy of the province’s financial assurance requirements.

6.1 The treatment of risk

As we discuss above in the context of Alaska’s policy approach, the way in which financial assurance is calibrated can have important implications for the adequacy of the protection it provides. A number of design details have implications here. But the treatment of risk can be particularly important.

In setting financial assurance requirements, governments commonly rely on point estimates of the cost of completing remediation and reclamation plans, rather than using a distribution for potential costs. This effectively assumes that mines’ remediation and reclamation will go according to the plans approved by regulators. But in practice, a site’s eventual remediation and reclamation needs can commonly diverge from what is laid out in these plans. For example, total disturbance at a site can exceed planned amounts, or contamination can prove more extensive or complex to remove than originally anticipated. While regular site monitoring and updating of financial assurance requirements can help address these kinds of issues, it cannot fundamentally resolve them. Failing to account for risk when setting financial assurance requirements can lead to systematic underestimation of costs and significant financial and environmental liabilities falling to affected communities and the public.

The risk of creating AMD provides an important example. Few modern mining operations would intend to create AMD as part of their operations, so dealing with it may therefore not feature in a site’s remediation plan. But the risk of creating AMD can nevertheless remain. If financial assurance requirements are not calibrated to reflect this risk, the public can end up absorbing significant costs in the event AMD gets created and the responsible company cannot bear the costs of its treatment.

This is happening right now in British Columbia with the Britannia Mine. The closed mine located 50 kilometres north of Vancouver operated from the early 1900s to 1974 and was, for a time, the largest copper producer in the British Commonwealth. Surface and groundwater at the site are highly acidified as a result of mining operations. Between the mine’s closure in 1974 and the construction of a water treatment plant in 2005, the mine discharged billions of litres of AMD and several tonnes of metals into Howe Sound, with significant impacts on fish mortality and soil and water quality. Water treatment at the site has since helped improve local environmental outcomes. However, operation of the treatment plant (pictured in Figure 5) will cost British Columbia taxpayers $3 million per year in perpetuity (i.e., forever) (Barry et al., 2000; Wilson et al., 2005; Solomon, 2009; CNSC, 2015; Government of British Columbia, 2017).

Figure 8: Britannia Acid Mine Water Treatment Plant
Source: Stantec

We discuss some of these other design details below. The methodologies that governments accept for the costing out of remediation and reclamation plans, for example, can have important implications for whether costs are underestimated or not, and, thereby, whether financial assurance requirements for a mine are adequate.

15 Of course, measures to mitigate the risk of creating AMD will often feature prominently in plans for a mine and in regulators’ requirements. But where these risk-mitigation measures are deemed adequate, the costs of dealing with AMD may not be reflected in the mine’s financial assurance requirements.

16 In 2001, the province accepted a $30 million settlement from the company that absolved the owners from any future liability. However, this settlement covered only a small portion of the $76 million Britannia Mine Remediation Project, to say nothing of its long-term water treatment costs.
6.2 The treatment of perpetual costs

The treatment of perpetual costs in financial assurance requirements is another critical design detail. Perpetual costs for water treatment are not uncommon: over 10% of British Columbia's mines have or will likely require long-term or perpetual treatment (AGBC, 2016). Perpetual costs also arise in the monitoring and maintenance of historic, in-development and producing mines that have tailings dams, impounded mine water, or metal waste. There are more than 1,800 metal and coal mines in British Columbia that are no longer in operation. Approximately 1,200 or fully two-thirds of these mines identified by the British Columbia government have the potential for AMD (Barrazuol & Stewart, 2003).

Financial assurance requirements for perpetual care are typically calibrated by estimating a site's annual care expenses (e.g., operating a water treatment facility or conducting on-site monitoring) and applying a “discount rate” to these future cash flows. A discount rate acts as a reverse interest rate, discounting future financial flows to produce an estimated present value for them.

The choice of discount rate has important implications for the adequacy of financial assurance requirements that deal with long-term care. For example, using a 3% discount rate effectively assumes that the security can be held in an interest-bearing account or investment vehicle that will generate annual real (i.e., post-inflation) returns in excess of 3% forever. This assumption carries significant risk: Returns on investment decades into the future—let alone centuries—are highly uncertain. If the returns on collected security proves insufficient and the company is no longer active, taxpayers will bear significant long-term costs. Failing to properly calibrate financial assurance requirements for perpetual care can create a costly legacy for future generations of British Columbians.

Table 2 provides an inventory of a number of other policy design features and choices that can have important implications for the adequacy of a jurisdiction’s financial assurance requirements.

<table>
<thead>
<tr>
<th>Design feature</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorities and governance</td>
<td>Where the authority for setting financial assurance requirements resides has important implications for how it is implemented and administered. Mining ministries that are mandated to encourage mining investment may be more likely to accept weaker forms of assurance or grant exemptions than when they share the responsibility for collecting financial assurance with environment ministries or when the authority rests independently.</td>
</tr>
<tr>
<td>Financial assurance scope</td>
<td>The types of environmental harms and risks that financial assurance is meant to cover is an important determinant of its stringency and ultimate effect on policy goals. Does assurance cover on-site damages only? If off-site damage is also covered, are only clean-up costs in-scope? What about effects on local livelihoods or non-remediable damages?</td>
</tr>
<tr>
<td>Liability and risk estimation</td>
<td>The methods used to determine the scale of the potential liability and the degree of risk can strongly influence how much financial assurance is required and what its effect is. For example, are clean-up costs estimated on the assumption they will be undertaken by a third party or by the company itself? What assumptions are made about remediation technologies and their costs? Is any third-party auditing and verification undertaken?</td>
</tr>
<tr>
<td>Underlying standards</td>
<td>The standards for remediation of environmental damages affect the amount of financial assurance required, and thereby, its effects. For example, is the standard simply that dangerous contaminants are removed? Does the land need to be returned to a state similar to what it was in prior to mining? Or does it simply need to be re-vegetated?</td>
</tr>
<tr>
<td>Monitoring and enforcement</td>
<td>The degree to which financial assurance requirements are backstopped with strong monitoring and enforcement will strongly influence how effective they are. For example, how frequently are operations monitored to ensure that their remediation plans reflect the site’s actual eventual needs? How is the ongoing reliability of financial assurance determined? Are the penalties for non-compliance on either of these fronts? How stringent are they?</td>
</tr>
<tr>
<td>Transparency</td>
<td>Stakeholders and third parties should be able to make their own assessments of the environmental and financial risks that mining operations pose. Poor transparency can undermine public confidence as well as miss opportunities for valuable external input. In particular, remediation and reclamation plans, liability estimation methods and assumptions, estimated remediation and reclamation costs, and the type and amount of financial assurance held by governments for particular mining operations should be public.</td>
</tr>
</tbody>
</table>
7. Recommendations

Based on the analysis presented in this report, we make one main recommendation and two supporting recommendations to British Columbia’s provincial government. We similarly make one main recommendation and three supporting recommendations to British Columbia’s Indigenous nations.

7.1 Recommendations to British Columbia’s provincial government

MAIN RECOMMENDATION:

Require hard financial assurance against the costs of mine remediation both in-full and up-front

To adequately protect communities and the public from the financial and environmental risks of non-remediation and respond to the issues raised by the province’s Auditor General, the British Columbia government should require—backed up by legislation—hard financial assurance against the cost of mine remediation both in-full and up-front. Strictly accepting hard types of assurance avoids security falling in value before it is needed. And requiring the assurance in-full and up-front ensures that there are sufficient funds to cover remediation even if an operator goes bankrupt early in a mine’s life.

The province should implement financial assurance policy in line with what Québec implemented as part of its 2013 mining sector reforms. Policy experience in both Alaska and Québec demonstrate that this type of stringent policy approach is not at odds with a thriving mining sector.

British Columbia’s Indigenous nations will increasingly make these kinds of requirements a condition of their consent to mining projects. Implementing them in provincial legislation would therefore not only improve outcomes in the mining sector and ensure a consistent and predictable investment environment for mining companies, it would also be an important part of bringing the province’s laws in line with the UN Declaration.

SUPPORTING RECOMMENDATIONS:

1. Add contingencies to financial assurance requirements that account for the risk of remediation costs exceeding official estimates

Recognizing that remediation and reclamation costs can exceed what is laid out in companies’ approved plans for mine closure, British Columbia should add contingencies to financial assurance requirements when there is a material risk of costs exceeding official estimates. Saskatchewan, for example, addresses the risk of unforeseen events by applying a contingency of 10-20% to estimates of a mine site’s future monitoring and maintenance costs (NOAMI, 2010).

Critically, contingencies do not have to cover the full costs of potential worst-case scenarios in order to improve policy outcomes. When there is a risk of, for example, AMD being created at a mine site, requiring financial assurance against the full costs of dealing with it may not be appropriate. Policymakers can instead adjust their financial assurance requirements upward to a degree that corresponds to the mine’s unique risk of creating AMD. While doing so will not protect the public from the full costs of dealing with AMD, it can provide better compensation in the event it gets created. More importantly, doing so provides valuable deterrence. It strengthens the economic incentive companies have to reduce the chance of their creating AMD by, for example, better managing risks, coming up with alternative mine designs or production plans, or putting forward altogether different projects.
2. When setting financial assurance requirements for perpetual care, use a discount rate that minimizes financial risks for taxpayers

When monitoring, maintenance or treatment costs are expected to extend into perpetuity, British Columbia policymakers should use a very conservative discount rate in their calibration of financial assurance requirements. While the Treasury Board of Canada Secretariat’s Canadian Cost-Benefit Analysis Guide recommends a 3% discount rate for use in public-policy decision-making, this rate is not necessarily appropriate in a context where costs are certain and can extend hundreds or even thousands of years into the future (Treasury Board of Canada Secretariat, 2007). In fact, the Treasury Board does not address costs for an infinite period of time.

Using a lower discount rate would better protect future generations of British Columbians, since returns on the financial assurance that governments hold would not have to be as high in order to adequately cover costs. Given that returns on future investment returns are so uncertain over the long-term, British Columbia should make conservative assumptions about the future rate of return by adopting a low discount rate in its calibration of financial assurance requirements.

7.2 Recommendations to British Columbia Indigenous nations

MAIN RECOMMENDATION:

If the British Columbia provincial government does not implement the above recommendations, Indigenous nations should require in-full and up-front financial assurance as a condition of their consent to mining projects

If the British Columbia government implements less-stringent financial assurance policy than what we describe in our main recommendation to the provincial government, British Columbia’s Indigenous nations should require stringent financial assurance as a condition of their consent to mining projects that occur on their lands (we discuss available mechanisms for doing so in the supporting recommendations below). Making such requirements a condition of their consent would be fully in line with their rights as articulated in the UN Declaration.

Indigenous nations should demand that mining companies provide hard financial assurance against the cost of remediation in-full and up-front, as is done in Québec. They can do so either in parallel to the requirements that the Chief Inspector of Mines imposes or by building on these requirements (e.g., by having the company agree to provide more assurance to the Chief Inspector than what is officially required). In cases where the assurance is required in parallel, it should be held in trust by a third party. And it should top-up—rather than duplicate—assurance required by the Chief Inspector.

SUPPORTING RECOMMENDATIONS:

1. Build Indigenous communities’ capacity on financial assurance issues

Indigenous nations should build their capacity to understand, negotiate and implement financial assurance requirements. On numerous aspects of mine development, Indigenous communities are at a disadvantage when dealing with government, the mine proponent and even the consultants they must engage. This disadvantage applies even more so to remediation financial assurance. When mines are proposed on their lands, it is paramount that Indigenous governments and peoples have sufficient capacity and resources to engage in a manner that allows them to provide their consent in the manner articulated by the UN Declaration.

2. Include financial assurance requirements in impact benefit agreements (IBAs) with mining companies

Indigenous nations looking to implement their own financial assurance requirements against the risk of mine non-remediation should pursue including them in the scope of impact benefit agreements. Impact benefit agreements (IBAs) between mining companies and impacted Indigenous nations are standard practice in the mining sector. Ensuring that funds are available to cover the costs of remediation regardless of whether the operator goes bankrupt is a key safeguard for Indigenous nations and should—in the event financial assurance requirements from the province are inadequate—be a foundational element in the IBAs Indigenous nations negotiate with mining companies in British Columbia.
3. Pursue financial assurance requirements through the frameworks that may be enabled by the province's pending UN Declaration legislation

In its 2019 throne speech, the government of British Columbia said that it will implement the UN Declaration through legislation and bring provincial laws and policies into harmony with it (Curpen et al., 2019). At the date of release of this report, UN Declaration enabling legislation has been introduced in the provincial legislature. This legislation and action plans and engagement processes that will implement it will provide British Columbia's Indigenous nations with a potential opportunity to make financial assurance requirements a core feature of their free, prior and informed consent to mining projects. If the government of British Columbia does not require adequate financial assurance against the costs of mine remediation, Indigenous nations may be able to use the province's UN Declaration legislation as a vehicle for doing so themselves.

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Whatever course the government of British Columbia takes in its reform of mining sector financial assurance, it must deliver a balance across the three policy goals that makes sense for all British Columbians. But in doing so, it must also closely consider the views and priorities of the province's Indigenous nations. The government's own commitments demand it.
References


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