Rio Tinto

Rio Tinto's Approach to Safe Tailings Management & Governance

Subregional workshop on mine tailings safety and the prevention of accidental water pollution in Central Asia, 25-26 May 2023

Marnie Pascoe
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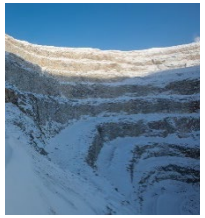
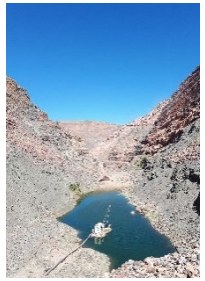
Surface Mining Centre of Excellence

Major Hazards Team

Ensure fit-for-purpose processes and controls are in place to manage major hazard risks





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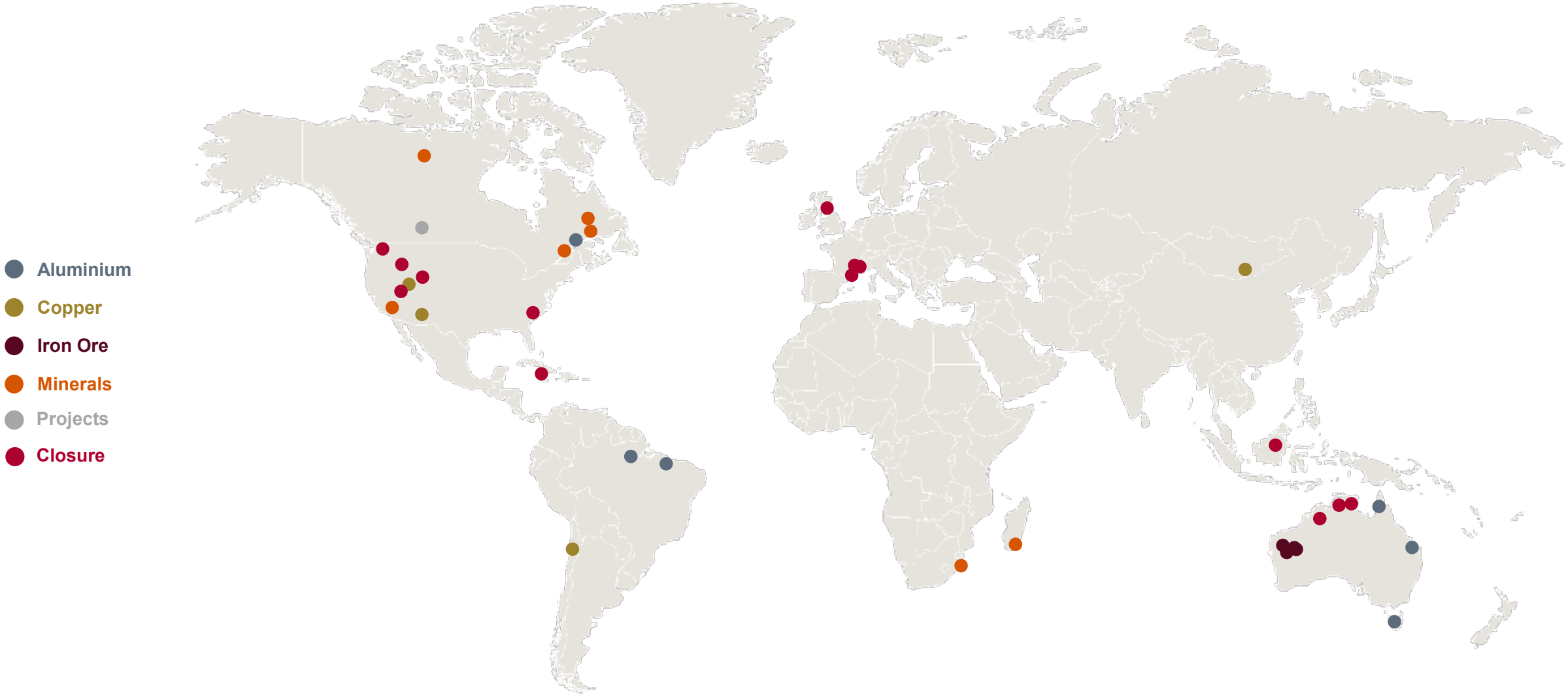
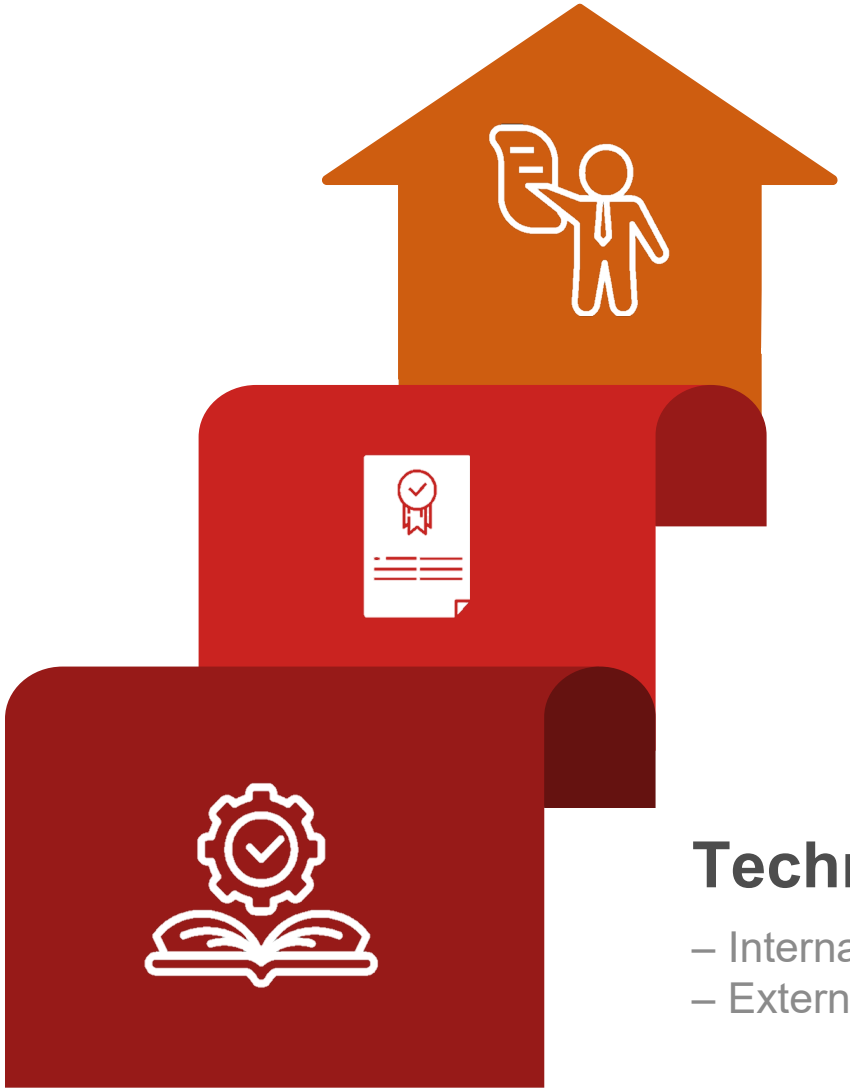
Rio Tinto has an interest in 147 TSFs across 42 sites

105 operated TSFs (44 active, 61 inactive/closed)



Tailings Management System



Tailings Policy

Zero fatalities and elimination of catastrophic failures. Prevent or mitigate socioeconomic and environmental impacts

Reinforces Rio Tinto's commitment to the protection of the health and safety of people, host communities, the environment, and water conservation to the highest standards in all our operations and locations

Auditable Standards

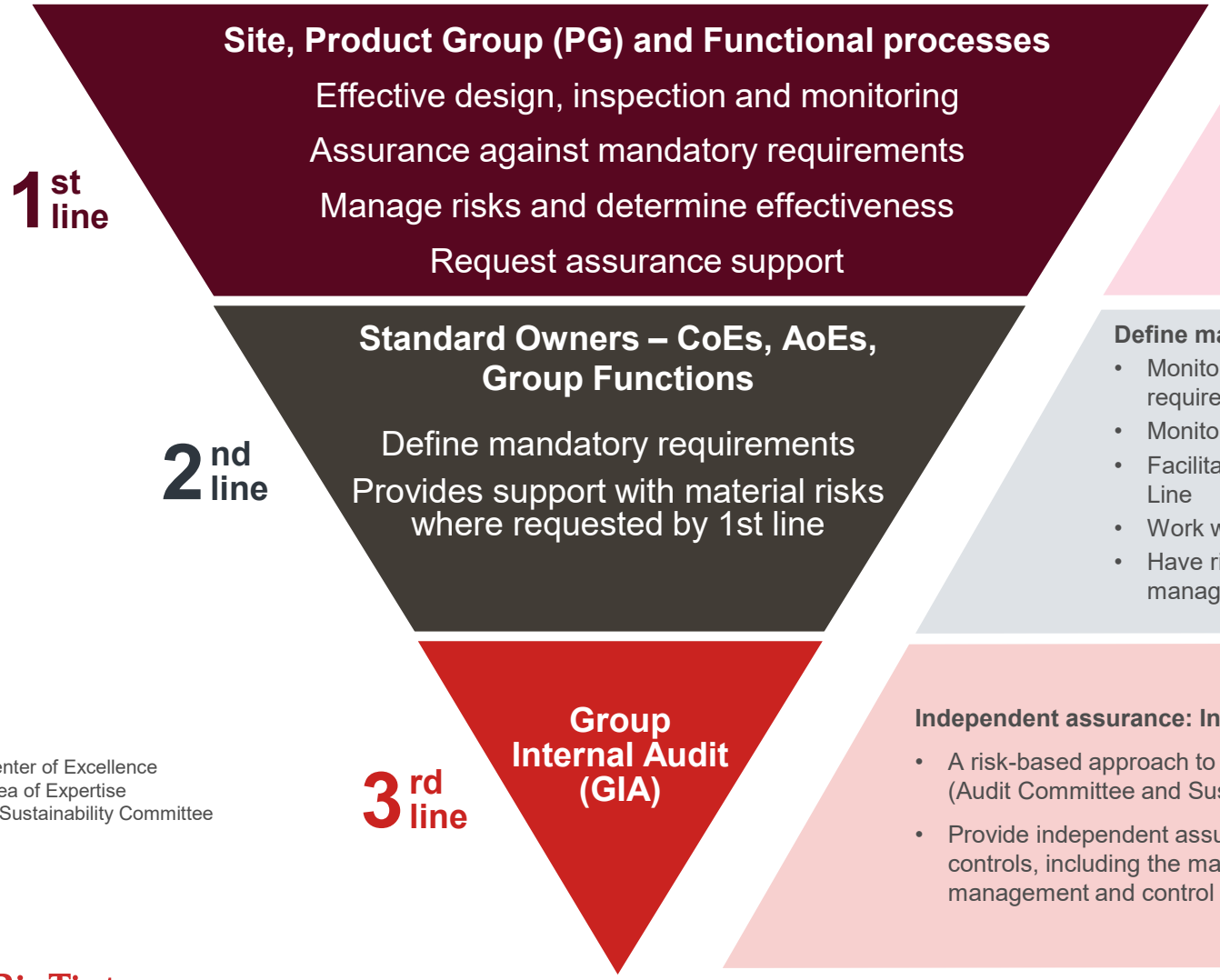
– Rio Tinto Tailings Management Standard (D5)
– Other Rio Tinto Standards
– **GISTM**

Technical guidance documents

– Internal guidance notes and Leading Practice Guides
– External good practice guides (ICMM, ANCOLD, ICOLD, etc.)

Three Lines of Defense Model

Group Standard and Procedure (D5 – Tailings & Water Storage)



Own and manage risks: operational management

- Identify, assess, own and manage risks. Implement controls to address risks
- Effective facility design (Engineer of Record / Design Engineer)
- Comprehensive operational controls
- Independent external review undertaken at least every two years

First Line

Define mandatory requirements and proactively engage with First Line

- Monitor conformance of First Line self-assurance against “mandatory requirements” with transparent data
- Monitor performance against material risks and emerging risks and raise concerns
- Facilitate coaching / mentoring to develop capability where requested by the First Line
- Work with first line to provide assurance where requested
- Have right / obligation to undertake objective assurance where concerns with management of material risks. Do this through defined escalation process

Second Line

Independent assurance: Internal Audit

- A risk-based approach to assurance consistent with purpose as defined by the Board Committees (Audit Committee and SusCo)
- Provide independent assurance on the effectiveness of governance, risk management, and internal controls, including the manner in which the First and Second Lines of Defence achieve risk management and control objectives

Third Line

Notes:
CoE: Center of Excellence
AoE: Area of Expertise
SusCo: Sustainability Committee

Fundamentals of Safe Tailings Management

Design

- Completed by a qualified design engineer
- Based on best practice and sufficient investigations
- Independently reviewed

Construction

- Supervised by a construction supervisor
- Must meet design intent
- Periodic reviews by design engineer

Operation

- Must meet design intent
- Monitoring and design verifications
- Design engineer engaged during operations
- Independently reviewed by a specialist(s)

Rio Tinto's Tailings Management Standard

D5 Standard

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Group standard – D5 – Management of tailings and water storage facilities

HSEC-B-23

Group:	Function:	No. of Pages:
Standard	Health, Safety, and Environment (HSE)	6
Approved:	**Effective:**	**Auditable from:**
November 2020	1 January, 2021	1 July, 2021
Supersedes:		
Version 1		
Owner:	**Approver:**	**Target audience:**
Head of HSES	ExCo	All Rio Tinto staff and each Rio Tinto Group business and function

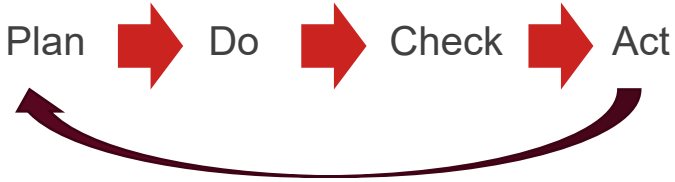
Direct linkages to other relevant policies, standards, procedures or guidance notes:

- Safety performance standards
- Environment performance standards
- Closure standard

Document purpose:

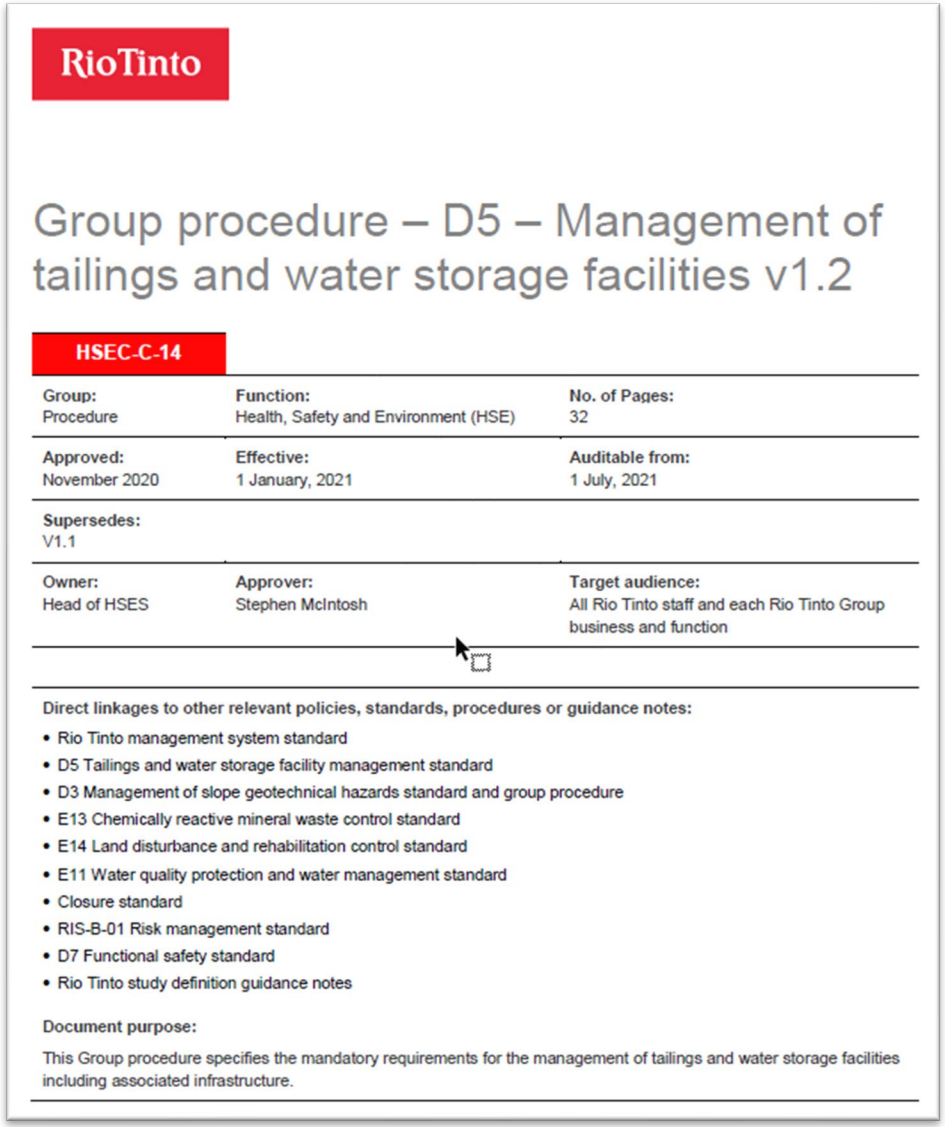
To support implementation of the Group Safety policy. This standard covers the management of risks associated with the operation of tailings storage facilities and water storage facilities.

- Mandatory standard applicable to all Rio Tinto managed tailings and water dams including closed sites – part of Rio Tinto HSEC assurance process
- Covers all development phases from planning, design, through construction, operation, closure and post-closure
- Safety standard as opposed to an Environmental standard
- Development of standard started prior to Mt Polley failure in 2014
- D5 Standard is not entirely a technical standard but a management standard for technical risk reduction
- Its organisation is typical of any other management standard



- Auditable via internal audits and external independent operational reviews

D5 Standard Highlights



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Group procedure – D5 – Management of tailings and water storage facilities v1.2

HSEC-C-14

Group:	Function:	No. of Pages:
Procedure	Health, Safety and Environment (HSE)	32
Approved:	**Effective:**	**Auditable from:**
November 2020	1 January, 2021	1 July, 2021
Supersedes:		
V1.1		
Owner:	**Approver:**	**Target audience:**
Head of HSES	Stephen McIntosh	All Rio Tinto staff and each Rio Tinto Group business and function

Direct linkages to other relevant policies, standards, procedures or guidance notes:

- Rio Tinto management system standard
- D5 Tailings and water storage facility management standard
- D3 Management of slope geotechnical hazards standard and group procedure
- E13 Chemically reactive mineral waste control standard
- E14 Land disturbance and rehabilitation control standard
- E11 Water quality protection and water management standard
- Closure standard
- RIS-B-01 Risk management standard
- D7 Functional safety standard
- Rio Tinto study definition guidance notes

Document purpose:

This Group procedure specifies the mandatory requirements for the management of tailings and water storage facilities including associated infrastructure.

- Clear identification of “accountable” and “responsible” roles – Nominated Manager, Design Engineer, Independent Reviewer, etc.
- Emphasis on risk based approach in planning, design, construction, and operation
- Stress on good documentation – management plans, design and construction reports, operating manual, emergency response plan, etc.
- Focus on keeping design engineer engaged during construction and operation – design engineer to provide written confirmations of meeting design intent
- Mandated independent design reviews and independent operational reviews
- Management of Change process required for Design/Construction/Operation
- Focus on effective monitoring and design verification

Alignment with ICMM

International Council on Mining and Metals (ICMM) Working Group formulated with participation from 29 companies

Position Statement

Key recognition statements:

- Tailings production is inherent to mining industry
- Management of change is integral to TSF safety
- TSF failures are unacceptable and owners are accountable
- Science and expertise exist for preventing TSF failures

Six elements of Tailings Storage Facilities governance framework, published by ICMM:

1. Accountability, Responsibility, and Competency;
2. Planning and Resourcing;
3. Risk Management;
4. Change Management;
5. Emergency Preparedness and Response;
6. Review and Assurance

All these six elements are specifically covered in Rio Tinto's tailings management standard

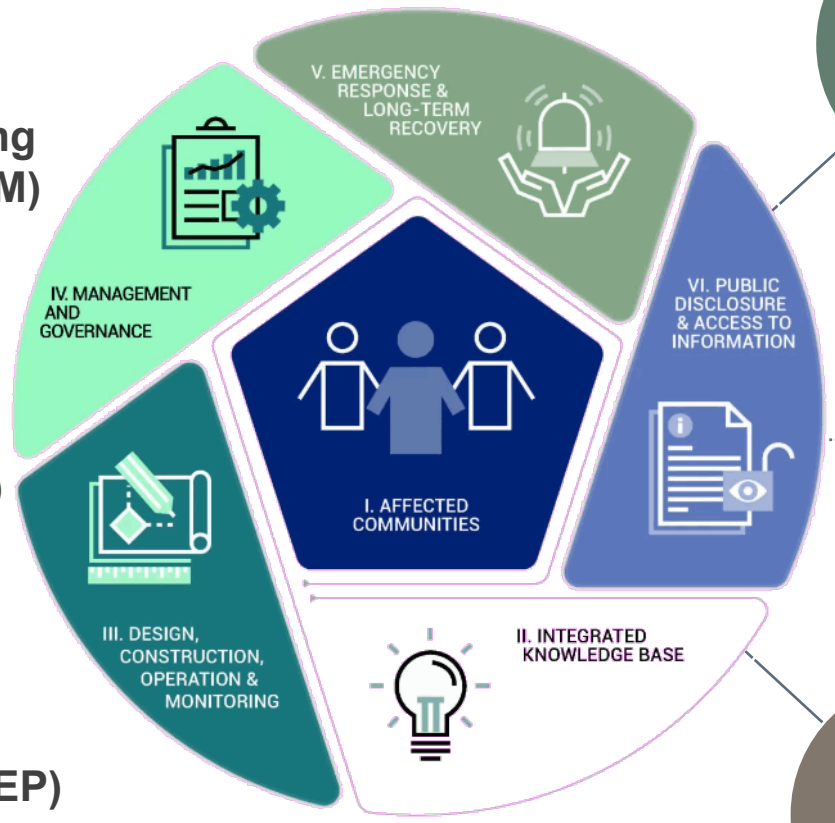
Global Industry Standard on Tailings Management

Global Tailings Review commissioned.

International Council on Mining and Metals (ICMM)

Principles for Responsible Investment (PRI)

United Nations Environmental Programme (UNEP)



Standard

Development of an international Standard of best practices on tailings storage facilities.

Chair

Led by Dr Bruno Oberle (Independent chair).

Panel

Chair supported by an expert panel of seven members and an advisory panel of 15 members.

GISTM's structure and intent

Goal of zero harm

- The Global Industry Standard on Tailings Management (GISTM) was launched in August 2020.
- The GISTM strives to achieve the ultimate goal of zero harm to people and the environment.
- It embodies a step-change in terms of transparency, accountability and safeguarding the rights of people living and working in proximity to a tailings facility.
- All ICMM member companies, including Rio Tinto, have committed to implementing the GISTM across their businesses within five years of the launch.

GISTM is structured under six topics which are a combination of engineering, tailings management, environment, social performance and disclosure

Topic I:
Affected Communities

Topic II:
Integrated Knowledge Base

Topic III:
Design, Construction, Operation and Monitoring of the Tailings Facility

Topic IV:
Management and Governance

Topic V:
Emergency Response and Long-term Recovery

Topic VI:
Public Disclosure and Access to Information

The topics are further divided into 15 Principles and 77 Requirements

GISTM implementation challenges

Incorporating GISTM into our existing processes

Rio Tinto has a well-established approach to tailings management

- Our facilities are regulated, permitted and have been managed for many years to comply with local laws, regulations, permits, licences and other requirements.
- Tailings management has been included in the Group risk register since 2010.

Our internal Standards cover many of the GISTM Requirements

- Our Group safety Standard for tailings and water storage facilities has been in place since 2015, and was updated in 2020.
- We also have Group Standards for Closure, Environment, and Communities & Social Performance.
- Our internal assurance processes verify that our managed TSFs operate in accordance with these internal Standards.

Implementation of GISTM requires additional work

- GISTM implementation is about adapting our existing processes to incorporate GISTM; and
- Developing and implementing new processes to address gaps with GISTM requirements.

Our internal landscape is complex

- Rio Tinto is made up of Product Groups and Functions with varied portfolios, organisational structures and accountabilities.
- Our TSFs vary significantly in age, size, construction, tailings material, regulatory setting, complexity, etc.
- Closed and legacy facilities are a particular challenge.

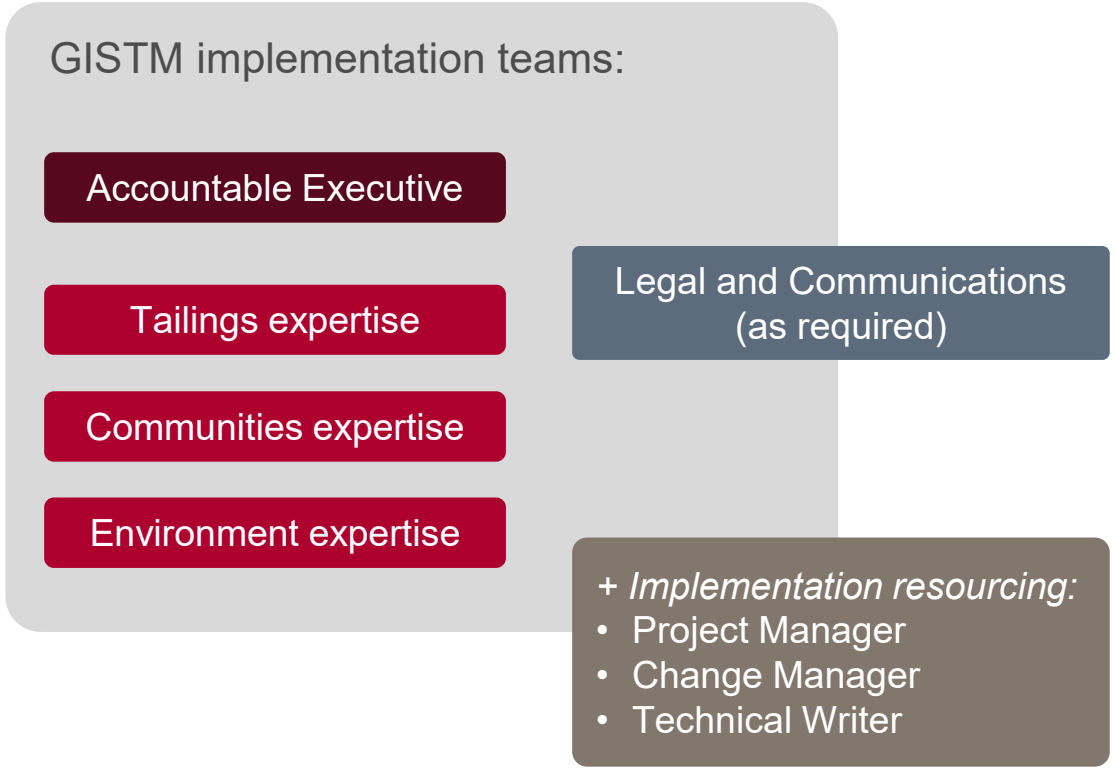
GISTM implementation challenges

Cross-discipline collaboration across a diverse TSF portfolio

GISTM implementation is being managed at the sites and within the Product Groups by multi-disciplinary teams of those who know the facilities best, with oversight and guidance from a corporate-level central team.

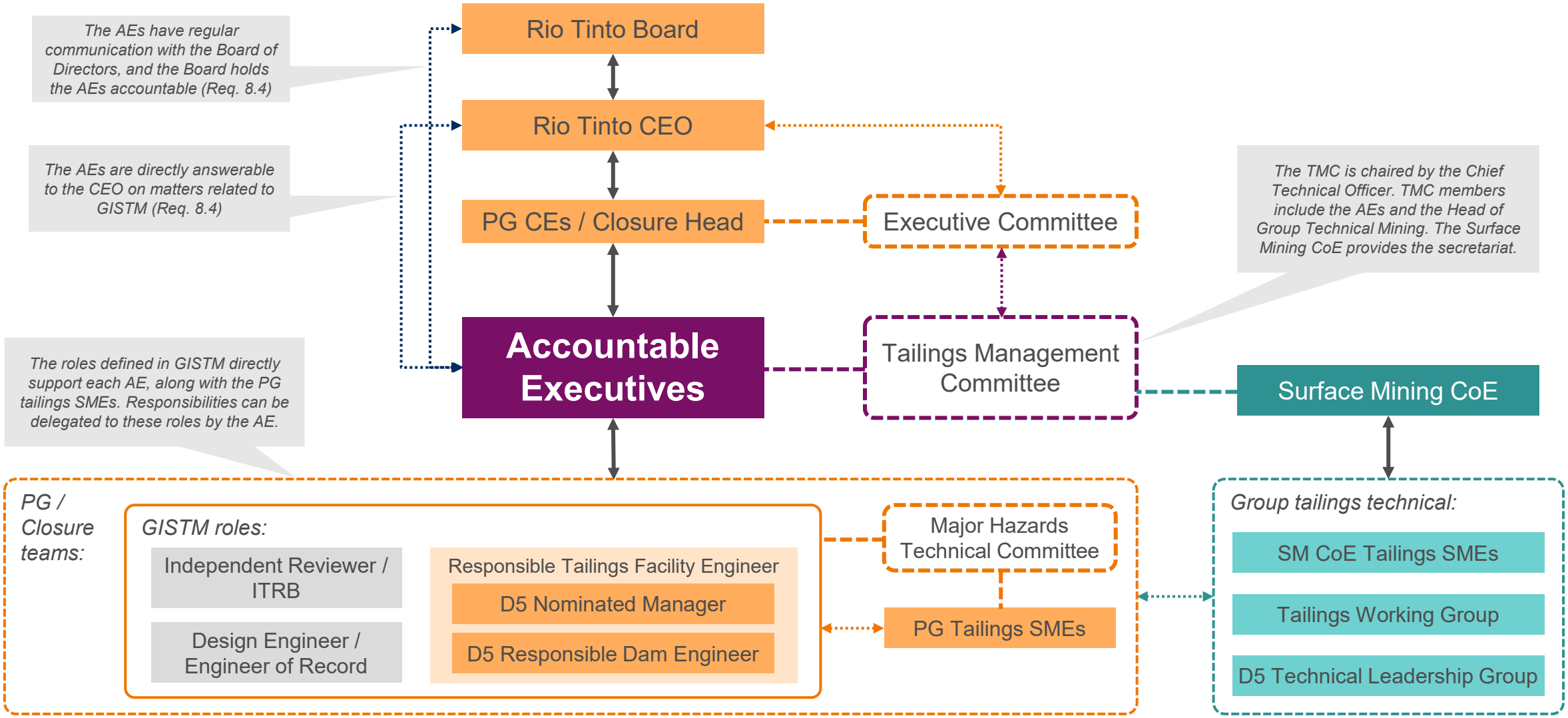
Key focus areas:

- Meaningful engagement with project-affected peoples.
- Development of an *Integrated* Knowledge Base.
- Designs that minimise risk for *all* phases of the lifecycle.
- Updated Dam Break Studies to understand impacted areas.
- Assessment of the impacts of of climate change.
- Demonstrating that risk is ALARP.
- Preparations for emergency response and long-term recovery.



Rio Tinto's tailings management framework

Ensuring strong governance, accountability and assurance



ICMM

ICMM was founded in 2001, as a CEO-led leadership organization, to improve sustainable development performance in the mining and metals industry.

The ICMM works by bringing member companies together to develop industry guidance, implementation guides and training on important topics. Since 2015 the ICMM has convened a Tailings Working Group under the Sustainability theme, which has developed or contributed to:

- Review of Tailings Management Guidelines and Recommendations for Improvement (2016)
- Tailings Governance Framework: Position Statement (2016)
- Global Industry Standard on Tailings Management (2020) – ICMM co-convened the development of the standard
- Conformance Protocols: Global Industry Standard on Tailings Management (2021)
- Tailings Management: Good Practice Guide (2021)
- Good Practice Guide Training Materials (2022)
- Tailings Reduction Roadmap (2022)

https://www.icmm.com/en-gb/our-work/innovation-for-sustainability/tailings

Future Tails

Future Tails has been jointly developed in partnership with UWA and BHP

Future Tails is a five-year initiative to provide:

- World-class training for industry; increasing capability and capacity in tailings management
- Research outcomes that will inform and develop future generations of engineers and scientists
- Transfer of existing knowledge and new knowledge generated, to empower the sector.

https://www.uwa.edu.au/schools/Engineering/Future-Tails

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GISTM Impacts so far….

ICMM - Lessons From Disaster: Mining's Journey to a Safer Future

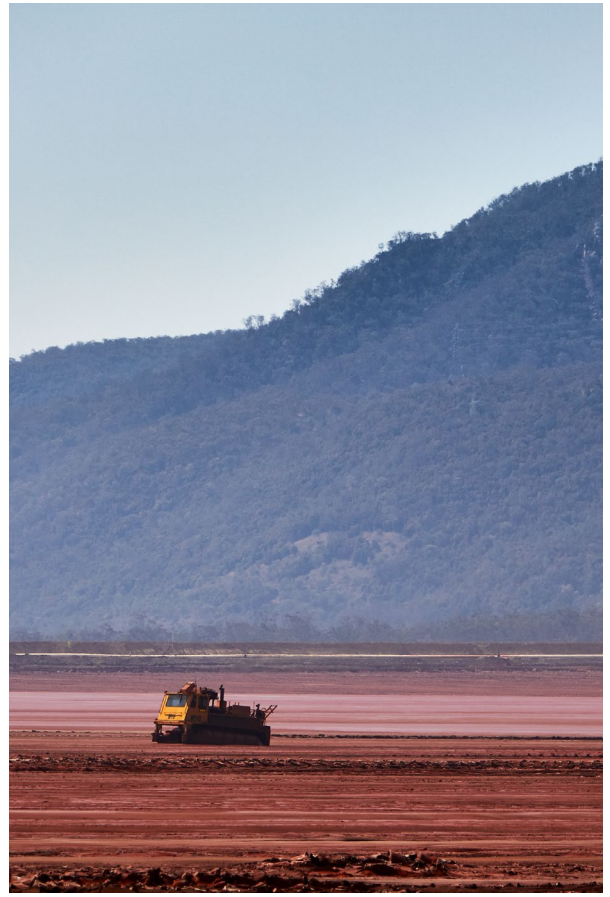
The Standard has made tailings dams a focus for the entire global industry rather than just a few companies. This has put responsible management of tailings on the agenda of executives and boards in a way that rarely happened before.

This is having an impact. As of January 2022, 79 companies (including ICMM's 26 members) have committed to implementing the Standard.

ICMM alongside UNEP and PRI continue to advocate for broad-based uptake and implementation of the Standard. Although the Standard is voluntary, there are consequences for ignoring it.

For example, the Church of England Pension Board, managing about £4 billion in assets, has said it will vote against the Chairs of companies that have not committed to implement the Standard.

On the other hand, companies that can credibly demonstrate comprehensive management of tailings are more likely to attract favourable terms for insurance and may benefit from lower costs of capital.



What has changed in Rio Tinto?

GISTM implementation is driving improvements within the business

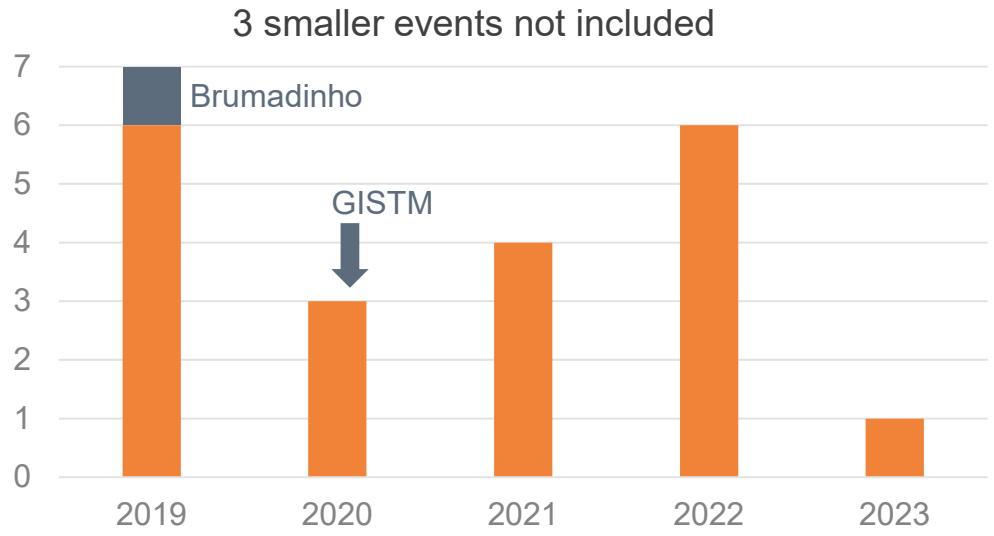
GISTM implementation is changing the way we work together, partner, and communicate about tailings:

- Improving our engagement and communication about tailings with host communities and external stakeholders.
- Increasing capacity by building teams to manage tailings.
- Formation of cross-disciplinary teams.
- Breaking down internal silos.
- Global engagements with our engineering consultants.
- Standardising our approaches to tailings management.
- Improving our communication to senior leaders about tailings risks and controls.

Strengthening our ESG credentials and maintaining our licence to operate

Rio Tinto

Number of tailings related incidents – since Brumadinho



Investor Mining and Tailings Safety Initiative (IMTSI)

The initiative is led by the Church of England Pensions Board and the Swedish Council on Ethics. It is a coalition of more than 100 investors with more than $20 trillion of funds under management.

Following the Brumadinho disaster, they wrote to more than 500 extractive companies and asked them to publish the answers to 20 questions about their tailings facilites on their company website as part of an attempt to improve transparency of the potential hazards from tailings storage facilities and to develop a global register of tailings storage facilities.

IMTSI have continued to contribute to the tailings governance landscape via the Principals for Responsible Investment (PRI) who co-convened the Global Industry Standard on Tailings Management and the Global Tailings Management Institute.

Global Tailings Management Institute

On the eve of the fourth anniversary of the Brumadinho disaster the co-conveners of GISTM (UNEP, PRI and ICMM) announced the formation of an independent Global Tailings Management Institute (GTMI).

The core function of the Institute is to oversee the implementation of, and conformance with, the Global Industry Standard on Tailings Management (GISTM). To achieve this, the Institute's core priority will be:

Assurance: Managing an assurance framework where tailings facilities will be audited and certified against the Global Industry Standard on Tailings Management by qualified, independent third-party assessors.

This will be supported by:

Awareness: Promoting awareness, understanding and adoption of the GISTM by (all) mining companies (public, private and government owned), building on the efforts of the Global Tailings Review.

Knowledge Sharing: Facilitating the sharing of knowledge of implementing the Standard to improve overall knowledge in tailings management.

Disclosures: Supporting confidence in the Standard and its implementation through transparency of tailings facility details and auditing outcomes.

Mining industry ESG Standards and initiatives

A complex landscape with differences in requirements on specific topics

Overarching	Disclosure	Lender Standards	Responsible Mining / Sourcing	Issue Specific
United Nations Initiatives: • UN Global Compact • UN Sustainable Development Goals	***Non-financial / Sustainability Reporting Initiatives:*** • Global Reporting Initiative (GRI) • Sustainable Accounting Standards Board (SASB)	***World Bank Group:*** • IFC Performance Standards	***Industry Led Initiatives:*** • International Council on Mining and Metals (ICMM) • Towards Sustainable Mining (TSM)	Voluntary Principles on Security and Human Rights (VPSHR)
Other International Bodies: • International Labour Organization (ILO) • Organization for Economic Cooperation and Development (OECD) due diligence for supply chains	***Climate Specific Disclosure:*** • Taskforce on Climate-related Financial Disclosures (TCFD) • Carbon Disclosure Project (CDP)		***Supply Chain Initiatives:*** • Responsible Gold Mining Principles (RGMP) • Aluminium Stewardship Initiative (ASI) • The Copper Mark (CM) • Responsible Minerals Initiative • Responsible Steel (RS) • Responsible Jewellery Council (RJC) • London Bullion Market Association (LBMA) • London Metal Exchange (LME)	**Global Industry Standard on Tailings Management (GISTM)**
International Organization for Standardization (ISO): • ISO MS Standards (14001, 45001, 50000) • ISO Guidelines (26000)	***Financial Disclosure:*** • Extractives Industry Transparency Initiative (EITI) • Securities and Exchange Commission (SEC) (Draft) Rules pertaining to climate-related financial disclosures	***Equator Principles Association:*** • Equator Principles	***Stakeholder Led Initiatives:*** • Initiative for Responsible Mining Assurance (IRMA)	International Cyanide Management Code (ICMC)

Scope of ESG themes

Overlapping themes; GISTM adds another layer

- Well-defined, prescriptive, performance driven, aligned to international best practice
- Referenced but less prescriptive, or in development as program enhancement
- Absent from scope of ESG themes

ESG Theme	ICMM International Council on Mining and Metals	TSM Towards Sustainable Mining	IRMA Initiative for Responsible Mining Assurance	ISO International Organization for Standardization	CM The Copper Mark	RS Responsible Steel	RJC Responsible Jewellery Council	ASI Aluminium Stewardship Initiative	LBMA London Bullion Market Association	LME London Metal Exchange	GISTM Global Industry Standard on Tailings Management
Ethical Business Practices											
Human Rights											
Risk Management											
Environmental Performance											
Climate Change											
Health and Safety Performance											
Social Performance											
Stakeholder Engagement											
Indigenous Peoples											
Biodiversity											
Responsible Sourcing											
Water Stewardship											
Tailings Management											
Closure											

The standards take variable approaches to defining expected performance across the various ESG themes:

- Some (eg ICMM) are focused on policy and frameworks to establish generally defined expectations, augmented with guidance.
- Some (eg IRMA, TSM, ASI) are more prescriptive and establish specific requirements and additional guidance.
- Others (eg LBMA, LME) are issue specific so may appear to lack detail, but are focused within their subject area.