



## **Public Disclosure Regarding Boliden's Tailings Management Framework**

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## I. INTRODUCTION

Boliden has committed to apply the Global Industry Standard on Tailings Management (GISTM), adopted by the International Council for Mining and Metals (ICMM) in 2020, setting a precedent for the safe management of tailings facilities, towards the goal of zero harm (the “Standard” or “GISTM”).

The Standard contains 77 specific requirements that need to be fulfilled to be in full compliance with the Standard. The Standard also requires that adhering members annually issue a status report on their implementation of and compliance with the requirements to support public accountability. In accordance herewith, Boliden as the operator of its tailings facilities is to publish and regularly update information on its commitment to safe tailings facility management, implementation of its tailings governance framework, its organization-wide policies, standards and approaches to the design, construction, monitoring and closure of its tailings facilities.

In accordance with the above, Boliden has published this document providing a general description of Boliden’s tailings and dam safety management, supplemented by site specific disclosure documents for the Aitik and Kevitsa tailings facilities.

Existing and new tailings facilities are defined by the Standard as:

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

*For the purposes of the Standard, tailings facilities are higher than 2.5 m measured from the elevation of the crest to the elevation of the toe of the structure or have a combined water and solids volume more than 30,000 m<sup>3</sup>, unless the Consequence Classification is ‘High’, ‘Very High’ or ‘Extreme’, in which case the structure is considered a tailings facility regardless of its size.*

*For the purposes of this Standard, existing tailings facilities are facilities that are accepting new mine tailings on the date that the Standard takes effect or not currently accepting new mine tailings but are not in a state of safe closure. All other facilities will be treated as New for the purposes of this Standard.”*

## **1 COMMITMENT TO SAFE TAILINGS FACILITY MANAGEMENT**

Boliden has, as a member of the International Council on Mining & Metals (“ICMM”), committed to implement the Global Industry Standard on Tailings Management (ICMM, UNEP, PRI, 2020) as well as all ICMM’s mining principles, to all its operations, independent of location.

Furthermore, Boliden has, as a member of the Swedish Association of Mines, Metal and Mineral producers (“Svemin”), committed to conform to GruvRIDAS (Svemin, 2021), which defines guidelines for dam safety for the Swedish mining industry member companies.

In addition, Boliden Kevitsa Mining OY has, as a member of the Finnish Mining Association (“Finmin”), committed to conform to the Towards Sustainable Mining initiative, under the lead of Mining Association of Canada.

Boliden has adopted a Tailings Governance Commitment, specifically focusing on the safe management of tailings facilities, emergency preparedness and response and recovery after failure. This commitment is available at Boliden’s external web and clarifies Boliden’s commitment to:

- Accountability, Responsibility and Competence
- Proper Planning and Resourcing
- Effective Risk and Change Management
- Comprehensive Emergency Preparedness and Swift Response
- Regular, Competent Review and Assurance

In addition, Boliden has adopted the following policies and commitments:

- Environmental Policy
- Water Management Commitment
- Climate Commitment
- Biodiversity Commitment
- Indigenous People Commitment
- Human Rights Commitment
- Whistleblower Policy
- Code of Conduct

Boliden is committed to transparent communication with our stakeholders and have established mechanisms, easily accessible via Boliden’s intranet (GRIA) and external web (Stakeholder Feedback Portal), for receiving and addressing grievances from affected persons and other stakeholders.

## **2 CONSEQUENCE CLASSIFICATION**

In order to ensure international good practice, Boliden has, assisted by external experts, developed an internal guideline “*Dam Breach Assessment and GISTM Consequence Classification*” to provide the basis for the GISTM consequence classification and how to conduct dam breach assessments. The guideline applies to Boliden’s tailings facilities and includes instructions for how dam breach analysis should influence emergency preparedness and response plans.

Part one of the internal guideline provides guidance for how to assess a potential catastrophic dam failure, including how to consider flowable materials at the tailings facilities and how to simulate the outflowing material. Part two of the guideline concerns consequence classification according to the GISTM and describes the process on how to assess the consequences of a potential dam failure in relation to the five incremental loss categories defined in the Standard.

In addition to the GISTM consequence classification, Boliden also classifies the tailings facilities according to national legislation and regulatory requirements.

Boliden’s tailings facilities consequence classifications and dam breach assessments shall be reviewed at a minimum every five years, or in connection with a material change either to the tailings facility or the physical area impacted by a potential dam breach.

## **3 RISK MANAGEMENT**

Boliden has, assisted by external experts, developed an internal instruction for risk management related to failures of tailings facilities. The instruction has been aligned with international good practices as defined in the ICMM’s Good Practice Guide, the SME Tailings Management Handbook as well as Svemin’s GruvRIDAS.

To achieve resilient and effective risk management at the tailings facilities, risk management is an integrated part of planning, design, operation, workplace culture and administrative systems. Identification, control, verification and mitigation of risks associated with the tailings facility is essential for the integrity of the facility, meaning:

- Risks can be both technical, human, and organizational factors.
- Risk controls and their associated verification activities shall be identified based on failure modes and their associated consequences and evaluated on a tailings facility specific basis considering all phases of the tailings facility life cycle. Suitably qualified and experienced experts shall be involved in the tailings facility risk identification and analysis, as well as in the development and review of effectiveness of the associated controls.

- Performance criteria shall be established for risk controls and their monitoring, reporting and verification activities.
- Identified risks shall be prioritized and mitigated to reduce the risk of failure as low as reasonably practicable (ALARP).

Risks can be reduced by reducing the potential consequences or likelihood of occurrence through adjustments of the design, operation, maintenance and surveillance activities. This includes, but is not limited to, altered constructions, additional preventive and mitigative controls.

While risk management is continuous work, site-specific risk assessments shall be conducted and/or reviewed by a qualified multidisciplinary team at a minimum every of three years, and more frequently whenever there is a material change to the tailings facility or the physical area impacted by a potential dam breach.

## **4 IMPACT ASSESSMENT**

An environmental and social impact assessment is to describe and assess the environmental, social and socio-economic consequences, both direct and indirect from the overall mine activities including the tailings facility. The aim has been to present the current state of knowledge about the environmental, social and socio-economic conditions in the vicinity of the mining area and how the mine has affected these. The knowledge compilation must also be able to be used as a basis for future activities in the vicinity of the mine.

As stated in Bolidens internal guideline “*Dam Breach Assessment and GISTM Consequence Classification*” the dam breach analysis shall continuously be updated for all tailings facilities. The results from the analysis shall be used to identify the groups most at risk, as well as to assess and document potential human exposure and vulnerability to tailings facility credible failure scenarios. This includes, but is not limited to, assessments related to social, environmental, and local economic impacts of a potential failure throughout the lifecycle of a facility.

As an example, to study the tailings facilities impact on social aspects, a survey can be carried out among local residents. The survey is conducted with the aim of deepening and broadening the understanding of the impact on society and local residents. Socio-economic aspects have been studied through the analysis of statistics regarding, for example, population and the labor market.

The impact assessment must be updated at least every five years or when there is a material change in the tailings facility or in the surroundings regarding social, environmental or economic aspects.

## **5 TAILINGS FACILITY DESIGN APPROACH**

Boliden is committed to safety during the whole tailings facility lifecycle, with zero tolerance for human fatalities and strive for zero harm to people and the environment. To conform to this commitment Boliden continuously works on reviewing and improving the internal tailings management and the environmental and social management systems.

Boliden's Tailings and Dam Safety Management system defines the approach for tailings facility design, construction, operation, closure, and post closure. This includes an integrated life of mine planning, involving integration of planning for ore extraction and processing, sitewide water management, management of all mine waste (waste rock, tailings), as well as planning for mine closure.

Conforming to Boliden's internal standard allows not only compliance with regulatory requirements, license and operating conditions, but also for conformance to international good practice as defined by relevant industry bodies, such as ICMM, Mining Association of Canada (MAC), International Commission on Large Dams (ICOLD), etc.

## **6 PERFORMANCE REVIEWS**

In order for effectiveness and risk management related to tailings facilities to be comprehensively assessed and continually improved, Boliden requires internal management reviews and tailings facility performance reviews to be conducted.

The annual management review focuses primarily on the organization's compliance with management systems, including the ones for tailings and dam safety and environmental and social management system. The annual performance review is more specifically focused on tailings management, with main focus on the following key areas:

- Design and construction
- Operation, maintenance, and surveillance
- Risk and change management
- Emergency preparedness and response
- Organizational capacity and resourcing
- Audit and review

## **7 ENVIRONMENTAL AND SOCIAL MONITORING PROGRAMME**

The objective of the Environmental and Social Monitoring Programme is to outline actions for minimizing or eliminating potential negative impacts and for monitoring the application and performance of mitigation measures.

The environmental performance of the tailings facility shall be monitored according to a site specific established environmental monitoring program, which is approved by the supervising environmental authority.

Review of the environmental and social monitoring program is done according to the environmental and social risks and impacts related to the tailings facilities and compliance requirements stated in the site-specific environmental permit.

## **8 EMERGENCY PREPAREDNESS RESPONSE PLAN (EPRP)**

To achieve a uniform emergency preparedness, with structure and method ensuring a robust and effective approach dealing with emergencies, Boliden has an internal requirement and an internal guideline to describe all elements involved in the development of emergency preparedness procedures. The basis for achieving this is adapting procedures to reflect the local conditions at each tailings facility.

Each tailings facility shall establish and maintain emergency preparedness procedures that can be put into practice in the event of an emergency and correspond to emergency preparedness for Boliden as a whole.

The minimum requirements for emergency preparedness and response plan at all tailings facilities are:

- The emergency preparedness must be designed to handle accidents and incidents identified by locally conducted risk assessments.
- The local emergency preparedness organization must be assigned sufficient resources and predefined roles with descriptions of areas of responsibility and activities. Locally adapted checklists and support are to be created for these roles. Redundancy in the local emergency preparedness organization is an important aspect designed to safeguard the function.
- Being able to handle an emergency effectively requires a dedicated management location specifically prepared for the purpose. The work at this location must be documented during an emergency, preferably in a logbook.
- An analysis must be carried out of the relevant equipment and materials that may be required during an emergency.
- Procedures for alerting the necessary resources and public services, and for sharing information internally in the event of an emergency, must be put in place.
- Sufficient resources for psychosocial care of affected staff must be ensured.



- It is important that all the above requirements to be continuously maintained, that a training plan is in place and that the necessary expertise has been safeguarded through training.

The emergency preparedness instruction includes checklists to support the people who hold key roles for emergency preparedness planning.

In the event of a dam failure Boliden has developed a recovery plan instruction to assist and accelerate the clean-up and remediation work at any of Boliden's operations. Such recovery work will be initiated after the immediate danger is over, that is, after everyone involved has been brought to safety and their immediate needs have been met.

## **9 INDEPENDENT REVIEWS**

Boliden has appointed independent reviewers for all tailings facilities, where Independent Tailings Review Board (ITRB) has been appointed for facilities in GISTM consequence class Extreme and Very High, while senior independent technical reviewers (IR) have been appointed the tailings facilities with lower consequence classes.

The objective for an ITRB as well as for an IR is to review the tailings and dam safety management throughout the tailings facility life cycle and to provide recommendations to Boliden's accountable and responsible persons for improving the effectiveness of the tailings and dam safety management system and give opinions about risks and status of the tailings facilities. The review scope includes review of the policies, commitments, tailings and dam safety management system, knowledge base, tailings procedures, tailings facility design, construction, operation, closure planning and post closure management.

Another key component of Boliden's independent review is to conduct Dam Safety Reviews (DSR) consistent with international good practices such as Canadian Dam Association (CDA) in its 2016 Technical Bulletin Dam Safety Reviews.

DSRs are detailed processes that involve a review of governance as well as the integrity of the facility. The review is led by a qualified professional engineer with support and input from other technical specialists from relevant disciplines.

## **10 RECLAMATION SECURITIES AND OTHER FINANCIAL SAFEGUARDS**

Mining operations, including tailings management, are subject to court/authority approved environmental permits, including the posting of mandatory reclamation securities, usually in the form of bank guarantees. These securities are intended to

make sure that the operator has sufficient financial capacity to cover estimated costs of planned closure, early closure, reclamation, and post-closure of the tailings facility and its appurtenant structures. In addition, insurance is used to cover sudden and unexpected tailings related incidents.

Boliden’s current provisions for reclamation works, can be found in its Annual and Sustainability Report.

## 11 IMPLEMENTATION OF THE GLOBAL INDUSTRY STANDARD ON TAILINGS MANAGEMENT

To support its member companies, ICMM has provided Conformance Protocols clarifying the criteria for how to fully demonstrate conformance to the Standard.

Conformance is assessed referring to all the Requirements and all the Criteria in the ICMM Conformance Protocols, using the conformance level descriptions given in **Table 1** below. Evidence of conformance include existence of steering documents, adherence to steering through existence of resulting documents, process reports and records.

**Table 1 Description of conformance levels (ICMM, Conformance Protocols)**

Conformance level	Description of outcome
<b>Meets</b>	Systems and/or practices related to the Requirement have been implemented and there is sufficient evidence to demonstrate that the Requirement is being met.
<b>Partially Meets</b>	Systems and/or practices related to meeting the Requirement have been only partially implemented. Gaps or weaknesses persist that may contribute to an inability to meet the Requirement, or insufficient verifiable evidence has been provided to demonstrate that the activity is aligned to the Requirement.
<b>Does not meet</b>	Does not Meet – Systems and/or practices required to support implementation of the Requirement are not in place, or are not being implemented, or cannot be evidenced.
<b>Not applicable</b>	The specific Requirement is not applicable to the context of the asset.

For Boliden’s tailings facilities in consequence category Extreme and Very High, self-assessments have been conducted by on-site personnel with support from the site management team. To validate the self-assessment, support was later provided by a panel of subject matter specialists from Boliden Mines Staff Functions. The results of these self-assessments are summarized in the site-specific disclosure documents for Aitik and Kevitsa respectively.