

## Update on Implementation of Recommendations from the Expert Panel Report and the Chief Inspector of Mines Investigation Report

Two investigations into the Aug. 4, 2014 Mount Polley tailings storage facility (TSF) failure have resulted in 26 recommendations to prevent similar incidents from occurring in the future. On Jan. 30, 2015, the Independent Expert Engineering Panel completed its investigation and made seven recommendations and on Dec. 17, 2015, the Chief Inspector of Mines presented his investigation findings and made 19 recommendations. Government is committed to ensuring all of the recommendations are implemented.

On June 24, 2015, Minister of Energy and Mines Bill Bennett appointed a Code Review Committee, pursuant to section 34 of the [Mines Act](#) that is determining how best to implement the 26 recommendations made in the reports of Independent Expert Engineering Panel and the Chief Inspector of Mines.

The Code Review Committee is chaired by the Chief Inspector of Mines and includes an equal number of representatives nominated by First Nations, mine labour unions and industry. The review consists of three separate committees: an overarching Code Review Committee and two sub-committees that are providing technical reviews for the tailings storage facilities and the Health and Safety sections of the code.

Work to implement the 26 recommendations is either substantially underway or complete, including improving corporate governance, improving professional engineering practices, and strengthening current regulatory operations. Significant progress has been made on the seven recommendations from the Independent Expert Engineering Panel – government has already completed one recommendation and six others are expected to be addressed by the end of 2016. Five of these seven recommendations, along with 12 of the recommendations from the Chief Inspector of Mines will be addressed through the ongoing Code Review.

The tailings storage facility portion of the Code Review is well underway and revisions could be legally in force by mid-2016. Government will also work with industry and professional organizations to ensure recommendations directed at them are implemented. It is anticipated this work will be completed by spring 2017.

The recommendations are listed in the table below, along with status of implementation as of February 2016.

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## Mount Polley Recommendations Table

Recommendation by Expert Panel	Implementation
<p><b>1. Implement Best Available Technologies (BAT) using a phased approach.</b></p> <ul style="list-style-type: none"> <li>• <b>For existing tailings impoundments.</b> Rely on best practices for the remaining active life.</li> <li>• <b>For new tailings facilities (TSF).</b> BAT should be actively encouraged for new tailings facilities at existing and proposed mines.</li> <li>• <b>For closure.</b> BAT principles should be applied to closure of active impoundments so that they are progressively removed from the inventory by attrition.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016.</p> <p>Environmental Assessment Office (EAO) letter sent (March 19, 2015) to new mine projects requesting that they consider the implications of the Expert Panel findings and recommendations in their project TSF plan and must provide additional information outlining how they have met this requirement</p> <p>See News Release for more information:  <a href="https://news.gov.bc.ca/stories/government-appoints-mining-code-review-committee-members">https://news.gov.bc.ca/stories/government-appoints-mining-code-review-committee-members</a></p>
<p><b>2. Improve corporate governance:</b></p> <ul style="list-style-type: none"> <li>• Corporations proposing to operate a tailings storage facility (TSF) should be required to be a member of the Mining Association of Canada (MAC) or be obliged to commit to an equivalent program for tailings management, including the audit function.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016.</p> <p>Gov't supports adoption of industry best practices including the "Towards Sustainable Mining" program. The Mining Association of Canada (MAC) established independent expert task force to review its tailings management requirements under its Towards Sustainable Mining (TSM) program. Recommendations were released in December 2015 – see MAC for more information: <a href="http://mining.ca/news-events/press-releases/independent-task-force-towards-sustainable-mining%E2%80%99s-tailings-management">http://mining.ca/news-events/press-releases/independent-task-force-towards-sustainable-mining%E2%80%99s-tailings-management</a></p>

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<p><b>3. Expand corporate design commitments:</b></p> <ul style="list-style-type: none"> <li>• 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, which might have an accuracy of +/- 10-15%. More explicitly it should contain the following:               <ul style="list-style-type: none"> <li>• A detailed evaluation of all potential failure modes and a management scheme for all residual risk</li> <li>• Detailed cost/benefit analyses of BAT tailings and closure options so that economic effects can be understood, recognizing that the results of the cost/benefit analyses should not supersede BAT safety considerations</li> <li>• A detailed declaration of Quantitative Performance Objectives (QPOs).</li> </ul> </li> </ul>	<p>EAO has established additional information requirements in order to evaluate tailings management options for proposed major mines in B.C. Applies to all projects with new tailings dams currently undergoing EA. Ensures that companies proposing to build mines with tailings dams have:</p> <ul style="list-style-type: none"> <li>• Considered other options that address potential for adverse effects on environmental, health and economic values</li> <li>• Considered potential risks of chosen option and have technically and economically feasible plan to address them</li> <li>• Provided clear and transparent rationale to support selected option</li> </ul> <p>The tailings storage facility portion of the Code Review is expected to be completed in spring 2016, and revisions could be legally in force by mid-2016. This committee is considering this recommendation as part of its review.</p>
<p><b>4. Enhance validation of safety and regulation of all phases of a TSF:</b></p> <ul style="list-style-type: none"> <li>• Increase utilization of Independent Tailings Review Boards.</li> <li>• Utilize the concept of Quantitative Performance Objectives to improve regulator evaluation of ongoing facilities.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016.</p>
<p><b>5. Strengthen current regulatory operations:</b></p> <ul style="list-style-type: none"> <li>• Utilize the recent inspections of TSFs in the province to ascertain whether they may be at risk due to the following potential failure modes and take appropriate actions               <ul style="list-style-type: none"> <li>○ Filter adequacy</li> <li>○ Water balance adequacy</li> <li>○ Undrained shear failure of silt and clay foundations</li> </ul> </li> </ul>	<p>Final submissions received June 30. This recommendation now complete.</p> <p>More information on this is available here:  <a href="http://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/dam-safety-inspections-2014">http://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/dam-safety-inspections-2014</a></p>

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<p><b>6. Improve professional practice:</b></p> <ul style="list-style-type: none"> <li>Encourage the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) to develop guidelines that would lead to improved site characterization for tailings dams with respect to the geological, geomorphological, hydrogeological and possibly seismotectonic characteristics.</li> </ul>	<p>APEGBC is developing professional practice guidelines for dam site characterization assessments Guidelines are expected to be released by summer 2016</p>
<p><b>7. Improve dam safety guidelines:</b></p> <ul style="list-style-type: none"> <li>Recognizing the limitations of the current Canadian Dam Association (CDA) guidelines incorporated as a statutory requirement, develop improved guidelines that are tailored to the conditions encountered with TSFs in British Columbia and that emphasize protecting public safety.</li> </ul>	<p>CDA expected to complete review over the next year and will release Engineer of Record and Factor of Safety as part of Mining Dam Bulletin for CDA guidelines mid-2016. Tailings review portion of Code Review will determine best way to incorporate guidelines into regulation will be considered in Code Review</p>

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Recommendation by Investigation Report from Chief Inspector of Mines	Implementation
<p><b>1-1 Mine Dam Safety Manager</b></p> <ul style="list-style-type: none"> <li>Any mine with tailings storage facilities (TSFs) should have a qualified individual designated as a mine dam safety manager responsible for oversight of planning, design, operation, construction</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016.</p>
<p><b>1-2 Water Balance Management</b></p> <ul style="list-style-type: none"> <li>Water management and water balance issues for mining projects must be designed by a qualified professional. These issues require the integration of relevant mine departments.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016.</p>
<p><b>1-3 TSF Operations, Maintenance and Surveillance Manual</b></p> <ul style="list-style-type: none"> <li>The mine manager should ensure the Operation, Maintenance and Surveillance manual (OMS) required by the Code for all impoundments adheres to applicable CDA and MAC guidelines. Additional guidance for the OMS should include incorporation of an annual risk assessment/risk management plan and relevant findings of an independent technical review board.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016.</p>
<p><b>1-4 Mine Emergency Response Plan</b></p> <ul style="list-style-type: none"> <li>The mine manager must ensure that the Mine Emergency Response Plan (MERP) adheres to applicable regulations, is maintained on a regular basis for currency, incorporates appropriate response measures to emergencies including those involving the TSF, and is written and distributed in such format as to serve as a procedural guide during an emergency or other event.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016. The committee is considering revisions to the Emergency Preparedness and Response Plan (EPRP) specifically directed at TSFs.</p> <p>The Health and Safety Portion of the Code Review is expected to be completed and in force by early 2017, this committee will consider revisions to allow the Mine Emergency Response Plan (MERP) and how it will align with the EPRP.</p>

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<p><b>1-5 Risk Recognition and Communication</b></p> <ul style="list-style-type: none"> <li>All mine personnel have a role to play in recognizing and reporting risk conditions, especially those that could affect health, safety and environmental protection; and should be educated in the recognition of conditions and events that could impact TSF safety or contravene applicable permit conditions and regulations.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016.</p>
<p><b>2-1 Design Objectives</b></p> <ul style="list-style-type: none"> <li>Tailings storage and water management systems and structures should be designed for worker and public safety and the protection of the environment. TSF design should incorporate a comprehensive feasibility assessment that considers technical, environmental, social, and economic aspects of the mining project in sufficient detail to support the submitted design.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016.</p> <p><i>Linked to Expert Panel recommendation #1 and #3</i></p>
<p><b>2-2 Independent Technical Review Board</b></p> <ul style="list-style-type: none"> <li>Mines with impoundments should each develop independent technical review boards (ITRB) to provide additional perspectives on site investigation, site selection, design, construction, maintenance, operations, surveillance, water management and closure.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016.</p> <p><i>Linked to Expert Panel recommendation #4</i></p>
<p><b>3-1 Professional Reliance</b></p> <ul style="list-style-type: none"> <li>The Chief Inspector recognizes the necessity of reliance on professional practice for the design, construction, operation and closure of mines and mine facilities. The Regulator does not design the mine or associated structures, and thus is reliant on the professional practice of the designer. Reliance on professional practice requires that the organizations overseeing the professionals or developing guidelines and standards for the professional community incorporate best available practices into their oversight.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016. The Health and Safety Portion of the Code Review is expected to be completed and in force by early 2017.</p> <p><i>Linked to Expert Panel recommendation #6 and #7</i></p>

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<p><b>3-2 Integration of Standards</b></p> <ul style="list-style-type: none"> <li>The Regulator should consider and incorporate as appropriate guidelines from these external associations as applicable and consistent with MEM objectives.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016.</p> <p><i>Linked to Expert Panel recommendation #2</i></p>
<p><b>4-1 Review of the Code</b></p> <ul style="list-style-type: none"> <li>MEM should undertake a comprehensive review of the Code to ensure that the lessons learned and recommendations from this report are fully considered and appropriately incorporated; and that all relevant standards and guidelines from external bodies (such as MAC, CDA, and APEGBC) are fully considered in the review as appropriate.</li> </ul>	<p>The Minister of Energy and Mines appointed a Code Review Committee, pursuant to section 34 of the Mines Act, that is determining how best to implement the 26 recommendations made by in the reports of Independent Expert Engineering Panel and the Chief Inspector of Mines.</p>
<p><b>4-2 Life of Mine Planning for Permitting</b></p> <ul style="list-style-type: none"> <li>Short-term, incremental Mines Act permit amendment applications can obscure life-of-mine conditions and long-term risks. The Regulator should ensure a perspective that spans the life of the mine be considered for Mines Act permit applications, while acknowledging that the nature of mining frequently requires changes to the life-of-mine plan.</li> </ul>	<p>This recommendation is being considered by the tailings storage facility portion of the Code Review which is well underway and revisions could be legally in force by mid-2016. The Health and Safety Portion of the Code Review is expected to be completed and in force by early 2017.</p> <p><i>Coincides with Expert Panel recommendation #1</i></p>

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<p><b>4-3 Investigation, Compliance and Enforcement Review</b></p> <ul style="list-style-type: none"> <li>The Regulator must enhance its investigative capacity, as well as its ability to exercise its existing compliance and enforcement authority under the Mines Act and Code. A supported director-equivalent position specific to investigation, compliance and enforcement should be established to evaluate and oversee these roles. This oversight should extend to applying recommended standards to the Regulator’s compliance and enforcement function. A full range of regulatory tools, such as incentives, administrative penalties, outside agency collaboration and other best practices should be considered.</li> </ul>	<p>Deputy Chief Inspector of Mines position has been created. Legislation to enable Administrative Penalties within Mines Act enacted in the Winter/Spring session of Legislature.</p>
<p><b>4-4 Geotechnical Oversight</b></p> <ul style="list-style-type: none"> <li>The Regulator has a responsibility to oversee the decisions of the EoR. The Regulator must maintain sufficient technical capacity to conduct appropriate oversight of the professional opinions on which it relies. A Regulatory Dam Safety Manager dedicated to the coordinated regulatory oversight of tailings dams in the Province could be responsible for ongoing policy development, technical review, and inspection capacity as it relates to tailings impoundments.</li> </ul>	<p>Province is reviewing how best to clarify accountability for this role within the inspectorate.</p>
<p><b>4-5 Organizational Review of Inspectorate</b></p> <ul style="list-style-type: none"> <li>There exists an ongoing need to adequately support the increased tempo of review, monitoring and inspection that would be placed on MEM’s inspectorate. It is recommended that a comprehensive internal review of operational and business practices be conducted.</li> </ul>	<p>Work is ongoing and is expected to be complete by Summer 2016.</p>



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<p><b>5-1 Internal Records Management</b></p> <ul style="list-style-type: none"> <li>A formal MEM management system of documentation for all mines from development to post-closure should be established. The system will assist the Chief Inspector in integrating regulatory oversight capabilities; assist with investigation, project tasking, formal documentation and indexing; and enhance the ability of MEM to meet the expectations for transparency and appropriate disclosure within the limits of privacy considerations.</li> </ul>	<p>Field inspection tools information technology projects are in design phase, expectation to be completed by early 2017.</p>
<p><b>6-1 Alignment of Regulatory Objectives</b></p> <ul style="list-style-type: none"> <li>Agency objectives (environmental protection, worker health and safety, facilities integrity) overlap but are not always integrated. MOE and MEM interests, disciplines and standards should be reviewed for alignment opportunities to support timely and effective program outcomes while optimally fulfilling the mandates of both agencies.</li> </ul>	<p>Province is currently reviewing</p>
<p><b>6-2 Permitting Process Alignment</b></p> <ul style="list-style-type: none"> <li>Separate permitting processes for MEM and MOE should be reviewed for opportunities to integrate and align these processes as appropriate to avoid duplication and increase efficiencies.</li> </ul>	<p>Integration between Ministry of Energy and Mines and Ministry of Environment is a key priority. Permitting process is being led by the Major Mines Permitting Office which is accountable to a cross-sector project board.</p>
<p><b>7-1 Collaborative Education</b></p> <ul style="list-style-type: none"> <li>MEM, the industry, professional organizations, and educational institutions should continue to seek new collaborative opportunities to foster education (including formal academic, onsite or online employee-focused, public-facing, and professional continuing education).</li> </ul>	<p>Ongoing educational programs being supported by Mining Association of BC, BCIT, Community College School of Exploration and Mining, UBC, Northwest Community College and others.</p>

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<p><b>7-2 Research and Development</b></p> <ul style="list-style-type: none"> <li>• Current technologies in tailings processing, dewatering, and discharge water treatment have not achieved a sufficient level of technical and economic feasibility in many projects. Both government and industry should support research and development efforts to improve these technologies for practical application.</li> </ul>	<p>Government is now requiring an assessment of BAT/BAP under the new EAO requirements.            This recommendation is also being reviewed as part of the Code Review.            Government is also participating in various initiatives such as the Mine Environment Neutral Drainage (MEND) Committee who has commissioned a study on Tailings Management Technologies which is expected to be complete in 2016.</p> <p><i>Linked to Expert Panel recommendation #1</i></p>