

BACKGROUND 1

Code updates address independent panel recommendations

Government has implemented changes to the Health, Safety and Reclamation Code for Mines in British Columbia. With these updates to the code, along with new site characterization guidelines from the Association of Professional Engineers and Geoscientists of BC, the seven recommendations from the Independent Expert Engineering Panel's investigation into the Aug. 4, 2014, tailings pond breach at the Mt. Polley Mine have been addressed as follows:

1. Implement best available technologies (BAT) using a phased approach:

- a) **For existing tailings impoundments:** Rely on best practices for the remaining active life.
- b) **For new tailings facilities:** BAT should be actively encouraged for new tailings facilities at existing and proposed mines. The panel recommended the adoption of best available technology, including filtered tailings (dry stack) technology where appropriate. The panel also noted that there are circumstances where other technologies are more appropriate.
- c) **For closure:** BAT principles should be applied to closure of active impoundments so that they are progressively removed from the inventory by attrition.

Action:

- New requirements for Mines Act applications must include an alternatives assessment of best available technologies for tailings storage, as outlined under section 10.1.3 of the Health, Safety and Reclamation Code for Mines in British Columbia.
- The Environmental Assessment Office requires new mine projects to provide an alternatives assessment which considers BAT for tailings management

2. Improve corporate governance: Companies should be required to be a member of the Mining Association of Canada (MAC) or commit to an equivalent program for tailings management which includes an audit function.

Action:

- New requirements under the section 10.4.2 of the updated code, all mines in British Columbia must develop and maintain a Tailings Management System that includes regular system audits.
- The MAC's Towards Sustainable Mining Program is an example of a Tailings Management System that meets the requirements under section 10.4.2 of the code.

3. Expand corporate design commitments: Future permit applications for a new TSF should be based on a bankable feasibility that would have considered all technical, environmental, social and economic aspects of the project in sufficient detail to support an investment decision.

Action:

- In order to demonstrate the selection of Best Available Technology (BAT), inclusion of an alternatives assessment is required in Mines Act Permit Applications that include one or more tailings storage facilities.
- The alternatives assessment provides a comparative analysis of options considering the following sustainability factors:
 - Environment
 - Society
 - Economics
- Part 10 changes also require updates to the Mines Act permit application requirements to provide a declaration of Quantifiable Performance Objectives and include a proposed program for prediction, identification and management of physical, chemical and other risks associated with tailings storage facilities and dams.
- Additionally, the B.C. Environmental Assessment Office has also established additional information requirements in order to evaluate tailings management options for proposed major mines in B.C.

4. Enhance validation of safety and regulation of all phases of a TSF: Government should increase the utilization of independent tailings review boards.

Action:

- All existing mines in British Columbia with TSFs must establish an Independent Tailings Review Board by Dec. 31, 2016.
- The Terms of Reference and the proposed membership of the Independent Tailings Review Boards must be approved by the chief inspector of mines.

5. Strengthen current regulatory operations: Determine if other TSFs may have similar risks to those found at Mt. Polley.

Action:

- Immediately following the release of the independent panel report and recommendations on the Mt. Polley TSF failure, the chief inspector of mines ordered mines to undertake an assessment to determine if any of the dam(s) associated with their tailings storage facilities may be at risk due to:
 - Un-drained shear failure of silt and clay foundation – whether Glaciolacustrine (GLU) foundation materials, similar to those at Mt. Polley, exist below any of their dams.
 - Water balance adequacy – outline current and long-term water management plans.
 - Filter adequacy – identify internal dam erosion prevention methods and other means to prevent piping and cracking.
- The order applied to the 38 B.C. mines with an operating TSF, or a non-operating TSF with a dam safety classification of significant or higher.

- Government completed its review of these assessments in October 2015 and the results are available online.

6. Improve professional practice: Government should encourage the Association of Professional Engineers and Geoscientists of BC to develop guidelines that would lead to improved site characterization for tailings dams.

Action:

- APEGBC has completed its review for site characterization guidelines
- These guidelines set out the appropriate standards for site characterization for tailings dams in British Columbia with respect to the geological, geomorphological, hydrogeological and seismotectonic characteristics.

7. Improve dam safety guidelines: Government should develop guidelines that are tailored to the conditions encountered with TSFs in British Columbia and that emphasize protecting public safety.

Action:

- The Mining Code now includes design standards for TSFs that are tailored to the conditions encountered in British Columbia and that emphasize protecting the public and environment including:
 - TSF design requirements for the steepness of downstream slopes.
 - A minimum static factor of safety.
 - New seismic and flood design criteria.
 - Defined roles and responsibilities for the engineer of record, including a duty to report any safety concerns to the regulator.
- Additionally, section 10 of the code now requires mines operating in B.C. to:
 - Designate a TSF-qualified person for safe management of all TSFs.
 - Have a water balance and water management plan prepared by a qualified person.
 - Have in place quantifiable performance objectives developed by the mine's engineer of record and the TSF-qualified person.
 - Establish an Independent Tailings Review Board.
 - Ensure all staff involved in the operations of the TSF or dam are trained and qualified, based on the Operations, Maintenance and Surveillance Manual for the TSF.

Existing mines in British Columbia must immediately make any and all necessary changes to comply with the code, with the following exceptions:

Mine managers have until Sept. 30, 2016 to:

- Designate and notify the chief inspector of mines of the Engineer of Record retained by the mine.
- Designate a TSF-qualified person for safe management of all TSFs.

Additionally, mine managers have until Dec. 31, 2016 to:

- Have a water balance and water management plan prepared by a qualified person.
- Have in place quantifiable performance objectives developed by the mine's engineer of record and the TSF-qualified person.
- Establish an Independent Tailings Review Board.
- Ensure all staff involved in the operations of the TSF or dam are trained and qualified, based on the Operations, Maintenance and Surveillance Manual for the TSF.

With these revisions to the mining code now law, government has addressed 20 of the combined 26 recommendations from the Independent Expert Panel and the chief inspector of mines' reports.

BACKGROUND 2

Timeline of government's response to Mt. Polley

On Aug. 4, 2014, a large and unprecedented breach occurred at the Mt. Polley Mine tailings storage facility. Government took immediate steps to respond, addressing health and safety concerns and initiating three investigations.

Water sampling by Ministry of Environment (MOE) staff began on the evening of Aug. 4, 2014, and remains ongoing. The drinking water ban was lifted by Interior Health for Quesnel Lake, outside the immediate area of impact – 100 metres from the mouth of Hazeltine Creek, on Aug. 13, 2014. To-date, MOE has taken more than 365 water samples and continues to monitor impacts on fish. MOE's sampling is in addition to the more than 4,500 water samples taken by the Mount Polley Mining Corporation (MPMC).

As part of the pollution abatement order issued by MOE on Aug. 5, 2014, MPMC was ordered to take immediate action to stop the further release of mine tailings into nearby waterways and to submit environmental impact assessments and clean-up action plans to the ministry, including plans to stabilize Hazeltine Creek.

In December 2014, the Ministry of Energy and Mines approved an amendment to the MPMC Mines Act permit to allow the company to begin repairs of the breach in its tailings storage facility dam. This work was completed in April 2015.

Throughout the response and remediation process, government and the Mt. Polley Mining Corporation have held regular community meetings to keep residents up-to-date on efforts to address the breach and related issues. To-date, more than 20 community meetings have been held for residents of Likely, Williams Lake and members of the Soda Creek Indian Band (Xats'ull First Nation) and Williams Lake Indian Band.

Since the August 2014 failure of the tailings pond at Mt. Polley Mine, the provincial government has continued to oversee all environmental remediation work undertaken by the MPMC. Phase 1 outcomes, completed by summer 2015, included completely protecting the Hazeltine Creek channel against erosion and ensuring the water quality in Quesnel Lake met all provincial guidelines.

Phase 2 of the remediation and restoration of Polley Lake, Hazeltine Creek, Edney Creek and Quesnel Lake is ongoing and will run through the rest of 2016 and beyond. This phase is focussing on repairing impacts of the breach and includes active participation from area First Nations and local communities.

To-date, remediation and restoration efforts have seen more than 30,000 trees and shrubs planted along with grass planted for more than 16 hectares of area in the Hazeltine Creek corridor. Mammal-denning habitats and avian perches have also been put in place. To-date, the company has spent approximately \$70 million on remediation work.

On Jan. 30, 2015, the Independent Expert Engineering Investigation and Review Panel delivered a final report on its investigation into the cause of the failure of the tailings storage facility at the Mt. Polley Mine. The report also included the release of 35,000 pages of documentation related to the panel's investigation. The panel concluded the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in its original design and made seven recommendations to prevent such incidents in the future.

Government committed to implement all of the panel's recommendations and on June 24, 2015, Energy and Mines Minister Bill Bennett appointed a Code Review Committee pursuant to section 34 of the Mines Act to determine how best to implement the panel's recommendations.

In March 2015, the B.C. Environmental Assessment Office established additional information requirements to evaluate tailings management options for proposed major mines in B.C. The new requirements apply to all mine projects with new tailings dams that are currently undergoing an environmental assessment. The required information ensures that companies proposing to build mines with new tailings dams have:

- In addition to the selected option, considered other options that can address the potential for adverse effects on environmental, health, social, heritage and economic values.
- For the option selected, considered the potential risks and implications of that option and have a technically and economically feasible plan to address them.
- Provided a clear and transparent rationale to support the selected option.

On June 5, 2015, MPMC released its Post Event Environmental Impact Assessment Report, which provides detailed information on the physical, chemical and biological impacts of the spill and will inform future work in the area. An updated second version was posted for public comment on June 21, 2016. British Columbians have until July 21, 2016 to provide feedback on the report. This document is available at: <http://www.env.gov.bc.ca/epd/mount-polley/>

On July 9, 2015, statutory decision makers with the ministries of Energy and Mines, and Environment conditionally authorized the Mt. Polley Mine Corporation to begin restricted operations. The amended Mines Act permit authorized the company to operate at roughly half the rate of normal operations. The permit did not provide authorization for use of the tailings facility during the operation. Under the permit, Mt. Polley Mine used Springer Pit, an existing open pit on the mine site, to manage the tailings.

On Nov. 30, 2015, the Province approved MPMC's application for a short-term permit to treat and then discharge water outside of the mine site. The Mount Polley Mining Corporation must submit a draft technical assessment report in support of the long-term water management plan to government by June 30, 2016, in order to continue operations.

On Dec. 17, 2015, the chief inspector of mines (CIM) released the findings and recommendations of his investigation into the Aug. 4, 2014 tailings storage facility failure at Mt. Polley Mine. The CIM investigation found, as did the Independent Expert Panel in January, that the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design or in subsequent dam raises. The CIM made 19

recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry.

Government committed to work with industry and professional associations to ensure all 19 of the CIM's recommendations are implemented.

On March 15, 2016, government passed legislation that enables it to include administrative monetary penalties as a much more flexible and nimble compliance and enforcement tool under the Mines Act. The legislation also increased penalties available for court prosecutions under the act from \$100,000 and/or up to one year imprisonment to \$1 million and/or up to three years imprisonment.

On May 3, 2016, the Office of the Auditor General released its report, "An Audit of Compliance & Enforcement of the Mining Sector", which contained 17 recommendations. Government committed to implementing all 42 of the combined recommendations from the independent expert panel, auditor general and CIM reports, and at least a significant part of the 43rd recommendation from the auditor general.

On June 23, 2016, statutory decision makers with the Ministry of Energy and Mines authorized the Mt. Polley Mining Corporation to return to full production using the repaired and strengthened tailings storage facility (TSF) to manage tailings.

In July 2016, the Association of Professional Engineers and Geoscientists of BC completed its Professional Practice Guidelines – Site Characterization Assessments for Dam Foundations in B.C. These guidelines, which will be released publically on the APEG BC website in August 2016, were developed in response to the independent expert panel recommendations and set out the appropriate standards for site characterization for tailings dams in British Columbia with respect to the geological, geomorphological, hydrogeological and seismotectonic characteristics.

On July 20, 2016, government announced changes to the TSF portions of the code that further strengthen B.C.'s regulatory framework for mining. Updates include new design and operation criteria for TSFs, requiring water balance and water management plans for TSFs, and requiring mines with TSFs to establish Independent Tailings Review Boards.

A third independent investigation of the Mount Polley tailings pond breach is being led by British Columbia's Conservation Officer Service, and assisted by Environment Canada, Department of Fisheries and Oceans Canada and the RCMP.

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