

BC
MINING
LAW REFORM



Water
Protection

University of Victoria Environmental Law Centre



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Introduction

In addition to the water contamination that tailings storage creates (see "Waste Disposal and Management"), mines can degrade water in a multitude of other ways. Exploration and drilling can lead to erosion, hydrocarbon pollution and acid rock drainage from abandoned drill holes. Mine operations themselves not only produce mine waste residues (tailings), but also remove rock that is not processed for minerals, as well as spent "heap leach" materials.¹ Water flowing across and through these waste materials can leach and carry toxic metals and other contaminants into ground and surface water. Other pollution occurs when water used in the mining process is discharged into the environment. Chemicals used in mining and processing (e.g., cyanide, vehicle and machinery fluids) can contaminate water—as can contaminants that escape from water treatment sludge.

There is no doubt that mines seriously impact watersheds on a large scale. In 2017, Environment Canada's third national assessment report of environmental effects monitoring for metal mines indicated that 76% of mines cause effects on fish or fish habitat. Worse, 92% of those mines with effects had significant impacts—effects that "may be indicative of a higher risk to the environment." Although not individually identified, many of these mines are in British Columbia.² In 2019, the federal Commissioner on Environment and Sustainable Development found that, despite these troubling findings, there was often "no requirement for companies to fix the problems." The Commissioner recommended fixing these important gaps. In addition, the Commissioner recommended the release of all data, mine-by-mine, to allow the public and communities to make informed decisions about the use of affected waters and fish habitat.³

To deal effectively with the threats that mining poses to BC's waters, the provincial government must implement the recommendations set out in "Waste Disposal and Management". In addition, Government must require, at a minimum, that mining companies:

- Identify all uses of water (including ecological uses) that may be affected by a proposed mine;
- Characterize the current baseline state of water quantity, quality and dynamics;
- Identify project-related chemicals, wastes, facilities, and activities that may impact water quality and quantity;
- Scientifically model to predict and quantify significant water quality and quantity impacts;⁴
- Develop options to mitigate significant risks to water—giving priority to proactive prevention and source control;
- Effectively monitor ongoing impacts to water; and

- Plan for effective adaptive management actions, to be implemented when monitoring reveals defined impacts.

The IRMA standard

The Initiative for Responsible Mining Assurance (IRMA) requires all of the above actions. BC laws must be strengthened to require that companies meet or exceed the global best practices found in the IRMA standards. In particular, BC could learn from a number of the IRMA standard provisions on water management.⁵

For example, unlike BC's current regime, IRMA requires full consultation with communities and stakeholders on critical water-related issues, with third party independent reviews.⁶ Good water management and public accountability require participation and oversight from Indigenous Nations and members of the public. In recognition of this, IRMA requires that mining companies engage with these groups and individuals on key topics such as:

- Planning long-term water goals and protection provisions;
- Monitoring impacts on water quality and quantity;
- Implementing adaptive management;
- Publishing monitoring data; and
- Notifying communities of imminent threats to water resources.

To comply in a meaningful way with the IRMA Standards, companies must regularly report monitoring results on an easily accessible public website—and be fully accountable to the public for the way they manage water throughout their operations and reclamation activities.⁷

- 1. RECOMMENDATION: Adopt the *IRMA Standard for Responsible Mining water management standards as minimum requirements in BC's mining laws, including full consultation with communities and stakeholders on critical water-related issues, with third party independent reviews.*⁸**

Perpetual water treatment

Fourteen major BC mines currently have water treatment facilities. The provincial government estimates that 45 additional mines have moderate-to-high acid rock drainage/leaching potential—and predicts that 12 of these will require perpetual water treatment.⁹ This creates a risk that, if water treatment ceases, long-term environmental damage could occur (as has happened with the Tulsequah Chief Mine in the Taku watershed).¹⁰ It also creates a significant financial risk to taxpayers that has been identified as a major concern by the Auditor General.

Yet BC policy allows mines to be developed even if they have acid rock drainage potential and may require perpetual water treatment.¹¹ This policy is far less conservative than the approach taken in the Northwest Territories, Manitoba, Yukon, New Mexico, and Wisconsin—where taxpayers and the environment are protected by a simple ban on mining operations that will require very long-term water treatment. The BC Auditor General noted that these jurisdictions prohibit such mines "due to the increased risk that taxpayers will ultimately be left with the cost of remediation."¹²

IRMA similarly recognizes these risks, and the IRMA standard generally prohibits mines that will require perpetual water treatment. IRMA begins with the default prohibition of mines requiring long-term water treatment, and only provides for exceptions in strictly defined circumstances.

Under the IRMA standard, reliance on perpetual treatment is only acceptable if all the following exceptional circumstances apply: (1) the company has made all practicable efforts to implement best practices to avoid long-term treatment, including use of independent third-party reviews; (2) the untreated water itself poses no significant risk to health or community livelihoods; (3) the company minimizes the volume of water that must be treated; and (4) the company provides financial assurance to cover the cost of long-term water treatment.¹³

- 2. RECOMMENDATION: Prohibit mines that are likely to require perpetual water treatment unless the mine meets the exceptional circumstances set out in the *IRMA Standard for Responsible Mining*.¹⁴**

Exploration activities

Before full mine operations commence, mining exploration can also seriously impact watersheds. Exploration activities can cause various impacts to water, due to: erosion; camp, airstrip and road activities; line cutting; drilling and drilling fluids; fuel storage; and abandoned boreholes (which may generate acid rock drainage). Current BC rules governing exploration need to be carefully reviewed and strengthened to protect water, as recommended by experts in the field.¹⁵

- 3. RECOMMENDATION: Strengthen mining exploration rules to protect water.**

Endnotes

- 1 Unprocessed materials include waste rock, unprocessed ore, overburden, etc. In heap leaching, ore is placed on pads and treated with cyanide and other chemicals to remove metals.
- 2 Eighty-two metal mines were assessed, with 62 showing effects, 19 with inconclusive results, and one with no effect. The report states: "Although the metal mining sector is achieving over 95% compliance with the prescribed discharge limits, a decade of results have shown that impacts do occur on fish and fish habitat downstream from metal mines." See Environment and Climate Change Canada, Third national assessment of environmental effects monitoring data from metal mines (Government of Canada, 2017, online <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/publications/third-national-assessment-monitoring-data/chapter-6.html> and <https://www.ec.gc.ca/eseee-em/default.asp?lang=En&n=F2078Co8-1&offset=7&toc=show>).
- 3 The Commissioner also found that up to 35% of the 138 metal mines in Canada were out of compliance by not fully reporting their pollution data to Environment Canada; and that, under the current regulations, 117 of non-metal mines (incl. coal mines) were not subject to mandatory monitoring and reporting of their effects to water and fish habitat. See Commissioner of the Environment and Sustainable Development, Report 2—Protecting Fish From Mining Effluent (Office of the Auditor General of Canada, 2019, online http://www.oag-bvg.gc.ca/internet/English/parl_cesd_201904_02_e_43308.html). See also MiningWatch Canada, Canada Fails To Protect Waters & Fish from Mine Pollution (2019, online <https://miningwatch.ca/news/2019/4/2/new-environment-commissioner-audit-canada-fails-properly-protect-waters-fish-mine> and https://miningwatch.ca/sites/default/files/2019-04-05-miningwatchcanada-cesdreport_7_o.pdf).
- 4 Wherever these impacts are potentially significant.
- 5 Initiative for Responsible Mining Assurance, *IRMA Standard for Responsible Mining IRMA-STD-001* (2018) at Chapter 2.6, "Planning and Financing Reclamation and Closure" and Chapter 4.2, "Water Management." Note that discussion of a number of water issues is also included in Maya Stano & Emma Lehrer, *Fair Mining Practices: A New Mining Code for British Columbia* (Fair Mining Collaborative, 2013). For example, see the discussion on the need to require adequate baseline data on groundwater and surface water collected over minimum time periods, at p. 256.
- 6 See IRMA Chapter 4.2, table on cross-references to other chapters p.136: "The requirements to consult or collaborate with stakeholders regarding mine water management (in 4.2.1.2, 4.2.1.3, 4.2.4.1) shall conform with IRMA stakeholder engagement

requirements in Chapter 1.2. This includes determining if the stakeholders have the capacity to effectively participate in discussions, and provision for access to independent experts if necessary to ensure meaningful engagement in water monitoring (requirement 4.2.5.3)."

- 7 Hydrogeologist Dr. Gilles Wendling has recommended that government require that mining companies: (1) On a quarterly basis, update all water quality monitoring data on the provincial Environment Management System database; and (2) Provide adequate funding for independent review of baseline water quality data and proposed monitoring programs—and for regular independent review of provincial government water quality monitoring during and post mining.
- 8 In particular, IRMA standards set out in IRMA chapters 2.6 and 4.2 in relation to water management and post-closure planning and financing. NOTE: IRMA standards have specific provisions on cyanide and mercury that are not detailed under BC law. However, the interim IRMA standard on cyanide is arguably insufficient. See the discussion in: Initiative for Responsible Mining Assurance, *IRMA Standard for Responsible Mining IRMA-STD-001* (2018), at p. 138
- 9 Auditor General of British Columbia, *An Audit of Compliance and Enforcement of the Mining Sector* (Victoria: Office of the Auditor General, 2016) at p. 38.
- 10 See "Closure, Reclamation and Abandoned Mines" for a discussion of this and other mines with problematic water treatment issues.
- 11 For an explanation of acid rock drainage, see Auditor General of British Columbia, *An Audit of Compliance and Enforcement of the Mining Sector* (Victoria: Office of the Auditor General, 2016) at p. 35.
- 12 Auditor General of British Columbia, *An Audit of Compliance and Enforcement of the Mining Sector* (Victoria: Office of the Auditor General, 2016) at p. 38. The information about the Yukon, New Mexico and Montana comes from Dave Chambers, Center for Science in Public Participation. For further discussion on this issue see Maya Stano & Emma Lehrer, *Fair Mining Practices: A New Mining Code for British Columbia* (Fair Mining Collaborative, 2013) at pp. 366–367 and 192.
- 13 In Chapter 2.6, IRMA prohibits long-term water treatment unless: all practicable efforts to implement best practice water and waste management methods to avoid long-term treatment have been made; the company funds an engineering and risk assessment that includes consultations with stakeholders and determines that the contaminated water to be treated perpetually poses no significant risk to human health or to the livelihoods of communities if the discharge were to go untreated; and the company takes all practicable efforts to minimize the volume of water to be treated. Section 2.6.6.1 in IRMA states "If long-term water treatment is required post-closure:

a. The water treatment cost component of the post-closure financial surety shall be calculated conservatively, and cost calculations based on treatment technology proven to be effective under similar climatic conditions and at a similar scale as the proposed operation; and b. When mine construction commences, or whenever the commitment for long-term water treatment is initiated, sufficient funding shall be established in full for long-term water treatment and for conducting post-closure monitoring and maintenance for as long as IRMA Water Quality Criteria are predicted to be exceeded." This is also cross-referenced in IRMA Chapter 4.2: "Chapter 2.6 includes additional requirements for a risk assessment prior to long-term water treatment (see 2.6.6.1), and provision of financial assurance to cover the cost of long-term water treatment (see 2.6.7.2)." See Initiative for Responsible Mining Assurance, *IRMA Standard for Responsible Mining IRMA-STD-001* (2018) at Chapter 2.6.6. On this issue, also see Letter. "A New Mineral Resources Act for the Northwest Territories." Ugo Lapointe, MiningWatch Canada. Received by Honourable Minister Wally Schumann, Government of the Northwest Territories (2017 December 1) (Ottawa: Ontario) at pp. 15–16.

¹⁴ See *Ibid*, IRMA, Chapter 2.6.6.

¹⁵ For example, the *Fair Mining Practices Code* has made the following recommendations: (1) Require mining companies to comply strictly with commitments to protect water in environmental protection plans, as part of access/exploration agreements; (2) Strengthen rules on exploration drill hole abandonment, to ensure that deleterious substances are not released from or leached from such holes; (3) Prohibit abandonment of drill holes in a way that would permit movement of water from one aquifer or groundwater formation to another; and (4) Increase riparian setbacks for exploration activities. See *Fair Mining Practices Code*, Appendix A, p. 29 and pp. 152–157.