**Summary & Conclusions section from Bowker and Chambers, 2015**

The advances in mining technology over the past 100 years which have made it economically feasible to mine lower grades of ore against a century of declining prices have not been counterbalanced with advances in economically efficient means of managing the exponentially expanding volume of associated environmental liabilities in waste rock, tailings and waste waters. In fact, those new technologies which do offer better management of mine wastes usually add significant cost and are often detrimental to bottom line financial feasibility. This is evidenced in a post-1990 trend toward un-fundable environmental losses of greater consequence. This interdisciplinary review of TSF failures 1910-2010 establishes a clear and irrefutable relationship between the mega trends that squeeze cash flows for all miners at all locations, and this indisputably clear trend toward failures of ever greater environmental consequence.

The implication of our findings (Bowker and Chambers 2015) is that a continuation of the present Mining Metric is not environmentally or economically sustainable, and that regulatory systems must begin to understand and address financial capacity of the miner, and the financial feasibility of mining itself, both in permitting criteria and in oversight of mine water management over the life of the mine.

Our findings point toward undocumented and unstudied risks of failure in the standing operating already permitted mines of smaller miners globally where cash flow pressures have led to an avoidance of best practices in waste management, and where political pressures have led to avoided close scrutiny of decades of neglect and shortfalls.

We have not identified an existing statutory or regulatory system anywhere that has the authority and capacity to identify and prevent the $6 billion in losses we estimate the public globally will be liable for by the end of this decade.

References

Bowker and Chambers 2015. The Risk, Public Liability, & Economics of Tailings Storage Facility Failures, Lindsay Newland Bowker and David M. Chambers, July 21, 2015.

Note

"Mining Metric" is defined as higher mine production necessitated by lower grades of ore. The metric is to continuously develop the resource through economies of scale, larger and deeper footprints, more efficient operations, bigger and better bulk mining technology.