



EXTRACTIVES & MINERALS PROCESSING SECTOR

METALS & MINING

Sustainability Accounting Standard

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

Prepared by the
Sustainability Accounting Standards Board

October 2018

INDUSTRY STANDARD | VERSION 2018-10

METALS & MINING

Sustainability Accounting Standard

About SASB

The SASB Foundation was founded in 2011 as a not-for-profit, independent standards-setting organization. The SASB Foundation's mission is to establish and maintain industry-specific standards that assist companies in disclosing financially material, decision-useful sustainability information to investors.

The SASB Foundation operates in a governance structure similar to the structure adopted by other internationally recognized bodies that set standards for disclosure to investors, including the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB). This structure includes a board of directors ("the Foundation Board") and a standards-setting board ("the Standards Board" or "the SASB"). The Standards Board develops, issues, and maintains the SASB standards. The Foundation Board oversees the strategy, finances and operations of the entire organization, and appoints the members of the Standards Board.

The Foundation Board is not involved in setting standards, but is responsible for overseeing the Standards Board's compliance with the organization's due process requirements. As set out in the *SASB Rules of Procedure*, the SASB's standards-setting activities are transparent and follow careful due process, including extensive consultation with companies, investors, and relevant experts.

The SASB Foundation is funded by a range of sources, including contributions from philanthropies, companies, and individuals, as well as through the sale and licensing of publications, educational materials, and other products. The SASB Foundation receives no government financing and is not affiliated with any governmental body, the FASB, the IASB, or any other financial accounting standards-setting body.

SUSTAINABILITY ACCOUNTING STANDARDS BOARD

1045 Sansome Street, Suite 450

San Francisco, CA 94111

415.830.9220

info@sasb.org

sasb.org

The information, text, and graphics in this publication (the "Content") are owned by The SASB Foundation. All rights reserved. The Content may be used only for non-commercial, informational, or scholarly use, provided that all copyright and other proprietary notices related to the Content are kept intact, and that no modifications are made to the Content. The Content may not be otherwise disseminated, distributed, republished, reproduced, or modified without the prior written permission of The SASB Foundation. To request permission, please contact us at info@sasb.org.

Table of Contents

Introduction.....	4
Purpose of SASB Standards.....	4
Overview of SASB Standards.....	4
Use of the Standards.....	5
Industry Description.....	5
Sustainability Disclosure Topics & Accounting Metrics.....	6
Greenhouse Gas Emissions.....	8
Air Quality.....	12
Energy Management.....	14
Water Management.....	16
Waste & Hazardous Materials Management.....	18
Biodiversity Impacts.....	22
Security, Human Rights & Rights of Indigenous Peoples.....	27
Community Relations.....	32
Labor Relations.....	36
Workforce Health & Safety.....	38
Business Ethics & Transparency.....	40

INTRODUCTION

Purpose of SASB Standards

The SASB’s use of the term “sustainability” refers to corporate activities that maintain or enhance the ability of the company to create value over the long term. Sustainability accounting reflects the governance and management of a company’s environmental and social impacts arising from production of goods and services, as well as its governance and management of the environmental and social capitals necessary to create long-term value. The SASB also refers to sustainability as “ESG” (environmental, social, and governance), though traditional corporate governance issues such as board composition are not included within the scope of the SASB’s standards-setting activities.

SASB standards are designed to identify a minimum set of sustainability issues most likely to impact the operating performance or financial condition of the typical company in an industry, regardless of location. SASB standards are designed to enable communications on corporate performance on industry-level sustainability issues in a cost-effective and decision-useful manner using existing disclosure and reporting mechanisms.

Businesses can use the SASB standards to better identify, manage, and communicate to investors sustainability information that is financially material. Use of the standards can benefit businesses by improving transparency, risk management, and performance. SASB standards can help investors by encouraging reporting that is comparable, consistent, and financially material, thereby enabling investors to make better investment and voting decisions.

Overview of SASB Standards

The SASB has developed a set of 77 industry-specific sustainability accounting standards (“SASB standards” or “industry standards”), categorized pursuant to SASB’s [Sustainable Industry Classification System® \(SICS®\)](#). Each SASB standard describes the industry that is the subject of the standard, including any assumptions about the predominant business model and industry segments that are included. SASB standards include:

1. **Disclosure topics** – A minimum set of industry-specific disclosure topics reasonably likely to constitute material information, and a brief description of how management or mismanagement of each topic may affect value creation.
2. **Accounting metrics** – A set of quantitative and/or qualitative accounting metrics intended to measure performance on each topic.
3. **Technical protocols** – Each accounting metric is accompanied by a technical protocol that provides guidance on definitions, scope, implementation, compilation, and presentation, all of which are intended to constitute suitable criteria for third-party assurance.
4. **Activity metrics** – A set of metrics that quantify the scale of a company’s business and are intended for use in conjunction with accounting metrics to normalize data and facilitate comparison.

Furthermore, 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.

The *SASB Conceptual Framework* sets out the basic concepts, principles, definitions, and objectives that guide the Standards Board in its approach to setting standards for sustainability accounting. The *SASB Rules of Procedure* is focused on the governance processes and practices for standards setting.

Use of the Standards

SASB standards are intended for use in communications to investors regarding sustainability issues that are likely to impact corporate ability to create value over the long term. Use of SASB standards is voluntary. A company determines which standard(s) is relevant to the company, which disclosure topics are financially material to its business, and which associated metrics to report, taking relevant legal requirements into account¹. In general, a company would use the SASB standard specific to its primary industry as identified in *SICS*[®]. However, companies with substantial business in multiple *SICS*[®] industries can consider reporting on these additional SASB industry standards.

It is up to a company to determine the means by which it reports SASB information to investors. One benefit of using SASB standards may be achieving regulatory compliance in some markets. Other investor communications using SASB information could be sustainability reports, integrated reports, websites, or annual reports to shareholders. There is no guarantee that SASB standards address all financially material sustainability risks or opportunities unique to a company's business model.

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. It also produces iron ores, rare earth metals, and precious metals and stones. Larger companies in this industry are vertically integrated – from mining across global operations to wholesaling metals to customers.

Note: SASB has separate standards for the Iron & Steel Producers industry (EM-IS).

¹ **Legal Note:** SASB standards are not intended to, and indeed cannot, replace any legal or regulatory requirements that may be applicable to a reporting entity's operations.

SUSTAINABILITY DISCLOSURE TOPICS & ACCOUNTING METRICS

Table 1. Sustainability Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	Quantitative	Metric tons (t) CO ₂ -e, Percentage (%)	EM-MM-110a.1
	Discussion of long-term 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 tons (t)	EM-MM-120a.1
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	EM-MM-130a.1
Water Management	(1) Total fresh water withdrawn, (2) total fresh water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (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
Waste & Hazardous Materials Management	Total weight of tailings waste, percentage recycled	Quantitative	Metric tons (t), Percentage (%)	EM-MM-150a.1
	Total weight of mineral processing waste, percentage recycled	Quantitative	Metric tons (t), Percentage (%)	EM-MM-150a.2
	Number of tailings impoundments, broken down by MSHA hazard potential	Quantitative	Number	EM-MM-150a.3
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	Percentage of (1) proved and (2) probable reserves in or near areas of conflict	Quantitative	Percentage (%)	EM-MM-210a.1

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
of Indigenous Peoples	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
	Number and duration of non-technical delays	Quantitative	Number, Days	EM-MM-210b.2
Labor Relations	Percentage of active workforce covered under collective bargaining agreements, broken down by U.S. and foreign employees	Quantitative	Percentage (%)	EM-MM-310a.1
	Number and duration of strikes and lockouts ²	Quantitative	Number, Days	EM-MM-310a.2
Workforce Health & Safety	(1) MSHA 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) full-time 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 tons (t) saleable	EM-MM-510a.2

Table 2. Activity Metrics

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

² Note to **EM-MM-310a.2** – 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 the risks posed by climate change may result in additional regulatory compliance costs and risks for metals and mining companies due to climate change mitigation policies. Operational efficiencies can be achieved through the cost-effective reduction of GHG emissions. Such efficiencies can mitigate the potential financial impact of increased fuel costs from regulations that seek to limit—or put a price on—GHG emissions.

Accounting 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), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).
 - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (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 include, but are not limited to, equipment at mine sites, refineries and smelting facilities, office buildings, and 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, but are not limited to:

- 2.2.1 *GHG Reporting Guidance for the Aerospace Industry* published by 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 emissions data shall be consolidated and disclosed 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 published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, "Organisational boundary," of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 3.1 Examples of emissions-limiting regulations include, but are not limited to:
 - 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 (Draft Bill 42 of 2009)
 - 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO₂-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO₂-e).
 - 3.2.1 For emissions that are subject to multiple emissions-limiting regulations, 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 (e.g., voluntary trading systems), as well as reporting-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].

- 4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 5 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) 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, but are not limited to: aluminum, copper, zinc, iron ore, precious metals, or diamonds.

EM-MM-110a.2. Discussion of long-term 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-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
 - 1.1 Scope 1 emissions are defined according to [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), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
 - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions the target is applicable to);
 - 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 toward the achievement of the target;
 - 2.4 The timelines 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 and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 4 The entity shall discuss the scope of its strategies, plans, and/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, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/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, criteria air pollutants, and Volatile Organic Compounds (VOCs) from smelting and refining activities. These can have significant, localized human health and environmental impacts. Depending on the metal, uncaptured sulfur dioxide, lead, mercury, cadmium, and arsenic are among the chief pollutants, along with particulate matter. Financial impacts 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 companies to limit the impacts of increasingly stringent air quality regulations globally. Companies could also benefit from operational efficiencies that could lead to a lower cost structure over time.

Accounting 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 tons per pollutant, that are released into the atmosphere.
 - 1.1 The scope of disclosure includes air pollutants associated with the entity's direct air emissions resulting from all of the entity's activities and sources of emissions, including, but not limited to, stationary and 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 sulfur (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 micrometers or less in diameter (PM₁₀), reported as PM₁₀.
 - 5.1 PM₁₀ is defined, according to U.S. 40 CFR Part 51.100, as any airborne finely divided solid or liquid material with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

- 6 The entity shall disclose its emissions of (5) lead and lead compounds, reported as Pb.
- 7 The entity shall disclose its emissions of (6) mercury and mercury compounds, reported as Hg.
- 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 by the U.S. Environmental Protection Agency (EPA) as having negligible photochemical reactivity.
 - 8.1.1 This definition is aligned with U.S. 40 CFR Part 51.100, where a list of compounds that have been determined to have negligible photochemical reactivity can be obtained.
 - 8.1.2 Where applicable regulatory definitions of VOCs may conflict with this definition, such as the EU Paints Directive (Directive 2004/42/EC), and Schedule 1 of the Canadian Environmental Protection Act 1999, the entity may define VOCs as per the applicable regulatory definition.
- 9 The entity may discuss the calculation methodology for its emissions disclosure, such as whether data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.
- 10 The entity may provide a breakdown of its emissions by mineral or business unit, where relevant.
 - 10.1 Minerals or business units may include, but are not limited to: aluminum, 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. While 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 use of alternative energy, can play an important role 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 a company 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.

Accounting Metrics

EM-MM-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (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 sources external to the entity 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 directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 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 is 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 program, 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 (i.e., 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 must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order 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 hydro and biomass sources is limited to the following:
 - 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
 - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), 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, and/or materials that are eligible for an applicable state 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 impact both the availability and the quality of local water resources. Metals and mining companies face operational, regulatory, and reputational risks due to water scarcity, costs of water acquisition, regulations on effluents or amount of water used, and competition with local communities and other industries for limited water resources. Impacts associated with water management may include higher costs, liabilities, and lost revenues due to curtailment or suspension of operations. The severity of these risks can vary depending on the region's water availability and the regulatory environment. Companies 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 companies and lower their operating costs.

Accounting Metrics

EM-MM-140a.1. (1) Total fresh water withdrawn, (2) total fresh 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 meters, that was withdrawn from freshwater sources:
 - 1.1 Fresh water may be defined according to the local statutes and regulations where the entity operates. Where there is no regulatory definition, fresh water shall be considered to be water that has less than 1000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
 - 1.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 2 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations
 - 2.1 Water consumption is defined as:
 - 2.1.1 Water that evaporates during withdrawal, usage, and discharge;
 - 2.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
 - 2.1.3 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.
- 3 The entity shall analyze all of 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](#).

- 3.1 The entity shall list its facilities or operations which are located in areas of High or Extremely High Baseline Water Stress.
- 4 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 5 The entity shall disclose its 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 instances of non-compliance, including violations of a technology-based standard and exceedances of quality-based standards.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, the discharge of a hazardous substances, violation of pretreatment 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 actions that address a violation or threatened violation of water quantity and/or quality laws, regulations, policies, or orders, and can result in administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. Environmental Protection Agency (EPA) provides guidance on the scope of formal enforcement actions in, [Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites](#).
- 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 average, and monthly averages.
 - 4.2 Non-continuous discharges and 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 mineral processing and smelting wastes, including slags and tailings, some of which may be hazardous or chemically reactive. Impoundments for tailings can cover large areas of land. This can present a significant threat if the impoundments burst, collapse, or leak, leading to the loss of life or damage to property and ecosystems. Mineral wastes are also often stored in-pit, using abandoned open pit surface mines. Such storage can create the potential for groundwater contamination and could affect the stability of active mines in the area. Companies that reduce and recycle waste streams while implementing policies to manage risks related to the integrity of tailings facilities may enjoy lower regulatory and litigation risks, remediation liabilities, and costs. Additionally, tailings can contain hazardous chemical residues from extraction and processing operations. Companies' ability to manage the sourcing, transport, use, and disposal of mining and metal processing chemicals and by-products can reduce associated risks.

Accounting Metrics

EM-MM-150a.1. Total weight of tailings waste, percentage recycled

- 1 The entity shall disclose the total amount of tailings waste generated by the entity during the reporting period.
 - 1.1 The amount of total tailings waste shall be calculated in metric tons, where waste is defined as anything for which the entity has no further use and which is discarded or released to the environment.
 - 1.2 The scope includes tailings waste generated from mining activities.
 - 1.3 The scope of disclosure excludes waste rock and overburden.
- 2 The entity shall disclose the percentage of tailings waste that was recycled during the reporting period.
 - 2.1 The percentage recycled shall be calculated as the weight of tailings waste material that was reused plus the weight recycled or remanufactured (through treatment or processing) by the entity plus the amount sent externally for further recycling divided by the total weight of tailings waste material, where:
 - 2.1.1 Reused materials are defined as those recovered materials that are used for the same purpose for which they were conceived.
 - 2.1.2 Recycled and remanufactured materials are defined as waste materials that have been reprocessed or treated by means of production or manufacturing process and made into a final product or made into a component for incorporation into a product.

- 2.1.3 The scope of recycled and remanufactured products includes primary recycled materials, co-products (outputs of equal value to primary recycled materials), and by-products (outputs of lesser value to primary recycled materials).
- 2.1.4 Portions of waste materials that are disposed of in landfills are not considered recycled; only the portions of materials that are directly incorporated into new products, co-products, or by-products shall be included in the percentage recycled.
- 2.1.5 Materials sent for further recycling include those materials which are transferred to a third party for the expressed purpose of reuse, recycling, or refurbishment.
- 2.1.6 Materials incinerated, including for energy recovery, are not considered reused or recycled. Energy recovery is defined as the use of combustible waste as a means to generate energy through direct incineration with or without other waste but with recovery of the heat.

EM-MM-150a.2. Total weight of mineral processing waste, percentage recycled

- 1 The entity shall disclose the total amount of mineral processing waste generated by the entity during the reporting period.
 - 1.1 The amount of total mineral processing waste shall be calculated in metric tons, where waste is defined as anything for which the entity has no further use and which is discarded or released to the environment.
 - 1.2 The scope includes waste generated during metals processing (e.g., smelting and refining), such as slags, dusts, sludges, and spent solvents.
 - 1.3 The scope includes scrap metal, reject coal, used oil, and other solid wastes and excludes gaseous wastes.
- 2 The entity shall disclose the percentage of mineral processing waste that was recycled during the reporting period.
 - 2.1 The percentage recycled shall be calculated as the weight of waste material that was reused plus the weight recycled or remanufactured (through treatment or processing) by the entity plus the amount sent externally for further recycling divided by the total weight of waste material, where:
 - 2.1.1 Reused materials are defined as those recovered products or components of products that are used for the same purpose for which they were conceived.
 - 2.1.2 Recycled and remanufactured materials are defined as waste materials that have been reprocessed or treated by means of production or manufacturing process and made into a final product or made into a component for incorporation into a product.

- 2.1.3 The scope of recycled and remanufactured products includes primary recycled materials, co-products (outputs of equal value to primary recycled materials), and by-products (outputs of lesser value to primary recycled materials).
- 2.1.4 Portions of products and materials that are disposed of in landfills are not considered recycled; only the portions of products that are directly incorporated into new products, co-products, or by-products shall be included in the percentage recycled.
- 2.1.5 Materials sent for further recycling include those materials which are transferred to a third party for the expressed purpose of reuse, recycling, or refurbishment.
- 2.1.6 Materials incinerated, including for energy recovery, are not considered reused or recycled. Energy recovery is defined as the use of combustible waste as a means to generate energy through direct incineration with or without other waste but with recovery of the heat.

EM-MM-150a.3. Number of tailings impoundments, broken down by MSHA hazard potential

- 1 The entity shall disclose the number of tailings impoundments according to the following U.S. Mine Safety and Health Administration (MSHA) hazard potential classification:
 - 1.1 High hazard potential
 - 1.2 Significant hazard potential
 - 1.3 Low hazard potential
- 2 For locations under the auspices of the MSHA, the hazard potential shall be determined by Mine Safety and Health enforcement personnel (Metal and Nonmetal) during regular (E01) inspections through verification that the mine operator has appropriately classified the dam or by assigning a hazard classification if the existing one does not appear reasonable or if no classification has been assigned.
- 3 For locations not under the auspices of the MSHA, hazard potential shall be determined by a third party following [MSHA Procedure Instruction Letter No. I13-IV-01](#) guidance.
- 4 High hazard potential impoundments are dams, regardless of their condition or size, whose failure will probably cause loss of life.
 - 4.1 These facilities are generally located in populated areas or where dwellings are found in the flood plain, and failure can reasonably be expected to cause loss of life, serious damage to homes, industrial and commercial buildings, and damage to important utilities, highways, or railroads.

- 5 Significant hazard potential impoundments are dams, regardless of their condition or size, whose failure would result in no probable loss of life but would disrupt important utilities or cause significant economic loss or significant environmental damage.
 - 5.1 These facilities are generally located in predominantly rural areas, but could be in populated areas with significant infrastructure, where failure could damage isolated homes, main highways, and minor railroads, or disrupt the use of service of public utilities.
- 6 Low hazard potential impoundments are dams whose failure would not be expected to cause loss of life, disrupt important utilities, or cause significant economic loss or significant environmental damage.
 - 6.1 These facilities are usually located in rural or agricultural areas where losses are limited principally to the owner's property or where failure would cause only slight damage to farm buildings, forest and agricultural land, and minor roads.
 - 6.2 The scope includes only dams that either: (1) Equal or exceed 25 feet in height and can or do store a volume of more than 15 acre-feet, or (2) Exceed six feet in height and can or do store 50 or more acre-feet.
- 7 Hazard potential classification depends solely on the consequences of failure of the dam and not on the condition of the dam.
- 8 Hazard potential classification can change over time.

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 to wildlife habitats. Acid rock drainage is a particularly significant risk: it is highly acidic water, rich in heavy metals, formed when surface and shallow subsurface water come into contact with mining overburden. Acid rock drainage can have harmful effects on humans, animals, and plants. Biodiversity impacts of mining operations can affect the valuation of reserves and create operational risks. The environmental characteristics of the land where reserves are located could increase extraction costs due to increasing interest in the protection of ecosystems. Companies could also face regulatory or reputational barriers to accessing reserves in ecologically sensitive areas. This may include new protection status afforded to areas where reserves are located. Metals and mining companies face regulatory risks related to reclamation after a mine is decommissioned, per applicable regulatory requirements to restore mined property according to a prior, 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, ongoing mining operations are subject to laws protecting endangered species. Companies that have an effective environmental management plan for different stages of the project lifecycle may minimize their compliance costs and legal liabilities, face less resistance in developing new mines, and avoid difficulties in obtaining permits, accessing reserves, and facing delays in project completion.

Accounting Metrics

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

- 1 The entity shall describe its environmental management plan(s) implemented at active sites, including, where relevant:
 - 1.1 Lifecycle stages to which the plan(s) apply, such as: pre-bid (when the entity is considering acquisition of a site), exploration and appraisal, site development, production, and during closure, decommissioning, and restoration.
 - 1.2 The topics addressed by the plan(s), such as: ecological and biodiversity impacts, waste generation, noise impacts, emissions to air, discharges to water, natural resource consumption, and hazardous chemical usage.
 - 1.3 The underlying references for its plan(s), including whether they are codes, guidelines, standards, or regulations; whether they were developed by the entity, an industry organization, a third-party organization (e.g., a non-governmental organization), a governmental agency, or some combination of these groups.
- 2 Where relevant, the entity shall describe specific policies and practices that apply to areas with protected conservation status and/or areas of critical habitat, which are defined by the International Finance Corporation (IFC)

Performance Standard 6 as:

- 2.1 Areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes.³
- 3 If the management policies and practices do not apply to all of the entity's sites or operations, it shall indicate the percentage of sites to which they were applied.
- 4 Where environmental management policies and practices differ significantly by mineral resource (e.g., bauxite mining as compared to silver mining) then the entity shall describe differences for each resource.
- 5 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](#), January 1, 2012, including specifically:
 - 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.
 - 5.4 Performance Standard 6 — Biodiversity Conservation and Sustainable Management of Living Natural Resources.
- 6 Additional relevant references may include:
 - 6.1 "[Environmental management in oil and gas exploration and production – An overview of issue and management approaches](#)," Joint E&P Forum/UNEP Technical Publication 1997.
 - 6.2 "[Towards Sustainable Decommissioning and Closure of Oil Fields and Mines: A Toolkit to Assist Government Agencies](#)," DRAFT Version 2.0, November 2009, World Bank Multistakeholder Initiative.

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 in metric tons) where acid-generating seepage into surrounding surface water and/or groundwater is: (1) predicted to occur, (2) actively mitigated, and (3) under treatment or remediation.

³ International Finance Corporation (IFC), Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*, January 1, 2012.

- 2 Acid Rock Drainage (ARD) is predicted to occur if, based on computer simulations, chemical evaluations, and/ or acid-base accounting, it is biochemically likely that ARD could form at the mine site.
- 3 ARD is considered to be actively mitigated if the entity is preventing the formation of ARD through methods that include, but are not limited to: storing or covering sulfite-bearing minerals to prevent oxidation, flood prevention and mine sealing, mixing of acid buffering materials with acid-producing materials, or chemical treatment of sulfide wastes (e.g., organic chemicals designed to kill sulfide-oxidizing 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 (active or passive).
- 5 The entity may provide a breakdown by mineral or business unit.
 - 5.1 Minerals or business units may include, for example: aluminum, copper, zinc, iron ore, precious metals, or diamonds.
- 6 ARD may also be referred to 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 the percentage and grade (in percentage metal content) of proved reserves in sites with protected conservation status or in areas of endangered species habitat.
 - 1.1 The percentage of proved reserves shall be calculated as the amount of proved reserves located in areas either with protected conservation status or in areas of endangered species habitat divided by the total amount of proved reserves
 - 1.2 The entity shall provide a breakdown of the calculations by grade (in percentage metal content) of proved reserves
 - 1.3 The entity shall, where relevant, provide a breakdown of calculations by mineral or business unit where minerals or business units include, for example: aluminum, copper, zinc, iron ore, platinum group metals, or diamonds.
- 2 The entity shall disclose the percentage and grade (in percentage of metal content) of probable reserves in sites with protected conservation status or in areas of endangered species habitat.
 - 2.1 The percentage of probable reserves shall be calculated as the amount of probable reserves located in areas either with protected conservation status or in areas of endangered species habitat divided by the total amount of probable reserves

- 2.2 The entity shall provide a breakdown of the calculations by grade (in percentage metal content) of probable reserves
 - 2.3 The entity shall, where relevant, provide a breakdown of calculations by mineral or business unit where minerals or business units include, for example: aluminum, 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 UNESCO World Heritage Sites
 - 3.4 Biosphere Reserves recognized within the framework of UNESCO's Man and the Biosphere (MAB) Programme
 - 3.5 Natura 2000 sites
 - 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"⁴
 - 3.6.1 These sites may be listed in the World Database of Protected Areas (WDPA) and mapped on [ProtectedPlanet](#)
- 4 Reserves are considered to be in endangered species habitat if they are in or near areas where IUCN Red List of Threatened Species that are classified as 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 5 kilometers (km) of the boundary of an area of protected conservation status or an endangered species habitat to the location of the entity's proven and probable reserves.
- 6 Reserves are defined by the U.S. Securities and Exchange Commission (SEC) Industry Guide 7, Description of Property by Issuers Engaged or to Be Engaged in Significant Mining Operations:

⁴ Dudley, N. (ed.) (2008) Guidelines for Applying Protected Areas Management Categories. IUCN: Gland, Switzerland. p.8-9.

- 6.1 Reserves, as that part of a mineral deposit which could be economically and legally extracted or produced at the time of the reserve determination.
- 6.2 Proved reserves, as reserves for which (a) quantity is computed from dimensions revealed in outcrops, trenches, workings, or drill holes; grade and/or quality are computed from the results of detailed sampling, and (b) the sites for inspection, sampling, and measurement are spaced so closely and the geographic character is so well-defined that size, shape, depth, and mineral content of reserves are well-established.
- 6.3 Probable reserves are reserves for which quantity and grade and/or quality are computed from information similar to that used for proven (measured) reserves, but the sites for inspection, sampling, and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for proven (measured) 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 "[A-Z Guide of Areas of Biodiversity Importance](#)" prepared by the United Nations Environment Programme’s World Conservation Monitoring Centre (UNEP-WCMC).
- 9 The entity may discuss reserves that are located in protected areas or endangered species habitat but present low risk 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 biodiversity or ecosystem services risks.

Security, Human Rights & Rights of Indigenous Peoples

Topic Summary

Metals and mining companies face additional community-related risks when operating in conflict zones and in areas with weak or absent governance institutions, rule of law, and legislation to protect human rights. They also face risks when operating in areas with vulnerable communities, such as indigenous peoples. Companies using private or government security forces to protect their workers and assets may knowingly, or unknowingly, contribute to human rights violations, including use of excessive force. Indigenous people are often the most vulnerable sections of the population, with limited capacity to defend their unique rights and interests. Companies perceived as contributing to human rights violations or failing to account for indigenous peoples' rights may be affected due to protests, riots, or suspension of permits. They 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 country laws to address such cases, several international instruments have emerged to provide guidelines for companies. These instruments include obtaining the free, prior, and informed consent of indigenous peoples for decisions affecting them. With greater awareness, several countries are also beginning to implement specific laws protecting indigenous peoples' rights, creating increasing regulatory risk for companies.

Accounting Metrics

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

- 1 The entity shall disclose the percentage and grade (in percentage metal content) of proved reserves that are located in or near areas of active conflict.
 - 1.1 The percentage of proved reserves shall be calculated as the amount of proved reserves located in or near areas of conflict divided by the total amount of proved reserves
 - 1.2 The entity shall provide a breakdown of the calculations by grade (in percentage metal content) of proved reserves
 - 1.3 The entity shall, where relevant, provide a breakdown of calculations by mineral or business unit where minerals or business units include, for example: aluminum, copper, zinc, iron ore, platinum group metals, and diamonds.
- 2 The entity shall disclose the percentage and grade (in percentage metal content) of probable reserves that are located in or near areas of active conflict.
 - 2.1 The percentage of probable reserves shall be calculated as the amount of probable reserves located in or near areas of conflict divided by the total amount of probable reserves.

- 2.2 The entity shall provide a breakdown of the calculations by grade (in percentage metal content) of probable reserves
- 2.3 The entity shall, where relevant, provide a breakdown of calculations by mineral or business unit where minerals or business units include, for example: aluminum, copper, zinc, iron ore, platinum group metals, or diamonds
- 3 Active conflict is defined according to the Uppsala Conflict Data Program (UCDP) [definition](#) as:
 - 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 it is 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 that is not proximate to its reserves then it may exclude these from the scope of disclosure.
 - 4.2 If reserves are located in a country, region, or state adjacent to an active conflict and/or can be reasonably expected to be operationally impacted by the conflict, then these reserves shall be included in the scope of disclosure.
- 5 Reserves are defined by the Securities and Exchange Commission (SEC) [Industry Guide 7, Description of Property by Issuers Engaged or to Be Engaged in Significant Mining Operations](#):
 - 5.1 Reserves, as that part of a mineral deposit which could be economically and legally extracted or produced at the time of the reserve determination.
 - 5.2 Proved reserves, as reserves for which (a) quantity is computed from dimensions revealed in outcrops, trenches, workings, or drill holes; grade and/or quality are computed from the results of detailed sampling, and (b) the sites for inspection, sampling, and measurement are spaced so closely and the geographic character is so well-defined that size, shape, depth, and mineral content of reserves are well-established.
 - 5.3 Probable reserves are reserves for which quantity and grade and/or quality are computed from information similar to that used for proven (measured) reserves, but the sites for inspection, sampling, and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for proven (measured) 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 the percentage and grade (in percentage metal content) of proved reserves that are located in or near areas that are considered to be indigenous peoples' land.
 - 1.1 The percentage of proved reserves shall be calculated as the amount of proved reserves located in or near areas that are considered to be indigenous peoples' land divided by the total amount of proved reserves.
 - 1.2 The entity shall provide a breakdown of the calculations by the grade (in percentage metal content) of proved reserves
 - 1.3 The entity shall, where relevant, provide a breakdown of calculations by mineral or business unit where minerals or business units include, for example: aluminum, copper, zinc, iron ore, platinum group metals, or diamonds.

- 2 The entity shall disclose the percentage and grade (in percentage metal content) of probable reserves that are 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 amount of probable reserves located in or near areas that are considered to be indigenous peoples' land divided by the total amount of probable reserves.
 - 2.2 The entity shall provide a breakdown of the calculations by the grade (in percentage metal content) of probable reserves
 - 2.3 The entity shall, where relevant, provide a breakdown of calculations by mineral or business unit where minerals or business units include, for example: aluminum, copper, zinc, iron ore, platinum group metals, or diamonds.

- 3 Indigenous lands are considered those occupied by people who self-identify as indigenous per Article 33 of the United Nations Declaration on the Rights of Indigenous Peoples and the International Labour Organization Convention No. 169, and likely have one or more of the following characteristics based on the [working definition](#) of "Indigenous Peoples" adopted by the United Nations:
 - 3.1 Historical continuity with pre-colonial and/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

- 3.6 Resolve to maintain and reproduce ancestral environments and systems as distinctive peoples and communities
- 4 For the purposes of this disclosure, “near” is defined as within 5 kilometers of the recognized boundary of an area considered to be indigenous land to the location of the entity’s proven and probable reserves.
- 5 Reserves are defined by the SEC [Industry Guide 7, Description of Property by Issuers Engaged or to Be Engaged in Significant Mining Operations](#):
 - 5.1 Reserves, as that part of a mineral deposit which could be economically and legally extracted or produced at the time of the reserve determination.
 - 5.2 Proved reserves, as reserves for which (a) quantity is computed from dimensions revealed in outcrops, trenches, workings, or drill holes; grade and/or quality are computed from the results of detailed sampling, and (b) the sites for inspection, sampling, and measurement are spaced so closely and the geographic character is so well-defined that size, shape, depth, and mineral content of reserves are well-established.
 - 5.3 Probable reserves are reserves for which quantity and grade and/or quality are computed from information similar to that used for proven (measured) reserves, but the sites for inspection, sampling, and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for proven (measured) 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 include, but are not limited to:
 - 1.1 Upholding International Labour Organization (ILO) Convention No. 169
 - 1.2 Use of free, prior, and informed consent (or consultation) processes
 - 1.3 The establishment of project grievance mechanisms
 - 1.4 The establishment of formal community agreements
- 2 The entity shall describe its due diligence practices and procedures with respect to human rights, including:
 - 2.1 Upholding the fundamental ILO conventions on freedom of association (No. 87), collective bargaining (No. 98), forced labor (No. 29, No. 105), child labor (No. 138, No. 182), fair wages (No. 100), and discrimination (No. 111).

- 2.2 Implementation of the European Commission’s “Oil and Gas Sector Guide on Implementing the UN Guiding Principles on Business and Human Rights,” specifically Human Rights Due Diligence (Principle 17a-c).
- 2.3 Implementation of 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 [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 impact 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 (i.e., prior, during, and post).
- 7 The discussion may include governance mechanisms the company puts in place to ensure that its policies and practices are adhered to throughout all levels of the organization.
- 8 The discussion shall include how practices apply to business partners, such as contractors, sub-contractors, suppliers, and joint venture partners.
 - 8.1 Where 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 of time, and companies may be involved in multiple projects in a region that can have a wide range of community impacts. 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 companies rely upon support from local communities to be able to obtain permits and leases as well as to conduct their activities without disruptions. Companies may experience adverse financial impacts if the community interferes, or lobbies its government to interfere, with the rights of a mining company in relation to their ability to access, develop, and produce reserves. In addition to community concerns about 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 companies that are perceived as engaging in rent-seeking and exploiting a country or community's resources without providing any socio-economic benefits in return may be exposed to the risk of actions, motivated by resource nationalism, and by host governments and communities. These could include imposition of ad hoc taxes and export restrictions. Companies in the extractives industries 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 the integration of community engagement into phases of the project cycle. Companies are beginning to adopt a "shared value" approach to provide a key socio-economic benefit to the community while allowing the company to profitably operate.

Accounting 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 the rights and interests of communities in areas where it conducts business, where community rights and interests include:
 - 1.1 Economic rights and interests, including, but not limited to, employment, fair wages, payment transparency, national resource governance, and respect of infrastructure and agricultural land.
 - 1.2 Environmental rights and interests, including, but not limited to clean local air and water, as well as safe discharge and disposal of waste.
 - 1.3 Social rights and interests, including, but not limited to adequate health care, education, and housing.
 - 1.4 Cultural rights and interests, including, but not limited to protection of places of cultural significance (e.g., sacred sites or burial sites).

- 2 The entity shall disclose the following, where relevant:
 - 2.1 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, and during closure, decommissioning, and restoration.
 - 2.2 The community rights and interests (enumerated above) specifically addressed by the practices.
 - 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 organization, a third-party organization (e.g., a non-governmental organization), a governmental agency, or some combination of these groups.
- 3 Risks and opportunities include, but are not limited to: non-technical delays, availability and development of local content, availability and access to adequate infrastructure, community actions related to resource nationalism, 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](#), January 1, 2012, including specifically:
 - 4.1 Performance Standard 4 — Community Health, Safety, and Security
 - 4.2 Performance Standard 5 — Land Acquisition and Involuntary Resettlement
 - 4.3 Performance Standard 8 — Cultural Heritage
- 5 The discussion shall include how practices apply to business partners such as contractors, sub-contractors, suppliers, and joint venture partners.
- 6 The entity may describe its efforts to eliminate or mitigate community risks and/or address community concerns, including, but not limited to:
 - 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.
 - 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 to its capital expenditure projects as the difference in value between a project free from country, regional, and/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 when 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 due to country risk when 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 due to the cost of insurance when calculating the net present value of a project using DCF analysis.
- 7.2 Country, regional, and/or community risks include, but are not limited to: corruption, business legal structure, political stability, regulation, resource nationalism, ethnic conflict, stability of the local market, labor force (skills) availability, resettlement and access to land, quality of access to infrastructure (e.g., ports, roads, shipping channels), and/or general license to operate.
- 7.2.1 These risks are likely to manifest differently at the country (national), regional (state), community (local) levels, and project levels.
- 7.2.2 This risk differs 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 key 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 may include the identification of country, regional, and community risks and/or the discussion of specific projects.
- 7.3.2 This may include discussion of how the entity has mitigated these risks (e.g., 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 Discussion should be in addition to broad country risk classification (e.g., Organisation for Economic Cooperation and Development (OECD) Prevailing 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. Number and duration of non-technical delays

- 1 The entity shall disclose the total number and aggregate duration (in days) of site shutdowns or project delays due to non-technical factors.
- 2 The scope includes shutdowns and project delays including, but not limited to, those resulting from pending regulatory permits or other political delays related to community concerns, community or stakeholder resistance or protest, and armed conflict.
- 3 The scope of disclosure excludes delays due to strikes and lockouts that are disclosed according to EM-MM-310a.2.
- 4 The entity may discuss specific delays including associated costs, root cause and corrective actions for resolved delay, and status of ongoing delays.

Labor Relations

Topic Summary

Metals and mining companies face inherent tension between the need to lower the cost of labor to remain price competitive, and to manage human resources to ensure long-term performance. Working conditions related to metal and mining operations are usually physically demanding and hazardous. Labor unions play a key role in representing workers' interests and managing collective bargaining for better wages and working conditions. At the same time, metals and mining companies often operate in areas where worker rights are not adequately protected. The nuances of both domestic and international worker concerns make management of labor relations critical for metals and mining companies. Conflict with workers can result in labor strikes and other disruptions that can delay or stop production. Work stoppages frequently result in significant lost revenue and reputational damage. Continued labor stresses can impact the long-term profitability of the business. At the same time, positive outcomes of effective labor engagement can include enhanced work practices, labor utilization, as well as the reduction in safety incidents, accidents, or fatalities.

Accounting Metrics

EM-MM-310a.1. Percentage of active workforce covered under collective bargaining agreements, broken down by U.S. and foreign employees

- 1 The entity shall disclose the percentage of U.S. employees and the percentage of foreign employees in the active workforce that are covered under collective bargaining agreements during any part of the reporting period.
 - 1.1 Active workforce is defined as the maximum number of unique employees employed at any time during the reporting period.
 - 1.2 Collective bargaining agreements are defined as a mechanism or tool of negotiation by which a union has a collective interest in negotiations to the benefit of several employees.
 - 1.3 U.S. employees are defined as employees that do not need a visa to work in the U.S.
 - 1.4 Foreign employees are defined as employees that do need a visa to work in the U.S.

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

- 1 The entity shall disclose the number of work stoppages and total duration, in worker days idle, of work stoppages involving 1,000 or more workers lasting one full shift or longer.
 - 1.1 Worker days idle is calculated as the product of days idle and number of workers involved.

- 2 The scope of disclosure includes work stoppage due to disputes between labor and management, including strikes and lockouts.
- 3 The scope of disclosure excludes work stoppages due to other non-technical reasons that are disclosed according to EM-MM-210b.2.

Note to **EM-MM-310a.2**

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

Workforce Health & Safety

Topic Summary

Safety is critical to mining operations due to the often hazardous working conditions. The Metals & Mining industry has relatively high fatality rates compared to other industries. Fatalities or injuries can result from a number of hazards associated with the industry, including 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 from more stringent oversight. A company's ability to protect employee health and safety, and to create a culture of safety and well-being among employees at all levels, can help prevent accidents, mitigate costs and operational downtime, and enhance workforce productivity.

Accounting Metrics

EM-MM-320a.1. (1) MSHA 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) full-time employees and (b) contract employees

- 1 The entity shall disclose its U.S. Mine Safety and Health Administration (MSHA) All-Incidence rate and fatality rate.
 - 1.1 For U.S.-based workforces, the entity shall disclose its All-Incidence Rate (AIR) and fatality rate, as calculated and reported through the Mine Safety and Health Administration's (MSHA) Form 7000-1 (as required under U.S. 30 CFR, Part 50), where incidents include:
 - 1.1.1 Fatalities, or work-related injuries resulting in death to employees on active mine property;
 - 1.1.2 Nonfatal, Days Lost (NFDL) cases, or occupational injuries that result in 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 (NDL) 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.
 - 1.2 For non-U.S.-based workforces, the entity shall calculate its AIR and fatality rate according to the MSHA [instructions](#) and [definitions](#).
- 2 The entity shall disclose its near miss frequency rate (NMFR) for work-related near misses.
 - 2.1 A near miss is defined as an unplanned incident in which no property or environmental damage or personal injury occurred, but where damage or personal injury easily could have occurred but for a slight circumstantial shift.

- 2.2 The U.S. National Safety Council (NSC) provides guidance on implementing near miss reporting, including in, [“Near Miss Reporting Systems.”](#)
- 2.3 The entity may disclose its process for classifying, identifying, and reporting near misses.
- 3 The entity shall disclose the average number of training hours provided to its workforce for health, safety, and emergency management training.
 - 3.1 Training shall relate to topics listed under Regulation U.S. 29 CFR Part 1910 Occupational Health and Safety Standards
 - 3.1.1 The entity may include training hours related to topics not listed under Regulation U.S. 29 CFR Part 1910 so long as (1) the training relates to 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 (2) the entity discloses the subject of the training and the specific occupational risks or hazards the training is intended to address.
- 4 Rates shall be calculated as: $(\text{statistic count} \times 200,000) / \text{total hours worked}$
 - 4.1 The U.S. Bureau of Labor Statistics (BLS) provides additional guidance for the calculation of rates in, [“How to Compute a Firm’s Incidence Rate for Safety Management”](#) and [“Incidence Rate Calculator and Comparison Tool.”](#)
- 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 entity shall disclose the rates by each of the following employee categories:
 - 6.1 Direct, full-time employees, defined as those employees on the entity’s payroll and work full-time for the entity.
 - 6.2 Contract employees, defined as those who are not on the entity’s payroll, but who are supervised by the entity on a day-to-day basis, including independent contractors and those employed by third parties (e.g., temp agencies and labor brokers).
- 7 The scope of disclosure includes all employees regardless of employee location.

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 due to the importance of government relations to companies' ability to conduct business in this industry and to gain access to mining reserves. The emergence of several anti-corruption, anti-bribery, and payments-transparency laws and initiatives create regulatory mechanisms to reduce certain risks. Violations of these laws could lead to significant one-time costs or higher ongoing compliance costs, whereas successful compliance with such regulations could provide risk mitigation opportunities and avoid adverse outcomes. Companies with significant reserves or operations in corruption-prone countries could face heightened risks. Companies are under pressure to ensure that their governance structures and business practices can address corruption and willful or unintentional participation in illegal or unethical payments or gifts to government officials or private persons.

Accounting 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 internally and associated with business partners in its value chain.
 - 1.1 Business partners include, but are not limited to customers, suppliers, contractors, subcontractors, and joint venture (JV) partners
 - 1.2 Relevant aspects of a management system include, where relevant:
 - 1.2.1 Employee awareness programs
 - 1.2.2 Internal mechanisms for reporting and following up on suspected violations
 - 1.2.3 Anti-corruption policies
 - 1.2.4 Application of the Extractive Industry Transparency Initiative (EITI) Standard, including, but not limited to, provisions related to beneficial ownership and politically-exposed persons, licenses and contracts, social expenditures, project-level payments, subnational payments, data accessibility, and multi-stakeholder engagement
- 2 The entity may discuss the implementation of one or more of the following:
 - 2.1 Key Organisation for Economic Co-operation and Development (OECD) [guidelines](#)

- 2.2 International Chamber of Commerce (ICC): Rules of Conduct against Extortion and Bribery
 - 2.3 Transparency International: Business Principles for Countering Bribery
 - 2.4 United Nations Global Compact: 10th Principle
 - 2.5 World Economic Forum (WEF): Partnering Against Corruption Initiative (PACI)
- 3 The entity may discuss laws or regulations related to payments transparency that it is subject to, including, but not limited to:
- 3.1 European Union Accounting Directive Chapter 10
 - 3.2 European Union Transparency Directive Article 6
 - 3.3 Norway Forskrift om land-for-land-rapportering
 - 3.4 Canada Extractive Sector Transparency Measures Act

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; therefore, due to the fact that multiple countries share many ranks, 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 tons of minerals.
 - 3.1 The entity may provide a breakdown of calculations by mineral or business unit where minerals or business units may include, for example: aluminum, copper, zinc, iron ore, precious metals, or diamonds, where relevant.
- 4 The entity may discuss operations that are located in countries with low rankings in the index but present low business ethics risks; the entity 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.

SUSTAINABILITY ACCOUNTING STANDARDS BOARD

1045 Sansome Street, Suite 450

San Francisco, CA 94111

415.830.9220

info@sasb.org

sasb.org
