



Tailings dam spills at Mount Polley and Mariana

CHRONICLES OF DISASTERS FORETOLD

By Judith Marshall

AUGUST 2018



PoEMAS
Grupo Política,
Economia, Mineração,
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This paper is part of the Corporate Mapping Project (CMP), a research and public engagement initiative investigating the power of the fossil fuel industry. The CMP is jointly led by the University of Victoria, the Canadian Centre for Policy Alternatives BC and Saskatchewan Offices and the Parkland Institute. This research was supported by the Social Science and Humanities Research Council of Canada (SSHRC).



This report is co-published by the CMP, CCPA-BC Office, PoEMAS (Grupo Política, Economia, Mineração, Ambiente e Sociedade) and the Wilderness Committee.

PoEMAS is composed of researchers and students in Brazil who use their knowledge of economics, geography, sociology and public policy to investigate the mining industry's impacts on society and the environment, and to support communities in conflict with mining corporations.

The Wilderness Committee is Canada's people-powered, citizen-funded wilderness preservation group with 60,000 supporters and volunteers from coast to coast to coast. Founded in 1980, the group has helped gain protection for over 60 major wilderness areas in Canada, including millions of hectares of critical wildlife habitats and some of the world's last large tracts of old-growth temperate rainforest and boreal forest.



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Cover image: Bento Rodrigues, Brazil, one year after the dam breach. Photo by Bruno Milanez, PoEMAS/UJF. Thank you to PoEMAS, the Wilderness Committee, the Canadian Press and Richard Holmes for supplying the photos in this report.

ISBN 978-1-77125-416-8



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JUDITH MARSHALL is a Canadian popular educator and writer. She worked for eight years in the Ministry of Education in post-independence Mozambique, designing curricula for workplace literacy campaigns. On her return to Canada, she completed a PhD at the University of Toronto with a thesis—and later book—on literacy, power and democracy. She has recently retired after two decades in the Global Affairs department of the United Steelworkers, which included member education on global issues and the organization of many international exchanges of workers, especially in the mining sector. She is now an Associate of the Centre for Research on Latin America and the Caribbean at York University in Toronto.

ACKNOWLEDGEMENTS

I would like to acknowledge the many friends and fellow travellers who have played roles in bringing this study of Mt. Polley and Mariana to fruition. It began after the Mariana catastrophe with a request from Idle No More asking me to facilitate contacts with Brazil for Indigenous activists in Canada affected by the Mt. Polley disaster. I had spent time in Mariana three months before the tailings dam collapsed, participating in a meeting of the International Articulation of People Affected by Vale (AV). This network had been created in 2010 with USW, then on strike against Vale, as a founding member. I continued to be active in AV after retirement, transitioning to a CERLAC/York University hat.

To mobilize my Brazilian colleagues I needed to know more about Mt. Polley than the information available through the Toronto media. By chance, my first online search included a glance at a report by Harsha Walia on Rabble. Her article lamented meagre media coverage and ran through a litany of problematic circumstances leading up to the Mt. Polley tailings dam collapse—unheeded warnings, political contributions, reduced inspections, Indigenous land rights, no emergency plan. In the seemingly disparate realities of British Columbia and Brazil, the circumstances leading to tailings dam collapses triggering major socio-environmental disasters and the responses by the mining companies, governments and social movements afterwards were remarkably similar. A writing project was born.

I want to thank the Brazil social movement activists in Affected by Vale, Movement of the Affected by Mining (MAM) and Movement of the Affected by Dams (MAB) both for their social imagination in carrying out innovative forms of struggle in Brazil, however difficult the rapidly changing contexts, and their enthusiastic support for my comparative writing project. I also want to thank the impressive network of scholar-activists in Brazil who use their research and writing skills to support the work of social movements and ally themselves closely with communities affected by mining. Very special thanks to Bruno Milanez, coordinator of PoEMAS for ongoing collaboration and support. This included travel to Toronto for panel presentations with people from Mt. Polley at a Social Sciences Congress in 2017, organizing university seminars in Rio and Juiz de Fora where I presented the study to Brazilian graduate students in 2017 and editing and translating an excerpt of the study for a Brazilian publication. The Brazilians at the seminars were fascinated to hear that mining companies could so strongly influence governments in a country like Canada!

I would also like to acknowledge the support and encouragement from activist friends in Canada with special thanks to Anne Catherine Kennedy, Development and Peace, the staff teams at MiningWatch and Kairos and Liisa North of CERLAC.

Huge thanks are due to the editors, Shannon Daub and Lucy Kenward, who worked through many versions of the study, as well as to the other members of the production team. I would also like to thank my family and close friends for their endless patience with my rants about mining and their ongoing love and support through a lengthy editing process sorting out the fine points of “tons” and “tonnes”, post-boom commodity market trends and the arcane world of tailings dams.

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Summary



INTERIOR OF BUILDING IN BENTO RODRIGUES, THE TOWN CLOSEST TO THE MARIANA TAILINGS DAM. NOVEMBER 2016, ONE YEAR AFTER THE BREACH. PHOTO: MIGUEL FERNANDES FELIPPE, TERRA / UFJF.

THIS PAPER EXPLORES THE MANY PARALLELS between the tailings dam spills at the Mount Polley mine in British Columbia (BC), Canada, and the Samarco mine in Mariana, Minas Gerais, Brazil.

The Mount Polley disaster took place in August 2014, when the dam holding toxic waste from the copper and gold mine collapsed, creating the largest environmental disaster in Canada’s mining history. It was not long after—in November of the following year—that the largest mine disaster in Latin American history took place in Mariana, Brazil, when an even larger reservoir of waste collapsed at the Samarco iron mine.

The enormity of tailings ponds

Despite their name, tailings ponds are often more like lakes—many square kilometres in size, held in by dams that may be 40 to more than 100 metres high.

“Tailings” refers to the chemical-laden waste rock left behind from the processing of ore: in milling and separating ore from marketable minerals, a huge quantity of waste rock is ground to the consistency of sand and ends up mixed with a tremendous amount of water into a “slurry,” which is then piped into a tailings pond. The solids settle to the bottom of the pond and also form “tailings beaches” that become an important buffer between a pond’s embankment (waste rock set up to hold in solids) and the water. A dam at the outer perimeter of the embankment then serves as a failsafe when water levels rise—though over time, and without proper maintenance, dams may be weakened by erosion, crack and then fail, as was the case with Mount Polley and Mariana.

When the overfilled Mount Polley tailings dam failed, mining waste that included arsenic, lead, mercury, selenium and phosphorus, among other substances spilled into the surrounding forest and lakes. And when Samarco’s Fundão dam collapsed, waves of toxic muck buried three communities, partially damaged many others—killing 19 people and leaving hundreds homeless—and devastated the surrounding region and major waterways before making their way to the Atlantic Ocean.



CONTENTS FROM THE MOUNT POLLEY TAILINGS POND GOING DOWN HAZELTINE CREEK INTO QUESNEL LAKE ON AUGUST, 5, 2014. PHOTO: JONATHAN HAYWARD / THE CANADIAN PRESS.

A tale of two breaches

Canada and Brazil may appear to represent such markedly different jurisdictions that a meaningful comparison seems unlikely: Canada is understood as a rich, “developed,” politically stable nation in the Global North, while Brazil is located in the poorer, “developing” Global South, popularly understood to be endemically corrupt and politically unstable. Yet a closer look at the mining disasters at Mount Polley and Mariana immediately reveals remarkable similarities, not only in the contexts and circumstances leading up to the breaches but also in the corporate, governmental and civil society responses afterwards.

In both cases, the mining companies had enjoyed a decade of rising mineral prices, during which they pursued aggressive expansion, sought more relaxed licensing and regulatory procedures, and quickly built more and bigger tailings ponds in order to capitalize on the boom. When the boom ended and commodity prices plummeted, both companies took measures to maintain their profit levels that included cost-cutting, reducing maintenance and inspections, filling tailings ponds beyond their designated capacities and ignoring warnings, recommendations and known structural flaws.

The corporate owners of both mines—Imperial Metals, owner the Mount Polley Mining Corporation, and Vale and BHP Billiton, joint owners of Samarco Mining—enjoyed close relationships with major political parties and government officials. The mining industry in both jurisdictions pressured governments to adopt their agenda on licensing, environmental safety and third-party inspections. And the companies in question donated generously to political parties, thereby giving elected officials a financial interest—and, since electoral campaigns are expensive, a political interest—in promoting the mining sector and prioritizing the needs of industry.

In each jurisdiction, governments streamlined review and approval processes, reduced oversight and eased regulatory requirements for energy and mining corporations (among others).

At the same time, in both Brazil and Canada, mining law and common operational practices carried vestiges of the countries’ histories of colonial occupation and the dispossession of Indigenous peoples. Indeed, at both Mount Polley and Mariana the mining companies impacted territories

In both cases, the mining companies had enjoyed a decade of rising mineral prices, during which they pursued aggressive expansion, sought more relaxed licensing and regulatory procedures, and quickly built more and bigger tailings ponds in order to capitalize on the boom.

with Indigenous land claims, where spills would disproportionately impact Indigenous populations that, for practical and spiritual reasons, depended on the land, water and ecosystems in the surrounding areas.

Disasters foretold

The Mount Polley and Mariana dam spills should be understood as symbols of the unregulated power of transnational corporations.

At both sites, numerous warnings about the security of the dams were ignored and mining companies were allowed to go ahead with production despite serious risks.

At both sites, numerous warnings about the security of the dams were ignored and mining companies were allowed to go ahead with production despite serious risks. In the case of Mount Polley, a 2010 inspection report identified problems including a crack in the perimeter wall of the dam that had gone unreported, broken instruments for measuring water pressure, and a failure to develop adequate tailings beaches. A 2011 review also pointed out glaring omissions in the Mount Polley Mining Corporation's assessment of the potential impact of a discharge of wastewater, and the Corporation's failure to develop a detailed monitoring or emergency plan.

Despite this, after the dam collapse, Imperial Metals president Brian Kynoch was widely cited as saying, "If you asked me two weeks ago if this could have happened, I would have said it couldn't."

In the case of Mariana, a 2012 inspection into the possibility of unauthorized alterations to the Fundão dam identified a partial rupture that presented a severe structural risk and required more repairs than were being undertaken. In 2014, the same inspector also recommended the installation of additional instruments to measure water pressure (piezometers), but no such thing was done.

BENTO RODRIGUES, DECEMBER 2015, ONE MONTH AFTER THE BREACH. PHOTO: BRUNO MILANEZ, POEMAS / UFJF.





HAZELTINE CREEK (DOWNSTREAM), ONE MONTH AFTER THE MT. POLLEY BREACH. PHOTO: RICHARD HOLMES.

Further, like the Mount Polley Mining Corporation, Samarco Mining also failed to prepare for potential emergencies. A plan for monitoring and emergency procedures had been drawn up in 2009—including a dam monitoring protocol, warning systems and emergency evacuation drills—but then iron prices fell, the company sought to cut costs and the plans were shelved. As a result, there was no advance warning when the Fundão dam collapsed, even for communities hit by toxic muck 14 hours after the breach.

At both mines, the companies' failure to act on warnings and prepare for possible disasters point to an alarming corporate practice of putting production and profit ahead of safety considerations. It also raises serious questions about governments' ability to challenge the power and impunity of the global mining industry, and its willingness to govern in a manner that actively protects the environment and the rights of its citizens—economic, social, cultural, Indigenous and universal human rights.

Moving forward

After scrutinizing the events leading up to the breaches, it would seem that they are, indeed, chronicles of disasters foretold—with more in the offing.

A study of more than 40 years of tailings incidents (conducted for AMEC Earth and Environmental) suggested that the frequency of incidents can be expected to increase in the 24 to 36 months after market booms. And a report from the panel investigating the Mount Polley incident found that “if the inventory of active tailings dams in the province remains unchanged, and performance in the future reflects that in the past, then on average there will be two failures every 10 years and six every 30.”

This is not to mention the chilling fact that only seven months after the Mount Polley disaster, long before investigations into the disaster had concluded, Imperial Metals applied for a permit

Clearly, fundamental challenges still lie ahead in tackling the mining industry's current power and impunity.



BENTO RODRIGUES, DECEMBER 2015, ONE MONTH AFTER THE BREACH. PHOTO: BRUNO MILANEZ, POEMAS / UFJF.

To date, there is no independent compliance and enforcement agency for mining in BC—and lobbying activities by the mining industry continue without limitation.

to restart the mine. Similarly, an application for the reopening of Samarco was filed before assessments of damages were complete, and while clean up and reparations were still underway.

Clearly, fundamental challenges still lie ahead in tackling the mining industry's current power and impunity. Some of these challenges are being addressed by Indigenous leaders, social movements, NGOs and institutions such as churches, unions and universities, which have been critiquing mining company behaviour, supporting the emergency relief needs and compensation claims of those who lost lands and livelihoods because of the breaches, and producing numerous public policy recommendations. In Canada, the University of Victoria's Environmental Law Centre called for a Judicial Inquiry on BC mining regulation, for which an urgent need was established in the March 2017 study the Centre prepared for the Fair Mining Collaborative. The Centre's call portrayed a provincial mine regulatory system in a "state of profound dysfunction."¹ Amnesty International's study of rights violations linked to Mt. Polley also called for a public inquiry and release of information from impact studies. At the international level, the UN Environment Programme carried out a "Rapid Response Assessment" focused on mine tailings storage, with Mariana photos on the cover and a Mt. Polley case study in the contents.² UNEP made detailed recommendations on better tailings management that give priority to safety and called for the establishment of a UN Environment stakeholder forum on tailings dam regulation.

However, we must also address the context of "regulatory capture," which occurs when regulation, or the carrying out of regulatory oversight by a government body, is directed or unduly influenced by the private industry subject to regulation. The process of capture involves not only lobbying, political contributions and "revolving doors" between government and corporate leaders, but also the advancement of a narrative that blurs the distinction between corporate interests and what is genuinely in the public interest.

The BC government has recently taken important steps in three key areas. First, it has committed to implementing the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) and the calls to action from the Truth and Reconciliation Commission. Second, the government introduced a ban on corporate and union political donations, which cuts off the large stream of money flowing to political parties from mining and other extractive industry groups. And third, the government has undertaken a review of the model that allows resource companies to hire "qualified professionals" to review proposed projects instead of public officials.

Whether the mining industry's power and the problem of regulatory capture in BC are significantly curbed remains to be seen. Notably, the government has been silent on a central recommendation from the Auditor General of BC stemming from an investigation into the government's compliance and enforcement activities in the mining sector: to address the conflict of interest inherent in a model where the same government body (the Ministry of Energy and Mines) is tasked with both promoting mining and regulating it. To date, there is no independent compliance and enforcement agency for mining—and lobbying activities by the mining industry continue without limitation.

If regulatory capture continues, who will speak for workers and communities, for land, rivers and the salmon? The challenge now is ultimately one of political will.

1 Environmental Law Centre, *Re: Request for Establishment of a Judicial Commission of Public Inquiry to Rectify and Improve BC Mining Regulation*, March 8, 2017, http://www.elc.uvic.ca/wordpress/wp-content/uploads/2017/03/2016-03-02-MiningPublicInquiry_2017Mar8.pdf
2 Roche, C., Thygesen, K., Baker, E. (Eds.), *Mine Tailings Storage: Safety Is No Accident*, A UNEP Rapid Response Assessment, 2017, <http://www.grida.no/publications/383>

Introduction

ON AUGUST 4, 2014, THE DAM HOLDING TOXIC WASTE from the Mount Polley copper and gold mine in the Cariboo region of British Columbia (BC) collapsed. More than 24 million cubic metres of metals-laden fine sand and water were spilled from the breached dam, creating the largest environmental disaster in Canada's mining history. The spill flooded Polley Lake and flowed into Hazeltine Creek and Quesnel Lake. Land, water systems and salmon habitat were destroyed. The Northern Secwepemc people, on whose territory the mine was located, lost land, livelihoods and traditional uses integrally linked to the land.

On November 5, 2015, the Fundão tailings dam, an even larger reservoir of mine waste, collapsed at the Samarco iron mine in Mariana, Brazil. More than 32 million cubic metres of toxic tailings were spilled into the 853-kilometre-long Rio Doce (Sweet River in English) causing a tsunami-like wave of toxic muck that rapidly made its way through the states of Minas Gerais and Espírito Santo and out to the Atlantic coast. The Rio Doce basin is home to 3.2 million people.

The Samarco mine disaster is the largest in Latin American history. Nineteen people lost their lives, three nearby communities were buried and more than 1,200 people were left homeless.³ Communities located even hundreds of kilometres from the mine site lost their lands, crops, livestock, fishing livelihoods and water access. These included an Indigenous community of 400 Krenak people living on the remaining 4,000 hectares of their traditional land on the bank of the Rio Doce.

Canada and Brazil represent such markedly different jurisdictions that, at first glance, a meaningful comparison seems unlikely. Canada is located in the Global North, popularly understood as being countries that are rich, "developed," politically stable and democratic. Brazil is located in the Global South, also known as the "Third World" and popularly understood as being countries that are poor, "developing," endemically corrupt and politically unstable. Yet a closer look at

A closer look at the mining disasters at Mount Polley and Mariana immediately reveals remarkable similarities, not only in the contexts and circumstances leading up to the breaches but also in the corporate, governmental and civil society responses afterwards.

3 Grupo Política, Economia, Mineração, Ambiente e Sociedade (PoEMAS), *Antes fosse mais leve a carga: avaliação dos aspectos econômicos, políticos e sociais do desastre da Samarco/Vale/BHP em Mariana (MG)*, 2015, <http://www.ufjf.br/poemas/files/2014/07/PoEMAS-2015-Antes-fosse-mais-leve-a-carga-versão-final.pdf>. PoEMAS is an interdisciplinary working group of university-based researchers in Brazil who are monitoring the mining industry through the lenses of public policy, economy, mining, environment and society. Just two months after the collapse of the Fundão dam, PoEMAS published a full report on the economic, policy and social aspects of the disaster, designating it an "environmental crime." I am grateful to PoEMAS for their encouragement to take on this comparative study, drawing deeply on their material, and for their invitation to present the paper at the Federal Universities of Rio de Janeiro and Juiz de Fora in October 2017.



In both cases, warnings about weaknesses in the tailings dam structures were downplayed and/or went unheeded.

the mining disasters at Mount Polley and Mariana immediately reveals remarkable similarities, not only in the contexts and circumstances leading up to the breaches but also in the corporate, governmental and civil society responses afterwards.

In both countries, the mining companies had enjoyed a decade of rising mineral prices that ended with an equally dramatic price collapse. In response to post-boom market conditions, they were intensifying production while cutting costs in an effort to keep profit levels up. In both cases, warnings about weaknesses in the tailings dam structures were downplayed and/or went unheeded. Neither company had made even minimal preparations for dealing with a major environmental disaster, whether measured in emergency evacuation plans or financial resources to cover environmental damages and compensation claims.

In both Canada and Brazil, the mining companies enjoyed close relationships with political parties and government officials. They made significant contributions to the major political parties and carried out intense lobbying activities to pressure governments to adopt the mining industry's agenda on licensing, taxation and royalties, environmental safety and third-party inspections.

Another common feature was that in both countries, the mines had an impact on land protected by government. In Canada, the mine site was part of an active Indigenous land claim. In Brazil, the mining operation abutted *quilombos*, land that belongs to slave descendants, and the toxic spill destroyed Indigenous communities. While governments in both Brazil and Canada acknowledged these special rights, Indigenous peoples and *quilombo* residents regularly saw their rights trumped by mining company demands exercised with full government support.

The Mount Polley and Mariana spills make it abundantly clear that the location of a mine—whether in the Global North or the Global South—brings no guarantee of rigorous government regulation of the industry or effective company management to protect workers and the surrounding environment. This paper will explore the many parallels between the disasters at the Mount Polley and Samarco mines, reflecting on how similar circumstances exist globally. It will look at how power relations between mining corporations and governments are being transformed in many jurisdictions. And it will reflect on ways to mitigate the factors that contributed to the tragedies in order to prevent similar disasters at other mines.



COLLAPSED MT. POLLEY
TAILINGS DAM WALL, FOUR
DAYS AFTER THE BREACH.
PHOTO: RICHARD HOLMES.

I travelled to Brazil in August 2015, three months before the dam breach in Mariana, as part of a “caravan” to monitor mining operations in preparation for a meeting of the International Articulation of Those Affected by Vale. This network of unions, environmental and human rights activists, mining communities, public policy analysts, researchers and faith communities was established in 2010 at a meeting in Rio de Janeiro attended by 160 activists from 14 countries where Vale operates. Its function is to monitor, communicate and initiate joint action to resist Vale’s abuses of power and seeming impunity.⁴

In both Canada and Brazil, the mining companies enjoyed close relationships with political parties and government officials.

A year later, in November 2016, I returned to Mariana to commemorate the first anniversary of the Fundão dam disaster, or what Brazilian activists had designated as the Rio Doce “environmental crime.” This time our caravan started at Linhares, the fishing and surfing town where the toxic spill had entered the Atlantic Ocean, and we worked our way back along the route of the spill to the mine. Along the way we held commemorative events and tree plantings with local communities, and public meetings that included a two-day session hearing testimonials from affected communities, Indigenous leaders, political and religious figures, university scholar-activists and international guests from other mining communities. On November 5, in what used to be Bento Rodrigues, the town closest to the tailings dam, those present renewed their commitments—to keep fighting for the rights of the citizens who suffered most directly from the dam collapse at Mariana and to strengthen the campaigns for a radical paradigm shift in the extractive sector, both in Brazil and globally.⁵

In the fall of 2017 I returned to Brazil once more to participate in the Eighth National Meeting of MAB, the Movement of People Affected by Dams. Immediately after the spill, MAB had sent activists from dams in other regions of Brazil to work in the affected communities along the Rio Doce. They coordinated relief efforts, carried out damage surveys and worked with church and

4 Canadian participation in the first years of the Vale network was through USW (then on strike against Vale) and MiningWatch. Since my retirement from the Global Affairs Department of USW in 2013, I have continued to be active in the network as an Associate of the Centre for Research on Latin America and the Caribbean (CERLAC) at York University.

5 Judith Marshall, “Toxic Tsunami,” *Canadian Dimension*, January 16, 2017, <https://canadiandimension.com/articles/view/toxic-tsunami>.

In both Canada and Brazil, the responses of governments and mining companies to these disasters have been wholly inadequate, strongly raising the question of how many other operational mines are at similar risk of catastrophic failure.

labour movements to rally support for those affected. Two years later, 3,500 activists, including teens and kids, gathered in Rio for a MAB conference. They attended strategic planning sessions and carried out street demonstrations to demand justice for those affected by the tailings dam spill at the Samarco mine, to protest further privatizations in Brazil and to propose a new energy policy.

In both Canada and Brazil, the responses of governments and mining companies to these disasters have been wholly inadequate, strongly raising the question of how many other operational mines are at similar risk of catastrophic failure. Operations at Mount Polley have resumed, and no one has faced fines or punitive measures connected with the spill. And though that breach polluted the glacial waters of Quesnel Lake in 2014, the mine was quietly given official permission to dump its waste into the lake permanently in 2017.⁶ Furthermore, new mines in BC, like Imperial Metals' Red Chris mine, continue to use the same tailings dam technology that failed at Mount Polley to create even bigger tailings reservoirs to hold even more toxic tailings.

In Brazil, Samarco has not yet resumed operations. Yet mining companies continue to try to rush through even larger mining projects, like Anglo American's Minas Rio mine with a tailings dam seven times bigger than the one at Fundão. In April 2017 local community activists were able to temporarily suspend the public hearing about Minas Rio's expansion for lack of adequate and timely community notification. The activists were later subjected to intimidation, however, and the project was expanded.⁷

All over the world, Indigenous peoples, local communities, environmentalists, social movements, universities and churches are working to resist the power of mining corporations and the image they sell of mining projects as guarantors of economic growth, jobs and poverty alleviation. They are working to challenge the seeming impunity of mining corporations when they put profit for shareholders and directors ahead of workers' rights, community well-being and protection of the environment. They are working at community, local, national and global levels.

Mount Polley and Mariana have become symbols of the unregulated power of transnational corporations. This paper serves as a cautionary tale about why mining corporations need to be challenged.

6 Carol Linnitt, "B.C. Quietly Grants Mount Polley Mine Permit to Pipe Mine Waste Directly into Quesnel Lake," *DeSmog Canada*, April 17, 2017, <https://www.desmog.ca/2017/04/17/b-c-quietly-grants-mount-polley-mine-permit-pipe-mine-waste-directly-quesnel-lake>.

7 "Briefing on Anglo American's Minas Rio Iron Ore Mine in Brazil," London Mining Network, July 24, 2017, <http://Londonminingnetwork.org/2017/07/briefing-on-anglo-americans-minas-rio-iron-ore-mine-in-brazil/>.

The Mount Polley and Samarco mines in context

IN BC, MINERAL AND COAL MINING HAVE HISTORICALLY been a vital component of the economy. Major transnational mining companies—Teck, Goldcorp, First Quantum Minerals and Placer Dome (before its merger with Barrick Gold)—have headquarters in Vancouver from which they run operations abroad and/or in Canada. Mid-sized mining companies, such as Imperial Metals, which owns the Mount Polley mine, also operate in the province.

Imperial Metals was incorporated in December 1959. It went through several phases in its evolution as an exploration, development and mining company, most important of which was a merger with Bethlehem Resources Corporation in 1995. Today, the company's headquarters and all of its operations are in BC. The Mount Polley gold and copper mine, the Red Chris copper and gold mine near Dease Lake, and the Huckleberry copper mine near Houston are all fully owned by Imperial Metals.⁸ The Ruddock Creek zinc-lead project northeast of Kamloops is still under study. It is a joint venture in which Imperial holds 50 per cent, with Mitsui Mining and Smelting (30%) and Itochu Corporation (20%) holding the balance.⁹

Imperial Metals' subsidiary, Mount Polley Mining Corporation (MPMC), consists of an open-pit mine with an underground component and a mill that processes over 18,000 tonnes¹⁰ of ore per day. It has one tailings storage facility. Currently, concentrate from the mill is trucked to the Port of Vancouver and shipped to smelters overseas (primarily in Asia) or sent by rail to smelters across North America. Opened in 1997, the current mine is expected to be productive through 2026.¹¹

Mine workers travel from nearby communities to the mine site, which is located approximately eight kilometres southwest of Likely (about 30 kilometres by road) and 60 kilometers (almost 100 kilometres by road) northeast of Williams Lake. The Mount Polley employees work on a cycle of 12-hour shifts, alternating between a week of seven 12-hour shifts and a week off.¹² At the time

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8 Imperial Metals website, accessed January 8, 2018, <https://www.imperialmetals.com/>.

9 Ibid., <https://www.imperialmetals.com/projects/ruddock-creek/overview>.

10 Tonne and metric ton are the same unit of measurement (1,000 kilograms) and are used interchangeably in this paper.

11 Ibid., <http://www.imperialmetals.com/our-operations/mount-polley-mine/overview>.

12 Cited in United Steelworkers, Collective Agreement between Mount Polley Mining Corporation and United Steelworkers, January 1, 2013–December 31, 2017, http://www.uswa425.ca/documents/Mt_Polley_2013-2017_CA.pdf.

DRONE PHOTO OF THE DRAINED MOUNT POLLEY TAILINGS POND ONE YEAR AFTER THE DAM BURST. NOTE THE RED DEAD TREES AT THE EDGES AND HOW THE TAILINGS POND IS PERCHED UP HIGHER THAN ITS SURROUNDINGS. PHOTO: JEREMY WILLIAMS / WILDERNESS COMMITTEE.



of the tailings dam collapse, MPMC employed about 380 permanent workers with another 1,000 connected through sub-contractors or suppliers.

Brazil's thriving extractive sector includes massive iron mines, and the Samarco operation in Mariana ranks as the third-largest iron-mining site in Brazil. It processes low-grade iron into pellets that are marketed to the global steel industry. Samarco is owned by two transnational mining giants: Vale, formerly a Brazilian state company, and BHP Billiton, an Anglo-Australian company headquartered in Melbourne. Founded in 1977, Samarco operates an integrated system in the states of Minas Gerais and Espírito Santo that comprises two mines, three processing plants, three mineral pipelines, four pellet plants and a maritime terminal. The Mariana complex also includes three other mines and four processing plants wholly owned by Vale.¹³ Samarco stores the dry waste from extraction and initial processing in waste dumps and the wet waste in one of nine tailings dams (three owned by Samarco, six by Vale) or eight dikes (all owned by Vale), all within the Mariana complex.¹⁴

Between 2009 and 2014, Samarco employed more than 6,600 workers, about 56 per cent of them hired by sub-contractors.¹⁵ Large numbers of sub-contracted workers have become the norm throughout the mining industry in Brazil and elsewhere. At the time of the disaster, more than half of Samarco's workers had been hired on short-term contracts, sometimes rotating in and out of the same job but for different sub-contractors. The sub-contracted workers were earning less and had poorer working conditions than the permanent—and unionized—employees. A large number of these sub-contracted workers were laid off after the global price of iron collapsed.¹⁶

13 JustiçaGlobal, *Inside the Vale of Mud: A Report on the Tailings Dam Collapse in Brazil*, January 13, 2016, https://issuu.com/justicaglobal/docs/inside_the_vale_of_mud.

14 PoEMAS, 2015, 48. Samarco's Germano, Santarém and Fundão dams plus Vale's Campo Grande are all categorized by Brazilian environmental authorities as Class III dams. There are 450 tailings dams in Minas Gerais, of which 159 are classified as Class III, which means they present a high risk for causing environmental damage and therefore need to be inspected annually.

15 *Ibid.*, 34.

16 *Ibid.*

At the time of the disaster, more than half of Samarco's workers had been hired on short-term contracts, sometimes rotating in and out of the same job but for different sub-contractors.

Table 1: The Mount Polley and Samarco mines at a glance

	Mount Polley Mining Company	Samarco Mining S.A.
Ownership	Imperial Metals Corporation	Vale/BHP Billiton 50/50
Location	Williams Lake, British Columbia, Canada	Mariana, state of Minas Gerais, Brazil
Founded	1995	1977
Products	Copper, gold, some silver	Iron
Operations	Open-pit mine, mill, tailings dam, truck transport to port in Vancouver	2 open-pit mines, 3 processing plants, 4 pellets plants, 3 mineral pipelines, 3 tailings dams, port
Boom price peak (Can\$)	Gold \$1,883/oz (2011) Copper \$4.50/lb (2011)	Iron ore pellets \$210/metric ton (2011)
Post-boom lows (Can\$)	Gold \$1,300/oz (2013) Copper \$2.25/lb (2014)	Iron ore pellets \$80/metric ton (2015)
Direct employees	380, unionized with USW	2,900, unionized with Metabase
Contract employees/suppliers	1,000 plus	3,700 on short-term contracts
Tailings dam collapse	August 2014	November 2015
Volume of spill	25 million m ³	32 million m ³
Environmental impact	Surrounding water systems polluted, salmon-spawning areas destroyed	800-km Rio Doce basin polluted
Social impact	0 fatalities, loss of livelihoods for Indigenous communities, loss of properties and small businesses	19 fatalities, 1,200 homeless, loss of livelihoods throughout Rio Doce basin, which is home to 3.2 million people

Source: Compiled by author.

Mining operations in post-boom commodity markets

The new millennium ushered in a decade of steadily rising commodity prices worldwide that peaked at extremely high levels before falling sharply.

MANY MINING ANALYSTS ARE NOW STUDYING the correlation between tailings dam collapses and post-boom commodity markets. A commodity market is a physical or virtual marketplace that trades in raw, or primary, products rather than in manufactured goods. Soft commodities include agricultural products such as wheat, cocoa, coffee, tea and sugar. Hard commodities are extracted and include minerals, oil and natural gas. There are presently about 50 major commodity markets worldwide that trade in about 100 primary commodities.

The boom-and-bust cycles typically seen in commodity markets have many causes. Most obvious are natural disasters causing crop failures, major oil spills or conflicts that disrupt supply chains—all of which put pressure on supply and can drive prices up. Less obvious are the actions of millions of investors whose goal is to make money by buying when the prices are low and selling for a profit. Much of this trading is speculative. The new millennium ushered in a decade of steadily rising commodity prices worldwide that peaked at extremely high levels before falling sharply. For minerals, one major factor driving the boom was the seemingly insatiable demand from Asian countries, especially China, during processes of rapid and dramatic industrialization. Concern over long-term availability of commodities like iron and copper kept prices high over an unusually sustained period. Mining companies expanded dramatically to meet the demand.

A few years before this 'super cycle' began, MPMC had faced a situation of dropping metals prices and mining operations were temporarily suspended in 2001. Gold was hovering around \$400 per ounce, down from almost \$600 per ounce just four years earlier¹⁷ (see Figure 1) and copper prices were stuck around \$1 per pound¹⁸ (see Figure 2).

Exploration for new ore zones at Mount Polley continued during this period, however.¹⁹ As gold and copper prices began to rise, and with the discovery of significant new mineral deposits at Mount Polley and new technologies for leaching lower-grade, highly oxidized deposits, MPMC

17 <https://goldprice.org/spot-gold.html>. Accessed July 9, 2018.

18 "Historical Copper Prices and Price Chart," InfoMine website, accessed March 5, 2018, <http://www.infomine.com/investment/metal-prices/copper/all/>.

19 "Hidden but Hot," Canadian Mining Journal, January 1, 2012, <http://www.canadianminingjournal.com/features/hidden-but-hot/>.

Figure 1: 20 Year Gold Price in CAD/oz



Source: GoldPrice.org

Figure 2: World copper prices, 2000 to 2017



Source: InfoMine.com



BENTO RODRIGUES, DECEMBER 2015, ONE MONTH AFTER THE BREACH. PHOTO: BRUNO MILANEZ, POEMAS / UFJF.

At the peak of the sky-high mineral prices, companies expand aggressively. They also push for more relaxed licensing procedures and more self-regulation in order to capitalize on the boom.

was able to resume operations in 2005.²⁰ It went on to realize large profits when gold and copper prices peaked in 2011 at \$1,883 per ounce²¹ and almost \$4.50 per pound respectively²².

Boom-and-bust cycles are a regular feature of trade in commodities, and inevitably prices collapsed again. By 2013, gold prices had plunged 30 per cent to close the year at under \$1,300 per ounce. And by 2014, copper prices had fallen 33 per cent from their peak to just \$3 per pound. Imperial Metals and the Mount Polley mine were feeling the effects.

Not surprisingly, the rise and fall of the commodities super cycle also had a dramatic impact on iron mining in Brazil. Iron ore pellet prices plunged from a historic high of over \$210 per metric ton in 2011 to a low of less than \$80 per metric ton in 2015.²³ Vale/BHP Billiton and the Samarco mine were directly affected.

Brazilian analysts are among those arguing that mining companies and their government allies around the globe have had the same responses during boom-and-bust cycles. At the peak of the sky-high mineral prices, companies expand aggressively. They also push for more relaxed licensing procedures and more self-regulation in order to capitalize on the boom. The boom prices make it cost-effective to extract scattered lower-grade ore bodies in difficult-to-access areas. Mining companies increase their use of open-pit mining and use more heap leaching, a low-cost method of extracting precious metals like gold and copper from low-grade ores by heaping them on a pad and applying a leaching solvent. These techniques dramatically increase the ratio of mining waste to marketable ore, which in turn means a need for more and bigger tailings ponds and increased pressure to overextend the engineered capacity of the existing dams.²⁴

Before the breach of the Fundão dam, Samarco had been accelerating the scale of iron production (and therefore the amount of tailings) at the Mariana mine in order to maintain its profit levels in the post-boom market. Samarco's fourth pellet plant, which it launched in 2014, increased production by 37 per cent. At the same time, Samarco had been reducing its costs by laying off workers and spending less on maintenance and safety and cutting workers benefits like food rations and payment for travel time.²⁵

Are there indications that MPMC followed this trend of increasing production and decreasing costs and safety measures? Dr. Werner Antweiler from the Sauder School of Business at the University of British Columbia drew attention to what substances and what quantities were going into Mount Polley's tailings pond (Table 2) in his blog post entitled "Lessons from the Mount Polley Mine Tailings Spill."²⁶ Dr. Antweiler concluded that the data MPMC disclosed to the National Pollutant Release Inventory in the five years before the spill "makes it quite apparent that the level of production increased dramatically in 2013 from the previous four years, leading to a much higher need to discharge effluent through the tailings pond."

20 "Project Review: Mount Polley Porphyry-Copper Mine BC, Canada," Geology for Investors website, accessed April 25, 2018, <https://www.geologyforinvestors.com/project-review-mount-polley-porphyry-copper-bc-canada/>.

21 GoldPrice.org.

22 "Historical Copper Prices and Price Chart," InfoMine website, accessed March 5, 2018, <http://www.infomine.com/investment/metal-prices/copper/all/>.

23 <http://www.infomine.com/investment/metal-prices/iron-ore-pellets/all/>. Accessed May 23, 2018.

24 PoEMAS, 2015.

25 Ibid.

26 Dr. Werner Antweiler, "Lessons from the Mount Polley Mine Tailings Spill," personal blog, August 8, 2014, <https://wernerantweiler.ca/blog.php?item=2014-08-08>.

Table 2: Mount Polley tailings dam pollutants, 2009 to 2013

Year	Arsenic (tonnes)	Cobalt (tonnes)	Copper (tonnes)	Lead (tonnes)	Manganese (tonnes)	Mercury (kg)	Nickel (tonnes)	Phosphorus (tonnes)	Vanadium (tonnes)
2013	406	475	18,413	177	20,988	3,114	326	41,640	5,047
2012	101	142	6,723	141	4,733	435	63	10,056	1,637
2011	125	129	7,570	66	4,733	469	56	9,735	1,357
2010	171	139	9,044	81	7,444	670	73	11,374	1,474
2009	121	105	9,016	125	3,231	509	48	7,784	1,045

Source: National Pollutant Release Inventory, Facility Number 5102²⁷

Both mining companies faced post-boom market conditions after commodity prices plummeted. To maintain their profit levels with low ore prices, they—like other mining companies around the world—simultaneously intensified production levels and cut costs. The result: mining with fewer safeguards, up to and including filling tailings ponds beyond their designed capacities and reducing inspections and safety measures.

The Fundão tailings dam that ruptured in Mariana dates back to 2008, at the height of the mining boom.

Various tailings dams were built in a hurry in those years to take advantage of high commodity prices. Afterwards, the need to reduce costs as a function of the crisis in the sector...impelled cuts, up to and including cuts in budgets for mine safety. This results not only in major accidents like Mariana, but also in smaller accidents, including workplace accidents. This is a global tendency in the sector.²⁸

At Mount Polley, a technical report prepared in 2011 in response to MPMC’s proposal for a controlled spill already pointed to major problems. Dr. Werner Antweiler drew on this report as he analyzed the lessons from the Mount Polley breach:

The company had not yet prepared a detailed monitoring plan or emergency contingency plan. Also, the pond levels were already getting too high, and the mine was in need of discharging 1.4 million cubic meters of water per year to remain at the same level. The report did not include a review of the structural engineering of the tailings pond and dams, however. Since 2012, the company has been warned several times that the height of the water in the pond exceeded recommended levels. While not all facts are known yet, there are early indications that the tailings pond failure was preventable if the company had acted sooner to address concerns and not increased output of the mine before appropriate and adequate effluent treatment options were in place.²⁹

MPMC and Samarco both faced post-boom market conditions after commodity prices plummeted. To maintain their profit levels with low ore prices, they simultaneously intensified production levels and cut costs. The result: mining with fewer safeguards.

27 Ibid.

28 Sônia Araripe and Hélio Rocha, “Maior crime ambiental do Brasil deixa lições e alerta,” *Plurale* em revista no. 50 (November–December 2015): 26, <https://issuu.com/prodweb/docs/plurale-50>. Author’s translation.

29 Antweiler, 2014.

Tailings dams: accidents waiting to happen?



PARACATU DE BAIXO,
DECEMBER 2015, ONE
MONTH AFTER THE
BREACH. PHOTO: BRUNO
MILANEZ, POEMAS / UFJF.

THE COLLAPSE OF THE TAILINGS DAMS at Mount Polley and at Mariana created the biggest environmental disasters in Canadian mining history and in Latin American mining history, respectively. While some argue that these events were singular incidents, many others see them as the new normal in the world of mining. In other words, should tailings dams best be seen as accidents waiting to happen?

The environmental disasters caused by tailings dam collapses like the ones at Mount Polley and Mariana have put mining waste disasters on public policy agendas not just in Canada and Brazil but globally. They have brought increased attention to the challenges of mine waste management and safety and a new focus on mine tailings dams as storage facilities.

In the wake of the Mount Polley disaster, the *Vancouver Sun* published a primer on tailings dams (based on interviews with Harvey McLeod, chair of the Subcommittee on Tailings Dams for the International Commission on Large Dams, and Scott Dunbar of the Norman B. Keevil Institute of Mining Engineering at the University of British Columbia), which can be summarized as follows:³⁰

Grinding up ore to separate out marketable minerals leaves behind a huge quantity of waste rock and uses a tremendous amount of water. During this process, the waste rock is reduced to the consistency of sand and referred to as tailings. These tailings are piped out of the mill in a slurry and deposited into tailings “ponds.” A tailings dam is the physical structure that holds in, or impounds, the pond, which contains not only the tailings from the ore-milling and separation process but also the water to be reused in processing. In the pond, the solids settle to the bottom and the water on top is pumped back into the mill. Despite its name, a tailings pond is often more like a lake, many square kilometres in size. A tailings dam can reach as high as 300 metres in mountainous valleys.

How a dam is built depends on where it is located and the materials available, but generally it is an earth-filled structure or it is built from the sand or rock generated in mining. The pond is created by forming an embankment of waste rock, and then the tailings slurry is deposited at the crest of that embankment. As the solids settle out, they form

³⁰ Derrick Penner, “How Tailings Dams Work,” *Vancouver Sun*, August 12, 2014, www.vancouversun.com/technology/tailings+dams+work/10102756/story.html.

a beach that becomes an important buffer between the dam's embankment and the water in the pond. Essentially, the embankment is meant to hold back solids rather than water, though a dam is designed to withstand water up to the crest of the embankment in an emergency. If the water level remains high over time, it will eventually erode the structure.

In the primer, Mr. McLeod offered further observations on tailings dam standards:

McLeod added that standards for tailings dams have evolved, but in Canada today are built under and regulated by the guidelines of the Canadian Dam Association. They are overseen by the BC Ministry of Energy and Mines, which requires annual inspections and comprehensive dam safety reviews that are done every five years. He added that the CDA and Association of Professional Engineers of BC recommends that the five-year reviews be conducted by an independent third party, but don't require it.³¹

Dr. Daniel Franks, former director of the Centre for Social Responsibility in Mining at the University of Queensland and a specialist in sustainable development in extractive industries, lectures internationally on how to deal responsibly with mine waste management. In his presentations, Dr. Franks underscores the fact that the global mining industry is by far the largest annual producer of solid waste, both as waste rock and as tailings.³² He further highlights two related facts. First, ore grades are generally declining and therefore the ratio of waste (tailings and waste rock) to marketable ore is increasing. Second, the tailings typically stored in tailings ponds are laden with chemicals from the extraction and separation processes. According to Dr. Franks, "The most significant pollution incidents associated with tailings dams result from the failure of the dam and the dispersal of tailings into nearby ecosystems."³³

The challenge, contends Dr. Franks, is to render mining and mineral processing waste inert (or at least chemically stable and contained), reduce the water and energy needed to do so, and find alternate uses for it. He notes:

Future trends in mining and processing may compound the challenges of waste management, as lower ore grades increase the ratio of waste produced for a given unit of resource, and emphasise the urgency and need for the industry to adopt new approaches. New technologies and innovations...have greatly increased the waste disposal methods available to meet the future challenges to sustainable development.³⁴

In 2014, Andrew Nikiforuk, a journalist and long-time commentator on the energy sector, reflected on the scale of mine waste and the trend toward ever-larger tailings dams.

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31 Ibid.

32 Dr. Franks lectures widely. In 2014, he presented a paper to United Nations Development Programme (UNDP) and the Government of Brazil entitled "The Extractive Sector and the Post-2015 Development Agenda: Cross Sector Cooperation to Address Environmental Challenges." In 2012, the mining industry worldwide produced approximately 7.3 billion tonnes of tailings and 8.42 billion tonnes of waste rock (see p. 32, <http://www.extractivedialogue.com/wp-content/uploads/2014/09/TheExtractiveSector.pdf>). Dr. Franks also designed a course called "Natural Resources for Sustainable Development: The Fundamentals of Oil, Gas and Mining Governance" for mid-level government employees and non-governmental organizations offered by the Natural Resource Governance Institute at Columbia University in 2016.

33 Franks, 2014, 29.

34 Daniel M. Franks et al., "Sustainable Development Principles for the Disposal of Mining and Mineral Processing Wastes," *Resources Policy* 36 (2011): 114–122.



Findings suggest that the frequency of tailings dam incidents can be expected to increase in the 24 to 36 months after cyclical booms.

Every year, the industry digs and moves as much solid rock (several thousand million tonnes per year) as all earthen materials transported by natural geological processes, such as landslides and erosion.

Because of the challenge of peak metals and high global demand, the mining industry... must not only dig deeper for poorer quality ores, but create larger and taller dams of tailings waste.

As a result, the dykes that contain the waste have been growing higher and larger every year. The maximum height of a tailings dam has grown from 120 metres in the 1960s to 240 metres today.³⁵

Dams and ponds are not the only way to manage tailings, however. In his analysis of the Mount Polley mine disaster, Dr. Antweiler considered best practices with respect to tailings. He wrote:

A tailings pond is usually the cheapest method of treating tailings.... There are also more costly alternatives to tailings ponds. One method is dry stacking: tailings are dewatered through a combination of mechanical pressure systems and vacuum filtration systems. The filtered tailings can be transported by conveyor belt to a “stack” site. Dry stacking completely eliminates the risk of catastrophic failure and tailings runout, and also prevents groundwater contamination through seepage.³⁶

Safer storage options cost more money, as Dr. Antweiler pointed out, which may well be why they, in fact, are rarely used.

35 Andrew Nikiforuk, “The Risky Rise of the Dams,” *The Tyee*, August 7, 2014, <https://thetyee.ca/News/2014/08/07/Risky-Rise-of-Dams/>.

36 Antweiler, 2014.

In 2009, Michael Davies and Todd Martin, both working at the time for the mining engineering consultancy firm AMEC Earth and Environmental,³⁷ analyzed commodity prices and 143 tailings incidents that occurred between 1968 and 2009.³⁸ Their findings suggest that the frequency of tailings dam incidents can be expected to increase in the 24 to 36 months after cyclical booms. When they dug further into the case studies and reports related to these tailings dam incidents, Davies and Martin discovered a number of reasons for the correlation.

During a boom period, companies often try to move quickly to increase production and get new projects going. The result is often hastily issued permits, fast-tracked investigations, problematic design and construction of dams, and inappropriate “cookie cutter” designs to take advantage of the boom prices. Furthermore, capital and operations costs related to these dubious designs may be downplayed, designers may be scarce or overextended because of the boom-induced demand for their services, design expectations and operational realities may be disconnected and third-party reviews may be absent. When the boom cycle ends, many companies try to implement these projects while cutting costs or they shelve the projects until prices rise slightly and then rush them into production.³⁹

In the summer of 2015, the Center for Science in Public Participation issued a report on the same theme, concluding that serious mine dam failures around the world are predictable, as companies respond to commodity price booms with open pits and bigger mills that allow them to pursue low-grade ore bodies. These lower-grade deposits require more ore to be extracted to make them economical. As a result, the ratio of waste to marketable ore increases dramatically.

The report further noted that serious mine dam failures are a growing risk even at smaller mines with older tailings ponds:

Very large releases do not just occur at very large mines.... The Mount Polley TSF [tailings storage facility] was relatively small, only about 35 meters high at failure with a total capacity of about 74 million cubic meters (Independent Panel 2015). In fact this is the pattern we see on close examination of Very Serious and Serious failures; older TSFs with smaller footprints are pushed to unplanned heights to accommodate additional production that was not anticipated when the tailings dams were originally designed and the permits originally issued.⁴⁰

It would seem, then, that the increase in tailings dam incidents and accidents can be attributed both to (a) rapid intensification and expansion of production during a boom cycle to derive maximum profits from the high commodity prices and (b) continued intensification of existing productive facilities during post-boom cycles to offset the drop in profit levels.

The challenge presented by tailings dam management is one of scope. An expert engineering panel convened to investigate the Mount Polley spill pointed clearly to the multiplicity of factors

During a boom period, companies often try to move quickly to increase production and get new projects going. The result is often hastily issued permits, fast-tracked investigations, problematic design and construction of dams and inappropriate “cookie cutter” designs to take advantage of the boom prices.

37 Ironically, AMEC (now AMEC Foster Wheeler) was contracted to take responsibility for engineering at the Mount Polley dam in 2011. After the breach, the company issued a statement claiming that the dam ruptured while still in its original state, before AMEC’s alterations had been introduced.

38 Michael Davies and Todd Martin, “Mining Market Cycles and Tailings Dams Incidents” (Proceedings of the 13th International Conference on Tailings and Mine Waste, November 1–4, 2009, Banff, AB). <http://www.infomine.com/library/publications/docs/Davies2009.pdf>

39 Ibid.

40 Lindsay Newland Bowker and David M. Chambers, *The Risk, Public Liability and Economics of Tailings Storage Facility Failures*, July 21, 2015. <http://www.csp2.org/files/reports/Bowker%20%26%20Chambers%20-%20Risk-Public%20Liability-Economics%20of%20Tailings%20Storage%20Facility%20Failures%20%E2%80%93%2023Jul15.pdf>

Shortly before the dam collapsed, MPMC was seeking approval for Stage 10, which would have further increased the height of the dam.

in creating and maintaining safe tailings storage (the appointment of this expert panel, its mandate and findings are discussed in greater detail in the sections following).

Tailings dams are complex systems that have evolved over the years. They are also unforgiving systems, in terms of the number of things that have to go right. Their reliability is contingent on consistently flawless execution in planning, in subsurface investigation, in analysis and design, in construction quality, in operational diligence, in monitoring, in regulatory actions, and in risk management at every level. All of these activities are subject to human error.⁴¹

Safe tailings management goes far beyond initial engineering questions and technologies, especially given that tailings ponds like those at Mount Polley and Mariana are works in progress. At Mount Polley, for example, the height of the embankments was increased in nine stages after the mine became operational in 1995. Shortly before the dam collapsed, MPMC was seeking approval for Stage 10, which would have further increased the height of the dam.

41 Independent Expert Engineering Investigation and Review Panel, *Report on Mount Polley Tailings Storage Facility Breach* (Victoria: Province of British Columbia, 2015), 119, <https://www.mountpolleyreviewpanel.ca/sites/default/files/report/ReportonMountPolleyTailingsStorageFacilityBreach.pdf>.

Before the breaches at Mount Polley & Mariana

Warnings not heeded

IN BOTH CANADA AND BRAZIL, THERE WERE WARNINGS about the structural weakness of the tailings dams and/or the danger of allowing water levels to exceed their engineered capacity—warnings that went unheeded.

In his reporting on the Mount Polley spill, *Vancouver Sun* reporter Gordon Hoekstra uncovered a 2010 inspection report that identified numerous concerns about the security of the tailings storage facility, including a 10- to 15-metre crack in the perimeter wall of the dam that was known to the company but that went unreported, broken instruments (40 of 92) for measuring water pressure in the pond and an ongoing failure to develop adequate tailings beaches.⁴²

The provincial government refused to release subsequent inspection reports, though a few days after the breach it posted limited details of several “recent advisories” issued by the Ministry of Environment to the Mount Polley mine, including two relating to incidents where the height of effluent in the pond exceeded authorized levels.⁴³ At the time of the tailings dam collapse at Mount Polley, the “pond” was a four-square-kilometre reservoir⁴⁴ filled with mining waste that, according to the National Pollutants Release Inventory, included arsenic, lead, mercury,

At the time of the tailings dam collapse at Mount Polley, the “pond” was a four-square-kilometre reservoir filled with mining waste.

42 Gordon Hoekstra, “Crack in Mount Polley Mine’s Dam Noted in 2010 Inspection Report (with Report),” *Vancouver Sun*, September 26, 2014, <http://www.vancouversun.com/technology/Crack+Mount+Polley+mine+noted+2010+inspection+report+with+report/10236487/story.html>. For the full 2010 inspection report, see Knight Piésold Consulting, *Mount Polley Mine Tailings Storage Facility Report on 2010 Annual Inspection*, January 25, 2011, <https://www.scribd.com/document/241108453/Mount-Polley-Mine-Tailings-Storage-Facility-Report-on-2010-annual-inspection-by-Knight-Piesold>.

43 “Mount Polley Tailings Pond Situation Update (Friday, Aug. 8),” factsheet of Ministry of Environment and Climate Change Strategy, BC, <https://news.gov.bc.ca/stories/friday-aug-8---mount-polley-tailings-pond-situation-update>.

44 Ibid.

selenium and phosphorus, among other substances.⁴⁵ Standing between this toxic material and the surrounding forest and lakes were walls about 35 metres high.⁴⁶ The University of Victoria Environmental Law Centre discussed these publicly known concerns about the dam in greater detail in a submission to the expert engineering panel that investigated the breach.⁴⁷

In the year preceding the Mount Polley breach, the talk among workers—many of whom brought experience from other mining operations— included worries about the safety of the tailings dam.

The workers employed at MPMC were acutely aware of the problems. Larry Chambers was a fuel and lube operator whose work took him to various points in the operation between the mechanics bay and fuelling stops for large pieces of equipment. In the year preceding the breach, the talk among workers—many of whom brought experience from other mining operations— included worries about the safety of the tailings dam. Chambers wrote several letters to the Ministry of Energy and Mines (MEM)⁴⁸ in which he voiced his concerns. He had a bet with his wife that he would be fired for his actions and, indeed, MPMC informed him at the end of 2013 that his services were no longer needed.⁴⁹ Interviewed after the disaster, Chambers said:

I phoned the Ministry of Mines and told them that the dam was pushed out. A lot of the employees working there knew the dam was going to give.... I told them they've gotta do something about this. It's going to breach. It's a disaster waiting to happen. It all fell on deaf ears.⁵⁰

Gerald MacBurney, tailings foreman for the last two years of his seven-year employment at MPMC, resigned shortly after a government inspector visited and failed to acknowledge the seriousness of a small breach. This incident occurred two months before the dam collapsed. After the spill, MacBurney spoke readily to Carol Linnitt from *DeSmog Canada* citing stress as the reason he quit as tailings dam foreman. He stated that management had persistently shrugged off his warnings and disregarded his recommendations about fortifying the dam. MacBurney strongly criticized Imperial Metals and the BC government, for both their handling of the conditions leading up to the breach and their ineptitude in carrying out emergency and cleanup procedures.⁵¹

After the breach, United Steelworkers (USW) joined other organizations in calling for whistleblower protection. USW District 3 Director Steve Hunt made a persuasive case for worker participation in the inquiry based on workers' intimate knowledge of the workings of the mine.⁵² Workers could pose the questions of why there was too much water in the dam, for example. Why wasn't the

45 Government of Canada, National. Pollutant Release Inventory. Facility and Substance Information for Imperial Metals Corporation/Mount Polley Mine (2014). https://pollution-waste.canada.ca/national-release-inventory/archives/index.cfm?do=facility_substance_summary&lang=en&opt_npri_id=0000005102&opt_report_year=201

46 Wendy Stueck, "Mount Polley Operator Was Raising Height of Tailings Dam at Time of Breach," *Globe and Mail*, August 15, 2014, <http://www.theglobeandmail.com/news/british-columbia/tailings-pond-capacity-under-scrutiny/article20072768/>.

47 University of Victoria Environmental Law Centre, "'Not an Act of God': The Embankment Failure at Mount Polley Mine," submission to the Mount Polley Independent Expert Engineering Investigation and Review Panel, December 2014, https://www.mountpolleyreviewpanel.ca/sites/default/files/SUB00018_2014-12_Environmental%20Law%20Centre%20-%20University%20of%20Victoria.pdf.

48 In 2017 this Ministry was restructured and renamed the Ministry of Energy, Mines and Petroleum Resources.

49 Damien Gillis, "Mount Polley Whistleblower Lost Job, Then Home," *The Common Sense Canadian*, September 8, 2014, <http://commonsensecanadian.ca/VIDEO-detail/mount-polley-whistleblower-lost-job-home/>.

50 Nicky Young, "PHOTOS: Company Responsible for Mount Polley Disaster Applies to Reopen Mine," *Ricochet*, April 10, 2015, <https://www.ricochet.media/en/396/photos-company-responsible-for-mount-polley-disaster-applies-to-reopen-mine>.

51 Gerald MacBurney, "Mount Polley Mine Spill: Interview with Gerald MacBurney," interview by Carol Linnitt, *DeSmog Canada*, August 11, 2014, video, 6:54, <https://www.youtube.com/watch?v=tmrHtuNTRw>.

52 Don Hawkins, "Steelworkers Seek Answers in Mt Polley Spill," *250 News*, January 31, 2015, <http://250news.theexplorationplace.com/www.250news.com/43498.html>.



measuring equipment on the dam working? Why was the crack on the top of the dam filled in with a grader? Why did the inspections decrease so dramatically? According to Hunt:

We asked the Minister of Mines to participate on the advisory group so we could put some questions to them.... The Minister rejected our participation outright.... It seems that the original dam was approved and then they continued to add to it.... And we know as well that leading up to the disaster that there was a sharp decrease in inspections. If the Ministry and the government were responsible for monitoring this, maybe had they been doing their job, they would have caught it before it failed.⁵³

Hunt also raised the deeper problem of conflicts of interest when the same provincial government body responsible for promoting mining—the Ministry of Energy and Mines—holds responsibility for defining and enforcing mining regulations. He further identified the conflict of interest between promoting mining and protecting the environment. Hunt suggested a tripartite division of responsibility—split among the Ministry of Energy and Mines, the Ministry of the Environment and the Workers’ Compensation Board (WorkSafeBC)—as a surer way to guarantee effective oversight and monitoring.⁵⁴

In Brazil, there were also many problems in ensuring an effective regulatory process. In Mariana, the Fundão dam that collapsed at the Samarco operation had been fast-tracked to take advantage of the booming economy. The first environmental impact assessment of the dam, which was fundamental to Samarco’s expanding production, was carried out in 2005. The operating licence for Fundão was granted in 2008. In 2011, the operating licence came up for renewal and permission was granted to continue operations until 2013. Already in 2012, an environmental impact assessment was presented for a project to join and heighten the Fundão and adjacent Germano tailings dams. The rapidly changing proposals from Samarco, each with challenging technical dimensions, and the tendency to dispense with the public hearings required by law meant that, in effect, Samarco was operating with little monitoring or regulatory control.⁵⁵

In 2014, Joaquim Pimenta de Ávila, one of the engineers responsible for the construction of the original dam, was asked to inspect the dam as part of a government investigation into the possibility of unauthorized alterations to the original project. Ávila’s company had had ongoing technical responsibility for the project until 2012, when it lost a bid to expand the dam. During his inspection, Ávila noted that the dam had suffered a partial rupture that presented a “severe” structural risk and required more measures to repair than Samarco was undertaking. In a statement

L: AERIAL VIEW OF MOUNT POLLEY MINE SITE, JULY 24, 2014 PRIOR TO THE DAM BREACH. R: AFTER THE AUGUST 4, 2014 DAM BREACH. BY JESSE ALLEN, USING LANDSAT DATA FROM THE U.S. GEOLOGICAL SURVEY. —VISIBLE EARTH, NASA

In Mariana, the Fundão dam that collapsed at the Samarco operation had been fast-tracked to take advantage of the booming economy.

53 Ibid.
 54 Ibid.
 55 PoEMAS, 2015: 50, 51.

The cases of Mount Polley and Mariana point to the seeming normalcy of warnings about tailings dam weaknesses going unheeded.

to the police after the collapse, Ávila told investigators that he had alerted Samarco to the risk of a rupture in 2014 and that he had also recommended the installation of an instrument to measure water pressure so that water levels could be lowered if pressure behind the dam became too high. His recommendations went unheeded.⁵⁶

The cases of Mount Polley and Mariana point to the seeming normalcy of warnings about tailings dam weaknesses going unheeded and mining companies being allowed to short-circuit regulatory processes and go ahead with production even after serious structural risks have been identified. This, in turn, points to an alarming corporate practice of putting production and profit ahead of safety considerations. We are left to ponder how many other mines in Canada, in Brazil and globally are operating with tailings dams that present a safety risk for workers, communities and the environment.

Lack of disaster preparedness

The mining companies in both Canada and Brazil were woefully unprepared for breaches at their tailings storage facilities, especially major collapses with toxic emissions that reached well beyond the actual mine site, damaging watersheds and communities. The scope of the spills has raised complex and ongoing public policy questions for governments and mining companies about short-term and long-term risks in mine tailings storage and the liabilities of both governments and mining companies in the face of far-reaching environmental disasters.

In the days immediately after the Mount Polley spill, the BC government hastened to assure the public that the cost of the cleanup after the breach would be borne by Imperial Metals and not by taxpayers. Mary Polak, the Environment Minister at the time, said: “We have a polluter-pay model in British Columbia and we expect the company will be the one paying for the cleanup and recovery.”⁵⁷ Economist Robyn Allan noted, however, that BC lacks an enforceable polluter-pay model. In an opinion piece for the *Vancouver Sun*, she wrote:

While Polak assured the public that Imperials Metals would pick up the tab for the accident, the company was booking tax refunds related to it. In its Sept. 30, 2014 shareholder’s report, Imperial Metals said that for the Mount Polley breach the “company recorded costs of \$67.4 million (\$43.8 million net of tax).” This means taxpayers are subsidizing cleanup costs to the tune of \$23.6 million, 35 cents of each dollar the company spent.⁵⁸

When the Mount Polley breach occurred, the BC’s Auditor General was already in the midst of an audit to determine whether the provincial government’s compliance and enforcement regulations of the mining industry were adequately protecting the province from significant environmental risks. With the decline in commodity prices leaving so many mining companies fighting to survive, the Auditor General had identified the need to ensure protection of the environment, whether mining companies were in a phase of expansion or slowdown. The audit was still in progress when the Mount Polley breach occurred, and work plans were adjusted to give full attention to Mount Polley.

56 Marco Grillo, “Engenheiro alertou para risco de ruptura em barragem de Mariana,” *O Globo*, January 16, 2016, <http://oglobo.globo.com/brasil/engenheiro-alertou-para-risco-de-ruptura-em-barragem-de-mariana-18491114>.

57 Mary Polak quoted in Robyn Allan, “Opinion: Mount Polley Cleanup Heavily Taxpayer Subsidized,” *Vancouver Sun*, August 3, 2016, <http://vancouversun.com/opinion/columnists/opinion-mount-polley-cleanup-heavily-taxpayer-subsidized>.

58 Allan, 2016.

In her final report *An Audit of Compliance and Enforcement of the Mining Sector*, the Auditor General, Carol Bellringer, stressed that while the expert engineering investigation had been set up to determine the mechanics of *how* the dam failed, the Auditor's assessment would focus on *why* it failed.⁵⁹ This meant close scrutiny of the regulatory framework, compliance and enforcement activities of the two ministries with major responsibility for mining, the Ministry of Energy and Mines and the Ministry of the Environment.

In BC, MEM has the authority to require mines to provide a financial security that is held by government as a means of ensuring that BC taxpayers do not end up footing the bill for mine reclamation costs if a company defaults on its environmental obligations. While companies are required to cover the full cost of environmental reclamation, they are not required to post bonds sufficient to cover these costs.

In her report, the Auditor General revealed that mining companies in BC had deposited security for only a fraction of their anticipated liability for reclamation. Mining company bonds posted for site reclamation after mine closure showed a shortfall of \$1.2 billion.⁶⁰ Teck alone was responsible for \$743 million of that deficit, and Barrick Gold owed the second-largest amount at \$212 million. When presented with this information, Bill Bennett, then Minister of Energy and Mines, professed great surprise.⁶¹

Furthermore, the existing regulations covered reclamation of environmental damages only during normal operations and on closure. One of Bellringer's recommendations around permitting was to introduce a new category of "security—catastrophic events" in order to ensure BC taxpayer protection from the costs of environmental disasters like that of Mount Polley.⁶²

Looking back can be instructive. Imperial Metals' original proposal was for a mine with a "zero discharge" tailings impoundment.⁶³ Yet by 2009, MPMC was making its first request to discharge waste water from the Mount Polley operation into Hazeltine Creek. As part of its permit application to obtain an additional point of release for mine waste, MPMC prepared a technical assessment report. Because the mine is within the northern part of Secwepemc traditional territory and within the traditional territories of T'exelc Williams Lake Band and the Xat'sull Soda Creek First Nation, the Province had an obligation to consult. The BC Ministry of Environment (MoE) and the T'exelc and Xat'sull agreed to an integrated review, and therefore the Province hired Brian Olding & Associates to "conduct an independent and objective review of the TA [technical assessment] Report on behalf of, and in the mutual interests of" these groups and MPMC.⁶⁴ MPMC's technical assessment was placed under a microscope since there were many areas of impact to consider even for a controlled discharge.

The Auditor General revealed that mining companies in BC had deposited security for only a fraction of their anticipated liability for environmental reclamation.

59 Office of the Auditor General of British Columbia, *An Audit of Compliance and Enforcement of the Mining Sector*, May 2016, 8, <http://www.bcauditor.com/sites/default/files/publications/reports/OAGBC%20Mining%20Report%20FINAL.pdf>.

60 *Ibid.*, 6.

61 Justine Hunter, "B.C. Mines Minister 'Surprised' by Cleanup Fund Shortfall," *Globe and Mail*, May 25, 2016, <https://www.theglobeandmail.com/news/british-columbia/bc-mines-minister-surprised-by-cleanup-fund-shortfall/article30170103/>.

62 Office of the Auditor General of British Columbia, 2016, 12.

63 BC Ministry of Environment, "Ministry Assessment" [of Mount Polley Mining Corporation request to add an additional point of release for mine effluent], PE-11678, October 26, 2012, http://mssi.nrs.gov.bc.ca/1_CIMMountPolley/DOC1388.pdf.

64 Brian Olding & Associates Ltd. in association with LGL Limited, Independent Review of the Mount Polley Mine Technical Assessment Report for a Proposed Discharge of Mine Effluent (2009): Final Report June 2011 (Surrey, BC: Brian Olding & Associates Ltd., 2011), <http://s3.documentcloud.org/documents/1262983/final-report-mpmc-master-ta-review-jun21-2011.pdf>.

What is most striking about Olding's analysis, presented in a final report in June 2011, is the number of glaring omissions in the MPMC technical assessment report.⁶⁵ First, Olding raised concerns about the accuracy of MPMC's hydrological data in Hazeltine Creek. Instead of just using generalized annual or monthly mean values to predict the potential impact of a discharge as MPMC did, Olding cited the need to anticipate dilution factors in a range of conditions, including short periods with concentrations high enough to harm aquatic life. He also noted that the MPMC data included only the summer fishing practices of tourists and non-Indigenous residents in the area, but no data linked to the year-round traditional fishing practices of Indigenous people in the area. Nor did the MPMC proposal consider the potential effluent effects on wildlife and vegetation adjacent to Hazeltine Creek, both of which are vitally important for traditional land use practices. In fact, the MPMC technical assessment report made no references to any kind of consultative process with First Nations. T'exelc and Xat'sull rights and land use practices were not mentioned in it.

The MPMC data included only the summer fishing practices of tourists and non-Indigenous residents in the area, but no data linked to the year-round traditional fishing practices of Indigenous people in the area.

Another glaring omission was safety. In his assessment, Olding concluded that MPMC had developed neither a detailed monitoring plan nor a detailed emergency plan. He wrote:

As part of the contingency plan, MPMC should include response timelines and communication plans that include the Williams Lake Indian Band and Soda Creek First Nation.... MPMC should work in a close partnership with these two groups on all future studies on the archaeology and traditional land use of the areas potentially affected by the discharge permit and on the direct and indirect mine footprint in general.⁶⁶

Olding's report is important because it examined the many-layered impacts of even a planned and controlled discharge on the surrounding ecological and social systems. It made visible the impact of a discharge on real land use, livelihoods, water quality and salmon. It pointed to what robust roles for shared sovereignty over the land and resource might look like.

Olding also commented on the need for both immediate and long-term operational plans for water management in the tailings storage facility (TSF):

Traditionally, MPMC has raised the TSF dam annually to retain all water on site. Dam-raising activities are presently underway in anticipation of conditions in 2012 and beyond. In looking ahead to a post-closure scenario, a sustainable means of discharging excess water is required because dam building cannot continue indefinitely. The annual excess water must be discharged in order to maintain the integrity of the TSF.⁶⁷

MPMC seemingly paid little attention to Olding's report. After the dam collapse three years later, Imperial Metals president Brian Kynoch was widely quoted as saying, "If you asked me two weeks ago if this could have happened, I would have said it couldn't."⁶⁸

Public debate about how to ensure that mining companies pay for the environmental damages caused by their mining operations intensified greatly after the Mount Polley disaster. The Auditor General's close scrutiny of the Mount Polley case only added fuel to the fire. As Bellringer wrote in

65 Ibid.

66 Ibid., 5.

67 Ibid., 8.

68 Rhiannon Coppin and Bal Brach, "Mount Polley Mine Tailings Water 'Very Close' to Drinking Quality, Company Says," *CBC News* (online), August 5, 2014, <http://www.cbc.ca/news/canada/british-columbia/mount-polley-mine-tailings-water-very-close-to-drinking-quality-company-says-1.2727776>.

her summary comment: “We found almost every one of our expectations for a robust compliance and enforcement program within the MEM and the MoE were not met.”⁶⁹

With specific reference to the Mount Polley mine, the Auditor General found:

- 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.⁷⁰

In Brazil, the proximity of mining operations and tailings dams to local communities introduced another set of risks. The state of Minas Gerais, where the Samarco mine is located, is one of Brazil’s major mining areas. There are 450 tailings dams in Minas Gerais, of which 159 are classified as Class III, those presenting the highest risk of causing environmental damage. There had already been six tailings dam breaches between 1986 and 2008 in Minas Gerais, causing 12 deaths and leaving thousands homeless. In September 2010, new legislation was passed, creating a National Dam Safety Policy that established norms for construction, operations procedures, inspections and emergency plans for adjacent communities.⁷¹

After the Fundão tailings dam collapse, it came to light that Samarco had actually commissioned a 24-hour monitoring plan of its tailings dams in 2009, as well as an Emergency Action Plan. The plan included emergency drills for workers and residents in the adjacent community of Bento Rodrigues. With the fall in iron prices and company cost-cutting measures, however, the tailings dam monitoring plan and emergency evacuation drills were never implemented.⁷²

As a result, there was no advance warning when the Fundão dam at the Samarco mine collapsed. If contract workers at the mine had not texted and ridden their motorbikes from the mine site to the two closest villages to warn people to flee, the death rate would have been even higher. The breach occurred at 4:20 in the afternoon. Within 11 minutes, it had reached Bento Rodrigues.⁷³ Both Bento Rodrigues and Paracatu de Baixo were literally buried in muck. Two hours later, the toxic tsunami reached the Rio Doce. Even communities where the wave of toxic muck arrived 12 and 14 hours later had no idea it was coming and therefore had no time to save livestock or personal possessions.⁷⁴

At both the Mount Polley and Samarco mines, the mining companies’ failure to act on warnings and prepare for possible disasters has had devastating long-term effects environmentally, economically and socially. What is most alarming is the likelihood that similar warnings for other mines with tailings ponds in Brazil, in Canada and globally may also be going unheeded and that other mining companies, governments, workers and communities are equally unprepared for tailings dam tragedies.

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69 Office of the Auditor General of British Columbia, 2016, 3.

70 Ibid., 8.

71 PoEMAS, 2015, 47.

72 JustiçaGlobal, 2016, 7–8.

73 Eduardo Gonçalves and Nicole Fusco, “Tragédia em Mariana: para que não se repita,” *Veja*, November 11, 2015, <https://veja.abril.com.br/especiais/tragedia-em-mariana-para-que-nao-se-repita/>.

74 Emiliano Castro de Oliveira, “A ligação destruidora do Rio Doce com o oceano após o desastre de Mariana,” *Le Monde diplomatique Brasil*, January 4, 2016, <https://diplomatie.org.br/a-ligacao-destruidora-do-rio-doce-com-o-oceano-apos-o-desastre-de-mariana/>.

Corporate & government responses to the breaches



PARACATU DE BAIXO, DECEMBER 2015, ONE MONTH AFTER THE BREACH. PHOTO: BRUNO MILANEZ, POEMAS / UFJF.

IN BOTH CANADA AND BRAZIL, THE MINING COMPANIES initially characterized the tragedies as isolated incidents—accidents beyond the capacity of any mining company to control. They downplayed the level of toxicity of the metals-laden muck and the contamination of surrounding water systems.

In both countries, the period after the tailings dam disasters also brought a multiplicity of official government investigations, lawsuits, claims and counterclaims, but particularly in Brazil where responsibility for the environment is covered by three levels of liability: criminal, administrative and civil.

BC government: “a ministry in ‘irreconcilable conflict’”?

Three separate investigations of the spill were carried out by public officials and independent experts. On August 18, two weeks after the dam breach at Mount Polley, the BC government announced the establishment of an Independent Expert Engineering Investigation and Review Panel (briefly discussed earlier in this report). It reported its findings six months later on January 30, 2015. Immediately following the breach, Al Hoffman, BC’s Chief Inspector of Mines, also launched an investigation, with a broader mandate than the expert panel, including investigating the “root causes” of the dam breach. Hoffman’s report was released on December 17, 2015. The third investigation was carried out by the Office of the Auditor General of BC. As noted earlier, this audit looked at whether the Ministry of Energy and Mines and the Ministry of Environment compliance and enforcement activities for the mining sector were adequate to protect BC from significant environmental risks. The Auditor General’s final report was released May 3, 2016.⁷⁵

75 All three of these reports are available to the public. See: Mount Polley Independent Expert Investigation and Review Report, <https://www.mountpolleyreviewpanel.ca/final-report>
Chief Inspector of Mines’ Investigation Report on Mount Polley, <https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/further-information/directives-alerts-incident-information/mount-polley-tailings-breach/mount-polley-investigation>
An Audit of Compliance and Enforcement of the Mining Sector, <http://www.bcauditor.com/pubs/2016/audit-compliance-and-enforcement-mining-sector>

The Independent Expert Engineering Investigation and Review Panel was made up of three geotechnical experts with extensive backgrounds in tailings storage facilities. The panel was chaired by Norbert Morgenstern, an internationally recognized authority in geotechnical engineering and professor emeritus at the University of Alberta. It also included Dirk Van Zyl from the Norman B. Keevil Institute of Mining Engineering at the University of British Columbia, who brought more than 35 years of experience in research, teaching and consulting in tailings and mine waste rock disposal, and Steven Vick, a geotechnical engineer and internationally recognized review consultant and forensic investigator. When the investigation was announced, then-Minister of Energy and Mines Bill Bennett declared: “We have a responsibility, as the jurisdiction where this failure took place, to find out exactly why it happened, ensure it never happens again and take a leadership role internationally in learning from this serious incident.”⁷⁶

The experts were charged with determining how the tailings storage facility failed and any technical, management or other practices contributing to that failure—considering geotechnical standards, design, construction, operation, surveillance, maintenance and regulation. Their report was also to include “any changes that could be considered to reduce the potential for future such occurrences.”⁷⁷ The BC government also ordered third-party reviews of the 2014 dam safety inspections at every permitted tailings impoundment in the province, a total of 60 operating and closed metals and coal mines.

In their highly technical final report released in January 2015, the experts concluded the dam had been built on a foundation of fine sediment deposited by retreating glaciers that is much less stable than layers of rock or compact soil. Almost every year after the dam was completed in 1997, the company added to its height. The load from the expanding pond of toxic waste further weakened the unstable foundation. Finally, when the company ran out of the rock fill used to build the dam, it changed the slope of the dam to a steeper angle to compensate. This interim measure was never corrected, however. Norbert Morgenstern, the head of the panel, summarized the problem: “We have gone ahead and built on this weak layer [of glacial silt], loading the gun. Building the steep slope pulled the trigger.”⁷⁸

The report further noted that the scale of the disaster was partially due to the “acute” surplus of water stored behind the dam. With regard to management oversight, particularly as concerns water balance, the panel said it was unable to assess adequately. With regard to regulatory oversight, it found strong regulatory processes and personnel in place. While the number of inspections had decreased, the report indicated that more frequent inspections of the operation would not have discovered the problems of the design. In short, the panel concluded that Imperial Metals had been operating within existing regulations but had failed to use best practices.

The Panel’s conclusion did not, however, call for a continuation of “business as usual.” One of the most quoted findings of the report was that “if the inventory of active tailings dams in the province remains unchanged, and performance in the future reflects that in the past, then on average there will be two failures every 10 years and six every 30.”⁷⁹ The expert panel argued

Almost every year after the dam was completed in 1997, the company added to its height. The load from the expanding pond of toxic waste further weakened the unstable foundation.

76 BC Ministry of Energy and Mines, “Independent Expert Engineering Review Launched following Mount Polley Dam Breach,” media release, August 18, 2014, <https://www.mountpolleyreviewpanel.ca/independent-expert-engineering-review-launched-following-mount-polley-dam-breach>.

77 Mount Polley Independent Expert Investigation and Review Report, website, <https://www.mountpolleyreviewpanel.ca/panel/about>.

78 Justine Hunter and Mark Hume, “Design Failure Caused Mount Polley Tailings Breach, Expert Panel Concludes,” *Globe and Mail*, January 30, 2015, <https://www.theglobeandmail.com/news/british-columbia/design-failure-caused-mount-polley-tailings-breach-expert-panel-concludes/article22719967/>.

79 Independent Expert Engineering Investigation and Review Panel, 2015, *Report on Mount Polley Tailings Storage Facility Breach*, 118.

for “zero failure” as the only acceptable goal and, having built a historical risk profile of other tailings dams in BC, strongly recommended adoption of Best Available Technology (BAT) and Best Applicable Practices (BAP) to ensure that goal.

The panel recommended that adopting best practices include improving corporate design responsibilities and putting in place independent tailings dam review boards. It suggested that moving toward BAT meant opting for filtered, unsaturated, compacted tailings (e.g., dry stacking) and reducing the use of tailings ponds.⁸⁰ The report also summarized a phased-in approach to implementing BATs for both existing and new tailings enclosures as well as mine closures.⁸¹

In July 2015, the BC government gave conditional authorization to Imperial Metals to start up restricted operations, despite two pending investigations that could have led to civil or criminal charges.

In April 2015, Imperial Metals applied for a permit to restart the mine with a temporary work plan. The company was struggling financially due to the shutdown of its Mount Polley operation and delays in development of its Red Chris mine, leading to an injection of \$30 million from its chief shareholder, Murray Edwards.⁸² Unionized workers, most of whom had been retained to help with the cleanup, were also pressuring company management to resume full production.⁸³ Indigenous activists immediately protested the application to reopen. The Secwepemc Women’s Warrior Society called for a National Day of Action on April 29, 2015, and coordinated protest actions were carried out at the mine site itself and at several other locations.⁸⁴

In July 2015, the BC government gave conditional authorization to Imperial Metals to start up restricted operations,⁸⁵ despite two pending investigations that could have led to civil or criminal charges. Moreover, the company was given permission to temporarily dump tailings into an abandoned mine pit, after which the water, treated to remove contaminants, would be dumped into Hazeltine Creek. Imperial was given a year to submit a long-term plan for tailings management. Six months later, the Springer Pit—the mine pit being used temporarily to hold the tailings—was in danger of overflowing. At the beginning of December, the government issued a short-term water discharge permit.⁸⁶

Later that month, Chief Inspector of Mines Al Hoffman’s final report was released. Hoffman made 19 recommendations, addressing specific recommendations to mining operators, the mining industry, professional organizations and regulators.⁸⁷ The recommendations included introducing a designated “mine dam safety manager” at each mine site and the establishment of independent review boards to provide third party opinions on dam designs and operation, as well as improved records management and transparency around design, construction and operation of mining

80 Ibid., iv.

81 Ibid., 139.

82 Bloomberg News, “Murray Edwards helps bail out Imperial Metals Corp with \$30 million loan,” *Financial Post* (online), May 19, 2015, <http://business.financialpost.com/commodities/mining/murray-edwards-helps-bail-out-imperial-metals-corp-with-30-million-loan>.

83 Sunny Dhillon, “Reopen Mount Polley mine, union says,” *The Globe and Mail*, September 7, 2014, <https://www.theglobeandmail.com/news/british-columbia/reopen-mount-polley-mine-union-says/article20464893/>.

84 Danny Kresnyak, “First Nation group launches protest to halt re-opening of Mount Polley mine,” *Vancouver Observer*, April 29, 2015, <https://www.vancouverobserver.com/news/first-nation-group-launches-protest-halt-re-opening-mount-polley-mine>.

85 Canadian Press, “Mount Polley Mine Gets Restricted OK to Reopen,” *CBC News* (online), July 9, 2015, <http://www.cbc.ca/news/canada/british-columbia/mount-polley-mine-gets-restricted-ok-to-reopen-1.3145642>.

86 Gordon Hoekstra, “Province Grants Two-Year Water Discharge Permit to Mount Polley Mine,” *Vancouver Sun*, December 1, 2015, <http://www.vancouverobserver.com/news/province+grants+year+water+discharge+permit+mount+polley+mine/11555602/story.html>.

87 Investigation Report of the Chief Inspector of Mines, 2015, 8-12, https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/mineral-exploration-mining/documents/directives-alerts-info/chief-inspector-s-report-page/m-200_mount_polley_2015-11-30_ci_investigation_report.pdf.

facilities. The report highlighted the role of mine employees, noting that “concerns regarding steep slope, dam construction material availability, buttress sub-excavation, and supervision were identified by employees but not elevated for action by MPMC management.”⁸⁸

The most dramatic feature of the report was the announcement that no charges against Imperial Metals would be forwarded to Crown counsel, nor would any fines be issued since BC’s mining laws do not allow for administrative penalties.⁸⁹ Minister Bennett responded to the report announcing that all 19 recommendations would be implemented. With regard to legislation for levying administrative penalties against mining operators, Bennett announced his hopes to introduce such legislation in future since imposing government fines would, in his view, encourage compliance.⁹⁰

Many were left dissatisfied by these outcomes. John Horgan, then-Leader of the Opposition, charged: “The design was flawed, but every time they amended that design—13 times—government had an opportunity to revisit the design to ensure the public interest was protected, and they didn’t do that. This was a preventable accident.”⁹¹ Ugo Lapointe from MiningWatch Canada was also shocked by Hoffman’s report. He stated: “How can so many things be done so poorly, sloppily, or haphazardly, and result in massive damage, without someone being ‘at fault’? It was not an ‘Act of God.’ The report makes it clear that it was poor design, poor practices, poor oversight, and misconduct.”⁹²

The Auditor General released her report on compliance and enforcement of the mining sector in May 2016. The main conclusion was that BC government structures and practices for compliance and enforcement in the mining sector were seriously flawed, thereby compromising environmental protection and placing workers and communities in harm’s way. The audit devoted particular attention to compliance and enforcement at Mount Polley, focusing not on the mechanics of *how* the dam failed but *why*. The audit revealed that the Ministry of Energy and Mines did not ensure construction and operation of the tailings dam according to approved design, nor did it ensure that MPMC rectify the design and operational deficiencies. The Auditor General called for major change in mining governance with 16 specific recommendations plus one overall recommendation to address the “irreconcilable conflict” when the same government body has responsibility for mining development and compliance and enforcement.⁹³ That overall recommendation called for the creation of an independent and integrated compliance and enforcement unit outside the Ministry of Energy and Mines and with a mandate to protect the environment.

Minister Bennett agreed to implement the 16 specific recommendations. He balked, however, at creating an independent agency. Instead, a board comprising the Deputy Minister of Mines (chair), the Deputy Minister of the Environment, and the Associate Deputy Minister for the

The report highlighted the role of mine employees, noting that “concerns regarding steep slope, dam construction material availability, buttress sub-excavation, and supervision were identified by employees but not elevated for action by MPMC management.”

88 Investigation Report of the Chief Inspector of Mines, 2015, 7.

89 Carol Linnitt, “No Fines, No Charges Laid for Mount Polley Mine Disaster,” *DeSmog Canada*, December 18, 2015, <http://www.desmog.ca/2015/12/18/no-fines-no-charges-laid-mount-polley-mine-disaster>.

90 Gordon Hoekstra, “No charges under B.C.’s mining laws for failure of Mount Polley mine dam,” *Vancouver Sun*, December 17, 2015, <http://vancouversun.com/news/local-news/no-charges-under-b-c-s-mining-laws-for-failure-of-mount-polley-mine-dam>.

91 Hunter and Hume, 2015.

92 “MiningWatch Shocked by Chief Inspector of Mines’ Report on Mount Polley Disaster,” news release, MiningWatch Canada website, December 18, 2015, <http://miningwatch.ca/news/2015/12/18/miningwatch-shocked-chief-inspector-mines-report-mount-polley-disaster>.

93 Office of the Auditor General of British Columbia, 2016, 4.

Environmental Assessment Office now oversees compliance and enforcement. "People who work in compliance and enforcement don't promote mining," he insisted. "That's not their job."⁹⁴

Brazilian government: "embarrassed partner of the corporation"

In Brazil, government and corporate leaders also downplayed the gravity of the tragedy and sidestepped questions of responsibility in the days after the collapse of the Fundão dam.

The government—working from an operations centre on Samarco's premises—immediately deployed police, firefighters and army and civil defence forces for search-and-rescue operations in Bento Rodrigues. Members of the 200-strong rescue team perforated the muck with metal pipes that allowed rescue dogs to catch the scent of survivors,⁹⁵ and people rescued from mud-buried communities were temporarily housed in the Mariana arena. Community members, workers and the media, however, were given no access to information about how the disaster was being managed.

Residents were bitter that they'd lost everything because no one had warned them the mud was coming, and nobody had organized an evacuation plan.

Three days after the collapse, Minas Gerais Governor Fernando Pimental made his first official statement about the tragedy. Speaking from Samarco headquarters, he addressed the press: "The dam collapsed, it is a tragedy. The state and municipal governments are making tremendous efforts and the company is taking care of the things for which it is responsible... We cannot assign blame without more accurate technical expertise."⁹⁶

Samarco president Ricardo Vescovi's first public response was to release a video on the company's Facebook page in which he said, "Our focus in this critical moment is to preserve the integrity of people and of the environment... We are deeply sorry and we are very moved by what happened, but we are also in full action to stop the damage caused by this tragic accident." He later claimed that Samarco had deployed 600 people along the affected route of the spill, liaising with victims, helping those made homeless and supplying drinking water.⁹⁷

Yet as the toxic spill was making its way toward the Atlantic Ocean over the next 16 days, neither the government nor Samarco was in communication with the affected communities to provide information and logistical support for evacuations. The flow of mud reached the municipality of Barra Longo on November 6, one day after the breach, destroying many large dairy farms, burying cattle and damaging the central area of the city. A year later the water marks were still visible on public buildings. Residents were bitter that they'd lost everything because no one had warned them the mud was coming, and nobody had organized an evacuation plan.⁹⁸ Local government officials all along the Rio Doce were left to deal with the crisis as they could. Polluted drinking water and lands covered with toxic mud were just the beginning.

Official action was slow in coming. When there was still no response from the mining companies or the state five days after the spill, Mayor Neto Barros of Baixo Guandu took matters into his

94 Charlie Smith, "B.C. Energy and Mines Minister Bill Bennett Won't Resign in Wake of Damning Auditor General's Report," *The Georgia Straight*, May 4, 2016, <https://www.straight.com/news/691076/bc-energy-and-mines-minister-bill-bennett-wont-resign-wake-damning-auditor-generals>.

95 PoEMAS, 2015, 70.

96 "Pimentel dá coletiva de imprensa na sede da Samarco," *Esquerda Diário*, November 8, 2015, <http://www.esquerdadiario.com.br/Pimentel-da-coletiva-de-imprensa-na-sede-da-Samarco>. Author's translation.

97 Dom Phillips, "Brazil's Mining Tragedy: Was It a Preventable Disaster?," *The Guardian*, November 25, 2015, <https://www.theguardian.com/sustainable-business/2015/nov/25/brazils-mining-tragedy-dam-preventable-disaster-samarco-vale-bhp-billiton>.

98 JustiçaGlobal, 2016, 3.



GUALAXO DO NORTE RIVER, DECEMBER 2015, ONE MONTH AFTER THE BREACH. PHOTO: BRUNO MILANEZ, POEMAS / UFFJ.

own hands. He switched his city's drinking water supply from the Rio Doce to an uncontaminated tributary. Noting that trains still passed through his city almost hourly carrying mineral ore and assorted merchandise from Minas Gerais to the ocean port of Victoria, Mayor Barros called for a community blockade of the rail line. While a judicial order forced him to remove the tractors blocking the rail line within hours, the act of civil disobedience got attention. Samarco representatives arrived at city hall the next day, and Barros got to show them firsthand how the Fundão rupture had affected his city and determine what the mining companies were planning to do about it.⁹⁹

Paradoxically, even before the toxic mudflow had reached the Atlantic and before emergency aid had been extended to survivors, both the government and the mining companies had launched investigations. The Minas Gerais police force opened a full inquiry into the Fundão tailings dam breach and its impact on November 6, one day after the collapse. Their inquiry named Samarco as the operator of the tailings dam, and Vale and BHP Billiton as joint owners of Samarco. The scope of the police investigation included the 19 deaths, treated as homicides; destruction of Bento Rodrigues district and flooding in many other localities; damages in Barra Longa and 40 other cities in the states of Minas Gerais and Espírito Santo; and provocation of an environmental disaster throughout the Rio Doce basin without precedent in Brazil.

The three mining companies contracted New York law firm Cleary Gottlieb Steen and Hamilton LLP to set up an independent review panel to investigate the collapse. The panel of four experts included Norbert Morgenstern and Stephen Vick, both of whom had been on the Mount Polley review panel. The other two members were Cássio Viotti and Bryan D. Watts. Viotti, the lone Brazilian, is an independent consultant with over 45 years of experience in dam engineering. He has served as president of the International Commission on Large Dams and the Brazilian Committee on Dams. Watts is the chairperson of Klohn Crippen Berger, a leading engineering firm based in Vancouver, with lengthy experience in tailings dam design and post-failure investigations.

As with the Mount Polley review, the terms of reference for the review panel set up by Samarco, Vale and BHP Billiton were very narrowly defined.

⁹⁹ Zoe Sullivan, "Rio Doce Grassroots Response Arises out of Fundão Mining Disaster," *Mongabay*, June 8, 2016, <https://news.mongabay.com/2016/06/rio-doce-grassroots-response-arises-out-of-fundao-mining-disaster/>.

As with the Mount Polley review, the terms of reference for the review panel were very narrowly defined: to provide a technical investigation to determine the immediate cause of the November 5, 2015, Fundão tailings dam failure. The panel “did not seek documents and information related to fault or responsibility nor did they endeavor to assign fault or responsibility to any person or party, to evaluate whether or not the failure could have been foreseen or prevented, or to gauge environmental or other downstream effects or damages of the Fundão Dam failure.”¹⁰⁰

While Vale and BHP Billiton immediately made public statements of regret, they took pains to indicate their arms-length relationship with Samarco. At a press conference on November 11, Vale president Murilo Ferreira offered this explanation: “... Samarco is not part of Vale. Samarco is an independent company. It has its own governance, and company decisions are made in its Administrative Council.”¹⁰¹ The international business press, however, was quick to out Vale’s strategy. The *Wall Street Journal* argued that while the joint venture between Vale and BHP Billiton is a limited liability company that, theoretically, should protect its shareholders from litigation in the case of a disaster, in practice this would not be automatic. The message the business press was getting from Brazilian authorities and lawyers was that the corporate structure would do little to shield the parent companies from big fines in addition to cleanup and legal costs.¹⁰²

Two weeks after the November 5 dam collapse, Samarco signed a US\$262 million agreement with the Brazilian government to fund mitigation and remediation measures for the environmental disaster.¹⁰³ Word was already circulating, however, that the Brazilian government was preparing to sue Vale, BHP Billiton and Samarco jointly. Indeed, the Brazilian government launched a civil suit against all three companies on November 28, 2015, for US\$5.3 billion. The payments were to be stretched over 10 years and used for environmental recovery and victim compensation.¹⁰⁴

On December 3, a Brazilian court set out its preliminary demands, ordering BHP and Vale to deposit US\$491.5 million in a court-managed bank account within 10 days, alluding to the possibility of billions more. In addition, the assets of the two parent mining giants were frozen in Brazil and they were given court orders to undertake large-scale environmental damage repairs and compensate for widespread losses of land, housing and livelihoods.¹⁰⁵

A month after the disaster, João Pedro Stédile, a national leader of the Landless Workers’ Movement (MST), Brazil’s largest social movement, questioned the roles the state and the mining companies were playing in determining damages. In an article entitled “Vale of Death” he wrote:

In the end, who is going to determine the compensation paid to the families that were directly affected and the population of the entire region? And determine the fines for having killed the biodiversity of the country’s most important watersheds? Up to now,

100 The Fundão Tailings Dam Investigation website, accessed March 5, 2018, <http://fundaoinvestigation.com/>.

101 “Vale admite que usava barragem de Fundão para depositar rejeitos,” *Globo.com*, November 24, 2015, <http://g1.globo.com/minas-gerais/desastre-ambiental-em-mariana/noticia/2015/11/vale-admite-que-usava-barragem-de-fundao-para-depositar-rejeitos.html>. Author’s translation.

102 Alex MacDonald, Justin Scheck and Rhiannon Hoyle, “Samarco May Not Shield BHP, Vale from Brazil Dam-Breach Repercussions,” *The Wall Street Journal*, November 11, 2015, <https://www.wsj.com/articles/vale-says-company-it-jointly-owns-is-legally-responsible-for-dam-breach-1447245510>.

103 “BHP Billiton and Vale Lawsuit (re Dam Collapse in Brazil),” Business and Human Rights Resource Centre website, undated, accessed March 5, 2018, <https://business-humanrights.org/en/bhp-billiton-vale-lawsuit-re-dam-collapse-in-brazil>.

104 Australian Associated Press, “Brazil to Sue Mining Companies BHP and Vale for \$5bn over Dam Disaster,” *The Guardian*, November 28, 2015, <https://www.theguardian.com/world/2015/nov/28/brazil-to-sue-mining-companies-bhp-and-vale-for-5bn-over-dam-disaster>.

105 Oscar Williams-Grut, “Mining Giant BHP Billiton Is in Big Trouble over Brazil’s Worst Ever Environmental Catastrophe,” *Business Insider UK*, December 22, 2015, <http://uk.businessinsider.com/samarco-dam-disaster-bhp-billiton-ordered-to-set-aside-cash-by-brazilian-court-2015-12>.

the Attorney General, and the judicial powers and parliamentarians, have only wanted to make press appearances. The federal government has behaved like an embarrassed partner of the corporation.¹⁰⁶

In fact, it was unions, churches, universities and social movements like the Movement of the Affected by Dams (MAB) that stepped in to support and organize people directly affected by the dam collapse. Civil society organizations provided emergency food, drinking water and shelter; sorted through the debris and documented the damages; and carried out epidemiological studies and water tests¹⁰⁷ to substantiate future compensation claims. They also insisted that those directly affected be treated as citizens whose rights had been infringed on by the actions of a private mining company and that they have a voice in all plans for resettlement and compensation.¹⁰⁸

Demands for accountability accelerated in the first months of 2016. In February, the conclusions of the 2,432-page investigative report by the Minas Gerais police were reported in the media. The cause of the collapse was “liquefaction.” The police report explained, “There were high saturation levels of sandy tailings deposited in Fundão, failures to monitor, defective equipment, inadequate equipment for monitoring, elevated rates of annual dam heightening, silt buildup behind dam 2 and deficiencies in the drainage system.”¹⁰⁹

Although no formal criminal charges were laid (in Brazil, only prosecutors can do this), the police recommended that six top executives at Samarco and one director of a sub-contracted engineering company be charged with “qualified homicide,” which is equivalent to voluntary manslaughter and carries a sentence of 12 to 30 years in prison. The seven were also accused of endangering public health by polluting drinking water in the broad area affected by the breached dam. Two of those accused, former Samarco President Ricardo Vescovi and Kleber Terra, director of operations, had already stepped down from the company a month earlier. BHP and Vale responded that, while they appreciated the seriousness of the charges, they were awaiting the results of the independent external investigation before determining blame.¹¹⁰

On March 2, 2016, representatives of Samarco, Vale and BHP, the national government and provincial officials from Minas Gerais and Espírito Santo reached what they claimed was a final agreement on a R\$20 billion (US\$7.5 billion) settlement. The agreement also included establishing a private, non-profit foundation—Fundação Renova—to reconstruct, restore and recover the environment and the affected communities.¹¹¹

Negotiated with neither transparency nor broad participation, the Transaction and Adjustment of Conduct Framework Agreement (TTAC) was announced in a public ceremony. Andrew Mackenzie,

It was unions, churches, universities and social movements like the Movement of the Affected by Dams (MAB) that stepped in to support and organize people directly affected by the dam collapse.

106 João Pedro Stédile, “Vale da Morte,” *Caros amigos* no. 225 (January 5, 2016), <http://www.carosamigos.com.br/index.php/revista/203-edicao-225/5801-joao-pedro-stedile-vale-da-morte>. Author’s translation.

107 “Análise aponta presença de arsênio, chumbo, cobre e mercúrio em lama da barragem,” *Folha Vitória*, November 12, 2015, <http://www.folhavoritória.com.br/geral/noticia/2015/11/analise-aponta-presenca-de-arsenio-chumbo-cobre-e-mercúrio-em-lama-da-barragem.html>. Tests done a week after the dam collapse by local authorities downriver revealed unacceptably high levels of arsenic, barium, lead, copper and mercury.

108 Sullivan, 2016.

109 Thaís Pimentel, “Excesso de água em barragem provocou rompimento, diz Polícia Civil,” *Globo.com*, February 23, 2016, <http://g1.globo.com/minas-gerais/desastre-ambiental-em-mariana/noticia/2016/02/excesso-de-agua-em-barragem-provocou-rompimento-diz-policia-civil.html>. Author’s translation.

110 Cecilia Jamasmie, “Samarco Executives Accused of Homicide by Brazilian Police over Dam Burst,” *Mining.com*, February 24, 2016, <http://www.mining.com/samarco-executives-accused-of-homicide-by-brazilian-police-over-dam-burst/>.

111 *Termo de transação e de ajustamento de conduta*, signed March 2, 2016, http://www.meioambiente.mg.gov.br/imagens/stories/2016/DESASTRE_MARIANA/CIF/ACORDO_-_FINAL_-_ASSINADO.PDF.

CEO of BHP Billiton, stated, "This agreement is an important step in supporting the long-term recovery of the affected communities and the environment."¹¹²

According to the agreement, Samarco would fund the Renova Foundation with US\$500 million in 2016 and US\$300 million in the two following years, with Vale and BHP on the hook for any shortfall in Samarco's ability to meet its funding obligations. The agreement specified that people affected by the disaster who wished to dispute the compensation offered by Renova Foundation could use the services of lawyers paid for by the Foundation. And although Renova would be led by a board of directors whose members were to be nominated by BHP Billiton and Vale, it was accountable to a broader committee that comprised various federal and state representatives.

Federal and state prosecutors criticized the US\$7.5 billion settlement, claiming that it was reached in haste, without appreciating the effects and the scope of the tragedy. It also lacked legal mechanisms to ensure company compliance and really amounted to little more than a "letter of intent." Federal prosecutor Edmundo Antônio Dias Netto Júnior commented that while the board of the Renova Foundation was ostensibly created to invite local participation, those holding community positions on the board had no decision-making power. He also argued, "The foundation serves as a shield against the responsibilities of the companies and the government, both federal and state, with respect to those affected...engineering that, in a certain sense, puts the companies on the margins, and draws all eyes to the foundation."¹¹³

In May 2016, Brazilian federal prosecutors filed their own 359-page civil lawsuit based on the findings from their six-month investigation. They insisted the earlier agreement did not guarantee proper cleanup and damages because the people affected by the collapse were not included in settlement talks.¹¹⁴ Their new civil lawsuit for cleanup and restoration named Samarco and its joint owners, Vale and BHP Billiton, along with federal and state governments in Minas Gerais and Espírito Santo, as those responsible for the disaster.¹¹⁵ In calculating the amount of damages in this US\$58 billion lawsuit, federal prosecutors took the Deepwater Horizon oil spill as a reference point, arguing that the tailings dam breach in Mariana had caused damages in Brazil equivalent to those caused by BP's dumping of five million barrels of oil into the Gulf of Mexico in 2010. The lawsuit demanded that the companies contract an independent auditor to evaluate the full extent of the damages. It also demanded that the three companies be prohibited from receiving public funding and suspend payment of returns to shareholders until the damages were fully repaired.¹¹⁶

On August 29, 2016, the independent review panel of engineering experts announced the results of their investigation. Like the police, their conclusion, verified by laboratory tests and sophisticated numerical computer modelling, and taking into account three small earthquakes just prior to the breach, was that:

The failure of the Fundão Tailings Dam by liquefaction flowsliding was the consequence of a chain of events and conditions. A change in design brought about an increase in



BARRA LONGA, DECEMBER 2015, ONE MONTH AFTER THE BREACH. PHOTO: BRUNO MILANEZ, POEMAS / UFJF.

112 Oscar Williams-Grut, "Mining Companies Are Paying \$1.1 Billion to Repair Brazil's Worst Environmental Catastrophe," *Business Insider UK*, March 3, 2016, <http://uk.businessinsider.com/bhp-billiton-vale-settle-samarco-dam-disaster-brazil-2016-3>.

113 Sullivan, 2016.

114 Heloisa Mendonça, "Procuradoria pede 155 bilhões de Samarco, Vale e BHP por danos em Mariana," *El País*, May 4, 2016, http://brasil.elpais.com/brasil/2016/05/04/politica/1462315157_587626.html?id_externo_rsoc=TW_CC.

115 The earlier civil lawsuit for US\$5.3 billion launched in November 2015 was settled when the TTAC was announced. See Natasha Schmitt Caccia Salinas, "Samarco Case: Legal, Economic and Social Implications of the Greatest Environmental Disaster in Brazil," teaching case study, FGV Direito Rio website, 2016, http://diretorio.fgv.br/sites/diretorio.fgv.br/files/u2726/teaching_case_mariana_2016.pdf.

116 Mendonça, 2016.

saturation which introduced the potential for liquefaction. As a result of various developments, soft slimes encroached into unintended areas on the left abutment of the dam and the embankment alignment was set back from its originally-planned location. As a result of this setback, slimes existed beneath the embankment and were subjected to the loading its raising imposed. This initiated a mechanism of extrusion of the slimes and pulling apart of the sands as the embankment height increased. With only a small additional increment of loading produced by the earthquakes, the triggering of liquefaction was accelerated and the flowslide initiated.¹¹⁷

Based on the findings of the expert panel, federal prosecutors finally brought criminal charges against 21 executives of Samarco, Vale and BHP and one senior engineer from a contracted engineering company. The Samarco, Vale and BHP employees were charged with manslaughter and crimes related to flooding and collapse after the dam burst, personal injury and environmental crimes. The three mining companies were charged with nine counts of environmental crime.¹¹⁸ The engineer and his company were charged with environmental crimes.

On January 18, 2017, Samarco, Vale and BHP came to a preliminary agreement with the federal prosecutors, and in March 2017 a judge suspended the earlier civil lawsuit of May 2016 as part of the new settlement agreement under negotiation. In August 2017, a federal judge in Minas Gerais suspended the criminal case launched against the mining executives pending resolution of arguments advanced by their defence lawyers that the evidence used against them was obtained through wiretapping beyond the period authorized by the court.¹¹⁹ In November 2017, the mining companies managed to close a deal with state prosecutors that distanced them from the lawsuits filed relating to cleanup and reparations. The deal gave the company another 150 days to finetune how prosecutors will participate in overseeing reparations. It also stipulated that the companies hire consultants to complete a broader assessment of damages wrought on fishing and tourism industries. During the same week, the regulator responsible for granting licences announced a hearing on November 24 to discuss the first permit required for the mine to reopen.¹²⁰

Twenty-one executives of Samarco, Vale and BHP and one senior engineer were charged with manslaughter and crimes related to flooding and collapse after the dam burst, personal injury and environmental crimes.

117 Norbert R. Morgenstern et al., *Fundão Tailings Dam Review Panel: Report on the Immediate Causes of the Failure of the Fundão Dam*, August 25, 2016, iii, <http://fundaoinvestigation.com/wp-content/uploads/general/PR/en/FinalReport.pdf>.

118 Thaís Pimentel, "MPF denuncia 22 pessoas e quatro empresas por desastre em Mariana," *Globo.com*, October 20, 2016, <http://g1.globo.com/minas-gerais/desastre-ambiental-em-mariana/noticia/2016/10/mpf-denuncia-26-pessoas-por-rompimento-da-barragem-da-samarco.html>.

119 Maiana Diniz, "Judge Suspends Case on 2015 Mariana Mining Disaster," *Agência Brasil*, August 8, 2017, <http://agenciabrasil.ebc.com.br/en/geral/noticia/2017-08/judge-suspends-case-2015-mariana-mining-disaster>.

120 R.T. Watson, "BHP-Vale Deal Distances Companies from \$71.5b in Dam Collapse Lawsuits," *The Sydney Morning Herald*, November 18, 2017, <https://www.smh.com.au/business/companies/bhpvale-deal-distances-companies-from-715b-in-dam-collapse-lawsuits-20171118-gzo1ar.html>.

Regulatory capture and the mining industry¹²¹

In the name of economic growth and job creation, governments in Canada and Brazil have actively catered to private investors, national or foreign, including mining companies. The result is that mining interests often supersede the public interest.

IN BOTH CANADA AND BRAZIL, THE OFFICIAL INVESTIGATIONS considered how the tailings dams breached but not why. Yet the actions (or lack of actions) that allowed those breaches to occur are directly related to matters of policy and finance. Federal and provincial/state governments have followed the mantras of privatization, deregulation, downsizing and cuts to social spending since the mid-1970s.¹²² In the name of economic growth and job creation, they have actively catered to private investors, national or foreign, including mining companies. The result is that mining interests often supersede the public interest.

Government transformation from “regulator” to “service provider”

When Gordon Campbell and the BC Liberal Party took office in 2001, they immediately made steep cuts to the public service, including to the ministries responsible for environmental protection and oversight of resource development.¹²³ The government also restructured key ministries and altered their mandates. As the Canadian Centre for Policy Alternatives noted during the first round of cuts and restructuring, the changes were sweeping:

The Ministry of Water, Land and Air Protection (MWLAP) will focus on “client service” in order to do away with “constraints on economic development.” The Ministry of Sustainable Resource Management (MSRM) will “facilitate sustainable economic development.”... The Ministry of Energy and Mines’ mandate is to trim regulations to foster “a more competitive investment climate.” The Environmental Assessment Office, originally intended to identify the environmental risks associated with major projects, will

121 Regulatory capture occurs when regulation, or the carrying out of regulatory oversight by a government body, is directed or unduly influenced by the private industry subject to regulation.

122 See Judith Marshall, “Contesting Big Mining from Canada to Mozambique,” in *State of Power 2015: An Annual Anthology on Global Power and Resistance* (Amsterdam: Transnational Institute, 2015), 63–76, https://www.tni.org/sites/www.tni.org/files/download/06_tni_state-of-power-2015_contesting_big_mining_from_canada_to_mozambique-1.pdf, for an exploration of how mining companies gain, exercise and legitimate their power.

123 Iglia Ivanova, *Reality Check on the Size of BC’s Public Sector* (Vancouver: Canadian Centre for Policy Alternatives, 2013), <https://www.policyalternatives.ca/bc-public-sector-reality-check>.



now use “enabling statutes” to approve projects in a more “timely, cost-effective, and certain” fashion. The transformation from regulator to service provider is also evident in the one-stop shopping approach to mining project approvals.¹²⁴

In October 2012, two years before the Mount Polley disaster, Byng Giraud, vice president of corporate affairs at Imperial Metals, made a presentation to BC’s Standing Committee on Finance and Government Services. He lobbied, among other things, to reduce the approval process for new mines from 10 years or more to just three. Seven months later, the BC Liberal Party went to the polls promising to streamline the mining application process and work with the federal government for a single environmental review process.

In January 2014, seven months before the dam collapse, then-BC Premier Christy Clark addressed the Association for Mineral Exploration British Columbia (AME BC). In the middle of her speech about extending a \$10 million tax-credit program for BC’s mining industry, she also announced plans to review the provincial Environmental Assessment Office. She described it as “cumbersome” and promised to make it “more effective and efficient.” Clark told her corporate audience: “I think over the years, the environmental assessment process has gotten so long, so difficult and so complex that communities, proponents, can’t get a yes, can’t get a no.”¹²⁵

The investigative news site *The Tyee* reported shortly after the Mount Polley tailings breach that mine inspections in the province had been reduced by nearly half since 2001, the year the BC

Seven months before the Mount Polley dam collapse, in a speech to the Association for Mineral Exploration British Columbia, then-BC Premier Christy Clark described the provincial environmental assessment office as “cumbersome.”

124 Dale Marshall, “In Service of Business,” commentary on Canadian Centre for Policy Alternatives website, January 1, 2002, <https://www.policyalternatives.ca/publications/commentary/service-business#sthash.AxcvkpJ5.dpuf>.

125 Dermod Travis, “Commentary: Crony Capitalism Alive and Well at Mount Polley,” IntegrityBC.ca, August 11, 2014, http://www.integritybc.ca/?page_id=5172. See also Vivian Luk, “B.C. to Review Environmental Assessments,” *Global News* online, January 27, 2014, <https://globalnews.ca/news/1109862/b-c-to-review-environmental-assessments/>.

Liberal government took power.¹²⁶ *The Tyee* also reported that as early as 2010 Glen Davidson, a senior engineer in the Ministry of Environment, had expressed his concerns in a memorandum to his deputy minister. He mentioned staff cuts but was particularly concerned about the adoption in the early 2000s of a new dam safety program which was “results-based.” Noting that it shifted the responsibility for maintaining dam safety from regular, third-party inspections to professionals—usually employed by the mining companies—and dam owners,¹²⁷ he already foresaw an increase in dam failures or incidents:

Under this new approach it is anticipated that there will be a certain number of negative results, which in the field of dam safety are represented by dam failures or incidents. On average we have been experiencing several incidents and at least one dam failure in British Columbia annually.¹²⁸

Yet in January 2015, with investigations into the collapse at Mount Polley underway and allegations swirling, the BC Premier announced additional support for mining through the establishment of a new Major Mines Permitting Office, plus an additional \$6 million to speed up permit turnaround times.¹²⁹ Clearly the BC government had come to see its role as serving the mining industry rather than first and foremost as defending the public interest.

In Brazil, the federal government deliberately and aggressively sold off large state-owned companies in the 1990s in order to capitalize strong domestic businesses to reduce imports, serve the Brazilian market and grow exports. The Brazilian Privatization Program, financed by the Brazilian Economic and Social Development Bank (BNDES), began in 1991, and by 1997 it had orchestrated the sale of state-owned Vale to a public-private consortium known as Valepar S.A. Comprising four pension funds (58%), the domestic Bradesco banking group (17%), Japanese multinational Mitsui (15%) and BNDES (9.5%), the “privatized” Vale was run by a new breed of pension fund managers who were inextricably intertwined with the major Brazilian companies and BNDES.¹³⁰

When Luiz Inácio Lula da Silva (Lula) became president in 2003, his Partido dos Trabalhadores (PT, or Workers’ Party) rode the wave of the commodity boom. Buoyed by high prices for both oil and iron, he and his party were able to hold together a complex coalition of political parties and constituencies. They invested in massive infrastructure projects to promote the export commodity model while at the same time launching impressive social programs.¹³¹ Between 2005 and 2010, BNDES loans increased by 257 per cent¹³² and by 2009/2010, the World Bank’s disbursements of US\$40.3 billion were less than half of what BNDES disbursed over the same period.¹³³

Economist Marcio Pochmann, PT member and one-time director of the Institute of Applied Economic Research, explained the Lula government believed that a world was emerging in which 500 large transnationals would dominate. Countries without large economic groups would play a subordinate role to these transnationals. The Lula government opted to use state resources to

126 David P. Ball, “Mine, Dam Inspections Dropped Since 2001,” *The Tyee*, August 8, 2014a, <https://thetyee.ca/News/2014/08/08/Mine-and-Dam-Inspections-Dropped/>.

127 Ibid.

128 Ibid.

129 “Premier announces new funding to support mining in BC,” news release, Office of the Premier, January 26, 2015, <https://news.gov.bc.ca/stories/premier-announces-new-funding-to-support-mining-in-bc>.

130 Raúl Zibechi, *The New Brazil: Regional Imperialism and the New Democracy* (Baltimore: AK Press, 2014).

131 For an excellent account of the period, see special issue on Lula’s legacy in Brazil, *NACLA Report on the Americas* 44, no. 2 (March/April 2011), <http://ggjalliance.org/sites/default/files/2%20-%20NACLA%2044-2.pdf>.

132 “BNDES empresta mais que Banco Mundial,” *Otempo*, March 9, 2011, <http://www.otempo.com.br/capa/economia/bndes-empresta-mais-que-banco-mundial-1.356517>.

133 Zibechi, 2014.

During Lula’s two terms in office, the ambitions of Brazilian government and corporate leaders to become significant players in the global economy far outweighed any investment in social programs to redress poverty and inequality.

build up contenders for inclusion in this group of 500 transnationals. Pochmann argued: “We are moving into a phase in which it is not the countries that have the companies but the companies that have countries, given the size of corporations with profits many times greater than any national GDP. So there is no alternative, in my view, than to go about constructing these groups.”¹³⁴

The Brazilian state aligned itself strongly with the domestic growth and global expansion of Brazilian corporations like Vale, Odebrecht and Petrobras, using BNDES loans to finance the projects. During Lula’s two terms in office, the ambitions of Brazilian government and corporate leaders to become significant players in the global economy far outweighed any investment in social programs to redress poverty and inequality. In Brazil, then, in addition to significant corporate funding for national and state electoral campaigns, the state was actively promoting the capacity of Brazilian transnationals to become major global players by streamlining regulations, reducing oversight and facilitating growth.

Lobbying and corporate contributions to political parties

The intimate relationship between corporate and government leaders emerged as an issue related to the dam collapses in both countries. In 2017, the *New York Times* published an article entitled “British Columbia: The ‘Wild West’ of Canadian Political Cash” that detailed how wealthy individuals, corporations and unions are buying access to power in the province. It documented how the Premier’s salary of \$195,000, which was drawn from the public payroll, was being augmented with up to \$50,000 each year sourced from private political contributions.¹³⁵ The story described how Christy Clark, in her capacity as Premier of BC and as head of the BC Liberal Party, made herself available regularly for private functions arranged through wealthy donors and corporations.

One of the BC Liberal Party’s biggest donors is Alberta billionaire N. Murray Edwards, a major financier in Alberta oil-sands projects and the controlling shareholder in Imperial Metals, which operates the Mount Polley mine. In 2013, Edwards hosted a \$1 million fundraiser for the BC Liberal party at the Calgary Petroleum Club.¹³⁶

The *New York Times* article suggested that the big donors to Premier Clark’s party “often appear to have benefited financially from their political generosity. These include banks, Chinese real estate developers, and companies like Imperial Metals, the owner of a mine tailings pond that spilled billions of gallons of toxic debris in 2014, and was then permitted to operate an even larger mine.”¹³⁷

Between 2003 and 2014, Imperial Metals and its subsidiaries (MPMC, Red Chris Development Company and Huckleberry Mines Limited) donated a total of \$233,710 to the BC Liberal Party (with contributions of \$60,000 in 2013 alone).¹³⁸ The *Vancouver Sun* looked beyond just Imperial Metals and its direct subsidiaries to include other companies in which Edwards has interests,

One of the BC Liberal Party’s biggest donors is Alberta billionaire N. Murray Edwards, a major financier in Alberta oil-sands projects and the controlling shareholder in Imperial Metals, which operates the Mount Polley mine.

134 Ibid., 127.

135 Dan Levin, “British Columbia: The ‘Wild West’ of Canadian Political Cash,” *New York Times*, January 13, 2017, <https://www.nytimes.com/2017/01/13/world/canada/british-columbia-christy-clark.html>.

136 Kelly Sinoski, “Major Imperial Metals Shareholder Held Private Fundraiser for Clark’s Re-election Bid,” *Vancouver Sun*, August 12, 2014, <http://www.vancouversun.com/news/Major+Imperial+Metals+shareholder+held+private+fundraiser+Clark+election/10102715/story.html>

137 Ibid.

138 David P. Ball, “Imperial Metals’ Political Gifts to BC Liberals Total \$234,000,” *The Tyee*, August 9, 2014b, <https://thetyee.ca/News/2014/08/09/Imperial-Metals-Monetary-Gifts/>.

and found contributions to the BC Liberal Party totalling \$436,227 between 2005 and 2014.¹³⁹ Edwards and Imperial Metals were among a large group of individual and corporate donors from the extractive sector who contributed millions to the BC Liberal Party over the years.¹⁴⁰

According to Dermod Travis, executive director of Integrity BC, a nonpartisan transparency watchdog, unlimited political donations create public cynicism:

Companies that have given large donations to the BC Liberals walk away with nothing more than slaps on the wrist for various regulatory infractions.... There is an ongoing suspicion from the public that these donations aren't being made by companies that just want to be good corporate citizens, but that they want to ensure their voice is heard in the regulatory process.¹⁴¹

The audit staff insisted that their inquiries showed clear evidence that the Ministry of Energy and Mines had not focused on developing stronger compliance and enforcement mechanisms.

Donations by corporations (and unions) to political parties in BC were subsequently banned in 2017 by a new NDP minority government, following an election campaign in which the problem of political donations was a major issue.

The Auditor General's report took up the question of regulatory capture head on. Its overall recommendation could not have been sharper:

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."¹⁴²

There was heated debate in the legislature, particularly around the recommendation to take compliance and enforcement functions out of the Ministry of Energy and Mines. The Minister of that department, Bill Bennett, whose 2009 re-election campaign had also received a donation of \$3,000 from Imperial Metals,¹⁴³ was one of the strongest voices against the restructuring.

The audit team stuck to its guns, however, in the debates with Members of the Legislative Assembly (MLAs). *Times Colonist* journalist Les Leyne captured the tone of the debate in his article "Bellringer, MLAs at Odds over Mining." The audit staff insisted that their inquiries showed clear evidence that the Ministry of Energy and Mines had not focused on developing stronger compliance and enforcement mechanisms. Instead their efforts were "devoted to supporting the development of mining through processing permits."¹⁴⁴

The audit staff emphasized again to the MLAs that government was running the risk of being unduly influenced by the mining companies to the point where the regulators ended up serving the needs of the industry.

139 Kelly Sinoski, "Major Imperial Metals Shareholder Held Private Fundraiser for Clark's Re-election Bid," *Vancouver Sun*, August 12, 2014.

140 Ibid. See also Nicholas Graham, Shannon Daub & Bill Carroll, *Mapping Political Influence: Political Donations and Lobbying by the Fossil Fuel Industry in BC* (Vancouver: CCPA, 2017). https://www.policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office/2017/03/ccpa-bc_mapping_influence_final.pdf

141 Ball, 2014b.

142 Office of the Auditor General of British Columbia, 2016, 11.

143 Ball, 2014b.

144 See more at Les Leyne, "Bellringer, MLAs at Odds over Mining," *Times Colonist*, June 9, 2016, <http://www.timescolonist.com/opinion/columnists/les-leyne-bellringer-mlas-at-odds-over-mining-1.2274072#sthash.PAfIjuWE.dpuf>.

“We found that the Ministry exhibits most of the possible signs of regulatory capture,” audit director Ardice Todosichuk told the committee. She said there’s been a “decade of neglect” in the Ministry’s enforcement and significant deficiencies in the Environment Ministry. Their work protecting the province is inadequate.¹⁴⁵

In Brazil, regulatory capture is also an established reality. PoEMAS issued a report that argues the practice of contributions from private corporations to electoral campaigns distorts the political system:

To the extent that corporations are allowed to finance electoral campaigns, the electoral process becomes more and more expensive. This introduces a dynamic of artificial selection through which those with access to these resources increase their probability of being elected. Once in power, maintaining a good relationship with their financial backers becomes the precondition for obtaining future support. In this way, the political representatives become more and more oriented to the interests of their financial backers.¹⁴⁶

The Vale group financed electoral campaigns at both the federal and state levels. Electoral records from the 2015 elections show that Dilma Rousseff received direct contributions of C\$33.6 million from Vale while state governor Fernando Pimentel received C\$8.7 million. An Extraordinary Dams Commissions was created a week after the Fundão spill with two state deputies named to it who had had direct campaign contributions from Vale. Among the 19 members of an External Commission of the Chamber of Deputies tasked with accompanying and monitoring the consequences of the Fundão breach, ten had had their campaigns financed by Vale.¹⁴⁷

Beatriz Cerqueira, president of the Central Única dos Trabalhadores (CUT), an organization that protects workers’ rights, called for a parliamentary commission of inquiry into the Mariana disaster, including the question of corporate financing of political campaigns, corporate funding of universities and corporate control over the media:

Mining companies today exercise a strategic role in financing electoral campaigns. The main candidates for the presidency of the Republic, the main candidates for governor of Minas and a large number of the candidates for state deputies, federal deputies and mayors are financed by the mining companies. Much of the research at universities is also financed by the mining companies. In addition, major public relations campaigns are carried out in the media, which compromises the journalistic coverage of these companies.¹⁴⁸

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145 Ibid.

146 PoEMAS, 2015, 44. Author’s translation.

147 Ibid.

148 Beatriz Cerqueira in Marco Weissheimer, “Barragem da Samarco continua vazando e lama segue descendo o rio, diz presidente da CUT-MG,” *Sul21*, March 7, 2016, <https://www.sul21.com.br/jornal/barragem-da-samarco-continua-vazando-e-lama-segue-descendo-o-rio-diz-presidente-da-cut-mg/>. Author’s translation.

Mining on Indigenous land

Indigenous peoples throughout the Americas (and people of African origin brought to the Americas as slaves) are still seeking justice not only for the occupation, pillage and abuses of the colonial era but also for modern incursions on their lands and contemporary denials of their rights.

AS NOTED AT THE OUTSET OF THIS PAPER, at both Mount Polley and Mariana, the mining companies operated on territories with land claims dating back to the colonial era. In Canada, the Mount Polley mine is located on Northern Secwepemc territory. Most affected by the tailings dam collapse were the Xat'sull (Soda Creek) First Nation and the T'exelc (Williams Lake) Band. In Brazil, the disaster affected an Indigenous community of the Krenak located downriver from the mine and several *quilombos*, communities of descendants of people brought from Africa to Brazil as slaves during the 1700s gold rush, in small farming communities adjacent to the mines.

Both Canada and Brazil have a history of settler colonialism. Indigenous peoples throughout the Americas (and people of African origin brought to the Americas as slaves) are still seeking justice not only for the occupation, pillage and abuses of the colonial era but also for modern incursions on their lands and contemporary denials of their rights. Questions over land are central, and clashes with mining companies are frequent.

Eminent geographer and anthropologist David Harvey has developed the concept of “accumulation by dispossession” to show that the practices of colonial occupation, slavery, violence and fraud are not limited to the early stages of capitalism but have been ongoing throughout its development. These practices have allowed European settlers to accumulate land and other resources essentially by theft. The land grabs have actually intensified since the mid-1970s with the consolidation of neoliberalism.¹⁴⁹ Political scientist Jeffery Webber has confirmed that in Latin America, “assets previously held under collective ownership, either by the state or in common, have been forced on an unprecedented scale into the realm of the market, often through fraud, coercion, and innumerable forms of predation both by the state and powerful private actors.”¹⁵⁰

Noted Indigenous intellectual and activist Glen Coulthard has framed the concept as settler-state dispossession, a fluid phenomenon that remains the most important tool in contemporary settler colonial oppression of Indigenous peoples. Arguing that there are no automatic “stages of development” leading from a life based on the land to dispossession and an industrial labour force, he wrote of Canada:

149 David Harvey, “The ‘New’ Imperialism: Accumulation by Dispossession,” in *Socialist Register* 40, (2004): 63–87, <http://www.socialistregister.com/index.php/srv/article/view/5811/2707#.WILbShT8HeA>.

150 Jeffery R. Webber, “Book Review: *Behind Colombian Coal: Mining, Multinationals and Human Rights*,” *Upside Down World*, March 25, 2008, <http://upsidedownworld.org/archives/colombia/book-review-behind-colombian-coal-mining-multinationals-and-human-rights/>.

It is now generally acknowledged among historians and political economists that following the waves of colonial settlement that marked the transition between mercantile and industrial capitalism...Native labor became increasingly (although by no means entirely) superfluous to the political and economic development of the Canadian state. Increased European settlement combined with an imported, hyper-exploited non-European workforce meant that, in the post-fur trade period, Canadian state-formation and colonial-capitalist development required first and foremost land, and only secondarily the surplus value afforded by cheap, Indigenous labor.¹⁵¹

Throughout the Americas, then, the mineral deposits being extracted in the 21st century are often located on lands populated by vulnerable populations who historically have had limited ability to control foreign access to those lands and resources or to bargain for adequate compensation when they are dispossessed.

In many jurisdictions in Canada, mining law still carries vestiges of practices that date back to early settler state governance. One of these is the “free entry” system, which grants prospectors and mining companies the freedom to enter onto public lands to explore for minerals and acquire rights to establish mines. In BC, as well as in Ontario, Quebec and the Northwest Territories, there is a movement to end this practice.¹⁵² West Coast Environmental Law, an organization that aims to strengthen legal protection for the environment by bridging Indigenous and Canadian law, has been one of the strong BC voices against this system:

Free entry thwarts sensible land use planning and elevates miners to a form of extraordinary privilege. It has negative fiscal implications for governments, it interferes with the exercise of Aboriginal Title and Rights, and the exercise of private property rights.¹⁵³

To focus public attention on the free entry system, aim was taken at Bill Bennett (then-Minister of Energy and Mines). As the *Globe and Mail* reported: “It took less than an hour for Bev Sellars, a lawyer and former chief of the Xat’sull First Nation at Soda Creek, to file an application with the Province to become a free miner and then to use the Ministry’s online registry to stake her claim for the right to explore a chunk of land that includes Mr. Bennett’s Cranbrook home.”¹⁵⁴

In Canada today, governments speak of respect and shared governance with Indigenous peoples, espousing the duty “to consult and to accommodate” and the right of Indigenous peoples to “free, prior and informed consent” (FPIC). The highly contested right to FPIC is enshrined in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), which was adopted by the UN General Assembly in September 2007 to protect the right of Indigenous peoples to

Throughout the Americas the mineral deposits being extracted in the 21st century are often located on lands populated by vulnerable populations who historically have had limited ability to control foreign access to those lands.

151 Glen Sean Coulthard, *Red Skin, White Masks: Rejecting the Colonial Politics of Recognition* (Minneapolis: University of Minnesota Press, 2012), 12.

152 Jamie Kneen, “End Mining’s Privileged Access to Land! Communities across Canada Outraged by Free Entry System,” MiningWatch Canada blog, January 21, 2008, <http://miningwatch.ca/news/2008/11/28/end-mining-s-privileged-access-land-communities-across-canada-outraged-free-entry>.

153 Jessica Clogg, *Modernizing BC’s Free Entry Mining Laws for a Vibrant, Sustainable Mining Sector* (Vancouver: West Coast Environmental Law and Fair Mining Collaborative, 2013), 3, http://wcel.org/sites/default/files/publications/WCEL_Mining_report_web.pdf.

154 Justine Hunter, “Former First Nations Chief Stakes Legal Claim on Mining Minister’s Property,” *Globe and Mail*, January 14, 2017, <http://www.theglobeandmail.com/news/british-columbia/former-first-nations-chief-stakes-legal-claim-on-mining-ministers-property/article33752692/>.

exercise control over land.¹⁵⁵ In reality, however, adequate information is rarely provided and Indigenous peoples are often consulted only after entry on Indigenous land has already taken place. And an Indigenous “no” to a mining project is often characterized as being “anti-development,” “anti-progress” or manipulated by non-Indigenous environmental extremists.

Not surprisingly, mining on Indigenous land in Brazil is also complex, contested and integrally linked with Brazil’s colonial history. As in Canada, the settlers were primarily interested in the gold and other minerals found on Indigenous land. Today there are mining claims from local artisanal miners, Brazilian mining companies and transnational giants like Barrick and Anglo American on 25 per cent of the territories officially designated as Indigenous, many of these lands concentrated in the Amazon Basin. According to data from the Indigenous Missionary Council (CIMI), speculators are increasingly invading Indigenous lands to lay illegal claims.¹⁵⁶

Adequate information is rarely provided and Indigenous peoples are often consulted only after entry on Indigenous land has already taken place.

While Article 321 of Brazil’s federal constitution does make reference to mining on Indigenous land, it also states that this mining can only be carried out if regulated by specific legislation not yet enacted. In other words, mining activity on Indigenous lands is illegal. It is not clear, however, whether or not that rule applies to existing mines on Indigenous lands and whether or not those operations should be suspended. For now, the practice of mining on Indigenous lands remains in legal limbo.¹⁵⁷

A new law for regulating mining on Indigenous land in Brazil is currently being debated. If PL 1.610/96 becomes law, mining would become legal on Indigenous lands subject to consultation and to the transfer of a percentage of the profits to Indigenous peoples. “We are very concerned about this PL 1.610. We think it represents the interests of entrepreneurs who want to mine these lands more than the interests of Indigenous peoples,” according to Sonia Guajajara, general coordinator of Articulation of Indigenous Peoples of Brazil (APIB).¹⁵⁸

Márcio Santilli, a social activist and politician, suggested that the push from business and government toward opening Indigenous land to mining has to do with Brazil’s return to being a producer of primary products and its increasing dependence on the export of commodities like iron ore. He explained, “This means strengthening the sectors of society and the economy that most run counter to dedicating lands, like Indigenous lands, for social and environmental purposes.”¹⁵⁹

155 United Nations Department of Economic and Social Affairs, “An Overview of the Principle of Free, Prior and Informed Consent and Indigenous Peoples in International and Domestic Law and Practices,” workshop notes, New York, January 17–19, 2005, 48, www.un.org/esa/socdev/unpfii/documents/workshop_FPIC_tamang.doc. The right of Indigenous people to free, prior and informed consent means not just the right to be consulted but the right to say no to mining. It also means that:

- Indigenous peoples are not coerced, pressured or intimidated in their choices of development;
- Their consent is sought and freely given prior to the authorization and start of development activities;
- Indigenous peoples have full information about the scope and impacts of the proposed development activities on their lands, resources and well-being;
- Their choice to give or withhold consent over developments affecting them is respected and upheld.

Canada initially voted against UNDRIP, but in December 2017 a private member’s bill that requires the federal government to ensure consistency of the laws of Canada with UNDRIP and the development of a national action plan to this end, including full consultation and cooperation with Indigenous peoples, received second reading. There was support for the bill in theory but the principles of free, prior and informed consent have yet to be applied with respect to mining on Indigenous land.

156 Caco Bressane, “Em terra de índio, a mineração bate à porta,” *Brasil de Fato*, June 21, 2016, <https://www.brasildefato.com.br/2016/06/21/em-terra-de-indio-a-mineracao-bate-a-porta/>.

157 Ibid.

158 Ibid. Author’s translation.

159 Ibid. Author’s translation.



BENTO RODRIGUES,
NOVEMBER 2016, ONE YEAR
AFTER THE BREACH. PHOTO:
PAULO ROBERTO RODRIGUES
DE OLIVEIRA, PPGE0 / UFJF.

In Brazil, mining companies are well known for their blatant disregard of the land rights of both Indigenous peoples and slave descendants despite laws that are meant to protect these very rights. The country's constitution, written following the transition from dictatorship to democracy in the 1980s, guarantees Indigenous peoples various legal and political rights. Brazil also signed on to UNDRIP in 2007 as well as to the earlier International Labour Organization (ILO) Indigenous and Tribal Peoples Convention in 1989, both of which guarantee respect for the culture, spirituality, and social and economic organization of Indigenous peoples. As with all UN declarations, however, UNDRIP is non-binding, which means long delays in transforming international standards into local laws and even longer delays in enforcing them.¹⁶⁰

Raising questions about Mariana: institutionalized racism toward Indigenous communities and *quilombos*?

The Indigenous community immediately affected by the Mariana disaster has faced a history of institutionalized racism that would be familiar to many Indigenous peoples in Canada.¹⁶¹ One of its contemporary forms occurred during the military dictatorship in the 1960s. The state-run Indian Protection Service, today known as the National Foundation of Indians (FUNAI), gave directives to the Minas Gerais military police to maintain order in the villages of the Rio Doce region, an area coveted at the time by miners and ranchers. Those who disobeyed the rules were deemed criminal or badly behaved and sent to the Krenak Reformatory. There they were incarcerated, beaten, placed in solitary confinement or forced to do farm labour. Interviewed after the Mariana disaster, Dejanira Krenak remembered the Krenak Reformatory years as a time when

The Indigenous community immediately affected by the Mariana disaster has faced a history of institutionalized racism that would be familiar to many Indigenous peoples in Canada.

160 Holly Eva Ryan, "Brazil Must Protect Its Remaining 'Uncontacted' Indigenous Amazonians," *The Conversation*, September 19, 2017, <http://theconversation.com/brazil-must-protect-its-remaining-uncontacted-indigenous-amazonians-84141>.

161 This section on the Krenak people draws heavily on an article by Renata Mariz, "As tragédias dos índios Krenak," *O Globo*, January 24, 2016, <http://oglobo.globo.com/brasil/as-tragedias-dos-indios-krenak-18533019>. Author's translation.

“you couldn’t be happy, light a fire, speak your language or have a drink.”¹⁶² People entered the Krenak Reformatory and disappeared. At least 94 people from 15 ethnic groups in 11 other states were also institutionalized there. A National Truth Commission held in Brazil estimated that at least 8,350 Indigenous people died during the dictatorship “as a result of direct action or omission of government agents.”¹⁶³

The United Nation’s Special Rapporteur on the rights of Indigenous peoples visited Brazil in 2008 and again in 2016. On that second visit “a disturbing absence of progress in the implementation of [the 2008] recommendations and the resolution of long-standing issues of key concern to Indigenous peoples” was noted, as well as “a worrying regression in the protection of Indigenous peoples’ rights.”¹⁶⁴ The Brazilian government immediately contested these overall conclusions.

When the Fundão dam collapsed, many Krenak people were affected. One community of 400 people had established seven villages on the remaining 4,000-hectare stretch of their traditional land along the Rio Doce. They depended on the river for fishing, for drinking water for themselves and their animals, for bathing, for irrigating their crops, for recreation and for transport. According to one member of the community: “The river gave us everything. If I needed a package of sugar, I went fishing and sold the fish to the restaurants. Now, everything is dead.”¹⁶⁵

In April 2016, a few months after the dam breach, a caravan of researchers and activists surveyed the affected communities in the Rio Doce basin, many of them small and remote. Many people were living off the land and interacting with the river with rituals and ceremonies linking them to their ancestors. When they were asked to comment on the quality of the water being supplied to the community by Samarco, one villager replied indignantly: “You don’t get it. We’re not here talking about water and whether or not it is good to drink. We are talking about the Rio Doce. For the Krenak people, the Rio Doce is Uatu, the oldest of the ancestors, a relative who is always present in our lives, who provides water to baptize our children. That is still our main point of reference in demarcating the territory of belonging and shelter.”¹⁶⁶

Since the breach, the Krenak communities have been completely transformed. People can no longer hunt and fish along the river. Initially, Samarco delivered bottled water to the community; a water tanker supplied water for washing and bathing, but there were regular interruptions in supply because of road conditions after heavy rains. Fences were put up to prevent animals from drinking the contaminated river water but later taken down because the river was central to Krenak sacred rituals. In the longer term, FUNAI, the government agency responsible for Indigenous peoples, negotiated monthly compensation payments for the Krenak. This money has made them considerably better off than their neighbours in non-Indigenous communities along the river: they now live in improved houses, eat supermarket food and ride motorcycles, but they have no means of earning a living and their sacred land has been despoiled.¹⁶⁷

162 Ibid.

163 Ibid.

164 United Nations General Assembly, *Report of the Special Rapporteur on the Rights of Indigenous Peoples on Her Mission to Brazil*, September 19, 2016, 2, https://www.socioambiental.org/sites/blog.socioambiental.org/files/nsa/arquivos/resposta_do_governo_brasileiro_-_ingles.pdf.

165 Mariz, 2016.

166 Simone Raquel Batista Ferreira, “Marcas da colonialidade do poder no conflito entre a mineradora Samarco, os povos originários e comunidades tradicionais do Rio Doce,” in *Desastre no Vale do Rio Doce: Antecedentes, impactos e ações sobre a destruição*, eds. Bruno Milanez and Cristina Losekann (Rio de Janeiro: Folio Digital, 2016), 275. Author’s translation.

167 Luisa Torre and Patrik Camporez, “Life for Brazil’s Krenak after Fundão Dam Collapse,” *Al Jazeera*, July 3, 2017, <http://www.aljazeera.com/indepth/features/2017/05/life-brazil-krenak-fundao-dam-collapse-170518073228854.html>.

Since the breach, the Krenak communities have been completely transformed. People can no longer hunt and fish along the river.

Immediately after the breach, the Krenak renewed their demand for resettlement in Sete Salões, the traditional land on the west side of the Rio Doce from which they were forcibly displaced by the military government in the 1960s. That land, which contains many natural springs, was granted to farmers, but private landowners have since built luxury mansions on it and denied access to the Krenak. In 2015, federal prosecutors filed a lawsuit calling on the Brazilian state to recognize the serious violations of rights committed against the Krenak and to adopt measures “to rescue and preserve their culture,” including having Sete Salões designated as Krenak land. On December 14, 2016, the Federal Court ruled that FUNAI must reclaim Sete Salões as Krenak Indigenous land within one year and that the National Archives must publish all documents pertaining to human rights abuses against Indigenous peoples carried out by the military regime.¹⁶⁸

Several rural *quilombos* adjacent to the mine were also completely destroyed by the tailings dam collapse. The PoEMAS report on the economic, institutional and social aspects of the disaster in Mariana raised the question of environmental racism. Was the decision to locate tailings dams next to land belonging to former slaves merely by chance? Or did Samarco’s deliberations about where to locate its tailing dams include the probability that poor black farmers would offer little resistance?¹⁶⁹ That question has not yet been adequately answered.

Learning from Mount Polley: Indigenous rights and mineral resources

BC’s provincial government, like all jurisdictions in Canada, is “legally obligated to consult and accommodate First Nations, where required, on land and resource decisions that could impact their Indigenous interests.”¹⁷⁰ How does this actually play out on the ground for Indigenous peoples on territories with mineral resources in BC? Examining the tailings dam collapse at Mount Polley provides many insights into the challenges.

Brian Olding, the environmental consultant who carried out the evaluation of MPMC’s proposals for a controlled discharge from the tailings dam a few years before the breach, was one of the few involved to make clear the distance between the very narrowly defined parameters of MPMC legality and security and the very broad parameters of the claims by the T’exelc Band and the Xat’sull First Nation. As noted earlier, Olding found that the company considered only data collected in the summer months when calculating the impact of its operations on fish ecology, yet the Secwepemc people rely on salmon year-round. He also reported that the company collected no data on the impact a spill would have on surrounding flora and fauna, yet the Secwepemc actively use the area around the mine to hunt game and gather edible plants, berries and medicinal herbs.¹⁷¹ The reality of Indigenous society and sovereignty was essentially invisible to the mining company.

The reality of Indigenous society and sovereignty was essentially invisible to the mining company.

When the tailings dam breached, it spilled into Polley Lake, down Hazeltine Creek and into Quesnel Lake. The lake is not only an important source of drinking water and spawning territory for one-quarter of BC’s famed sockeye salmon, but also a direct connection to the Fraser River, one of the province’s major watersheds. Jacinda Mack, formerly natural resource coordinator for the Xat’sull and currently coordinator of First Nations Women Advocating for Responsible Mining (FNWARM), captured the enormity of the spill:

168 Ministério Público Federal, “MPF/MG: Justiça Federal obriga Funai a delimitar terra indígena Krenak no prazo de um ano,” Procuradoria da República em Minas Gerais, December 14, 2016. Author’s translation.

169 PoEMAS, 2015, 63–66.

170 “Consulting with First Nations,” Government of British Columbia website, <https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations>, Accessed June 27, 2018.

171 Olding & Associates, 2011.



Quesnel Lake is not only an important source of drinking water and spawning territory for one-quarter of BC's famed sockeye salmon, but also a direct connection to the Fraser River, one of the province's major watersheds.

I know that Hazeltine Creek was little more than a four foot wide very calm very slow moving low water stream. To see 150–200 feet wide 30 feet deep raging river of toxicity coming down the mountain and slamming into one of the deepest freshwater lakes in North America, to the heart of our territory, to the heart of the ecosystem that depends on this lake—all of the salmon, the trout, all the animals, the people who live in this area.... The shock was so huge that we couldn't comprehend what really happened.¹⁷²

The T'exelc Band and Xat'sull First Nation had already established natural resource coordinators and had a history of engagement with corporate and government officials on mining issues. Important questions arose immediately around how to ensure that the Indigenous leaders had access to enough information for them to play a robust role in deciding how to respond to the tragedy.

In a CBC Radio interview, then Xat'sull chief Bev Sellars remarked: "We are going to be looking at getting independent scientists and people to help us determine whether the disaster is as benign as they say.... We don't believe it is."¹⁷³ Chief Sellars indicated that the priority for her community was to ensure access to independent information and confirmed that the Xat'sull had hired its own experts using money saved up over many years for a community hall.¹⁷⁴

Two days later, the *Williams Lake Tribune* announced that the Xat'sull and T'exelc had signed a letter of understanding with the BC government "to work in partnership to address all aspects of the breach of the tailings storage facility."¹⁷⁵ The agreement had five components: "a principals table of First Nations and Ministers of Environment, Aboriginal Relations and Reconciliation and Energy and Mines to oversee a government-to-government response;" a senior officials committee to oversee all response activities with "full sharing of information;" a grant of \$200,000 to each of the two First Nations to cover costs already incurred; a recognition by all parties of the "importance of mining to BC;" and dialogue about policy issues and agreement that the "entities responsible for the disaster should pay" for costs and damages.¹⁷⁶

Indigenous responses to the spill also included actions around the mine itself. Leila Darwish, former Pacific regional organizer for the Council of Canadians, provided a first-hand account of how activists from Secwepemc Territorial Authority built an encampment at the mine gate 14 days after the breach. A sacred fire was lit "to call and strengthen people of all Nations to stand up for the water, the land, the salmon and all of the other animals affected by the spill."¹⁷⁷ Darwish described how disaster monitoring was carried out by slowing down traffic and speaking with workers, contractors and delivery drivers coming and going from the site. Local people passing by donated salmon and berries for food. Non-Indigenous people were also drawn to the fire, including nearby community members in shock at the devastation and desperate for information. Grand Chief Stewart Phillip, fisheries advocate Alexandra Morton, hereditary chiefs and residents of Likely and Williams Lake all came to show their support.¹⁷⁸

172 Leila Darwish, "Update on the Mount Polley Mine Disaster—Imperial Metals and Government Focus on Covering Up Instead of Cleaning Up," Council of Canadians blog, August 30, 2014, <https://canadians.org/blog/update-mount-polley-mine-disaster-imperial-metals-and-government-focus-covering-instead>.

173 Belle Puri, "First Nations Worry Mount Polley Impact Not as Benign as Claimed," *CBC News* (online), August 11, 2014, <http://www.cbc.ca/news/canada/british-columbia/first-nations-worry-mount-polley-impact-not-as-benign-as-claimed-1.2733429>.

174 Carol Linnitt, "Soda Creek First Nation Struggles to Cover Costs of Independent Mount Polley Water Testing," *DeSmog Canada*, August 18, 2014, <https://www.desmog.ca/2014/08/18/soda-creek-first-nation-struggles-cover-costs-independent-mount-polley-water-testing>.

175 "First Nations and Gov't Partner on Mount Polley Mine Breach," *Williams Lake Tribune*, August 20, 2014, <http://www.wltribune.com/news/272026571.html?mobile=true>.

176 *Ibid.*

177 Darwish, 2014.

178 *Ibid.*



HAZELTINE CREEK, LOOKING EAST TOWARD QUESNEL LAKE, FOUR DAYS AFTER THE MT. POLLEY BREACH. PHOTO: RICHARD HOLMES.

The encampment participants wrote a 17-page report, including testimonials dealing with not only the environmental and economic impacts, but also the spiritual and cultural impacts of the tragedy:

The site of the disaster is the same area in which smallpox wiped out entire villages of hundreds of pit houses...an area where Secwepemc hunted, gathered and fished, went on vision quests and even derived some of their names. The Secwepemc gathered huckleberries, soap berries, saskatoon berries, thimble berries, raspberries, cranberries, blueberries, chokecherries as well as powerful medicines only available in this area.... The Secwepemc are speaking of the spiritual and emotional impact of the disaster as losing a close relative, an entire village and as the end of a way of life.¹⁷⁹

The breach also spurred the Northern Secwepemc te Qelmuw Leadership Council, which comprises four northern Secwepemc communities, to work quickly to finalize a mining policy document that they had begun to formulate in 2012. The carefully researched, 54-page Northern Secwepemc te Qelmuw Mining Policy was formally released on December 1, 2014.¹⁸⁰ Jacinda Mack, who was serving as mining coordinator for the Shuswap Tribal Council at the time, declared: "This policy isn't about shutting down mining. It's basically saying that we have four operational mines in our territory, and how are we going to deal with them in a way that makes them safer, more accountable and more engaged with us?"¹⁸¹

Chief Ann Louie of the T'exelc (Williams Lake) Band was equally blunt:

The impetus for [this policy] was the cumulative effect of more than 150 years of bad mining practices and devastating impacts on First Nations in BC. For years we warned that the Mount Polley dam was a disaster waiting to happen and we were ignored. This NSTQ Mining Policy is designed to make sure that this does not happen again, and

"The site of the disaster is the same area in which smallpox wiped out entire villages of hundreds of pit houses...an area where Secwepemc hunted, gathered and fished, went on vision quests and even derived some of their names." — *Yuct Ne Senxiymetkwe Camp*

179 Yuct Ne Senxiymetkwe Camp, 2014, 9.

180 Michael Allan McCrae, "First Nations release 'clear mining policy and rules' for central BC," *Mining.com*, December 2, 2014.

181 Dirk Meissner, "First Nation in B.C. sets out tougher rules for mining in its territory," CBC News (online) & Canadian Press, December 2, 2014, <http://www.cbc.ca/news/indigenous/first-nation-in-b-c-sets-out-tougher-rules-for-mining-in-its-territory-1.2857699>.

provide us with the tools to monitor and ensure compliance with safety and all other regulation and conditions imposed on any mines that are allowed.¹⁸²

“For years we warned that the Mount Polley dam was a disaster waiting to happen and we were ignored.”— Chief Ann Louie, T'exelc (Williams Lake) Band.

Indigenous responses were quickly organized at other mines owned by Imperial Metals. Neskonlith Chief Judy Wilson declared that the Mount Polley spill proved Imperial Metals could not be trusted to build and operate a mine while also protecting the surrounding environment. As she hand-delivered an eviction notice to the company's head office in Vancouver, Chief Wilson told reporters that the Secwepemc people were concerned about the company's exploratory work at the Ruddock Creek zinc-lead mine near Kamloops, at the headwaters of the Adams River: “We do not want the mine developing or operating in that sacred headwaters.... Our elders have stated very clearly that they do not want anything poisoning our water or our salmon.”¹⁸³

At Imperial's Red Chris copper mine near Dease Lake, then in the final stages of construction, the Klabona Keepers—a group of Tahltan elders and families—mounted a blockade across the two main access roads.¹⁸⁴ Five days later, BC Minister of Energy and Mines, Bill Bennett and Imperial Metals president Brian Kynoch visited the blockade and promised to halt construction until Tahltan demands were met. The Klabona Keepers and the Tahltan Central Council proposed a third-party review of the tailings dam plan by a company of their choosing, paid for by Imperial Metals.

The consulting firm Klohn Crippen Berger (KCB) conducted the review and presented its report in October 2014 with 22 recommendations.¹⁸⁵ The report identified significant concerns related to design of the tailings storage facility and glaring weaknesses in its management protocols, including the lack of an operating, maintenance and surveillance manual and the absence of an emergency response plan.¹⁸⁶ In April 2015, the Tahltan Central Council signed an Impact Benefit and Co-Management Agreement with Red Chris. Chad Day, president of the Tahltan Central Council, indicated that environmental provisions and a significant role for the Tahltan in environmental monitoring were built in as a result of the Mount Polley disaster, including regular third-party reviews of the tailing facilities.¹⁸⁷

182 Steve Forseth, “NStQ Mining Policy Approved,” statement of the Northern Secwepemc to Qelmuw Leadership Council, Cariboo Politics blog, December 1, 2014, <https://cariboopolitics.blogspot.ca/2014/12/nstq-mining-policy-approved.html>.

183 Canadian Press, “First Nation Aims to Evict Imperial Metals over Mount Polley Tailings Spill,” *CBC News* (online), August 13, 2014, <http://www.cbc.ca/news/indigenous/first-nation-aims-to-evict-imperial-metals-over-mount-polley-tailings-spill-1.2735216>.

184 Albrecht Berg, “Tahltans Blockade Imperial Metals' Red Chris Mine in Response to Mount Polley Spill,” *DeSmog Canada*, August 18, 2014, <https://www.desmog.ca/2014/08/18/tahltans-blockade-imperial-metals-red-chris-mine-response-mount-polley-spill>. Blockades were not new to the Tahltans. In 2005, 15 Klabona Keepers had been arrested for defying orders to clear this same access road during a standoff with Fortune Minerals over an open-pit coal mine, a battle that continues to this day. In 2012, the Klabona Keepers succeeded in calling a halt to Royal Dutch Shell's project to extract coalbed methane in the same region. Shell withdrew from the region.

185 Klohn Crippen Berger, *Red Chris Mine Site: Review of Tailings Impoundment Design*, report prepared for the Tahltan Central Council, October 2014, <http://tahltan.org/wp-content/uploads/2015/08/KCB-Red-Chris-Third-Party-Review.pdf>.

186 Gordon Hoekstra, “Third-Party Review of Red Chris Mine Tailings Dam Design Finds Concerns,” *Vancouver Sun*, November 18, 2014, <http://www.vancouversun.com/technology/Third+party+review+Chris+mine+tailings+design+finds+concerns/10392164/story.html>.

187 Gordon Hoekstra, “Tahltan Approve Management and Revenue Deal for Red Chris Mine,” *Vancouver Sun*, April 23, 2015, <http://www.vancouversun.com/Tahltan+approve+management+revenue+deal+Chris+mine/10998923/story.html>. Commercial production at Red Chris began on July 1, 2015, and the Impact Benefit and Co-Management Agreement was formally signed the same month. Since the actual terms of the agreement are kept confidential, it is impossible to monitor whether or not it has actually improved environmental and social protection of the land. What is known is that there have been several rounds of layoffs at the Red Chris mine in recent years.

Lessons to be learned: the state of mining today

I BEGAN THESE CHRONICLES OF THE TAILINGS dam disasters at Mount Polley and Mariana by asking whether they were best understood as unique events, caused by circumstances unlikely to be repeated, or representative of the state of mining in the current global order. After scrutinizing the events leading up to the breaches, it would seem that they are, indeed, chronicles of disasters foretold—with more in the offing. Filling dams beyond their engineered capacity, failing to inspect infrastructure and install emergency systems, ignoring clear warnings—all have contributed to the disasters. The context for these catastrophes, however, is “regulatory capture.” Governments and other public institutions have, in effect, been heavily influenced by the mining companies through lobbying, political contributions and “revolving doors” between government and corporate leaders.

The process of capture can also include more subtle dynamics, such as the creation of a larger narrative about mining that blurs the distinction between corporate interests and what is genuinely in the public interest. Public policy analyst Kevin Taft has investigated the workings of the oil industry in Alberta and documented how political parties, universities, legislative assemblies, media, think tanks and the courts—the fundamental institutions of democracy—have all been captured by oil companies to the point that they now espouse the oil industry’s vision of unbridled growth for Alberta’s oil resources, global warming notwithstanding. As a consequence, these vital institutions “increasingly serve the interests not of democracy, science or the public, but the interests of the fossil fuel industry, especially the oil industry.”¹⁸⁸ Taft calls this “oil’s deep state.” Is the mining industry succeeding in creating a “deep state” in BC?

The results of the BC election in May 2017 raised expectations of major changes in the extractive sector, with the election of a BC NDP minority government supported by the BC Green Party.

August 2017 marked the third anniversary of the tailings dam breach at Mount Polley and the deadline for the Province to lay charges against MPMC. With time running out, Bev Sellars, chief of Xat’sull First Nation at the time of the tragedy, filed a private prosecution. With the support of

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188 Kevin Taft, *Oil’s Deep State: How the Petroleum Industry Undermines Democracy and Stops Action on Global Warming—in Alberta, and in Ottawa* (Toronto: Lorimer, 2017), 16-17.

DRONE PHOTO OF MOUNT
POLLEY MINE, ONE YEAR
AFTER BREACH. PHOTO:
JEREMY WILLIAMS /
WILDERNESS COMMITTEE.



several advocacy groups, 15 charges were laid under the BC Mines Act and the BC Environmental Management Act.¹⁸⁹

In January 2018, Premier John Horgan reiterated his support for punitive measures against MPMC, saying “I think all British Columbians were mortified that three years would pass with no consequences to the most horrific mine disaster in BC history. I remain concerned and I am anxious to hear what the courts say.”¹⁹⁰ Hopes were dashed in February, however, when the BC Prosecution Service announced it was quashing the private prosecution.

The new government has taken important steps in three key areas. First, the Supply and Confidence Agreement between the BC NDP and BC Green parties makes a “foundational” commitment to implement the UN Declaration on the Rights of Indigenous Peoples and the calls to action from the Truth and Reconciliation Commission. All mandate letters issued by the Premier to his government ministers referenced this commitment. Exactly how the government will interpret this commitment in practice remains to be seen. Second, the government introduced a ban on corporate and union political donations (provincially and in municipal elections), which came into effect in November 2017 and cut off the large stream of money flowing to political parties from mining and other extractive industry groups. Finally, the new government has also undertaken a review of the previous government’s “professional reliance model,” which allows resource companies to hire “qualified professionals” to review proposed projects instead of public officials.

To date, however, there has been silence on the Auditor General’s central recommendation to address the conflict of interest inherent in a model where the same government body is tasked with

To date there has been silence on the BC Auditor General’s central recommendation to address the conflict of interest inherent in a model where the same government body is tasked with promoting mining and regulating it.

189 Carol Linnit, Breaking: Last-minute Charges Laid Against Mount Polley in Private Prosecution, *The Narwhal*, August 5, 2017, <https://thenarwhal.ca/breaking-last-minute-charges-laid-against-mount-polley-private-prosecution/>.

190 Carol Linnit, “Decision on Private Prosecution against Mount Polley Expected Any Day,” *DeSmog Canada*, January 17, 2018, <https://www.desmog.ca/2018/01/17/b-c-won-t-intervene-private-prosecution-against-mount-polley-horgan>.

promoting mining and regulating it by creating an independent compliance and enforcement agency for mining.¹⁹¹

In December 2017, Minister of Environment and Climate Change George Heyman announced the provincial government's decision not to issue the environmental certificate for the proposed Ajax mine near Kamloops, which faced major opposition from local Indigenous communities, but he took pains during his press conference to say this decision did not constitute an Indigenous veto.¹⁹²

In Brazil, the state of mining continues to worsen. As the lawsuits grind their way through the courts, astonishing revelations are emerging from previously unreported internal documents. On March 1, 2018, a startling headline in the *Guardian* read: "Brazil Dam Disaster: Firm Knew of Potential Impact Months in Advance." The documents revealed that six months before the Fundão dam collapsed, Samarco had carried out a worst-case assessment of the maximum possible loss from a "liquefaction break" and was warned that such a break could cause "up to 20 deaths, cause serious impacts to land, water resources and biodiversity over 20 years, and cost \$3.4bn."¹⁹³

Samarco, BHP Billiton and Vale have all denied wrongdoing and reiterated their abiding concern for public safety. After the article appeared, Vale again tried to distance itself from Samarco's operational management. The company claimed that Samarco's board of directors, which included Vale and BHP representatives, was "always expressly assured of the regularity of the structures."¹⁹⁴



BENTO RODRIGUES, DECEMBER 2015, ONE MONTH AFTER THE BREACH. PHOTO: BRUNO MILANEZ, POEMAS / UFJF.

191 Office of the Auditor General of British Columbia, *An Audit of Compliance and Enforcement of the Mining Sector*, May 2016, 8, <http://www.bcauditor.com/sites/default/files/publications/reports/OAGBC%20Mining%20Report%20FINAL.pdf>.

192 "Environmental assessment sinks proposed Ajax mine near Kamloops," CBC News (online), December 14, 2017, <http://www.cbc.ca/news/canada/british-columbia/environmental-assessment-sinks-proposed-ajax-mine-near-kamloops-1.4449434>.

193 Dom Phillips and Davilson Brasileiro, "Brazil Dam Disaster: Firm Knew of Potential Impact Months in Advance," *The Guardian*, March 1, 2018, <https://www.theguardian.com/world/2018/feb/28/brazil-dam-collapse-samarco-fundao-mining>.

194 Ibid.

“They prioritized profits and left safety in second place.”

— José Adércio Sampaio, coordinator of Brazilian task force of federal prosecutors

However, minutes in the court documents from meetings at which Vale and BHP representatives were present recorded multiple discussions between 2009 and 2014, on the dam’s construction problems. These minutes also recorded strong admonitions from the board for the company to keep cutting costs. José Adércio Sampaio, coordinator of the task force of federal prosecutors, summarized the criminal case against the joint venture and its parent companies: “They prioritized profits and left safety in second place.”¹⁹⁵

Clearly, tackling the global mining industry’s current power and impunity presents fundamental and complex challenges. There is no dearth of excellent public policy recommendations on mining, with new studies triggered by the catastrophes at Mount Polley and Mariana. In March 2017, the Environmental Law Centre at the University of Victoria released a study prepared for the Fair Mining Collaborative arguing that the provincial mine regulatory system was in a “state of profound dysfunction.” Their report was entitled *Fixing Systemic Failures in BC’s Mining Regulation: The Urgent Need for a Judicial Inquiry*. In May 2017, Amnesty International issued a comprehensive report on the human rights impact of the Mount Polley disaster, arguing that the disaster raises serious questions about the Province’s ability to protect British Columbians’ economic, social, cultural, Indigenous and universal human rights as enshrined by the UN. The report makes recommendations for a public inquiry and release of information from impact studies carried out by the BC government.¹⁹⁶ The UN Environment Programme published a “Rapid Response Assessment” in 2017 on mine tailings storage which includes a case study of Mount Polley.¹⁹⁷ It contains detailed recommendations on better tailings management that give priority to safety and proposes the organization of a UN stakeholder forum to facilitate stronger tailings dam regulations.

If regulatory capture continues, who will speak for workers and communities, for land, rivers and the salmon? The challenge now is ultimately one of political will.

195 Ibid.

196 https://www.amnesty.ca/sites/amnesty/files/FINAL_May%202024_Mount%20Polley%20briefing.pdf

197 UNEP GRID-Arendal. Mining Tailings Storage Safety Is No Accident. <http://www.grida.no/publications/383>



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