

MINE TAILINGS STORAGE FACILITIES AND FAILURES: Definitions

Global Industry Standards for Tailings Management (GISTM, 2020) P32:

Tailings Facility: A facility that is designed and managed to contain the tailings produced by the mine. Although tailings can be placed in mined-out underground mines, for the purposes of the Standard, tailings facilities refer to facilities that contain tailings in open pit mines or on the surface ('external tailings facilities')

ICMM: Tailings Management Good Practice Guide, 2021.

Tailings facility: A facility that is designed and managed to contain the tailings produced by a mine. A tailings facility includes the collective engineered structures, components and equipment involved in the management of tailings solids, other mine waste managed with tailings (eg waste rock, water treatment residues), and any water managed in tailings facilities, including pore fluid, any pond(s), and surface water and run-off. https://www.icmm.com/website/publications/pdfs/environmental-stewardship/2021/guidance_tailings-management.pdf

ANCOLD, Guidelines on Tailings Dams (2012):

Tailings Dam - a structure or embankment that is built to retain tailings and/or to manage water associated with the storage of tailings, and includes the contents of the structure. This does not include separate water dams (e.g., seepage collection dams or clarification ponds) that may be part of the overall Tailings Storage Facility (TSF).

Tailings Storage Facility (TSF) - includes the tailings storage, containment embankments and associated infrastructure.

Failure - the occurrence of an event outside the expectation of the design or facility licence conditions, that could range from the uncontrolled release of water including seepage, to a major instability of an embankment leading to loss of tailings and/or water.

Canadian Dam Association Tailings Dam Breach Analysis (2022): "A tailings dam failure can generally be defined as the inability of the dam to meet its design intent, whether in terms of management, operational, structural or environmental function, resulting in potential loss of life, loss to the stakeholders, or adverse environmental effects.

Global Industry Standards on Tailings Management: Affected Communities: Requirement 1.1 Demonstrate respect for human rights in accordance with the United Nations Guiding Principles on Business and Human Rights (UNGPR), conduct human rights due diligence to inform management decisions throughout the *tailings facility lifecycle* and address the human rights risks of *tailings facility credible failure scenarios*.
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Questions: what is annual probability of failure of the QMM tailings dam? Emerman's 2018 analysis looked in terms of overtopping, but the dam can also fail by slumping e.g., slope failure. So that is another kind of annual probability of failure that has to be calculated. Annual probability of failure by slumping depends on a factor of safety – QMM already told us that the safety factor applied to the dam at QMM is 1,3, which is not very substantial. A factor of safety is one thing. The other factor is the level of engineering. Level of engineering is not only about managing current problems e.g., seepage – it is about the ability of the operator to avoid and mitigate problems – this is reflected in design, monitoring documenting and reporting etc. Since two previous overtopping incidents occurred at QMM (one in 2010, and one in 2018 when dead fish also appeared in the lake), with 2019 reports and recommendations following the 2018 incident, **what mitigation and prevention steps have been taken between 2010 and 2022 to address dam safety issues? When will the Interface investigation report from the 2022 events be released?**