Equivalency Between Requirements of *Towards Sustainable Mining* and the *Global Industry Standard on Tailings Management*
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Towards Sustainable Mining® (*TSM®*) is an international standard for responsible mining. Developed by the Mining Association of Canada (MAC) and launched in 2004, the objective of *TSM* is to enable mining companies to meet society's needs for minerals, metals, and energy products in the most socially and environmentally responsible way. Implementation of *TSM* is a condition of MAC membership for member's Canadian operations and *TSM* was adopted in Canada by the Quebec Mining Association in 2014, increasing its application within Canada. Many MAC members are also applying *TSM* at their operations outside of Canada. In addition, *TSM* has been adopted by industry associations in Finland (2015), Argentina (2016), Botswana (2017), the Philippines (2017), Spain (2018), Brazil (2019), Norway (2020), and Australia (2021).

TSM provides companies with a set of tools, referred to as protocols, to measure, report, and improve their performance in eight key areas:

- Tailings management
- Water stewardship
- Biodiversity conservation management
- Climate change
- Indigenous and community relationships
- Safety and health
- Crisis management
- Prevention of child and forced labour

The *Global Industry Standard on Tailings Management* (the Standard) has 77 requirements for tailings management addressing six topic areas:

- Affected communities
- Integrated knowledge base
- Design, construction, operation and monitoring of the tailings facility
- Management and governance
- Emergency response and long-term recovery
- Public disclosure and access to information

The objective of the tailings management component of *TSM* is to continually work towards minimizing harm. Minimizing harm encompasses both physical and chemical performance and risks associated with tailings facilities, including:

- Zero catastrophic failures of tailings facilities
- No significant adverse effects on the environment or human health

Similarly, the Standard strives to achieve the ultimate goal of zero harm to people and the environment with zero tolerance for human fatality.

MAC has conducted a detailed analysis of the requirements of *TSM* compared to the Standard. Given the scope of topics addressed in the Standard, this analysis considers the tailings management component of *TSM* as well as the:

- *Indigenous and Community Relationships Protocol*
- *Water Stewardship Protocol*
- *Climate Change Protocol*

Tailings Management Component of *TSM*

The tailings management component of *TSM* includes the *Tailings Management Protocol* which has five performance measurement indicators focused on:

- Having a corporate tailings management policy and commitment
- Developing and implementing site-specific tailings management systems and emergency preparedness measures
- Assigning accountability and responsibility for tailings management
- Conducting annual tailings management reviews
- Developing and implementing site-specific OMS manuals

The *Tailings Management Protocol* refers to and is supported by:

A Guide to the Management of Tailings Facilities (the Tailings Guide) provides guidance on responsible tailings management, helps companies develop and implement site-specific tailings management systems, and improves consistency of application of engineering and management principles to tailings management.

Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities (the OMS Guide) provides guidance on the development and implementation of operation, maintenance, and surveillance (OMS) activities, described in a site-specific OMS manual.

Table of Conformance which identifies elements of the Tailings Guide and the OMS Guide that must be implemented to meet the performance criteria for each of the indicators in the *Tailings Management Protocol*.

Indigenous and Community Relationships Protocol

This protocol was developed to measure performance related to community engagement. It was introduced in 2019 and replaced the *Aboriginal and Community Outreach Protocol*, introduced with the launch of *TSM* in 2004. The *Indigenous and Community Relationships Protocol* has five performance indicators, all of which are relevant in assessing equivalency between *TSM* and the Standard:

1) Community of Interest (COI) identification: confirm that processes are in place to identify COI, including Indigenous communities and organizations, affected or perceived to be affected by the company's operations and activities or who have a genuine interest in the performance and activities of a company and/or operation.

2) Effective COI engagement and dialogue: confirm that processes have been established to support development and maintenance of meaningful relationships with COI, including Indigenous communities and organizations, to gain mutual understanding of viewpoints, to build effective relationships, and to create shared value and mutual benefits.
3) Effective Indigenous engagement and dialogue: confirm that mining facilities are actively building meaningful relationships and implementing engagement and decision-making processes with Indigenous communities. This includes aiming to achieve free, prior, and informed consent (FPIC) for impacts on rights of directly affected Indigenous peoples before proceeding with development and maintaining it throughout the life of the project. This indicator also confirms that efforts are made to ensure that Indigenous peoples have equitable access to opportunities with the company. Furthermore, this indicator seeks to ensure that management and designated employees are educated on the history of Indigenous peoples and receive skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.
4) Community impact and benefit management: confirm that processes have been established to ensure that adverse community impacts, including human rights impacts, are identified, avoided and mitigated and that processes are in place to encourage and optimize social benefits generated from the facility. Additionally, this indicator seeks to confirm that facilities identify and engage with COI on potential adverse environmental impacts that may directly affect communities, including those associated with tailings management (as applicable), and potential adverse impacts related to community safety and health.
5) COI response mechanism: confirm that there are processes in place to receive, track and respond to incidents, concerns and feedback from COI, including Indigenous communities and organizations, leading towards stronger relationships and building trust.

Water Stewardship Protocol

This protocol was introduced in 2019 and has four performance indicators:

1) Water governance: confirm that commitment and accountabilities are in place and communicated to relevant COI to support water stewardship.
2) Operational water management: confirm that water-related plans and management systems are implemented at the facility level. This indicator includes both water quality and water quantity.
3) Watershed-scale planning: confirm that the facility supports engagement with other water users and COI in the watershed and participates in watershed-scale planning and governance fora, where they exist. This indicator focuses on watershed planning beyond the operational footprint of the facility.
4) Water performance and reporting: confirm that water related objectives or targets have been established to measure performance and that reporting is in place to inform decision-making and to communicate performance publicly.

Climate Change Protocol

This protocol, approved in March 2021, replaces the *Energy and Greenhouse Gas Emissions Management Protocol*. Unlike the previous protocol, the *Climate Change Protocol* addresses climate change adaptation as well as emissions, and the protocol has one performance indicator relevant to assessing equivalency between *TSM* and the Standard:

2) Facility climate change management: confirm that systems are in place at the facility level to manage energy, GHG emissions, physical climate impacts and adaptation. Performance criteria include establishing a process for the management of the physical climate impacts and adaptation.

In addition, MAC has developed a new *Guide on Climate Change Adaptation for the Mining Sector*. This guide provides tools that can be used by Owners to consider climate related risks and opportunities and incorporate climate change adaptation into their decision-making.

Assessment of Equivalency Between *TSM* and the Standard

The table below provides an assessment of the equivalency between *TSM* and the Standard for each of the 77 requirements in the Standard. The table reflects revisions to the Tailings Guide approved by the MAC Board of Directors in March 2021, as well as the introduction of the new *Climate Change Protocol*.

It is important to note that:

- This assessment is based on what is required to achieve a Level A *TSM* rating for each performance indicator relevant to a given requirement in the Standard. MAC's objective is for members to achieve a Level A or higher for all indicators across all *TSM* protocols within three years of adopting *TSM*.
- Equivalency is assessed for existing tailings facilities in the operations phase of the life cycle, during which MAC members are expected to apply all *TSM* protocols.
- Equivalency is also assessed for tailings facilities in the closure and post-closure phases of the life cycle for requirements in the Standard addressed in the tailings management component of *TSM*. The MAC Board of Directors agreed in November 2020 to extend the scope of application of the *Tailings Management Protocol* to include tailings facilities in the closure and post-closure phases. Application of other protocols remains voluntary.
- For new tailings facilities in the planning, design, and initial construction phases of the life cycle, Owners would need to voluntarily apply all relevant protocols to achieve equivalency with the Standard. Application of *TSM* to such tailings facilities is not currently required, although MAC is considering a potential extension of the application of the *Tailings Management Protocol* to include such tailings facilities.

For each requirement in the Standard, the table identifies:

- The conclusions of MAC assessment of equivalency, colour coded as follows:

	Requirement met or exceeded by *TSM* requirements	**47**
	Requirements met in intent • Details of the Standard requirement are not all explicitly addressed, but the TSM requirements would achieve the same outcome.	**4**
	Requirement largely met by TSM requirements • Standard requirement is addressed in a *TSM* protocol but not in a manner that gives full equivalency	**12**
	Requirement partially met by *TSM* guidance: • Standard requirement is addressed in TSM guidance but is not reflected as a requirement in a TSM protocol	**9**
	Requirement is not addressed by *TSM*	**5**

- Relevant TSM protocols and guidance
  - In the case of the tailings management component of *TSM*, the table identifies the relevant indicator in the *Tailings Management Protocol* (were applicable) and the relevant sections of the Tailings Guide and the OMS Guide. Contents of the Tailings Guide and OMS Guide are only deemed to be equivalent if they are reflected in the Table of Conformance, linking the guidance to conformance with the Protocol.
  - In the case of other *TSM* protocols, the table identifies the relevant protocol and indicators.

- In cases where there are other relevant MAC guidance documents, these documents are also identified.
- This column also provides an explanation in cases where *TSM* requirements are not considered to meet or exceed the requirements in the Standard and identifies where future revisions to the tailings management component of the *TSM*, expected to be completed by early 2022, may increase the degree of equivalency.
- In the case of requirements not addressed by *TSM* the table also identifies, where applicable, relevant guidance from the Canadian Dam Association.

Note that, in a number of cases, single requirements in the Standard address more than one category of tailings facilities, notably new versus existing facilities. In these cases, *TSM* equivalency is assessed separately for the different categories addressed in the Standard requirement.

There are many cases where *TSM* requirements exceed the requirements in the Standard. The table below does not specifically identify requirements in the Standard that are exceeded by *TSM* (i.e., requirements for which the Standard is not equivalent to *TSM*), but *TSM* requirements would be considered to exceed the requirements in the Standard in cases where *TSM* performance criteria are more detailed and comprehensive.

The most notable examples are requirements in the Standard related to tailings management systems and operation, maintenance, and surveillance (OMS) activities. *TSM* guidance and requirements for tailings management systems and OMS are very comprehensive and take a holistic approach, providing the foundation for safe, responsible tailings management. In addition to the requirements in the Standard where these are explicitly referred to (R6.1, 7.1, 8.2, and 10.2 for tailings management systems, R6.4 and 6.5 for OMS), there are many other requirements in the Standard that are linked, particularly to tailings management systems. Example of this include:

- Requirements related to the Accountable Executive Officer. The Standard describes specific decisions that the Accountable Executive Officer must take. An effective tailings management system provides a mechanism for checks and balances on decision-making, helping to ensure that accountability rests with the Accountable Executive Officer even in cases where those decisions are made by others. Key to this is the management review for continual improvement, the "Act" element of the Plan-Do-Check-Act cycle of a management system. In *TSM*, the management review must be conducted annually and must be reported to the Accountable Executive Officer and must consider the performance of the tailings facility and all associated plans, procedures, and systems, including the tailings management system.
- R6.5 requires a formal change management system. In *TSM*, the tailings management system provides the mechanism for managing change in a holistic manner, including a wide range of potential changes that could occur throughout the life cycle of a tailings facility, including but not limited to deviations and material changes. When an effective tailings management system is in place, establishing a separate change management system would be redundant.
- R6.6 requires Operators to include new and emerging technologies and approaches and use the evolving knowledge in the refinement of the design, construction and operation of the tailings facility. In *TSM*, this is integrated into the requirements for the annual management review as part of the tailings management system. This provides better context, a mechanism to communicate this information to the Accountable Executive Officer, and a mechanism to potentially act on this information by developing action plans to adopt emerging technologies or approaches.
- R7.1 and 7.2 require the establishment and implementation of monitoring programs and systems, without making reference to R6.4 which requires the development and implementation of an OMS manual. *TSM* has comprehensive, detailed requirements for the development and implementation of surveillance activities as part of OMS.

- R9.3 requires the establishment and implementation of a program to manage the quality of all engineering work, the interactions between the EoR, the Responsible Person and the Accountable Executive Officer, and their involvement in the tailings facility life cycle as necessary to confirm that both the implementation of the design and the design intent are met. In *TSM*, this is a key function of an effective tailings management system supported by OMS.
- R10.4 requires the EoR or senior independent technical reviewer to conduct tailings facility construction and performance reviews annually or more frequently if required. In *TSM*, this is addressed through guidance and requirements for performance evaluation (the "Check" element of the Plan-Do-Check-Act cycle) and the annual management review. *TSM* requirements are not only more detailed, but are also more comprehensive, inclusive of tailings facility performance and engineering aspects as well as the performance of all associated plans, procedures, and systems. *TSM* also requires the identification of any deficiencies or opportunities for continual improvement, and the development of action plans accordingly.
- R11.3 requires the establishment of mechanisms that promote cross-functional collaboration to ensure effective data and knowledge sharing, communication and implementation of management measures to support public safety and the integrity of the tailings facility. In *TSM*, this is the one of the functions of an effective tailings management system.

By integrating a wide range of aspects of tailings management into the rigorous tailings management system approach, supported by OMS, *TSM* provides a more comprehensive and holistic approach to ensuring safe, responsible tailings management.

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
TOPIC I: AFFECTED COMMUNITIES		
PRINCIPLE 1: Respect the rights of project-affected people and meaningfully engage them at all phases of the tailings facility lifecycle, including closure.		
REQUIREMENT 1.1: Demonstrate respect for human rights in accordance with the United Nations Guiding Principles on Business and Human Rights (UNGP), conduct human rights due diligence to inform management decisions throughout the tailings facility lifecycle and address the human rights risks of tailings facility credible failure scenarios. For existing facilities, the Operator can initially opt to prioritise salient human rights issues in accordance with the UNGP.		• *Indigenous and Community Relationships Protocol*, Indicator 4
REQUIREMENT 1.2: Where a new tailings facility may impact the rights of indigenous or tribal peoples, including their land and resource rights and their right to self- determination, work to obtain and maintain Free Prior and Informed Consent (FPIC) by demonstrating conformance to international guidance and recognised best practice frameworks.		• *Indigenous and Community Relationships Protocol*, Indicator 3
REQUIREMENT 1.3: Demonstrate that project-affected people are meaningfully engaged throughout the tailings facility lifecycle in building the knowledge base and in decisions that may have a bearing on public safety and the integrity of the tailings facility. The Operator shall share information to support this process.		• *Indigenous and Community Relationships Protocol*, Indicators 1, 2, 3, and 4
REQUIREMENT 1.4: Establish an effective operational-level, non-judicial grievance mechanism that addresses complaints and grievances of project-affected people relating to the tailings facility, and provide remedy in accordance with the UNGP.		• *Indigenous and Community Relationships Protocol*, Indicator 5 • *Site-Level Grievance and Community Response Mechanisms*
TOPIC II: INTEGRATED KNOWLEDGE BASE		
PRINCIPLE 2: Develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the tailings facility lifecycle, including closure.		
REQUIREMENT 2.1: Develop and document knowledge about the social, environmental and local economic context of the tailings facility, using approaches aligned with international best practices. Update this knowledge at least every five years, and whenever there is a material change either to the tailings facility or to the social, environmental and local economic context. This knowledge should capture uncertainties due to climate change.		• *Indigenous and Community Relationships Protocol*, Indicator 5 • *Tailings Management Protocol*, Indicator 2 o Tailings Guide, Section 4.7.1 and Appendix 6 • *Tailings Management Protocol*, Indicator 5 o OMS Guide, Section 3.2 and Appendix 8 • *Climate Change Protocol*, Indicator 2 • *Guide to Climate Change Adaptation for the Mining Sector*
REQUIREMENT 2.2: Prepare, document and update a detailed site characterisation of the tailings facility site(s) that includes data on climate, geomorphology, geology, geochemistry, hydrology and hydrogeology (surface and groundwater flow and quality), geotechnical, and seismicity. The physical and chemical properties of the tailings shall be characterised and updated regularly to account for variability in ore properties and processing.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide, Section 4.7.1 and Appendix 6 • *Tailings Management Protocol*, Indicator 5 o OMS Guide, Section 3.2 and Appendix 8
REQUIREMENT 2.3: Develop and document a breach analysis for the tailings facility using a methodology that considers credible failure modes, site conditions, and the properties of the slurry. The results of the analysis shall estimate the physical area impacted by a potential failure. When flowable materials (water and liquefiable solids) are present at tailings facilities with Consequence Classification of 'High', 'Very High' or 'Extreme', the results should include estimates of the physical area impacted by a potential failure, flow arrival times, depth and velocities, and depth of material deposition. Update whenever there is a material change either to the tailings facility or the physical area impacted.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide, Section 5.2.3 • There is no distinction made on the basis of consequence classification, so this requirement applies equally in all cases where there is a risk of inundation.

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
REQUIREMENT 2.4: In order to identify the groups most at risk, refer to the updated tailings facility breach analysis to assess and document potential human exposure and vulnerability to tailings facility credible failure scenarios. Update the assessment whenever there is a material change either to the tailings facility or to the knowledge base.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide, Section 5.2.3 • *Indigenous and Community Relationships Protocol*, Indicator 1
PRINCIPLE 3: Use all elements of the knowledge base - social, environmental, local economic and technical - to inform decisions throughout the tailings facility lifecycle, including closure.		
REQUIREMENT 3.1: To enhance resilience to climate change, evaluate, regularly update and use climate change knowledge throughout the tailings facility lifecycle in accordance with the principles of Adaptive Management.		• *Climate Change Protocol*, Indicator 2 • *Guide to Climate Change Adaptation for the Mining Sector* • Tailings Guide o Section 2.2.1 • May be addressed further in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 3.2: For new tailings facilities, the Operator shall use the knowledge base and undertake a multi-criteria alternatives analysis of all feasible sites, technologies and strategies for tailings management. The goal of this analysis shall be to: (i) select an alternative that minimises risks to people and the environment throughout the tailings facility lifecycle; and (ii) minimise the volume of tailings and water placed in external tailings facilities. This analysis shall be reviewed by the Independent Tailings Review Board (ITRB) or a senior independent technical reviewer.		<u>For New Tailings Facilities</u> • Tailings Guide o Sections 2.2.2, 4.2, and Appendix 3. • May be addressed further in the tailings management component of *TSM* as part of future updates.
For existing tailings facilities, the Operator shall periodically review and refine the tailings technologies and design, and management strategies to minimise risk and improve environmental outcomes. An exception applies to facilities that are demonstrated to be in a state of safe closure.		<u>For Existing Tailings Facilities</u> • *Tailings Management Protocol*, Indicator 5 o Tailings Guide, Section 7
REQUIREMENT 3.3: For new tailings facilities, use the knowledge base, including uncertainties due to climate change, to assess the social, environmental and local economic impacts of the tailings facility and its potential failure throughout its lifecycle. Where impact assessments predict material acute or chronic impacts, the Operator shall develop, document and implement impact mitigation and management plans using the mitigation hierarchy.		• *Indigenous and Community Relationships Protocol*, Indicator 4 • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 2.2.1, 4.1 and 4.2 and Appendix 1 • *Climate Change Protocol*, Indicator 2 • *Guide to Climate Change Adaptation for the Mining Sector* • May be addressed further in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 3.4: Update the assessment of the social, environmental and local economic impacts to reflect a material change either to the tailings facility or to the social, environmental and local economic context. If new data indicates that the impacts from the tailings facility have changed materially, including as a result of climate change knowledge or long-term impacts, the Operator shall update tailings facility management to reflect the new data using Adaptive Management best practices.		• *Indigenous and Community Relationships Protocol*, Indicator 4 • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 4.1, 4.2, 4.6 and 4.7.1, and Appendices 1 and 6 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 • *Climate Change Protocol*, Indicator 2 • *Guide to Climate Change Adaptation for the Mining Sector* • May be addressed further in the tailings management component of *TSM* as part of future updates.

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
TOPIC III: DESIGN, CONSTRUCTION, OPERATION AND MONITORING OF THE TAILINGS FACILITY		
PRINCIPLE 4: Develop plans and design criteria for the tailings facility to minimise risk for all phases of its lifecycle, including closure and post-closure.		
REQUIREMENT 4.1: Determine the consequence of failure classification of the tailings facility by assessing the downstream conditions documented in the knowledge base and selecting the classification corresponding to the highest Consequence Classification for each category in Annex 2, Table 1. The assessment and selection of the classification shall be based on credible failure modes, and shall be defensible and documented.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 2.2.1, 4.1, and Appendix 1
REQUIREMENT 4.2: With the objective of maintaining flexibility in the development of a new tailings facility and optimizing costs while prioritizing safety throughout the tailings facility lifecycle: a) Develop preliminary designs for the tailings facility with external loading design criteria consistent with both the consequence of failure classification selected based on current conditions and higher consequence classifications (including 'Extreme'). b) Informed by the range of requirements defined by the preliminary designs, either: 1. Implement the design for the 'Extreme' consequence classification external loading criteria; or 2. Implement the design for the current consequence classification criteria, or a higher one, and demonstrate that the feasibility, at a proof of concept level, to upgrade to the design for the 'Extreme' classification criteria is maintained throughout the lifecycle of the facility. c) If option b.2 is implemented, review the consequence of failure classification at the time of the Dam Safety Review (DSR) and at least every five years, or sooner if there is a material change in the social, environmental and local economic context, and complete the upgrade of the tailings facility to the new consequence classification as determined by the DSR within three years. This review shall proceed until the facility has been safely closed according to this Standard. d) The process described above shall be reviewed by the Independent Tailings Review Board (ITRB) or the senior independent technical reviewer, as appropriate for the tailings facility consequence classification. Subject to Requirement 4.7, Requirements 4.2.C and 4.2.D shall also apply to existing tailings facilities.		• Not addressed by *TSM* • Addressed by the Canadian Dam Association *Dam Safety Guidelines* and Technical Bulletin: *Application of Dam Safety Guidelines to Mining Dams*
REQUIREMENT 4.3: The Accountable Executive shall take the decision to adopt a design for the current Consequence Classification criteria and to maintain flexibility to upgrade the design for the highest classification criteria later in the tailings facility lifecycle. This decision shall be documented.		• *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3.2 o MAC's requirement provides flexibility for companies of different sizes and corporate structures to develop appropriate approval processes, while ensuring that accountability rests with the Accountable Executive Officer. o In MAC's view, this flexibility is important to achieving the intent of this requirement, particularly given the competencies required to make such critical design decisions. • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
		o A tailings management system provides a mechanism to ensure checks and balances on decision making, and accountability for decisions, including decisions related to design of tailings facilities. o A management review for continual improvement, required annually by *TSM* and reported to the Accountable Executive Officer, is a key mechanism for ensuring accountability, addressing deficiencies, and driving continual improvement.
REQUIREMENT 4.4: Select, explicitly identify and document all design criteria that are appropriate to minimise risk for all credible failure modes for all phases of the tailings facility lifecycle.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 2.2.1, 4.1, 4.6, and Appendices 1 and 6 • May be addressed in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 4.5: Apply design criteria, such as factors of safety for slope stability and seepage management, that consider estimated operational properties of materials and expected performance of design elements, and quality of the implementation of risk management systems. These issues should also be appropriately accounted for in designs based on deformation analyses.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 2.2.1, 4.1, 4.6, and Appendices 1 and 6 • May be addressed in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 4.6: Identify and address brittle failure modes with conservative design criteria, independent of trigger mechanisms, to minimise their impact on the performance of the tailings facility.		• Not addressed by *TSM* • Addressed by the Canadian Dam Association *Dam Safety Guidelines* and Technical Bulletin: *Application of Dam Safety Guidelines to Mining Dams* • May be addressed in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 4.7: Existing tailings facilities shall conform with the Requirements under Principle 4, except for those aspects where the Engineer of Record (EOR), with review by the ITRB or a senior independent technical reviewer, determines that the upgrade of an existing tailings facility is not viable or cannot be retroactively applied. In this case, the Accountable Executive shall approve and document the implementation of measures to reduce both the probability and the consequences of a tailings facility failure in order to reduce the risk to a level as low as reasonably practicable (ALARP). The basis and timing for addressing the upgrade of existing tailings facilities shall be risk-informed and carried out as soon as reasonably practicable.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 2.2.1, 4.1, and Appendix 1 • May be addressed further in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 4.8: The EOR shall prepare a Design Basis Report (DBR) that details the design assumptions and criteria, including operating constraints, and that provides the basis for the design of all phases of the tailings facility lifecycle. The DBR shall be reviewed by the ITRB or senior independent technical reviewer. The EOR shall update the DBR every time there is a material change in the design assumptions, design criteria, design or the knowledge base and confirm internal consistency among these elements.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 4.7.1 and Appendix 6

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
PRINCIPLE 5: Develop a robust design that integrates the knowledge base and minimizes the risk of failure to people and the environment for all stages of the tailings facility lifecycle, including closure and post-closure.		
REQUIREMENT 5.1: For new tailings facilities, incorporate the outcome of the multi-criteria alternatives analysis including the use of tailings technologies in the design of the tailings facility. For expansions to existing tailings facilities, investigate the potential to refine the tailings technologies and design approaches with the goal of minimising risks to people and the environment throughout the tailings facility lifecycle.		• Tailings Guide o Sections 2.2.2, 4.2, and Appendix 3. • May be addressed in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 5.2: Develop a robust design that considers the technical, social, environmental and local economic context, the tailings facility Consequence Classification, site conditions, water management, mine plant operations, tailings operational and construction issues, and that demonstrates the feasibility of safe closure of the tailings facility. The design should be reviewed and updated as performance and site data become available and in response to material changes to the tailings facility or its performance.		• Tailings Guide o Sections 2.2.1, 2.2.2, 2.2.4, 4.2, and Appendices 2 and 3. • May be addressed in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 5.3: Develop, implement and maintain a water balance model and associated water management plans for the tailings facility, taking into account the knowledge base including climate change, upstream and downstream hydrological and hydrogeological basins, the mine site, mine planning and overall operations and the integrity of the tailings facility throughout its lifecycle. The water management programme must be designed to protect against unintentional releases.		• *Tailings Management Protocol*, Indicator 5 o OMS Guide Section 3.3.2.3 o Tailings Guide Appendix 8 • *Water Stewardship Protocol*, Indicator 2
REQUIREMENT 5.4: Address all potential failure modes of the structure, its foundation, abutments, reservoir (tailings deposit and pond), reservoir rim and appurtenant structures to minimise risk to ALARP. Risk assessments must be used to inform the design.		• Tailings Guide o Sections 2.2.1, 4.1, and Appendix 1
REQUIREMENT 5.5: Develop a design for each stage of construction of the tailings facility, including but not limited to start-up, partial raises and interim configurations, final raise, and all closure stages.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 4.7.1 and Appendix 6
REQUIREMENT 5.6: Design the closure phase in a manner that meets all the Requirements of the Standard with sufficient detail to demonstrate the feasibility of the closure scenario and to allow implementation of elements of the design during construction and operation as appropriate. The design should include progressive closure and reclamation during operations.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 4.7.1 and Appendices 6 and 8 o TSM requirements apply to documentation of the closure plan, but do not address specifics of closure design.
REQUIREMENT 5.7: For a proposed new tailings facility classified as 'High', 'Very High' or 'Extreme', the Accountable Executive shall confirm that the design satisfies ALARP and shall approve additional reasonable steps that may be taken downstream, to further reduce potential consequences to people and the environment. The Accountable Executive shall explain and document the decisions with respect to ALARP and additional consequence reduction measures.		<u>For New Tailings Facilities</u> • Tailings Guide o Sections 2.2.1, 4.1, 4.3.2, and Appendix 1
For an existing tailings facility classified as 'High', 'Very High' or 'Extreme', the Accountable Executive, at the time of every DSR or at least every five years, shall confirm that the design satisfies ALARP and shall seek to identify and implement additional reasonable steps that may be taken to further reduce potential consequences to people and the environment. The Accountable Executive shall explain and document the decisions with respect to ALARP and additional consequence reduction measures, in consultation with external parties as appropriate.		<u>For Existing Tailings Facilities</u> • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 2.2.1, 4.1, 6, and 7, and Appendix 1 address risk assessment and management, and performance evaluation (including DSRs and other inspections) • *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3.2 addresses the role of the EoR

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
		o MAC's requirement provides flexibility for companies of different sizes and corporate structures to develop appropriate approval processes, while ensuring that accountability rests with the Accountable Executive Officer. • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 o A tailings management system provides a mechanism to ensure checks and balances on decision making, and accountability for decisions, including decisions related to design of tailings facilities. o A management review for continual improvement, required annually by *TSM* and reported to the Accountable Executive Officer, is a key mechanism for ensuring accountability, addressing deficiencies, and driving continual improvement. • *Tailings Management Protocol*, Indicator 5 o OMS Guide Section 3.5.2 addresses DSRs, but a frequency is not prescribed.
REQUIREMENT 5.8: Where other measures to reduce the consequences of a tailings facility credible failure mode as per the breach analysis have been exhausted, and pre-emptive resettlement cannot be avoided, the Operator shall demonstrate conformance with international standards for involuntary resettlement.		• *Indigenous and Community Relationships Protocol*, Indicator 4 o Indicator requires that: ▪ Processes are in place to engage with COI on the identification, prioritization and avoidance or mitigation of potential and actual adverse impacts related to the facility's activities that directly affect COI. ▪ In prioritizing potential and actual adverse impacts, processes should consider the relevancy of the following on COI: … Environmental adverse impacts that may directly affect communities including those associated with tailings management (as applicable). ▪ Action plans for prioritized impacts have been informed through engagement with relevant COI and are being implemented.
PRINCIPLE 6: Plan, build and operate the tailings facility to manage risk at all phases of the tailings facility lifecycle, including closure and post-closure.		
REQUIREMENT 6.1: Build, operate, monitor and close the tailings facility according to the design intent at all phases of the tailings facility lifecycle, using qualified personnel and appropriate methodology, equipment and procedures, data acquisition methods, the Tailings Management System (TMS) and the overall Environmental and Social Management System (ESMS) for the mine and associated infrastructure.		<u>For new tailings facilities in the initial construction phase</u> • Voluntary application of TSM to new tailings facilities in the initial construction phase would meet this requirement. • May be addressed further in the tailings management component of *TSM* as part of future updates.
		<u>For existing tailings facilities in the operations, closure, or post-closure phases</u> • *Tailings Management Protocol*, all indicators • All aspects of the requirements of the tailings management component of TSM are relevant to meeting this requirement

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
REQUIREMENT 6.2: Manage the quality and adequacy of the construction and operation process by implementing Quality Control, Quality Assurance and Construction vs Design Intent Verification (CDIV). The Operator shall use the CDIV to ensure that the design intent is implemented and is still being met if the site conditions vary from the design assumptions.		<u>For new tailings facilities in the initial construction phase</u> • Voluntary application of *TSM* to new tailings facilities in the initial construction phase would meet this requirement. • May be addressed further in the tailings management component of *TSM* as part of future updates. <u>For existing tailings facilities in the operations, closure, or post-closure phases</u> • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 4.7.1 and 4.8, and Appendix 6 • *Tailings Management Protocol*, Indicator 5 • OMS Guide Sections 3.1.4, 3.3, 3.4, and 3.5
REQUIREMENT 6.3: Prepare a detailed Construction Records Report ('as-built' report) whenever there is a material change to the tailings facility, its infrastructure or its monitoring system. The EOR and the Responsible Tailings Facility Engineer (RTFE) shall sign this report.		<u>For new tailings facilities in the initial construction phase</u> • Voluntary application of *TSM* to new tailings facilities in the initial construction phase would meet this requirement. • May be addressed further in the tailings management component of *TSM* as part of future updates. <u>For existing tailings facilities in the operations, closure, or post-closure phases</u> • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 4.7.1 and Appendix 6 • OMS Guide o Section 3.3, but not reflected in the Table of Conformance
REQUIREMENT 6.4: Develop, implement, review annually and update as required 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 RTFE shall provide access to the OMS Manual and training to all levels of personnel involved in the TMS with support from the EOR.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 4.9, 5.1, and 6. • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 • *Tailings Management Protocol*, Indicator 5 o OMS Guide all sections
REQUIREMENT 6.5: Implement a formal change management system that triggers the evaluation, review, approval and documentation of changes to design, construction, operation or monitoring during the tailings facility lifecycle. The change management system shall also include the requirement for the EOR to prepare a periodic Deviance Accountability Report (DAR), that provides an assessment of the cumulative impact of the changes on the risk level of the as-constructed facility. The DAR shall provide recommendations for managing risk, if necessary, and any resulting updates to the design, DBR, OMS and the monitoring programme. The DAR shall be approved by the Accountable Executive.		Managing change is integral to the management systems approach described in the Tailings Guide. A tailings management system is a mechanism to manage change, and a separate "formal change management system" would be redundant. • *Tailings Management Protocol*, Indicator 2 o Sections 4.6, 4.7.1, 6, and 7, and Appendix 6 • *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3.2 addresses the role of the Accountable Executive Officer

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
		o TSM does not specify that the DAR must be approved by the Accountable Executive Officer. o MAC's requirement provides flexibility for companies of different sizes and corporate structures to develop appropriate approval processes, while ensuring that accountability rests with the Accountable Executive Officer. o In MAC's view, this flexibility is important to achieving the intent of this requirement, particularly given the competencies required to approve a detailed technical document such as a DAR. • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 o A tailings management system provides a mechanism to ensure checks and balances on decision making, and accountability for decisions. o A management review for continual improvement, required annually by *TSM* and reported to the Accountable Executive Officer, is a key mechanism for ensuring accountability, addressing deficiencies, and driving continual improvement. • *Tailings Management Protocol, Indicator 5* o OMS Guide Section 2.2.3 and many other sections throughout the Guide
REQUIREMENT 6.6: Include new and emerging technologies and approaches and use the evolving knowledge in the refinement of the design, construction and operation of the tailings facility.		• *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7
PRINCIPLE 7: Design, implement and operate monitoring systems to manage risk at all phases of the facility lifecycle, including closure		
REQUIREMENT 7.1: Design, implement and operate a comprehensive and integrated performance monitoring programme for the tailings facility and its appurtenant structures as part of the TMS and for those aspects of the ESMS related to the tailings facility in accordance with the principles of Adaptive Management.		A surveillance program is integral to developing and implementing an OMS manual (R6.4). *TSM* does not have a separate requirement for a monitoring program since this is redundant. • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 4.9, 5.1, and 6 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 • *Tailings Management Protocol*, Indicator 5 o OMS Guide Section 3.5

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
REQUIREMENT 7.2: Design, implement and operate a comprehensive and integrated engineering monitoring system that is appropriate for verifying design assumptions and for monitoring potential failure modes. Full implementation of the Observational Method shall be adopted for non-brittle failure modes.		A surveillance program is integral to developing and implementing an OMS manual (R6.4). *TSM* does not have a separate requirement for a monitoring program or system since this is redundant. In addition, *TSM* places a strong emphasis on the development and implementation of critical controls are consistent with the Observational Method. • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 2.2.1, 4.1, 4.9, 5.1, 5.2, and 6 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 • *Tailings Management Protocol*, Indicator 5 o OMS Guide Sections 2.2.2, 2.3, 3.1.1, 3.3, 3.4, 3.5, and 4, and Appendices 2 and 3.
Brittle failure modes are addressed by conservative design criteria.		<u>For facilities with brittle failure modes</u> • Not addressed by *TSM* • Addressed by the Canadian Dam Association *Dam Safety Guidelines* and Technical Bulletin: *Application of Dam Safety Guidelines to Mining Dams* • May be addressed in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 7.3: Establish specific and measurable performance objectives, indicators, criteria, and performance parameters and include them in the design of the monitoring programmes that measure performance throughout the tailings facility lifecycle. Record and evaluate the data at appropriate frequencies. Based on the data obtained, update the monitoring programmes throughout the tailings facility lifecycle to confirm that they remain effective to manage risk.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 4.1, 4.2, 4.9, 5.1, 5.2, and 6 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 • *Tailings Management Protocol*, Indicator 5 o OMS Guide, particularly in Sections 2.1, 2.2, 2.3, 3.3, 3.4, and 3.5
REQUIREMENT 7.4: Analyse technical monitoring data at the frequency recommended by the EOR, and assess the performance of the tailings facility, clearly identifying and presenting evidence 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, if required. Performance outside the expected ranges shall be addressed promptly through Trigger Action Response Plans (TARPs) or critical controls.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 2.2.1, 4.1, 4.9, 5.1, 5.2, and 6 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 *Tailings Management Protocol*, Indicator 5 o OMS Guide Sections 2.2.2, 2.3, 3.1.1, 3.3, 3.4, 3.5, and 4, and Appendices 2 and 3

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
REQUIREMENT 7.5: Report the results of each of the monitoring programmes at the frequency required to meet company and regulatory requirements and, at a minimum, on an annual basis. The RTFE and the EOR shall review and approve the technical monitoring reports.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 6 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 o A tailings management system provides a mechanism to ensure checks and balances on decision making, and accountability for decisions. o A management review for continual improvement, required annually by *TSM* and reported to the Accountable Executive Officer, is a key mechanism for ensuring accountability, addressing deficiencies, and driving continual improvement. *Tailings Management Protocol*, Indicator 5 o OMS Guide Sections 2.3 and 3.5
TOPIC IV: MANAGEMENT AND GOVERNANCE		
PRINCIPLE 8: Establish policies, systems and accountabilities to support the safety and integrity of the tailings facility.		
REQUIREMENT 8.1: The Board of Directors shall adopt and publish a policy on or commitment to the safe management of tailings facilities, to emergency preparedness and response, and to recovery after failure.		• *Tailings Management Protocol*, Indicator 1 o Tailings Guide Section 3
REQUIREMENT 8.2: Establish a tailings governance framework and a performance based TMS and ensure that the ESMS and other critical systems encompass relevant aspects of the tailings facility management.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide all sections • *Tailings Management Protocol*, Indicator 5 • OMS Guide sections 2.2 and 2.4.3
Requirement 8.3: For roles with responsibility for tailings facilities, develop mechanisms such that incentive payments or performance reviews are based, at least in part, on public safety and the integrity of the tailings facility. These incentive payments shall reflect the degree to which public safety and the integrity of the tailings facility are part of the role. Long-term incentives for relevant executive managers should take tailings management into account.		• Not addressed by *TSM*
REQUIREMENT 8.4: Appoint one or more Accountable Executives who is/are directly answerable to the CEO on matters related to this Standard. The Accountable Executive(s) shall be accountable for the safety of tailings facilities and for avoiding or minimising the social and environmental consequences of a tailings facility failure. The Accountable Executive(s) shall also be accountable for a programme of tailings management training, and for emergency preparedness and response. The Accountable Executive(s) must have scheduled communication with the EOR and regular communication with the Board of Directors, which can be initiated either by the Accountable Executive(s), or the Board. The Board of Directors shall document how it holds the Accountable Executive(s) accountable.		• *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3.2 • No specific requirement to document how the Accountable Executive Officer is held accountable. • May be addressed further in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 8.5: Appoint a site-specific Responsible Tailings Facility Engineer (RTFE) who is accountable for the integrity of the tailings facility, who liaises with the EOR and internal teams such as operations, planning, regulatory affairs, social performance and environment, and who has regular two-way communication with the Accountable Executive. The RTFE must be familiar with the DBR, the design report and the construction and performance of the tailings facility.		• *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3.3

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
REQUIREMENT 8.6: Identify appropriate qualifications and experience requirements for all personnel who play safety-critical roles in the operation of a tailings facility, including, but not limited to the RTFE, the EOR and the Accountable Executive. Ensure that incumbents of these roles have the identified qualifications and experience, and develop succession plans for these personnel.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 4.11 • *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3 • *Tailings Management Protocol*, Indicator 5 o OMS Guide Section 2.5, 3.1.6, 3.4, and 3.5
REQUIREMENT 8.7: For tailings facilities with Consequence Classification of 'Very High' or 'Extreme', appoint an Independent Tailings Review Board (ITRB). For all other facilities, the Operator may appoint a senior independent technical reviewer. The ITRB or the reviewer shall be appointed early in the project development process, report to the Accountable Executive and certify in writing that they follow best practices for engineers in avoiding conflicts of interest.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 2.2.3, 8 and Appendix 4, with many other references to Independent Review throughout the Guide • The Tailings Guide does not prescribe the nature of Independent Review based on consequence classification. Rather, it provides guidance to consider risk in identifying required competencies of reviewers, and the composition of an Independent Review body.
PRINCIPLE 9: Appoint and empower an Engineer of Record.		
REQUIREMENT 9.1: Engage an engineering firm with expertise and experience in the design and construction of tailings facilities of comparable complexity to provide EOR services for operating the tailings facility and for closed facilities with 'High', 'Very High' and 'Extreme' Consequence Classification, that are in the active closure phase. Require that the firm nominate a senior engineer, approved by the Operator, to represent the firm as the EOR, and verify that the individual has the necessary experience, skills and time to fulfil this role. Alternatively, the Operator may appoint an in-house engineer with expertise and experience in comparable facilities as the EOR. In this instance, the EOR may delegate the design to a firm ('Designer of Record') but shall remain thoroughly familiar with the design in discharging their responsibilities as EOR. Whether the EOR or the DOR is in-house or external, they must be competent and have experience appropriate to the Consequence Classification and complexity of the tailings facility.		• *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3.4
REQUIREMENT 9.2: Empower the EOR through a written agreement that clearly describes their authority, role and responsibilities throughout the tailings facility lifecycle, and during change of ownership of mining properties. The written agreement must clearly describe the obligations of the Operator to the EOR, to support the effective performance of the EOR.		• *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3.4
REQUIREMENT 9.3: Establish and implement a programme to manage the quality of all engineering work, the interactions between the EOR, the RTFE and the Accountable Executive, 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.		This is the function of a tailings management system. A separate program is not needed. • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 6 • *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3 *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
REQUIREMENT 9.4: Given its potential impact on the risks associated with a tailings facility, the selection of the EOR shall be decided by the Accountable Executive and informed, but not decided, by procurement personnel.		• *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3.2 o MAC's requirement provides flexibility for companies of different sizes and corporate structures to develop appropriate approval processes, while ensuring that accountability for ensuring that the EoR has the appropriate competencies and experience rests with the Accountable Executive Officer. o In MAC's view, this flexibility is important to achieving the intent of this requirement, while ensuring that procedures for selecting the EoR are consistent with corporate policies and procedures for procurement or hiring.
REQUIREMENT 9.5: Where it becomes necessary to change the EOR (whether a firm or an inhouse employee), develop a detailed plan for the comprehensive transfer of data, information, knowledge and experience with the construction procedures and materials.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 4.6
PRINCIPLE 10: Establish and implement levels of review as part of a strong quality and risk management system for all phases of the tailings facility lifecycle, including closure		
REQUIREMENT 10.1: Conduct and update risk assessments with a qualified multi-disciplinary team using best practice methodologies at a minimum every three years and more frequently whenever there is a material change either to the tailings facility or to the social, environmental and local economic context. Transmit risk assessments to the ITRB or senior independent technical reviewer for review, and address with urgency all unacceptable tailings facility risks.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 2.2.1, 4.1, 6 and Appendix 1 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7
REQUIREMENT 10.2: Conduct regular reviews of the TMS and of the components of the ESMS that refer to the tailings facility to assure the effectiveness of the management systems. Document and report the outcomes to the Accountable Executive, Board of Directors and project-affected people. The review shall be undertaken by senior technical reviewers with the appropriate qualifications, expertise and resources. For tailings facilities with 'High', 'Very High' or 'Extreme' Consequence Classification, conduct the review at least every three years.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guides Sections 6 and 8 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7
REQUIREMENT 10.3: Conduct internal audits to verify consistent implementation of company procedures, guidelines and corporate governance requirements consistent with the TMS and aspects of the ESMS developed to manage tailings facility risks.		• *Tailings Management Protocol*, all indicators o Internal audits required to achieve level A for all indicators
REQUIREMENT 10.4: The EOR or senior independent technical reviewer shall conduct tailings facility construction and performance reviews annually or more frequently, if required.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guides Sections 6 and 8 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 • *Tailings Management Protocol*, Indicator 5 o OMS Guide Section 3.5
REQUIREMENT 10.5: Conduct an independent DSR at least every five years for tailings facilities with 'Very High' or 'Extreme' Consequence Classifications and at least every 10 years for all other facilities. For tailings facilities with complex conditions or performance, the ITRB may recommend more frequent DSRs. The DSR shall include technical, operational and governance aspects of the tailings facility and shall be completed according to best practices. The DSR contractor cannot conduct consecutive DSRs on the same tailings facility and shall certify in writing that they follow best practices for engineers in avoiding conflicts of interest.		• *Tailings Management Protocol*, Indicator 5 o OMS Guide Section 3.5 - does not prescribe frequency of DSRs and does not prescribe who can do DSRs o The scope of a DSR as described in this requirement includes governance which may be effectively addressed using other assurance mechanisms

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
REQUIREMENT 10.6: For tailings facilities with 'Very High' or 'Extreme' Consequence Classifications, the ITRB, reporting to the Accountable Executive shall provide ongoing senior independent review of the planning, siting, design, construction, operation, water and mass balance, maintenance, monitoring, performance and risk management at appropriate intervals across all phases of the tailings facility lifecycle. For tailings facilities with other Consequence Classifications, this review can be done by a senior independent technical reviewer.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guides Sections 6 and 8 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7
REQUIREMENT 10.7: The amount of estimated costs for planned closure, early closure, reclamation, and post-closure of the tailings facility and its appurtenant structures shall be reviewed periodically to confirm that adequate financial capacity (including insurance, to the extent commercially reasonable) is available for such purposes throughout the tailings facility lifecycle, and the conclusions of the review shall be publicly disclosed annually. Disclosure may be made in audited financial statements or in public regulatory filings. Subject to the provisions of local or national regulations on this matter, Operators shall use best efforts to assess and take into account the capability of an acquirer of any of its assets involving a tailings facility (through merger, acquisition, or other change in ownership) to maintain this Standard for the tailings facility lifecycle.		• Not addressed by *TSM*
PRINCIPLE 11: Develop an organizational culture that promotes learning, communication and early problem recognition.		
REQUIREMENT 11.1: Educate personnel who have a role in any phase of the tailings facility lifecycle about how their job procedures and responsibilities relate to the prevention of a failure.		• *Tailings Management Protocol*, Indicator 1 o Tailings Guide Section 3 • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 4.11 • *Tailings Management Protocol*, Indicator 5 o OMS Guide Sections 2.5 and 3.1.6
REQUIREMENT 11.2: Establish mechanisms that incorporate workers' experience-based knowledge into planning, design and operations for all phases of the tailings facility lifecycle.		• *Tailings Management Protocol*, Indicator 5 o OMS Guide Sections 2.1.2 and 2.4
REQUIREMENT 11.3: Establish mechanisms that promote cross-functional collaboration to ensure effective data and knowledge sharing, communication and implementation of management measures to support public safety and the integrity of the tailings facility.		This is one of the functions of a tailings management system • *Tailings Management Protocol*, Indicator 2 o Tailings Guide, particularly in Sections 4.1, 4.11, 5, and 6 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7 • *Tailings Management Protocol*, Indicator 5 o OMS Guide Section 2.4 and 3.1.1
REQUIREMENT 11.4: Identify and implement lessons from internal incident investigations and relevant external incident reports, paying particular attention to human and organisational factors.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 6
REQUIREMENT 11.5: Establish mechanisms that recognise, reward and protect from retaliation, employees and contractors who report problems or identify opportunities for improving tailings facility management. Respond in a timely manner and communicate actions taken and their outcomes.		• *Indigenous and Community Relationships Protocol*, Indicator 5 • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 4.11 o Requirements address protection from retaliation but do not address mechanisms to recognize or reward employees and contracts who report problems.

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
		• *Site-Level Grievance and Community Response Mechanisms*
PRINCIPLE 12: Establish a process for reporting and addressing concerns and implement whistleblower protections.		
REQUIREMENT 12.1: The Accountable Executive shall establish a formal, confidential and written process to receive, investigate and promptly address concerns from employees and contractors about possible permit violations or other matters relating to regulatory compliance, public safety, tailings facility integrity or the environment.		• *Indigenous and Community Relationships Protocol*, Indicator 5 • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 4.11 • *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3.2 o MAC's requirement provides flexibility while ensuring that accountability rests with the Accountable Executive Officer, particularly regarding Owners that already have such processes in place which can be applied to tailings but are not specific to tailings. o In MAC's view, this flexibility is important to achieving the intent of this requirement, while avoiding overlap or duplication of existing processes for which a different corporate executive is accountable. • *Site-Level Grievance and Community Response Mechanisms*
REQUIREMENT 12.2: In accordance with international best practices for whistleblower protection, the Operator shall not discharge, discriminate against, or otherwise retaliate in any way against a whistleblower who, in good faith, has reported possible permit violations or other matters relating to regulatory compliance, public safety, tailings facility integrity or the environment.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 4.11 • *Tailings Management Protocol*, Indicator 3 o Tailings Guide Section 4.3.2 • *Site-Level Grievance and Community Response Mechanisms*
TOPIC V: EMERGENCY RESPONSE AND LONG-TERM RECOVERY		
PRINCIPLE 13: Prepare for emergency response to tailings facility failures.		
REQUIREMENT 13.1: As part of the TMS, use best practices and emergency response expertise to prepare and implement a site-specific tailings facility Emergency Preparedness and Response Plan (EPRP) based on credible flow failure scenarios and the assessment of potential consequences. Test and update the EPRP at all phases of the tailings facility lifecycle at a frequency established in the plan, or more frequently if triggered by a material change either to the tailings facility or to the social, environmental and local economic context. Meaningfully engage with employees and contractors to inform the EPRP, and co-develop community-focused emergency preparedness measures with project-affected people.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 5.2 and 6 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7
REQUIREMENT 13.2: Engage with public sector agencies, first responders, local authorities and institutions and take reasonable steps to assess the capability of emergency response services to address the hazards identified in the tailings facility EPRP, identify gaps in capability and use this information to support the development of a collaborative plan to improve preparedness.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 5.2 and 6 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7
REQUIREMENT 13.3: Considering community-focused measures and public sector capacity, the Operator shall take all reasonable steps to maintain a shared state of readiness for tailings facility credible flow failure scenarios by securing resources and carrying out annual training and exercises. The Operator shall conduct emergency response simulations at a frequency established in the EPRP but at least every 3 years for tailings facilities with potential loss of life.		• *Tailings Management Protocol*, Indicator 2 o Tailings Guide Sections 5.2 and 6 • *Tailings Management Protocol*, Indicator 4 o Tailings Guide Section 7

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
REQUIREMENT 13.4: In the case of a catastrophic tailings facility failure, provide immediate response to save lives, supply humanitarian aid and minimise environmental harm.		This requirement cannot be fully met unless a catastrophic failure occurs. • *Tailings Management Protocol*, Indicator 1 o Tailings Guide Section 3 • *Tailings Management Protocol*, Indicator 2 o Tailings Guide Section 5.2 • MAC requirements are focused on taking a proactive approach of ensuring that plans are in place and that Owners maintain a state of readiness to respond if an emergency occurs.
PRINCIPLE 14: Prepare for long term recovery in the event of catastrophic failure.		
REQUIREMENT 14.1: Based on tailings facility credible flow failure scenarios and the assessment of potential consequences, take reasonable steps to meaningfully engage with public sector agencies and other organisations that would participate in medium- and long-term social and environmental post-failure response strategies.		• *Indigenous and Community Relationships Protocol*, Indicator 4
REQUIREMENT 14.2: In the event of a catastrophic tailings facility failure, assess social, environmental and local economic impacts as soon as possible after people are safe and short-term survival needs have been met.		This requirement cannot be fully met unless a catastrophic failure occurs. • *Indigenous and Community Relationships Protocol, Indicator 4* • May be addressed further in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 14.3: In the event of a catastrophic tailings facility failure, work with public sector agencies and other stakeholders to develop and implement reconstruction, restoration and recovery plans that address the medium- and long-term social, environmental and local economic impacts of the failure. The plans shall be disclosed if permitted by public authorities.		This requirement cannot be fully met unless a catastrophic failure occurs. • *Indigenous and Community Relationships Protocol*, Indicator 4 • May be addressed further in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 14.4: In the event of a catastrophic tailings facility failure, enable the participation of affected people in reconstruction, restoration and recovery works and ongoing monitoring activities.		This requirement cannot be fully met unless a catastrophic failure occurs. • *Indigenous and Community Relationships Protocol*, Indicator 4 • May be addressed further in the tailings management component of *TSM* as part of future updates.
REQUIREMENT 14.5: Facilitate the monitoring and public reporting of post-failure outcomes that are aligned with the thresholds and indicators outlined in the reconstruction, restoration and recovery plans and adapt activities in response to findings and feedback.		This requirement cannot be fully met unless a catastrophic failure occurs. • *Indigenous and Community Relationships Protocol*, Indicator 4 • May be addressed further in the tailings management component of *TSM* as part of future updates.

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
TOPIC VI: PUBLIC DISCLOSURE AND ACCESS TO INFORMATION		
PRINCIPLE 15: Publicly disclose and process access to information about the tailings facility to support public accountability.		
REQUIREMENT 15.1: Publish and regularly update information on the Operator's commitment to safe tailings facility management, implementation of its tailings governance framework, its organisation-wide policies, standards or approaches to the design, construction, monitoring and closure of tailings facilities. A. For new tailings facilities for which the regulatory authorisation process has commenced, or that are otherwise approved by the Operator, the Operator shall publish and update, in accordance with Principle 21 of the UNGP, the following information: 1. A plain language summary of the rationale for the basis of the design and site selected as per the multi-criteria alternatives analysis, impact assessments, and mitigation plans (Information may be obtained from the output of multiple Requirements including, but not limited to, Requirements 3.2, 3.3, 5.1, 5.3, 6.4, 6.6, 7.1 and 10.1); and 2. The Consequence Classification. (Requirement 4.1). B. For each existing tailings facility and in accordance with Principle 21 of the UNGP, the Operator shall publish and update at least on an annual basis, the following information: 1. A description of the tailings facility (information may be obtained from the output of Requirements 5.5 and 6.4); 2. The Consequence Classification (Requirement 4.1); 3. A summary of risk assessment findings relevant to the tailings facility (Information may be obtained from the output of Requirement 10.1); 4. A summary of impact assessments and of human exposure and vulnerability to tailings facility credible flow failure scenarios (Information may be obtained from the output of Requirements 2.4 and 3.3); 5. A description of the design for all phases of the tailings facility lifecycle including the current and final height (Information may be obtained from the output of Requirement 5.5); 6. A summary of material findings of annual performance reviews and DSR, including implementation of mitigation measures to reduce risk to ALARP (Information may be obtained from output of Requirements 10.4 and 10.5); 7. A summary of material findings of the environmental and social monitoring programme including implementation of mitigation measures (Requirement 7.5); 8. A summary version of the tailings facility EPRP for facilities that have a credible failure mode(s) that could lead to a flow failure event that: (i) is informed by credible flow failure scenarios from the tailings facility breach analysis; (ii) includes emergency response measures that apply to project affected people as identified through the tailings facility breach analysis and involve cooperation with public sector agencies;		• *Indigenous and Community Relationships Protocol*, Indicator 4 • May be addressed further in the tailings management component of *TSM* as part of future updates.

Requirements in Standard	TSM Equivalency	Relevant *TSM* Protocols and Guidance
and (iii) excludes details of emergency preparedness measures that apply to the Operator's assets, or confidential information (Requirements 13.1 and 13.2); 9. Dates of most recent and next independent reviews (Requirement 10.5); and 10. Annual confirmation that the Operator has adequate financial capacity (including insurance to the extent commercially reasonable) to cover estimated costs of planned closure, early closure, reclamation, and post-closure of the tailings facility and its appurtenant structures (Requirement 10.7). Such disclosures shall be made directly, unless subject to limitations imposed by regulatory authorities. C. Provide local authorities and emergency services with sufficient information derived from the breach analysis to enable effective disaster management planning (Information may be obtained from the output of Requirement 2.3)		
REQUIREMENT 15.2: Respond in a systematic and timely manner to requests from interested and affected stakeholders for additional information material to the public safety and integrity of a tailings facility. When the request for information is denied, provide an explanation to the requesting stakeholder.		• *Indigenous and Community Relationships Protocol*, Indicator 5
REQUIREMENT 15.3: Commit to cooperate in credible global transparency initiatives to create standardised, independent, industry-wide and publicly accessible databases, inventories or other information repositories about the safety and integrity of tailings facilities.		Not addressed by *TSM*