

An aerial photograph of a large dam and reservoir. The reservoir is a light blue-green color, surrounded by a concrete dam structure. The surrounding landscape is covered in dense, dark green forest. The image is overlaid with a blue hexagonal pattern in the top right corner and a yellow hexagonal pattern in the bottom left corner. White curved lines are also present, framing the central image.

May 2016

AN AUDIT OF COMPLIANCE AND ENFORCEMENT OF THE MINING SECTOR

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The Honourable Linda Reid
Speaker of the Legislative Assembly
Province of British Columbia
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Dear Madame Speaker:

I have the honour to transmit to the Legislative Assembly of British Columbia my report, *An Audit of Compliance and Enforcement of the Mining Sector*.

We conducted this audit under the authority of section 11 (8) of the *Auditor General Act* and in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (CPA) in the CPA Canada Handbook – Assurance, and in accordance with Value-for-Money Auditing in the Public Sector.



Carol Bellringer, FCPA, FCA
Auditor General
Victoria, B.C.
May 2016

AUDITOR GENERAL'S COMMENTS

THE MINING INDUSTRY has a long history in British Columbia and continues to be an important source of employment for thousands of people. Government has stated its plan to continue to support and develop this industry by creating opportunities for new investment. However, the recent decline in commodity prices has left many mining companies struggling to survive. Regardless of whether the mining industry is experiencing growth or slow-down, protection of the environment needs to be ensured. This is only possible through strong regulatory oversight. We conducted this audit to determine whether the regulatory compliance and enforcement activities of the Ministry of Energy and Mines (MEM) and the Ministry of Environment (MoE), pertaining to mining, are protecting the province from significant environmental risks.



CAROL BELLRINGER, FCPA, FCA
Auditor General

We found almost every one of our expectations for a robust compliance and enforcement program within the MEM and the MoE were not met.

We found major gaps in resources, planning and tools. As a result, monitoring and inspections of mines were inadequate to ensure mine operators complied with requirements. The ministries have not publicly disclosed the limitations with their compliance and enforcement programs, increasing environmental risks, and government's ability to protect the environment.

During the course of this audit, these risks became a reality and disaster occurred when the tailings dam at Mount Polley failed – releasing approximately 25 million cubic metres of wastewater and tailings into adjacent water systems and lakes. It may be many years before the financial, environmental and social implications are fully known.

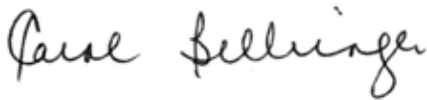
AUDITOR GENERAL'S COMMENTS

After the failure at Mount Polley and during our audit, we felt it necessary to review MEM's performance as regulator for this site. We noted the same issues in the Mount Polley file as we did throughout the audit – that is, too few resources, infrequent inspections, and lack of enforcement.

Our advice, to reduce the risk that unfortunate and preventable incidents like Mount Polley don't happen again, is for government to remove its compliance and enforcement program for mining from MEM. MEM's role to promote mining development is diametrically opposed to compliance and enforcement. This framework, of having both activities within MEM, creates an irreconcilable conflict. Because compliance and enforcement is the last line of defence against environmental degradation, business as usual cannot continue.

I am therefore disappointed in the resistance to this overall recommendation as it is consistent with many other jurisdictions' response to similar incidences. In addition, it is disconcerting that government will not be disclosing its rationale for decisions that it makes in the public's interest under section 137 of the *Environmental Management Act*. The next opportunity to discuss these and other areas of disagreement and the contents of this report, will be at a meeting of the Select Standing Committee on Public Accounts.

This was a very large and involved audit. I appreciate the dedication and commitment that everyone, both in the ministries and my Office, showed to see it through to completion.



Carol Bellringer, FCPA, FCA
Auditor General
May 2016

SUMMARY

MINING IS AN important economic driver for British Columbia. More than 30,000 people are employed in mining and related sectors, and in 2013, the total value of production at B.C. mines was about \$7 billion and mineral exploration spending reached \$476 million.

In B.C., there are 13 major coal and metal mines in operation, over 160 temporarily or permanently **closed mines**, and several mines moving through the permitting approvals process. While the degree of environmental risk varies for each mine, many sites will require ongoing oversight by government that includes a robust compliance and enforcement program to manage the risk.

The major risk to the environment from mining activities is water contamination from the chemical processes of **acid rock drainage** and **heavy metal and non-metal leaching**. Once these processes begin, they can continue indefinitely. In some cases, the only solution is water treatment and monitoring – in perpetuity – which can cost millions of dollars a year.

While most major mines will not require perpetual water treatment, government has estimated that approximately 10% of the major mines in B.C. either have water treatment facilities or will require them in the future (see sidebar). Industry is responsible for both building and maintaining these facilities indefinitely; however, the lifespan of mines and mining companies is finite, creating a risk that taxpayers may bear the costs. So, while the benefit from mining occurs for a limited time, the costs, including government's obligation to monitor these sites, may continue for a very long time.

Just over 10% of B.C. major mines have or will likely require long-term or perpetual water treatment.

- ♦ 14 major mines currently have water treatment facilities.
- ♦ Government has estimated that another 12 existing mines will require water treatment facilities.

Several laws apply to mining in B.C., but for this audit we focused on those that are the responsibility of the Ministry of Energy and Mines (MEM) and Ministry of Environment (MoE), as both of these ministries:

- ♦ are the primary permitting agencies for major mine operations in the province, and
- ♦ have environmental protection mandates and associated compliance and enforcement responsibilities under provincial legislation.

MEM's responsibilities apply generally *within the mine site*. MEM must ensure the mine is designed, built, operated and reclaimed to an acceptable standard. Under the *Mines Act*, MEM is empowered to require that mines provide a financial security deposit that is held by government. This deposit is designed to ensure that taxpayers will not have to contribute to



Click on the terms that are **bold and blue** to go to the definition in the glossary (**Appendix B**).

SUMMARY

mine reclamation costs if a company defaults on its environmental obligations.

MoE's responsibilities apply generally to regulating the impact of mining activities that *extend beyond the borders of the mine site*. MoE regulates the quantity and quality of any waste discharges from metal and coal mines to ensure the protection of the environment.

OVERALL AUDIT FINDINGS

MEM and MoE's compliance and enforcement activities of the mining sector are inadequate to protect the province from significant environmental risks

Overall findings of MEM's and MoE's regulatory program:

Planning

- ♦ MEM's mandate to promote the mining industry conflicts with its role as a regulator, thus reducing its regulatory effectiveness.
- ♦ MEM has a limited compliance and enforcement program and weak planning, and therefore its regulatory oversight activities are inadequate.
- ♦ Although MoE has adopted a compliance and enforcement framework, there are significant gaps in how the framework is applied.
- ♦ Neither ministry coordinates with the other on their compliance and enforcement activities.

- ♦ Both ministries lack sufficient resources and tools to manage environmental risks from mining activities.
- ♦ To meet the provincial goals for new mines and mine expansions, MEM and MoE are focusing on permit applications. As a result, there are few resources dedicated to the regulatory activities of monitoring, compliance and enforcement.

Permitting

- ♦ Neither ministry ensures that permits are consistently written with enforceable language.
- ♦ Neither ministry uses a permitting approach that reduces the likelihood taxpayers will have to pay costs associated with the environmental impacts of mining activities (known as the **polluter-pays principle**).
 - ♦ MEM is not holding an adequate amount of security to cover the estimated environmental liabilities at major mines. The ministry has estimated the total liability for all mines at more than \$2.1 billion, yet has obtained financial securities for less than half that amount (\$0.9 billion).
 - ♦ MoE has not reviewed or revised its fee schedule for pollutants issued under an *Environmental Management Act* permit since 2004. And, in some cases, the waste discharge fees do not reflect the environmental impacts.

SUMMARY

Compliance promotion

- ◆ Both MEM and MoE have created guidance documents and worked with stakeholders to promote compliance. However, neither ministry could demonstrate that its activities and guidance materials were effective in achieving voluntary compliance or government's environmental outcomes.

Compliance verification

- ◆ Neither MEM nor MoE are conducting adequate monitoring and site inspections and neither have assessed how this is impacting risks.

Enforcement

- ◆ Both MEM's and MoE's enforcement responses have significant deficiencies and MEM's enforcement tools are in some cases, ineffectual. This is resulting in delayed or unsuccessful enforcement by the ministries and inaction by industry in several instances.

Ensuring continuous improvement

- ◆ Neither MEM nor MoE have adequately evaluated the effectiveness of their regulatory programs. Both ministries are aware that deficiencies in their regulatory activities are resulting in risks to the environment. In at least two instances—the tailings breach at Mount Polley mine and the degradation of water quality in the Elk Valley—these risks have manifested into real environmental impacts.

Reporting

We found that the two ministries are not informing the public and legislators about the long-term risks from mining, the effectiveness of the agencies' regulatory oversight, and the overall performance of the companies being regulated.

SUMMARY

OTHER COMPLIANCE AND ENFORCEMENT MATTERS

The impacts of an ineffective regulatory regime are increased risks to the environment and the potential for deterioration of the province's water systems, loss of wildlife habitat, and damage to culturally significant areas and values. In recent years, this risk has become a reality and resulted in actual environmental damage, such as at the Mount Polley mine site and in the Elk Valley.

Compliance and enforcement at the Mount Polley Tailings Dam

On August 4, 2014, a breach occurred within the Perimeter Embankment of the **tailings storage facility (or tailings dam)** at the Mount Polley copper and gold mine in south-central B.C. The breach resulted in the release of an estimated 25 million cubic metres of wastewater and tailings. The mining company has since been working on the clean-up from this event, but the full extent of the environmental repercussions from the breach are still not known.

In response to this event, government convened an independent, expert, engineering investigation and review panel (panel) to determine the mechanics of **how** the dam failed. Their conclusion was that the primary cause of the breach was dislocation of a part of the Perimeter Embankment due to foundation failure. The specifics of the failure were triggered by the construction of the downstream rockfill zone at a steep slope. They noted that had the downstream

embankment slope been flattened in recent years as proposed in the original design, failure would have been avoided.

Our assessment differed from the panel's review in that we focused on **why** the dam failed and the Ministry of Energy and Mines' (MEM) overall compliance and enforcement activities. We found that the ministry did not ensure that the tailings dam was being built or operated according to the approved design, nor did it ensure that the mining company rectified design and operational deficiencies. MEM continued to allow the mine to operate and to approve permit amendments to raise the tailings dam.

In relation to the Perimeter Embankment where the dam failed, MEM's weak regulatory oversight allowed inconsistencies with the intended dam design to persist over several years. This included: an over-steepened Perimeter Embankment slope and inadequate management of the tailings beach. At the Main Embankment, in addition to accepting a steep embankment slope and an inadequate tailings beach, MEM also did not ensure that buttressing was built to the height and extent included in the dam design.

We concluded that MEM did not enforce the design due to the following:

Over reliance on qualified professionals

It is not MEM's practice to carry out its own technical review (or to oversee an independent technical review) to confirm that tailings dams are built in accordance with the design.

SUMMARY

Inadequate standards to guide both inspectors and industry

We expected that MEM would have ensured that their design standards were clear for both industry and inspectors to enforce. However, MEM had adopted the Canadian Dam Association's Dam Safety Guidelines for dam construction that were not specific to the conditions in B.C. or specific to tailings dams. These guidelines were open to interpretation by the Engineer of Record and MEM inspectors, and this resulted in a tailings dam that was built below generally accepted standards for tailings dams.

Inspections did not meet policy

MEM performed no geotechnical inspections for a number of years, even though their policy requires a minimum of an annual inspection. Although these inspections would not have identified the weak foundation layer, staff could have identified that the operator was not actually building or operating the tailings dam to the prescribed design and was raising the dam without any long-term planning. Also, additional inspections would have provided MEM the opportunity for increased onsite vigilance.

Lack of enforcement culture

MEM has adopted a collaborative approach to compliance and enforcement that emphasizes cooperation and negotiation. In the case of Mount Polley, this approach failed to produce the desired results. MEM has the ability to compel a mining company to take corrective action when necessary, and has done so in the past using enforcement mechanisms under the Act, Code and permit. However, at Mount

Polley, MEM did not use most of these enforcement mechanisms to compel the mine operator to build or operate the dam as designed and intended.

MoE has not publicly disclosed the risks associated with permitting coal mines in the Elk Valley

Lack of sufficient and effective regulatory oversight and action by MoE to address known environmental issues has allowed degradation of water quality in the Elk Valley. Coal mining, which has been underway in the area for over 100 years, has resulted in high concentrations of selenium in the water system. As selenium accumulates up the food chain, it can affect the development and survival of birds and fish, and may also pose health risks to humans.

For 20 years, MoE has been monitoring selenium levels in the Elk Valley and over that time has noted dramatic annual increases of selenium in the watershed's tributaries. MoE tracked this worsening trend, but took no substantive action to change it. Only recently, has the ministry attempted to control this pollution through permits granted under the *Environmental Management Act*.

We examined the Line Creek Expansion Permit, the Area-Based Management Plan and the Area-Based Management Permit (Valley Permit)¹ to understand how they support MoE's responsibility to minimize risks to the environment. We found that these documents do not address several risks, including the following:

- ♦ MoE staff, with input from external experts, concluded that the selenium levels in the

¹ Line Creek mine is one of five coal mines that Teck Resources Ltd. is operating in the Elk Valley.

SUMMARY

proposed Line Creek Expansion Permit were not likely protective of the environment. The statutory decision-maker could not approve the permit. Subsequently, the permit was granted by Cabinet. This was the first time that Cabinet used this approval process. The rationale for the decision was not publicly disclosed.

- ♦ The Line Creek Expansion Permit allows mining activities to be extended into an area inhabited by Westslope Cutthroat Trout, a species listed as being of “**special concern**” under the federal *Species at Risk Act*. This approved expansion of mining operations creates a risk of further decline of this species.
- ♦ The Area-Based Management Plan commits industry to developing six water treatment facilities in the Elk Valley. This creates a future economic liability for government to monitor these facilities in perpetuity and ensure that they are maintained.
- ♦ There is a risk that if MoE is unable to enforce the Area-Based Management Permit and the mine exceeds its permit limit for selenium at Lake Koocanusa, the outcome could be a violation of the 1909 *Treaty relating to boundary Waters and Questions arising along the Boundary between Canada and the United States* (the Treaty). The Treaty forbids the pollution of water bodies on either side of the border.
- ♦ The levels for selenium in the Area-Based Management Permit are inconsistent with the **precautionary principle**. The proposed targets over the next seven years show a reduction in selenium, but are still significantly higher than current concentrations creating a high risk of further environmental impacts.

The ministry has not disclosed these risks to legislators and the public.

Ultimately, despite the addition of water treatment facilities, the current permit levels of selenium are above the water quality guidelines set by B.C. to protect aquatic life, and for human health and safety. Selenium from both historical mining activities and the ongoing expansion is likely to continue to impact the environment far into the future.

SUMMARY OF RECOMMENDATIONS

WE FOUND OVER a decade of neglect in compliance and enforcement program activities within the Ministry of Energy and Mines, and significant deficiencies within the Ministry of Environment's activities. Overall, we concluded that compliance and enforcement activities of the two ministries are inadequate to protect the province from significant environmental risks.

The independent expert panel for Mount Polley stated clearly that "business as usual cannot continue." We reached a similar conclusion at the end of this audit regarding compliance and enforcement, and we have one overall recommendation.

OVERALL RECOMMENDATION

WE RECOMMEND THAT THE GOVERNMENT OF BRITISH COLUMBIA

create an integrated and independent compliance and enforcement unit for mining activities, with a mandate to ensure the protection of the environment.

Given that the Ministry of Energy and Mines (MEM) is at risk of **regulatory capture**, primarily because MEM's mandate includes a responsibility to both promote and regulate mining, our expectation is that this new unit would not reside within this ministry.

Establishment of such a unit will:

- ♦ show all stakeholders concerned about regulatory oversight that government has put a sound system in place
- ♦ enable government to demonstrate that it will meet its public commitment to be a sound environmental steward

SUMMARY OF RECOMMENDATIONS

In addition to this overall recommendation, we have included 16 recommendations that provide further guidance to government in the development of this new unit. These recommendations are themed by activity: Planning, Permitting, Compliance Promotion, Compliance Verification, Enforcement, Evaluation and Adjustment, and Reporting.

Each recommendation was in response to specific findings. In some cases, the recommendation was made due to specific issues as a result of the Ministry of Environment's or the Ministry of Energy and Mines' performance, and in other cases, the recommendation was applicable to both ministries.

Planning

1.1 Strategic planning

We recommend that government develop a strategic plan that would detail the activities of an integrated and coordinated regulatory approach, and the necessary capacity, tools, training and expertise required to achieve its goals and objectives.

Permitting

1.2 Permit language

We recommend that government ensure both historical and current permit requirements are written with enforceable language.

1.3 Security – adequate coverage

We recommend that government safeguard taxpayers by ensuring the reclamation liability estimate is accurate and that the security held by government is sufficient to cover potential costs.

1.4 Security – catastrophic events

We recommend that government review its security mechanisms to ensure taxpayers are safeguarded from the costs of an environmental disaster.

1.5 *Environmental Management Act* waste discharge fees

We recommend that government review its fees under the *Environmental Management Act* and ensure that the fees are effective in reducing pollution at mine sites.

SUMMARY OF RECOMMENDATIONS

1.6 Cost recovery

We recommend that government adopt a cost recovery model for permitting and compliance verification activities that is consistent across all ministries in the natural resources sector.

1.7 Decision-making – Use of section 137 of the *Environmental Management Act*

We recommend that government publically disclose its rationale for granting a permit under section 137 of the *Environmental Management Act*. Specifically, information should include how factors such as economic, environmental, and social attributes were considered in the determination of public interest.

Compliance Promotion

1.8 Reclamation guidance

We recommend that government develop clear and comprehensive reclamation guidance for industry.

1.9 Incentives

We recommend that government create effective incentives to promote environmentally responsible behavior by industry.

SUMMARY OF RECOMMENDATIONS

Compliance Verification

1.10 Risk-based approach

We recommend that government develop a risk-based approach to compliance verification activities, where frequency of inspections are based on risks, such as industry's non-compliance record, industry's financial state, and industry's activities (e.g., expansion), as well as risks related to seasonal variations.

1.11 Systematic compliance verification

We recommend that government systematically monitor and record compliance with high-risk mine permit requirements.

1.12 Qualified Professionals

We recommend that government establish policies and procedures for the use and oversight of qualified professionals (QP) across the natural resources sector. These policies and procedures should have the following:

- ♦ guidance for staff that outlines the specific nature and amount of oversight expected of a QP's work
- ♦ guidance for staff as to expected timeframe for review and response to QP reports
- ♦ updated guidance for staff for recognizing and responding to misconduct by a QP
- ♦ controls in place to ensure that there is no undue influence on the QPs by industry
- ♦ controls in place to ensure that recommendations by QPs are adhered to

1.13 Mine design

We recommend that government adopt appropriate standards, review mine designs to ensure that they meet these standards, and ensure that mines, as constructed, reflect the approved design and standards.

SUMMARY OF RECOMMENDATIONS

Enforcement

1.14 Policies, procedures and tools

We recommend that government develop policies, procedures and enforcement tools for responding to non-compliances when industry does not meet government's specified timeline.

Evaluation & Adjustment

1.15 Evaluation & adjustment

We recommend that government regularly evaluate the effectiveness of its compliance promotion, compliance verification, and enforcement activities and tools, and make changes as needed to ensure continuous improvement.

Reporting

1.16 Public reporting

We recommend that government report publicly the:

- ♦ results and trends of all mining compliance and enforcement activities
- ♦ effectiveness of compliance and enforcement activities in reducing risks and protecting the environment
- ♦ estimated liability and the security held for each mine