

# REGULATING THE MOUNT POLLEY MINE DISASTER:

## *Neoliberalism, Objectivity, and Settler-Colonialism in British Columbia*

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**T**HE SURGE OF MINE waste felt endless. On 4 August 2014, 25 million cubic metres of mine waste – the equivalent of nearly ten thousand Olympic swimming pools – escaped a crumbling earthen tailings retainment wall at the Mount Polley gold and copper mine. The disaster took place on unceded Secwepemc territory in what is commonly known as the central interior of British Columbia, releasing massive plumes of heavy-metal-laden mine waste into what many considered a nearly pristine glacial fjord.<sup>1</sup> According to Environment Canada, the Mount Polley mine disaster released 2.14 tonnes of mercury and 134 tonnes of lead into the environment,<sup>2</sup> accounting for 92 percent of the total lead and mercury released into waterways across the entire country in 2014, and spiking the national mercury and lead levels to an amount ten times higher than the previous year. Contrary to claims subsequently made by the Mount Polley Mine Corporation (MPMC), quantities of copper, arsenic, selenium, and aluminum released into nearby aquatic environments have been found to be bioavailable to fish and toxic to the epibenthic invertebrates upon which they feed.<sup>3</sup>

On 5 August the Shuswap Nation Tribal Council released a statement condemning the disaster at the heart of its territory, connecting it with

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<sup>1</sup> Ellen L. Petticrew, Sam J. Albers, Susan A. Baldwin, and Eddy Carmack, “The Impact of a Catastrophic Mine Tailings Impoundment Spill into One of North America’s Largest Fjord Lakes: Quesnel Lake, British Columbia, Canada,” *Geophysical Research Letters* 42, no. 9 (2015): 3347–55; Patrick Byrne, Karen A. Hudson-Edwards, Mark G. Macklin, and Paul Brewer, “The Long-Term Environmental Impacts of the Mount Polley Mine Tailings Spill, British Columbia, Canada,” in *EGU General Assembly Conference Abstracts*, vol. 17, 2015.

<sup>2</sup> Environment and Climate Change Canada, “Canadian Environmental Sustainability Indicators: Releases of Harmful Substances to the Environment,” August 2016.

<sup>3</sup> Gregory G. Pyle, Raegan D. Plomp, Lauren Zink, and Jaimie L. Klemish, “Invertebrate Metal Accumulation and Toxicity from Sediments Affected by the Mount Polley Mine Disaster,” *Environmental Science and Pollution Research* 29, no. 46 (2022): 70380–95.

centuries of colonial affronts to Indigenous sovereignty.<sup>4</sup> Secwépemc people “live off our land,” the Chiefs stated, have “cultural ties to territory,” and have “*never ceded, surrendered, or given up any of our interest in our territory.*”<sup>5</sup> Since then, Indigenous-led research investigations of the consequences of the spill have amplified this message, connecting what is often viewed as a discrete ecological event directly to the broader political and historical context of colonial violence in British Columbia.<sup>6</sup>

The response of the provincial government and representatives from the mining company, in contrast, served to abstract the disaster from its political and economic circumstances and, instead, to inscribe it within an alternative and depoliticized context defined by chance. Senior politicians (including the minister for energy and mines and BC premier) framed the disaster with remarks about “the power of nature” and, on multiple occasions, likened the ecological consequences of the spill to natural disasters, including avalanches and landslides.<sup>7</sup> The MPMC and its parent company Imperial Metals issued daily statements (in press and material disclosure updates) describing ongoing efforts to remove and recover natural debris and fallen timber from the site, and to stabilize and reconstruct nearby Hazeltine Creek.<sup>8</sup> At the same time the company downplayed the consequences of the tonnes of heavy metals and other chemical wastes that poured into the creek and lake, insisting

<sup>4</sup> “SNTC Chiefs Condemn Mount Polley Mine Inaction – Press Release,” YouTube.com Kamloops, BC, 5 August 2014, 00:15, <https://www.youtube.com/watch?v=ah1OfcHw9FU>.

<sup>5</sup> “SNTC Chiefs Condemn Mount Polley Mine Inaction – Press Release,” 06:40.

<sup>6</sup> Janis Shandro, Laura Jokinen, Alison Stockwell, Francesco Mazzei, and Mirko S. Winkler, “Risks and Impacts to First Nation Health and the Mount Polley Mine Tailings Dam Failure,” *International Journal of Indigenous Health* 12, no. 2 (2017): 84–102; Janis Shandro, Mirko Winkler, Laura Jokinen, and Alison Stockwell, “Health Impact Assessment of the 2014 Mount Polley Mine Tailings Dam Breach: Screening and Scoping Phase Report,” in *Screening and Scoping Phase Report* (First Nations Health Authority, 2016); Norah Bowman, “Our Economy Walks on the Land: Secwepemc Resistance and Resilience after the Imperial Metals Mt. Polley Tailings Storage Facility Breach,” *Canadian Review of Comparative Literature/Revue Canadienne de Littérature Comparée* 44, no. 1 (2017): 25–35.

<sup>7</sup> *Raw: Christy Clark Speaks about Mount Polley Mine Disaster*, news broadcast, Vancouver, 2014, <https://globalnews.ca/video/1498093/raw-christy-clark-speaks-about-mount-polley-mine-disaster>; Gordon Hoekstra, “Mount Polley Dam Breach Not an Environmental Disaster: Mines Minister Bill Bennett (But First Nations, Residents, and Environmentalists Have Ongoing Concerns),” *Vancouver Sun*, 12 August 2014, <http://www.vancouversun.com/technology/mount+polley+breach+environmental+disaster+mines+minister+bill+bennett/10109949/story.html>.

<sup>8</sup> Imperial Metals, “Imperial Reports on Tailings Storage Facility Breach at Mount Polley Mine,” press release, 4 August 2014, available from SEDAR; Imperial Metals, “Imperial Reports on Tailings Storage Facility Breach at Mount Polley Mine,” press release, 5 August 2014, available from SEDAR; Imperial Metals, “Mount Polley Mine Community Update,” press release, 7 August 2014, available from SEDAR; Imperial Metals, “Material Change Report,” form 15-102F3, 4 August 2014. Documents available from SEDAR at <https://www.sedarplus.ca/landingpage/>.

that there was no risk of chemical contamination since the impacts of the spill were “physical and not chemical.”<sup>9</sup> Since then, and over the course of the post-disaster investigations that followed, the company and its scientific advisors have remained unwavering in their assertion that the consequences of the tailings wastes released in the disaster were negligible: according to the company’s chief scientific officer the disaster caused less of a physical disturbance than would have been caused by a large-scale landslide or “the surface disturbance associated with [the construction of] nine km of the Trans-Canada Highway in Vancouver.”<sup>10</sup>

Abstraction is fundamental to the operation of colonial power.<sup>11</sup> Abstracting land as a “standing reserve,”<sup>12</sup> or nature “as a provider of easily quantifiable ecosystem services,”<sup>13</sup> violently reduces socio-ecological relations to those required to sustain colonial capitalism. Jodi Melamed describes this as a process of “disjoining or deactivating” relations “so that they may be interconnected in ways that feed capital.”<sup>14</sup> Downplaying the disaster by analogy to “natural” and largely unforeseeable but familiar and recurrent natural events – like an avalanche – abstracts the disaster from its origins in colonial capitalist violence and normalizes the recurrence of ecological harms.<sup>15</sup> It also enlivens these structures, materially reproducing socio-ecological relations (on unceded Indigenous territories) as disruptable and exploitable. Following the disaster, as investigations into the causes and consequences of the spill unfolded, ongoing efforts on behalf of the company and government to abstract the disaster proved exculpatory. Imperial Metals, the provincial regulator, and the mining regime itself were largely cleared of fault or guilt, and the destructive and dispossessive arrangements that allow for mass ecological destruction as a condition of mining in British Columbia remained intact.

This article examines the extent to which the coherence of these abstractions hinged on specific modes of scientific representation. We argue that the notion of objectivity and the belief in the objectivity of

<sup>9</sup> These claims are highlighted on the Imperial Metals website: <https://imperialmetals.com/our-operations/mount-polley-mine/breach-overview>.

<sup>10</sup> Personal communication, February 2017, Vancouver; Lyn Anglin, “How Things Were Made Right after the Mount Polley Spill,” BC Resource Sector lobby group, *Resource Works* (blog), 29 July 2019, <https://www.resourceworks.com/polley-remediation>.

<sup>11</sup> Ruth Wilson Gilmore, “Fatal Couplings of Power and Difference: Notes on Racism and Geography,” *Professional Geographer* 54, no. 1 (2002): 15–24; Alex Loftus, “Violent Geographical Abstractions,” *Environment and Planning D: Society and Space* 33, no. 2 (2015): 366–81.

<sup>12</sup> Max Liboiron, *Pollution Is Colonialism* (Durham, NC: Duke University Press, 2021).

<sup>13</sup> Loftus, “Violent Geographical Abstractions,” 366.

<sup>14</sup> Jodi Melmed, “Racial Capitalism,” *Critical Ethnic Studies* 1, no. 1 (2015): 78.

<sup>15</sup> Liboiron, *Pollution Is Colonialism*, 63.

Western scientific knowledge were crucial to the ability of the province and the company to abstract the disaster from the violent dispossessive conditions from which it unfolded. Post-disaster investigations relied heavily on the scientific expertise of a small group of engineers, hand-picked by the Department of Environment and Resources, as well as on scientific evidence conducted or paid for by the company. The claims of these scientists – despite the existence of contradictory determinations of the causes of the disaster (for instance from British Columbia’s auditor general and the chief inspector of mines) and in the face of considerable evidence to the contrary – were held up as definitive and exhaustive. Modes of scientific representation and objectivity play an important role in upholding patterns of colonial domination and violence,<sup>16</sup> including in British Columbia. Engaging British Columbia’s early colonial history, Braun in particular has shown how Western scientific constructions of objectivity and knowledge advanced extractive colonial interests and helped facilitate the province’s patterns of socio-ecological destruction.<sup>17</sup> As a metaphysical stance objectivity pretends to an impossible separation and dislocation of the knower, abstracting knowledge from the relations within which it is inevitably construed.<sup>18</sup> In so doing it imparts a fungibility to scientific claims, masking the way in which they are contingent, partial, and constituted in land relations.<sup>19</sup>

Objectivity, and the belief in the objectivity of Western scientific knowledge, we suggest, made it possible over the course of the investigations for regulators to curate and weaponize narrow, partial understandings of the ecological consequences of the disaster, including of those most invested in its outcomes. The disaster science that ensued

<sup>16</sup> Sandra Harding, *Sciences from Below: Feminisms, Postcolonialities, and Modernities* (Durham, NC: Duke University Press, 2008); Leroy Little Bear, “Foreword,” in *Native Science: Natural Laws of Interdependence* by Gregory Cajete (Santa Fe, NM: Clear Light Publishers, 2000); Gregory Cajete, *Native Science: Natural Laws of Interdependence* (Santa Fe, NM: Clear Light Publishers, 2000); Rebecca Lave, “The Future of Environmental Expertise,” *Annals of the Association of American Geographers* 105, no. 2 (2015): 244–52; Aníbal Quijano, “Coloniality and Modernity/Rationality,” *Cultural Studies* 21, nos. 2–3 (2007): 168–78; Santiago Castro-Gómez and Desiree A. Martin, “The Social Sciences, Epistemic Violence, and the Problem of the ‘Invention of the Other,’” *Nepantla: Views from South* 3, no. 2 (2002): 269–85; Malin Ideland, “Science, Coloniality, and ‘the Great Rationality Divide,’” *Science and Education* 27, no. 7 (2018): 783–803; Liboiron, *Pollution Is Colonialism*.

<sup>17</sup> Bruce Braun, “Producing Vertical Territory: Geology and Governmentality in Late Victorian Canada,” *Ecumene* 7, no. 1 (2000): 7–46; Bruce Braun, *The Intemperate Rainforest: Nature, Culture, and Power on Canada’s West Coast* (Minneapolis: University of Minnesota Press, 2002), 39, 40.

<sup>18</sup> Liboiron, *Pollution Is Colonialism*; Donna Haraway, “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective,” *Feminist Studies* 14, no. 3 (1988): 575–99.

<sup>19</sup> Liboiron, *Pollution Is Colonialism*.

was self-serving and ultimately worked to safeguard the interest of the province and Imperial Metals relative to Indigenous lands.

The premise of our argument is that the Mount Polley mine disaster is best understood as a feature of a colonial-capitalist system that depends on the systematic dismantling and destruction of life-giving social and ecological systems. The origins of this system, of course, predate the disaster by centuries. The colony of British Columbia was formed to facilitate deadly, dispossessive extractivism and traces its history as a state in efforts to craft and maintain the dispossessive colonial arrangements that make extraction possible.<sup>20</sup> Now, as then, the ability to dismantle and destroy the socio-ecological underpinnings of Indigenous sovereignty remains paramount to mining.

Our account begins in the decades prior to the disaster, at a time when the colonial land relations necessary for mining had become tied to the liberalization of extraction. We start by foregrounding the negligent and dangerous managerial practices that led to the disaster. These practices are rooted in contemporary relations of neoliberal capitalist and settler colonial production in British Columbia and underscore the extent to which the failure itself is a manifestation of structural violence. The disaster was prefaced by an exhaustive range of policy and legislative reforms aimed at liberalizing conditions for extraction, which we then briefly outline for context. These reforms transferred significant power and authority to corporate actors, actively undermined public institutions, and profoundly dismantled environmental safeguards and protections. The resulting regulatory system was one that incentivized reckless and dangerous behaviour and handed the mining industry the ability to self-manage responses to the disaster. Of salience to the “disaster science” that followed, these reforms gutted the province’s scientific capacity, compromised the reliability of third-party scientific oversight, and expanded the power of corporations to shape scientific results. Belief in the objectivity of scientific knowledge lent credibility to these arrangements, suggesting that, despite the retrenchment of public oversight and the dismantling of environmental protections, decision-making about the causes and consequences of the Mount Polley mine disaster was nonetheless backed by science.

<sup>20</sup> Neil Nunn, “The 2014 Mount Polley Mine Disaster: Environmental Injustice, Anti-relationality, and Dreams of Unconstrained Futures” (PhD diss., University of Toronto, 2022); Neil Nunn, “Repair and the Mount Polley Mine Disaster: Antirelationality, Constraint, and Legacies of Socio-Ecological Disruption in Settler Colonial British Columbia,” *Environment and Planning D: Society and Space* 41, no. 5 (2023): 808–909.

In the second half of this article, we turn to the post-disaster context and analysis of the “disaster science” conducted under the newly construed neoliberal-objectivist regime, first by provincial regulators and second by Imperial Metals. We demonstrate how disaster science worked (1) to privilege the narrow, partial, and often highly strategic claims made by Imperial Metals and government-appointed scientists regarding the causes and consequences of the disaster and (2) to obscure the ways in which these claims are implicated in colonial land relations. We close by considering the relationship between (1) the disaster science conducted by the province and corporation and (2) possessive colonial entitlements to Indigenous land.

### CONTEXTUALIZING THE DISASTER

The Mount Polley Mine began production in 1997, with an estimated ore reserve of 85 million tonnes.<sup>21</sup> Production was paused in 2001 due to a decline in the price of metals, and the mine was placed on care and maintenance. During this time, a new high-grade zone of minerals was discovered,<sup>22</sup> and, in conjunction with the recovery of metal prices, the mine restarted production in March 2005. Renewed production and aggressive exploration and discovery of new reserves subsequently extended the lifespan of the mine and challenged the capacity of the original tailings storage facility (TSF).<sup>23</sup>

In January 2011, after four years of production, Knight Piésold, the engineer of record at the time for the Mount Polley Mine, wrote a letter to the corporation, cc'ing the minister of energy mines and petroleum, outlining its concerns, and explaining that it would no longer take responsibility for the facility:

It is essential that it be recognized that Knight Piésold will not have any responsibility for any aspects of the on-going operations, or of any modifications to the facilities that are undertaken from now onwards ... The embankments and the overall tailings impoundment are

<sup>21</sup> Knight Piésold Consulting, *Mount Polley Mining Corporation Tailings Storage Facility Report on 2010 Annual Inspection*, Inspection Engineering Report, Vancouver, 25 January 2011, <https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/mineral-exploration-mining/documents/directives-alerts-incidents/chief-inspector-s-report-page/doc0592.pdf>.

<sup>22</sup> Knight Piésold Consulting, “Statement by Knight Piésold Ltd. Regarding the Mount Polley Mining Incident,” 8 August 2011, <https://www.knightpiesold.com/en/news/articles/statement-by-knight-piesold-ltd-regarding-the-mount-polley-mining-incident/>.

<sup>23</sup> Knight Piésold Consulting, *Mount Polley Mining Corporation Tailings Storage Facility Report*, 3.

getting large and it is extremely important that they be monitored, constructed and operated properly to prevent problems in the future.<sup>24</sup>

Four days after the disaster, Knight Piésold released a statement reminding the public of this 2011 letter,<sup>25</sup> reiterating that the “original engineering done by Knight Piésold Ltd. accommodated a significantly lower water volume than the TSF reportedly held at the time of the breach” and that “significant engineering and design changes were made subsequent” to the company’s involvement.<sup>26</sup>

To accommodate a significantly increased volume of tailings, the dam was raised in seven stages. First in 2007 (stage 5) by more than five metres and subsequently in smaller increments until its eventual collapse in 2014. As was later documented in an investigation by the auditor general, increases to the dam’s elevation were matched with “substantial changes to the [permitted] design of its tailings dam, [in which the corporation] did not build the dam to design, and did not operate the tailings dam as intended.”<sup>27</sup> The dam was originally permitted to have embankment slopes with a defined steepness of two-to-one; whereby every vertical foot added to the dam matched with two horizontal feet of material support.<sup>28</sup> In 2006, the Ministry of Energy and Mines (MEM) (at the request of the corporation) permitted a temporary modification to the stage 5 elevation that allowed it to proceed with a slope steeper than two-to-one. Stage 5 and 6 elevations were also completed, despite knowledge that its tailings embankments lacked wide enough beaches and adequate buttressing.<sup>29</sup>

By 2010, the mine set a record of 21,629 tonnes of throughput per day, exceeding the planned amount of 20,000 tonnes. Due to higher commodity prices, the mine had begun to process lower grades of stockpiled ore, sending more waste to the TSF. The corporation was also struggling to maintain profitability: the mine’s contribution to Imperial’s income was shrinking steadily year over year and Imperial’s gross revenues had declined considerably from a peak of \$256 million

<sup>24</sup> Ken Brouwer and Jeremy Haile, “Letter to Brian Kynoch CEO of Mount Polley Mine Corporation. Re: Mount Polley Tailings Storage Facility Engineer of Record,” Knight Piésold Consulting, 10 February 2011.

<sup>25</sup> Knight Piésold Consulting, “Statement by Knight Piésold Ltd. Regarding the Mount Polley Mining Incident,” 8 August 2011.

<sup>26</sup> Knight Piésold Consulting, 2011, para. 4.

<sup>27</sup> Carol Bellringer, *An Audit of Compliance and Enforcement of the Mining Sector: Auditor General of British Columbia* (Victoria: Office of the Auditor General of British Columbia, May 2016), 78, <http://www.bcauditor.com/pubs/2016/audit-compliance-and-enforcement-mining-sector>.

<sup>28</sup> Bellringer, 71.

<sup>29</sup> Bellringer, 71.

in 2007.<sup>30</sup> By the end of 2010, the mine had yet to comply with its 2006 supporting requirements and continued to lack sufficient tailing embankment beaches and buttressing,<sup>31</sup> despite continued heightening of the dam. Between 2011 and 2014, the dam was raised in stages by a height of approximately ten metres, despite what the auditor general referred to as significant known “structural and operational deficiencies.”<sup>32</sup> According to the auditor general’s report, in 2011, immediately following the departure of Knight Piésold, and as part of the stage 7 elevation, embankments were further steepened to a slope that exceeded that of the (temporary) interim slope. As the dam was built higher and higher, the mine continued to defer construction of buttresses and tailings beaches.<sup>33</sup>

Regulatory filings also suggest that, during this time, the mine continued to cut costs to increase its profitability, an area in which it began to see improvement towards the end of 2013 (though overall revenues for Imperial Metals continued to decrease). To increase productivity the corporation ramped up production at the mine, aggressively boosting throughput quarter after quarter, eventually hitting a record throughput of 23,404 tonnes per day in the months immediately prior to the dam failure.<sup>34</sup>

Accounts from the mine’s employees confirm the extent to which the company was willing to pursue profitability and to clarify the destructive logics according to which it operated. When asked about the cause of the disaster, a retired decades-long employee of the mine answered:

<sup>30</sup> Imperial Metals Corporation, *Imperial Metals Corporation 2007 Annual Report*, Vancouver, 2008, 1–38, <https://www.annualreports.com/Company/imperial-metals-corp>; Imperial Metals Corporation, *Imperial Metals Corporation 2008 Annual Report*, Vancouver, 2009, 1–46, [https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX\\_III\\_2008.pdf](https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX_III_2008.pdf); Imperial Metals Corporation, *Imperial Metals Corporation 2009 Annual Report*, Vancouver, 2010, 1–48, [https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX\\_III\\_2009.pdf](https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX_III_2009.pdf); Imperial Metals Corporation, *Imperial Metals Corporation 2010 Annual Report*, Vancouver, 2011, 1–48, [https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX\\_III\\_2010.pdf](https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX_III_2010.pdf).

<sup>31</sup> Bellringer, *Audit of Compliance and Enforcement*, 73.

<sup>32</sup> Bellringer, 71.

<sup>33</sup> Bellringer, 70.

<sup>34</sup> Imperial Metals Corporation, *Imperial Metals Corporation 2011 Annual Report*, Vancouver, 2012, 1–62, [https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX\\_III\\_2011.pdf](https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX_III_2011.pdf); Imperial Metals Corporation, *Imperial Metals Corporation 2012 Annual Report*, Vancouver, 2013, 1–54, [https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX\\_III\\_2012.pdf](https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX_III_2012.pdf); Imperial Metals Corporation, *Imperial Metals Corporation 2014 Annual Report*, Vancouver, 2015, 1–80, [https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX\\_III\\_2015.pdf](https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX_III_2015.pdf); Imperial Metals Corporation, *Imperial Metals Corporation 2013 Annual Report*, Vancouver, 2014, 1–81, [https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX\\_III\\_2014.pdf](https://www.annualreports.com/HostedData/AnnualReportArchive/i/TSX_III_2014.pdf).



I tried and tried to tell our foreman, you know, this isn't going to hold. You can't keep building this thing higher. They fired the company that designed the dam. And they hired another engineering company who said, "Yeah you can keep going higher, just build it up on the inside."<sup>35</sup>

While government and regulators concluded that the dam "slipped" unexpectedly due to an undetected layer of weak glacial material at the base of the dam,<sup>36</sup> workers pointed to information that substantiated years of negligence in the building and maintenance of the facility, including concerns with the dam's stability that had been brought to the attention of managers and the MEM prior to the disaster.<sup>37</sup> As the employee above further explains:

The higher you go, the more pressure is pushing against the base of the original dam that was not designed to have the extra height. Now, in the final report, and I have a copy of it, they were saying that there was a seam of pea gravel under the till and that's what caused it to slip and they didn't know the pea gravel was there. They knew the pea gravel was there. We dug test holes – hundreds of them – through that area where the dam was to be built. When we would hit it we would bring up a bucket and pile it up on the side away from the till. In the final report they said they did not know that the underlying layer existed.<sup>38</sup>

It bears repeating that this negligent and high-risk behaviour took place on unceded Secwepemc territory. The value logics according to which the MPMC painstakingly chased profitability and, quarter by quarter, attempted to grow shareholder value are rooted in land relations defined by possessive colonial entitlements to Secwepemc land and water. The pecuniary interests that motivated each decision to increase production, to process lower and lower grades of ore, to raise the height of the tailings dam without proper support, and to ignore evidence of structural

<sup>35</sup> Phone interview with former worker, in discussion with Nunn, February 2018.

<sup>36</sup> Independent Expert Engineering Investigation and Review Panel, [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/mineral-exploration-mining/documents/directives-alerts-incidents/chief-inspector-s-report-page/m-200\\_mount\\_polley\\_2015-11-30\\_ci\\_investigation\\_report.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/mineral-exploration-mining/documents/directives-alerts-incidents/chief-inspector-s-report-page/m-200_mount_polley_2015-11-30_ci_investigation_report.pdf).

<sup>37</sup> Common Sense Canadian, "Mount Polley: Husband and Wife Warned Company, Faced Consequences," YouTube, 8 September 2014, 2:02, <https://www.youtube.com/watch?v=0iXuqA8zKK0&t=113s>; Dene Moore, "First Nations Chief: Warning about BC Tailings Pond 'Ignored' Imperial Metals Denies Claim It Knew Pond at Mount Polley Mine Was Unsustainable before It Filled Waterways with Mine Waste Monday," *Maclean's*, 5 August 2014, <https://www.macleans.ca/news/canada/warnings-about-b-c-tailings-pond-growth-ignored-before-collapse/>.

<sup>38</sup> Phone interview with former worker, in discussion with author, February 2018.

deficiencies were enabled by a regulatory system that was willing to disregard, to displace, and to subject to death the lives and relationships that threatened the primacy of extraction.<sup>39</sup> The negligent and dangerous behaviour of the mining company and the province that oversaw it is evidence not only of an institutionalized disregard for socio-ecological relations on Indigenous land but also of institutionalized reliance on the ability to dismantle and destroy those relations as a condition of profitability.

The MPMC's entitlement to undermine Secwepemc sovereignty was yoked to a regulatory structure carefully engineered over several decades to liberalize the conditions for extraction. Leading up to the disaster, as we have seen above, this was manifest in a considerable lack of oversight that resulted in the near certain potential for ecological harm on Secwepemc land and water being persistently overlooked.<sup>40</sup> The auditor general's 2016 report comprehensively traces the complicity of the province in events leading up to the disaster. The MEM approved the steepening of embankment slopes, permitted five stages of raises to the dam despite insufficient structural support, ignored concerns raised by the engineer of record, allowed the MPMC to continually defer the installation of adequate structural supports (buttress and tailings beaches), and failed to inspect the TSF in the years between 2009 and 2014.<sup>41</sup>

### *Roll-back neoliberalism and the outsourcing of scientific knowledge*

The events surrounding the Mount Polley mine disaster reflect a now commonly discussed process in Canadian mining whereby governments withdraw or "rationalize" regulatory and other requirements in order to enhance the profitability of extraction and "de-risk" investment.<sup>42</sup> Peck and Tickell describe this governing trend as "roll-back neo-liberalism," a governance strategy whereby states pursue specific political, economic, and social objectives by transferring authority and responsibility to private-sector actors and away from traditional, state-led actors and

<sup>39</sup> Nunn, "Repair and the Mount Polley Mine Disaster."

<sup>40</sup> Nunn, "2014 Mount Polley Mine Disaster."

<sup>41</sup> Bellringer, *Audit of Compliance and Enforcement*.

<sup>42</sup> Anna Stanley, "Risk Management and the Logic of Elimination," *Journal of Cultural Economy* 14, no. 1 (2021): 54–69; Anna Stanley, "Resilient Settler Colonialism: 'Responsible Resource Development,' 'Flow-Through' Financing, and the Risk Management of Indigenous Sovereignty in Canada," *Environment and Planning A: Economy and Space* 48, no. 12 (2016): 2422–42; Emilie Cameron and Tyler Levitan, "Impact and Benefit Agreements and the Neoliberalization of Resource Governance and Indigenous-State Relations in Northern Canada," *Studies in Political Economy* 93 (2014): 25–42.

institutions.<sup>43</sup> States *ostensibly* withdraw their involvement, only to find alternative means in the hands of investors and other corporate actors (whose decisions are shrouded from scrutiny) to extend their reach and achieve their objectives. The continuity of state power is salient to roll-back neoliberalism in British Columbia and other settler colonial jurisdictions where the dismantling of regulatory structures, the privatization of state responsibilities, and the transfer of authority to market actors (such as corporate shareholders) has been shown to amplify the state's ability to guarantee corporate access to Indigenous lands and to uphold geographies of occupation and extraction.<sup>44</sup>

The Mount Polley mine disaster occurred in the wake of two decades of neoliberal reforms undertaken by British Columbia's Liberal Party (BCLP). An expanded role for corporate-led science was a key feature of these reforms. Soon after taking power in 2001, the party implemented the *Environmental Assessment Act, 2002*, which handed regulatory "oversight" to mining corporations, eliminated provisions requiring engagement with local First Nations and other stakeholders, and granted unprecedented discretionary powers to the minister and the executive director of the Environmental Assessment Office.<sup>45</sup> It also shelved plans developed by its predecessors to require mining companies to fully fund environmental liabilities, thus incentivizing companies to cut corners and flout safeguards, and socializing the costs of mass ecological destruction.<sup>46</sup> Beginning in 2001, the BCLP introduced profound cuts to the public-service sector: departments with science-based mandates lost on average 25 percent of staff scientist and licensed expert positions, dramatically eroding their ability to fulfill mandates and to make evidence-based decisions.<sup>47</sup>

In 2004, having hollowed out scientific capacity and enforcement, the BCLP continued its sweep of neoliberal reforms with the implementation of a regulatory program that outsourced evidence gathering, decision

<sup>43</sup> Jamie Peck and Adam Tickell, "Neoliberalizing Space," *Antipode* 34, no. 3 (2002): 389.

<sup>44</sup> Stanley, "Resilient Settler Colonialism"; Stanley, "Risk Management and the Logic of Elimination."

<sup>45</sup> Mark Haddock, "Current Issues in Environmental Assessment in British Columbia," *Journal of Environmental Law and Practice* 21 (2010): 221.

<sup>46</sup> R. Allan, *Toward Financial Responsibility in British Columbia's Mining Industry* (Vancouver: Union of British Columbia Indian Chiefs, May 2016).

<sup>47</sup> Emma Gilchrist, "How BC Outsourced Environmental Protection (And What You Can Do about It)," *Narwhal* (blog), 19 January 2018, <https://thenarwhal.ca/how-b-c-outsourced-environmental-protection-and-what-you-can-do-about-it/>; Judith Lavoie, "British Columbians Saddled with \$40 Million Clean-Up Bill as Imperial Metals Escapes Criminal Charges," *Narwhal*, 29 March 2017, <https://thenarwhal.ca/british-columbians-saddled-40-million-clean-bill-imperial-metals-escapes-criminal-charges/>.

making, and environmental protection to industry-paid professionals.<sup>48</sup> This change saw scientific evidence-based assessment of industrial activities now being carried out by third-party qualified environmental professionals (QEP), enacted through the *Fish Protection Act* and the Riparian Areas Protection Regulation. This so-called “professional reliance model” has allowed companies and project proponents to pay for their own scientific experts to identify and determine environmental harms,<sup>49</sup> an arrangement that has been shown to be especially prone to manipulation.<sup>50</sup>

While QEPs can work independently as consultants, the common way for large industrial projects to procure QEPs is through corporate engineering firms. Proponent-led scientific evaluation has significantly changed British Columbia’s environmental regulatory system, especially since those carrying out the science now have a vested interest in ensuring profitable outcomes for those who are paying for the science. Observers have demonstrated a measurable shift in the analytic approaches used by QEPs to determine environmental outcomes (away from the use of “quantitative thresholds” and towards a variety of “significance determination approaches”) that rely on “reasoned argumentation.”<sup>51</sup> They have also demonstrated that findings of “significant impacts” in recent environmental assessments have become “exceedingly rare.”<sup>52</sup> The experience of QEPs underscore these trends, confirming that, while there is an appearance of independence due to a third-party research system, the arrangement is anything but, as QEPs report experiencing corporate

<sup>48</sup> Andrew Appleton, “Riparian Areas (Protection) Regulation (RAPR) – 2019 Amendments,” provincial government presentation, Ministry of Forests, Lands, Natural Resource Operations, and Rural Development, October 2019, [https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-fish-habitat/riparian-areas-regulations/rar\\_amendments\\_webinar\\_sep\\_19\\_qep.pdf](https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-fish-habitat/riparian-areas-regulations/rar_amendments_webinar_sep_19_qep.pdf).

<sup>49</sup> Lavoie, “British Columbians Saddled with \$40 Million Clean-Up Bill.”

<sup>50</sup> Gavin Smith, “BC’s Proposed New Environmental Assessment Act: Some Things Have Really Changed ... Others, Not So Much,” *West Coast Environmental Law* (blog), 21 November 2018, paras. 22, 24, <https://www.wcel.org/blog/bcs-proposed-new-environmental-assessment-act-some-things-have-really-changed-others-not-so-much>; Ainslie Cruickshank, “Scientists Say BC’s Proposed Environmental Assessment Process Lacks Scientific Rigour, Independence,” *Toronto Star*, 19 November 2018, [https://www.thestar.com/vancouver/scientists-say-b-c-s-proposed-environmental-assessment-process-lacks-scientific-rigour-independence/article\\_094a66f3-b1b2-5499-8973-1d19b87c9962.html?utm\\_medium=social&utm\\_source=copy-link&utm\\_campaign=user-share](https://www.thestar.com/vancouver/scientists-say-b-c-s-proposed-environmental-assessment-process-lacks-scientific-rigour-independence/article_094a66f3-b1b2-5499-8973-1d19b87c9962.html?utm_medium=social&utm_source=copy-link&utm_campaign=user-share); Anne Casselman, “Who Is Watching BC’s Environmental Watch Dogs?” *BC Business: Natural Resources*, 14 July 2015, para. 20, <https://www.bcbusiness.ca/who-is-watching-bcs-environmental-watch-dogs>.

<sup>51</sup> Cathryn Clarke Murray, Janson Wong, Gerald Singh, and Megan Mach, “The Insignificance of Thresholds in Environmental Impact Assessment: An Illustrative Case Study in Canada,” *Environmental Management* 61, no. 6 (2018): 1067.

<sup>52</sup> Murray et al., 1067.

pressure to change results, ranging from suggested edits in final reports to more aggressive insistence that findings be communicated in a way that better fits the needs of the company.<sup>53</sup>

As a metaphysical stance, objectivity lends credibility to these arrangements, and in the disaster science that ensued made it possible for regulators to curate and weaponize narrow and self-serving explanations of the causes and consequences of the disaster. Regulators were able to rely on arbitrary and strategic claims (provided and paid for by Imperial Metals) whose coherence hinged on misdirection and manipulation. Imperial Metals was empowered to downplay and misrepresent evidence about the impacts of the disaster. Vested interests (on the part of the province and Imperial Metals) in protecting possessive colonial entitlements to Secwepemc land were, in turn, shrouded from scrutiny under a guise of neutral and disinterested scientific knowledge.

#### DISASTER SCIENCE I: GOVERNMENT RESPONSES TO THE DISASTER

The province has a vested interest in narrowly framing the disaster as a one-off technical failure caused by natural (and unforeseen) conditions rather than as a feature of a regulatory system engineered over three decades to perpetuate mass ecological destruction and undermine Indigenous sovereignty. One of the province's first acts (undertaken fourteen days after the disaster and amid considerable criticism for its apparent lack of action) was to commission a panel of scientific experts to investigate and determine the cause of the dam failure. The Mount Polley Independent Expert Engineering Investigation and Review Panel (IEERP), as it was called, consisted of three internationally recognized geotechnical engineers appointed for their expertise on the mining industry, each in the past having worked as consultants and advisors to both proponents and regulators. The panel's terms of reference directed its members to define the mechanisms of failure, including (at their discretion) those related to management practices and regulatory oversights.<sup>54</sup> The panellists drew primarily on their experience as geotechnical engineers to define the root cause of the disaster as a "sliding failure and weak clay layer 10 meters below the surface," which caused the dislocation of part of the perimeter embankment<sup>55</sup> – a characterization

<sup>53</sup> Personal communication with R.P. Bio, in discussion with Nunn, 23 April 2018; Casselman, "Who Is Watching," para. 10.

<sup>54</sup> IEERP, *Report on Mount Polley Tailings Storage Facility Breach*, Appendix A: Terms of Reference, 2–3.

<sup>55</sup> IEERP, 118.

later challenged by the investigations of the chief inspector of mines<sup>56</sup> and the auditor general.<sup>57</sup>

Given the narrowness of their mandate and the specific nature of their expertise, it is not surprising that the members of the IEERP found that they were “not able to offer an adequate assessment of the role of management and oversight in its contribution to the cause of the failure.”<sup>58</sup> Nor is it surprising that they chose to treat regulatory oversight as an afterthought to their analysis. As noted by the auditor general, the panellists mandated geotechnical engineers to determine the specific mechanisms of *how* the dam failed. Due to their mandate and areas of expertise, they were not asked (nor were they able) to determine *why* it failed.<sup>59</sup> Following a paltry engagement with the MEM’s regulatory oversight of the TSF, which barely scratched the surface (a five-page overview compared to 107 pages of in-depth analysis of the technical causes accompanied by multiple appendices), the panel nonetheless concluded that there weren’t any problems with regulatory oversight. While inspections were missed, the report still concluded that the Mount Polley mine disaster “was a sudden failure without precursors” and that “additional inspections of the TSF would not have prevented the failure.”<sup>60</sup>

Notwithstanding the narrowness of their expertise, their inability to engage important dimensions of the disaster, or gaps in their analysis, the province upheld the panellists’ perspective as exhaustive and definitive. As scientists qua scientists, their claims and conclusions were represented as the truth – as the *most* neutral, disinterested, and accurate account of what happened – and were used by governments to uphold their preferred and depoliticized framing of the disaster as an isolated event. Constructing, through the lens of geoscience, a narrowed understanding of the disaster as a material problem proved exculpatory (for the province and the MPMC) and helped to displace mounting evidence of a system engineered for the circulation of mining capital and commodities. In the guise of exhaustive, neutral, and detached knowledge, the panel’s claims and conclusions were represented by the province as definitive and were subsequently utilized to undermine competing assessments of the tailings facility’s failure, representing the latter as either “unscientific” (narrow, uninformed, or partial) or as accurate only insofar as they demonstrated consistencies with the panel’s conclusions.

<sup>56</sup> Chief Inspector of Mines, *Chief Inspector of Mines’ Investigation Report on Mount Polley*.

<sup>57</sup> Bellringer, *Audit of Compliance and Enforcement*.

<sup>58</sup> IEERP, *Report on Mount Polley Tailings Storage Facility Breach*, 119.

<sup>59</sup> Bellringer, *Audit of Compliance and Enforcement*.

<sup>60</sup> IEERP, *Report on Mount Polley Tailings Storage Facility Breach*, 124.

In December 2015, one year after the IEERP's report, the chief inspector of mines (CIM) released the report of its investigation into the root causes of the disaster.<sup>61</sup> This was a separate investigation, required under the *Mines Act*, and was not commissioned by the province. The report was scathing and directly contradicted the IEERP's findings. The CIM found that the structural failure of the tailings facility was caused by three factors, none of which, alone, would have been sufficient to cause the failure: a weak, uncharacterized glaciolaucustrine layer of soil (of which, the evidence indicated, the MPMC was aware but the significance of which it failed to realize); a buttress sub-excavation along the perimeter embankment (that it concluded had been left unfilled for eight months prior to the spill while workers were redirected to other work considered more critical); and embankment geometry (including both the unprecedented slope and height of the embankment).<sup>62</sup> Moreover, the CIM found that the structural failure alone was "not sufficient to account for the breach and release of the tailings and water into the environment."<sup>63</sup> The breach, according to the CIM, was triggered by a lack of an adequate tailings beach at the location of the breach and an excess of supernatant water in the tailings facility.<sup>64</sup>

In a press statement responding to the release of the report, the province identified only what was consistent with the IEERP's conclusions, clearly misrepresenting the CIM's findings of cause and representing them as further corroboration of the panel's narrow understanding:

The CIM report found, as did the Independent Expert Panel in January, that the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design or in subsequent dam raises. The chief inspector also found other factors including the slope of the perimeter embankment, inadequate water management, insufficient beaches and a sub-excavation at the outside toe of the dam exacerbated the collapse of the dam and the ensuing environmental damage. While the breach would not have occurred had it not been for the undetected glaciolaucustrine layer of soils (UGLU), the consequences of the breach were made worse by the other factors.<sup>65</sup>

<sup>61</sup> Chief Inspector of Mines, *Chief Inspector of Mines' Investigation Report on Mount Polley*.

<sup>62</sup> Chief Inspector of Mines, chap. 10.

<sup>63</sup> Chief Inspector of Mines, 131.

<sup>64</sup> Chief Inspector of Mines, 131.

<sup>65</sup> Ministry of Energy, Mines, and Low Carbon Innovation, "Government Takes Action on Chief Inspector of Mines' Recommendations," *BC Government News*, 17 December 2015, <https://news.gov.bc.ca/releases/2015MEM0030-002119>.

Reframed, as consistent with the findings of the IEERP, the “conclusions” of the CIM were also upheld as “scientific” and used by the MEM to further corroborate and defend the province’s preferred account of the disaster as an isolated and unforeseeable event.

The auditor general’s 2016 investigation into the role of regulation relative to the Mount Polley mine disaster also contradicted the IEERP’s findings, inferring that, with proper exercise of regulatory powers, the MEM might have prevented the dam failure at Mount Polley.<sup>66</sup> The province condemned this determination out of hand as narrow, uninformed, and unscientific. Pointing to the IEERP *and* (the repackaged) CIM’s determination of the cause of the failure, its formal response to the investigation registered professional “concern” over the auditor general’s “different findings on fundamental facts” and dismissed its inferences as “contrary” to the expert “finding[s] of cause”:<sup>67</sup>

Both the Expert Panel and the CIM investigation concluded that the fundamental cause of the Mount Polley failure was the lack of appropriate subsurface site characterization when the dam was designed and built. We respectfully point out that this was not a question of the number of ministry staff on the ground, the number of inspections performed, or an increase in professional reliance since.

Without a hint of irony (given the IEERP’s lack of subject matter expertise in regulatory matters) the MEM suggested that the auditor general’s investigation lacked understanding of “appropriate engineering practice” and that its inferences were “not supported by facts or engineering.”<sup>68</sup> The MEM further attempted to undermine the report by challenging the scientific credibility of the auditor general’s subject matter experts:

In conducting the Mount Polley case study, the audit team – quite understandably – augmented their own knowledge of environmental principles, geotechnical engineering and regulatory law. They did so by consulting a panel of subject matter experts, comprising an environmental academic, environmental lawyer, engineer and a former employee. We understand this to be consistent with normal audit practice. However, proceeding in that manner did not give the Ministries the opportunity to know who was on the panel, what data the panel may have considered on specific points, what opinions they

<sup>66</sup> Bellringer, *Audit of Compliance and Enforcement*, 19.

<sup>67</sup> Bellringer, 20.

<sup>68</sup> Bellringer, 20.



might have offered, or to challenge the thinking of panel members with additional engineering evidence and/or competing legal or scholarly opinions.<sup>69</sup>

The reframing of the CIM's findings as a scientific corroboration of the IEERP's claims about the disaster also provided opportunities for the MEM to draw from among those findings to authoritatively defend core aspects of its neoliberal reforms. In its scathing (and far from exculpatory) review of the failures of the MPMC and the MEM with respect to the operation, management, and regulation of the dam, the CIM nonetheless found that the MPMC's practices were "not in contravention of any regulation" and that they did not "constitute a contravention of existing mining legislation."<sup>70</sup> It also found that the regulator (the MEM) was not responsible for the "design of engineered structures such as tailings facilities nor construction oversight by approving or improving upon the work of the design engineers" – by necessity the regulator must defer to professionally regulated engineers.<sup>71</sup> The province has used both statements to defend its regulatory approach against challenge (including its collaborative approach to compliance, over-reliance on qualified professionals, and apparent delegation of regulatory authority to the MPMC's engineer of record), presenting them (out of context) as the objective determinations of scientists (rather than as the opinion of a senior public servant) regarding the regulatory system and culpability of the MEM and the MPMC. Otherwise intended as a critical reflection on the quality and character of British Columbia's regulatory and legal system, and the problematization of the extent to which the province's system of professional reliance is vulnerable to manipulation by vested interests, these statements have been stripped of context. In the discussion immediately preceding, for instance, the CIM states:

The Regulator must have the capacity to assess the adequacy of the designer's work product, and when questions arise, must have an appropriate vehicle to receive substantive answers. Professional reliance can be diluted when it conflicts with client expectations. While clients must rely on the judgement of the EoR, they should not create conditions that exert undue influence on the professional with respect to minimum standards.<sup>72</sup>

<sup>69</sup> Bellringer, 21.

<sup>70</sup> Ministry of Energy, Mines, and Low Carbon Innovation, "Government Takes Action on Chief Inspector of Mines' Recommendations."

<sup>71</sup> Chief Inspector of Mines, *Chief Inspector of Mines' Investigation Report on Mount Polley*, 63.

<sup>72</sup> Chief Inspector of Mines, 151.

DISASTER SCIENCE 2: SCIENCE THAT FAVOURS  
THE CORPORATION, BY THE CORPORATION

Doing scientific research is hard. Finding things is hard. Not finding anything is easy, you don't have to be a bad person not to find anything, you just have to be incentivized not to.<sup>73</sup>

Immediately following the disaster, the MPMC released a map entitled “Overview of Area Affected by the Mount Polley Mine Breach” and placed it at the landing page of the mine’s website. Despite much of the 25 million cubic metres of mine by-product from the disaster flowing into the lake itself, the map communicated the “impacts” of the spill as confined to a terrestrial area that ended where the waste-flow met the lake. Reminiscent of the efforts (described in the introduction to this article) to abstract the disaster as a natural event, this graphic is part of an attempt by the MPMC to argue that the disaster has had little (and certainly no lasting or harmful) impact on proximate ecologies – an argument that rests primarily on the claim made by its scientific advisors that the tailings have been found to be chemically stable. The truncated map (like the community-oriented tours provided by the corporation to the town of Likey and other nearby residents in the years following the breach and information sessions provided by the corporation to the town of Likely and other nearby residents) misrepresents the geography of the spill to make it consistent with this claim. It represents an explicit effort on behalf of the corporation to redirect attention towards physical disturbance and terrestrial remediation of the Hazeltine corridor and Quesnel shoreline, and to circumscribe questions about the millions of cubic metres of waste deposited in Quesnel Lake.

The MPMC has a vested interest in fabricating simplistic narratives about the consequences of the disaster that downplay social and ecological harm, and that abstract the disaster from broader patterns of structural violence. The neoliberal shift of power and responsibility for scientific verification to industry has allowed the province to rely on research conducted or paid for by the MPMC, and it has empowered the MPMC to self-direct scientific research and define the ecological consequences of the spill. Under a mantle of objectivity, the MPMC was able to offer allegedly scientific representations of the disaster as harmless, to abstract knowledge about its consequences from its own interests, and to occlude the ways in which its claims were informed by possessive, colonial entitlements to Indigenous lands. The MPMC’s central claim

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<sup>73</sup> Personal communication with anonymous participant, in discussion with Nunn, January 2018.

about the spill was that it proved to be harmless: its consequences were limited to a physical disturbance that did not extend to aquatic ecosystems; they were physical, not chemical, and had no lasting effects on proximate ecologies. These claims are, however, arbitrary and strategic (not to mention pre-emptive), and their coherence relies primarily on strategic omissions and misrepresentations rather than on a balance of evidence that clearly belies their partiality. Here we limit ourselves to two examples.

*Example 1: Strategic uses of uncertainty*

The political configuration whereby corporations are granted expanded control in environmental governance thrives on uncertainty – as does the coherence of the MPMC’s arguments. The corporation has suggested that “all the geochemical studies, and sediment, water, and benthic species monitoring, have indicated that the tailings [released into the lake] are both physically and chemically stable, and *are not* releasing metals to the lake water.”<sup>74</sup> While these claims to chemical stability and “negligible” impacts of the deposited tailings were confirmed by the scientists contracted by the MPMC, they have proven to be inconsistent with the scientific research that was carried out independent from the mine. In the wake of the disaster there has been a flurry of independent university-based scientific research that has determined that the spill *has* affected the geochemistry of sediment, soils, and benthic microbial communities;<sup>75</sup> that the biological composition<sup>76</sup> and seasonal turbidity<sup>77</sup> of areas where the waste was deposited have been affected; and that (as

<sup>74</sup> Lyn Anglin, “How Things Were Made Right after the Mount Polley Spill,” *Resource Works* (blog), 2019, para. 16 (emphasis added), <https://www.resourceworks.com/polley-remediation>.

<sup>75</sup> Heath W. Garris, Susan A. Baldwin, Jon Taylor, David B. Gurr, Daniel R. Denesiuk, Jonathan D. Van Hamme, and Lauchlan H. Fraser, “Short-Term Microbial Effects of a Large-Scale Mine-Tailing Storage Facility Collapse on the Local Natural Environment,” *PLoS One* 13, no. 4 (2018): 1–15; Ido Hatam, Ellen Petticrew, Todd French, Philip Owens, Bernard Laval, and Sue Baldwin, “The Bacterial Community of Quesnel Lake Sediments Impacted by a Catastrophic Mine Tailings Spill Differ in Composition from Those at Undisturbed Locations – Two Years Post-Spill,” *Nature: Scientific Reports* 9, no. 1 (2019): 2705; Karen A. Hudson-Edwards, Patrick Byrne, Graham Bird, Paul A. Brewer, Ian T. Burke, Heather A. Jamieson, Mark G. Macklin, and Richard D. Williams, “Origin and Fate of Vanadium in the Hazeltine Creek Catchment Following the 2014 Mount Polley Mine Tailings Spill in British Columbia, Canada,” *Environmental Science and Technology* 53, no. 8 (2019): 4088–98.

<sup>76</sup> Petticrew et al., “Impact of a Catastrophic Mine Tailings Impoundment Spill”; Ellen Petticrew, Philip Owens, Bernard Laval, and Todd French, “Comparing the Composition and Metal Content of Mt Polley Mine Tailing Deposits and Natural Sediments in Quesnel Lake, British Columbia,” in *EGU General Assembly Conference Abstracts* 2 (2018): 11365.

<sup>77</sup> Andrew K. Hamilton, Bernard E. Laval, Ellen L. Petticrew, and Sam J. Albers, “Seasonal Turbidity Linked to Physical Dynamics in a Deep Lake Following the Catastrophic 2014 Mount Polley Mine Tailings Spill,” *Water Resources Research* 56, no. 8 (2020): 1–44.

noted previously) dangerous heavy metals, including copper, arsenic, selenium, and aluminum released into the lake have become bioavailable to fish and the epibenthic invertebrates upon which they feed.<sup>78</sup>

The MPMC has persistently cast doubt on these findings, claiming that there is no evidence that the heavy metals sampled in the fish are causally linked to the spill; that there are no pre-breach data to confirm that the heavy metal concentrations in the fish did not exist prior to the disaster; that, given the many factors that affect salmon health, it is not possible to draw strong cause-and-effect relationships between toxins introduced into the lake and poor sockeye survival; and that none of the studies demonstrate proof (according to Western thresholds) of clear-cut legal culpability in relation to major ecosystem disturbances in Quesnel Lake. This notwithstanding that uncertainty runs both ways and casts doubt on the MPMC's claims that, for instance, the tailings are *not* bioavailable and are *not* the source of the heavy metals found in fish.

The unknowability and indeterminacy of the impacts of the disaster is to a significant extent an artifact of the specific methodological choices made by the mine, including regarding how, where, and in which forms of life to look for impact. The methodological approach chosen by the corporation and associated QEPs hired to conduct assessments, for instance, made strategic use of the uncertainty surrounding fish. While it is commonly accepted that the impacts on fish and fish habitat remain indeterminable over the short term, this is not the case for all life – especially bacterial life that reproduces on a much shorter time scale. Independent research has, for instance, documented significant transformation in the bacterial composition of the areas of the lake where the tailings were deposited. A two-year post-disaster study published in the journal *Nature* compared bacterial communities from sediments of disturbed and undisturbed sites and found significant differences in each site's physical and chemical properties. The disturbed sites had higher pH and copper concentrations, indicating a significant transformation of the bacterial composition in the areas where the mine tailings were directly deposited.<sup>79</sup>

The majority of the MPMC's research into the aquatic consequences of the spill, however, focused on fish (trout and salmon) and fish habitat,

<sup>78</sup> Pyle et al., "Invertebrate Metal Accumulation"; Klemish et al., "Quesnel Lake Database Construction and Assessment," Quesnel Lake Database Construction and Assessment, Environmental Quality Series, EQS2019, Victoria, 22, [https://www2.gov.bc.ca/assets/gov/environment/air-land-water/spills-and-environmental-emergencies/docs/mt-polley/sample-monitor/quesnel\\_lake\\_watershed\\_database\\_and\\_assessment\\_report.pdf](https://www2.gov.bc.ca/assets/gov/environment/air-land-water/spills-and-environmental-emergencies/docs/mt-polley/sample-monitor/quesnel_lake_watershed_database_and_assessment_report.pdf).

<sup>79</sup> Garris et al., "Short-Term Microbial Effects"; Hatam et al., "Bacterial Community of Quesnel Lake Sediments."

and found “no evidence” (after a year and a half of research) of: “acute toxicity in trout,” “fish mortality,” or “exposure related impacts on survival,” and “no adverse effect on the development of eggs.”<sup>80</sup> These claims are deliberately pre-emptive and constitute an attempt to simplify the complexity of ecological systems and falsely represent certainty – in this case by interpolating the spatio-temporality of ecosystem effects. Independent scientists have suggested that, given the complexity of aquatic ecosystems and the magnitude of the transformation of lake substratum due to the disaster, it may take decades before the effects of the heavy metals deposited at the bottom of the lake are known: “[the tailings] will weep for a long time – decades, perhaps centuries – at the bottom of the lake. They will mix with the water column and get into the food web, first of all through zooplankton and phytoplankton, which are eaten by sockeye smolts ... then up the food chain that way.”<sup>81</sup> The abbreviated time frames according to which the MPMC and its scientific advisors assessed the effects of the spill are short and ignore potential longer-term effects, particularly given that a slow, continuous release of toxins could lead to enough materials in the water column to have significant impacts on the food web. Convenient as it might be for the MPMC to establish the certainty of no ecological damage after two years of measuring something that does not yet exist, to claim that the tailings have had negligible impacts at such an early stage is purely strategic.

### *Example 2: Deliberate misrepresentation of the evidence*

The coherence of the MPMC’s favourable narratives about the disaster are also rooted in misleading representations of its findings. A considerable amount of the company’s post-disaster research was carried out according to the proponent-led third-party research arrangement outlined above. The MPMC hired three engineering and environmental consulting firms – Golder Associates, Minnow Environmental Inc., and Tetra Tech Engineering – to carry out diagnostic and remediation assessments in conjunction with its own staff environmental scientists. In addition to the strategic methodological choices made by scientists in the context of this arrangement (outlined above), research produced

<sup>80</sup> Golder Associates, “Mount Polley Rehabilitation and Remediation Strategy: Ecological Risk Assessment,” 15 December 2017, 142–43.

<sup>81</sup> Mark Hume, “Mount Polley Tailings Spill Effects Could Last for Decades,” *Globe and Mail*, 14 September 2014, <https://www.theglobeandmail.com/news/british-columbia/mount-polley-tailings-spill-effects-could-last-for-decades/article20596892/>.

by QEPs on behalf of the mine indicates a deliberate attempt to mislead regulators and the public.

The MPMC's conceptual remediation plan, published by Golder Associates, provides an especially obvious example. In one of several studies meant to analyze the extent of the disaster, Golder Associates compared the abundance of two invertebrate species, *Chiromonids* (fly larvae species) and *Tubifex tubifex* (a species of worm also known as *Oligochaetes*). *Tubifex tubifex* is a type of worm commonly found in highly disturbed areas. *Chiromonids* is a type of fly larvae that is less disaster resistant, and, therefore, its growing presence would give some indication of life beginning to return to the areas of the lake most disturbed by mine waste. The results of the comparison were published as Figure 19 of the plan written by Golder in 2018 and circulated to researchers and the town of Lively.<sup>82</sup> In Figure 19 Golder uses unnecessarily complicated stacked bar charts measured along a logarithmic scale to present its counts of *Oligochaetes* and *Chiromonids*. Despite having found significantly higher counts of slug worms (*Oligochaetes*) than fly larva (*Chiromonids*), the way these data were presented in the report (and the use of a logarithmic scale) made it appear that there was a predominance of the actually far less numerous *Chirominids*. The part of the bar associated with the more desirable *Chironomids*, however, spans from about 0 to 1,000, and the part of the bar associated with the less desirable *Oligochaetes* spans from about 2000 to 10,000. The real ratio of *Chiromonids* to *Oligochaetes* is close to one-to-eight, meaning that there were in fact close to about eight times more disaster-resistant worms than there were the more desired fly larvae.<sup>83</sup>

None of the data that Golder Associates provided is inherently logarithmic or large enough to warrant a logarithmic display, and there appears to be no reason for using logarithmic scales other than “visually downplaying the magnitude of their impacts.”<sup>84</sup> The report did not further qualify the data, and the figures were not accompanied by any

<sup>82</sup> Golder Associates, *Mount Polley Mine Conceptual Remediation Plan: Perimeter Embankment Breach* (Vancouver: Golder Associates, 2018), 64. A representative from WSP, the company that acquired Golder in 2021, withheld consent to include this figure in this article. This graph was included in the original draft of this article and was included in the article during the anonymous peer-review process. A previous employee of Golder responded to our request to include the figure stating: “The figure in question contains biological data that is appropriately interpreted by a registered professional biologist – this is not a reserved practice in British Columbia. I infer, from the title, that the authors are not registered professional biologists.” A copy of this report can be accessed by contacting the authors directly.

<sup>83</sup> Golder Associates, 64.

<sup>84</sup> Personal communication with anonymous participant, in discussion with Nunn, November 2018.

raw data or supplementary discussion – raising important questions about the extent to which the report is deliberately intended to mislead.

Ultimately, the tenuous arrangement in which industry is offered liberal conditions to extract capital relies on a belief in the objectivity of scientific knowledge and the saliency of dominant Euro-Western ideals of science as objective knowledge – a condition of possibility of which the MPMC is well aware. The arrangement of the QEPs and other forms of proponent-led science allows regulators to rely on self-interested and misleading narratives painstakingly crafted under a mantle of objectivity by those with the most significant material and financial stake in down-playing the destructive effects of their activities. And while, for the most part, locals and Indigenous communities (some of whom are themselves scientists) have largely seen through the truncated maps, half-truths, and abbreviated tours, the system of professional reliance and industry-led science has proven instrumental in advancing the corporation's possessive, colonial entitlements to Secwepemc lands. It has also proven instrumental in nurturing the regulatory-epistemic configurations that furnish the MPMC with the right to dismantle socio-ecological relations and violently undermine Secwepemc sovereignty.

#### CONCLUDING REMARKS:

##### EXPANDED ACCESS TO INDIGENOUS LAND

In closing we turn to the relationship between disaster science and possessive colonial entitlements. Imperial Metals has to date faced no fines or criminal charges and has never been held liable for the harm that it caused. The province's mining regulatory regime has escaped relatively unscathed, proportionate to the scale of the disaster and the size of the province's role in enabling it. The BC government has let all statutory deadlines (to lay charges under the *Mines* and *Environmental Management Acts*) pass without pressing charges against the company. The federal government appears to have followed suit. Both levels of government have actively intervened to stay criminal proceedings against the company, including a private suit launched in 2017 by Bev Sellars, former Chief of the Xat'sull/Soda Creek First Nation, the First Nation upon whose territory the disaster occurred. The private prosecution cited fifteen infractions against British Columbia's *Environmental Management Act*. Instantiating the violence of British Columbia's colonial project, in January 2018 the province's Prosecution Service announced that it would take over the charge against the MPMC and dropped the case.

Instead of charges or fines, the Mount Polley Mine Corporation and Imperial Metals were afforded expanded access to lands and waters in Secwepemc and Tahltan territories. Less than a year after the spill, in June 2015, Imperial Metals subsidiary, Red Chris Development Corporation (RCDC), received provincial approval to open another (hotly contested) open pit copper mine (Red Chris) on unceded Tahltan territory, with a tailings storage facility similar in design to Mount Polley's but much larger. Weeks later (July 2015), the Mount Polley Mine Corporation received a conditional permit from the provincial government to resume partial operation at Mount Polley Mine.<sup>85</sup> Less than a year after that, the mine returned to full operation.<sup>86</sup> The reason for this expeditious return to operation is clearly spelled out one year after the disaster by Senior Inspector of Mines, Ministry of Energy and Mines Steve Rothman: "The province would like to see the mine back in operation in a safe and environmental conscious program ... that takes all the workers back to work and helps to support the communities."<sup>87</sup> A similar rationale was supplied by the minister for fast-tracking the approval of the highly controversial Red Chris Mine post-disaster: "Mining in BC helps bolster the province's economy. Getting permits to build mines should be difficult ... but the province needs to be competitive when it comes to attracting mining companies."<sup>88</sup>

This "environmentally conscious program" included approval to deposit additional mine waste directly into Quesnel Lake. In November 2015 the government issued a short-term discharge permit to the MPMC, allowing it for the first time to discharge effluent directly into Hazeltine Creek and Quesnel Lake. According to the terms of the permit, effluent would be released directly into the creek, from where it would flow into a settling pond. On 20 October 2016, the MPMC applied to the British Columbia Ministry of Environment (MoE) to amend the

<sup>85</sup> David P. Ball, "As Mount Polley Re-Opens, Neighbours Feel Like 'Collateral Damage,'" *The Tyee*, 9 July 2015, <http://thetyee.ca/News/2015/07/09/Mount-Polley-Reopens/>; Gordon Hoekstra, "Mount Polley Tailings Dam Repairs OK'd as Gold and Copper Mine to Get Back to Full Business," *Vancouver Sun*, 23 June 2016, <http://vancouver.sun.com/news/local-news/mount-polley-tailings-dam-repairs-okd-as-gold-and-copper-mine-to-get-back-to-business>.

<sup>86</sup> Carol Linnitt, "BC Quietly Grants Mount Polley Mine Permit to Pipe Mine Waste Directly into Quesnel Lake," *Narwhal*, 17 April 2017, <https://thenarwhal.ca/b-c-quietly-grants-mount-polley-mine-permit-pipe-mine-waste-directly-quesnel-lake/>; BC Ministry of Environment, "Long-Term Water Management Plan Approved for Mount Polley," *BC Gov News*, 7 April 2017, <https://news.gov.bc.ca/releases/2017ENV0038-001156>.

<sup>87</sup> *Mount Polley One-Year Recap*, YouTube, 2015, 3:40, <https://www.youtube.com/watch?v=JMIORbuebYk>.

<sup>88</sup> "BC Government Approves Permits for Controversial Red Chris Mine," *City News Vancouver*, 19 June 2015, <https://vancouver.citynews.ca/2015/06/19/b-c-government-approves-permits-for-controversial-red-chris-mine/>.



previous Environmental Management Act (EMA) permit 11678 to allow the MPMC to pump 10 million cubic metres of treated effluent annually into Quesnel Lake.<sup>89</sup> A similar amendment (this time to the metal mining effluent regulations) had been granted months earlier to Imperial's RCDC to allow the tailings facility at RC to expand into nearby fish-bearing Trail Creek. The amendment allowed the RCDC to dump mine tailings into the creek.<sup>90</sup> The MPMC's permit, granted in April 2017 following the amendment to the EMA, currently allows the MPMC to pump up to 10 million cubic metres of mine-waste water annually into Quesnel Lake.<sup>91</sup>

The MPMC has repeatedly broken the terms of this permit and has, according to Mount Polley's Public Liaison Committee, operated in a state of near constant non-compliance in the years since its issue.<sup>92</sup> During its first year of permitted dumping the company exceeded maximum levels of dissolved cadmium, copper, and aluminum on at least three separate occasions in one month and received six advisories and two warnings from the province for permit infractions without facing fines or penalties.<sup>93</sup>

In the aftermath of the disaster, Imperial Metals and the MPMC have been given expanded access to socio-ecological relations that underpin Secwepemc sovereignty and a renewed licence to dismantle and undermine these relations as a condition of profitability. The province, in turn (relying on a process of external scientific verification that amplified the interests and objectives of both mining companies and the state), has succeeded in reproducing colonial authority and exercising effective territorial control over Secwepemc lands and waters. As a metaphysical stance, objectivity pretends to an impossible separation and dislocation of the knower, abstracting knowledge from the relations within which

<sup>89</sup> "Long-Term Water Management Plan Approved."

<sup>90</sup> Government of Canada, "Regulations Amending the Metal Mining Effluent Regulations," pub. L. no., vol. 150, no. 10, SOR/2016-87 Fisheries Act Metal Mining Effluent Regulation Amendment 2016, <https://gazette.gc.ca/rp-pr/p2/2016/2016-05-18/html/sor-dors87-eng.html>.

<sup>91</sup> "Long-Term Water Management Plan Approved," para. 5.

<sup>92</sup> Christopher Pollon, "Lake Interrupted," *Narwhal*, 27 October 2018, <https://thenarwhal.ca/lake-interrupted/#:~:text=This%20is%20the%20second%20part,part%20one%20of%20this%20investigation>; Christopher Pollon, "Year Four: Tracing Mount Polley's Toxic Legacy," *The Narwhal*, 24 October 2018, <https://thenarwhal.ca/year-four-tracing-mount-polleys-toxic-legacy/>; Alexis Stoyenoff, "Challenging Mount Polley's Wastewater Permit in Quesnel Lake," *West Coast Environmental Law*, 18 August 2020, para. 13, <https://www.wcel.org/blog/challenging-mount-polleys-wastewater-permit-in-quesnel-lake>. Records that show these values can be found here: <https://nrced.gov.bc.ca/records;keywords=Mount%20Polley%20;ms=501;activityType=InspectionNRCED;currentPage=1;pageSize=100;sortBy=-dateIssued>.

<sup>93</sup> Pollon, "Lake Interrupted."

it is inevitably and unavoidably construed. Using the Mount Polley mine disaster as a reference point, we argue that, in the wake of the Mount Polley Mine disaster, cultural beliefs in the objectivity of science (which bolstered and legitimized the liberalization of conditions for extraction in British Columbia) empowered the province to curate scientific claims about the causes and consequences of the disaster – claims that were narrow, arbitrary, strategic, and pre-emptive, and whose coherence (in the case of the MPMC) relied primarily on misdirection. The extent to which these claims were implicated in colonial land relations and embodied a unitary and partial set of political objectives relative to the ongoing occupation and use of Indigenous lands was obscured under a mantle of objectivity. These claims also worked to abstract material realities of the disaster from violent colonial systems of mass ecological destruction dependent on the systematic dismantling of life-giving social and ecological systems, and to disappear structures of colonial-capitalist violence.