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OPINION ISSUE

The Global Tailings Review

Opinion - David M Chambers, Ph.D., P. Geop.

As a partial response to societal concerns raised following the catastrophic tailings dam failures at Mt Polley (British Columbia, 2014), Fundao (Minas Gerais, Brazil, 2015), and Brumadinho (Minas Gerais, Brazil, 2019), the United Nations Environmental Program, the International Commission on Mining and Metals, and the Principles for Responsible Investment co-convened the Global Tailings Review to adopt global best practices on tailings storage facilities. The aim is to complete this work early in 2020. The review is being led by Dr Bruno Oberle, a professor for Green Economy and Resource Governance at L'École Polytechnique Fédérale de Lausanne, Switzerland, and heads the International Risk Governance Center.

The Global Tailings Review published a Draft Global Tailings Standard in late 2019, and accepted public comment on that draft. At the time of this writing (Mar20), a final Global Tailings Standard is anticipated shortly.

Brumadinho Independent Investigation Report

Of particular relevance are the recently released results of an internal investigation of the Brumadinho tailings dam failure (Independent Investigation Report, Failure of Dam 1 of the Córrego do Feijão Mine – Brumadinho, Extraordinary Independent Consulting Committee for Investigation, to the Board of Directors of Vale, February 20, 2020). Like the analysis and recommendations provided by the Expert Panel on the Mt Polley dam failure, released in 2015, the Brumadinho report provides significant insight into the fundamental causes of these catastrophic dam failures, and guidance into what fundamental steps must be taken in order to prevent, or at least minimize, future catastrophic tailings dam failures.

The report exposes the fundamental weaknesses in the regulation of, and guidance for, the design, construction, operation, and closure of tailings dams. These are: (1) lack of corporate prioritization, allocation of resources, visibility, and clarity between safety and operational considerations; (2) corporate capture of engineering consultants; and, (3) regulatory absence, and/or incompetence. Steven Vick, the world's foremost expert on tailings dams, has described this as "normalization of deviance", a term coined by sociologist Diane Vaughan who reviewed NASA's Challenger investigation.



Brumadinho, Minas Gerais, Brazil, January 25, 2019

I know this is being very blunt, but that is what the report documents. The Brumadinho report says the problems with tailings dam safety are fundamental, and will require changes in regulatory policy and engineering procedures that address these fundamental issues, and that superficial changes will make little or no difference.

For example, in response to the Mt Polley failure both regulators and the industry have placed considerable weight on Independent Tailings Review Boards (ITRB), or their equivalents, to fix the catastrophic dam failure problem. ITRBs are a necessary part of the solution, but are not sufficient in themselves as a solution. Unfortunately, the Brumadinho Report indicates it will take much more than that. ITRBs were in place before both the Fundao and Brumadinho dam failures, and yet the accidents still happened.

It is probably too late for Brumadinho Independent Investigation Report to affect the outcome of the Global Tailings Review and the new Global Tailings Standard. Just the timing of the release of the Brumadinho Report will probably prevent it from significantly influencing the Standard. The sad part is that if the fundamental issues in the Brumadinho Report are not acknowledged and addressed, then catastrophic dam failures will continue. Perhaps the failure rate will slow somewhat due to the new measures to be implemented by the Global Tailings Standard, but by not decreasing the failure rate as much as we can, this will mean that environmental damage will continue to occur, and people will continue to die, unnecessarily. That should and will be hard to reconcile.



Fundao, Minas Gerais, Brazil, November 5, 2015

The Role of Regulatory Agencies

Regulatory agencies worldwide will never have the number of skilled professionals, or even the number of capable inspectors, it would take for a regulatory agency to properly enforce safety considerations at all tailings dams. But, what these agencies can provide in a regulatory framework are: (1) rules that place safety as the primary consideration in the design, construction, operation, and closure of tailings dams; (2) rules that ensure independent tailings review boards and environmental impact assessments are truly independent of company and agency political influence; and, (3) market incentives for tailings dam operators to “do the right thing” by making safety more important than cost.

At the present time, safety is “a consideration” in the design, construction, operation, and closure of tailings dams, but has not been clearly made “the most important consideration”. Because of the fundamental design of our economic system, if safety is given equal consideration with cost, then cost considerations will always prevail. In today’s world, cost considerations dominate safety considerations, not because there are rules that say this should be so, but because this is the incentive the system provides, and corporations and people are only responding as would be expected to this incentive.

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Mt Polley, British Columbia, Canada, August 4, 2014

Environmental Impact Statements & Fake Science

Opinion – David M Chambers, Ph.D., P. Geop.

“Fake News” has been an issue for political discussion for several years now. Fake News is “you have your facts, and I have my facts.” What is Fake Science? Most importantly, Fake Science is science that starts with a conclusion, and proceeds to identify only those facts that support the desired conclusion. Fake Science does not utilize peer review. Fake Science is also typically paid for by a party that stands to gain financially from the findings of Fake Science.

Fake Science has been employed for decades by the tobacco industry to minimize the impacts of tobacco use. Pesticide use in agriculture suffers a similar criticism. We still confront these issues, today in the form of controversy over vaping. Tobacco sellers (now nicotine sellers) want us to believe there is no harm from the use of nicotine products. But, because vaping, like cigarettes, can be very profitable, the burden of proof to show that risks exist is being placed on those potentially impacted, rather than applying the Precautionary Principle, another underutilized scientific tenet. The Precautionary Principle (or precautionary approach) is a strategy for approaching issues of potential harm when extensive scientific knowledge on the matter is lacking. It emphasizes caution, pausing and review before leaping into new innovations that may prove disastrous.

Environmental impact statements for mines have for decades failed to accurately predict water contamination from minesites. The science used in environmental impact statements does not undergo independent scientific review, only review by agency consultants and the few internal experts these agencies may have. These agencies, mostly land management agencies, but including the EPA, have known for decades that EIS predictions for water quality discharges from mines have been woefully inaccurate, but they have never studied these problems systematically. Nor have they asked academic or professional societies to study these problems. In this case, ignorance is not only bliss, but it is very profitable.

Today, politicians of both parties tell us that we need to further streamline environmental reviews, rather than to find out why these environmental reviews still have significant scientific problems. Receiving permits in an expeditious manner is the primary goal of the permitting process, not protection of the public. Government scientists are facing more restrictions on what they can say, and to whom they can say it.

The Scientific Method versus Fake Science

Science embraces use of the scientific method and peer-reviewed research. The process of the scientific method involves putting forward an idea (hypotheses), testing the idea through experiments and observation, and analyzing results to see to what degree the idea was supported.

Fake Science starts with a conclusion and collects only those facts that justify the assumed conclusion.

Facts are facts. They are not my facts, or your facts. Unfortunately, we will never be able to collect enough facts to answer all of the questions/issues. In order to come up with the best possible answers, we must stick to scientific method to collect and analyze these facts in order to give us the best possible results. The EIS process in general, and the Pebble EIS in particular, suffers from a lack of scientific rigor. The problems we continue to experience with the process clearly demonstrate this fact. We know how to analyze issues such as these, but the political will to do it is clearly lacking. Failing to fix the EIS process will only lead to continue conflict between development and conservation interests. Failing to resolve these issues will also lead to whichever party happens to be on the losing side of the political argument to take even more extreme measures to make sure it wins the next round.

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Sockeye salmon (photo by Michelle Ravenmoon)

The Pebble Mine EIS – How not to use Science

Opinion – David M Chambers, Ph.D., P. Geop.

The EIS for the proposed Pebble mine is a good example of Fake Science research, especially with regard to its fisheries analysis. The EIS also suffers from a simple lack of analysis in number of other areas, which the EIS clearly acknowledges.

This is a serious assertion, so it requires some discussion.

The Army Corps, which is managing this EIS, justifies this lack of analysis by saying that it will be done at a later point in the permitting process. If we were to carry this “it will be done later” approach to its extreme, why are doing an EIS at all? Would it not be sufficient just for the mine proponent to say that it promises to all of the things identified by the reviewing agencies, and to grant permission to mine on this promissory basis? That has not been the intent of requiring an EIS, which has been to be fact-based, not promise-based.

The EPA conducted a research project completed in 2014, the Bristol Bay Watershed Assessment (BBWA), and concluded there could be unacceptable salmon impacts from a mine smaller than the proposed Pebble mine.

“... mining of the Pebble deposit ... could result in significant and unacceptable adverse effects on ecologically important streams, wetlands, lakes, and ponds and the fishery areas they support.”

However, the Pebble EIS comes to a different conclusion; “... there would be no discernible change to commercial and recreational fishing.” This finding is justified in the EIS by saying, “*The EPA BBWA was prepared for a different purpose, and analyzes a hypothetical project, whereas the EIS analyzes the specific Applicant’s project. In addition, the BBWA relies on different assumptions and assessments regarding loss of habitat and fish populations; the assessment of impacts in the EIS reaches a different conclusion.*”

There was no significant new fisheries data taken during or after the time the Bristol Bay Watershed Assessment was produced. Both the Watershed Assessment and the EIS use data provided by the PLP Environmental Baseline Document. The Watershed Assessment also uses a broad base of peer-reviewed scientific research on both salmon and the potential impacts from mining that the EIS either ignores or finds irrelevant.

Ultimately, the EIS concludes, “... *the productivity of the habitat is marginal overall, and higher-quality habitat is available in lower reaches of the system. The loss of the marginal habitat would not be expected to result in detectable changes in the numbers of returning adult salmon available for harvest in the commercial, recreational, or subsistence fisheries.*”

Several years ago, I recall being told by a PLP representative there were no fish on the Pebble minesite. CSP2 proved that to be false after we inventoried the minesite for fish ourselves, using accepted scientific sampling methods. Now we are being told that the minesite is marginal habitat. Since I am not a habitat expert, I cannot personally refute that as fact, but that is certainly not what was said in the Watershed Assessment, which did have the PLP Environmental Baseline Data to review.

The Pebble EIS appears to use “Fake Science” to justify a large scale industrial mine development in Bristol Bay, Alaska, despite the evidence to the contrary, and the obvious risks that exist.

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