

Text included in bold font in the body of this message refers to comments which have fundamental importance to UNEP. The way in which such recommendations should be handled in the standard is described through highlighted text in the body of the draft standard.

Standards-based comments

- Requirements should be written to be stand-alone and self-contained, identifying who needs to act and what they need to do. This helps when assessing compliance and providing assurance. We have therefore provided specific guidance through changes in the attached document on how the wording would need to be modified.
- **We have included public reporting requirements under each requirement of the draft standard so that they are clear and can be acted upon in each of the requirements.**
- Some work needs to be done to differentiate the requirements from the guidance in the standard. Normally requirements use 'shall' language, while guidance uses 'should' and 'may' language. The guidance is currently mainly contained in footnotes: we recommend that many of these footnotes are moved into the main text as guidance after the main requirement. This will improve the readability and understanding of the standard. It will also make assessment of compliance and assurance provision easier, since footnotes are not usually considered as 'part of the standard'.
- **The clause on the Engineer of Record needs to be moved up to step 1 or step 2, since the EOR is mentioned in many of the clauses of the standard.**
- The 'Principles' do not help the standard. They could easily be converted to headings within the standard. This would be less confusing, since any text in a standard is meant to either be adhered to or be guidance.
- The preamble should be shortened and only focus on why the standard is needed. We have recommended the text which should be retained in the final version of the standard.
- Key definitions shall be moved up to the front of the standard, to improve readability and understanding. In addition, definitions should be well informed (e.g. in some cases there may exist standards that the definitions could refer to).
- Some of the concepts used, even if defined in the glossary, remain open for interpretation. For example, the concept of "independent" (Tailings Review Board, senior technical reviewer, review etc.) should be better defined so it is not left to the interpretation of the operator.

Substantive comments on the content of the draft standard

- **The text currently in the role of the State (p.3) "*The standard is not intended to displace or preempt any requirements of applicable law, and where conflicting, applicable law shall prevail*" should be a fundamental element of the principles/requirements, and could be strengthened to make it clear that it is a basic requirement that the Operator complies with the applicable law in the first place. This should become part of the standard. This should be the minimum, and the standard provides an additional safeguard. This is what most voluntary standards do (including for instance ISO 14000).**
- **In case the operator is part of a multinational corporation (see requirement 10.1), the most stringent requirements that apply to any of its subsidiaries/joint ventures/HQ should be applied to all facilities. For example, if the parent organization has activities or has its HQ in a country with very stringent legislation on any aspect of the management of the facility (including, for example, on EIA), the same requirements should apply in any country, including a country with very weak national legislation.**
- In general, the language on applicable legislation should be improved to be more accurate (e.g. what is the applicable law, ensure that higher level of protection is always provided, make it clear that not only "mine tailings" specific legislation may be relevant, other laws may apply etc.).
- **The opening statement in the Preamble "*This Standard strives to achieve the ultimate goal of zero harm to people and the environment and zero tolerance for human fatality from failure of mine tailings facilities*" needs to be strong and should align with Recommendation 1 of UNEP's work on tailing facilities:** "The approach to tailings storage facilities must place safety first by making environmental and human safety a priority in management actions and on-the-ground operations. Regulators, industry and communities should adopt a shared zero-failure objective to tailings storage facilities where "safety attributes should be evaluated separately from economic considerations, and cost should not be the determining factor" (Mount Polley expert panel, 2015, p. 125).^[1]

^[1] Roche, C., Thygesen, K., Baker, E. (Eds.) 2017. Mine Tailings Storage: Safety Is No Accident. A UNEP Rapid Response Assessment. United Nations Environment Programme and GRID-Arendal, Nairobi and Arendal, www.grida.no

- The public disclosure requirements, as per the recommended wording provided by UNEP in several of the requirements of the standard, should be strengthened to allow for more involvement by governments and civil society in the management of tailings facilities.
- For the same reason, decisions related to the tailing facilities should be reviewed by the Independent Tailings Review Board, rather than an individual expert. The membership of the Review Board should be clearly defined in the standard and it shall include members from different stakeholder groups.
- The industry standard should envisage a clear role for project-affected people in decisions that affect them. We understand that the current wording of “meaningfully engage” has been suggested to align the standard with agreed language used by several bodies in reference to community relations management systems in the mining industry. We would however want to make sure that the definition included in the glossary is very explicit in clarifying that stakeholder engagement means an ongoing dialogue (throughout the life of the mine and particularly when it comes to closure/rehabilitation/post-closure etc.) with stakeholders on issues of mutual interest and that is dynamic over time and becomes integrated into the company’s core business. Moreover when we talk about meaningful (including in the human rights context) we’re talking about a joint decision-making process that ensures that engagement is done in the most appropriate manner depending on the stakeholders and their unique vulnerabilities (even more important when it comes to indigenous peoples), that there is disclosure, consultation, incorporating the feedback received, identification of shared value, measures put in place should grievances arise, accountability etc. Essentially, engagement that matters. In the glossary of the draft standard we have worked on the proposed language to ensure these points are explicitly reflected.
- The standard refers to “communities”, “local communities” and “stakeholders” across the different principles and requirements, without having introduced specific definitions. Preferred wording which should be used across the standard which is all-inclusive is “interested and affected parties” or “interested and affected stakeholders”. **We can keep a reference to “stakeholders” across the standard (as suggested in the attached commented version), provided we include a clear definition of stakeholders in the glossary.** UNEP has offered a proposed definition directly in the glossary.
- **The standard should include financial assurance to cover the full cost of closure of the failing facilities, as well as requirements for insurance to cover full cost of the failing facility’s failure.**
- **The standard should clearly point to the fact that the Board has responsibility for tailing facilities and accountability for their failures. The current reference to the highest level decision maker being a senior manager is unacceptable. While a senior manager could be involved in day-to-day follow-up and activities, responsibility should remain with the Board.**
- **For the standard to raise the bar in the management of tailing facilities, it should strongly call for alternatives to management of mine waste to be considered first. Only when all these alternatives fail, then new operations should consider tailing facilities. It should be clearly explained in the standard (requirement 5.1) through which process other alternatives are assessed. Such process of assessment of alternatives should also include social, including safety, and environmental considerations, in addition to economic costs.**
- The standard should include requirement(s) aimed at preventing and addressing corruption.
- **The standard should request that the bonus for Board and staff be revamped to put safety before production targets.**
- We have added the ‘non-retaliation’ clauses directly in the requirements where they are relevant. This is meant to ensure the requirements are self-contained, which will improve compliance and assurance.
- The standard should elaborate more on the scope and targeted audience. The current Standard is tailored to large scale mining operations. Some of the specific requirements might be tough to implement for the artisanal or small-scale mining (ASM) operations, which are often informal, seasonal, migratory and face complex and sector specific social, economic and political challenges. Nevertheless, tailing management is also an issue for the ASM. The last Minamata COP has called for a specific guidance on tailings management for artisanal and small-scale gold mining.
- The requirements on the protection of the natural environment are weak in the current standard.
- The standard should take on board international frameworks to better define the expected outcomes. For example, if we want to avoid harm from exposure to toxic chemicals, we should refer to Multilateral Environmental Agreements regulating such chemicals. Similarly, for biodiversity and other issues.
- **In the elaboration of Principle 15, we recommend referring to existing best practices in the community preparedness and engagement in the case of technological hazards and**

environmental emergencies, including guidance consolidated by UNEP in the Handbook on Awareness and Preparedness for Emergencies at Local Level (APELL)^[2].

^[2] https://www.preventionweb.net/files/45469_unepawarenesspreparednessemergencie.pdf

GlobalTailings
Review.org

GLOBAL REQUIREMENTS AND GUIDANCE
FOR MANAGING MINE TAILINGS
STANDARD FACILITIES

Draft for Public Consultation

November 2019

Commented [A1]: The title of the standard should be explicit.



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Acronyms

CDIV	Construction vs Design Intent Verification
DBR	Design Basis Report
DSR	Dam Safety Review
EoR	Engineer of Record
EPRP	Emergency Preparedness and Response Plan
ERP	Emergency Response Plan
ESMS	Environmental and Social Management System
FPIC	Free prior and informed consent
GTR	Global Tailings Review
IAIA	International Association of Impact Assessment
ICMM	International Council on Mining and Metals
ICOLD	International Commission on Large Dams
IFC	International Finance Corporation
ILO	International Labor Organization
ITRB	Independent Tailings Review Board
MAC	Mining Association of Canada
OECD	Organization for Economic Cooperation and Development
OMS	Operations, Maintenance and Surveillance Manual
PAP	Project-affected People
PRI	Principles for Responsible Investment
RTFE	Responsible Tailings Facility Engineer
TARPs	Trigger response actions plans
TMS	Tailings Management System
UNDRIP	United Nations Declaration on Rights of Indigenous Peoples
UNEP	United Nations Environment Program
UNGP	United Nations Guiding Principles on Business and Human Rights

Foreword

Catastrophic tailings facility failures devastate the environment and destroy lives and livelihoods. The severity of recent failures spurred the United Nations Environment Program (UNEP), the Principles for Responsible Investment (PRI) and the International Council on Mining and Metals (ICMM) to co-convene the Global Tailings Review. In April 2019, I was invited to chair the Review and tasked with preparing a global standard for the safe and secure management of mine tailings facilities. There is an urgency associated with this task as the first anniversary of the Brumadinho tragedy approaches.

To prepare the Standard, I selected a team of seven experts to work with me, and I engaged a multi-stakeholder group to advise us. We have collaborated intensively over the past four months to prepare this draft for public consultation. The public consultation is an intermediate step to allow for critique, feedback and suggestions from others. It will be on the basis of this input that I will work with the Expert Panel and our Advisory Group to finalise this Standard, and submit it to the Co-conveners, along with an accompanying report. I hope that the Standard is accepted immediately by mining companies and endorsed by other stakeholders globally.

The problem that the Co-conveners asked me to address is clear. When a tailings facility fails, slurry and wet sand breach the containment structure, escape, and cause destruction. Finding a solution to this problem, however, is far more complex. I have learned that tailings facilities are in fact an intricate construction, realised over years and decades, managed by a cadre of specialists, influenced by the natural environment and subject to many socio-political and economic factors. These interactions form a dynamic, complex and interconnected system. An integrated approach is therefore needed – bringing together mine Operators, technical specialists, stakeholders, and technologies, all in the context of environmental conditions, and the lived experience of local populations. It is for this reason that I selected a multidisciplinary team of experts to work with me to prepare the Standard.

Our effort of synthesis and knowledge integration has been – and will continue to be – a challenge. We are still working towards balancing and streamlining certain requirements and ensuring that the Standard supports an integrated approach, across the lifecycle of a tailings facility. In addition, we are considering the level of detail that is appropriate for the scope of the Standard. We also acknowledge that there will be variations in the application of the Standard for new and existing facilities. I continue to work with the Expert Panel on these important matters.

Undoubtedly, ongoing work on the Standard will need to be grounded in stakeholder engagement, incorporating visits to mine sites and consultation with communities affected by tailings facilities. It will also require ongoing engagement with the three co-conveners – UNEP, ICMM and PRI – who have not endorsed the current consultation draft. It is vital that we continue to learn and understand what must be done to eliminate tailings facility failures. By continuing to integrate diverse insights and points of view, we will drive the change process forward.

There are many reasons for mining companies to welcome a global standard for the safe and secure management of tailings facilities. Leading companies will want to demonstrate to States, investors, insurers and local communities that they are committed to managing tailings facilities with integrity. Ultimately, Operators are required to strive towards zero

harm to people and the environment – with zero tolerance for any human fatality. The mining industry is encouraged to invest in new technologies and safer mining methods to achieve this goal.

To create a step change, many other actors will need to be involved. Investors can insist that the Standard be embedded in corporate practice, and insurers can encourage adoption by linking implementation to the availability and cost of insurance. Consumers can choose to buy or use mining and metal products that are responsibly sourced, and local communities can demand that a company complies with the Standard. Finally, local, regional and central authorities of the State each have a critical role to play in embedding aspects of the Standard into their laws, their mining permits and other authorizations.

The online consultation for this draft is open for six weeks from November 15 to December 31. During this period, I will be visiting different countries and communities to ensure that local voices are heard and taken into consideration in the preparation of the Standard. All feedback will be carefully gathered, collated and provided to the team of experts for consideration and integration. I hope that this process will create awareness and trust in the Standard and help it to become influential. I invite you to read our draft, and to share your opinion. You can participate in the process by visiting www.globaltailingsreview.org and completing a questionnaire, by commenting on specific requirements, or by freely expressing your views in a submitted statement. The consultation schedule is also available on the website.

Every day, quality of life around the world is improving as more and more States commit to achieving the United Nations Sustainable Development Goals. The achievement of these goals needs a material basis and will be supported by the extraction and consumption of natural resources. Better technology will help us reduce consumption – but the overall needs of humanity will nonetheless continue to grow. To become safer, resource efficient, and contribute to sustainable development, we must better manage waste, including the residual material from mining, metal extraction and processing. This is not an option, but an obligation and I strongly believe this Standard can become a positive step in this direction.



*Dr. Bruno Oberle
Chair of the Global Tailings Review*

THE GLOBAL TAILINGS STANDARD

Introduction

The Global Tailings Standard (the ‘Standard’) aims to achieve the safe and secure management of mine tailings facilities globally. The Standard compels Operators¹ to use specified measures to prevent the catastrophic failure of tailings facilities and to implement best practices² in the planning, design, construction, operation, maintenance, monitoring, and closure of tailings facilities. An independent Expert Panel is working to develop the Standard, taking into account multiple stakeholder perspectives, including those of local communities, civil society groups, regulators, investors, insurers, and the mining industry. Acknowledging these diverse perspectives requires a standard that extends beyond the facility itself to encompass the social, economic and environmental context, human rights, stakeholder engagement, corporate governance, and public disclosure.

The Standard makes clear that extreme consequences to people and the environment from catastrophic tailings facility failures are unacceptable. Operators must have zero tolerance for human fatalities and must strive for ‘zero harm’ to people and the environment from the inception of project planning. Operators are also expected to innovate and apply new technologies and mining methods that reduce risks and minimize consequences should problems arise.

Once a tailings facility moves from concept to reality, it becomes a hazard that must be managed to minimize risk. The Standard anticipates that individuals in the highest positions of authority within the organizational hierarchy will be accountable for the Operator’s decisions and will insist on actions that reduce the risk of tailings facility failure to the fullest extent possible. In addition, the Standard expects Operators to adopt best management practices and to apply rigorous technical controls. Zero harm is the goal at all stages of a tailings facility lifecycle.

Overview of the Standard

The Standard is organised around six Topic Areas, 17 Principles and 77 specific Requirements. This section provides a brief orientation to the Standard.

Topic Area 1 requires Operators to develop knowledge about the social, human rights, economic and environmental context of a proposed or existing tailings facility, and to conduct a detailed site characterization. Inundation studies build an understanding of inundation areas, associated impacts, and the identification of groups most at risk from tailings facility failures. A multi-disciplinary knowledge base developed and used by the Operator and key stakeholders, in an iterative way, will enable all parties to make informed decisions throughout the tailings facility lifecycle. These decisions will arise in the context of the alternatives analyses, the choice of technologies and facility designs, emergency response

¹In this Standard, ‘Operator’ means any person, corporation, partnership, owner, affiliate, subsidiary, joint venture, or other entity, including any State agency, that operates, or controls a tailings facility.

²The Standard recognizes that there is no one “best practice” that can be viewed as applying to every tailing facility. Instead, there are a range of “best practices” that can apply to safely manage tailing facilities.

Commented [A3]: Which local communities – mining affected communities? How are they engaged? Which regions do they represent?

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Commented [A5]: Although these descriptions are useful for the review draft, they are typically not needed in the final standard, which should be concise and to the point. The preambular text in a standard usually describes only ‘why’ the standard is needed.

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plans, and closure and post-closure plans, amongst others.

Topic Area 2 focuses on project-affected people. In order to appropriately respect human rights, a human rights due diligence process is required to identify and address those rights that are most at risk from potential failures of tailings facilities. Topic Area 2 also requires respect for individual rights and the collective rights of local, indigenous and tribal peoples who may own, occupy or use land or natural resources at or near a tailings facility site, or downstream areas that may be affected by a failure. To demonstrate this respect, project-affected people must be afforded opportunities for meaningful engagement in decisions that affect them. The requirements outlined in Topic Area 2 are intended to be cross-cutting and ongoing throughout the tailings facility lifecycle.

Topic Area 3 aims to lift the performance bar for designing, constructing, operating, maintaining, monitoring, and closing tailings facilities. For new tailings facilities, the Standard requires designers to presume an 'Extreme' consequence of failure classification. Operators can rebut this presumption only when specific conditions are met. Where upgrading an existing facility is not feasible, the Operator must reduce the consequences of a potential failure to the greatest extent possible. Recognizing that tailings facilities are dynamic engineered structures, Topic Area 3 requires the ongoing use of an updated knowledge base, consideration of alternative tailings technologies, robust designs, and well managed construction and operation processes to minimize the risk of failure. It also specifies the development and implementation of an Operations, Maintenance and Surveillance (OMS) Manual that supports effective risk management of the tailings facility. A comprehensive monitoring system must support the full implementation of the Observational Method and the use of a performance-based approach for the design, construction and operation of tailings facilities.

Topic Area 4 focuses on the ongoing management and governance of a tailings facility. This section elevates the accountability for tailings facilities that would result in 'Very High' or 'Extreme' consequences in the event of failure, to the upper level of an organization's hierarchy – the Board of Directors or a member of senior management (as appropriate to the Operator's organizational structure). It also provides for the designation and assignment of responsibility to key roles in tailings facility management, including an Accountable Executive, an Engineer of Record, and a Responsible Tailings Facility Engineer. Further, it sets standards for critical systems and processes, such as the Tailings Management System and independent reviews, which are essential to upholding the integrity of a tailings facility during its entire lifecycle. Cross-functional collaboration and the development of a learning organizational culture that welcomes the identification of problems and protects whistleblowers are also included.

Topic Area 5 covers emergency preparedness and response in the event of a tailings facility failure. Operators must avoid complacency about the demands that would be placed on them and on public sector agencies in the event of a catastrophic failure. The Standard requires that Operators consider their own capacity, in conjunction with that of other parties, and to plan ahead, build capacity, and work collaboratively with other parties to prepare for the unlikely case of a failure. Topic Area 5 also outlines the fundamental obligations of the Operator in supporting the re-establishment of ecosystems, and the long-term recovery of affected communities in the event of a failure.

Topic Area 6 requires public access to information about tailings facilities to fairly inform internal and external stakeholders about risks and potential impacts, management and mitigation plans, and performance monitoring. Operators must respond in a systematic and timely manner to all reasonable stakeholder requests for information. The Standard concludes by requiring that Operators commit to transparency, and participate in global initiatives to create standardized, independent, industry-wide and publicly accessible databases, inventories, and information about tailings facilities. This reflects the Co-convenors' commitment to increased public accountability.

A Systems Approach

The Standard is underpinned by a deep systems logic, reflecting and extending the well-established 'Plan, Do, Check, Act' cycle to enhance cross-functional collaboration. This does not mean, however, that the Standard seeks to build a single, overarching, management system. Instead, the Standard supports the effective interaction of multiple systems, each built on a strong disciplinary base. Some systems will sit within the organization. Others will cross the organizational boundary and interact with broader social, political, cultural, economic, environmental and climatic systems. This reflects the fact that a tailings facility is situated within a complex and dynamic local and global environment.

At the core of the Standard sits the tailings management system (TMS). This system is focused on the safe operation and management of the tailings facility itself. The TMS, and its various elements, must interact with other systems, such as the environmental and social management system (ESMS), the mine-wide management system, and the regulatory system. It is at the point of interface among these systems that data collection and accessibility, documentation, procedures, processes, resources and people must interact. This enables multidisciplinary teams to plan, implement, monitor and adapt to meet the requirements of this Standard. This systems interaction is fundamental to the effective implementation of the Standard.

The Role of the State

The Standard guides the conduct of Operators but it also informs States about best practices for tailings facilities and it affords them a framework for designing rules for managing such facilities where required. This is a critical point because States are uniquely situated to provide independent oversight of the permitting, construction, operation, maintenance, monitoring, and closure of tailings facilities. They are likewise the most appropriate entity to set up an independent inspection and enforcement program capable of identifying problems early and making sure those problems are corrected promptly before they increase the risk of catastrophic failures. The Standard is not intended to displace or pre-empt any requirement of applicable law, and where conflicting, applicable law shall prevail. **Moreover, adherence to this proposed Standard does not, in any way, guarantee that an Operator is complying with applicable environmental (and other) laws. Adherence to the proposed Standard merely means that the Operator has a framework in place which should, theoretically, help it comply with applicable laws and minimise the possibility of failure of tailings storage facilities. Adoption on the proposed Standard is therefore not an indication that an Operator is in compliance with national environmental or mineral resources laws (or other applicable legislation), nor is it a substitute for reporting environmental non-compliance.**

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Not all States currently have the capacity to carry out these tasks. Good oversight requires a comprehensive understanding of the planning and engineering necessary to build, operate, maintain, and ultimately close tailings facilities. Without this, there is a risk that companies may find it easier to avoid detection of violations, or to tie authorities up in lengthy and complex disputes about whether violations have in fact occurred. Inspectors with the credibility and authority to issue citations and to mandate appropriate corrective actions must share an understanding of these issues and possess the capacity to identify solutions to reported problems. Moreover, developing a reliable and professional staff where one does not currently exist will require time and resources and these may be scarce. All States with tailings facilities should aspire to develop and implement an effective and well-staffed regulatory program.

The best standards in the world will not prevent catastrophic tailings facility failures unless those standards are scrupulously followed and unless an effective third-party enforcement program exists that mandates corrective action where an Operator falls short. Only States have a mandate to carry out oversight and enforcement. States should embrace this responsibility and use this Standard as a guide for building capacity and a regulatory framework that will ultimately fulfil a critical role in the safe management of tailings facilities.

The Role of Other Stakeholders

While an effective State regulatory and enforcement regime is an essential element for the long-term success of tailings facility management, other stakeholders such as investors, insurers, and communities also have important roles to play. Investors can limit their financial support to only those projects that follow strict standards for tailings facility management such as the Standard proposed here. Investors can further demonstrate their commitment to strict standards by insisting on regular reporting, public disclosure of relevant documents, and third-party audits that ensure compliance.

Insurance companies that indemnify against damages to people and the environment from tailings facility failures will benefit by insisting that Operators use this standard to minimize the risk of failure to the fullest extent possible. This would limit their exposure to significant claims, which can sometimes be in the billions of dollars. The risk of significant liability also incentivizes insurance companies to closely monitor tailings facilities and demand immediate correction of problems that are identified.

Local communities and civil society organizations have a strong interest in ensuring that tailings facilities are managed so as to protect public safety and the environment. These stakeholders and other interested and affected parties can best protect this interest if they are given a meaningful role in contributing to key decisions that affect them as proposed in this Standard. They are also in a strong position to demand transparency from Operators regarding tailings facility plans, management plans, and other data and information relating to the tailings facility. Insisting on strict compliance with the Standard can also support positive relationships and help foster trust.

Implementation

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Once comments from this consultation period have been incorporated and the Standard has been approved by the three Co-conveners, a process will be needed for both implementation and ongoing development. The implementation process will require the following elements:

- a guarantee of independence;
- access to a multi-disciplinary team of experts to review implementation of the Standard;
- protocols for determining compliance and non-compliance with the Standard;
- procedures for seeking further information or agreeing an action plan should an Operator fail to meet requirements in the Standard;
- resources to conduct compliance monitoring;
- a framework against which to assess the competency of reviewers;
- a process for approving or conditionally approving providing assurance that the Standard is being implemented correctly;
- the power to revoke or suspend assurance where necessary;
- procedures for ensuring transparency and public reporting; and
- opportunities for meaningful public engagement in the process.

An accompanying report (the 'Report') will be issued along with the release of the Standard. In addition to proposing an implementation method, the Report will address matters relating to further refinement of the Standard, development of verification protocols, harmonization with existing assurance schemes, and good governance.

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GLOBAL TAILINGS STANDARD

Preamble

This Standard strives towards to achieve the ultimate goal of zero harm to people and the environment and zero tolerance for human fatality from failure of mine tailings facilities. It requires Operators to take responsibility for the safe and secure management of their tailings facilities, through all phases of the project lifecycle, including closure and post-closure. For the purposes of this Standard, the term 'Operator' is broadly defined to encompass the people or organizations with responsibility for the tailings facility as set forth in Annex 1. Operators that are seeking to lead, innovate and pursue best practice will be well placed to meet the requirements set out henceforth.

All terms that appear in *italics* are defined in Annex 1: Glossary and Notes.

TOPIC I: KNOWLEDGE BASE

PRINCIPLE 1: Develop and maintain an updated knowledge base to support safe tailings management across the *tailings facility lifecycle*.³

REQUIREMENT 1.1: The operator shall develop and regularly update knowledge about the social (including human rights), economic and environmental context of a tailings facility. This should also include for example, concerns around political instability, conflicts etc. [In case of artisanal and small scale operations, the migratory aspect of miners and temporary nature of mining operations should be taken into account.] aligned with international *best practice*.^{4,5}

REQUIREMENT 1.2: The operator shall prepare and regularly update and make-and publicly available detailed *site characterization* of the tailings facility site(s) that includes geomorphology, geology, geochemistry, hydrogeology, geotechnical, seismicity and hydrology, content and concentration of toxic compounds, e.g. heavy metals and other persistent pollutants. The physical and chemical properties of the *tailings* shall be determined and regularly updated and made freely and publicly available.

REQUIREMENT 1.3: Where there is a potential for *tailings flow* failure, the operator shall conduct and regularly update and make freely and publicly available an *inundation study* for the tailings facility using a methodology that considers credible hypothetical failure modes, site conditions, *tailings facility* conditions, hydraulic routing models of the slurry, and the amount of *tailings* and downstream materials entrained in the outflow. The results of the study should include estimates of the inundation area, flow arrival times, depth and velocities, duration of flooding, and depth of material deposition.

REQUIREMENT 1.4: Updates shall be carried out whenever there is a material change to the tailings facility, the social or environmental context or conditions, or at a minimum every 3 years for 'Very High' and 'Extreme' Consequence Classifications, and every 5 years for others.

Commented [A14]: There should be a glossary of all important terms at the front of the standard.

Commented [A15]: Important terms should be defined at the start of the standard rather than in an Annex. Additional, less important terms, can be defined in the annex.

Commented [A16]: In order to be a requirement, the term 'shall' needs to be appear. Also, the person or organization who is responsible for implementing this requirement should be identified to avoid confusion in roles.

Alternatively "should" could be used, following many other standards including the UN Guiding Principles on Business and Human Rights and OECD Guidance for Responsible Business Conduct. The IFC Performance Standards use "will" and the ISO Standards distinguish between "Shall" (requirement) and "Should" (recommendation).

Commented [A17]: As well as throughout the text in several other requirements.

Commented [A18]: To ensure transparency to stakeholder communities.

Commented [A19]: Information about the ore, the commodities that were separated and the method of separation (or beneficiation) is also important and should be recorded, in order to be able to take appropriate response measures if failure occurs.

Commented [A20]: Flow of what?

Commented [A21]: No requirements should be in footnotes. All requirements need to be clearly part of the text of the standard.

³ Updates should be carried out whenever there is a material change to the tailings facility, the social or environmental context or conditions, or at a minimum every 3 years for 'Very High' and 'Extreme' Consequence Classifications, and every 5 years for others.

⁴ This knowledge should capture the uncertainties associated with variations due to climate change.

⁵ This information may already exist in whole-of-operations studies (e.g. baselines, impact assessments and specialist studies) and/or may subsequently be incorporated into other studies.

REQUIREMENT 1.4: The operator shall identify stakeholders and how they are related to the *tailings facility* site, inundation area and impacted area⁶; collect land, livelihood and demographic data⁷ for groups most at risk⁸ from a *tailings facility* failure. The operator shall meaningfully engage with stakeholders on the Tailings Management Plan.

PRINCIPLE 2: Integrate the social, economic, environmental and technical information to select the site and the technologies⁹ to minimize the risk of tailings facility failure.

REQUIREMENT 2.1: The operator shall undertake a formal, multi-criteria *alternatives analysis* of all feasible sites and technologies for tailings management with the goal of minimizing risk to people and the environment. The operator shall make the knowledge base publicly available and use the knowledge base to inform this analysis and to develop facility designs, *inundation studies*, a *monitoring program*, *Emergency Preparedness and Response Plans* (EPRP), and closure and post-closure plans.

REQUIREMENT 2.2: The operator shall engage an *Independent Tailings Review Board* (ITRB) or an independent senior technical reviewer with no conflicts of interest to assess and review the *alternatives analysis* for site and technology selection.

REQUIREMENT 2.3: The operator shall use the knowledge base to assess the social, human rights, economic and environmental impacts of the tailings facility and its potential failure.¹⁰ The operator shall develop impact mitigation and management plans¹¹, and meaningfully engage stakeholders, including potentially affected communities, in the process.

REQUIREMENT 2.4: The operator shall update and make freely and publicly available the assessment of the social (including human rights), economic and environmental impact and update stakeholder identification and information for any material change to the *tailings facility*, the social or environmental context or conditions. If new data indicates that the impacts from the *tailings facility* differ from those assumed in the original assessments, the operator shall adjust the management of the facility shall be adjusted to reflect the new data using *adaptive management best practices*.

Commented [A22]: This term should be defined.

Commented [A23]: This term should be defined. What is included in a monitoring program?

Commented [A24]: What is the appropriate membership of the Tailings Review Board? It shall include representatives of different stakeholder groups.

Commented [A25]: Each requirement should be fully understandable as a standalone piece of text, so footnotes should be converted to Guidance so that they are identifiable as part of the Standard.

Commented [A26]: We understand that the use of "meaningfully engage" aims at aligning the standard with agree language in other related standards. We however expect the definition of "meaningfully engage" to align with our expectations of such engagement process.

⁶ The area of potential impact may be larger than the inundation area.

⁷ Data collection should include participatory processes, follow established ethical research protocols, and consider matters of privacy and data sovereignty. A comprehensive approach would include data and information relating to: the physical environment within which people live and work, natural resources and built infrastructure; social, economic, legal, cultural and political systems, norms and rules that govern how people interact with the environment and with each other; the population within the study area, demographic patterns and human activities or issues in the area; boundaries that demarcate rights over the ownership, and use of land and territory.

⁸ Groups that are most at risk include people who risk loss of life in the event of a tailings facility failure and people who would experience significant impacts to livelihoods, cultural heritage, health or other aspects of their lives. Special attention must be given to gender, diversity and vulnerability when identifying groups at risk.

⁹ The Standard does not ban any specific design technology, such as upstream tailings facilities. Banning particular technologies was outside the Expert Panel's scope of work, available here: <https://globaltailingsreview.org/about/scope/>

¹⁰ Given the long-term nature of a tailings facility, the Operator is encouraged to address uncertainties around climate change and its potential impacts on environmental and social conditions and trends.

¹¹ This Requirement applies the mitigation hierarchy to consequences or impacts and where avoidance is not feasible, to first minimize the impacts and then include measures to allow future compensation for remaining impacts to the extent

they occur. See International Finance Corporation's (IFC) 2012 Performance Standards on Environmental and Social Sustainability, Performance Standard 1 Assessment and Management of Environmental and Social Risks and Impacts (p.6), and Performance Standard 6 Biodiversity Conservation and the Sustainable Management of Living Natural Resources requirement 7.

REQUIREMENT 2.5: ~~The operator shall periodically review, update and make publicly available~~ the amount of financial assurance ~~shall be reviewed periodically and updated~~ based on estimated closure and post-closure costs.

REQUIREMENT 2.6: Taking into account actions to mitigate risks, the Operator ~~will consider~~ ~~shall~~ obtain~~ing~~ appropriate insurance, ~~to the extent commercially reasonable,~~ or providing other forms of financial assurance ~~if appropriate,~~ to address risks relating to the construction, operation, maintenance, and/or closure of a *tailings facility*.

Commented [A27]: The way this was worded before, it is not a requirement. The rewrite now makes it a requirement.

Commented [A28]: Unclear why there should be a reference to "if appropriate", given that this standard applies to tailing facilities only.

DRAFT

TOPIC II: INTERESTED AND AFFECTED COMMUNITIES/STAKEHOLDERS

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PRINCIPLE 3: The Operator shall ~~be~~ respect the rights¹² of project-affected people and meaningfully engage them at all stages of the tailings facility lifecycle.

Commented [A29]: This term should be defined. Who is in this category?

Commented [A30]: I thought this was defined. Shouldn't it be in italics?

REQUIREMENT 3.1: The Operator shall ~~be~~ demonstrate respect for human rights by conducting and making freely and publicly available human rights due diligence¹³ to understand how a tailings facility failure may cause or contribute to adverse human rights impacts, including especially impacts on the individual and collective rights of indigenous peoples¹⁴ and tribal peoples¹⁵.

Commented [A31]: These could be converted from footnotes to definitions.

REQUIREMENT 3.2: The Operator shall ~~also~~ meaningfully engage project-affected people (PAP) throughout the tailings facility lifecycle regarding the matters that affect them.^{16,17}

REQUIREMENT 3.3: Where the risks of a potential tailings facility failure could result in loss of life or sudden physical and/or economic displacement of people, the Operator shall ~~consider~~ implement in good faith additional necessary measures to minimize those risks or implement resettlement following international standards¹⁸. The Operator shall communicate and make publicly available these decisions to those affected.

REQUIREMENT 3.4: The Operator shall ~~be~~ establish an effective operational-level, non-judicial grievance mechanism that addresses the concerns, complaints and grievances that relate to tailings facilities of or for project-affected people that relate to the tailings facility¹⁹.

¹² As defined in the United Nations Guiding Principles on Business and Human Rights (UNGPR). Demonstrating respect for indigenous peoples rights may often involves obtaining their 'free prior and informed consent' (FPIC), as outlined in the ICMM Indigenous Peoples and Mining Position Statement.

¹³ While human rights due diligence should be conducted for all aspects of a mining business, this Standard requires a specific focus on the tailings facility. Human rights due diligence should be conducted for potential failure modes, and in the event of a failure.

¹⁴ The Universal Declaration on the Rights of Indigenous Peoples (UNDRIP), 2007, delineates and defines the individual and collective rights of indigenous peoples.

¹⁵ The International Labor Organization (ILO) Convention 169, the Indigenous and Tribal Peoples Convention, 1989 is the major binding international instrument concerning indigenous peoples and tribal peoples and was a pre-cursor to UNDRIP.

¹⁶ Operators shall also engage on those matters referred to in Requirements 1.3, 2.1, 2.3, 3.1, 3.3, 3.4, 5.6, 7.7, 7.8, 15.2, 15.4 and in case of a tailings facility failure, in Requirements 16.2-16.4. These activities may be documented in a mine-wide Stakeholder Engagement Plan.

¹⁷ Meaningful engagement, participation and consultation are related processes that are included in key instruments of the United Nations (UN); in the policy frameworks of international finance institutions, such as the IFC's Social and Environmental Performance Standards; and in performance expectations of industry associations, including the ICMM, and leading companies.

¹⁸ International standards include the IFC's (2012) Environmental and Social Performance Standard (PS) 5 Land Acquisition and Involuntary Resettlement and IFC (PS) 7 Indigenous Peoples.

¹⁹ This process may be part of an existing operational-level grievance mechanism, which may in turn form part of the mine-

wide ESMS.

TOPIC III: DESIGN, CONSTRUCTION, OPERATION AND MONITORING OF THE TAILINGS FACILITY

PRINCIPLE 4: Design, construct, operate and manage the *tailings facility* on the presumption that the consequence of failure classification is ‘Extreme’, unless this presumption can be rebutted.

REQUIREMENT 4.1: ~~The Operator shall~~ presume the consequence of failure classification of all new tailings facilities as being ‘Extreme’ (see Annex 2, Table 1: Consequence Classification Matrix) and design, construct, operate and manage the facility accordingly. This presumption can be ~~rebutted~~ if the following three conditions are met:

- a) The knowledge base demonstrates that a lower classification can be applied for the near future, including no potential for impactful flow failures; and
- b) A design of the upgrade of the facility to meet the requirements of an ‘Extreme’ consequence of failure classification in the future, if required, is prepared and the upgrade plan is made freely and publicly available and is demonstrated to be feasible; and
- c) The consequence of failure classification is reviewed every ~~3~~three (3) years, or sooner if there is a material change in any of the categories in the Consequence Classification Matrix, and the *tailings facility* is upgraded to the new classification within three (3) years. This review should be made freely and publicly available and proceed until the facility has been safely closed²⁰ and achieved a confirmed ‘landform’ status or similar permanent non-credible flow failure state.

Commented [A32]: The rebuttee and rebutter should be explicitly identified.

REQUIREMENT 4.2: The decision to rebut the requirement to design for ‘Extreme’ Consequence Classification, shall be taken by ~~the Accountable Executive or~~ the Board of Directors (the ‘Board’), with input from ~~an independent senior technical reviewer or~~ the ITRB. The ~~Accountable Executive or Board~~ shall give written reasons for their decision and make these publicly available.

REQUIREMENT 4.3: Operators of Existing facilities shall comply with Requirements 4.1 and 4.2. Where the required upgrade to Extreme classification is deemed not feasible, the Board, or senior management (as appropriate based on the Operator’s organizational structure), with input from the ITRB, shall approve the implementation of measures to reduce the risks of a potential failure to the greatest extent possible.

Commented [A33]: Who deems this not feasible? How is feasibility assessed?

PRINCIPLE 5: Develop a robust design that integrates the knowledge base and minimizes the risk of failure for all stages of the *tailings facility lifecycle*.

REQUIREMENT 5.1 ~~The Operator shall~~ consider implementation of alternative options, including but not limited to in-pit disposal and underground tailings placement, and application of the technologies selected according to Requirement 2.1, to minimize the amount of tailings and water placed in external²¹ tailings facilities.

Commented [A34]: Priority should be given to these alternatives, particularly in the context of new facilities.

²⁰ Safe closure is achievement of a confirmed ‘landform’ status or similar status that also has a permanent non-credible flow failure state.

²¹ External or out-of-pit tailings facilities are tailings disposal areas that are not located in mined-out open pits or underground mine workings.

REQUIREMENT 5.2: The Operator shall Ddevelop and implement water balance and water management plans for the *tailings facility*, taking into account the knowledge base, upstream and downstream hydrological basins, the overall mine site, mine planning and operations and the integrity of the *tailings facility* for all stages of its lifecycle.

REQUIREMENT 5.3: The Operator shall Ddevelop and make publicly available a *robust design* that considers the social, economic and environmental context, the *tailings facility* Consequence Classification, site conditions, water management, mine plant operations, tailings operational issues, and the construction, operation and closure of the *tailings facility*.

REQUIREMENT 5.4: The Operator shall Aaddress all credible failure modes of the structure, its foundation, abutments, reservoir (tailings deposit and pond), reservoir rim and appurtenant structures to minimize risk. Risk assessments ~~must~~ shall be used by the Operator ~~be used~~ to inform the *tailings facility* design.

Commented [A35]: It would be useful to make this information publicly available.

REQUIREMENT 5.5: The Operator shall Ddevelop a design for all stages of the *tailing facility*, including but not limited to start-up, partial raises and interim configurations, final raise, and all closure stages. The design should be reviewed and updated as performance and site data become available and in response to material changes to the risk assessment.

REQUIREMENT 5.6: The Operator shall Design the closure stage of the tailings facility in a manner that meets all the Requirements of the Standard with sufficient detail to demonstrate the feasibility of the closure scenario and allows immediate implementation of elements of the design, as required. The design should be made freely and publicly available and include, ~~where possible~~, progressive closure and *reclamation* during operations.

Commented [A36]: This is implied by the term 'should'.

PRINCIPLE 6: Adopt design criteria that minimize risk²².

REQUIREMENT 6.1: The Operator shall Select and clearly identify design criteria that are appropriate to reduce risk for the adopted Consequence Classification for all stages of the *tailings facility lifecycle* and for all ~~credible-identified~~ failure modes.

Commented [A37]: If 'credible failure modes' is not defined, then the identified failure modes from the analysis above should be used.

REQUIREMENT 6.2: The Operator shall Apply factors of safety that consider the variability and uncertainty of geologic conditions and construction materials and ~~of~~ the data on their properties, the parameters selection approach, the mobilized shear strength with time and loading conditions, the sensitivity of the failure modes and the strain compatibility issues, and the quality of the implementation of risk management systems.

Commented [A38]: Should be defined.

Commented [A39]: Should be defined.

Commented [A40]: Should be defined.

REQUIREMENT 6.3: The Operator shall Identify and address brittle failure mechanisms with conservative design criteria and factors of safety to minimize the likelihood of their occurrence, independent of trigger mechanisms.

Commented [A41]: Should be defined.

REQUIREMENT 6.4: The EOR shall prepare a *Design Basis Report* (DBR) that details the design criteria, including operating constraints, and that provides the basis for the design of all stages of the *tailings facility lifecycle*. The *DBR* must be reviewed by the *ITRB* ~~or senior independent technical reviewer~~.

Commented [A42]: Who is this?

²² In all cases, minimizing risk means minimizing risk to people, environment and the Operator.

PRINCIPLE 7: Build and operate the *tailings facility* to minimize risk.

REQUIREMENT 7.1: ~~The Operator shall build~~, raise, operate, monitor and close the tailings facility according to the ~~design intent~~ best practices ~~of~~ at all stages of the *tailings facility lifecycle*, using qualified personnel and appropriate methodology, equipment, procedures, data acquisition, the *TMS* and the *environmental and social management system (ESMS)*.

REQUIREMENT 7.2: ~~The Operator shall manage~~ the quality and adequacy of the construction and operation process by implementing *Quality Control, Quality Assurance and Construction vs Design Intent Verification (CDIV)*. QC, QA and CDIV shall be used to ensure that the design intent is implemented and is still being met if the site conditions vary from the design assumptions.

REQUIREMENT 7.3: ~~The Operator shall prepare~~ and make publicly available a detailed *Construction Records Report* at least annually or whenever there is any change to the *tailings facility*, its infrastructure or its monitoring system. The *EOR* shall sign this report.

REQUIREMENT 7.4: ~~The Operator shall develop, implement, and annually update~~ and make publicly available an *Operations, Maintenance and Surveillance (OMS) Manual* that supports effective risk management as part of the *TMS*. The *OMS Manual* should follow *best practices*, clearly provide the context and *critical controls* for safe operations, and be reviewed for effectiveness. The *EOR* and *RTFE* shall provide public access to the *OMS Manual* and training to all personnel involved in the *TMS*.

REQUIREMENT 7.5: ~~The Operator shall implement~~ and make freely and publicly available a formal *change management system* that triggers the evaluation, review, approval and documentation of all changes to design, construction, operation and monitoring during the *tailings facility lifecycle*. The *change management system* shall also include the requirement for a periodic *Deviance Accountability Report (DAR)*, prepared by the *EOR* and made publicly available, that provides an assessment of the cumulative impact of the changes on the risk level of as-constructed facility. The *DAR* shall provide any resulting requirements for updates to the design, *DBR*, *OMS* and the monitoring program.

REQUIREMENT 7.6: ~~The Operator shall refine~~ the design, construction and operation throughout the *tailings facility lifecycle* by considering the lessons learned from ongoing work and the evolving knowledge base, and by using opportunities for the inclusion of new and emerging technologies and techniques.

REQUIREMENT 7.7: ~~The Operator shall ensure~~ that the *ESMS* is designed and implemented to align decisions about the tailings facility with the changing environmental and social context, including of the Project Affected People as identified in the knowledge base, in accordance with the principles of *adaptive management*.

REQUIREMENT 7.8: Independent *senior technical reviewers*, with qualifications and expertise in social and environmental sciences and performance management, shall carry out a full review of the *ESMS* and monitoring results every 3 years, with annual summary reports made publicly available and provided to relevant stakeholders.

Commented [A43]: Relevant Stakeholders and especially PAP should be involved in the review of the ESMS and not only informed of modifications of the management system.

PRINCIPLE 8: Design, implement and operate monitoring systems.

REQUIREMENT 8.1: The Operator shall ~~D~~esign, document, make publicly available, implement and operate a comprehensive performance monitoring program for the *tailings facility* that allows full implementation of the *Observational Method* and covers all potential failure modes.

REQUIREMENT 8.2: The Operators shall ~~E~~establish performance objectives, indicators, criteria, and performance parameters and include them in the design of a monitoring program that measures performance at all stages of the *tailings facility lifecycle*. The Operator shall also ~~R~~ecord, evaluate, ~~and~~ publish and make publicly available the results at appropriate frequencies. Based on the data obtained, the Operator shall update the monitoring program throughout the *tailings facility lifecycle* to confirm that it remains effective.

REQUIREMENT 8.3: The Operator shall ~~A~~alyze monitoring data at the frequency recommended by best practices, the EOR, and assess the performance of the facility, clearly identifying, ~~and~~ presenting evidence and making this publicly available on any deviations from the expected performance and any deterioration of the performance over time. Promptly submit evidence to the *EOR* for review and update the risk assessment and design, ~~when~~ required. Performance outside the expected ranges shall be addressed swiftly through *critical controls* or *trigger response action plans* (TARPs).

REQUIREMENT 8.4: The Operator shall ~~R~~eport the results of the monitoring program at the frequency required to meet company, regulatory and public disclosure requirements, and as a minimum on a quarterly basis. The *RTFE* and the *EOR* shall review and approve these reports.

TOPIC IV: MANAGEMENT AND GOVERNANCE

PRINCIPLE 9: Elevate decision-making responsibility for *tailings facilities* with a ‘Very High’ or ‘Extreme’ Consequence Classification²³.

REQUIREMENT 9.1: For a proposed *new facility* where a potential credible failure could have ‘Very High’ or ‘Extreme’ consequences, the ~~Board or senior management (as appropriate based on the Operator’s organizational structure)~~ shall be responsible for approving the proposal and presenting it to government regulators, after ~~deciding~~ agreeing with government regulators what additional steps shall be taken to minimize the consequences.

Commented [A44]: Decision making in these instances should be with the Board.

Commented [A45]: I think this is essential if we are to have a proper regulatory context around these facilities.

REQUIREMENT 9.2: For an *existing facility*, where a potential credible failure could have ‘Very High’ or ‘Extreme’ consequences, the ~~Board or senior management (as appropriate based on the Operator’s organizational structure)~~ shall mandate in collaboration with government regulators, additional steps to minimize the consequences and publish reasons for its decision. This process ~~is to~~ shall be repeated at the time of every *Dam Safety Review* (DSR).

PRINCIPLE 10: Establish roles, functions, accountabilities and remuneration systems to support the integrity of the tailings facility.²⁴

REQUIREMENT 10.1: The *Board* of the *parent corporation* shall adopt ~~and~~ publish and make publicly available a policy on or commitment to the safe management of tailings facilities, to emergency preparedness and response, and to recovery after failure that is mandatory for all its subsidiaries and joint ventures. The commitment shall require the Operator to establish a *Tailings Management System* (TMS), and a governance framework to assure the effective implementation and continuous improvement of the *TMS*.

~~REQUIREMENT 10.2: A member of senior management shall be identified and made accountable for the safety of tailings facilities and for minimizing the social and environmental consequences of a tailings facility failure. This Accountable Executive will also be accountable for a program of tailings management training, for emergency preparedness and response, and for recovery after failure. The Accountable Executive or delegate must shall~~ have regular scheduled communication with the *Engineer of Record* (EOR).²⁵

Commented [A46]: Responsibilities and decision making related to tailing facilities management shall remain with the Board and not be further delegated to a senior manager in the organization. The senior manager can be responsible for day-to-day follow-up of the tailing management system. Therefore the description of his/her responsibilities should be amended accordingly.

REQUIREMENT 10.3: ~~The Operator shall~~ Appoint a site-specific *Responsible Tailings Facility Engineer* (RTFE) who is accountable for the integrity of the *tailings facility*, liaises with the *EOR*, the Operations and the Planning teams and who either reports directly to the ~~Accountable Executive~~ Board, or via a reporting line that culminates with the ~~Accountable Executive~~ Board. The RTFE will have a dotted reporting line to mine management to represent the delivery of services to the site.

Commented [A47]: This needs to be defined. Is this a Second Reporting Officer?

REQUIREMENT 10.4: ~~For employees who have a role in the TMS, consider the Operator shall~~ implementing a performance incentive program to include a component linked to the integrity of *tailings facilities*.

Commented [A48]: This will need to be relevant for Board members as well, with a bonus revamped to put safety before production targets.

²³ See Annex 2, Table 1: Consequence Classification Matrix.

²⁴ See Annex 3: Outline of the Organizational Structure referred to in the Standard

²⁵ In the case of joint ventures, all venture partners shall appoint an Accountable Executive and it shall be the responsibility of the partners to jointly implement this Requirement.

REQUIREMENT 10.5: The Operator shall identify appropriate qualifications and experience requirements for all personnel who play safety-critical roles in the operation of a *tailings facility*, in particular, for the *RTFE*, the *EOR* and the *Accountable Executive*. The Operator shall ensure that occupants of these roles have the identified qualifications and experience, and develop succession plans for these personnel.

PRINCIPLE 11: Establish and implement levels of review as part of a strong quality and risk management system for all stages of the *tailings facility lifecycle*.

REQUIREMENT 11.1: The Operator shall ~~conduct~~ and regularly update and make publicly available risk assessments with a qualified multi-disciplinary team using best practice methodologies. The Operator shall ~~transmit~~ risk assessments to the *ITRB* for review, and address with urgency all risks considered as unacceptable.

REQUIREMENT 11.2: The Operator shall ~~conduct~~ internal audits to verify consistent implementation of company procedures, guidelines and corporate governance requirements consistent with the *TMS* and the *ESMS* developed to manage risks. The Operator shall act on the recommendations of the internal audits within 6 months of receiving them.

REQUIREMENT 11.3: The *EOR* ~~or a senior independent technical reviewer~~ shall be responsible for conducting and making publicly available annual tailings facility construction and performance reviews.

REQUIREMENT 11.4: A senior independent technical reviewer shall conduct an independent *DSR* periodically (every 3 to 10 years, depending on performance and complexity, and the Consequence Classification of the tailings facility). The *DSR* shall include technical, operational and governance aspects of the tailings facility and shall ~~be done according to~~ follow best practices. The same *DSR* contractor ~~cannot~~ shall not conduct a subsequent *DSR* on the same facility.

REQUIREMENT 11.5: For *tailings facilities* with 'Very High' or 'Extreme' Consequence Classification, the *ITRB*, reporting to ~~the Accountable Executive and/or the Board~~, shall provide ongoing senior independent review of the planning, siting, design, construction, operation, maintenance, monitoring, performance and risk management at appropriate intervals across all stages of the *tailings facility lifecycle* and make the findings of these reviews publicly available. For facilities with other consequence classifications, the ongoing senior independent review ~~can be~~ done performed by a single person.

Commented [A49]: Loose standards language.

Commented [A50]: While the review can be led by a single person, it shall involve interested and affected stakeholders.

PRINCIPLE 12: Appoint and empower an *Engineer of Record*.

REQUIREMENT 12.1: ~~The Operator shall Engage~~ an engineering firm with expertise and experience in design and construction of tailings facilities of comparable complexity to provide *EOR* services for the tailings facility. ~~The Operator shall Require~~ that the firm nominate an individual to represent the firm as the *EOR*, in concurrence with the *Operator*, and verify that the individual has the necessary experience, skills and time to fulfil this role. ~~Alternatively, the Operator may appoint an employee with expertise and experience in comparable facilities as the EOR. In this instance, t~~The *EOR* may delegate the design of the tailings facility to a firm (*'Designer of Record'*) but shall remain thoroughly familiar with the design in executing their responsibilities as *EOR*.

REQUIREMENT 12.2: ~~The Operator shall Empower~~ the *EOR* through a written agreement that clearly describes their authority, role and responsibilities throughout the lifecycle of all facilities, including closed facilities, and during transfer of ownership of mining properties.

REQUIREMENT 12.3: ~~The Operator shall Establish~~ and implement a system to manage the quality of all engineering work, the interactions between the *EOR*, the *RTFE* and the ~~Accountable Executive Board~~, and their involvement in the *tailings facility lifecycle* as necessary to confirm that both the implementation of the design and the design intent are met in all cases.

REQUIREMENT 12.4: Given its potential impact on the risks associated with a *tailings facility*, the selection of the *EOR* shall be decided by the ~~Accountable Executive Board~~ and not influenced or decided on by procurement personnel.

REQUIREMENT 12.5: Where it becomes necessary to change the *EOR* firm, ~~the Operator shall~~ develop a detailed plan for the comprehensive transfer of data, information, knowledge and experience to the new EOR, with-including specifics on the construction procedures and materials.

PRINCIPLE 13: Develop an organizational culture that promotes learning and early problem recognition.

REQUIREMENT 13.1: ~~The Operator shall Educate~~ personnel who have a role in the *TMS* ~~and include in their performance appraisal about the reason for and the~~ importance of their job procedures for the prevention of a *tailings facility* failure.

REQUIREMENT 13.2: ~~The Operator shall Incorporate~~ workers' experience-based knowledge into planning for all stages of the *tailings facility lifecycle*.

REQUIREMENT 13.3: ~~The Operator shall Establish~~ mechanisms that promote *cross-functional* collaboration to ensure data and knowledge integration and communication across the *TMS* and the *ESMS*.

Commented [A51]: Shouldn't this step be further up in the standard, since the EOR has many roles in the requirements before this. Recommend that this be moved up to Principle 1 or 2.

REQUIREMENT 13.4: The Operator shall identify and implement lessons learned from internal incident investigations and relevant external accident reports within six months of receiving these reports, paying particular attention to human and organizational factors.²⁶

REQUIREMENT 13.5: The Operator shall develop procedures to recognize, and reward and protect from retaliation employees and contractors who speak up about problems or identify opportunities for improvement in tailings facilities. The Operator shall respond in a timely manner and communicate to staff about the actions taken and their outcomes.

PRINCIPLE 14: Respond promptly to concerns, complaints and grievances.

REQUIREMENT 14.1: The Operator shall establish a formal written complaint process that provides the *Operator* and the appropriate regulatory authority with information about possible permit violations or other conditions relating to the *tailings facility* that pose a risk to public health, safety, respect for human rights or the environment.

REQUIREMENT 14.2: The Operator shall establish an effective pathway that guarantees anonymity and protection from retaliation for employees and contractors ~~to who~~ express concerns about *tailings facility* safety.

REQUIREMENT 14.3: The Operator shall initiate prompt investigations of all credible employee and stakeholder complaints and grievances, swiftly resolve concerns and complaints and provide remedy as required.

REQUIREMENT 14.4: In accordance with international *best practices for whistleblower protection*²⁷, the Operator shall not discharge, discriminate against, or otherwise retaliate in any way against a *whistleblower*, or any employee or person who, in good faith, has reported a possible violation or unsafe condition.

²⁶ International Association of Oil and Gas Producers, Demystifying human factors: Building Confidence in Human Factors Investigation, October 2018.

²⁷ See Study on Whistleblower Protection Frameworks, Compendium of best practices and Guiding Principles for Legislation, (OECD, 2010), available at, <https://www.oecd.org/g20/topics/anti-corruption/48972967.pdf>. Among other things, best practices require that the whistleblower be allowed to maintain their anonymity.

TOPIC V: EMERGENCY RESPONSE AND LONG-TERM RECOVERY

PRINCIPLE 15: Prepare for emergency response to *tailings facility* failures and support local level emergency preparedness and response using *best practice* methodologies.

REQUIREMENT 15.1: ~~The Operator shall prepare~~²⁸ and implement a site-specific *Emergency Response Plan* (ERP)²⁹ based on credible *tailings facility* failure scenarios and the assessment of potential consequences³⁰, using the knowledge base. ~~The Operator shall test and update the knowledge base~~ERP regularly, including during closure.

REQUIREMENT 15.2: ~~The Operator shall~~ ~~meaningfully engage~~³¹ employees and/or employee representatives, site contractors, *public sector agencies*, first responders and ~~stakeholders~~ at-risk ~~communities~~ to participate in emergency planning, and implementation and periodic testing, including the development of specific ERPs for ~~stakeholders~~ at-risk ~~communities~~.

REQUIREMENT 15.3: ~~The Operator shall~~ ~~meaningfully engage~~ with *public sector agencies* ~~government regulators~~, and first responders, and other organizations involved in emergency response for the purpose of developing and implementing a site-specific *Emergency Preparedness and Response Plan* (EPRP). The plan shall assess the capacity and capability of emergency response services³² and the Operator shall ~~ensure that all those involved in the management of the emergency have full capacity and capability, including necessary equipment accordingly~~.

REQUIREMENT 15.4: ~~The Operator shall~~ ~~maintain~~ a state of readiness at the mine site and within ~~stakeholders~~ at-risk ~~communities~~ by training all appropriate personnel, *public sector agencies*, first responders and ~~stakeholders~~ at-risk ~~communities~~ and by ~~periodically~~ testing *emergency response plans* and procedures with all involved stakeholders.³³

Commented [A52]: With periodicity defined on the basis of best practices.

PRINCIPLE 16: Prepare for long term recovery in the event of catastrophic failure.

REQUIREMENT 16.1: ~~The Operator shall~~ ~~meaningfully engage~~ with *public sector agencies* and other organizations that would participate in medium- and long-term social and environmental post-failure response strategies.

²⁸ Both the ERP and the EPRP should be developed by experts trained in emergency response planning.

²⁹ The ERP for the tailings facility may form part of the mine-wide ERP. The tailings facility ERP is disclosed publicly and forms the basis for the collaborative planning of the EPRP as well as ERPs for ~~stakeholders~~ at-risk ~~communities~~.

³⁰ The consequences to be addressed in the EPRP will be based on the findings of inundation studies and will include public and worker safety, health risks associated with the chemical composition of the tailings, and address how environmental damage and loss of infrastructure may influence emergency scenarios.

³¹ ERPs and EPRPs for tailings facility emergencies require engagement and participation of stakeholders due to the risk of loss of life and to support the internal safety culture (see Principle 13).

³² Where gaps remain in the capacity of public sector agencies to provide required emergency response services for credible failure scenarios, the Operator will provide them.

³³ The frequency of training and testing will be based on the regular assessment by a trained emergency response professional as to what is required to achieve and maintain readiness with the distinct stakeholders involved. Training and testing

performance results will be disclosed.

REQUIREMENT 16.2: The Operator shall, in the event of *tailings facility disaster*, assess social, economic and environmental *disaster* impacts as soon as possible after people are safe and short-term survival needs have been met.³⁴

REQUIREMENT 16.3: The Operator shall ~~W~~work with *public sector agencies* and other stakeholders to facilitate the development of a *Reconstruction and Recovery Plan* that is made publicly available and addresses medium- and long- term social, economic and environmental impacts of a *tailings facility disaster*.

REQUIREMENT 16.4: The Operator shall ~~E~~enable~~ensure~~ the participation of affected people in restoration, *disaster* recovery works and ongoing monitoring activities. The Operator shall ~~D~~design and implement plans that take an integrated approach to *remediation, reclamation* and the re-establishment of functional ecosystems.

REQUIREMENT 16.5: The Operator shall ~~F~~facilitate the monitoring and public reporting of post-failure outcomes that are aligned with the thresholds and indicators outlined in the plans and adapt recovery activities in response to findings and feedback.

³⁴ Disaster impact assessments ascertain the nature and extent of damages and losses, who has been affected and the support that they need, and the potential pathways to transition from emergency to recovery. Multiple aspects of human development should be considered, including the physical environment, economic, social, cultural, psychological, environmental, health, and gender, among others.

TOPIC VI: PUBLIC DISCLOSURE AND ACCESS TO INFORMATION

PRINCIPLE 17: Provide public access to information on *tailings facility* decisions, risks and impacts, management and mitigation plans, and performance monitoring.³⁵

REQUIREMENT 17.1: The Operator shall freely and publicly disclose³⁶ relevant data and information³⁷ about the *tailings facility* and its consequence classification in order to fairly inform interested and affected stakeholders.³⁸

REQUIREMENT 17.2: The Operator shall Respond in a systematic and timely manner to all reasonable stakeholder requests for information about the *tailings facility*, to the fullest extent possible and to fairly inform the interested party making the request.³⁸ The EOR shall determine whether a request is reasonable and the length of time for the Operator's response.

REQUIREMENT 17.3: The Operator shall Commit to transparency and participate in credible global initiatives led by qualified independent organizations to create standardized, independent, industry- wide and publicly accessible databases, inventories or other information repositories about *tailings facilities*.

Commented [A53]: Who defines 'reasonable' and who defines 'timely'.

Commented [A54]: Given that many countries have access to information laws, we should mention here that such determination by the EOR will also be made in compliance with relevant national laws where they exist as well as international law obligations on access to information and other procedural rights (oftentimes the law will make provision for how/by when requests for information should be honored).

³⁵ Disclosure activities relevant to the tailings facility may be included in a site-wide Communication Plan or Stakeholder Engagement Plan.

³⁶ A fundamental principle that underlies the Standard is that the public is entitled to timely access to information relating to the tailings facility. This information must be made available at no charge, as soon as possible, and in one or more languages as necessary to afford adequate access to interested stakeholders.

³⁷ Relevant information to be disclosed shall at a minimum include those items referred to in Requirements 1.3, 2.3, 2.4, 3.1, 4.2, 4.3, 5.5, 5.6, 7.8, 8.2, 8.4, 9.1, 9.2, 10.1, 10.2, 11.1, 11.4, 11.5, 12.1, 13.5, 14.3, 15.1, 15.3, 15.4, 16.1, and in case of a tailings failure 16.2-16.5, provided that such disclosure: (i) is subject to applicable law; (ii) may be complied with through relevant regulatory agencies in accordance with applicable legal requirements; and (iii) will in some cases be subject to the consent of external parties (for example where third party reports and external stakeholder information are involved).

³⁸ Public disclosure should exclude confidential financial and business information or where disclosure would present a risk to operational or physical security.

Annex 1: Glossary and Notes

Terms shown throughout the Standard appear in *italics* and are explained below.

Accountable Executive	A member of senior management who is accountable for the safety of tailings facilities and for minimizing the social and environmental consequences of a tailings facility failure.
Adaptive Management	<p>A systematic (robust and iterative) process for continually improving management policies, practices and decision-making for environmental and social management, by learning from the outcomes of previously employed policies, practices and decisions based on experience and actual changes.</p> <p><i>Adapted from: from IPBES (Global Assessment on Biodiversity and Ecosystem Services 2019) and Encyclopaedia of the Anthropocene 2018 citing Stankey et al., 2005, available at, https://www.sciencedirect.com/science/article/pii/B9780128096659093654#bib03101</i></p>
Alternatives Analysis	<p>An analysis that should objectively and rigorously consider all available options and sites for mine waste disposal. It should assess all aspects of each mine waste disposal alternative throughout the project life cycle (i.e. from construction through operation, closure and ultimately long-term monitoring and maintenance). The alternatives assessment should also include all aspects of the project, direct or indirect, that may contribute to the predicted impacts associated with each potential alternative.</p> <p><u>https://www.canada.ca/en/environment-climate-change/services/managing-pollution/publications/guidelines-alternatives-mine-waste-disposal/chapter-2.html</u></p>
Best Practices	<p>A procedure that has been shown by research and experience to produce optimal results and that is established or proposed as a standard suitable for widespread adoption. <u><i>Merriam-Webster Unabridged Dictionary, available at, https://www.merriam-webster.com/dictionary/best%20practice</i></u></p>
Board of Directors	<p>The ultimate governing body of the Operator typically elected by the shareholders of the Operator firm. The Board is the entity with the final decision-making authority for the Operator and holds the authority to, among other things, set the firm's policies, objectives, and overall direction and oversee firm's executives. Where the State serves as the Operator, the Board of Directors shall be understood to mean the government official with ultimate direct responsibility for the final decisions of the Operator.</p>
Change Management System	<p>Changes in projects are inevitable even if there had been detailed studies during the design development, and prior to the construction stage. The changes need to be managed to reduce the negative impacts to quality and stability. The impact and consequences of changes vary according to the type and nature of changes, but most importantly according to how they are managed. Managing changes effectively is crucial to the success of a project. A change management system has the objective of disciplining and coordinating the process, and should</p>

Commented [A55]: Suggest that this glossary comes at the beginning of/earlier in the standard.

Commented [A56]: Definition to be amended to reflect that main responsibilities remain with the Board.

	include an evaluation of the change, a review and formal approval of the change followed by detailed documentation including drawings, and in some cases changes to equipment, process, flow, information, cost, schedule or personnel.
Critical Controls	A control that is crucial to preventing the event or mitigating the consequences of the event. The absence or failure of a critical control would significantly increase the risk despite the existence of the other controls. In addition, a control that prevents more than one unwanted event or mitigates more than one consequence is normally classified as critical. See: ICMM Health and Safety Critical Control Management Good Practice Guide.
Cross-functional	A system or a practice whereby people from different areas of an organization share information and work together effectively as a team.
Construction Records Report	Describes all aspects of the 'as-built' product, including all geometrical information, materials, laboratory and field test results, construction equipment and procedures, changes, non-conformances and their resolution, and construction photographs, amongst others.
Design Basis Report	A report that provides the basis for the design, operation, construction monitoring and risk management of a tailings facility.
Designer of Record	Another professional engineer designated by the Engineer of Record to design the tailings facility.
Deviance Accountability Report	A report that provides an assessment of the cumulative impact of changes to the tailings facility on the risk level of the achieved product and that defines the potential requirement for updates to the design, DBR, OMS or the monitoring program
Disaster	A serious disruption to the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts. The effect of the disaster can be immediate and localized, but is often widespread and could last for a long period of time. The effect may test or exceed the capacity of a community or society to cope using its own resources, and therefore may require assistance from external sources, which could include neighbouring jurisdictions, or those at the national or international levels. See: UN Office for Disaster Risk Reduction terminology: https://www.unisdr.org/we/inform/terminology . In this Standard, the word 'catastrophic' is used interchangeably with the word 'disaster'.
Displacement (physical and economic)	'Physical displacement' of people refers to the loss of dwellings or other assets resulting from project-related land acquisitions and/or land uses that require affected persons to move to another location. 'Economic displacement' refers to loss of assets or access to assets and the resulting loss of income sources or other means of a livelihood as a result of project-related land acquisition or land use.
Emergency Preparedness and Response Plan	A community-focused tool for strategizing with relevant stakeholders in the context of emergency preparedness and disaster risk management. It includes measures to identify hazards faced by stakeholders and communities from different sources, assess capacity and capability

of public sector agencies and first responders, identify gaps in preparedness and strategies to close the gaps. It includes measures to help at-risk communities to safeguard lives and assets by improving knowledge of hazards, how to respond, and to strengthen local response and remediation capacities. Adapted from APELL *Awareness and Preparedness for Emergencies at Local Level* (2015) and ICMM/UNEP *Good Practice emergency preparedness and response* (2005).

Emergency Response Plan	A detailed, site-specific plan developed to identify hazards, assess and prepare for an emergency and to respond if it occurs. Best practice mine ERPs are internal plans to prepare for onsite response to identified hazards across the entire mine operation and to prepare detailed response activities for a range of credible emergencies. Such plans also identify any necessary coordination with off-site emergency responders and communities and state agencies should consequences extend off the mine property. The tailings facility ERP may be part of the mine-wide ERP.
Engineer of Record	<p>The qualified engineer who responsible for confirming that the tailings facility is designed, constructed, operated, and decommissioned with appropriate concern for health, safety and the environment, and that it aligns with and meets applicable regulations, statutes, guidelines, codes, and standards (<i>after Site Characterization for Dam Foundations in BC, EGBC, 2016</i>)</p> <p>For more information, please refer to PRINCIPLE 12: Appoint and empower an Engineer of Record.</p>
Environmental and Social Management System	Scaled to the nature and size of an operation, an ESMS helps companies integrate the rules and objectives for the management and mitigation of environmental and social impacts into core business operations, through a set of clearly defined, repeatable processes. An effective ESMS is a dynamic and continuous process initiated and supported by management, and involves engagement between the Operator, its employees and contractors, project affected people and, where appropriate, other stakeholders.
Existing Facility	A mine tailings facility that meets any of the following criteria: (1) the facility is accepting new mine tailings on the date that the Standard takes effect; (2) the facility is closed or is not currently accepting new mine tailings but is still being actively managed by an Operator on the date that the Standard takes effect; or (3) a facility has been proposed for construction as evidenced by the filing of a complete application for a license or permit to build the facility before the date that the Standard takes effect. For an application to be deemed 'complete' under this definition, the Operator must have completed all necessary processes for site selection and technology design and the application must contain all of the information necessary for the approving agency to make a final decision on the application without significant amendments.

Grievance Mechanism	<p>A non-judicial grievance mechanism is ‘effective’ when it is: legitimate; accessible; predictable; equitable; transparent; rights compatible and a continuous source of learning. In addition, operational-level mechanisms should be based on engagement and dialogue. See: https://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf</p> <p>A grievance is a perceived injustice evoking an individual’s or a group’s sense of entitlement, which may be based on law, contract, explicit or implicit promises, customary practice, or general notions of fairness of aggrieved communities.</p>
Hazard	<p>A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. It may be a natural or a technological (human built) hazard. Adapted from UNEP program <i>APELL</i>.</p>
Human Rights Due Diligence	<p>Involves an ongoing management process that a reasonable and prudent Operator would undertake to meet its responsibility to respect human rights under the UN Guiding Principles on Business and Human Rights and other related guidance such as the OECD Due Diligence Guidance for Responsible Business Conduct. This process should identify, prevent, mitigate and account for how the Operator addresses their impacts on human rights. See: https://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf</p>
Impact Assessment	<p>A decision-making support instrument which aims to identify, predict, evaluate and mitigate social, human rights, biophysical and other relevant environmental effects of development proposals, prior to major decisions and throughout the lifecycle of a project. Assessments should consider impacts that are chronic and cumulative, and those that are sudden and acute. While studies typically focus on a single project, impact assessments can be scoped at the landscape level, and consider strategic environmental, human rights, economic and social matters. Depending on the context, the circumstances, and the issues at hand, impact assessment studies can be stand-alone, or may be conducted as an integrated set of studies. This Standard encourages two types of impact assessment: (i) regular and scheduled impact assessments; and (ii) impact assessments that are triggered by a change to either the facility or the external context. In addition to describing the overall aims and objectives, agreed principles for the application of impact assessments are defined by the International Association of Impact Assessment (IAIA). See:</p>

Incremental Loss

This is the loss over and above that which would be caused by the hypothesised flood or earthquake where no tailings facility exists.

For a more detailed discussion of the meaning of incremental loss, see *British Columbia Ministry of Forests, Lands and Natural Resource Operations, Downstream Consequence of Failure Classification Interpretation Guideline, March 2017*

https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/dam-safety/con_class_guidelines_for_owners-2017.pdf

NSW Dam Safety Committee, Consequence Categories For Dams, June 2010, updated November 2015

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	<p>https://www.damsafety.nsw.gov.au/DSC/Download/Info_Sheets_PDF/Dam/DSC3A.pdf The preceding references are free of charge. See also guidelines produced by ICOLD, https://www.icold-ciqb.org/, ANCOLD, https://www.ancold.org.au/, and CDA, https://www.cda.ca/</p>
Independent Tailings Review Board	Provides independent technical review of the design, construction, operation and closure of tailings facilities. The expertise of the ITRB members relates to the specific technical aspects of the tailings facility site, material and design characteristics.
Inundation Study	A study that assumes a hypothetical failure of the tailings facility and estimates the inundation area, flow arrival times, depth and velocities, duration of flooding, and depth of material deposition. It is based on hypothetical scenarios not connected to probability of occurrence. It is primarily used to inform the emergency preparedness and response planning and the dam classification. The dam classification is then used to inform the design criteria. Refinements are ongoing to make these more realistic and applicable to tailings facilities.
Major Hazard Risk	Safety can be divided into two types: occupational safety and safety with respect to major hazards. Major hazards in the mining industry include tailings facility failure, pitwall failure and underground coal mine explosion amongst others. The indicators of how well major hazard risk is managed are necessarily quite different from the indicators used for occupational safety. Major hazard risk management focuses on low probability, high consequence events.
Meaningful Engagement	<p><u>. “Described by the United Nations (UN), the World Bank, the International Finance Corporation (IFC), the Organization for Economic Cooperation and Development (OCED), the Inter-American Bank, amongst other international and multilateral organizations and agencies, as a dynamic and ongoing process of dialogue on issues of mutual interest with interested and affected parties and stakeholders, throughout the life of the mine and particularly during closure, rehabilitation and post-closure stages, whereby project proponents not only have an obligation to consult and listen to stakeholder perspectives, but also have an obligation to take their perspectives into account in the making of joint decisions. The outcome of meaningful stakeholder engagement should become integrated into an operator’s core business. Meaningful engagement involves understanding and addressing structural and practical barriers, in the most appropriate manner depending on the stakeholders, to the active participation of diverse groups of people, for example: women, ethnic minorities, indigenous peoples, people who live in remote areas, and/or different language groups. Preconditions of meaningful engagement include access to relevant information that can be reasonably understood by the external party, disclosure, identification of shared values, accountability, participation in decision-making, and mechanisms for access to justice or remedy should grievances arise.”</u></p>

Commented [A57]: As commented earlier in the document, the Board should include representatives from interested and affected stakeholder groups. Its membership should be clearly defined.

Commented [A58]: Amended definition to reflect key aspects of “meaningful engagement”. Modifications are visible in bold font.

New Facility A mine tailings facility proposed for construction by an Operator who has not yet filed a complete application for a license or permit to build the facility before the date that the Standard takes effect.

Observational Method A continuous, managed, integrated, process of design, construction control, monitoring and review that enables previously defined modifications to be incorporated during or after construction as appropriate. All of these aspects must be demonstrably robust. The objective is to achieve greater overall safety.

See Peck, R.B. (1969) 'Advantages and Limitations of the Observational Method in Applied Soil Mechanics' Ninth Rankine Lecture, *Geotechnique*, Vol.19, No.2, 171-187.

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Operator	Any person, corporation, partnership, owner, affiliate, subsidiary, joint venture, or other entity, including any State agency, that operates or controls a tailings facility.
Parent Corporation	The ultimate owning company usually listed on a stock exchange. Where the ultimate owner is an arm of government or a government-owned entity, the reference is to that arm or entity.
Project-affected People	For the purposes of this Standard, project-affected people are those people experiencing impacts of any kind, either positive or negative, from a tailings facility either directly or indirectly. Impacts may include economic and/or physical displacement, disruption of ecosystem services, changes to cultural or social well-being, or a decline in the determinants of mental or physical health, amongst others. People affected by a tailings facility may include, for example, people who live nearby; people who hear, smell or see the project; or people who might own, reside on, or use the land on which the project is to be located or may potentially inundate. International standards require developers to identify the inherent and potential vulnerability of different PAPs, as this can influence a person or group's experience of impacts and corresponding responses. See: <i>IFC Environmental and Social Performance Standard 1 Assessment and Management of Environmental and Social Risks and Impacts</i> .
Public Sector Agencies	Refers to all governmental agencies at the State, regional, and/or local level with some responsibility or authority for regulating mining activities that occur within or impact their jurisdictions.
Reclamation	Refers to the process of restoring land to a useable state. Further measures are required to restore land to the state prior to exploitation including the restoration of functional ecosystems.
Remediation	Refers to the immediate approach to neutralize hazards after a tailings failure incident (of any scale).
Respect for Human Rights	The business responsibility to 'respect' human rights is a global standard of expected conduct, defined by the UN Guiding Principles on Business and Human Rights <u>and derived from international law</u> . Respect means that businesses should avoid infringing on the human rights of others and address adverse human rights impacts with which they are involved. The Guiding Principles make clear that efforts to promote or support human rights cannot be used to offset negative human rights impacts elsewhere in a company's operations. See: https://www.ohchr.org/Documents/Publications/Business_and_Human_Rights_Guiding_Principles.pdf
Responsible Tailings Facility Engineer	An engineer appointed by the Operator to be responsible for the tailings facility. The RTFE must be available at all times during construction, operations and closure. The RTFE has clearly defined, delegated responsibility for management of the tailings facility and has appropriate qualifications compatible with the level of complexity of the tailings facility. The RTFE is responsible for the scope of work and budget requirements for the tailings facility, including risk management. The RTFE may delegate specific tasks and responsibilities for aspects of tailings management to qualified personnel.
Robust Design	The robustness of a tailings facility depends on each particular situation and it may be associated with various aspects, for example, the

factor of safety against each of the potential failure modes, the presence or absence of materials with brittle behaviour, the degree of brittleness of these materials, the degree of variability of the materials, the potential for thresholds of deformation that significantly affect the facility performance. The degree of robustness is related to the facility maintaining its overall integrity despite less than ideal performance of one or more of its components.

Senior Technical Reviewer

A professional with in-depth knowledge and at least 15 years' experience in the specific area of the review requirements, e.g. tailings design, operations and closure; environmental and social aspects or any other specific topic of concern.

State

A term used broadly in the context of this Standard to encompass all relevant public sector agencies

Stakeholder

Stakeholders include: mining-host communities; neighbouring communities; host governments; traditional authorities; landowners; farmers; shareholders; regulators; media; non-governmental organisations and other civil society organisations, including faith-based organisations and academia; employees; labour-sending areas; political parties; other mines; and businesses. This Standard also recognizes that within stakeholder networks there may exist divergent views.

Tailings

A by-product of mining, consisting of the processed rock or soil left over from the separation of the commodities of value from the rock or soil within which they occur.

Tailings Facility

A facility that is designed and managed to contain the tailings produced by the mine. Tailings can be placed in mined-out underground mines, in open pit mines and on external surface facilities. Tailings can be produced and managed as slurry-based (a mixture of solids and water) at various moisture contents ranging in appearance from a watery mixture to a less watery mixture to paste and to a dryer material that has been filtered. Tailings slurry in a surface facility is contained by dams constructed of borrow materials including soil and rock as well as tailings. Dryer materials, like filtered tailings, can be contained by rock piles.

Tailings Facility Lifecycle

The succession of phases in the life of a facility consisting of:

- project conception, planning and design
- initial construction
- operation and ongoing construction
- closure (including temporary closure, care & maintenance)
- post-closure (including relinquishment, reprocessing, relocation, removal)

Adapted from MAC Guide to the Management of Tailings Facilities 2017 (Mining Association of Canada).

Tailings Management System

An overarching system to support the safe operation and management of a tailings facility throughout its lifecycle to meet the Requirements of the Standard. The TMS should follow the well-established Deming cycle (Plan, Do, Check and Act). Each Operator should develop a TMS that best suits their organization and tailings facilities. A TMS includes elements such as: establishing policies, planning, designing and establishing performance objectives, managing change, identifying and securing adequate resources (qualified personnel, equipment, scheduling, data, documentation and financial resources), conducting performance evaluations and risk assessments, establishing and implementing controls for risk management, auditing and reviewing for continual improvement, implementing a management system with clear accountabilities and responsibilities, preparing and Implementing OMS, EPP, and ERP.

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Trigger Action Response Plan

Components of the TMS may overlap or link with site-wide management systems. In this case, these systems should be integrated.

A planning tool used for managing or responding to critical situations caused by specific events.

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Annex 2: Consequence Classification

Tailings facilities are classified according to the potential severity of the consequences of a worst-case failure assuming no mitigative measures are in place. This Standard adopts the Consequence Classification Matrix set out in Table 1 (below), which is a slightly modified version of a draft matrix proposed in 2019 by the International Commission on Large Dams (ICOLD). The Matrix involves five levels of severity (at the left side of Table), ranging from 'Low' to 'Extreme', and a number of loss categories (across the top): potential population at risk, loss of life, environment, health social and cultural, infrastructure and economics, and livelihoods. The Consequence Classification of a tailings facility is assigned based on the most severe consequence among these loss categories. For example, if the hypothesized failure could cause catastrophic loss of critical habitat or rare and endangered species, the consequence classification of the tailings facility will be 'Extreme', even though no loss of life was expected. The types of losses described above do not include the consideration of economic and reputational losses to the mining company itself.

The descriptions of potential loss in the Matrix do not mean acceptance of those losses. They are identified as impact levels that trigger specific or additional requirements for planning, design and implementation of remedial measures to reduce the likelihood of those losses to negligible.

This classification has at least five uses:

- Assist tailings facility designers in establishing design criteria, in particular the external loading applied by floods and earthquakes;
- Trigger an escalation of decision-making to the *Board*;
- Define some of the *TMS* requirements;
- Allow comparison across a portfolio of facilities, either within an *Operator's* inventory or within a given jurisdiction; and
- Communicate with the public and regulators about the potential *hazard* levels and support the development and implementation of realistic *EPRP*.

Where the consequence of failure includes loss of life, tailings facilities must be designed, built and operated so that there is a negligible likelihood of failure. Table 2 (below) sets the criteria for external loading, applied by floods and earthquakes. These criteria mean the tailings facility will be designed to withstand floods and earthquakes very much greater than any known previous flood or earthquake in the region where the tailings facility is or will be located, making the likelihood of failure due to floods and earthquakes negligible. The Standard also includes a number of requirements across all stages of the tailings facility lifecycle to achieve the goal of negligible likelihood of failure.

It is reasonable for designers to choose less restrictive designs for tailings facilities with a Consequence Classification of 'Low' or 'Significant'. These are the facilities where the potential consequences of a hypothetical failure do not include loss of life (or other loss categories, see Table 1). However, it is noted that the criteria set out in Table 2 for 'Low' or 'Significant' Consequence Classifications also involve designing to withstand floods and earthquakes very

much greater than any known previous flood or earthquake in the region of the tailings facility. Moreover, the Standard also requires that any less rigorous tailings facility design allows for the possibility of a later upgrade to a more rigorous level, should the consequence level increase, for instance as a result of people settling in downstream areas.

The likelihood of a tailings facility failure cannot be rendered negligible by the use of stringent design criteria alone. This needs to be complemented by other measures such as the correct implementation of the design, quality construction and good management practices. In particular, inappropriate management decisions years or decades later (e.g., enlarging tailings facilities without following proper procedures) can dramatically increase the likelihood of failure in ways that are beyond the control of tailings facility designers. For this reason, the Standard endorses a number of other Requirements for reducing the likelihood of failure and it adds a further line of defence, which is to minimize the potential consequences of failure.

Possible ways to minimize consequences include: negotiating to resettle downstream populations, negotiating with local authorities to prevent future occupancy of land in the inundation area, changing the location of the tailings facilities, changing the technology used or the design to non-flowable facilities, or by some other means. Some of these measures may be beyond the authority of *Operators* and may require the participation of the State. The Consequence Classification ~~can provide the trigger to~~requires to escalate decisions about 'Very High' to 'Extreme' consequence tailings facilities to the *Board* so that it is aware of the material risks to which it is exposed and is able to take informed decisions. These include go/ no go decisions or approval of capital investments.

This Standard requires that tailings facilities be designed for the most severe level in the Consequence Classification Matrix, unless it can be demonstrated that a lower classification is appropriate. If this is demonstrated, it is also required that the design and construction be such that a future upgrade of the facility to a higher classification remains feasible. This approach recognizes that, given the longevity of tailings facilities, and the potential for population growth, in-migration and economic development downstream of a tailings facility, the consequences of a potential failure are likely to increase over time. Downstream development is not within the exclusive control of *Operators*, and in some cases is accelerated by the economic opportunities that the mine brings. The Standard addresses the fact that an adequate design and construction at one point in time may be rendered inappropriate and it could be difficult and/or costly to upgrade later if that is not considered during initial planning and design.

Finally, it is important that the Consequence Classification is not interpreted as a 'risk level'. Risk is a factor of both the consequences and the probability of the event occurring. By contrast, the consequence classification of a tailings facility is assessed independently of its probability of failure for the reasons discussed above. As noted earlier, the design of a tailings facility is intended to reduce the probability of failure to negligible levels.

Table 1: Consequence Classification Matrix

Dam Failure Consequence Classification	Incremental Losses					
	Potential Population at Risk	Potential Loss of Life	Environment	Health, Social & Cultural	Infrastructure & Economics	Livelihoods
Low	None	None expected	Minimal short-term loss or deterioration of habitat or rare and endangered species.	Minimal effects and disruption of business. No measurable effect on human health. No disruption of heritage, recreation, community or cultural assets.	Low economic losses; area contains limited infrastructure or services. <US\$1M	Up to 10 household livelihood systems disrupted and recoverable in the short term. No long-term non-recoverable loss of livelihoods.
Significant	Temporary only	None expected	No significant loss or deterioration of habitat. Potential contamination of livestock/fauna water supply with no health effects. Process water low potential toxicity. Tailings not potentially acid generating and have low neutral leaching potential. Restoration possible within 1 to 5 years.	Significant disruption of business, service or social dislocation. Low likelihood of loss of regional heritage, recreation, community or cultural assets. Low likelihood of health effects.	Losses to recreational facilities, seasonal workplaces, and infrequently used transportation routes. <US\$10M	Up to 10 household livelihood systems disrupted and recoverable in the longer-term; or Up to 100 household livelihood systems disrupted and recoverable in the short-term. No long-term non-recoverable loss of livelihoods
High	10-100	1 - 10	Significant loss or deterioration of critical habitat or rare and endangered species. Potential contamination of livestock/fauna water supply with no health effects. Process water moderately toxic. Low potential for acid rock drainage or metal-toxic leaching effects of released tailings. Potential area of impact 10 km ² - 20 km ² . Restoration possible but difficult and could take > 5 years	500-1,000 people affected by disruption of business, services or social dislocation. Disruption of regional heritage, recreation, community or cultural assets. Potential for short term human health effects.	High economic losses affecting infrastructure, public transportation, and commercial facilities, or employment. Moderate relocation/compensation to communities. <US\$100M	Up to 10 household livelihood systems lost and non-recoverable; or Up to 50 household livelihood systems disrupted and recoverable over the longer-term; or Up to 200 household livelihood systems disrupted and recoverable in the short term.
Very High	100-1000	10 to 100	Major loss or deterioration of critical habitat or rare and endangered species. Process water highly toxic. High potential for acid rock drainage or metal-toxic leaching effects from released tailings. Potential area of impact >20 km ² . Restoration or compensation possible but very difficult and requires a long time (5 years to 20 years).	>1,000 people affected by disruption of business, services or social dislocation for more than one year. Significant loss of national heritage, community or cultural assets. Potential for significant longer-term human health effects.	Very high economic losses affecting important infrastructure or services (e.g., highway, industrial facility, storage facilities, for dangerous substances), or employment. High relocation/compensation to communities. <US\$1B	Up to 50 household livelihood systems lost and non-recoverable; or Up to 200 household livelihood systems disrupted and recoverable over the longer-term; or Up to 500 household livelihood systems disrupted and recoverable in the short term.
Extreme	> 1000	More than 100	Catastrophic loss of critical habitat or rare and endangered species. Process water highly toxic. Very high potential for acid rock drainage or metal-toxic leaching effects from released tailings. Potential area of impact > 20 km ² . Restoration or compensation in kind impossible or requires a very long time (>20 years).	>5,000 people affected by disruption of business, services or social dislocation for years. Significant national heritage or community facilities or cultural asset destroyed. Potential for severe and/or longer-term human health effects.	Extreme economic losses affecting critical infrastructure or services, (e.g., hospital, major industrial complex, major storage facilities for dangerous substances) or employment. Very high relocation/compensation to communities and very high social readjustment costs. >US1B	More than 50 household livelihood systems lost and non-recoverable; or More than 200 household livelihood systems disrupted and recoverable in the longer-term; or More than 500 household livelihood systems disrupted and recoverable in the short term.

Commented [A59]: To address more broadly leachate of hazardous substances.

Table 2: External loading criteria required by the Standard

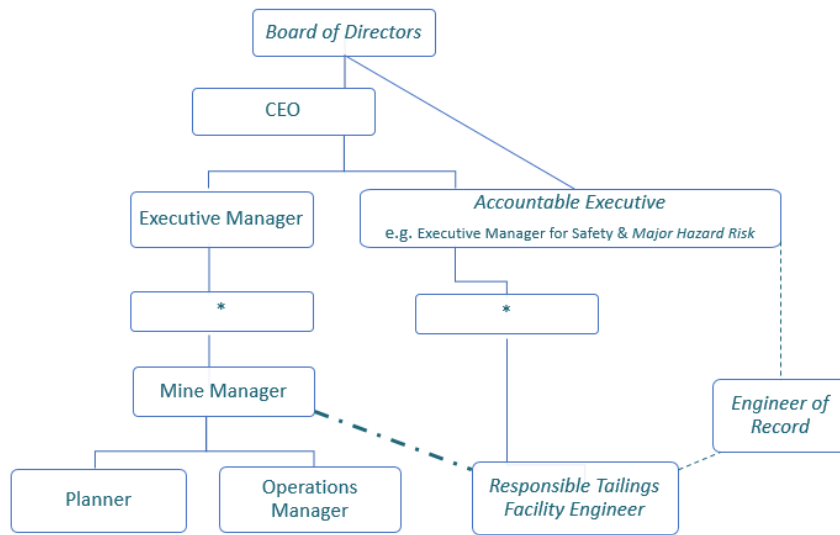
Dam Failure Consequence Classification	Design Flood Annual Exceedance Probability	Design Ground Motion Annual Exceedance Probability
Low	1/2500	1/2500
Significant		
High	1/5000	1/5000
Very High		
Extreme	1/10000 or PMF*	1/10000 or MCE**

* PMF Probable Maximum Flood

** MCE Maximum Credible Earthquake

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Annex 3: Outline of the Organizational Structure referred to in the Standard



- - - Service Delivery
- * Unspecified number of levels in the reporting line
- Line of communication

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