



**SASB
STANDARDS**

Now part of IFRS Foundation

Metals & Mining

Sustainability Accounting Standard

EXTRACTIVES & MINERALS PROCESSING SECTOR

Sustainable Industry Classification System[®] (SICS[®]) EM-MM

Under Stewardship of the International Sustainability Standards Board

INDUSTRY STANDARD | VERSION 2023-12



sasb.org

ABOUT THE SASB STANDARDS

As of August 2022, the International Sustainability Standards Board (ISSB) of the IFRS Foundation assumed responsibility for the SASB Standards. The ISSB has committed to maintain, enhance and evolve the SASB Standards and encourages preparers and investors to continue to use the SASB Standards.

IFRS S1 *General Requirements for Disclosure of Sustainability-related Financial Information* (IFRS S1) requires entities to refer to and consider the applicability of disclosure topics in the SASB Standards when identifying sustainability-related risks and opportunities that could reasonably be expected to affect an entity's prospects. Similarly, IFRS S1 requires entities to refer to and consider the applicability of metrics in the SASB Standards when determining what information to disclose regarding sustainability-related risks and opportunities.

In June 2023, the ISSB amended climate-related topics and metrics in the SASB Standards to align them with the industry-based guidance accompanying IFRS S2 *Climate-related Disclosures*. In December 2023, the ISSB amended the non-climate-related topics and metrics in connection with the International Applicability of SASB Standards project.

Effective Date

This version 2023-12 of the Standard is effective for all entities for annual periods beginning or after January 1, 2025. Early adoption is permitted for all entities.

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INTRODUCTION

Overview of SASB Standards

The SASB Standards are a set of 77 industry-specific sustainability accounting standards (“SASB Standards” or “Industry Standards”), categorised pursuant to the [Sustainable Industry Classification System[®] \(SICS[®]\)](#).

SASB Standards include:

1. **Industry descriptions** – which are intended to help entities identify applicable industry guidance by describing the business models, associated activities and other common features that characterise participation in the industry.
2. **Disclosure topics** – which describe specific sustainability-related risks or opportunities associated with the activities conducted by entities within a particular industry.
3. **Metrics** – which accompany disclosure topics and are designed to, either individually or as part of a set, provide useful information regarding an entity’s performance for a specific disclosure topic.
4. **Technical protocols** – which provide guidance on definitions, scope, implementation and presentation of associated metrics.
5. **Activity metrics** – which quantify the scale of specific activities or operations by an entity and are intended for use in conjunction with the metrics referred to in point 3 to normalise data and facilitate comparison.

Entities using the SASB Standards as part of their implementation of ISSB Standards should consider the relevant ISSB application guidance.

For entities using the SASB Standards independently from ISSB Standards, the [SASB Standards Application Guidance](#) establishes guidance applicable to the use of all Industry Standards and is considered part of the Standards. Unless otherwise specified in the technical protocols contained in the Industry Standards, the guidance in the SASB Standards Application Guidance applies to the definitions, scope, implementation, compilation and presentation of the metrics in the Industry Standards.

Historically, the [SASB Conceptual Framework](#) set out the basic concepts, principles, definitions and objectives that guided the SASB Standards Board in its approach to setting standards for sustainability accounting.

Use of the Standards

SASB Standards are intended to aid entities in disclosing information about sustainability-related risks and opportunities that could reasonably be expected to affect the entity's cash flows, its access to finance or cost of capital over the short, medium or long term. An entity determines which Industry Standard(s) and which disclosure topics are relevant to its business, and which associated metrics to report. In general, an entity should use the SASB Standard specific to its primary industry as identified in [SICS[®]](#). However, companies with substantial business in multiple SICS[®] industries should refer to and consider the applicability of the disclosure topics and associated metrics in additional SASB Standards.

The disclosure topics and associated metrics contained in this Standard have been identified as those that are likely to be useful to investors. However, the responsibility for making materiality judgements and determinations rests with the reporting entity.

Industry Description

The Metals & Mining industry is involved in extracting metals and minerals, producing ores, quarrying stones, smelting and manufacturing metals, refining metals, and providing mining support activities. Entities also produce iron ores, rare earth metals, and precious metals and stones. Larger entities in this industry are integrated vertically—from mining across global operations to wholesaling metals to customers.

Note: There exists a separate standard for the Iron & Steel Producers (EM-IS) industry.

SUSTAINABILITY DISCLOSURE TOPICS & METRICS

Table 1. Sustainability Disclosure Topics & Metrics

TOPIC	METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	Quantitative	Metric tonnes (t) CO ₂ -e, Percentage (%)	EM-MM-110a.1
	Discussion of long- and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	EM-MM-110a.2
Air Quality	Air emissions of the following pollutants: (1) CO, (2) NO _x (excluding N ₂ O), (3) SO _x , (4) particulate matter (PM ₁₀), (5) mercury (Hg), (6) lead (Pb), and (7) volatile organic compounds (VOCs)	Quantitative	Metric tonnes (t)	EM-MM-120a.1
Energy Management	(1) Total energy consumed, (2) percentage grid electricity and (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	EM-MM-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic metres (m ³), Percentage (%)	EM-MM-140a.1
	Number of incidents of non-compliance associated with water quality permits, standards and regulations	Quantitative	Number	EM-MM-140a.2

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TOPIC	METRIC	CATEGORY	UNIT OF MEASURE	CODE
Waste & Hazardous Materials Management	Total weight of non-mineral waste generated	Quantitative	Metric tonnes (t)	EM-MM-150a.4
	Total weight of tailings produced	Quantitative	Metric tonnes (t)	EM-MM-150a.5
	Total weight of waste rock generated	Quantitative	Metric tonnes (t)	EM-MM-150a.6
	Total weight of hazardous waste generated	Quantitative	Metric tonnes (t)	EM-MM-150a.7
	Total weight of hazardous waste recycled	Quantitative	Metric tonnes (t)	EM-MM-150a.8
	Number of significant incidents associated with hazardous materials and waste management	Quantitative	Number	EM-MM-150a.9
	Description of waste and hazardous materials management policies and procedures for active and inactive operations	Discussion and Analysis	n/a	EM-MM-150a.10
Biodiversity Impacts	Description of environmental management policies and practices for active sites	Discussion and Analysis	n/a	EM-MM-160a.1
	Percentage of mine sites where acid rock drainage is: (1) predicted to occur, (2) actively mitigated, and (3) under treatment or remediation	Quantitative	Percentage (%)	EM-MM-160a.2
	Percentage of (1) proved and (2) probable reserves in or near sites with protected conservation status or endangered species habitat	Quantitative	Percentage (%)	EM-MM-160a.3
Security, Human Rights & Rights of Indigenous Peoples	Percentage of (1) proved and (2) probable reserves in or near areas of conflict	Quantitative	Percentage (%)	EM-MM-210a.1
	Percentage of (1) proved and (2) probable reserves in or near indigenous land	Quantitative	Percentage (%)	EM-MM-210a.2
	Discussion of engagement processes and due diligence practices with respect to human rights, indigenous rights, and operation in areas of conflict	Discussion and Analysis	n/a	EM-MM-210a.3
Community Relations	Discussion of process to manage risks and opportunities associated with community rights and interests	Discussion and Analysis	n/a	EM-MM-210b.1
	(1) Number and (2) duration of non-technical delays	Quantitative	Number, Days	EM-MM-210b.2

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TOPIC	METRIC	CATEGORY	UNIT OF MEASURE	CODE
Labour Practices	Percentage of active workforce employed under collective agreements	Quantitative	Percentage (%)	EM-MM-310a.1
	(1) Number and (2) duration of strikes and lockouts ¹	Quantitative	Number, Days	EM-MM-310a.2
Workforce Health & Safety	(1) All-incidence rate, (2) fatality rate, (3) near miss frequency rate (NMFR) and (4) average hours of health, safety, and emergency response training for (a) direct employees and (b) contract employees	Quantitative	Rate	EM-MM-320a.1
Business Ethics & Transparency	Description of the management system for prevention of corruption and bribery throughout the value chain	Discussion and Analysis	n/a	EM-MM-510a.1
	Production in countries that have the 20 lowest rankings in Transparency International's Corruption Perception Index	Quantitative	Metric tonnes (t) saleable	EM-MM-510a.2
Tailings Storage Facilities Management	Tailings storage facility inventory table: (1) facility name, (2) location, (3) ownership status, (4) operational status, (5) construction method, (6) maximum permitted storage capacity, (7) current amount of tailings stored, (8) consequence classification, (9) date of most recent independent technical review, (10) material findings, (11) mitigation measures, (12) site-specific EPRP	Quantitative	Various	EM-MM-540a.1
	Summary of tailings management systems and governance structure used to monitor and maintain the stability of tailings storage facilities	Discussion and Analysis	n/a	EM-MM-540a.2
	Approach to development of Emergency Preparedness and Response Plans (EPRPs) for tailings storage facilities	Discussion and Analysis	n/a	EM-MM-540a.3

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Production of (1) metal ores and (2) finished metal products	Quantitative	Metric tonnes (t) saleable	EM-MM-000.A
Total number of employees, percentage contractors	Quantitative	Number, Percentage (%)	EM-MM-000.B

¹ Note to **EM-MM-310a.2** – The disclosure shall include a description of the root cause for each work stoppage.

Greenhouse Gas Emissions

Topic Summary

Mining operations are energy-intensive and generate significant direct greenhouse gas (GHG) emissions, including carbon dioxide from fuel use during mining, ore processing and smelting activities. The extent and type of GHG emissions can vary depending on the metal mined and processed. Regulatory efforts to reduce GHG emissions in response to climate change-related risks may result in additional regulatory compliance costs and risks for metals and mining entities. Entities can achieve operational efficiencies through the cost-effective reduction of GHG emissions. Such efficiencies can mitigate the potential financial effect of increased fuel costs from regulations to limit—or put a price on—GHG emissions.

Metrics

EM-MM-110a.1. Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).
 - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tonnes of carbon dioxide equivalent (CO₂-e) and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (2014).
 - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
 - 2.1 These emissions include direct emissions of GHGs from stationary or mobile sources that may include equipment at mine sites, refineries and smelting facilities, and office buildings, and equipment used in metal transportation (marine, road and rail).
 - 2.2 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include:
 - 2.2.1 *GHG Reporting Guidance for the Aerospace Industry* published by the International Aerospace Environmental Group (IAEG)

- 2.2.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
 - 2.2.3 India GHG Inventory Program
 - 2.2.4 ISO 14064-1
 - 2.2.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by Ipieca
 - 2.2.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* published by Entreprises pour l'Environnement (EpE)
- 2.3 GHG emission data shall be consolidated according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the 'financial control' approach defined by the GHG Protocol and the approach provided by the Climate Disclosure Standards Board (CDSB) that is described in REQ-07, 'Organisational boundary,' of the *CDSB Framework for reporting environmental and social information*.
- 3 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions covered under an emissions-limiting regulation or programme intended to limit or reduce emissions directly, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (for example, command-and-control approach) and permit-based mechanisms.
- 3.1 Examples of emissions-limiting regulations include:
 - 3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
 - 3.1.2 European Union Emissions Trading Scheme (EU ETS)
 - 3.1.3 Quebec Cap-and-Trade (Quebec Environment Quality Act)
 - 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO₂-e) covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO₂-e).
 - 3.2.1 For emissions subject to more than one emissions-limiting regulation, the entity shall not account for those emissions more than once.
 - 3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (for example, voluntary trading systems), as well as reporting-based regulations.
- 4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was because of emissions reductions, divestment, acquisition, mergers, changes in output or changes in calculation methodology.

- 5 In the case that current reporting of GHG emissions to the CDP or other entity (for example, a national regulatory disclosure programme) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 6 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations or mass balance calculations.
- 7 The entity may, where relevant, provide a breakdown of its emissions by mineral or business unit.
 - 7.1 Minerals or business units may include: aluminium, copper, zinc, iron ore, precious metals or diamonds.

EM-MM-110a.2. Discussion of long- and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets

- 1 The entity shall discuss its long- and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
 - 1.1 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
 - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).
- 2 The entity shall discuss its emission reduction target(s) and analyse its performance against the target(s), including, if relevant:
 - 2.1 The scope of the emission reduction target (for example, the percentage of total emissions to which the target is applicable);
 - 2.2 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target;
 - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated towards the achievement of the target;
 - 2.4 The time lines for the reduction activity, including the start year, the target year and the base year;
 - 2.5 The mechanism(s) for achieving the target; and
 - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.

- 3 The entity shall discuss the activities and investments required to achieve the plans or targets, and any risks or limiting factors that might affect achievement of the plans or targets.
- 4 The entity shall discuss the scope of its strategies, plans or reduction targets, such as whether they pertain differently to different business units, geographies or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, or reduction targets are related to, or associated with, emissions limiting or emissions reporting-based programmes or regulations (for example, the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international or sectoral programmes.
- 6 Disclosure of strategies, plans or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

Air Quality

Topic Summary

Non-greenhouse gas (GHG) air emissions from the Metals & Mining industry include hazardous air pollutants from smelting and refining activities. These air pollutants can create significant and localised environmental or health risks. Depending on the metal, uncaptured sulphur dioxide, lead, mercury, cadmium and arsenic are among the chief pollutants, along with particulate matter. Financial effects resulting from air emissions will vary depending on the specific location of operations and the applicable air emissions regulations. Active management of the issue—through technological and process improvements—could allow entities to limit the effects of increasingly stringent air quality regulations globally. Entities could also benefit from operational efficiencies that could lead to a lower cost structure over time.

Metrics

EM-MM-120a.1. Air emissions of the following pollutants: (1) CO, (2) NO_x (excluding N₂O), (3) SO_x, (4) particulate matter (PM₁₀), (5) mercury (Hg), (6) lead (Pb), and (7) volatile organic compounds (VOCs)

- 1 The entity shall disclose its emissions of air pollutants, in metric tonnes per pollutant, released into the atmosphere.
 - 1.1 The scope of the disclosure includes air pollutants associated with the entity's direct air emissions resulting from all the entity's activities and sources of emissions, which may include stationary or mobile sources, production facilities, office buildings and transportation fleets.
- 2 The entity shall disclose its emissions of (1) carbon monoxide, reported as CO.
- 3 The entity shall disclose its emissions of (2) oxides of nitrogen (NO_x) reported as NO_x.
 - 3.1 The scope of NO_x includes NO and NO₂ but excludes N₂O.
- 4 The entity shall disclose its emissions of (3) oxides of sulphur (SO_x), reported as SO_x.
 - 4.1 The scope of SO_x includes SO₂ and SO₃.
- 5 The entity shall disclose its emissions of (4) particulate matter 10 micrometres or less in diameter (PM₁₀), reported as PM₁₀.
 - 5.1 PM₁₀ is defined as any airborne finely divided solid or liquid material with an aerodynamic diameter less than or equal to a nominal 10 micrometres.
- 6 The entity shall disclose its emissions of (5) mercury and mercury compounds, reported as Hg.

- 7 The entity shall disclose its emissions of (6) lead and lead compounds, reported as Pb.
- 8 The entity shall disclose its emissions of (7) non-methane volatile organic compounds (VOCs).
 - 8.1 VOCs are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and methane, that participates in atmospheric photochemical reactions, except those designated under applicable jurisdictional laws or regulations as having negligible photochemical reactivity.
 - 8.2 If applicable regulatory definitions of VOCs conflict with this definition, the entity may define VOCs in accordance with the applicable jurisdictional legal or regulatory definition. In this case, the entity shall identify the source of the definition.
- 9 The entity may discuss the calculation method for its emissions disclosure, such as whether data is from continuous emissions monitoring systems (CEMS), engineering calculations or mass balance calculations.
- 10 The entity may provide a disaggregation of its emissions by mineral or business unit, if relevant.
 - 10.1 Minerals or business units may include aluminium, copper, zinc, iron ore, precious metals or diamonds.

Energy Management

Topic Summary

Mining and metals production is often energy-intensive, with a significant proportion of energy consumption in the industry accounted for by purchased electricity. Although fuel combustion on-site contributes to the industry's direct (Scope 1) GHG emissions, electricity purchases from the grid can result in indirect, Scope 2 emissions. The energy intensity of operations may increase with decreasing grades of deposits and increasing depth and scale of mining operations. The choice between on-site versus grid-sourced electricity and the use of alternative energy can be important in influencing both the costs and reliability of energy supply. Affordable and easily accessible energy is an important competitive factor in a commodity market driven by global competition, and purchased fuels and electricity can account for a significant proportion of total production costs. The way in which an entity manages its overall energy efficiency and intensity, its reliance on different types of energy, and its ability to access alternative sources of energy, can therefore be a material factor.

Metrics

EM-MM-130a.1. (1) Total energy consumed, (2) percentage grid electricity and (3) percentage renewable

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
 - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from external sources and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling and steam energy are all included within the scope of energy consumption.
 - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
 - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are measured directly or taken from the Intergovernmental Panel on Climate Change (IPCC).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
 - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that was renewable energy.
 - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro and biomass.
 - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.

- 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier programme, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.
- 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
- 3.3.2 For renewable PPAs and green power products, the agreement shall explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity for the entity to claim them as renewable energy.
- 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from biomass sources is limited to materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, or materials eligible for an applicable jurisdictional renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

Water Management

Topic Summary

Mining and metals production can affect both the availability and the quality of local water resources. Metals and mining entities face operational, regulatory and reputational risks because of water scarcity, costs of water acquisition, regulations on effluents or the amount of water used, and competition with local communities and other industries for limited water resources. Effects associated with water management may include higher costs, liabilities and lost revenues because of curtailment or suspension of operations. The severity of these risks may vary depending on the region's water availability and the regulatory environment. Entities in the industry may deploy new technologies to manage risks related to water risk, including desalination, water recirculation and innovative waste-disposal solutions. Reducing water use and contamination can create operational efficiencies for entities and reduce their operating costs.

Metrics

EM-MM-140a.1. (1) Total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress

- 1 The entity shall disclose the amount of water, in thousands of cubic metres, withdrawn from all sources.
 - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
 - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. If no legal definition exists, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids.
 - 2.2 Water obtained from a water utility in compliance with jurisdictional drinking water regulations can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic metres, consumed in its operations.
 - 3.1 Water consumption is defined as:
 - 3.1.1 Water that evaporates during withdrawal, use and discharge
 - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service
 - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea

- 4 The entity shall analyse all its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, Aqueduct.
 - 4.1 The entity shall list its facilities or operations which are located in areas of High or Extremely High Baseline Water Stress.
- 5 The entity shall disclose water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

EM-MM-140a.2. Number of incidents of non-compliance associated with water quality permits, standards and regulations

- 1 The entity shall disclose the total number of incidents of non-compliance, including violations of a technology-based standard and exceedances of quantity or quality-based standards.
- 2 The scope of disclosure includes incidents governed by applicable jurisdictional statutory permits and regulations, which include the discharge of a hazardous substance, violation of pre-treatment requirements or total maximum daily load (TMDL) exceedances.
 - 2.1 Typical parameters of concern include arsenic, copper, lead, nickel, zinc, cyanide, radium-226, total suspended solids, pH and toxicity.
- 3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).
 - 3.1 Formal enforcement actions are defined as governmental recognised actions that address a violation or threatened violation of water quantity or quality laws, regulations, policies or orders, and can result in administrative penalty orders, administrative orders and judicial actions, among others.
- 4 Violations shall be disclosed, regardless of their measurement methodology or frequency. These include violations for:
 - 4.1 Continuous discharges, limitations, standards and prohibitions that are generally expressed as maximum daily, weekly and monthly averages; and
 - 4.2 Non-continuous discharges, limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge and mass or concentration of specified pollutants.

Waste & Hazardous Materials Management

Topic Summary

The Metals & Mining industry generates large volumes of non-mineral and mineral wastes, including waste rock, tailings, slurries, slags, sludges, smelting and industrial wastes, some of which may contain toxic, hazardous or chemically reactive substances. Mineral processing sometimes also requires the use of hazardous materials for metal extraction. Waste produced during mining operations, depending on its type, can be treated, discarded, or stored in on- or off-site impoundments or old mining pits. Improper hazardous materials storage or disposal can present a significant long-term threat to human health and ecosystems through potential contamination of groundwater or surface water used for drinking or agriculture purposes. Entities that reduce waste streams while implementing policies to manage risks related to handling hazardous materials may reduce regulatory and litigation risks, remediation liabilities and costs.

Metrics

EM-MM-150a.4. Total weight of non-mineral waste generated

- 1 The entity shall disclose the total weight, in metric tonnes, of non-mineral waste generated.
 - 1.1 Non-mineral waste is defined as material for which the entity has no further use and that is discarded, intended to be discarded or released into the environment.
 - 1.2 The scope of the disclosure includes non-mineral waste generated from all activities.
 - 1.2.1 The scope of non-mineral waste includes scrap metal, reject coal, used oil, tyres, batteries and other solid wastes.
 - 1.3 The scope of non-mineral waste excludes overburden, waste rock, tailings and gaseous wastes.

EM-MM-150a.5. Total weight of tailings produced

- 1 The entity shall disclose the total weight, in metric tonnes, of tailings it produced.
 - 1.1 The definition of tailings shall be consistent with that provided in the Global Tailings Review *Global Industry Standard on Tailings Management* (GISTM).

EM-MM-150a.6. Total weight of waste rock generated

- 1 The entity shall disclose the total weight, in metric tonnes, of waste rock generated.
 - 1.1 Waste rock is defined as mineral material and low-grade ore with target minerals in concentrations too low for economic recovery at the time of mining.

EM-MM-150a.7. Total weight of hazardous waste generated

- 1 The entity shall disclose the total weight, in metric tonnes, of waste generated that was hazardous.
 - 1.1 Hazardous wastes are defined in accordance with the applicable jurisdictional legal or regulatory framework where the waste is generated.
 - 1.1.1 The entity may use definitions from the United Nations Environment Programme (UNEP) *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*.
- 2 The entity shall disclose the frameworks used to define hazardous waste and the amounts defined in accordance with each applicable framework.

EM-MM-150a.8. Total weight of hazardous waste recycled

- 1 The entity shall disclose the total weight, in metric tonnes, of hazardous waste it generated that was recycled.
 - 1.1 Hazardous wastes are defined in accordance with the applicable jurisdictional legal or regulatory framework where the waste is generated.
 - 1.1.1 The entity may use definitions from the United Nations Environment Programme (UNEP) *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal* (Basel Convention).
 - 1.2 Recycled materials are defined as waste reprocessed or treated through production or manufacturing processes and made into a final product or a component to be integrated into a product.
 - 1.2.1 This definition is based on the Basel Convention.
 - 1.3 Materials incinerated, including for energy recovery, shall not be considered within the scope of recycled waste.
 - 1.3.1 Energy recovery is defined as the use of combustible waste to generate energy through direct incineration, with or without other waste, but with recovery of the heat.
- 2 The entity shall disclose the frameworks used to define recycled hazardous waste and the amounts defined in accordance with each applicable framework.

EM-MM-150a.9. Number of significant incidents associated with hazardous materials and waste management

- 1 The entity shall disclose the total number of significant incidents associated with the handling, storage, transportation or disposal of hazardous materials used in mineral processing activities and hazardous waste being generated.

- 1.1 The scope of the disclosure includes incidents of seepage from tailings facilities that contain a meaningful concentration of hazardous raw materials, or significant spills or releases that occurred during handling, storage, transportation, use or disposal of raw hazardous materials that impacted the environment, employees or surrounding communities.
 - 1.1.1 A meaningful concentration is defined as a concentration that exceeds the concentration limits of applicable local regulatory requirements or industry-wide accepted codes, such as the International Cyanide Management Code regarding cyanide.
 - 1.1.2 Impacts on the environment, employees or surrounding communities may include contamination of surface water, ground water and land that required response and remediation, reduced biodiversity, or caused injuries or deaths among employees or community members.
- 1.2 A significant incident is defined as a release of hazardous waste to the environment that: exceeds the volume and concentration limits of local regulatory requirements or industry-accepted codes; is included in the entity's financial statements (for example, because of resulting liabilities); is recorded by the entity as an incident required to be reported to applicable local jurisdictions; or does not meet any of these criteria but is judged as significant by the operator.
 - 1.2.1 The entity may disclose its own criteria for establishing the threshold in volume and concentration in excess of which it considers an incident significant.
- 1.3 Hazardous materials are defined in accordance with the applicable jurisdictional legal or regulatory framework where materials were used.
 - 1.3.1 Hazardous materials used in direct mineral processing may include cyanides, sulphuric acid, hydrochloric acid, nitric acid, ammonia, mercury and lead.
- 1.4 Hazardous wastes are defined in accordance with the applicable jurisdictional legal or regulatory framework where the waste was generated.
 - 1.4.1 The entity may use definitions from the United Nations Environment Programme (UNEP) *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*.
- 1.5 Mineral processing is defined as the process through which commercially valuable minerals are separated from their ores.
 - 1.5.1 Examples of mineral processing may include leaching and flotation.
- 2 The entity shall disclose the frameworks used to define hazardous materials and waste and the number of significant incidents defined in accordance with each applicable framework.

EM-MM-150a.10. Description of waste and hazardous materials management policies and procedures for active and inactive operations

- 1 The entity shall describe the policies and procedures used in its waste and hazardous materials management strategy.

- 1.1 The scope of the disclosure shall include policies and procedures for the entity's active and inactive operations.
- 1.2 The scope of waste includes mineral and non-mineral waste.
 - 1.2.1 Mineral waste is defined as material generated during the extraction and beneficiation of ores and minerals.
 - 1.2.2 Non-mineral waste is defined as all other material (other than mineral waste) for which the entity has no further use and that is discarded, intended to be discarded or released into the environment.
- 1.3 The scope of hazardous raw materials includes chemicals and materials used for procedures such as leaching and flotation, which may include cyanides, sulphuric acid, hydrochloric acid and nitric acid.
- 2 The entity shall describe how its policies and procedures compare with those required under applicable jurisdictional laws or regulations.
 - 2.1 The entity shall discuss whether and how its policies and procedures exceed the requirements of local jurisdictions.
 - 2.2 The entity shall discuss how its policies and procedures vary by region.
- 3 The entity shall describe its approach to waste management throughout the project life cycle.
 - 3.1 The scope of the disclosure shall include a discussion of the entity's:
 - 3.1.1 approach to assessment of potential environmental impacts associated with waste streams;
 - 3.1.2 policies and procedures related to waste avoidance;
 - 3.1.3 approach to identification, assessment and application of recycling, reuse and repurposing as waste management strategies;
 - 3.1.4 policies and procedures related to waste disposal or incineration;
 - 3.1.5 policies and procedures related to the remediation of environmental or social impacts of incidents associated with the mishandling of hazardous waste disposal; and
 - 3.1.6 approach to decommissioning waste facilities.
- 4 The entity shall describe its approach to the management of hazardous materials used in processing. The scope of the disclosure shall include:
 - 4.1 process through which the entity determines which materials are hazardous, including applicable entity-specific policies or applicable regulations;
 - 4.2 approach to risk assessment of potential impacts associated with handling and use of hazardous materials;

- 4.3 policies and procedures related to avoiding and mitigating the risk of spills, seepage, poisoning, accidents and incidents that could have catastrophic impacts on human health, local communities and the environment; and
 - 4.4 policies and procedures related to the remediation of consequences of spills, seepage, poisoning, accidents and incidents that could have catastrophic impacts on human health, local communities and the environment.
- 5 The entity shall include a description of how waste and hazardous materials management efforts are coordinated among business partners (for example, contractors and subcontractors).
- 6 The entity shall describe how it ensures compliance and conformance with waste and hazardous material management policies and procedures.

Biodiversity Impacts

Topic Summary

The development, operation, closure and remediation of mines can have a range of impacts on biodiversity, such as alterations of landscape, vegetation removal and impacts on wildlife habitats. A particularly concerning effect of coal operations is acid rock drainage, in which surface and shallow subsurface water encounters coal mining overburden, contaminating the water with heavy metals and rendering it highly acidic, with harmful effects on humans, animals and vegetation. Biodiversity impacts of mining operations can affect the valuation of reserves and create operational risks. Because of increasing interest in the protection of ecosystems, the environmental characteristics of the land where reserves are located may lead to higher extraction costs. Entities might also face regulatory or reputational barriers to accessing reserves in areas with protected conservation status. Metals and mining entities face regulatory risks related to site reclamation after a mine is decommissioned, in accordance with applicable regulatory requirements to restore mined property according to a previously approved reclamation plan. Material costs may arise from removing or covering refuse piles, meeting water treatment obligations and dismantling infrastructure at the end of life. Furthermore, mining operations are subject to laws protecting endangered species. Entities with an effective environmental management plan for each stage of the project lifecycle may minimise their compliance costs and legal liabilities, face less resistance in developing new mines, and avoid difficulties in obtaining permits, accessing reserves and completing projects.

Metrics

EM-MM-160a.1. Description of environmental management policies and practices for active sites

- 1 The entity shall describe its environmental management plans implemented at active sites, including, if relevant:
 - 1.1 the lifecycle stages to which the plans apply, such as: pre-bid (when the entity is considering acquisition of a site), exploration and appraisal, site development, production, closure, decommissioning and restoration;
 - 1.2 the topics addressed by the plans, such as ecological and biodiversity impacts, waste generation, noise, emissions to air, discharges to water, natural resource consumption and hazardous chemical use;
 - 1.3 the underlying references for its plans, including whether they are codes, guidelines, standards or regulations; and
 - 1.4 whether they were developed by the entity, an industry organisation, a third-party organisation (for example, a non-governmental organisation), a governmental agency or some combination of these groups.
- 2 If relevant, the entity shall describe specific policies and practices that apply to areas with protected conservation status or areas of critical habitat, which are defined by the International Finance Corporation (IFC) Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources* as:

- 2.1 areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered or Endangered species; (ii) habitat of significant importance to endemic or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species or congregatory species; (iv) highly threatened or rare ecosystems; or (v) areas associated with important evolutionary processes.
- 3 If the management policies and practices do not apply to all the entity's sites or operations, it shall include the percentage of sites to which they were applied.
- 4 If environmental management policies and practices differ significantly by mineral resource (for example, bauxite mining as compared to silver mining), then the entity shall describe the relevant differences for each resource.
- 5 The entity shall disclose the degree to which its policies and practices are aligned with the IFC's *Performance Standards on Environmental and Social Sustainability*, 2012, including:
 - 5.1 Performance Standard 1, *Assessment and Management of Environmental and Social Risks and Impacts*;
 - 5.2 Performance Standard 3, *Resource Efficiency and Pollution Prevention*;
 - 5.3 Performance Standard 4, *Community Health, Safety, and Security*; and
 - 5.4 Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*.
- 6 Additional relevant references may include:
 - 6.1 Joint E&P Forum/UNEP, *Environmental Management in Oil and Gas Exploration and Production—an Overview of Issue and Management Approaches*, 1997; and
 - 6.2 World Bank Multistakeholder Initiative, *Towards Sustainable Decommissioning and Closure of Oil Fields and Mines: A Toolkit to Assist Government Agencies*.

EM-MM-160a.2. Percentage of mine sites where acid rock drainage is: (1) predicted to occur, (2) actively mitigated, and (3) under treatment or remediation

- 1 The entity shall disclose the percentage of its mine sites (by annual production output from mines by weight) for which acid-generating seepage into surrounding surface water or groundwater is: (1) predicted to occur, (2) actively mitigated, and (3) under treatment or remediation.
- 2 Acid rock drainage (ARD) is predicted to occur if computer simulations, chemical evaluations or acid-base accounting evaluate that ARD is likely to form at the mine site.
- 3 ARD is considered actively mitigated if the entity is preventing ARD through methods that include: storing or covering sulphite-bearing minerals to prevent oxidation, flood prevention, mine sealing, mixing of acid-buffering materials with acid-producing materials, and chemical treatment of sulphide wastes (for example, using organic chemicals designed to kill sulphide-oxidising bacteria).
- 4 ARD is considered under treatment or remediation if the acidic water discharged from the mine area is captured and undergoes a wastewater treatment process (whether active or passive).

- 5 The entity may provide a disaggregation by mineral or business unit.
 - 5.1 Minerals or business units may include, for example: aluminium, copper, zinc, iron ore, precious metals or diamonds.
- 6 ARD also may be referenced as acid-generating seepage or acid mine drainage.

EM-MM-160a.3. Percentage of (1) proved and (2) probable reserves in or near sites with protected conservation status or endangered species habitat

- 1 The entity shall disclose (1) the percentage, by weight, and grade (in percentage metal content) of its proved reserves in sites with protected conservation status or in endangered species habitat.
 - 1.1 The percentage of proved reserves shall be calculated as the quantity (tonnage) of proved reserves located in areas with protected conservation status or endangered species habitat, divided by the total quantity of proved reserves.
 - 1.2 The entity shall provide a disaggregation of the disclosure by grade (in percentage metal content) of its proved reserves.
 - 1.3 The entity shall, if relevant, provide a disaggregation of the disclosure by mineral or business unit where minerals or business units include, for example, aluminium, copper, zinc, iron ore, platinum group metals or diamonds.
- 2 The entity shall disclose the (2) percentage, by weight, and grade (in percentage of metal content) of its probable reserves in sites with protected conservation status or endangered species habitat.
 - 2.1 The percentage of probable reserves shall be calculated as the quantity (tonnage) of probable reserves located in areas with protected conservation status or endangered species habitat divided by the total quantity of probable reserves.
 - 2.2 The entity shall provide a disaggregation of the disclosure by grade (in percentage metal content) of probable reserves.
 - 2.3 The entity shall, if relevant, provide a disaggregation of the disclosure by mineral or business unit where minerals or business units include, for example: aluminium, copper, zinc, iron ore, platinum group metals or diamonds.
- 3 Reserves are considered to be in areas of protected conservation status if they are located within:
 - 3.1 International Union for Conservation of Nature (IUCN) Protected Areas (categories I–VI);
 - 3.2 Ramsar Wetlands of International Importance;
 - 3.3 United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites;
 - 3.4 Biosphere Reserves recognised within the framework of UNESCO’s Man and the Biosphere (MAB) Programme;

- 3.5 Natura 2000 sites; or
- 3.6 sites that meet the IUCN's definition of a protected area: 'A protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.'²
- 3.6.1 These sites may be listed in the World Database of Protected Areas (WDPA) and mapped on Protected Planet.
- 4 Reserves are considered to be in endangered species habitat if they are in or near areas where species on the IUCN Red List of Threatened Species that are classified Critically Endangered (CR) or Endangered (EN) are extant.
- 4.1 A species is considered extant in an area if it is a resident, present during breeding or non-breeding season, or if it makes use of the area for passage.
- 4.1.1 For the purposes of disclosure, 'passage' is defined as all areas of land or water that a migratory species inhabits, stays in temporarily, crosses or overflies at any time on its normal migration route.
- 5 For the purposes of this disclosure, 'near' is defined as within five kilometres (km) of the boundary of an area of protected conservation status or an endangered species habitat and the location of the entity's proved and probable reserves.
- 6 Reserves are defined as the weight of a mineral deposit that could be economically and legally extracted or produced at the time of the reserves determination.
- 6.1 Proved reserves are reserves for which (i) the quantity of the mineral deposit is computed from dimensions revealed in outcrops, trenches, workings or drill holes; grade or quality are computed from the results of detailed sampling, and (ii) the sites for inspection, sampling and measurement are spaced so closely, and the geographical character is so well defined, that size, shape, depth and mineral content of reserves are well established.
- 6.2 Probable reserves are reserves for which quantity and grade (quality) are computed from information similar to that used for proved reserves, but the sites for inspection, sampling and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance for probable reserves, although lower than that for proved reserves, is high enough to assume continuity between points of observation.
- 7 The entity should follow the Combined Reserves International Reporting Standards Committee (CRIRSCO) guidance for classifying ore reserves and mineral resources, including the use of a 'competent person' to compile information.
- 8 The entity may separately identify reserves in areas with additional ecological, biodiversity or conservation designations such as those listed by the Biodiversity A–Z resource prepared by the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC).

² IUCN, *Guidelines for Applying Protected Areas Management Categories*, 2008, pp. 8–9.

- 9 The entity may discuss reserves located in protected areas or endangered species habitats, but that present low risks to biodiversity or ecosystem services; the entity may provide similar discussion for reserves located in areas with no official designation of high biodiversity value but that present high risks to biodiversity or ecosystem services.

Security, Human Rights & Rights of Indigenous Peoples

Topic Summary

Metals and mining entities face additional community-related risks when operating in conflict zones and in areas with weak or absent governance institutions, rule of law or legislation to protect human rights; or in areas with vulnerable communities such as indigenous peoples. Entities using private or government security forces to protect their workers and assets may knowingly, or unknowingly, contribute to human rights violations, including the use of excessive force. Entities perceived as contributing to human rights violations or failing to account for indigenous peoples' rights may be affected by protests, riots or suspension of permits. These entities could face substantial costs related to compensation or settlement payments, and write-downs in the value of their reserves in such areas. In the absence of applicable jurisdictional laws or regulations to address such cases, several international instruments have emerged to provide guidelines for entities. These instruments include obtaining the free, prior and informed consent of indigenous peoples for decisions that affect them. Several countries have implemented specific laws protecting indigenous peoples' rights, increasing the regulatory risk for entities that violate those rights.

Metrics

EM-MM-210a.1. Percentage of (1) proved and (2) probable reserves in or near areas of conflict

- 1 The entity shall disclose (1) the percentage, by weight, and grade (in percentage metal content) of its proved reserves located in or near areas of active conflict.
 - 1.1 The percentage of proved reserves shall be calculated as the quantity (tonnage) of proved reserves located in or near areas of active conflict divided by the total quantity of proved reserves.
 - 1.2 The entity shall provide a disaggregation of the disclosure by grade (in percentage metal content) of proved reserves.
 - 1.3 The entity shall, if relevant, provide a disaggregation of the disclosure by mineral or business unit where minerals or business units include, for example: aluminium, copper, zinc, iron ore, platinum group metals and diamonds.
- 2 The entity shall disclose (2) the percentage, by weight, and grade (in percentage metal content) of its probable reserves located in or near areas of active conflict.
 - 2.1 The percentage of probable reserves shall be calculated as the quantity (tonnage) of probable reserves located in or near areas of active conflict divided by the total quantity of probable reserves.
 - 2.2 The entity shall provide a disaggregation of the disclosure by grade (in percentage metal content) of probable reserves.
 - 2.3 The entity shall, if relevant, provide a disaggregation of the disclosure by mineral or business unit where minerals or business units include, for example: aluminium, copper, zinc, iron ore, platinum group metals or diamonds.

- 3 Active conflict is defined according to the Uppsala Conflict Data Program (UCDP) definition:
 - 3.1 'A conflict, both state-based and non-state, is deemed to be active if there are at least 25 battle-related deaths per calendar year in one of the conflict's dyads.'
- 4 Reserves shall be considered to be in or near an area of active conflict if they are located in the same country as the active conflict.
 - 4.1 If the entity can demonstrate that a conflict is contained to a region, state or designated area not proximate to its reserves, then it may exclude these from the scope of the disclosure.
 - 4.2 If reserves are located in a country, region or state adjacent to an active conflict or can be reasonably expected to be operationally affected by the conflict, then these reserves shall be included in the scope of the disclosure.
- 5 Reserves are defined as the weight of a mineral deposit which could be economically and legally extracted or produced at the time of the reserves determination.
 - 5.1 Proved reserves are reserves for which (i) the quantity of the mineral deposit is computed from dimensions revealed in outcrops, trenches, workings or drill holes; grade or quality are computed from the results of detailed sampling, and (ii) the sites for inspection, sampling and measurement are spaced so closely and the geographical character is so well-defined that size, shape, depth and mineral content of reserves are well-established.
 - 5.2 Probable reserves are reserves for which quantity and grade (quality) are computed from information similar to that used for proved reserves, but the sites for inspection, sampling and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance for probable reserves, although lower than that for proved reserves, is high enough to assume continuity between points of observation.
- 6 The entity should follow the Combined Reserves International Reporting Standards Committee (CRIRSCO) guidance for classifying ore reserves and mineral resources, including the use of a 'competent person' to compile information.

EM-MM-210a.2. Percentage of (1) proved and (2) probable reserves in or near indigenous land

- 1 The entity shall disclose (1) the percentage, by weight, and grade (in percentage metal content) of its proved reserves located in or near areas considered to be indigenous peoples' land.
 - 1.1 The percentage of proved reserves shall be calculated as the quantity (tonnage) of proved reserves located in or near areas considered to be indigenous peoples' land divided by the total quantity of proved reserves.
 - 1.2 The entity shall provide a disaggregation of the disclosure by the grade (in percentage metal content) of proved reserves.

- 1.3 The entity shall, if relevant, provide a disaggregation of the disclosure by mineral or business unit where minerals or business units include, for example: aluminium, copper, zinc, iron ore, platinum group metals or diamonds.
- 2 The entity shall disclose (2) the percentage, by weight, and grade (in percentage metal content) of probable reserves located in or near areas that are considered to be indigenous peoples' land.
 - 2.1 The percentage of probable reserves shall be calculated as the quantity (tonnage) of probable reserves located in or near areas considered to be indigenous peoples' land divided by the total quantity of probable reserves.
 - 2.2 The entity shall provide a disaggregation of the disclosure by the grade (in percentage metal content) of probable reserves.
 - 2.3 The entity shall, if relevant, provide a disaggregation of the disclosure by mineral or business unit where minerals or business units include, for example: aluminium, copper, zinc, iron ore, platinum group metals or diamonds.
- 3 Indigenous people's lands are considered as those occupied by people who self-identify as indigenous in accordance with Article 33 of the United Nations *Declaration on the Rights of Indigenous Peoples* and the International Labour Organization Convention 169, and based on the working definition of 'Indigenous Peoples' adopted by the United Nations, probably have one or more of the following characteristics, such as:
 - 3.1 historical continuity with pre-colonial or pre-settler societies;
 - 3.2 strong link to territories and surrounding natural resources;
 - 3.3 distinct social, economic or political systems;
 - 3.4 distinct language, culture and beliefs;
 - 3.5 form non-dominant groups of society; and
 - 3.6 resolve to maintain and reproduce ancestral environments and systems as distinct peoples and communities.
- 4 For the purposes of this disclosure, 'near' is defined as within five kilometres of the recognised boundary of an area considered to be indigenous land and the location of the entity's proved and probable reserves.
- 5 Reserves are defined as the weight of a mineral deposit which could be economically and legally extracted or produced at the time of the reserves determination.
 - 5.1 Proved reserves are reserves for which (i) the quantity of the mineral deposit is computed from dimensions revealed in outcrops, trenches, workings or drill holes; grade or quality are computed from the results of detailed sampling, and (ii) the sites for inspection, sampling and measurement are spaced so closely and the geographical character is so well defined that size, shape, depth and mineral content of reserves are well established.

- 5.2 Probable reserves are reserves for which quantity and grade (quality) are computed from information similar to that used for proved reserves, but the sites for inspection, sampling and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance for probable reserves, although lower than that for proved reserves, is high enough to assume continuity between points of observation.
- 6 The entity should follow the Combined Reserves International Reporting Standards Committee (CRIRSCO) guidance for classifying ore reserves and mineral resources, including the use of a 'competent person' to compile information.

EM-MM-210a.3. Discussion of engagement processes and due diligence practices with respect to human rights, indigenous rights, and operation in areas of conflict

- 1 The entity shall describe its due diligence practices and procedures with respect to indigenous rights of communities in which it operates or intends to operate, which may include:
- 1.1 upholding International Labour Organization (ILO) Convention 169;
 - 1.2 use of free, prior and informed consent (or consultation) processes;
 - 1.3 the establishment of project grievance mechanisms; and
 - 1.4 the establishment of formal community agreements.
- 2 The entity shall describe its due diligence practices and procedures with respect to upholding the principles covered in human rights frameworks, such as the:
- 2.1 International Labour Organization (ILO) *Declaration on Fundamental Principles and Rights at Work* and the fundamental ILO conventions on freedom of association (No. 87), collective bargaining (No. 98), forced labour (No. 29 and No. 105), child labour (No. 138 and No. 182), fair wages (No. 100), and discrimination (No. 111);
 - 2.2 United Nations *Guiding Principles on Business and Human Rights*, specifically Human Rights Due Diligence (Principle 17a-c); and
 - 2.3 Voluntary Principles on Security and Human Rights.
- 3 The entity shall discuss its practices and procedures while operating in areas of conflict, such as:
- 3.1 describing its approach according to the Five-Step Framework outlined in the Organisation for Economic Co-operation and Development (OECD) *Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas*.
- 4 An area of conflict is located in the same country as an active conflict or adjacent to an active conflict that can be reasonably expected to affect the entity's operations.
- 5 Active conflict is defined according to the Uppsala Conflict Data Program (UCDP) definition as:

- 5.1 'A conflict, both state-based and non-state, is deemed to be active if there are at least 25 battle-related deaths per calendar year in one of the conflict's dyads.'
- 6 The discussion shall include due diligence processes employed during all stages of project development (prior, during and post).
- 7 The discussion may include how local or regional factors are considered in the entity's engagement processes and due diligence practices with respect to human rights, (and specifically indigenous rights, if applicable) and as well as operations in areas of conflict.
- 8 The discussion may include governance mechanisms the entity puts in place to ensure that all levels of the organisation adhere to its policies and practices.
- 9 The discussion shall include how practices apply to business partners, such as contractors, subcontractors, suppliers and joint arrangement partners.
- 9.1 If practices do not apply to business partners, the entity may discuss factors that prevent the application of such practices.

Community Relations

Topic Summary

Mining facilities are frequently active over long periods and can have a wide range of adverse effects on communities. Community rights and interests may be affected through environmental and social impacts of mining operations, such as competition for access to local energy or water resources, air and water emissions, and waste from operations. Mining entities rely upon support from local communities to obtain permits and leases as well as to conduct activities without disruptions. Entities may experience adverse financial effects if the community interferes, or lobbies government to interfere, with the rights of a mining entity in relation to their ability to access, develop and produce reserves. In addition to community concerns about the direct impacts of projects, the presence of mining activities may give rise to associated socio-economic concerns, such as education, health, livelihoods and food security for the community. Metals and mining entities engaging in rent-seeking and exploiting a community's resources without providing proportional socio-economic benefits in return may be exposed to actions by host governments and communities that restrict their activities or impose additional costs. These could include imposition of ad hoc taxes and export restrictions. Entities can adopt various community engagement strategies in their global operations to manage risks and opportunities associated with community rights and interests. Strategies are often underpinned by community engagement integrated into the project cycle. Entities are beginning to adopt a 'shared value' approach to provide significant socio-economic benefits to communities and allow them to operate profitably.

Metrics

EM-MM-210b.1. Discussion of process to manage risks and opportunities associated with community rights and interests

- 1 The entity shall discuss its processes, procedures and practices to manage risks and opportunities associated with community rights and interests in areas where it conducts business. Community rights and interests include:
 - 1.1 economic rights and interests, which may include employment, fair wages, payment transparency, national resource governance, and respect for infrastructure and agricultural land;
 - 1.2 environmental rights and interests, which may include clean local air and water, as well as safe discharge and disposal of waste;
 - 1.3 social rights and interests, which may include adequate health care, education and housing; and
 - 1.4 cultural rights and interests, which may include protection of places of cultural significance (for example, sacred sites or burial sites).
- 2 The entity shall disclose, if relevant:
 - 2.1 the lifecycle stages to which its practices apply, such as: pre-bid (when the entity is considering acquisition of a site), exploration and appraisal, site development, mineral production, closure, decommissioning and restoration;
 - 2.2 the community rights and interests (enumerated above) specifically addressed by the entity's practices; and

- 2.3 the underlying references for its procedures, including whether they are codes, guidelines, standards or regulations and whether they were developed by the entity, an industry organisation, a third-party organisation (for example, a non-governmental organisation), a governmental agency or some combination of these groups.
- 3 Risks and opportunities may include: non-technical delays, availability and development of local content, availability and access to adequate infrastructure, community actions, and challenges associated with resettlement and access to land.
- 4 The entity shall disclose the degree to which its policies and practices are aligned with the International Finance Corporation's (IFC) *Performance Standards on Environmental and Social Sustainability*, 2012, including:
 - 4.1 Performance Standard 4, *Community Health, Safety, and Security*;
 - 4.2 Performance Standard 5, *Land Acquisition and Involuntary Resettlement*; and
 - 4.3 Performance Standard 8, *Cultural Heritage*.
- 5 The discussion shall include how practices apply to business partners such as contractors, subcontractors, suppliers and joint arrangement partners.
- 6 The entity may describe its efforts to eliminate or mitigate community risks or address community concerns, which may include:
 - 6.1 the use of social impact assessment (SIA) that evaluates, manages and mitigates risks;
 - 6.2 efforts to engage with stakeholders, build consensus and collaborate with communities; and
 - 6.3 'shared' or 'blended' value projects that provide quantifiable benefits to the community and the entity.
- 7 The entity may quantify its community risks by calculating the aggregate estimated value at risk as the difference in value between a project free from country, regional or community risks (hereafter, country risk) and the value of a project adjusted for these risks.
 - 7.1 This calculation may be conducted using an appropriate valuation model; variations of the Capital Asset Pricing Model (CAPM) are commonly used to assess country risk.
 - 7.1.1 Value at risk can be calculated by applying an additional discount rate premium in calculating the net present value of a project using discounted cash flow (DCF) analysis.
 - 7.1.2 Value at risk can be expressed as a reduction in the expected cash flows of a project because of country risk in calculating the net present value of a project using DCF analysis.
 - 7.1.3 If a project is insured for country risks, the value at risk can be expressed as a reduction in the cash flows of a project because of the cost of insurance in calculating the net present value of a project using DCF analysis.

- 7.2 Country, regional or community risks may include: corruption, business legal structure, political stability, regulation, ethnic conflict, stability of the local market, availability of a skilled labour force, resettlement and access to land, quality of access to infrastructure (for example, ports, roads, shipping channels), or general licence to operate.
- 7.2.1 These risks may vary by jurisdiction and project level.
- 7.2.2 These risks differ from sovereign risk, which is defined as the potential for a central bank or government-backed entity to willingly or unwillingly default on debt obligations, or significantly alter important economic variables such as currency exchange rates, import ratios and money supply.
- 7.3 The entity should identify and describe country risks specific to its projects and unique operating context.
- 7.3.1 This description may include the identification of country, regional and community risks or the discussion of specific projects.
- 7.3.2 This description may include discussion of how the entity has mitigated these risks (for example, through community engagement partnerships, and blended value projects); the entity shall quantify this reduction in risk according to the methods described above.
- 7.3.3 The discussion should be in addition to broad country risk classification (for example, the prevailing Organisation for Economic Co-operation and Development (OECD) country risk classification, Standard & Poor's Country Risk ratings and the World Economic Forum Global Competitiveness Index).
- 7.4 The entity may describe the model or approach used to value capital expenditure projects such as adjusted discount rate, expected cash flow or other methods.

EM-MM-210b.2. (1) Number and (2) duration of non-technical delays

- 1 The entity shall disclose (1) the total number and (2) duration, in days, of site shutdowns or project delays because of non-technical factors.
- 2 The scope may include shutdowns and project delays resulting from pending regulatory permits, or other political delays related to community concerns, community or stakeholder resistance or protest, or armed conflict.
- 3 The scope of the disclosure excludes delays because of strikes and lockouts disclosed in EM-MM-310a.2.
- 4 The entity may discuss specific delays including associated costs, root cause and corrective actions for resolved delays, and status of ongoing delays.

Labour Practices

Topic Summary

Working conditions related to metal and mining operations may be physically demanding and hazardous. Labour unions play an important role in representing workers' interests and managing collective bargaining for better wages and working conditions. At the same time, metals and mining entities often operate in areas where worker rights are inadequately protected. The nuances of worker concerns make management of labour relations critical for metals and mining entities. Conflict with workers can result in labour strikes and other disruptions that can delay or stop production. Work stoppages frequently result in lost revenue and reputational damage. Persistent labour disputes can adversely affect the long-term profitability of mining entities.

Metrics

EM-MM-310a.1. Percentage of active workforce employed under collective agreements

- 1 The entity shall disclose the percentage of its employees in the active workforce employed under collective agreements during any part of the reporting period.
 - 1.1 The number of employees in the active workforce of an entity is calculated as the maximum number of unique employees it employed at any time during the reporting period.
 - 1.2 Collective agreements are defined as agreements between an entity and an employees' organisation on behalf of some or all employees of the entity concerning the engagement of employees, termination of employment, terms of employment, labour relations, and the rights and obligations of the organisations which are parties to the agreement.
 - 1.3 Employees are defined as individuals on the entity's payroll, whether they are full-time, short service, part-time, executive, labour, salary, seasonal, migrant, or hourly employees. Employees excludes contract workers.
 - 1.3.1 Contract workers are defined as individuals who are not on the entity's payroll, but whom the entity supervises and manages, including independent contractors and those employed by third parties (for example, temp agencies and labour brokers).
- 2 The percentage shall be calculated as the number of employees in the active workforce who were employed under collective agreements during any part of the reporting period divided by the average number of workers employed during the reporting period.
- 3 The scope of the disclosure includes all employees employed by the entity, including full-time, part-time and temporary employees.

EM-MM-310a.2. (1) Number and (2) duration of strikes and lockouts

- 1 The entity shall disclose (1) the number of work stoppages involving 1,000 or more workers lasting one full shift or longer.
 - 1.1 The scope of work stoppages includes strikes and lockouts.
 - 1.1.1 A strike is defined as a temporary stoppage of work by a group of employees (not necessarily union members) to express a grievance or enforce a demand.
 - 1.1.2 A lockout is defined as a temporary withholding or denial of employment during a labour dispute to enforce terms of employment upon a group of employees.
- 2 The entity shall disclose (2) the duration of strikes and lockouts as the total days idle because of work stoppages.
 - 2.1 'Days idle' is defined as the aggregate number of workdays lost because of work stoppages.
 - 2.2 Total days idle shall be calculated as the sum of the products of the number of workers involved in each work stoppage and the number of days each respective work stoppage was in effect.
- 3 The scope of the disclosure excludes work stoppages because of other non-technical reasons disclosed in EM-MM-210b.2.

Note to EM-MM-310a.2

- 1 The entity shall describe the reason for each work stoppage (as stated by labour), the effect on production, and any corrective actions taken as a result.

Workforce Health & Safety

Topic Summary

Safety is critical to mining operations because of the hazardous working conditions involved. The Metals & Mining industry has relatively high fatality rates compared to other industries. Fatalities and injuries can result from the many hazards associated with the industry, including working with powered haulage and machinery, as well as mine integrity. Poor health and safety records can result in fines and penalties, and an increase in regulatory compliance costs resulting from more stringent oversight. An entity's ability to protect employee health and safety, and to create a culture of safety and well-being among employees at all levels, may prevent accidents, mitigate costs, reduce operational downtime and enhance workforce productivity.

Metrics

EM-MM-320a.1. (1) All-incidence rate, (2) fatality rate, (3) near miss frequency rate (NMFR) and (4) average hours of health, safety, and emergency response training for (a) direct employees and (b) contract employees

- 1 The entity shall disclose (1) all-incidence rate and (2) work-related fatality rate.
 - 1.1 Incidents include:
 - 1.1.1 fatalities or work-related injuries resulting in death of employees on active mine property;
 - 1.1.2 non-fatal days lost cases or occupational injuries that result in the loss of one or more days from the entity's scheduled work, or days of limited or restricted activity while at work;
 - 1.1.3 no days lost cases or occurrences requiring only medical treatment (beyond first aid); that is, non-fatal injury occurrences resulting only in loss of consciousness or medical treatment other than first aid; and
 - 1.1.4 additional criteria defining an incident that are unique to an entity's jurisdiction may also be incorporated.
 - 1.2 First aid, defined as emergency care or treatment for an ill or injured person before regular medical aid can be provided, and other non-recordable incidents may be defined in accordance with jurisdictional guidelines. The entity shall disclose the legal, regulatory or industry framework used as the source for these guidelines.
- 2 The entity shall disclose (3) its near miss frequency rate (NMFR) for work-related near misses.
 - 2.1 A near miss is defined as an unplanned or uncontrolled event or chain of events that has not resulted in a recordable injury, illness, physical damage or environmental damage, but had the potential to do so in other circumstances.
 - 2.2 The entity may disclose its process for classifying, identifying and reporting near misses.

- 3 All disclosed rates shall be calculated as: $(\text{statistic count} \times 200,000) / \text{total number of hours worked by all employees in the year reported}$.
 - 3.1 The '200,000' in the rate calculation represents the total number of hours 100 full-time workers working 40 hours per week for 50 weeks per year can provide annually.
- 4 The entity shall disclose (4) the average number of training hours provided to its workforce for health, safety and emergency management training.
 - 4.1 Training shall relate to topics such as the health, safety or emergency preparedness of employees with respect to occupational risks or hazards to which employees are reasonably likely to be exposed, and to specific occupational risks or hazards.
- 5 The average number of hours of health, safety and emergency response training shall be calculated as: $(\text{total qualifying training hours provided by the entity}) / (\text{total number of employees})$.
- 6 The scope of the disclosure includes work-related incidents only.
 - 6.1 Work-related incidents are injuries and illnesses resulting from events or exposures in the work environment.
 - 6.2 The work environment is the establishment and other locations where one or more employees are working or are present as a condition of their employment.
 - 6.3 The work environment includes not only physical locations, but also the equipment or materials used by the employee during the course of work.
 - 6.4 Incidents that occur while an employee is travelling are work-related if, at the time of the injury or illness, the employee was engaged in work activities in the interest of the employer.
 - 6.5 A work-related incident must be a new case, not a previously recorded injury or illness being updated.
- 7 The entity shall disclose the rates for each of these employee categories:
 - 7.1 direct employees, defined as individuals on the entity's payroll, whether they are full-time, short service, part-time, executive, labour, salary, seasonal, migrant or hourly employees; and
 - 7.2 contract employees, defined as individuals who are not on the entity's payroll, but whom the entity supervises or manages, including independent contractors and those employed by third parties (for example, temp agencies and labour brokers).
- 8 The scope of the disclosure includes all employees regardless of employee location or type of employment.

Business Ethics & Transparency

Topic Summary

Managing business ethics and maintaining an appropriate level of transparency in payments to governments or individuals are significant issues for the mining industry. This is because government relations are important to entities' conducting business in this industry to gain access to mining reserves. Anti-corruption, anti-bribery, and payments-transparency laws and initiatives create regulatory mechanisms to reduce the risk of misconduct. Violations of these laws could result in significant one-time costs or higher compliance costs, whereas successful compliance with such regulations could avoid adverse outcomes. Entities with significant reserves or operations in corruption-prone countries could face heightened risks. Entities must ensure their governance structures and business practices reduce the risks associated with corruption and wilful or unintentional participation in illegal or unethical payments, or with gifts to government officials or private individuals.

Metrics

EM-MM-510a.1. Description of the management system for prevention of corruption and bribery throughout the value chain

- 1 The entity shall describe its management system and due diligence procedures for assessing and managing corruption and bribery risks within the scope of its own operations and those associated with business partners in its value chain.
 - 1.1 Business partners may include customers, suppliers, contractors, subcontractors and joint arrangement partners.
 - 1.2 Relevant aspects of a management system include, if relevant:
 - 1.2.1 employee awareness programmes;
 - 1.2.2 internal mechanisms for reporting and following up on suspected violations;
 - 1.2.3 anti-corruption policies; and
 - 1.2.4 application of the Extractive Industry Transparency Initiative (EITI) Standard, which may include provisions related to beneficial ownership and politically exposed persons, licences and contracts, social expenditures, project-level payments, subnational payments, data accessibility and multi-stakeholder engagement.
- 2 The entity may discuss its implementation of the following organisational guidelines:
 - 2.1 Organisation for Economic Co-operation and Development (OECD) anti-corruption guidelines;
 - 2.2 International Chamber of Commerce (ICC): *Rules of Conduct and Recommendations to Combat Extortion and Bribery*;

- 2.3 Transparency International: *Business Principles for Countering Bribery*;
 - 2.4 United Nations Global Compact: 10th Principle; and
 - 2.5 World Economic Forum (WEF) Partnering Against Corruption Initiative (PACI).
- 3 The entity may discuss applicable jurisdictional laws or regulations related to payments transparency to which it is subject.

EM-MM-510a.2. Production in countries that have the 20 lowest rankings in Transparency International's Corruption Perception Index

- 1 The entity shall disclose its net production from activities located in the countries with the 20 lowest rankings in Transparency International's Corruption Perception Index (CPI).
 - 1.1 The 20 lowest numerical ranks shall be used to generate the scope of countries. Because more than one country can share a single rank, the scope may include more than 20 countries.
- 2 The entity shall use the most current version of the CPI.
- 3 Production shall be disclosed in saleable metric tonnes of minerals.
 - 3.1 The entity may provide a disaggregation of the calculations by mineral or business unit where minerals or business units may include, for example: aluminium, copper, zinc, iron ore, precious metals or diamonds, if relevant.
- 4 The entity may discuss operations located in countries with low rankings in the index but that present low business ethics risks and may provide similar discussion for operations located in countries that do not have one of the 20 lowest rankings in the index but that present unique or high business ethics risks.

Tailings Storage Facilities Management

Topic Summary

The Metals & Mining industry faces significant operational hazards, particularly those associated with the structural integrity of tailings storage facilities (TSFs). A catastrophic failure of such facilities (for example, a dam failure) can release significant volumes of waste streams and potentially harmful materials into the environment, leading to significant impacts on ecosystems, human livelihood, local economies and communities. Such catastrophic incidents may result in significant financial losses for entities and may impair social licence to operate. Robust approaches to tailings facilities design, management, operation and closure, as well as appropriate management of associated risks, can help prevent such incidents from occurring. Entities that adopt comprehensive practices to maintain the integrity and safety of TSFs may do so through ensuring accountability for tailings management at the highest levels of the entity, conducting frequent internal and external independent technical reviews of TSFs and ensuring mitigation measures are implemented in a timely manner in case of a safety concern. Additionally, a strong safety culture and well-established emergency preparedness and response plans can mitigate the impacts and financial implications of such events should they occur. Entity obligations related to long-term remediation and compensation for damages may result in additional financial effects in case of failure. The ability of entities to meet such obligations after an incident has occurred is an additional component of emergency preparedness.

Metrics

EM-MM-540a.1. Tailings storage facility inventory table: (1) facility name, (2) location, (3) ownership status, (4) operational status, (5) construction method, (6) maximum permitted storage capacity, (7) current amount of tailings stored, (8) consequence classification, (9) date of most recent independent technical review, (10) material findings, (11) mitigation measures, (12) site-specific EPRP

1 The entity shall disclose an inventory of its tailings storage facilities.

1.1 The definition of tailings facilities shall be consistent with that provided in the Global Tailings Review *Global Industry Standard on Tailings Management* (GISTM).

2 For each tailings facility, the entity shall disclose (1) the facility name, (2) its location, (3) ownership status, (4) operational status, (5) construction method, (6) maximum permitted storage capacity, (7) current amount of tailings stored, (8) consequence classification, (9) date of the most recent independent technical review, (10) material findings, (11) mitigation measures, and (12) site-specific emergency preparedness and response plan (EPRP).

2.1 The entity shall provide the name or other identifier used by the entity for the facility.

2.2 Disclosure of the facility's location shall include the country in which it operates.

2.3 Ownership status shall include whether the entity is the operator of the facility.

2.3.1 The definition of an operator shall be consistent with that provided in the GISTM Glossary.

- 2.4 The entity shall disclose the operational status of its facilities (for example, active, inactive—under maintenance, closed).
- 2.5 The entity shall disclose the facility construction method.
- 2.5.1 The entity shall disclose the construction method as ‘downstream’, ‘upstream’ or ‘centreline’, consistent with the definitions provided by the International Council on Mining and Metals (ICMM).
- 2.5.2 If the construction method does not match any of these definitions, the entity shall disclose the construction method as ‘other’ and provide a brief description of it.
- 2.6 The entity shall disclose the maximum permitted facility storage capacity, in metric tonnes.
- 2.7 The entity shall disclose the quantity of tailings stored in the facility as of the end of the reporting period, in metric tonnes.
- 2.8 The entity shall disclose the consequence classification of the facility in accordance with Requirement 4.1 of the GISTM.
- 2.9 The entity shall disclose the date of the most recent independent technical review of the facility, conducted in accordance with Requirement 10.6 of the GISTM.
- 2.9.1 A review is considered independent if it is conducted by third parties who are not and have not been directly involved with the design or operation of the facility.
- 2.10 The entity shall disclose whether the most recent independent technical review resulted in material findings related to the safety of the facility.
- 2.10.1 The scope of material findings shall be consistent with the definition of ‘material’ provided in the GISTM, in which the criteria for what is material is to be defined by the entity, subject to the provisions of local regulations, and evaluated as part of any audit or external assessment that may be conducted on implementation.
- 2.10.2 The entity shall state either ‘Yes’ or ‘No’.
- 2.10.3 If the entity has responded ‘Yes’ for a facility, the entity may provide a summary of the material findings in addition to the inventory table.
- 2.10.4 If an independent technical review of a facility was not conducted, the entity shall state ‘N/A’.
- 2.11 If the entity has responded ‘Yes’ regarding material findings, the entity shall disclose whether mitigation measures have been implemented to reduce risk to a level as low as reasonably practicable (ALARP).
- 2.11.1 The definition of ALARP shall be consistent with that provided in the GISTM Glossary.
- 2.11.2 The entity shall state either ‘Yes’ or ‘No’.

2.11.3 If the entity has responded 'Yes' for a facility, the entity may provide a summary of the relevant mitigation measures in addition to the inventory table.

2.12 The entity shall disclose whether a site-specific EPRP is in place in accordance with requirements 13.1 and 13.2 of the GISTM.

2.12.1 The definition of EPRP shall be consistent with that provided in the GISTM Glossary.

2.12.2 The entity shall state either 'Yes' or 'No'.

3 The entity should disclose its inventory in this table format:

Table 3. Tailings storage facility inventory table

(a) Facility name	(b) Location	(c) Ownership status	(d) Operational status	(e) Construction method	(f) Maximum permitted storage capacity	(g) Current quantity of tailings stored	(h) Consequence classification	(i) Date of most recent independent technical review	(j) Material findings	(k) Mitigation measures	(l) Site-specific EPRP

EM-MM-540a.2. Summary of tailings management systems and governance structure used to monitor and maintain the stability of tailings storage facilities

1 The entity shall provide a summary of the tailings management systems used to monitor and maintain the structural integrity of tailings facilities and to minimise the risk of a catastrophic failure.

1.1 The scope of the disclosure shall include a summary of the policies and procedures for the entity's active and inactive tailings facilities for all phases of their lifecycle, including closure and post-closure.

1.2 The definitions of tailings facilities and tailings management systems shall be consistent with those provided in the Global Tailings Review *Global Industry Standard on Tailings Management* (GISTM).

2 The disclosure shall include concepts outlined in Principles 7–11 of the GISTM and may include:

2.1 a summary of the performance monitoring programme for tailings facilities and their appurtenant structures;

2.2 a summary of the engineering monitoring systems that verify design assumptions and monitor potential failure modes;

2.3 the frequency of risk assessments consistent with Requirement 10.1 of the GISTM;

2.4 the frequency of engineer of record or senior independent technical reviewer construction and performance reviews;

2.4.1 the definition of engineer of record shall be consistent with that provided in the GISTM;

- 2.5 a summary of the governance framework that outlines the accountability, from the site-level management through to executive leadership and the board of directors; and
- 2.6 frequency of reviews to confirm that adequate financial capacity (including insurance, to the extent commercially reasonable) is available for planned closure, early closure, reclamation, and post-closure of tailings facilities and their appurtenant structures.

EM-MM-540a.3. Approach to development of Emergency Preparedness and Response Plans (EPRPs) for tailings storage facilities

- 1 The entity shall disclose its approach to the development of Emergency Preparedness and Response Plans (EPRPs).
 - 1.1 The definition of EPRP shall be consistent with that provided in the Global Tailings Review *Global Industry Standard on Tailings Management* (GISTM) Glossary.
 - 1.2 The scope of the disclosure shall include a summary of plans, procedures and policies for the entity's active and inactive tailings storage facilities for all phases of the lifecycle, including closure and post-closure.
 - 1.2.1 The definition of tailings facility shall be consistent with that provided in the GISTM Glossary.
- 2 The entity shall disclose its approach to EPRPs at its facilities, including the preparedness of local stakeholders.
 - 2.1 The disclosure shall include:
 - 2.1.1 the entity's approach to engaging with employees, contractors, public sector agencies, first responders, and local authorities and institutions in accordance with requirements 13.1 and 13.2 of the GISTM; and
 - 2.1.2 the entity's frequency of emergency response plan tests and evacuation exercises to minimise the consequences of a potential failure.



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