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IGF CASE STUDY

Regulatory Continuous Improvement:

Lessons from British Columbia's new
statutory audit function's application to
mine tailings facilities

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INTRODUCTION

Mining is a significant economic contributor to the Canadian province of British Columbia (BC), with a forecasted 2021 mineral production value of over CAD 10 billion, exploration expenditures of CAD 660 million, and direct employment of over 30,000 people. These valuable economic contributions come with the potential for environmental and social impacts that must be managed with agility and care as we plan for and manage mining in BC. [The Ministry of Energy, Mines and Low Carbon Innovation](#) (the Ministry) is the provincial agency with primary responsibility for oversight of mining activities under the [Mines Act](#) and the [Health, Safety and Reclamation Code for Mines in British Columbia](#) (the Code).

The approach to mining oversight has changed over time with the evolution of mining technologies and practices, along with the public's increasing awareness of and concerns about the environment, the health and well-being of workers and community members, and Indigenous reconciliation. Like other modern mining regulators, the Ministry has a responsibility to maintain a current and comprehensive understanding of these issues in supporting a safe and environmentally responsible industry, as it works to address the need for competitiveness on the global stage. This

important balance is challenging, and it has informed changes to regulatory oversight made by the Ministry since 2016.

We live in a complex world and face an ever-escalating pace in the emergence of new knowledge and technologies. Decision making in mining must factor in a multitude of evolving influences, such as implementing the UN Declaration on the Rights of Indigenous Peoples (United Nations Department of Economic and Social Affairs, Indigenous Peoples, 2007), sustainable development, environmental, social, and governance principles, and challenging problems like climate change. In addition, the government must consider the often-divergent perspectives of the various parties impacted by these decisions alongside the demands of investors and buyers of metals, who often make economic decisions based on performance against these factors.

Given the changing landscape that a mining regulator must navigate, it is important that a continuous improvement lens be embedded in the regulatory approach to understand if the regulatory program is working as intended, to make recommendations for improvements, and to act as needed. Given the importance of evaluation and action to ongoing improvement, the Ministry



has established an audit function to evaluate the effectiveness of the mining regulatory framework in BC. This audit function is underpinned by the statutory authority of the Chief Auditor, whose role is enshrined in the Mines Act. The Chief Auditor operates independently from other regulatory functions within the Ministry to ensure audits are objective assessments that are unfettered by other competing interests. In addition, the Chief Auditor is required to produce publicly available results that, because of the independence of the role, can be trusted by all interested parties, including Ministry personnel, Indigenous communities, industry, worker representation groups, and the public.

The purpose of this article is to describe this new auditing function within the Ministry, including its development, implementation, and preliminary lessons learned from the first audit, to provide an example to other jurisdictions that are looking at their own efforts for more effective regulatory frameworks. This article provides the context for Audit Unit development as informed by lessons learned from the 2014 Mount Polley Tailings Storage Facility (TSF) breach, a 2016 audit by BC's Auditor General, and substantial research and engagement. These events informed dramatic changes to Ministry structure and the creation of several new work units. The audit function was born as a direct result of a recurring theme of ongoing improvement and the importance of formalizing this function. Although the Mount Polley breach was not the driver for the Audit Unit, it has influenced regulatory changes and informed the focus of the Chief Auditor's first audit.

This brief is unique in that it is co-authored by the Executive Director of the Mine Audits and Strategic Services Branch (and former Chief Auditor) within the Ministry of Energy, Mines and Low Carbon Innovation and the Director of the Materials Efficiency Research Group, a

consultancy working with a wide range of organizations, governments, and companies on responsible mining leadership strategies. The discussion is informed by knowledge, insight, and assessment from two different perspectives—government and civil society (a range of environmental, legal, and community organizations from BC and neighbouring downstream jurisdictions). This was done in support of the belief that solutions are stronger when parties with divergent perspectives engage in respectful, solution-oriented, and constructive dialogue.



BACKGROUND

On August 4, 2014, a breach occurred in the TSF at the Mount Polley Mine near the town of Likely, BC. No one was physically harmed; however, the breach resulted in the release of more than 20 million cubic metres of water, mine tailings, and construction materials into the surrounding environment, including Polley Lake, Hazeltine Creek, and Quesnel Lake. This event had an immediate and lasting impact on the local communities in the region of the mine (First Nations Health Authority, 2014; Fisheries and Oceans Canada, 2014).

The Government of BC ordered Mount Polley Mining Corporation, the owner and operator, to implement necessary remediation activities (Government of British Columbia, 2014; Imperial Metals, 2022). This included extensive site investigations, monitoring, and risk assessment work. The effects of the spill were determined to be primarily physical, not chemical (Imperial Metals, 2022); however, environmental monitoring continues and is necessary to understand any long-term impacts. Some studies report that this event has had a long-term impact on the overall well-being and mental health of some community members, including Indigenous communities' cultural relationship with the land and access to traditional food sources and medicines (Shandro et al., 2016). This incident lowered public trust in the ability and commitment

of mining companies to operate safely, and it negatively impacted public trust in government to prioritize the protection of human health and the environment.

Audit of Compliance and Enforcement in the Mining Sector

At the time of the breach at Mount Polley, the [Auditor General of British Columbia](#) (the OAG), an independent office reporting directly to the [Legislative Assembly of British Columbia](#), was conducting an audit of the Ministry and the Ministry of Environment and Climate Change Strategy regarding their compliance and enforcement in the mining sector. Given the gravity of the incident, the OAG provided its assessment of the Ministry's regulatory performance for this site in the audit. The [overall conclusion of the audit report](#), which was released in May 2016, was that the government's mining compliance and enforcement activities were inadequate to protect the province from significant environmental risks (Office of the Auditor General of British Columbia, 2016). Based on this conclusion, the OAG made 17 recommendations, including the overall recommendation for the Government of British Columbia to create an integrated and independent compliance



and enforcement unit for mining activities and included the expectation that this unit exist outside of the Ministry. The recommendation included the rationale that the Ministry's structure at that time (which included responsibility to promote and regulate mining) put the Ministry at risk for regulatory capture.

The Ministry understood that public trust in the government's ability to regulate mining was diminished by the Mount Polley incident and the OAG audit findings. While the government accepted 16 of the recommendations, it did not agree with the overall recommendation that mining oversight needed to be removed from the Ministry, nor did it find any examples where this structure was successfully operating; every jurisdiction that was reviewed had separation of functions but within the same agency. As a result, and informed by significant research, the Ministry took alternative action to address this recommendation by creating new functions and ultimately restructuring to create two mining divisions to separate core functions at a senior executive level within the Ministry:

- The Mines Competitiveness and Authorizations Division, with responsibility for permitting, cross-jurisdictional engagement, and promotion for the mining industry.
- The Mines Health, Safety and Enforcement Division, with responsibility for compliance and enforcement of the mining industry.

Additional changes implemented to address lessons learned from Mount Polley and recommendations of the OAG included: amending the Code in 2016 to address recommendations (Mining and Mineral Resources Division, Ministry of Energy and Mines, 2015; Report on Mount Polley Tailings Storage Facility Breach, 2015) following the Mount Polley breach (Government of British Columbia, 2017); adding significant

new resources to support mining oversight within the Ministry, including the creation of a dedicated unit to conduct investigations; amending the BC Mines Act to separate statutory authorities; creating additional enforcement tools; establishing a standing Code Review Committee to provide a venue for ongoing regulatory amendments; and, additional inspector resources (Government of British Columbia, n.d.c).

Creation of the Audit Unit

In 2019, the government directed the Minister of Energy, Mines and Petroleum Resources to establish an independent oversight unit to increase industry safety (Office of the Premier, British Columbia, 2017). This direction, built on work done to respond to the OAG report, ultimately led to the creation of [the Mine Audits Unit](#). In August 2020, the legislature established the oversight role of the Chief Auditor within the Mines Act to create a legal requirement for independence of the audit function, ensure that audit reports are publicly released to demonstrate accountability to the public, and work to build back trust.

The government's 2019 announcement of the intent to establish an independent oversight unit, which led to the establishment of the Chief Auditor role and Mine Audits Unit, was met with skepticism by some parties (University of Victoria Environmental Law Centre, n.d.). This skepticism of the Ministry's approach created some questions about the ability of the Chief Auditor to conduct audits and deliver reports without Ministry interference. The Chief Auditor recognized this hesitation in the public sphere and made an early decision to focus on transparency and bringing broad representation into their audit process. This was accomplished by engaging with Indigenous partners and others from across the spectrum of interests in the mining industry early and often.



MINING AUDITS IN BC

The mandate of the Chief Auditor is to evaluate the effectiveness of the regulatory framework for mining in BC. This role is supported by the Mine Audits Unit (Government of British Columbia, n.d.b), which includes a staff of auditors with technical expertise in mining and legislation.

The Chief Auditor is required to publish an annual Audit Plan outlining the audits that are to be prioritized in that year.

The Mine Audits Unit generally considers three main aspects of the regulatory program as part of its audits:

- Current regulatory requirements
- Ministry policies, programs, practices, and actions
- Mining sector compliance, health and safety, and environmental performance

At the end of each audit, the Chief Auditor provides a report to the Minister of Energy, Mines and Low Carbon Innovation that outlines the conclusions of the audit, including reasons for those conclusions, and any recommendations for the Ministry to improve the provincial mining regulatory program. This report is also released publicly on the Audit Unit's website (Government of BC, n.d.a).

The ability of the audit function to support ongoing improvement is predicated on the Ministry addressing recommendations produced by the Chief Auditor. A new team, the Strategy and Advisory Services Team, has been created within the Ministry to provide leadership, strategic oversight, and support to ensure the Ministry is able to fulfill its commitments to the audit function (Ministry of Energy, Mines and Low Carbon Innovation, 2021a), including development and successful implementation of actions in response to Chief Auditor recommendations, and transparent reporting of progress to the Chief Auditor for posting on their website. This investment in additional resources, together with the standing Code Review Committee as a venue to address regulatory elements of the Chief Auditor's recommendations, is key to supporting the Ministry in addressing audit recommendations and publicly sharing the results of this work.

Audit of Code Requirements for Tailings Storage Facilities

Since 2016, when the revised TSF Code requirements were put in place, TSF design, management, and regulation have remained key issues globally. In the wake of the 2019 failure of the Córrego do Feijão TSF in Brazil (also called the Brumadinho



failure), the regulation of TSFs has also experienced increased global attention, which has compelled mining jurisdictions and the investment community to continue evaluating how TSFs are regulated internationally. These factors, as well as the feedback received from the Chief Auditor's early engagement with external partners, influenced the selection of the provincial regulatory framework for TSFs as one of the first topics to be audited by the newly formed unit.

The objective of this audit was to evaluate:

- How consistent the 2016 Code revisions are with:
 - The original recommendations that came out of the investigations into the Mount Polley TSF failure.
 - Established TSF engineering and management best practices in use at the time of the audit.
- Whether the Code requirements for TSFs are clear and enforceable.
- How Ministry staff verify compliance and enforce Code TSF requirements and whether those actions are consistent with Ministry policies and procedures.
- Whether regulated parties comply with key Code TSF requirements.
- How BC's regulatory framework compares to the frameworks of other advanced mining jurisdictions, both domestically and internationally.

In addition to examining regulations, compliance and inspection data, and best practice documents, the Mine Audits Unit also engaged with and interviewed Ministry staff involved in the regulation of TSFs and senior engineering staff from several prominent geotechnical engineering consulting firms. A third-party consulting

firm was also engaged to provide technical expertise in TSFs to the TSF Audit Team.

The audit's overall conclusion was that the 2016 Code revisions pertaining to TSFs (and their implementation) are having positive impacts on the management and operation of TSFs in BC. The general commitment to TSF safety by inspectors, operators, and people in Code-mandated roles has supported the implementation of the 2016 Code revisions. More specifically, the audit concluded that:

- The Code requirements for TSFs:
 - Addressed the recommendations that followed the Mount Polley TSF failure.
 - Are generally consistent with established industry best practices.
 - Are generally clear and enforceable, but there are several provisions that lack definitions or are subject to differing reasonable interpretations.
- The Dam Safety Regulation, under the Water Sustainability Act (2014), contains regulatory requirements that also apply to TSF dams that are different from requirements in the Code.
- The current workload of the Ministry's geotechnical engineering team includes mine inspections, compliance, review of annual reporting, review of permit applications, and development of technical policies procedures and guidance. This team is meeting inspection targets for TSFs and has a regular presence at operating mines. However, there is a lack of recent policies and procedures to guide the Ministry's work on TSFs, particularly related to activities other than



inspections (such as permitting and document review) and all activities related to TSFs at non-operating mines.

- Industry parties, particularly operators of operating TSFs, are generally complying with Code requirements and demonstrating a shared interest in TSF safety.

While the overall conclusion was generally positive, the audit provided seven recommendations to help improve the TSF regulatory framework in BC. These recommendations can be grouped into four main themes:

- Resolving inconsistencies and overlap between the TSF components of the Code with the Dam Safety Regulation of the Water Sustainability Act
- Incorporating evolving best practices into the regulatory framework and clarifying ambiguous language
- Planning to effectively prioritize inspector workload
- Ensuring compliance data is managed consistently according to Ministry policies and procedures

The Ministry accepted all seven of these recommendations (Mihlar, 2021) and developed an action plan to address each (Ministry of Energy, Mines and Low Carbon Innovation, 2021b). These actions include commitments, together with timelines, that will be reported annually to the Chief Auditor and will be posted on the Mine Audits Unit website. The Ministry is committed to being transparent with its response to the TSF audit recommendations, as well as any other future responses to audits from the Chief Auditor. The success of the Mine Audits Unit is very much tied to the Ministry's commitment to taking its findings and recommendations seriously. This increases

external confidence in this new independent audit function, the Ministry's commitment to robust regulatory oversight, and the importance of continuous improvement to remain at the forefront of emerging practices and technologies for increasing benefits and mitigating risks related to mining. The response to the TSF audit reflects these commitments.

In addition to providing recommendations, audits can provide valuable learnings to inform the direction for future regulatory practice. For example, the TSF audit included a comparative analysis between the Code and TSF-related laws in seven jurisdictions around the globe (i.e., Alaska, Alberta, Brazil, Montana, New South Wales, Peru, and Quebec). It also included a high-level examination of two recently released publications related to TSF management: Global Industry Standard on Tailings Management (Global Tailings Standard) (United Nations Environmental Programme, Principles for Responsible Investment & International Council on Mining and Metals, 2020) and Safety First: Guidelines for Responsible Mine Tailings Management (Safety First), (MiningWatch Canada & EarthWorks, 2020). The purpose of this analysis was to understand where the Code may or may not be aligned with current and emerging practices for TSF management.

The Ministry views the results of the comparative analysis as a demonstration that BC's standards are aligned with current regulatory best practice. Although neither the Global Tailings Standard nor Safety First documents can yet be considered as best practice because they are not currently in widespread use throughout the mining industry, the Ministry gained some learnings from this analysis as well, as it provided a useful scan of global trends to understand how the BC regulatory framework compares to the evolving body of technical knowledge. The Ministry will continue to observe the implementation of



these and other standards and guidelines to inform future work and the standing Code Review Committee is reviewing emerging standards in detail to inform their work to address TSF audit recommendations related to Code provisions. The Ministry believes this comparative analysis could prove useful beyond BC's borders; other mining jurisdictions could use this work in much the same way as the Ministry and analyze whether their regulatory frameworks align with current and potential future best practice.

Civil society and other interested parties are closely watching the Ministry's progress on responding to the TSF audit. While civil society recognizes the importance of the analysis to understand whether BC's standards are in line with current policy and regulation around the world, there are two points of concern that should be kept in mind:

- Efforts to better ensure tailings dam safety are evolving rapidly and need to be a central commitment of continuous learning for governments and industry. Given recent TSF failures, from technical, regulatory, and economic perspectives, reforms to existing systems must be seen as a high priority for governments and companies alike.
- A standard is only as good as its implementation system. Given the high ecological, economic, and human consequences of TSF failures, it is the attention to detail on the full range of monitoring and enforcement activities that will be able to deliver on the promise of providing safer mining operations.

The results of the TSF audit identified some important areas for improvement that the Ministry is taking concrete action on to ensure the continued protection of environmental and community health

in BC. This includes the standing Code Review Committee with representation from Indigenous communities, labour, and industry as a mechanism to bring balanced perspectives to the Code review process, including the upcoming regulatory review related to TSFs as committed to in the Ministry's Action Plan for the TSF Audit. The Ministry recognizes the importance of publicly reporting on progress made toward fulfilling the audit recommendations and measuring the effectiveness of these changes over time. Actions and demonstrated commitment to continuous improvement have not fully addressed concerns and skepticism of some critics and observers, with continued calls for additional TSF safety reforms and fears about the capacity and commitment among governments and industry to implement existing promises. These ongoing tensions may reflect the need for increased engagement with a range of stakeholders to better understand the nature of concerns, as well as the options for addressing them.



CONCLUSION

This article provides an overview and practical context on the auditing function within the Ministry, including its development, implementation, and lessons learned to date. This is being done with the hope that this discussion may provide insight, inspiration, and an example for other jurisdictions working toward more effective regulatory frameworks.

There are specific and important challenges for government when it comes to the regulation and management of high-profile, high-consequence issues such as tailings dam safety in the mining sector. Through the creation of a statutory performance audit function that evaluates the effectiveness of the regulatory framework for mining, the province of BC has undertaken a unique and innovative approach to not only identify the challenges but to continuously improve mining oversight.

It has become clear from the ongoing issues that the international mining sector has faced over the past decade that attention and investment across the full system of regulation and compliance management are required. In addition, understanding and respecting the value of proactive, authentic engagement and trust building with Indigenous partners and the public are key aspects that cannot be overlooked.

Key Lessons Learned Include:

THE CONTINUOUS NEED FOR IMPROVEMENT

BC has a long history, ample experience, and substantial capacity for mining regulation, yet it is important to realize that the range of factors that affect mine safety and competitiveness continues to evolve. The world has and continues to change, and this is especially true when it comes to the mining sector. Public and market demands shift, technical innovation continues, and data regarding the impacts of mining (domestically and internationally) is increasingly granular and publicly available, all of which drive the need not just for accountability but also transparency and proactive communication.

If designed well, continuous review systems, such as the new audit function implemented in BC, can help ensure regulatory processes are clear, robust, and working. Creating a credible, centralized mechanism for reviewing key priority areas, developing actionable recommendations, and establishing a clear process for addressing these recommendations helps ensure ongoing improvement is a part of operations.



THE IMPORTANCE OF INVESTMENT IN A COMPREHENSIVE REGULATORY FRAMEWORK

Effective regulators require a comprehensive regulatory framework with the right balance of rules, clear policies and procedures to guide decision making, and adequate resources to implement the program. Continuous improvement of the regulatory framework involves understanding and addressing challenges in a systematic manner across all aspects of the framework to support successful implementation and ensure the right investments are made. For example, regulatory reforms can be difficult to fully implement if the supporting systems (e.g., policies, technical support, and human resources) are not in place to assist staff in consistently carrying out the changes on the ground.

As demonstrated by BC's first report from the Chief Auditor, reviewing the effectiveness of the regulatory framework for TSFs showed a range of elements that would benefit from refinements to policy, guidance, and procedures to better support the effective regulation of TSFs in BC. Taking an impartial and comprehensive look at how regulatory requirements are understood and applied throughout the compliance process allows for a deeper understanding of where gaps in capacity, differences in interpretation, and inconsistencies and ambiguities in implementation protocols may lead to issues at the mine site. These observations and resulting recommendations underpin informed decision making regarding best placed investments to support the regulatory framework.

A commitment to a thorough systems approach allows for the identification of the sometimes small but essential investments that are needed to ensure the intent of the regulations can be translated effectively and efficiently. This supports a clear and

commonly shared set of expectations among decision-makers, staff, industry, Indigenous people, and other affected parties.

TRUST BUILDING

For the mining sector, public trust is a crucial factor for success. Over the years, the concept of “earning the social licence” to mine has become integrated into the thinking of more and more mining companies, with varying degrees of success. Without efforts to meaningfully build trust with local communities, companies can experience project delays and cancellations. This experience is well documented around the world and is only increasing, with communities taking note of the recent international tailings dam failures (University of Queensland Sustainable Minerals Institute, 2014). Much of the responsibility for engaging and securing public trust falls to the mining companies; however, there is a substantial and practical role for governments to play in this area.

Through the commitment to transparent and inclusive continuous improvement, governments can send a message to industry, Indigenous groups, and members of the public about accountability and fairness in regulatory systems. With initiatives like the BC Mine Audits Unit, it is possible to establish feedback mechanisms that allow these varied constituent groups to actively engage and to provide input. It also allows for greater understanding of how the government works and contributes to ongoing improvements.

The link between transparency and trust is clear. The commitment to impartial, thorough public reviews of what effectiveness means and how it is achieved in practice—while taking the local communities, especially First Nations, into consideration—will hopefully go a long way to rebuilding that trust.



Going Forward

The newly established mine audit function in BC is a work in progress and will continue to grow based on learnings from future audits. With each new audit, the Ministry gains insights that support well-informed, proactive improvements. We believe that—as shown throughout this article—a commitment to and investment in an

independent regulatory performance audit framework provides for effective continuous improvement to mine regulation. We also believe that this has real potential for application in other jurisdictions around the world.

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