CIM Environmental, Social and Governance Guidelines for Mineral Resource and Mineral Reserve Estimation

Prepared by the
CIM Environmental and Social Responsibility Society
Adopted by CIM Council September 8, 2023

Canadian Institute of Mining, Metallurgy and Petroleum
Suite 1040, 3500 de Maisonneuve Blvd. West
Westmount, Quebec H3Z 3C1 CANADA
Tel.: (514) 939-2710
mrmr.cim.org | www.cim.org

Table of Contents

Introduction

Within the mining industry, the pathway from exploration, to planning, construction, operation and closure has become more complex over the last few decades. The current financial, environmental and social influences present the mining industry with unprecedented challenges and opportunities. In addition, international environmental and social reporting standards and codes are becoming increasingly robust. The reporting requirements provide an added impetus for issuers to effectively manage environmental and social impacts and risks. Reporting requirements also provide the opportunity to be transparent.

The intended audience for these Environmental, Social and Governance (ESG) Guidelines for Mineral Resource and Mineral Reserve Estimation includes practitioners, industry participants at all levels of skill and experience, corporate management and board members, government agencies, academic institutions and interested parties.

For practitioners, this document provides underlying key principles of environmental, social and governance practices. The ESG Guidelines provide guidance for those using environmental, social, governmental and governance information when preparing and implementing mineral exploration programs and contributing to the preparation of mineral resource and mineral reserve estimates for mineral properties that are either at the study stage (i.e., scoping / preliminary economic assessment, pre-feasibility, or feasibility studies) or in operation.

The guidelines can also be used to help mineral resource and mining companies apply good practice to manage their environmental and social risks and opportunities. Companies can identify and retain appropriate professionals to prepare environmental and social materials to support company studies. The guidelines are also a resource for companies developing effective environmental and social management strategies at any project stage.

This document is not intended to be prescriptive and is not intended to provide exhaustive guidance on what to consider in terms of environmental, social, legal and governmental modifying factors in the preparation of MRMR estimates. Rather, it is intended as general guidance to assist companies and practitioners in considering and applying these modifying factors for MRMR estimates. This document is also not intended to guide environmental and social impact assessment (ESIA); however, the measures needed to manage impacts help inform the constraints and costs for defining mineral resources and mineral reserves and inform the costs and schedules of mineral project studies.

All documentation of MRMR estimates made by an issuer and intended to be, or reasonably likely to be, made available to the public in a jurisdiction of Canada must comply with the requirements of National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101), as amended from time to time (Canadian Securities Administrators, 2016a and 2016b). Disclosure is not addressed in these ESG Guidelines. Determination of what to include in disclosures is defined in the applicable Securities' legal frameworks. Appendix A presents a summary table showing the linkage of the principles and topics in these ESG Guidelines to the potential effects on project costs, schedules, government permits and approvals, social licence to operate and financing.

Broad Focus on ESG Practice: *These ESG Guidelines provide guidance relating to the practice of preparing and executing mineral exploration programs or contributing to the preparation of mineral resource and mineral reserve estimates. Disclosure is not addressed in these ESG Guidelines and these ESG Guidelines are strictly voluntary. Determination of what to include in disclosures is defined in the applicable Securities' legal frameworks. Determination of materiality depends on many factors, including the project type, location, jurisdiction, legal requirements, shareholder, financing, and stakeholders. These ESG Guidelines may support underlying activities and practices but are not intended to guide any ESG performance or sustainability benchmarking for investors.*

International good practice documents describing sound ESG practices related to mining are extensive and varied depending on site-specific conditions. Hence, the ESG Guidelines identify the key principles involved and where appropriate, refer to external guidance for further detail. While these ESG Guidelines reflect CIM's current views of good practice in environmental and social responsibility, these practices are context-specific and continually evolving as industry experience increases and as public expectations, market expectations, and government legal frameworks change. These ESG Guidelines are updated on a periodic basis; readers may wish to consult the CIM website at www.cim.org to ensure that they are referring to the current version.

While these ESG Guidelines provide guidance based on the available current knowledge and experience, it is envisaged that some situations will be encountered that are not covered by the ESG Guidelines. Where guidance has not been provided for unique and unforeseen scenarios, readers should then be guided by scientific information and industry good practice principles and methods. Section 8 provides a list of current supporting information sources and other good practice standards. Note that practices are evolving, for example, towards prioritizing initiatives supporting de-carbonization and addressing climate risk. Therefore, practitioners are encouraged to search for the latest sources of information. Section 8 is intended to be updated in future revisions to this document.

International Focus: *These ESG Guidelines have an international focus. 48% of TSX and TSXV filings are for properties outside of Canada (TSX 2023, p.30).*

Background

Subject-matter experts relied upon by practitioners should prepare supporting materials and be consulted when interpreting environmental, social, governmental and governance information. A wide breadth of disciplines and local experts should be engaged to fully understand the environmental and social conditions, legal frameworks, context, risks and opportunities for a property. These experts should have appropriate levels of education and experience in their respective areas of work. It is essential to include multiple disciplines and areas of expertise in project management, project planning and implementation to appropriately address environmental and social aspects of a property. It is also good practice to have leads and experts work in close collaboration as a multi-disciplinary team.

Mineral exploration and mining companies (and contracted professionals) should be guided by the following:

- Information should be suitable and appropriate for the level of study being undertaken and meet regulatory requirements.
- Work should be completed by suitably skilled practitioners.
- Collection, analysis, interpretation and documentation of relevant data should follow leading practice.

Primary and secondary sources of environmental, social and related information and data should be collected and documented to support the work and reporting. This could include environmental and social monitoring data (e.g., water quality, wildlife, community interviews), impact assessments, management plans, audit reports, community agreements, etc. The collection of data should be guided by relevant guidance documents and the host country regulatory requirements.

Several industry-accepted practices in environmental and social aspects of mineral exploration and mining projects are presented and referenced in this document. Accepted industry practices generally exceed the minimum jurisdictional requirements to meet their environmental, social and governance standards, and to support the industry's reputation.

Applying ESG Modifying Factors to Mineral Resources and Mineral Reserves

The term "mineral resource" covers mineralization and natural material of intrinsic economic interest, which has been identified and estimated through exploration and sampling and within which mineral reserves may subsequently be defined by the consideration and application of modifying factors (CIM, 2014). The environmental, social, and governmental (i.e., regulatory and policy) modifying factors are the focus of these ESG Guidelines. Note that these modifying factors are to be considered in the estimation and reporting of mineral resources since resources also should have reasonable prospects of eventual economic extraction (CIM 2014). To be considered a mineral reserve, the following major categories of modifying factors should be applied to the mineral resource estimate (CIM, 2019):

a) mining;

b) processing;

c) metallurgical;

d) **environmental**;

e) location and infrastructure;

f) market factors;

g) legal;

h) economic;

i) **social**;

j) **governmental** (regulatory/permitting requirements set out by local/regional/national governments, potentially including Indigenous group requirements)**.**

> ***Broad Links to Modifying Factors:*** *ESG matters have the potential to affect project costs, schedules, government permits and approvals, social licence to operate and/or financing – and ESG matters vary from project to project depending on environmental and social context and jurisdiction. Therefore, the scope of these guidelines is necessarily broad so that all potential ESG modifying factors can be identified and accounted for as applicable to the project.*

While the modifying factors listed above relate to the considerations for the statement of a Mineral Reserve, they are also important considerations when completing technical studies. The scope and level of uncertainty of the modifying factors described above should reflect the level of accuracy of the study. As it relates to the underlined modifying factors listed above, the MRMR BP Guidelines note that the estimation of mineral reserves should involve various technical disciplines, including specialists dealing with environmental, social and permitting aspects (CIM, 2019). Appendix A presents a summary table showing the linkage of the principles and topics in these ESG Guidelines to the potential effects on project costs, schedules, government permits and approvals, social licence to operate and financing.

Organizations in other jurisdictions are working towards standardizing incorporation of ESG into mineral project disclosures or guidelines. This includes the US Securities and Exchange Commission, Society for Mining, Metallurgy & Exploration (SME), the Pan-European Standard for the Public Reporting of Exploration Results,

Mineral Resources and Mineral Reserves (the PERC Reporting Standard), the Australasian Joint Ore Reserve Committee (JORC), and the South African Guideline for the Reporting of Environmental, Social and Governance (SAMESG) associated with the South African reporting codes (SAMREC, SAMVAL and SAMOG; SAMCODES Standards Committee).

A considerable body of good practice guidance is available in the areas of environmental and social responsibility, both within Canada and internationally. Therefore, the key principles refer where appropriate to existing guidance and lists of good practice guidance included in the References section.

Companies and practitioners should consider the following key questions to assess and quantify the impact of the modifying factors on the mineral resource and/or mineral reserve:

a) What environmental and social constraints currently exist for the property and what considerations may be recommended for further exploration and development? For example, protected areas, protected species or land use limitations could affect the ability and costs to extract a mineral resource or mineral reserve.

b) What internal control systems and measures are in place to manage environmental and social risks on the project now and in the future while also meeting sustainability goals? For example, the controls and mitigations needed to minimize the environmental and social impacts and risks of project development affect the costs used to define the Mineral Reserve and affect the schedule and costs used in a pre-feasibility or feasibility study.

c) How does the company's governance affect uncertainty related to environmental and social performance? A company’s management system and ESG performance could affect the likelihood of acquiring permits, meeting schedules and minimizing liabilities, which could, in turn, affect the contingencies to apply to schedules and costs.

d) Does the project have all the necessary permissions and rights for the current activities and planned future activities? For example, permissions and rights may refer to government permits, surface tenure, mineral tenure, Indigenous consent and community acceptance to be able to access the mineral resources and mineral reserves.

e) What are the environmental, social and governmental costs (i.e., related to legal and permitting aspects) for current activities and any proposed development? For example, water treatment costs should be incorporated into the operating costs for defining the mineral reserve. What environmental, social and governmental considerations or uncertainties could affect the development schedule and the timing of the return on investment? For example, government GHG emission caps could affect the planned production rate.

f) What are the current, inherited and potential future liabilities with the current project and proposed development plans that could affect the investment/property now and in the long term? For example, contamination from past operations may require remediation as part of further development and could affect the costs associated with definition of the mineral reserve.

These are some of the questions that can be asked to define ESG factors affecting mineral resource and mineral reserve estimates. ESG factors considered for mineral resource and mineral reserve estimates and their application should be documented. For feasibility studies, the ESG factors affecting the project design, schedule and costs should also be clearly documented.

Key Principles for ESG

The ESG Guidelines are organized according to five key principles. The underlying Environmental, Social and Governance Principles (ESGPs) support good corporate practices and may assist the mineral and mining industry. The five overarching principles are:

- ESGP 1 - Environmental and Social Governance: Establish effective governance and management for ESG matters
- ESGP 2 - Impact and Risk Management: Assess and manage impacts and risks
- ESGP 3 - Permits: Acquire and maintain compliance with approvals and permits
- ESGP 4 - Environmental Planning: Minimize environmental impacts and long-term liabilities
- ESGP 5 - Social Planning: Protect people and benefit communities

CIM recommends exploration and mining companies and/or practitioners also refer to other guidance documents and standards to provide a fulsome understanding to achieve the key principles. Selected sources of good practice environmental and social management guidance applicable to mineral exploration and mining properties are included in the "References" section and can be accessed for additional guidance. For clarity, the selected references are provided for the convenience of the reader and are intended to serve as sources of further information on various topics to interested parties. Readers of this document are not obliged to consider these references as the sole source of information on any of the topics covered.

The ESG actions discussed in these ESG Guidelines follow a continuum that generally aligns with the project stages of a mineral project, with overlap. Figure 1 illustrates a typical alignment of environmental and social impact assessment (ESIA), permitting, environmental and social management and stakeholder engagement; however, each site's timeline will vary depending on the local context and legal framework. This figure also illustrates that decisions made during the study or design stage of a mine are very important, because the impacts of poor decisions will increase over time.

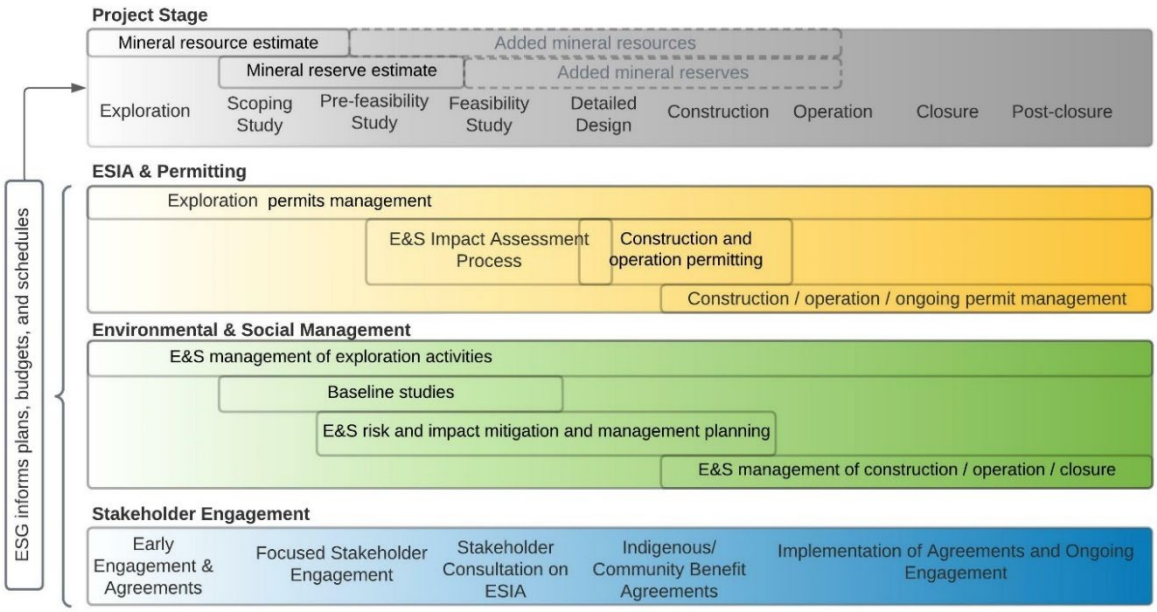

FIGURE 1: GENERAL ALIGNMENT OF ENVIRONMENTAL AND SOCIAL ACTIVITIES WITH PROJECT STAGE

1. ESGP 1 – Environmental & Social Governance: Establish effective governance and management systems

For the purposes of this document, governance is defined as the structures and processes that are designed to ensure accountability, transparency, compliance with applicable laws, equity, diversity and inclusiveness. At the core of this ESG Guideline document, governance is the mechanism by which all principles are achieved in a verifiable manner. Effective governance is aimed at reducing corporate risks through the adoption of a broad suite of controls to prevent and mitigate the potential for harm to human health and safety as well as that of the environment. The potential for risk to these areas can reasonably be assumed to be a direct risk to the company, so it is therefore in the company's best interest to properly manage risks, as a failure to do so can impact public acceptance, financing, environmental assessment and licensing, operations, shareholder perceptions and viability of the project itself.

Many structured and systematic approaches to developing a governance and management structure for ESG matters are available. Structures should consider flexibility so they can handle changing risks and are scalable to project size and project phases. ESG risks generally include, but are not limited to, regulatory compliance (environmental assessment and permitting), other environmental issues such as water and biodiversity management, social issues like land access, social licence to operate and lack of community engagement (or unforeseen conflicts developing with the local community) and corporate governance and labour issues. While there is a great deal of variation on what constitutes good governance or good management practices, common components should include, but are not limited to:

- Effective and systematic assessment of risk factors that allows for the determination of significant risk.
- Risk associated with defining materiality should be defined by the assessors for a specific project or corporation. The assessment for materiality should be rigorous and systematic. Clear direction on how to deal with risks should rely on practitioners and or subject matter experts. This direction could include:
    - Compliance with legislation, regulation, permits, licence conditions, and commitments.
    - Utilise experienced professionals and, where legislated, licensed professionals.
    - Employ a pollution control hierarchy (avoid, minimize, rectify, reduce and offset).
    - Effectively manage tailings, waste rock and refuse (including recycling of many of the materials brought onto the mine site).
    - Manage water to maximize conservation and protect water quality.
    - Employ a waste management hierarchy (eliminate, reduce, reuse, recycle and, as a last resort, responsible disposal).
    - Develop and implement emergency response and preparedness plans.
    - Climate change adaptation and energy conservation, decarbonization strategy and net zero.
    - Proactive and respectful community engagement, consultation and relationships.
    - Understanding and protecting of human and workers' rights.
    - Sustainable supply chain.
    - Provide effective safety programs and security for persons and physical plants.
    - Use of sustainability principles.
    - Life cycle stewardship.

- Other management components that may align with company values and/or are important for the project in hand.

An effective management system should include:

- Establishment of clear roles and responsibilities for the management of risks. The assignment of responsibilities for areas of areas of high risk to a specific individual is considered good practice.
- Risk management and mitigation strategies (typically documented in various management plans), which are properly resourced and periodically tested.
- Monitoring and reporting on how risks are handled, often with performance indicators.
- Verification (independent reviews, inspections and audits) and non-conformance protocols.
- Periodic review by those accountable for continual improvement.
- Systematically follow a "Plan-Do-Check-Act" cycle for the life of the project.

Good practice suggests that part of a corporate governance system should include setting company goals and targets, including ESG aspects. The UN Sustainable Development Goals (SDGs) can be considered in setting these goals in line with international good practice – aligning company goals to minimize impacts and enhance benefits where activities interact with the SDGs. The key to good governance is to make these goals a reality at the project level. Managers at the local level may have performance priorities that can be perceived as conflicting with corporate-level goals. Education, training and support should be provided at all levels of the company to generate the actions to meet the ESG goals and targets. For example, progressive reclamation may be a corporate goal that gets deferred by budget constraints and differing priorities at the site. Therefore, the monitoring and evaluation process plays a critical role in identifying unanticipated barriers to performance.

Management systems (e.g., ISO Standards such as ISO 14000 environmental management, ISO 18000 health and safety, ISO 26000 social responsibility, ISO 50000 energy management, ISO 20400 sustainable procurement) are commonly employed in areas where corporate actions have a high potential for risk to themselves, the public and/or the environment. Many regulatory agencies are requiring management plans for high-risk areas, especially for environmental protection and health and safety.

The Mining Association of Canada (MAC) and its Toward Sustainable Mining (TSM) programs provide a good example of the structured programs available for ESG matters, as does the Canadian Nuclear Safety Commission's (CNSC) guidance on safety and control areas related to uranium production. The CNSC guidance provides a look at a mining sector in Canada that has had systems for managing risks to human health, safety, and the environment for decades. There are standards embedded in legislation and, in mining, there are global standards that could be considered, such as the Global Reporting Initiative (GRI) Standards (GRI, 2016), the International Financial Reporting Standards (IFRS, 2023) and the International Finance Corporation (IFC) Corporate Governance Methodology (IFC, 2018), to name a few. The ideal system may be a combination of national and international standards combined with local legislative, reporting, social and site-specific requirements.

Effective corporate governance should include mechanisms to track compliance with corporate and regulatory requirements, effectively engage with communities and conduct due diligence to identify, prioritize and mitigate environmental and social risk. It is expected that a company's governance of ESG risk will include the principles of continual improvement for the improvement of its environmental and social risk management systems. Reporting is also an important part of ESG and this reporting should assist in the accountability and transparency of the ESG goals reported and allow for verification of the information.

Some background on international standards to manage financing risks provides context for governance of environmental and social components of projects. Important international initiatives on environmental awareness

began in the late 1980s with the 1987 United Nations publication of the Report of the World Commission on the Environment and Development, followed by Agenda 21 from the 1992 United Nations Earth Summit, the United Nations Millennium Development Goals (2001-2016), and now the UN Sustainable Development Goals (UN, 2015). The World Bank /and International Finance Corporation (IFC) first published the Equator Principles in 2003, which was most recently updated in 2020. As of 2021, 118 financial institutions in 37 countries have adopted the Equator Principles guiding environmental and social risk management of transactions (Equator Principles Association, 2021). The IFC issued its first sustainability framework for private sector projects in 2006 and, in 2012, issued the Environmental and Social Performance Standards (PS), which have evolved into a widely accepted international benchmark for the management of environmental and social risks by private sector project developers.

Other ESG reporting standards and initiatives were developed for investors and have included the Global Reporting Initiative (GRI), Carbon Disclosure Project (now known as the "CDP"), UN Global Compact, European Green Deal and the EU Taxonomy Regulation, to name a few. Reporting indicators and standards should be considered in governance. The reporting standards are expected to continue to change towards finding common indicators amid changing environmental and social risks and market demands.

2. ESGP 2 – Impact and Risk Management: Assess and manage impacts and risks

2.1. Environmental and Social Impact Assessment

Most jurisdictions require an environmental and social impact assessment (ESIA) prior to the development of a new mine or a major expansion of an existing one. However, regulatory requirements vary widely. It is important that the ESIA process be recognized not only in the context of permitting, but also as a planning tool vital to acquiring and maintaining the "social licence" (refer to ESGP5), limiting long-term environmental and social liabilities and supporting project financing. ESIA may be used at any stage of a mineral project from exploration through closure. Constraints associated with environmental and social impacts and risks should be clearly identified and defined when preparing the mineral resource and mineral reserve and determining the economic viability of a mineral property.

Where legally required, an ESIA process is used to determine that a project/activity has managed the environmental or social impacts prior to obtaining authorization. For exploration activities, permits to ensure no impact from these activities may require an ESIA or may have standard conditions in government regulations. An ESIA process is an overall review of the interaction between proposed activities and the environmental and social setting to determine whether the overall residual impacts and benefits of the project (after all proposed mitigations are applied) are acceptable to all affected stakeholders. As such, stakeholder engagement is considered a critical part of an ESIA process as well as a critical part of gaining social licence to operate. Through the engagement process, all proposed activities, potential impacts and proposed mitigations should be effectively communicated to stakeholders, and stakeholder concerns should be addressed.

Note that environmental assessment processes are on a cost-recovery basis in some jurisdictions which should be considered in budget planning (e.g., Canadian Impact Assessment Act, 2019) such as ESIA, permit application fees and annual permit fees. The conditions of an ESIA approval are also legally binding and costs for implementation and management of compliance should be included in project budget planning. In some jurisdictions, the responsibility and related costs for undertaking an ESIA falls on the applicant/issuer and not covered by government agencies (e.g., South Africa). Project budgets and related economic model implications for advanced projects should include provisions for ESIA costs and for executing the commitments of project approvals and permit conditions.

Identification of the environmental and social impacts and risks and opportunities are fundamental to sustainable development and mine operation. Resources on good practice guidance for conducting impact assessments are available through the International Association of Impact Assessment (IAIA, n.d.), the IFC Environmental and Social Performance Standards, PS1 (IFC, 2012) and guidance notes. It is also imperative to consult with the host country regulator to determine the detailed requirements for the content of the ESIA.

Identification of key interactions between the project and the biophysical, socioeconomic, cultural and human health environments is likely to support successful project execution. Environmental and social impact assessments can be used to identify potential effects. Through an iterative process of assessment and redesign, the project design, activities, mitigation measures and management plans may be improved to minimize the adverse environmental and social effects from the project. A precautionary approach — whereby appropriate controls may be warranted even in the absence of full scientific certainty regarding potential impacts — should be taken that includes actions to address uncertainties in predictions to avoid future damage. **The adjustments to project design to**

minimize environmental and social impacts inform the modifying factors (costs, schedule, limitations and opportunities) used to estimate mineral reserves and project feasibility.

Important aspects of activities/development should be identified through engagement with stakeholders (refer to ESGP5). Potential environmental and social impacts associated with mineral exploration and mining activities include (but are not limited to) the following:

- Atmospheric emissions such as fugitive dust, process emissions, equipment exhaust and greenhouse gas (GHG) emissions.
- Extraction and use of surface water and groundwater.
- Mined rock production and storage including waste rock stockpiles, low grade stockpiles and heap leach facilities.
- Process plant tailings resulting from the crushing, fine grinding and physical-chemical processing of mined material.
- Effluent discharges including, but not limited to, mined rock and tailings contact water, dewatering from underground and open pit mines, water treatment plant discharge and residue and domestic wastewater.
- Direct and indirect land disturbance.
- Use, storage and disposal of hazardous and non-hazardous materials.
- Transport of workers, goods and services.
- Procurement of goods and services.
- Employee and contractor camps and housing.
- Local and foreign employment and contracting and related policies and training programs.
- Worker influx and outflow (including temporary construction).

Impacts and risks associated with these activities and good practice for mitigation and management are further described under ESGP 4 (environmental planning) and ESGP 5 (social planning).

2.2. Environmental and Social Management Systems

This section addresses the environmental and social management systems (ESMS) and associated environmental and social management plans (ESMPs) that document the internal processes and procedures to manage the environmental and social risks, impacts and benefits associated with a project.

An ESMS typically comprises:

- The company's environmental and social policies.
- Organizational structure and capacity.
- ESMP.
- Emergency preparedness and response processes.
- Stakeholder engagement plans and procedures.
- Communication programs and grievance mechanism.
- Reporting standards.

- Management plans (including standard operating and maintenance procedures).
- Monitoring (including auditing).
- Review processes.

These elements support a "Plan-Do-Check-Act" cycle that is considered good management practice. This type of management system ties into the good practice on environmental and social governance. ESMS and ESMP should be developed and implemented at an appropriate scale for all mining projects, whether or not this is required by the host government as part of the ESIA process and permitting.

Material mitigation and management measures to minimize environmental and social impacts and risks should be clearly defined when preparing the mineral resource and mineral reserve and determining the economic viability of a mineral property.

Good practice guidance and standards for developing an ESMS are available through many sources, including IFC PS1 (IFC, 2012) and the PS1 Guidance Notes, the International Organization for Standardization (ISO) 14000 (ISO, n.d.) standard for environmental management systems (EMS), MAC's Towards Sustainable Mining (TSM) program (MAC, n.d.), Prospectors & Developers Association of Canada (PDAC, 2009), Global Reporting Initiative (GRI, 2016), and the Initiative for Responsible Mining Assurance (IRMA, 2018). There are also many other ESG reporting programs to assist companies and the public. The references section includes links to some of these; however, companies should recognize that these are changing as public needs change and indicators are revised.

Ideally, management systems and plans are initiated at the exploration stage. They are then updated, and new ones developed as a project moves through the mine cycle. Management systems and plans are "living" documents and should be reviewed and updated on a regular basis based on monitored performance.

Project aspects that may be addressed by ESMPs include (but are not limited to), tailings, mined rock, water abstraction and management, water discharges, air emissions, fugitive dust, noise, biodiversity, hazardous materials, community health and wellbeing, worker safety, human rights and heritage resources (i.e., archaeological, paleontology and cultural resources). Many of these impacts are discussed under ESGP 4 (environmental planning) and ESGP 5 (social planning) below. It is recommended that the level of detail and accuracy of impact assessment, mitigation and management planning be commensurate with the project development stage, the project complexity and increase in detail as the project advances.

Community engagement outcomes are important foundational components of ESMP and it is important that relevant aspects of the plans be disclosed to communities in a project's area of influence. Engagement is most important for management of potential impacts such as, but not limited to, requirements of standards to which the company subscribes (e.g., International Cyanide Management Code). Consultation is particularly important to support development of emergency preparedness and response plans, community development plans, tailings management plans, water management plans and biodiversity management plans.

3. ESGP 3 – Permits: Acquire permits and maintain compliance

Permitting requirements vary based on geographic location, the level of environmental protection and social consultation required by local regulations. If local regulations are limited, robust ESG practice may be guided by established international norms of good practice (see "References" for examples).

3.1. Regulatory Setting

Defining the regulatory setting is the starting point for addressing regulatory requirements for all phases of the mining process. The environmental assessment process, and development, operations and closure permits provide the context in which the property and company are working. Risks associated with permit acquisition, retention, enforcement, financial assurance requirements and financial liability depend on an understanding of regulatory requirements. Note that regulatory and legal frameworks in some jurisdictions may be less developed and pose a potential risk to reputation, sustainability goals, social licence and ability to obtain financing. To minimize risk, companies may consider incorporating other international standards to fill any legal gaps such as TSM, ICMM and IFC as options (see "References").

Companies and supporting practitioners should incorporate the following into their permitting strategy for project planning and execution from exploration through mine closure:

- International conventions, national, provincial/state, regional, local legislation and standards. (Note that a company should conform to the applicable international conventions to which Canada and the host country are signatory.)
- Current interpretation and application of mineral, mining, environmental and social legislation.
- Government agencies responsible for exploration, mining, environmental and social regulations.
- Prohibited and/or restrictive activities relevant to the property or future development.
- Timelines for environmental assessments and permitting.
- Legal and financial liabilities associated with the project.
- Risks and uncertainties in the regulatory regime of the applicable jurisdiction.

3.2. Permit Acquisitions

Permits required for exploration, mine development, ongoing operations and closure vary greatly between jurisdictions and depend on the activities carried out on site. In all jurisdictions, work is not authorized until permits have been issued. Permits also vary depending on the host country's federal, regional and local legal requirements. Permit terms and conditions define limitations on exploration programs and development activities.

As described in ESGP2, the ESIA process is usually a regulatory requirement. Approval for project development is usually required as the first step to obtaining further permits for mine development. When an environmental and social effects assessment has been approved by government regulators, binding commitments contained in the ESIA become conditions of an approval. Conditions of approval and further permits affect the budgets and schedules throughout the project life cycle. It is important to note that financial assurances (typically in a bond held by government) for project closure, reclamation and environmental protection are often required as permit conditions.

Permits and/or adherence to regulations are typically required from the exploration phase onward for the following activities:

- Exploration programs and employee accommodations, if provided.
- Mining construction, operations, reclamation and closure permit (typically via mines regulator).
- Mine waste rock and tailings storage facilities.
- Water diversion, extraction, storage and use.
- Effluent discharges (e.g., from tailings ponds, water treatment plants).
- Air emissions.
- Refuse waste disposal.
- Land use.
- Infringement on heritage and archaeological resources, if potentially present.
- Hazardous materials or waste transport, storage and use.
- Explosives production, transport, storage and use.

Regardless of the jurisdictions, permitting of mining projects is often a long and complex process involving the realisation of numerous environmental and socio-economic studies, interactions with regulators and Indigenous peoples and communities. Throughout the permitting process, adjustments are made to the project to meet the different expectations of regulators and communities. Notwithstanding the very prescriptive context, permitting remains an uncertain activity that is strongly impacted by external considerations and adjudication timelines outside of the control of the company. In fact, even if the project risks and issues are well understood, documented and explained, the permitting process can be impacted by external considerations such as the perception of the risks by the authorities and the communities, or by the regulators' capacity to manage the application process. A good permitting strategy should:

- Provide a list of the permits to be obtained and identify their importance and the potential time frame needed to obtain them.
- Develop a simple permitting road map showing the permitting process that is linked directly to the regulatory needs and associated estimated timeline.
- Describe, for each permit, the background information in general terms (ESIA, PFS, FS, etc.), the activity and purpose of each permit and the nature of any required consultation. Provide a realistic schedule that accounts for uncertainties.
- List commitments, including management plans associated with these permits.
- Conduct research of similar permits previously issued by the regulatory authority, and then synthesize a "draft" best fit permit to guide the various permit applications.

3.3. Permit Compliance Management

Obtaining permit approvals and complying with permit conditions and legislation represents an important risk factor. Permit compliance for the project is important to minimize potential material, reputational and legal risk. Non-compliance and poor performance may result in significant monetary penalties, and adversely affect future permit acquisitions and continuing exploration

and/or mining activities. Non-compliance can also be "administrative" non-compliance; i.e., failing to meet permit reporting requirements. For this reason, the principles of good governance of environmental, social, health and safety matters should be followed. It is important to also provide regular feedback to interested and affected parties on permit compliance. Good corporate and project-level governance programs promote environmental and social management systems, among other management plans, as a mechanism for effective compliance management. Types of compliance issues may include administrative non-compliance (i.e., failing to meet permit reporting requirements), minor non-compliance or more serious non-compliance. More serious non-compliance that is not immediately resolvable could lead to legal action by the government and inability to legally operate.

Permit compliance tracked using a structured internal management control system is good practice. Various software solutions are available to assist companies with permit tracking and compliance management. Components of a compliance tracking system may include:

- Registry of existing permits, conditions, fees and expiry dates.
- Permit conditions transferred into appropriate mitigation measures, objectives and targets, employee roles and responsibilities, corrective action systems and management plans within the overall environmental and social management system.
- Records of the history of compliance; e.g., monthly and annual compliance and inspection reports.
- Non-compliance events registry for follow up, such as remediation action plans, including responsible persons, resource allocations, schedule and reporting.
- Permit amendments, and new permit requirements, initiated internally or imposed by the regulatory authority, needed resource allocations and scheduling.
- Reporting and documentation requirements, including communication on permit compliance to external parties such as Indigenous representatives and communities.

Many jurisdictions may have detailed reporting requirements for compliance. Openness around permit compliance can help foster trust with communities, Indigenous leaders, authorities or any local groups. Effective communication should be simple, clear and transparent.

4. ESGP 4 – Environmental Planning: Minimize environmental impacts and long-term liabilities

Mining is commonly associated with a variety of potential environmental impacts to air, water, land and biota. Some of the most common environmental impacts include:

- Fugitive dust emissions associated with blasting in open pit mining operations and mobile equipment activities.
- Impacts to surface water due to the discharge of excess water that may have been in contact with mined rock or tailings.
- Impacts to groundwater due to the interaction of mine workings with local aquifers and/or the extraction of groundwater for the purpose of industrial water supply.
- Impacts to biodiversity due to, e.g., habitat loss caused by ground clearing.

Forward planning in the form of a robust ESIA process is preferable to managing impacts once they develop, especially when it comes to long-term environmental liabilities associated with, e.g., acid rock drainage and metals leaching (ARD/ML) from mined rock and tailings. ESIA includes detailed baseline studies, fulsome assessment of environmental risks and impacts and the development and implementation of an ESMS and ESMP for impact mitigation and monitoring. Over the last couple of decades, the "state of the art" in mining environmental impact management has evolved rapidly in response to the changing expectations of governments, financiers and affected communities.

4.1. Pollution Prevention

Mining produces significant quantities of tailings, waste rock and site runoff sediment during extraction and processing. Mine wastes are a potential source of pollution depending on the physical and chemical properties of the mineralization and surrounding host rock, as well as the mineral processing activities. Precipitation and groundwater can come in contact with the mine wastes and transport constituents of concern including dissolved metals, explosives residues and suspended solids. In addition, large volumes of water are often needed in mineral processing. Mines are also located in watersheds with multiple water users, which potentially makes water a scarce resource. Careful management of mine waste and water is necessary to prevent harm to surrounding communities and the environment.

Project design, control measures and management plans should be designed for compliance with all jurisdictional requirements. Designs, controls and plans may also conform to applicable international conventions and good practice for pollution prevention and sustainable resource development. The objective of sound mine waste management should be short- and long-term protection of communities and surrounding environments. Pollution prevention should follow the mitigation hierarchy of avoidance, minimization and then remediation to reduce exposure and impact, to optimize efficient capital spend and ongoing costs and liabilities, and to minimize development costs. When possible, use of mine wastes for construction should also be considered with the objective of minimizing wastes. Pollution prevention should also consider the supply chain and associated offsite facilities and activities. Environmental risks and impacts usually extend to areas beyond the mine site, tailings storage facilities, mine waste facilities, water and power infrastructure and airborne emissions sources. As such, all potentially affected stakeholders should be engaged when developing measures to manage mine wastes, water and hazardous materials and in associated emergency response planning.

Good practices for tailings, mine waste and water management are further explained in the next sections.

4.1.1. Management of Tailings Facilities

Potential instability and/or outright failure are the highest concern for tailings facilities and can lead to loss of life (in the worst case), loss of livelihood, loss of stored material, downstream erosion, contamination and loss of flora, fauna and aquatic resources. Tailings facility design and management requirements were strengthened after recent dam failures. Standards have been developed to promote safe design, construction and operation of tailings facilities, which are incorporated in the 2020 Global Industry Standard on Tailings Management (ICMM, 2020). Through extensive consultation with world experts, the key topics and principles for good practice to develop robust tailing management facilities include:

- Engagement with affected communities.
- Integrated knowledge base.
- Robust design and construction.
- Operation.
- Monitoring of tailings facilities.
- Strong management and governance.
- Well-planned emergency response that is co-developed with communities.
- An effective information documentation system.

Extensive analysis and investigative work have been completed on tailings facilities throughout the world as part of the Global Tailings Review. *Towards Zero Harm: A Compendium of Papers* (Global Tailings Review 2020) was the resulting report, which provides a rich source of background and technical information that should be reviewed by companies and practitioners. This review then resulted in development of the *Global Industry Standard on Tailings Management* (GISTM). Other guidance on leading tailings management practices has been produced by the International Commission on Large Dams (ICOLD), the Australian National Committee on Large Dams (ANCOLD), the Canadian Dam Association, and Mining Association of Canada – Towards Sustainable Mining - Tailings Management Protocol (MAC-TSM Tailings). The “References” section includes a list of these guidance documents.

4.1.2. Mine Waste Management

Mine wastes include tailings, reactive or non-reactive waste rock, coarse rejects, spent heap leach pad material and water treatment sludges. Generally, these materials are permanently stored in the immediate vicinity of the mine where they are produced. Risks from the mine waste storage facilities are dependent on foundation stability, facility design and development, physical properties and chemical reactivity of the rock, tailings, and/or other mine waste material and seepage quality and quantities. Potential downstream environmental and social effects from mine rock facility malfunctions are similarly dependent on the type and size of failure of controls and/or containment and emergency/contingency planning.

Mine waste characterization is essential to determine the potential for ARD/ML. Characterization may include mineralogical analysis, static and kinetic testing, geotechnical testing, leach testing, etc. The Global Acid Rock Drainage (GARD) Guide provides detailed, good international practices for sampling, analyzing and predicting the reactivity and leaching

potential of mine waste materials (INAP, 2014). Facility designs and materials management plans are developed to define how the physical and chemical stability of the mine waste facilities will be maintained long term into closure and post-closure.

Extensive research on mine waste management is available through the Mine Environment Neutral Drainage (MEND) program, and extensive guidance on leading mine waste management practices are available through organizations such as International Council on Mining and Metal (ICMM), MAC - TSM, IFC, the European Commission, etc. Links to these documents are included in the “References” section.

4.1.3. Water Management

If not managed properly to avoid or minimize downstream impacts to receiving water bodies, contact water (i.e., water having been in contact with mining areas, mineral processing facilities, tailings, waste rock, spent heap leach pads, etc.) can pose a risk to the affected communities and ongoing project activities. Water management facilities include collection, storage, interception, treatment and diversion systems (e.g., around pits, tailings impoundments, mine waste rock piles and/or heap leach pads), any of which can fail and result in an unplanned release of contaminants into downstream waterways and terrain.

Extensive guidance for good practice in water management is available through various organizations including ICMM, MAC, IFC, etc. Sources of guidance for water management in mining are presented in the "References” section.

A watershed-based approach can be taken to ensure water management considers and accommodates social factors, including protection of community and Indigenous water rights, availability and quality (for consumption, sustaining livelihoods and cultural values). From this starting point, water management should be considered for each stage of a project, from exploration through post-closure. Water management programs should have an overall water management strategy and design basis (e.g., permitted water sources; emergency response design features; treatment needs; discharge and receiving environment water quality and quantity criteria; groundwater quality criteria) for all key features or issues. Project planning should first minimize freshwater usage and maximize recycling opportunities.

Fundamental to environmental management is characterization, simulation (modelling) and verification sampling of the entire water system (e.g., surface and groundwater source waters, non-contact and contact waters) and determination of the mitigation and treatment needed to meet discharge and receiving water criteria. The key to designing a proper water management and treatment system is to properly establish and continuously update the major design criteria:

- Water volumes: an appropriate design recurrence event should be established and be part of the permitting. No release of untreated water should occur at any point below this design event.
- Raw water chemistry: mine waste characterisation and prediction, combined with the expected water volumes, should form a basis of high and low expected concentrations for management or treatment.
- Water quality objectives: these may be imposed by local regulations, receiver water quality objectives or recycle water requirements.

It is increasingly common for water management systems to be designed based on mathematical modelling of the complex and interrelated hydrogeological, surface hydrological and geochemical processes associated with mining projects. These models vary in complexity,

and modelling results are only predictions, so verification sampling is important to demonstrate conformity with predictions and with regulatory compliance. Modelling should be updated periodically as a mine develops, and operational data should be collected to verify the model and the results of any design change. Any process changes, mine expansions or tailings facility updates should be updated in the modelling. The GARD Guide provides additional guidance on water mitigation and treatment (INAP, 2014).

Climate change represents an emerging risk with significant implications for water management design. As appropriate, climate change projections should be incorporated into water management modelling efforts, with respect to short-term considerations (e.g., the increased likelihood of severe storm events leading to a change in hydrologic design criteria) and long-term considerations related to, for example, gradual changes in average annual precipitation and evaporation rates (Section 4.4).

4.2. Resource Efficiency

Resource efficiency refers to using limited resources in a sustainable manner while minimizing impacts on the environment. Examples of resource efficiency includes re-processing, repair, maintenance, recycling and eco-design, which can be applicable to many aspects of mineral exploration and mining. In the mining realm, resource efficiency is closely linked to the concept of "circular economy", which has also gained prominence as a policy goal for sustainable development. Circular economy implies reusing wastes into new products and uses. Therefore, steps to achieve a circular economy are an important part of resource efficiency; however, resource efficiency encompasses a wider range of strategies through the entire life cycle of mined products: mining/extraction – design – manufacturing/production – use/consumption – disposal/recovery.

It is considered good practice to examine options such as reprocessing or repurposing mine wastes and recovering valuable by-products. A holistic approach should be taken to look at mine wastes as a source of secondary metals and other valuable industrial minerals. Technologies exist to reprocess mine wastes for target metal recovery (e.g., gold and silver). Green Mining Innovation, through Natural Resources Canada, is also a valuable initiative for research of new waste management technologies, water management and energy efficiency.

4.3. Biodiversity

All mineral projects, by the nature of the business, will have an impact on natural living resources. Risk management strategies for mineral projects should recognize responsible biodiversity management from the earliest stages of a project (including exploration) through understanding of the risks to project design, permitting, scheduling and financing. Simple recognition of the biodiversity aspects is no longer considered good practice on its own, as complex management plans should be in place to provide for responsible management, mitigation and financing.

Global biodiversity loss is a critical issue addressed by the International Convention on Biological Diversity and UN SDGs to prevent a decline in biodiversity (SDG#15 Life on Land, and SDG#14 Life Below Water). Accordingly, extensive guidance on biodiversity management is available, including the IFC Performance Standard 6 guidance notes, Business and Biodiversity Offsets Programme (BBOP), the TSM Biodiversity Conservation Management protocol and framework and ICMM, to name a few.

The biodiversity goal for mineral projects should be no net loss and an overall net positive impact on biodiversity in line with international commitments towards the Convention on Biological Diversity. Biological conservation should be balanced with development goals through maintaining ecosystem services. Ecosystem services evaluation looks at the regulating, supporting, provisioning

and cultural services that the natural environment provides to humans. This recognizes that biodiversity supports human needs; therefore, sustainable development should integrate biodiversity conservation.

Biodiversity is an integral part of any project ESIA and is also included in specific protocols in some of the most important management systems (see guidance in the "References" section). A regional or landscape level approach allows for assessment of a project's direct, indirect and cumulative impacts in the context of current and proposed end land use. Furthermore, baseline assessments should be reinforced by incorporating Indigenous knowledge and historical information.

Biodiversity management should follow the mitigation hierarchy of first avoid, then minimize, restore and finally offset impacts. Ideally, projects should have a net positive impact on biodiversity. Species and ecosystems of conservation concern should be identified and appropriately avoided wherever possible. The project footprint should be minimized through optimized design. Minimizing impacts can be achieved by implementing programs such as timing construction to avoid biologically sensitive time periods, completing preclearance procedures for any land clearing, managing access and transportation, waste management, training employees and contractors and installing signage. Progressive and final reclamation should be planned early to re-establish biodiversity and minimize temporary reductions in habitat suitability and availability.

Offsets may be needed for residual biodiversity loss, even if they are temporary during the life of the mine. Offsets consider site-specific and regional biodiversity limiting factors and land use planning, but can include restoration of degraded lands, new conservation or support for other initiatives. Sustainably geared financing mechanisms may also be needed to ensure the offsets protect biodiversity for the long term, post-closure.

Building partnerships with conservation groups and universities to assist through the biodiversity management planning and implementation process can be an effective strategy that brings expertise, local knowledge and trust. Community engagement throughout the planning and implementation of the biodiversity management program is also essential to building trust, assessing ecosystem service values and ensuring long-term success. The engagement process also facilitates local education and awareness on the impact of human activities on biodiversity, which can help regional biodiversity protection.

With the development of new technologies for environmental characterization and monitoring over the last few decades, biodiversity can and is expected to be approached in a quantifiable manner. To develop relevant biodiversity management plans, it is essential to assess biodiversity before the project development (baseline conditions), and during and after the project implementation.

Biodiversity management plans should be developed to a level of detail that informs the project design and enables progressive mitigation, with the goal of final closure. The biodiversity management plan should also be developed with a long-term vision beyond the end of operation and be integrated in the progressive reclamation and closure plan.

4.4. Climate Change and Greenhouse Gases (GHG)

Climate change is an increasingly visible issue for mining projects, with significant risks related to operational risk assessment, project financing and project approvals. Mining companies and individual mining projects will come under increased pressure in future years as governments around the world work to meet their commitments under the 2015 Paris Agreement on climate change.

In 2015, the Financial Stability Board (FSB) established the Task Force on Climate-related Financial Disclosure (TCFD) to develop a set of voluntary, consistent disclosure recommendations for use by

companies in providing information to the public, lenders and insurance underwriters about their climate-related financial risks. In 2017, the TCFD released its recommendations in a report entitled "Recommendations of the Task Force on Climate-related Financial Disclosures". The TCFD recommendations have evolved into the most widely accepted framework for climate change risk assessment (CCRA) and related documentation.

The TSM Climate Change Protocol (MAC 2021) and ICMM Position Statement (ICMM 2021) have recognized the importance of an industry-wide effort to address climate change in support of the 2015 Paris Agreement. Both organizations have taken steps to address the risks associated with climate change in the context of the TCFD recommendations (refer to Section 4.4.3).

The mining industry is exposed to climate change in ways that many other sectors of society are not, due to the energy-intensive nature of many mining projects and the extent which most mining operations are exposed to short- and long-term changes in the local environment where they operate. Climate change is a cross-cutting theme that should be integrated into a company's impact and risk assessment and management strategies, with efforts commensurate with project stage. Climate change should be considered in the assessment and management of emissions, energy alternatives, water, mine waste, biodiversity and community health and safety – from the perspective of both the project's impacts effects on climate change and the effects of the environment on the project.

Programs and systems that can be considered as part of a climate change program consistent with good international practice include:

- Corporate climate change management strategy.
- Systems to manage energy and greenhouse gas (GHG) emissions.
- Innovative programs and applications to reduce emissions.
- Systems to track and publicly report key metrics related to energy use and GHG emissions.
- Investment and management of transitions towards lower carbon future, including climate adaptation.
- Systems to help host communities and equip operations to adapt to the physical impact of climate change.
- Engagement with peers, governments and society to share solutions, and develop collaborative initiatives.

4.4.1. Energy Use and GHG Emissions Management

Development of a comprehensive energy use and GHG emissions program should address both direct and indirect emissions. Scope 1 GHG emissions (direct from sources owned or controlled by the company) and Scope 2 GHG emissions (indirect from purchase of electricity, steam, heat or cooling) should be calculated and reported to support host country reporting frameworks. Scope 3 GHG emissions (indirect sources from the supply chain) can be considered in a company's sustainability goals as Scope 3 emissions are becoming increasingly important to financing organizations and the public. GHG emission caps and carbon offset options may also be considered depending on the legal framework and investor requirements for the project.

In 2021, the Mining Association of Canada published the Climate Change Protocol to facilitate continual performance improvements in the mining sector related to the management of climate-related risks and opportunities, including associated mitigation and adaptation strategies, target-setting and reporting (see the "References" section).

4.4.2. Climate Forecasting

A credible climate forecast underpins climate change risk assessment, which may be required for new project approvals and/or project financing. Generally, climate forecasting considers the short to medium term (present to 20 years in the future) and the long term, looking forward several decades to a century or more. Modeling in applicable stages of the mining project should be scenario-based because future climate change will depend on future trends in GHG emissions, which in turn will depend on the level of success of efforts worldwide to limit or curb emissions. These models will increase in detail and should consider uncertainty in climate scenarios and application of the precautionary principle as the project advances from scoping to pre-feasibility study, feasibility study, construction, and operation and closure.

4.4.3. Climate Risk Assessment

The TCFD considers climate-related risk in the context of physical and transition risks. Physical risks are classified as acute (those related to the increased frequency and/or severity of weather events, including storms and drought), and chronic (those related to long-term changes in climate causing, such as changes in sea level, water availability, etc.). Transition risks are those inherent in evolving policies, plans and investments as society works to reduce its net GHG emissions to mitigate climate change. The TCFD classifies transition risks as follows:

- Policy and legal risk, including carbon pricing, reporting obligations and exposure to climate-related litigation.
- Technology risk, including the investment to substitute existing products and services with lower emissions options and the risk that these investments may fail.
- Market risk, including changes in consumer behaviour and the increased cost of raw materials.
- Reputation risk, including increased concern by stakeholders and sector stigmatization.

Sufficient climate risks identification and management may allow the opportunity to build and operate resilient projects and future mines. No matter the size of the project, good practice is to incorporate climate risks in the overall risk management strategies for the mineral project.

4.5. Mine Closure Planning

Mining is a temporary use of land that aims to leave as small a footprint as possible. Closure planning represents an opportunity to promote the sustainable use of land after a mine closes.

A mine closure plan is a document that defines the long-term environmental, social, technical and financial objectives for a mine site, describes the measures that the operator implements to achieve these objectives and presents the estimated costs of implementation. Other terms that may be used to describe a mine closure plan include progressive reclamation, decommissioning, reclamation, rehabilitation, restoration and abandonment, or combinations thereof.

A considerable volume of technical guidance regarding mine closure planning is available publicly. Appendix B provides a comparative summary of guidance from seven organizations. Citations for these and other closure guidance materials are included in the “References” section.

This section summarizes key aspects of successful closure planning, as follows (and expanded upon in the next sections):

- Co-develop the post operational (or end) land use plan objectives through engagement with government and community stakeholders.
- Use elements of the knowledge base (social, environmental, legal, economic and technical) to develop and maintain a complete mine closure plan throughout the mining life cycle.
- Ensure the mine closure plan incorporates a robust process for identification and management of risks and opportunities related to closure activities.
- Adopt reliable designs and provide reliable cost estimates, implementation schedules and robust financial assurances and mechanisms to ensure that adequate funding is in place for implementation of mine closure measures.
- Establish adequate governance mechanisms, such as policies, standards and closure committees, to help coordinate the closure planning process and its integration into overall life of mine (LOM) planning.

Good planning and realistic assumptions in closure planning can help minimize cost escalation.

4.5.1. Mine Closure Plan Development and Maintenance

It is recommended that mine closure plan development starts as early as possible in the project life cycle so that closure concepts can inform design advancements that reduce long-term liabilities. The mine closure plan ideally includes progressive reclamation during the project lifecycle to evaluate and prove closure concepts and cost estimates, decrease liabilities over the life of the mine and foster the recovery and restoration of biodiversity.
The mine closure plan should be developed by an interdisciplinary team of practitioners knowledgeable about the mining project, the regulatory framework and good practice. Closure planning should be based on documented, realistic assumptions, and their validity tested throughout the life of the mine.

During the exploration phase, closure planning and reclamation activities are usually restricted to disturbances associated with exploration activities (e.g., drill pads, helicopter pads, access roads and camp sites). The reclamation activities should be documented, as knowledge gained in these activities could be useful in the future, should the prospect become a mine.

Closure planning for the LOM site configuration should be undertaken during project design and planning (i.e., design for closure), which ultimately reduces overall costs, reduces long-term liabilities, maintains community relations and helps improve industry reputation. Project economic models should incorporate closure cost estimates in consideration of closure financial security requirements. Although planning may be conceptual and based on assumptions at the design stage, the mine closure plan and cost estimate should be complete (see below). Initial closure plans are developed using broad estimates and conceptual plans. As the project evolves, plans are updated and refined through technical studies, field trials, options analysis and other studies.

Closure plans should be updated at regular intervals during a mine's operating life, especially when the LOM plan changes materially, and always in accordance with applicable legal requirements. Closure planning and cost estimating should contemplate the possible need for temporary cessation, or for sudden or premature (pre-LOM) mine closure.

Where feasible, mine operators should undertake progressive reclamation in areas where no further land disturbance is expected based on the current LOM plan and foreseeable future developments. The mine closure plan should document progressive reclamation activities already undertaken and should identify opportunities for future progressive reclamation.

Input from local communities is an important and frequently overlooked aspect of mine closure plan development and amendments. Operators should engage local stakeholders in closure planning early in the mining life cycle, even though mine closure may be many years in the future. Local and/or traditional knowledge may be important in shaping decisions regarding post-closure land use, water management, shared infrastructure and so on. Early buy-in from local stakeholders on closure issues directly affecting them helps to mitigate the unavoidable impacts of mine closure on the local economy, which in turn helps to control the associated costs to the company.

4.5.2. Risks and Opportunities

Mine closure plan development should incorporate an assessment of closure-related risks and opportunities, which should be documented and updated regularly during the mine's operating life. The risks and opportunities assessment should be used to inform updates of the mine closure plan and closure cost estimate. Good practice shows that integration and testing (through progressive reclamation) of the opportunities identified over the life of mine or property life cycle would reduce risks long term and facilitate closure plan implementation.

Early in the project life cycle, the mine closure plan will include assumptions about closure objectives, activities and costs. These assumptions should be well-documented and, in cases where the assumption may affect the closure cost estimate, the company should develop and implement action plans to test or refine the assumption. These action plans should be documented in the mine closure plan and subsequent updates should incorporate the action plan outcomes.

In addition, the closure cost estimate should consider the implications if key assumptions do not prove valid. For instance, where acid rock drainage and constituent leaching has developed or may reasonably be expected to develop based on geochemical testing, modelling and regulatory requirements, risk assessment should address the possibility of an extended post-closure phase where passive or active water treatment may be needed to achieve post-closure water quality objectives. The potential impact on the closure cost estimate should be documented in the mine closure plan amendments.

4.5.3. Financial Aspects of Closure

Regulatory requirements for closure vary widely between jurisdictions and often do not consider all closure activities. A common error in closure planning is to confine the scope of the mine closure plan and cost estimate to consider only the applicable regulatory requirements. While the closure cost estimate presented for the purposes of regulatory approval and/or establishing financial assurance can be tailored to the applicable legal requirements, the LOM mine closure plan should address all activities directly related to mine closure, including those that may not be required under applicable law, such as:

- **Owner's costs.** Project management costs, mine lease maintenance costs, taxes, insurance, stakeholder engagement and other administrative expenses associated with implementation of closure plans can be significant and should be estimated in a prudent and conservative manner.
- **Financial assurance costs.** Once established, financial assurance should be maintained until it is released by authorities, which may be many years after active closure activities cease. Any need to maintain financial assurance should be acknowledged in the mine closure plan and the cost of maintaining it should be included in the closure cost estimate.

- **Shared infrastructure.** When infrastructure (e.g., for potable water or power supply) is provided by the mining company and is used jointly by the mining operation and the community, the mine closure plan should incorporate a reasonable provision for a transition of control at the end of the operation.
- **Monitoring & Maintenance** of the site after closure activities are implemented. These activities and associated costs may be significant and continue for years, decades, or in some cases, in perpetuity.
- **Contingency.** Cost estimates for capital projects normally include a contingency that varies depending on the level of detail of the underlying technical studies and the assumed precision of the cost estimate. Contingency should also factor in elements such as potential changes in regulatory requirements and/or industry standards that could impact the site in the post-closure period. Companies should consider an appropriate contingency in closure plan depending on the level of uncertainty in the closure cost estimate (higher contingency would be appropriate when project is in scoping study, and contingency may change as details of the projects are becoming available).

Rapid cost escalation in the period immediately before closure and during the closure phase itself can be avoided by ensuring that early closure planning efforts are comprehensive, complete and accurate, and that the risks and opportunities of closure are effectively assessed and managed.

Closure costs estimates for the scoping stage, pre-feasibility study and feasibility study are based on the anticipated disturbances of the project and infrastructure. Level of accuracy should be aligned with financial modelling for the project and regulatory requirements. The accuracy of the closure cost estimate will improve over time as the estimate is informed by progressive reclamation efforts, the testing and refining of underlying assumptions and ongoing engineering, planning studies and implementation projects.

It is important to understand that there is not just one closure cost estimate. In practice, there are several types of estimates that serve distinct purposes, with different inputs and assumptions. These include:

- The LOM closure cost estimate considers all aspects of mine closure based on disturbance as projected for the current life-of-mine plan. This is the best estimate of the total cost of mine closure and should be used in project financial models, independent of regulatory approvals.
- The temporary closure cost estimate considers the costs of stabilizing the mine site based on the current disturbance footprint in addition to the annual recurring costs for care and maintenance.
- The sudden closure cost estimate considers all closure costs associated with mine closure based on the current disturbance footprint (i.e., assumes a decommissioning tomorrow scenario).
- The regulatory closure cost considers legal requirements in the mine's operating jurisdiction for the determination of financial assurance for closure. This is usually (but not always) based on the LOM disturbance footprint and is often a subset of the items included in the LOM closure cost estimate.

- The financial liability estimate considers reclamation costs associated with obligations for closure of the mine site with the current disturbance footprint.

Regulatory requirements vary and many jurisdictions require a reclamation financial security to cover closure costs if the company is unable to complete the work. Acceptable financial mechanisms might include full cash, insurance, bonds, etc. Governments and international guidance may require closure cost estimates to be based on assumptions of third-party contractors and equipment use and may not allow for equipment (salvage) sales to offset closure costs. This reduces risks and exposure for the security holders if the company goes bankrupt during the closure phase.

4.6. Emergency Preparedness and Response

Emergency planning addresses critical risks related to the future operation that would have a detrimental effect on the company reputation, financial wellbeing, communities and the environment. Being prepared and raising awareness of critical risks related to the future project or operation is an essential factor in emergency planning and emergency response.

Since 1988, the United Nations Environment Programme (UN Environment) has been leading the "Awareness and Preparedness for Emergencies at Local Level" (APELL) program, initiated in response to several chemical accidents that resulted in deaths and injuries, environmental damage and extensive economic impacts to the surrounding communities.

Guidance and standards of good practice include:

- MAC – TSM Crisis Management and Communication Protocol
- ICMM, Good Practice in Emergency Preparedness and Response, 2005
- World Bank Environment, Health and Safety Guidelines
- CDA Dam Safety Guidelines, 2013
- CDA Tailings Dam Breach Analysis, 2021

At a minimum, it is recommended that companies develop policies, procedures and processes to prevent health, safety and environmental emergencies. By doing so, critical risk identification and management play an important role. Corporate offices should have a minimum standard for emergency preparedness and response, and then develop site-specific emergency preparedness and response plans based on site-specific risk assessments for each of their properties (e.g., exploration, development, operation and closed properties). Recognizing critical risks (e.g., health and safety of personnel and communities, medical emergencies, mine rescue, potential failures of tailings facilities and defined alert levels, contaminants releases from tailings, waste rock storage facilities, hostage taking, etc.) allows better preparedness, and collaborative responses with the surrounding communities to reduce consequences.

Emergency preparedness and response plans should be co-developed with the potentially affected communities and local governments, and regularly communicated with them. Successful emergency responses typically also depend on community participation and collaboration and take into consideration the social context and the host country emergency response infrastructure and capacity. In cases where local government agencies have little or no capacity, company leadership in emergency preparedness and emergency response become paramount.

Components that should be considered in development of an emergency preparedness and response plan are:

- Evaluation of risks and hazards that may result in emergency situations in the community and define options for risk reduction.
- Identification of a level of emergencies and corresponding necessary responses.
- Identification of emergency response participants and establishment of their roles, resources and concerns.
- Development of a co-ordinated response between different participants.
- Identification of response tasks and resources available for the participants to the response taskforce.
- Integration of the plan with the community emergency plan and participating groups, so that written endorsement is obtained, and relevant approvals are in place.
- Provision of equipment and resources.
- Periodic training.
- Creation of an internal and external communication and implementation strategy.
- Establishment of procedures for training, periodic testing, review and updating of the plan.
- Communication of the integrated plan to the impacted communities (ICMM, Good Practice in Emergency Preparedness and Response, 2005).
- Rehearsal / testing of the plans, and enhancement of the plans based on lessons learned.

5. ESGP 5 – Social Planning: Protect people and benefit communities

5.1. Engagement

'Social licence' to operate represents one of the highest risks to mining projects at all phases. A 'social licence' refers to an informal, or perceived, level of approval for a company's operation or activities held by the community (or multiple communities), rights holders and stakeholders. The quality of the 'social licence' results from the direct relationship between parties, which can often involve and include effects of interacting with governments. Specifically, the social licence is never an actual licence, unlike the formal licences and permits issued by governing bodies responsible for the various processes in which companies engage to operate legally.

Social licence is more a notion than a process; however, it is useful and necessary terminology to direct and shape a process that helps assure the public that a company has the support of communities associated with the property selected by the company. Additionally, it helps reassure the public that the company has addressed, or has systems in place to address community concerns, including short- and long-term environmental stewardship along with community well-being. This is especially important because the success of a mining operation can depend heavily on the company's relationship to communities, activists, rights holders and stakeholder networks who may obstruct or delay projects, even projects where licences to conduct business were legally granted by a government. To attain and maintain a social licence, companies should support communities to build and maintain trust.

Developing and maintaining positive, mutually beneficial relationships with local communities, Indigenous peoples, rights holders, and other stakeholders – based on respect, inclusion, transparency, and meaningful participation – is fundamental to attaining and maintaining social licence for mineral and mining projects. Active and continuous engagement with all stakeholders (including vulnerable, marginalized, and/or other groups needing special accommodation) is recommended to meet this objective.

Dynamic Relationships: *Social relationships are characteristically dynamic and often highly context-specific with respect to place and time, and influenced by such factors as history, culture, politics and socio-economic conditions. The relationships should be monitored to track changes in the factors influencing the attitudes and behaviours of stakeholders, rights holders, the company and its personnel. Once the factors are understood, adjustments can be made to sustain good relations.*

5.1.1. Relevant International Standards and Guidance

National and international guidance related to social planning and social licence to operate has been developed over the years. Guidance for stakeholder engagement has been developed by the Mining Association of Canada (MAC), the Prospectors and Developers Association of Canada (PDAC), the Association of Mineral Exploration British Columbia (AME), the Organization for Economic Co-operation and Development (OECD), the United Nations (UN) and the International Finance Corporation (IFC), to name a few (see "References" section for more).

Fundamental principles of good engagement practice, project development and management are:

- Starting as early as possible in the life of a project and engaging often through the life of the project.
- Ensuring transparency from the beginning.
- Partnering with stakeholders where possible.
- Respecting and listening.
- Ensuring equity in engagement.

Engagement should be an ongoing active program to maintain positive and fruitful relationships, reduce conflict risks and delays and advance projects responsibly. Companies should record information from stakeholder engagement and use it to inform company actions and decisions. The process of engagement should be approached as a circular function comprising due diligence/review, analysis, planning, implementation and meaningful regular updates. Good practice in engagement processes includes due diligence, stakeholder analysis, engagement planning, grievance mechanism, multi-directional communication, monitoring, reviewing and updating. Engagement can be more effective if integrated into overall corporate management, including participation by upper management and incorporating appropriate targets and indicators.

5.1.2. Research and Stakeholder Analysis

Background research is recommended as a first step to understanding the social context of stakeholders and rights holders. The Mining Association of Canada's Towards Sustainable Mining group has created the Indigenous and Community Relationships Protocol. Stakeholders and rights holders should be identified, including minority and vulnerable groups and individuals, and those who self-identify as stakeholders and rights holders. Social, political, economic and environmental context should be investigated to understand the reality of the community and the risks and opportunities created at the various stages of a project. If Indigenous or tribal peoples are among the rights holders present, the provisions of relevant national laws and/or the International Labor Organization Convention 169 on Indigenous and Tribal Peoples may apply. Provisions of the United Nations Declaration on the Rights of Indigenous Peoples should also be considered.

Stakeholders and rights holders should be mapped first by their geographical relationship relative to the mining project and infrastructure, including traditional and legal land uses. Then, the social networks within and among stakeholders should be investigated to determine the concerns and issues that are shared. Based on this information, analysis can classify stakeholders to establish a preliminary understanding of priority and mode of engagement to be applied.

Companies should implement special provisions and tailor engagement and social management plans to the needs of individuals or groups that may be disproportionately affected by a project due to existing disadvantaged or vulnerable status, and those who may become vulnerable because of project development (i.e., through loss of livelihood) and loss of access to lands used for traditional and cultural practices.

5.1.3. Engagement Planning and Monitoring

If Indigenous or tribal peoples are present, identify and apply any national guidance or legislation for engagement with these groups. In the absence of national guidance, the provisions of the United Nations Declarations on the Rights of Indigenous People should be considered. In some jurisdictions, the provisions of International Labor Organization Convention 169 on The Rights of Indigenous and Tribal Peoples have been incorporated into national legislation and should be incorporated into engagement with these rights holders. Explorers and developers should be aware of the requirement for Free, Prior and Informed Consent, and should implement the requirement in a way that meets both legal regulation and the norms and expectations of the Indigenous or tribal peoples concerned. It is recommended that practitioners consult additional guidance on Free, Prior and Informed Consent such as that provided by Forest Stewardship Council (FSC) Canada (2019) and by the Food and Agriculture Organization of the United Nations (2016). Additional guidance on protocols and customs should be attained directly through engagement with the local Indigenous peoples.

The engagement plan and strategy should create clear corporate policy and procedures for communications and engagement with stakeholders and rights holders. The plan should include a management and internal reporting structure at the corporate and project/operational level to oversee and implement engagement with stakeholders and rights holders, with direct accountability at the highest levels of the company. Staff and contractors should be provided with the necessary training to enable them to effectively communicate and engage with stakeholders and rights holders.

The monitoring program and key engagement indicators should be developed in collaboration with priority stakeholders and/or rights holders. Regular reporting to stakeholders should be part of the overall program to build and maintain trust.

Effective implementation of an engagement plan should include diligent record keeping and monitoring. Companies should document all interactions (both formal and informal) with stakeholders and rights holders and track all offers, promises and commitments made by or on behalf of the project or company. Where issues arise, senior management should be notified of stakeholder concerns.

Additional programs for stakeholder involvement should be considered, such as participatory monitoring. Where possible, the company should support and facilitate the active participation of project-affected stakeholders, and/or rights holders, and other interested parties in monitoring project activities such as environmental performance and social investment.

As with all management plans, the engagement plan should include provisions for review, analysis and updating for continual improvement and to adapt to changing situations.

5.1.4. Grievance Mechanism

A grievance mechanism (feedback mechanism) should be site-level (with appropriate vertical reporting and accountability within the company) and established with input from priority stakeholders and rights holders. A grievance mechanism is a process to respond to complaints, claims and grievances and facilitate direct communication between stakeholders and companies. The mechanism should be workable and acceptable to all parties. The mechanism serves as an opportunity for groups to bring forward concerns and issues at any time, not just through formal engagement activities with the company. In this way, grievance mechanisms can sometimes serve as warning systems of issues arising; therefore, companies should ensure feedback is well-documented and followed-up. The mechanism should be sensitive to cultural

norms and be accessible to all. Achieving this should use traditional and community-based approaches and consider gender and other key status attributes (Indigenous, vulnerable and marginalized peoples). A strong grievance mechanism includes follow-up processes and record keeping methods that protect all parties.

5.2. Worker and Community Health and Safety

5.2.1. Worker Health and Safety

Guidance on good practices for worker health and safety are included in the IFC Performance Standard 2, Labor and Working Conditions. In addition, the Mining Association of Canada, TSM program includes a Safety and Health Framework (2019) and the Safety and Health Protocol (2020 revision), which provides good practice under four indicators pertaining to:

- Commitments and accountability.
- Planning and implementation.
- Training, behaviour and culture.
- Monitoring and reporting wherein companies recognize that zero harm is the goal for all facilities.

Companies should develop a strong worker health and safety program as part of their overall management strategy and to meet legal requirements and international conventions. The plan begins with executive and senior management commitment that drives the overall corporate safety culture and is documented in a corporate policy on safety and health. Worker relations, health and safety are key components of a company's overall culture involving its social responsibility and governance program. Consideration should also be given to mental health, gender-based issues, Indigenous peoples, potentially vulnerable or marginalized workers and cultural context.

Protection measures for a health and safety plan should be developed based on the level of activities and associated risks and opportunities. The plan should include details regarding personnel safety, hazard analysis, safe work procedures and emergency preparedness such as evacuation in event of fire, emissions, gas releases, spills and other hazards, etc. Employees should be engaged in making improvements to the health and safety program. A safety culture should be promoted focused on prevention through reporting unsafe acts and conditions and taking responsibility for their safety. Avoiding child and forced labour is fundamental. Guidance on preventing the use of child labour and forced labour as defined by ILO Conventions 29, 138, and 182 is available from MAC's TSM. The TSM verification protocol sets out the general approach taken to verify that processes are in place to ensure that neither child labour nor forced labour are occurring, as defined by ILO conventions.

5.2.2. Community Health and Safety

Protecting the health and safety of communities is a fundamental obligation for exploration and mining companies wherever they work to maintain permits, reputation and a licence to operate. Risks to community health and safety are present for almost any activity that has connections outside the community, including (but not limited to) protecting workers who live in the communities, containment of mine waste and hazardous materials at site, emissions, water use, discharges, noise, vibration, security forces, transportation, procurement, worker accommodation and social challenges associated with influx of workers and increased income (e.g., housing and food distribution, disease, community safety, gender-based violence, etc.).

Companies are encouraged to work with communities to complete a risk assessment following the Mining Association of Canada, TSM Indigenous and Community Relationships Protocol Indicator 4 - Community Impact and Benefit Management.

Guidance on good practices for community health and safety include the IFC Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts and IFC Performance Standard 4, Community Health, Safety, and Security. The Voluntary Principles on Security and Human Rights is one source of policies and actions that can be taken to protect the community from risks associated with public and private security forces.

Protection of community health, safety and wellbeing should start with setting policies or standards to which the company conforms. Community relations management and grievance mechanisms are also important for identifying issues and protecting the community. In addition, the emergency preparedness and response procedures should be developed with the community to respond to project risks (e.g., dam failures, flooding, fires, spills, evacuation, medical emergencies, etc.). A company's management system should address areas with potential for conflict over scarce resources (e.g., water). ICMM's A Practical Guide to Catchment-based Water Management for the Mining and Metals Industry and MAC's TSM Water Stewardship Policy Framework provide valuable guidance on how and why to manage water at the catchment level, which protects communities.

5.3. Economic Development

Employment, contracting and procurement are activities that can be managed effectively to minimize risks and enhance benefits. Using large foreign suppliers and employing expatriates can erode the social licence to operate, impact community trust and cause conflict. However, application of international standards, focused policies, planning and training can bring economic benefits to the local communities. A key consideration for effective management is early engagement, managing expectations with respect to opportunities and timelines and providing support for local suppliers to help them to succeed. Increasing investor demands on mining companies for supply chain due diligence mean that local businesses in some countries may need additional support to ensure they can demonstrate they meet investor requirements (e.g., ethical practice, GHG emissions). One source of guidance for local procurement can be found in the Mining Local Procurement Reporting Mechanism (German Cooperation et al 2017).

5.3.1. Employment

Local hiring is an effective way to foster sustainable development and avoid conflicts with stakeholders. Proactive efforts can be made to assess the local skills base and then hire employees from the communities nearest and/or most impacted by mining activity to the greatest extent possible. Companies can play an important role in providing training, skills development and promoting good practices. When significant changes in operations occur that impact employment levels, companies should provide reasonable notice and cooperate with worker representatives and appropriate government authorities to mitigate adverse impacts and maximize local benefits.

Companies can support skills upgrading and certification efforts for workers in partnership with local government, educational institutes and other organizations. Capacity building for employment should consider local and cultural customs and behaviours and work policy and planning documents should capture and reflect this local context.

Companies should take measures to implement policies and systems in hiring processes that are based on equal opportunity and fair treatment and take measures to assess prevailing practices related to preferential treatment and discrimination.

Companies should measure and publicly report the quantity and levels of employees hired from local areas, disaggregated by gender and other relevant groups (see Indigenous Peoples below). Measurement and public reporting of skills upgrading should also take place (e.g., number of community members with new certifications because of the mine's activity). To the extent possible, skills upgrading should reflect long-term improvements that are consistent with planned post-closure economic activities.

5.3.2. Local Procurement

Projects should be designed and planned to use locally provided goods and services to the greatest extent possible. Project design should incorporate planning to identify local businesses that can take part in supplying opportunities and incorporate capacity-building efforts to upgrade these businesses. Capacity-building for local businesses should be planned and executed in partnership with local institutions including government, business associations (e.g., a local Chamber of Commerce or equivalent) and other partners.

Projects should create different categories of suppliers (e.g., local, regional and national, and/or those based on Indigenous and other stakeholder groups), and measure and report procurement spending broken down by these categories. Projects and operations should publicly share information about procurement opportunities and how to access tendering opportunities to the fullest extent possible.

Companies should document their supply-chain management approach, including criteria used to screen the environmental, human rights and labour practices of new suppliers as well as how performance is being monitored and tracked.

5.3.3. Indigenous Community Considerations

Strategies and programming for local hiring and procurement should incorporate the presence of Indigenous communities, ensuring to prioritize Indigenous employees and entrepreneurs in communities with relevant legal rights and agreements in relation to the project.

Impact benefit agreements (the most common name in Canada and termed "community development agreements" globally) is one option to incorporate local hiring and procurement preferences, as well as capacity-building support for workers and Indigenous-owned businesses. Companies may also include Indigenous community considerations related to employment and procurement in an Indigenous Peoples Plan (or similar) that defines and lists all actions and objectives related to company engagement and benefits related to Indigenous peoples.

5.4. Land Access, Acquisition, Displacement, and Resettlement

Mineral deposits cannot be relocated, which can result in land use conflicts unless managed effectively. In obtaining access to land and the acquisition of land, explorers and developers should first comply with any relevant national laws and regulations. They should then take steps to align their actions with the higher of any standard defined by national law and regulation or those set out in international standards and good practice guidelines (as provided in the "References" section).

5.4.1. Land Access

Access should be requested from authorities, owners, users and rights holders prior to carrying out any activities on a property. This begins to build relationships and social licence to operate and could help avoid future conflict. A fundamental message is to treat existing owners, users and rights holders with courtesy and respect, avoiding the assumption of eventual approval.
Useful guidance for good practice in obtaining access to land for exploration and mineral project evaluation is found in the Community Engagement Guide published by PDAC. Explorers and developers should undertake a thorough investigation and due diligence to identify individuals, groups or organizations that own, use or have an existing or potential interest in the lands where the project is located.

In situations where permission to access land involves Indigenous or tribal people, every effort should be made to comply with national regulations and the requirement for Free, Prior and Informed Consent (FPIC) under the United Nations Declaration on the Rights of Indigenous People.

Permission to access the land should be obtained in writing from individuals, groups or organizations. It is important to formalize permission in an agreement that includes:

- A timeline/limit for access by the company.
- A description of any conditions agreed to governing access to the land.
- Definition of any compensation for access to the land (which may be in cash or in kind), disturbance, displacement or loss of livelihood or income.
- Access to and use of water sources.
- A process to receive and resolve disputes, complaints and concerns.
- Other pertinent details.

5.4.2. Land Acquisition

Construction and operation of a mine needs certainty of an exclusive right to use the surface of the land. Consequently, land is acquired for access to the mineral reserves, construction of a mine site and associated infrastructure that may include roads, railways, power lines, airstrips, residential accommodation and other utilities. Good practice is to limit the extent of land acquisition to the minimum necessary to successfully, and safely, execute the mining project. Fundamentally, it's important to only take what you need.

Legal certainty of land ownership is an essential element. However, all individuals affected by land acquisition are not affected in the same way, or to the same extent, are not equally vulnerable to hardship or able to take advantage of the situation. In addition, land acquisition is context specific due to social and cultural norms of land use and ownership unique to a given region or social group. Therefore, it is good practice to approach land acquisition as a social process led by social specialists supported by legal professionals.

5.4.3. Displacement and Resettlement

The impact of land acquisition on people affected by the process is highly variable and can range from negligible to profound. This can potentially lead to physical and/or economic displacement or the need for resettlement. In the context of land acquisition, displacement is a process whereby people lose land or other assets or access to resources, which may occur in one of several ways:

- Physical (loss of land, access to cultural sites and/or physical assets such as buildings and infrastructure) or economic (disruption of livelihood or loss of income), or both.
- Temporary (during mine construction, for example), or permanent.
- Partial or total, the latter creating residential dislocation.

Resettlement generally refers to the process by which those adversely affected by land acquisition are assisted in their efforts to improve or, at a minimum, maintain their living standards. It should be recognized that women are disproportionately affected by resettlement. Special consideration should be given to include them in negotiations and consider additional burdens that may occur from relocation. Resettlement takes considerable time and effort and should be started early and managed carefully.

5.4.4. Elements of Resettlement Good Practice

Displacement and resettlement create some of the most difficult challenges encountered by the mining industry. Whilst there is considerable opportunity for improvement in livelihoods and living standards for affected people, there are also significant risks. Good practice is to involve the expertise of social practitioners who specialise in this area of social performance. Extensive background and baseline investigations should be completed to properly understand the nature and needs of the affected population. A Stakeholder Engagement Plan and a detailed Resettlement Action Plan should be prepared to guide the process from initiation. The principles guiding good practice may be summarised as:

- Wherever possible, pursue alternative project designs to avoid displacing people.
- Minimize displacement if it cannot be avoided.
- Provide compensation to all affected people, and resettlement with livelihood restoration where displacement is unavoidable.
- Mitigate all adverse impacts.
- Assure the informed participation of affected people through adequate engagement, documentation and consultation.
- Improve, or at a minimum restore, the livelihoods, income earning capacity and standard of living for all affected people.
- Develop special provisions for assisting disadvantaged or vulnerable individuals/groups.
- Establish a mechanism for managing grievances, claims and complaints.
- Monitor the success of resettlement and mitigation of impacts.

In any case of resettlement, it is important to “imagine this is happening to you”. This approach will help ensure fair process and compensation while protecting human rights.

In addition, where Indigenous people are involved, implement the requirements of relevant national law and regulation and consider international standards (e.g., UNDRIP, IFC Performance Standard 7: Indigenous People).

5.5. Human Rights: Protect and respect human rights

Business activities can profoundly impact human rights. Consideration should be given for impacts within and along the supply chain. Assessing and managing associated risks throughout the project

lifecycle is key to meeting international and domestic human rights obligations, attaining social licence to operate, mitigating risks throughout the project lifecycle and accessing finance. A risk assessment conducted with communities from a community perspective can be effective at meeting these goals (MAC TSM). Companies should prevent, mitigate and account for how they address their adverse human rights impacts as part of their human rights due diligence. Although human rights due diligence can take place within broader enterprise risk management systems, it should always go beyond managing risks to the company itself, to include risks to rights holders.

Activities, policies and practice should consider international standards and guidelines (see the "References" section) as provided in the United Nations Guiding Principles on Business and Human Rights principle 17 (UNGPs), the International Bill of Human Rights, the ILO Declaration on the Fundamental Principles and Rights at Work, the OECD Due Diligence Guidelines for Multinational Enterprises (Chapter IV on Human Rights), the Voluntary Principles for Security and Human Rights, the ICMM Guide on Human Rights in the Mining and Metals Industry and the UN Global Compact Guide to Human Rights Impact Assessment and Management. Human rights impacts are becoming more important to investors and the public and are now an integral part of Equator Principles 4 (2020).

At a minimum, companies should identify broad areas where the risk of adverse human rights impacts is significant and prioritize these for human rights due diligence. Elevated risk can exist for several reasons, including but not limited to certain suppliers' or clients' operating context or the products or services involved.

Avoiding child and forced labour is fundamental. Guidance on preventing the use of child labour and forced labour as defined by ILO Conventions 29, 138 and 182 is available from MAC's TSM. The TSM verification protocol sets out the general approach taken to verify that processes are in place to ensure that neither child labour nor forced labour are occurring, as defined by ILO conventions.

In line with global standards for human rights due diligence, companies should:

- Comply with internationally recognised standards and obligations (including domestic laws and regulations of host countries).
- Conduct human rights due diligence.
- Have a human rights policy commitment
- Provide grievance mechanisms (both for internal and external purposes).
- Seek ways to prevent and mitigate adverse impacts that are linked to their activities.

Consistent human rights monitoring should also address the identification, prevention, mitigation and accountability for human rights abuses committed by a business's activities, including activities by third party service providers or suppliers.

Finally, companies should understand both legal and non-legal implications of complicity, as well as perceptions of complicity in human rights impacts, which may arise when a company either contributes to or is seen to contribute to adverse human impacts caused by other parties. Conducting appropriate human rights due diligence and ensuring companies can demonstrate that they avoided involvement with human rights abuse can help assist companies with addressing legal or non-legal claims against them but may not always resolve issues.

5.5.1. Indigenous Peoples and Vulnerable Groups

Companies should ensure they identify and respond to impacts on individuals from groups or populations that may be at heightened risk of vulnerability or marginalization, or requirements for special accommodation. These could include Indigenous peoples, women, children, migrant workers and/or other under-represented groups.

Human rights due diligence should always include, at the earliest stage, identification of all vulnerable groups and special rights holders like Indigenous peoples, who may be affected by a project. Good practice means not only identifying their rights through formal, explicit policies and engagement, but also listing the ways by which those rights could be affected.

More than other groups, Indigenous peoples are likely to be affected not only by "violation by commission" (i.e., acts that knowingly breach regulations or binding agreements), the intended effect of which *per se* constitutes a human rights violation, but also by unintended "violation by result" (e.g., violation of Indigenous peoples' land rights or decision-making methods due to a lack of knowledge on the part of a company).

For companies whose operations may specifically affect Indigenous peoples, a policy commitment concerning Indigenous peoples is beneficial, whether as a separate document or as part of a wider human rights policy commitment. Policies should be grounded in, and spell out the recognition of, Indigenous peoples' specific rights as set out in the relevant international human rights treaties and resolutions as well as in the jurisprudence of human rights courts and monitoring bodies.

Moreover, given the significance of Indigenous peoples' relationship to land, the recognition of their collective rights to lands and resources in accordance with their own customary law should also be considered, even in cases where Indigenous groups do not hold official title to land.

For companies to successfully assess or address human rights impacts of their operations, they should directly consult stakeholders in a way that considers accessibility throughout the operation of their project.

5.5.2. Security Forces

Security forces employed by the mine, and/or state security forces operating within the mine's zone of influence, should serve to protect individuals, communities and property and maintain the rule of law. Company-hired security forces should be trained specifically to safeguard human rights, including those of staff and personnel. Diversity amongst the security forces (in particular, gender diversity), should be considered to reduce the risk of gender-based violence.

Companies should develop a Security Management Plan (or similar) based on an assessment of security risks related to a project, including potential risks to management, staff, contractors, local stakeholders and community groups. The assessment of risks should seek to identify already existing human rights records at the local and national level, conflict history in the zone of influence and all relevant human rights-related training of security personnel. For preventing and mitigating adverse impacts in higher risk jurisdictions, companies can refer to the Voluntary Principles on Security and Human Rights Initiative (VPI), including its guidance for developing a Security Management Plan (SMP).

5.6. Cultural Heritage: Respect and protect cultural heritage

Archaeological and cultural heritage are extremely important components of the mining process because of the potential for earthmoving and other activities to affect these resources. These tangible

and intangible resources are sometimes protected either by national legislation or international convention, and other times by community groups without formal recognition. Companies should retain professionals and work with communities to develop and implement respectful protocols to identify and manage cultural heritage.

Archaeological and heritage resources are also important to Indigenous communities because they demonstrate the long-term use of their traditional territories and provide a physical link to their cultural history. Traditional sites such as named geographical features and other resources are also important to Indigenous peoples. Historical features such as cabins, trails and historic artifacts may be important to local communities and/or Indigenous peoples. These archaeological and heritage resources are vulnerable to surface and subsurface alteration from project activities. Any alteration, if not correctly handled, can result in potential litigation and issues with local Indigenous and community relationships.

The IFC's Performance Standard 8: Cultural Heritage (IFC, 2012) defines heritage resources as including:

- Tangible forms of cultural heritage that may include moveable and immovable objects, property, sites, structures or groups of structures having archaeological (prehistoric), paleontological, historical, cultural, artistic or religious values.
- Unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes and waterfalls.
- Certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations and practices of communities embodying traditional lifestyles.
- Critical cultural heritage.

The IFC Performance Standard 8 was developed to conform to the Convention Concerning the Protection of the World Cultural and Natural Heritage (United Nations Educational, Scientific and Cultural Organisation, 1972). Specialists should be contracted prior to land disturbance to assess cultural heritage potential using both desktop and field investigations and incorporate engagement with local communities and Indigenous groups. Detailed studies may need to be completed for areas with high potential impacts.

Prior to land disturbance, a Chance Find Procedure (or similar) should be developed and implemented, to be applied if cultural artifacts are subsequently discovered. A Chance Find Procedure should include training on what artifacts and cultural finds look like and how they are protected until an assessment by a suitable practitioner is made and appropriate protection and/or management measures are implemented. Communities and Indigenous groups should be consulted for the identification and management of artifacts or sites of cultural heritage as appropriate.

6. Conclusion

This document provides key principles of environmental, social and governance good practice intended for practitioners defining modifying factors for mineral reserve estimates and contributing to technical and economic studies of mineral exploration and mining projects. The ESG Guidelines can also support mining companies managing their environmental, social, governmental and governance risks and opportunities. Good ESG practice is all about societal expectations for the protection of the environment and public health and safety in very broad terms. However, strong ESG performance also provides benefits in maintaining social licence, permits, sustainable development goals, investor confidence and productivity.

These ESG Guidelines focus on the underlying environmental and social practices that modify the definition of mineral reserves as required under the Canadian Securities legal framework. Nonetheless, there is an increasing impetus in the investment and financial sectors to rank, report and track the ESG performance of companies in the mining industry. This guidance is also a foundation that can support other ESG performance and reporting. The References section of these ESG Guidelines also provides an extensive list of other guidance documents and standards that can support ESG reporting.

Unlike other technical aspects of mining projects, environmental and social risks may be difficult to assess using strict quantitative scientific or knowledge-based considerations since they may be dependent on the perception of the different rights holders, stakeholders and regulatory agencies. These challenges notwithstanding, it is of prime importance for a company to provide reasonable clarity on these risks and opportunities and how they are managed. One of the best examples of the risk from perceptions is defining permitting schedules, which are never fully prescribed or known and can result in exposure to delays and uncertainties resulting from external perceptions either by the government or by the impacted communities. It is therefore essential for companies to be transparent, clear, recognize uncertainties and communicate with all stakeholders.

Efforts to streamline the volume of information and to focus on impactful aspects, significant uncertainties and anticipated or possible hurdles are recommended. Finally, these ESG Guidelines are expected to be updated in the future as the state of practice in this space evolves.

7. Acknowledgements

These Environmental, Social and Governance (ESG) Guidelines were prepared by the ESG Working Group, which is a Sub-Committee of the Environmental and Social Responsibility Society (ESRS). ESRS is a Technical Society of the Canadian Institute of Mining, Metallurgy, and Petroleum (CIM) and incorporates those members of CIM with expertise and experience managing the environmental and social aspects of mining projects. The Sub-Committee reports to the Mineral Resource and Mineral Reserve (MRMR) Committee of CIM.

These ESG Guidelines supplement the CIM Mineral Exploration Best Practices Guidelines (CIM, 2018) and the CIM Mineral Resources and Mineral Reserves (MRMR) Best Practice Guidelines (CIM, 2019) as amended from time to time.

Working Group
The ESG Guidelines have drawn on the expertise of over 20 industry practitioners with various backgrounds and representation who have contributed to the discussion on environmental, social, governmental and governance factors. CIM would like to thank its members for their support in the preparation of this document and acknowledge the following people who contributed to the development and review of this guidance:

- David Forrester
- Doina Priscu
- Jeff Geipel
- Jenifer Hill
- Kim Bittman
- Mark Wittrup
- Michel Julien
- Derek Riehm

Advisors
In addition to others, we would like to recognize Reno Pressacco for invaluable advice and direction.

Reviewers
The guidance document was revised based on review and comments received during a peer review period from September to October 2021. CIM and the Working Group Members appreciate the comments received from peer reviewers.

A public comment period ran from 13 February to 13 June 2022. The Working Group appreciates these comments and perspectives that have helped improve and shape the final document.

8. References and Sources of International Standards and Guidance

8.1. International Standards and Principles

Carbon Disclosure Project (CDP). n.d. What we do. Website. https://www.cdp.net/en/info/about-us/what-we-do

CSA Group. 2023. Environmental, social, and governance (ESG) and sustainable development goals (SDGs) guidance for associations. CSA SPE-116:23. https://www.csagroup.org/store/product/CSA%20SPE-116%3A23/?format=PDF

European Commission. 2020. EU taxonomy for sustainable activities. [Website including explanation and the EU Taxonomy Regulation.] https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en

European Commission. n.d. A European Green Deal: Striving to be the first climate-neutral continent. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

Global Reporting Initiative (GRI). 2016. Standards. https://www.globalreporting.org/

IFRS Foundation. Integrated Reporting website. https://www.integratedreporting.org/

IFRS Foundation. International Sustainability Standards Board (ISSB). 2023. IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 Climate-related Disclosures. https://sasb.org/standards/

International Council of Mining and Metals (ICMM). n.d. 10 Principles. http://www.icmm.com/mining-principles

International Council on Mining and Metals (ICMM). n.d. ICMM website. https://www.icmm.com/

Initiative for Responsible Mining Assurance (IRMA). 2018. IRMA Standard for Responsible Mining IRMA-STD-001. https://responsiblemining.net/wp-content/uploads/2018/07/IRMA_STANDARD_v.1.0_FINAL_2018-1.pdf

Institutional Shareholder Services (ISS). n.d. ISS ESG: Apply responsible investment strategies throughout the investment cycle. https://www.issgovernance.com/esg/

Mining Association of Canada (MAC). n.d. Towards Sustainable Mining. TSM website. https://mining.ca/towards-sustainable-mining/

- Indigenous and Community Relationships Protocol
- Energy and GHG Emissions Management with Climate Change
- Tailings Management Protocol
- Biodiversity Conservation Management
- Safety and Health
- Crisis Management and Communications Planning
- Mine Closure Framework

- Preventing Child and Forced Labour
- Water Stewardship

Organisation for Economic Co-operation and Development (OECD). 2016. Recommendation of the Council on Common Approaches for Officially Supported Export Credits and Environmental and Social Due Diligence (The "Common Approaches"). https://one.oecd.org/document/TAD/ECG(2016)3/en/pdf

Pan-European Reserves & Resources Reporting Committee (PERC). 2021. PERC Reporting Standard: Pan-European Standard for the Reporting of Exploration Results, Mineral Resources, and Mineral Reserves. https://percstandard.org/perc-standard/

Principles for Responsible Investment (PRI). n.d. Reporting and Assessment. Website. https://www.unpri.org/signatories/reporting-and-assessment

Prospectors and Developers Association of Canada (PDAC). 2003. e3 Plus: A Framework for Responsible Exploration including principles, guidance, and toolkits. https://www.pdac.ca/priorities/responsible-exploration/e3-plus

SAMCODES Standards Committee. 2019. SAMCODES: The South African Mineral Reporting Codes. https://www.samcode.co.za/samcode-ssc/samesg. Late updated January 22, 2019.

Task Force on Climate-related Financial Disclosures (TFCFD). n.d. Website source of guidance and standards. https://www.fsb-tcfd.org/

The Copper Mark. 2022. Joint Due Diligence Standard for Copper, Lead, Nickel and Zinc. Version 2, 1 January 2022. https://coppermark.org/wp-content/uploads/2021/12/Joint-Due-Diligence-Standard_v2_1JAN2022.pdf

The Copper Mark and Responsible Minerals Initiative. 2020. The Criteria Guide for the Risk Readiness Assessment. https://coppermark.org/wp-content/uploads/2021/10/Copper-Mark-Criteria-Guide_FINAL_24FEB20_l.pdf

UN Global Compact. n.d. About the UN Global Compact. Website. https://www.unglobalcompact.org/about

United Nations. 2015. Transforming our world: the 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly on 25 September 2015. https://sdgs.un.org/2030agenda

US Securities and Exchange Commission. 2018. CFR Title 17 Subsection 229.1300-1305. Disclosure by Registrants Engaged in Mining Operations. https://www.law.cornell.edu/cfr/text/17/part-229/subpart-229.1300

World Bank. n.d. Environmental and Social Safeguard Policies website. https://www.worldbank.org/en/projects-operations/environmental-and-social-policies#safeguards

World Bank. 2005. Bank Policy. OP 4.00 – Table A1 – Environmental and Social Safeguard Policies – Policy Objectives and Operational Principles. https://ppfdocuments.azureedge.net/3900.pdf

World Bank. 2015. Operational Policies. OP 4.02. Environmental Action Plans. https://ppfdocuments.azureedge.net/3528.pdf

World Gold Council (WGC). n.d. Responsible Gold Mining Principles. https://www.gold.org/about-gold/gold-supply/responsible-gold/responsible-gold-mining-principles

8.2. Canadian Standards, Guidance and Guidelines

Canadian Institute of Mining, Metallurgy and Petroleum (CIM). 2014. CIM Definition Standards for Mineral Resources & Mineral Reserves. Prepared by the CIM Standing Committee on Reserve Definitions.

Adopted by CIM Council May 19, 2014. https://mrmr.cim.org/media/1128/cim-definition-standards_2014.pdf, 10 p.

Canadian Institute of Mining, Metallurgy and Petroleum (CIM). 2018. CIM Mineral Exploration Best Practice Guidelines. Prepared by the CIM Mineral Resource & Mineral Reserve Committee. Adopted by CIM Council November 23, 2018. https://mrmr.cim.org/media/1163/cim-mineral-exploration-best-practice-guidelines-2018.pdf, 17 p.

Canadian Institute of Mining, Metallurgy and Petroleum (CIM). 2019. CIM Estimation of Mineral Resources & Mineral Reserves Best Practice Guidelines. Prepared by the CIM Mineral Resource & Mineral Reserve Committee. Adopted by CIM Council November 29, 2019. https://mrmr.cim.org/media/1129/cim-mrmr-bp-guidelines_2019.pdf, 75 p.

Canadian Securities Administrators. 2016a. National Instrument (NI) 43-101: Standards of Disclosure for Mineral Projects. Document available from the Ontario Securities Commission website at: https://www.osc.gov.on.ca/en/15019.htm, 17 p.

Canadian Securities Administrators. 2016b. Companion Policy 43-101CP Standards of Disclosure for Mineral Projects. Document available from the Ontario Securities Commission website at: https://www.bcsc.bc.ca/-/media/PWS/Resources/Securities_Law/Policies/Policy4/43101CP-CP-February-25-2016.pdf, 22 p.

Canadian Securities Administrators. 2010. CSA Staff Notice 51-333 Environmental Reporting Guidance. https://www.osc.ca/sites/default/files/pdfs/irps/csa_20101027_51-333_environmental-reporting.pdf

TSX 2023. 2023 Guide to Listing. https://www.tsx.com/ebooks/en/2023-guide-to-listing/

8.3. Governance

Canadian Securities Administrators. 2005. National Policy 58-201 Corporate Governance Guidelines. https://www.osc.ca/sites/default/files/pdfs/irps/rule_20050617_58-201_corp-gov-guidelines.pdf

International Finance Corporation (IFC). n.d. Corporate Governance Methodology. https://www.ifc.org/content/dam/ifc/doc/2023/ifc-corporate-governance-methodology.pdf

Prospectors & Developers Association of Canada (PDAC). 2009. Excellence in environmental Stewardship e-toolkit (EES) Version-01. https://www.pdac.ca/priorities/responsible-exploration/e3-plus/toolkits/environmental-stewardship

Society for Mining, Metallurgy & Exploration. n.d. SME ESG Tookit. Curated list of international resources in the areas of Environmental Stewardship, Social Responsibility and Governance. https://community.smenet.org/esgtoolkit/home?ssopc=1

8.4. Impact and Risk Management

Inter-American Development Bank (IDB). 2020. Environmental and Social Policy Framework. https://www.iadb.org/en/mpas

International Finance Corporation (IFC). 2012. IFC Environmental and Social Performance Standards, and Guidance Notes. https://www.ifc.org/en/types/insights-reports/2012/publications-policy-gn-2012

International Association of Impact Assessment (IAIA). n.d. IAIA Resources website for publications, training, and videos. https://www.iaia.org/resources.php

International Finance Corporation (IFC). 2012. World Bank Group, Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-1

International Organization for Standardization (ISO). n.d. ISO 14000 Family: Environmental Management. https://www.iso.org/iso-14001-environmental-management.html

Society for Mining, Metallurgy & Exploration. n.d. SME ESG Tookit. Curated list of international resources in the areas of Environmental Stewardship, Social Responsibility and Governance. https://community.smenet.org/esgtoolkit/home?ssopc=1

World Bank. 2013. Operational Manual. OP 4.01. Environmental Assessment. https://ppfdocuments.azureedge.net/1565.pdf

8.5. Environmental Planning

British Columbia Ministry of Environment and Climate Change Strategy. 2018. Developing a Fugitive Dust Management Plan for Industrial Projects. https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrial-waste/industrial-waste/mining-smelt-energy/guidance-documents/dust_management_plan_guidance.pdf

British Columbia Ministry of Environment. 2016. Water and Air Baseline Monitoring, Guidance Document for Mine Proponents and Operators. Version 2 – June 2016.

E3 Plus: Principles for Responsible Exploration – PDAC

Environment Canada. 2009. Environmental Code of Practice for Metal Mines. https://www.ec.gc.ca/lcpe-cepa/documents/codes/mm/mm-eng.pdf

International Council on Mining and Metals (ICMM). 2005. Good Practice in Emergency Preparedness and Response. https://www.icmm.com/en-gb/guidance/health-safety/2004/emergency-preparedness-and-response

International Finance Corporation (IFC). 2007. Environmental, Health, and Safety Guidelines, General and for Mining. https://www.ifc.org/en/insights-reports/2000/general-environmental-health-and-safety-guidelines

International Finance Corporation (IFC). 2012. Performance Standard 3: Resource Efficiency and Pollution Prevention, Standards and Guidance Notes. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-3

International Finance Corporation (IFC). 2012. Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources, Standards and Guidance Notes. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-6

International Network for Acid Prevention (INAP). 2014. The global acid rock drainage (GARD) guide. http://www.gardguide.com/index.php?title=Main_Page

Mining Association of Canada. n.d. Towards Sustainable Mining. Website with protocols and guidance. https://mining.ca/towards-sustainable-mining/

The Cyanide Code. n.d. International Cyanide Management Code For the Manufacture, Transport, and Use of Cyanide In the Production of Gold. https://cyanidecode.org/the-cyanide-code/

8.6. Tailings Facility Management

Australian National Committee on Large Dams (ANCOLD). 2012. Guidelines on tailings dams, planning, design, construction, operation, and closure and 2019 revision.

Canadian Dam Association. 2013. Dam safety guidelines. https://issuu.com/canadiandamassociation/docs/cda_dam_safety_guidelines_2013_edit

Canadian Dam Association. 2019. Application of Dam Safety Guidelines to Mining Dams. https://cda.ca/publications/cda-guidance-documents

Finke Morrison, Kimberly (Editor). 2022. Tailings Management Handbook: A life-cycle approach. 1024 pp.

Global Tailings Review. 2020. Towards Zero Harm: A compendium of papers. 248 pp. https://globaltailingsreview.org/compendium/

International Commission on Large Dams (ICOLD). 2020. Bulletin 181 on tailings dam design – Technology update.

International Council on Mining and Metals (ICMM). 2020. Global Industry Standards on Tailings Management. https://www.icmm.com/en-gb/our-principles/tailings/global-industry-standard-on-tailings-management

International Council on Mining and Metals (ICMM). 2021. Tailings Management – Good Practice Guide. https://www.icmm.com/website/publications/pdfs/environmental-stewardship/2021/guidance_tailings-management.pdf

International Council on Mining and Metals (ICMM). 2021. Conformance Protocol: Global Industry Standard on Tailings Management. https://www.icmm.com/website/publications/pdfs/environmental-stewardship/2021/tailings_conformance-protocols.pdf

Mining Association of Canada's Towards Sustainable Mining. 2021. Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities (version 2.1). https://mining.ca/resources/guides-manuals/mac-oms-guide-version-2-1/

Mining Association of Canada's Towards Sustainable Mining. 2019a. Tailings management protocol. https://mining.ca/towards-sustainable-mining/protocols-frameworks/tailings-management-protocol/

Mining Association of Canada's Towards Sustainable Mining. 2019b. A guide to the management of tailings facilities (3rd edition). https://mining.ca/resources/guides-manuals/a-guide-to-the-management-of-tailings-facilities-third-edition/

8.7. Mine Waste Management

Australian National Committee on Large Dams (ANCOLD). 2019. Guidelines on Tailings Dams- Planning, Design, Construction, Operation and Closure. Revision 1 (2019). https://ancold.org.au/product/guidelines-on-tailings-dams-planning-design-construction-operation-and-closure-revision-1-july-2019/

Canadian Dam Association. 2013. Dam safety guidelines. https://cda.ca/publications/cda-guidance-documents

Eco Efficiency Consulting and Engineering Ltd. 2019. Development of a guidance document on best practices in the extractive waste management plans: Circular economy action. https://op.europa.eu/en/publication-detail/-/publication/f18472f8-36aa-11e9-8d04-01aa75ed71a1/language-en/format-PDF/source-87989698

Garbarino, E., Orveillon, G., Saveyn, H., Barthe, P. and Eder, P., 2018. Best Available Techniques (BAT) Reference Document for the Management of Waste from Extractive Industries in accordance with Directive 2006/21/EC, EUR 28963 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-77179-8, doi:10.2760/201200, JRC109657

International Council of Mining and Metals (ICMM). 2019. Integrated mine closure: Good practice guide (2nd ed). https://www.icmm.com/en-gb/guidance/environmental-stewardship/2019/integrated-mine-closure

International Finance Corporation (IFC). 2007. Environmental, health and safety general guidelines. https://www.ifc.org/content/dam/ifc/doc/2023/ifc-general-ehs-guidelines.pdf

International Finance Corporation (IFC). 2007. Environmental, health and safety guidelines for mining. https://www.ifc.org/en/insights-reports/2000/ehs-guidelines-oil-gas-mining

International Finance Corporation (IFC). 2012. Performance Standard 3: Resource efficiency and pollution prevention. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-3

International Network for Acid Prevention (INAP). 2014. Global acid rock drainage (GARD) guide. http://www.gardguide.com/images/5/5f/TheGlobalAcidRockDrainageGuide.pdf

International Commission on Large Dams (ICOLD). 2019. World declaration on dam safety. https://www.ussdams.org/wp-content/uploads/2020/01/World-Declaration-on-Dam-Safety_final.pdf

Mining Association of Canada (MAC). 2019. A guide to the management of tailings facilities. https://mining.ca/resources/guides-manuals/a-guide-to-the-management-of-tailings-facilities-version-3-1-2019/

Mining Association of Canada's Towards Sustainable Mining. 2021. Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities (version 2.1). https://mining.ca/resources/guides-manuals/mac-oms-guide-version-2-1/

Mining Association of Canada (MAC). 2019. Tailing Management Protocol. https://mining.ca/towards-sustainable-mining/protocols-frameworks/tailings-management-protocol/

Mine Environment Neutral Drainage (MEND). Website repository of Canadian-led research since 1989 on mine waste and water management. http://mend-nedem.org/default/

8.8. Water Management

British Columbia Ministry of Environment. 2015. Developing a Mining Erosion and Sediment Control Plan. Technical Guidance 3. Environmental Management Act. https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrial-waste/industrial-waste/mining-smelt-energy/erosion_sediment_control_plan_guide.pdf

British Columbia Ministry of Environment. 2015. Technical Guidance 7: Assessing the Design, Size, and Operation of Sediment Ponds Used in Mining. Environmental Protection Division, BC Ministry of Environment. https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrial-waste/industrial-waste/mining-smelt-energy/assessing_design_size_and_operation_of_sediment_ponds.pdf

DHI Water Policy (Denmark), United Nations Environment Programme–DHI Centre for Water and Environment (Denmark), & UNESCO World Water Assessment Programme. 2009. Integrated water resource management in action. https://unesdoc.unesco.org/ark:/48223/pf0000181891

European Union (EU). n.d. Water protection and management. https://www.europarl.europa.eu/factsheets/en/sheet/74/water-protection-and-management

Hill Sloan Associates Inc. 2008. First Nation Consultation Framework, Project Report to The National Centre for First Nations Governance. https://fngovernance.org/wp-content/uploads/2020/06/First_Nation_ConsultationFramework.pdf

International Council of Mining and Metals (ICMM). 2014. Water Stewardship Framework. https://www.icmm.com/en-gb/guidance/environmental-stewardship/2014/water-stewardship

International Council of Mining and Metals (ICMM). 2019. Adapting to a changing climate: Building resilience in the mining and metals industry. https://www.icmm.com/en-gb/guidance/environmental-stewardship/2019/adapting-to-a-changing-climate

International Council of Mining and Metals (ICMM). n.d. A practical guide to catchment-based water management for the mining and metals industry. https://guidance.miningwithprinciples.com/catchment-based-water-management/

International Finance Corporation (IFC). 2007. Environmental, Health, and Safety Guidelines, General and for Mining. https://www.ifc.org/en/insights-reports/2000/general-environmental-health-and-safety-guidelines

International Finance Corporation (IFC). 2012. Performance Standard 3: Resource efficiency and pollution prevention. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-3

International Network for Acid Prevention (INAP). 2014. Global acid rock drainage (GARD) guide. http://www.gardguide.com/images/5/5f/TheGlobalAcidRockDrainageGuide.pdf

Mining Association of Canada (MAC). 2017. Towards Sustainable Mining. Water Stewardship Framework. https://mining.ca/documents/tsm-water-stewardship-framework/

Mining Association of Canada (MAC). 2019. Towards Sustainable Mining: Water Stewardship Protocol. https://mining.ca/resources/guides-manuals/tsm-water-stewardship-protocol/

Mine Environment Neutral Drainage (MEND). n.d. Website repository of Canadian-led research since 1989 on mine waste and water management. http://mend-nedem.org/default/

U.S. Environmental Protection Agency (EPA). 2014. Reference guide to treatment technologies for mine-influenced water. https://clu-in.org/download/issues/mining/Reference_Guide_to_Treatment_Technologies_for_MIW.pdf

U.S. Environmental Protection Agency (EPA). n.d. Water quality criteria. https://www.epa.gov/wqc

Water Environment Federation. n.d. Watershed Management Community. https://www.wef.org/membership--community/communities/communities/watershed-management-community/

World Wildlife Foundation. n.d. Water Risk Filter Global Map and Guidance. https://riskfilter.org/water/explore/map

8.9. Resource Efficiency

Government of Canada. n.d. Mining research and innovation at CanmetMINING. https://natural-resources.canada.ca/our-natural-resources/minerals-mining/mining-research-and-innovation-canmetmining/25099

International Finance Corporation (IFC). 2012. Performance Standard 3: Resource Efficiency and Pollution Prevention, Standards and Guidance Notes. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-3

Young, A., M.L. Barreto, K. Chovan. 2021. Towards a Circular Economy Approach to Mining Operations, Key Concepts, Drivers and Opportunities. Prepared for Natural Resources Canada and The Canadian Minerals and Metals Plan. Enviro Integration Strategies Inc., Materials Efficiency Research Group.

8.10. Biodiversity

Breed, M. F., Harrison, P. A., Blyth, C., Byrne, M., Gaget, V., Gellie, N. J. C., Groom, S. V. C., Hodgson, R., Mills, J. G., Prowse, T. A. A., Steane, D. A., & Mohr, J. J. 2019. The potential of genomics for

restoring ecosystems and biodiversity. Nature Reviews Genetics, 20(10), 615–628. https://doi.org/10.1038/s41576-019-0152-0

Business and Biodiversity Offsets Programme (BBOP). 2018. BBOP Principles on Biodiversity Offsets. https://www.forest-trends.org/wp-content/uploads/2018/10/The-BBOP-Principles_20181023.pdf

Business and Biodiversity Offsets Programme (BBOP). 2018. Government planning for biodiversity net gain: A roadmap. https://www.forest-trends.org/wp-content/uploads/2018/11/BBOP-Business-Roadmap-1-11-18.pdf

Cross-Sector Biodiversity Initiative. 2017. CSBI timeline tool: A tool for aligning timelines for project execution, biodiversity management and financing. http://www.csbi.org.uk/wp-content/uploads/2017/10/CSBI-timeline-tool.pdf

European Bank for Reconstruction and Development (EBRD). 2014. EBRD Performance Requirement 6: Biodiversity conservation and sustainable management of living natural resources. https://www.ebrd.com/downloads/about/sustainability/ESP_PR06_Eng.pdf

Forest Trends. n.d. Business and Biodiversity Offsets Programme. Resource website. https://www.forest-trends.org/bbop/

International Council of Mining and Metals (ICMM). 2006. Good Practice Guidance for Mining and Biodiversity. https://www.icmm.com/en-gb/guidance/environmental-stewardship/2006/mining-and-biodiversity

International Finance Corporation (IFC). 2012. Performance Standard 6: Biodiversity conservation and sustainable management of living natural resources. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-6

International Union for Conservation of Nature (IUCN). 2016. IUCN Policy on Biodiversity Offsets. https://portals.iucn.org/library/sites/library/files/resrecfiles/WCC_2016_RES_059_EN.pdf

Maxwell, S. L., Cazalis, V., Dudley, N., Hoffmann, M., Rodrigues, A. S. L., Stolton, S., Visconti, P., Woodley, S., Kingston, N., Lewis, E., Maron, M., Strassburg, B. B. N., Wenger, A., Jonas, H. D., Venter, O., & Watson, J. E. M. 2020. Area-based conservation in the twenty-first century. Nature, 586(7828), 217–227. https://doi.org/10.1038/s41586-020-2773-z

Mining Association of Canada (MAC). 2020. Towards Sustainable Mining (TSM), Biodiversity Conservation Management (Protocol and Framework). https://mining.ca/towards-sustainable-mining/protocols-frameworks/biodiversity-conservation-management/

Sayer, J., Margules, C., & McNeely, J. A. 2021. People and biodiversity in the 21st century. Ambio, Folke 1989. https://doi.org/10.1007/s13280-020-01476-9

Sonter, L. J., Ali, S. H., & Watson, J. E. M. 2018. Mining and biodiversity: Key issues and research needs in conservation science. Proceedings of the Royal Society B: Biological Sciences, 285(1892). https://doi.org/10.1098/rspb.2018.1926

Sonter, L. J., Dade, M. C., Watson, J. E. M., & Valenta, R. K. 2020. Renewable energy production will exacerbate mining threats to biodiversity. Nature Communications, 11(1), 6–11. https://doi.org/10.1038/s41467-020-17928-5

Southern African Development Community (SADC). 2015. Guidelines for mainstreaming biodiversity and ecosystem services in extractive industry. https://biopama.org/wp-content/uploads/2021/02/SADC-Extractive-Industry-and-Biodiversity-Guidelines-EN-1.pdf

Supple, M. A., & Shapiro, B. 2018. Conservation of biodiversity in the genomics era. Genome Biology, 19(1), 1–12. https://doi.org/10.1186/s13059-018-1520-3

The Biodiversity Consultancy (TBC). 2015. A cross-sector guide for implementing the mitigation hierarchy. http://www.csbi.org.uk/wp-content/uploads/2017/10/CSBI-Mitigation-Hierarchy-Guide.pdf

World Bank. 2013. Operations Manual. OP 4.04 Natural Habitats. https://ppfdocuments.azureedge.net/1567.pdf

World Bank. 2013. Operations Manual. OP 4.36 Forests. https://ppfdocuments.azureedge.net/1574.pdf

8.11. Climate Change

Canadian Securities Administrators. 2019. Staff Notice 51-358 Reporting of Climate Change-related Risks. https://www.osc.ca/sites/default/files/pdfs/irps/csa_20190801_51-358_reporting-of-climate-change-related-risks.pdf

Ens, E. and C. Johnston. 2020. Scenario Analysis and the Economic and Financial Risks from Climate Change. Bank of Canada Staff Discussion Paper No. 2020-3 (May 2020). https://www.bankofcanada.ca/wp-content/uploads/2020/05/sdp2020-3.pdf

Equator Principles. 2020. Guidance Note on Climate Change Risk Assessment. 13 pp. https://equator-principles.com/wp-content/uploads/2020/09/CCRA_Guidance_Note_Ext_Sept_2020.pdf

International Council of Mining and Metals (ICMM). 2019a. Adapting to a changing climate: Building resilience in the mining and metals industry. https://www.icmm.com/en-gb/guidance/environmental-stewardship/2019/adapting-to-a-changing-climate

Intergovernmental Panel on Climate Change (IPCC). n.d. Website source of analysis, policy, and guidance on climate change. https://www.ipcc.ch/

Mining Association of Canada (MAC). n.d. Towards Sustainable Mining (TSM): Climate Change. Website including links to the Climate Change Protocol, Energy and GHG Management Protocol, and other resources. https://mining.ca/towards-sustainable-mining/protocols-frameworks/climate-change/

Task Force on Climate-related Financial Disclosures (TCFD). n.d. Website source of guidance and standards. https://www.fsb-tcfd.org/

8.12. Closure

Asia-Pacific Economic Cooperation (APEC). 2018. Mine Closure Checklist for Governments. 104 pp. https://www.apec.org/publications/2018/03/mine-closure---checklist-for-governments

Australian Government. 2016. Mine Closure: Leading Practice Sustainable Development Program for the Mining Industry. 131 pp. https://www.industry.gov.au/sites/default/files/2019-05/lpsdp-mine-closure-handbook-english.pdf

International Council of Mining and Metals (ICMM). 2019. Integrated Mine Closure: Good Practice Guide (2nd edition). https://www.icmm.com/en-gb/guidance/environmental-stewardship/integrated-mine-closure-2019

Initiative for Responsible Mining Assurance (IRMA). 2018. IRMA Standard 1.0. Chapter 2.6 Planning and Financing Reclamation and Closure. https://responsiblemining.net/wp-content/uploads/2018/08/Chapter_2.6_ReclamationClosure.pdf

Intergovernmental Forum on Mining, Minerals, Metals, and Sustainable Development (IGF). n.d. Post-mining Transition website with mine closure case study publications. https://www.igfmining.org/mine-closure-and-post-mining-transition/

International Finance Corporation (IFC). 2007. Environmental, Health, and Safety Guidelines, Mining. https://www.ifc.org/en/insights-reports/2000/general-environmental-health-and-safety-guidelines

ISO. 2021. ISO 21795-1:2021. Mine closure and reclamation planning. https://www.iso.org/standard/80425.html

Mining Association of Canada. 2008. Mine Closure Framework. https://mining.ca/towards-sustainable-mining/protocols-frameworks/mine-closure-framework/

8.13. Emergency Preparedness and Response

Department of Mines, Industry Regulation and Safety. 2018. Emergency management for Western Australian mines – Code of practice. Government of Western Australia. http://www.dmp.wa.gov.au/Documents/Safety/MSH_COP_EmergencyManagement.pdf

European Union (EU). 2006. Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32006L0021

International Council on Mining and Metals (ICMM) & United Nations Environment Programme (UNEP). 2005. Good practice in emergency preparedness and response. https://www.icmm.com/en-gb/guidance/health-safety/2004/emergency-preparedness-and-response

International Finance Corporation. 2012. Performance Standard 4: Community health, safety and security. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-4

Mining Association of Canada. 2016. Crisis management and communications planning reference guide. https://mining.ca/resources/guides-manuals/crisis-management-and-communications-planning-reference-guide-2016/

Mining Association of Canada. 2018. Towards Sustainable Development: Crisis management and communications planning protocol. https://mining.ca/resources/guides-manuals/crisis-management-and-communications-planning-protocol/

Ministry of Energy, Mines and Petroleum Resources. 2017. Mine emergency response plan: Guidelines for the mining industry (v. 1.4). Government of British Columbia. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/mineral-exploration-mining/documents/health-and-safety/code-review/merp_guideline_2017_revision_final.pdf

United Nations Environment Programme (UNEP). 2001. APELL for mining: Guidance for the mining industry in raising awareness and preparedness for emergencies at local level (Technical Report No.41). Division of Technology, Industry and Economics. https://wedocs.unep.org/20.500.11822/8093

8.14. Stakeholder Engagement

Association for Mineral Exploration (AMEBC). 2015. Aboriginal Engagement Handbook: A Practical and Principled Approach for Mineral Exploration. https://www.amebc.ca/wp-content/uploads/2017/04/aboriginal-engagement-guidebook-revised-may-2015.pdf

Forest Stewardship Council (FSC) Canada. 2019. Free, Prior and Informed Consent Guidance. F000205. https://ca.fsc.org/ca-en/forest-management/free-prior-and-informed-consent

Food and Agricultural Organization of the United Nations (FAO). 2016. Free Prior and Informed Consent: An indigenous peoples' right and a good practice for local communities. Roam Italy. 52pp. https://www.fao.org/3/i6190e/i6190e.pdf

Freeman, R.E. 1984. Strategic Management: A Stakeholder Approach. Pitman, Boston

International Finance Corporation (IFC). 2007. Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets. https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_stakeholderengagement__wci__1319577185063

Mining Association of Canada (MAC). n.d. Towards Sustainable Mining. https://mining.ca/towards-sustainable-mining/

Mining, Minerals and Sustainable Development (MMSD). 2002. Seven Questions to Sustainability: How to assess the contribution of mining and minerals activities. https://www.iisd.org/system/files/publications/mmsd_sevenquestions_brochure.pdf

Organization for Economic Co-operation and Development (OECD). 2017. OECD Due Diligence Guidance for Meaningful Stakeholder Engagement in the Extractive Sector. https://www.oecd.org/publications/oecd-due-diligence-guidance-for-meaningful-stakeholder-engagement-in-the-extractive-sector-9789264252462-en.htm

Prospectors and Developers Association of Canada (PDAC). n.d. Principles and Guidance for Responsible Exploration: Principle 5 – Engage Host Communities and Other Affected and Interested Parties. https://www.pdac.ca/docs/default-source/priorities/responsible-exploration/e3-plus---principles/engage-host-communities-and-other-affected-and-interested-parties.pdf?sfvrsn=1567bf92_6

Prospectors and Developers Association of Canada (PDAC). n.d. Community Engagement Guide. https://www.pdac.ca/priorities/responsible-exploration/e3-plus/community-engagement-guide/introduction

World Bank. 2013. Operations Manual. OP 4.10. Indigenous Peoples. https://ppfdocuments.azureedge.net/1570.pdf

8.15. Worker and Community Health and Safety

BC Ministry of Energy, Mines and Low Carbon Innovation. 2021. BC Health, Safety and Reclamation Code for Mines. Victoria. BC. 364 pp.

International Labour Organization (ILO). 1948. Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87).

International Council of Mining and Metals (ICMM). 2015. A Practical Guide to Catchment-based Water Management for the Mining and Metals Industry. https://www.icmm.com/website/publications/pdfs/environmental-stewardship/2015/guidance_catchment-based-water-management.pdf

International Finance Corporation (IFC). 2012. Performance Standard 2: Labor and Working Conditions, Standards and Guidance Notes. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-2

International Finance Corporation (IFC). 2012. Performance Standard 4: Community Health, Safety, and Security, Standards and Guidance Notes. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-4

International Labour Organization Conventions and Recommendations. https://www.ilo.org/global/standards/introduction-to-international-labour-standards/conventions-and-recommendations/lang--en/index.htm

- Abolition of Forced Labour Convention, 1957 (No. 105)
- Discrimination (Employment and Occupation) Convention, 1958 (No. 111)
- Equal Remuneration Convention, 1951 (No. 100)
- Forced Labour Convention, 1930 (No. 29)
- Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87)
- Minimum Age Convention, 1973 (No. 138)
- Right to Organise and Collective Bargaining Convention, 1949 (No. 98)
- Worst Forms of Child Labour Convention, 1999 (No. 182)

Mining Association of Canada (MAC). 2015. TSM Water Stewardship Policy Framework. https://mining.ca/towards-sustainable-mining/protocols-frameworks/water-stewardship/

Mining Association of Canada (MAC). 2021. TSM Indigenous and Community Relationships Protocol. https://mining.ca/towards-sustainable-mining/protocols-frameworks/indigenous-and-community-relationships/

Voluntary Principles on Security and Human Rights. n.d. Voluntary Principles on Security and Human Rights. https://www.voluntaryprinciples.org/

8.16. Local Procurement

German Cooperation, GIZ, Engineers Without Borders, and Mining Shared Value. 2017. The Mining Local Procurement Reporting Mechanism (LPRM). https://miningsharedvalue.org/mininglprm/

International Finance Corporation (IFC). 2011. A guide to getting started in local procurement. https://ppp.worldbank.org/public-private-partnership/sites/ppp.worldbank.org/files/documents/A_Guide_to_Getting_Started_Local_Procurement_EN_2011.pdf

8.17. Land Access and Resettlement

European Bank for Reconstruction and Development (EBRD). 2017. Performance Requirement 5: Land Access, Involuntary Resettlement and Economic Displacement. https://www.ebrd.com/who-we-are/our-values/environmental-and-social-policy/implementation.html

European Bank for Reconstruction and Development (EBRD). n.d. Resettlement Guidance and Good Practice. https://www.ebrd.com/who-we-are/our-values/environmental-and-social-policy/implementation.html

International Council of Mining and Metals (ICMM). 2015. Land Acquisition and Resettlement: Lessons Learned. https://www.icmm.com/en-gb/guidance/social-performance/2015/land-acquisition-and-resettlement

International Finance Corporation (IFC). 2012. IFC Performance Standard 5: Land Acquisition and Involuntary Resettlement. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-

5#:~:text=PS5%20advises%20companies%20to%20avoid,throughout%20the%20process%20is%20essential.

International Finance Corporation (IFC). 2002. Handbook for Preparing a Resettlement Action Plan. IFC Environment and Social Development Department. 96 pp. https://www.ifc.org/en/types/insights-reports/2000/publications-handbook-rap--wci--1319577659424.

International Council on Mining and Metals (ICMM). 2015. Land Acquisition and Resettlement: Lessons Learned. https://www.icmm.com/website/publications/pdfs/social-performance/2015/guidance_land-acquisition-and-resettlement.pdf

Prospectors and Developers Association of Canada (PDAC). n.d. Community Engagement Guide. https://www.pdac.ca/programs-and-advocacy/responsible-exploration/e3-plus/community-engagement-guide/introduction

United Nations Development Programme (UNDP). 2020. Guidance Note. UNDP Social and Environmental Standards. Standard 5: Displacement and Resettlement. https://info.undp.org/sites/bpps/SES_Toolkit/SES%20Document%20Library/Uploaded%20October%202016/UNDP%20SES%20S5%20Displacement%20and%20Resettlement%20GN_Final_December%202020(2).pdf

8.18. Human Rights

Abrahams, D. (IBLF) and Y. Wyss (IFC). 2010. Guide to Human Rights Impact Assessment and Management (HRIAM). The International Business Leaders Forum (IBLF) and the International Finance Corporation (IFC), in association with the UN Global Compact. https://www.unglobalcompact.org/library/25

Equator Principles. 2020. Equator Principles 4. https://equator-principles.com/ep4/

International Council of Mining and Metals (ICMM). 2023. Human Rights Due Diligence Guidance. https://www.icmm.com/en-gb/guidance/social-performance/2023/hrdd-guidance

International Finance Corporation (IFC). 2012. IFC Performance Standards for Environmental and Social Sustainability. https://www.ifc.org/en/types/insights-reports/2012/publications-handbook-pps

International Council on Mining and Metals (ICMM). 2013. Indigenous Peoples and Mining: Position Statement. https://www.icmm.com/en-gb/our-principles/position-statements/indigenous-peoples

International Labor Organization (ILO). 1989. C169 - Indigenous and Tribal Peoples Convention, 1989 (No. 169). https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C169

International Labor Organization (ILO). 1998. Declaration on the Fundamental Principles and Rights at Work. Amended in 2022. https://www.ilo.org/declaration/lang--en/index.htm#:~:text=The%20ILO%20Declaration%20on%20Fundamental,our%20social%20and%20economic%20lives.

ISO. 2010. ISO 26000:2010 Guidance on Social Responsibility. https://www.iso.org/standard/42546.html

Mining Association of Canada (MAC). 2015. Site-Level Grievance and Community Response Mechanisms Guide. https://mining.ca/resources/guides-manuals/site-level-grievance-and-community-response-mechanisms-guide/

OECD. 2018. Guidelines for Multinational Enterprises on Responsible Business Conduct. http://mneguidelines.oecd.org/mneguidelines/

United Nations (UN). 2007. The United Nations Declaration on the Rights of Indigenous Peoples. https://social.desa.un.org/issues/indigenous-peoples/united-nations-declaration-on-the-rights-of-indigenous-peoples

United Nations (UN). 2011. Guiding Principles for Business and Human Rights. https://www.ohchr.org/documents/publications/guidingprinciplesbusinesshr_en.pdf

United Nations (UN). International Bill of Human Rights. https://www.ohchr.org/en/what-are-human-rights/international-bill-human-rights

Voluntary Principles on Security and Human Rights. n.d. Voluntary Principles on Security and Human Rights. https://www.voluntaryprinciples.org/

8.19. Cultural Heritage

International Finance Corporation (IFC). 2012. Performance Standard 8: Cultural Heritage, Standards and Guidance Notes. https://www.ifc.org/en/insights-reports/2012/ifc-performance-standard-8

United Nations Educational, Scientific and Cultural Organization (UNESCO). 1972. The World Heritage Convention. https://whc.unesco.org/en/convention/

9. Glossary

These definitions are intended to clarify how the terms below have been applied in these ESG Guidelines for Mineral Resource and Mineral Reserve Estimation, recognizing that there are many different definitions and interpretations of these terms.

Area of Influence - the geographic space and those who inhabit that geographic space that will be affected directly or indirectly by activities at (or associated with) an exploration project or mining operation.

Biodiversity (also **biological diversity**) - the Convention on Biological Diversity defines biodiversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems."

Corporate governance - involves a set of relationships between an organization's management, its board, its shareholders, and other stakeholders. Governance provides the structure and processes through which the organization sets its objectives, monitors its progress against performance goals, and evaluates its results. — G20/OECD Principles of Corporate Governance.

Consultation - a conference or meeting at which opinions are exchanged with the aim to work together to reach an agreement on a change or find a solution to an issue. In some jurisdictions, consultation may refer to legal requirements for dialogue pertaining to specific impacts from a project on affected parties.

Engagement - a process of contact, dialogue and interaction that ensures all stakeholders and rights holders are informed and participating in decisions that affect their future, in a way that is satisfactory to them (MMSD 2002).

Environment - the components of the Earth, and includes (a) land, water and air, including all layers of the atmosphere; (b) all organic and inorganic matter and living organisms; and (c) the interacting natural systems.

Environmental - concerned with the ecological effects of altering the environment, such as environmental degradation or pollution, etc.

ESG (Environmental, Social, and Governance) - refers to the three key factors when measuring the sustainability and ethical impact of performance of a company.

ESIA – "ESIA" is the acronym for environmental and social impact assessments required in many jurisdictions. The ESIA process is an overall review of the interaction between proposed activities and the environmental and social setting to determine whether the overall residual impacts and benefits of the project (after all proposed mitigations are applied) are acceptable to all affected stakeholders.

FPIC (free, prior, informed consent) - the principle that Indigenous peoples, based on defined rights and claims, have the right to withhold or withdraw their consent to proposed projects that may affect them. Also refer to the United Nations Declaration on the Rights of Indigenous Peoples.

Good practices – practices that have wide industry use, that have been proven to work well and produce good results and are therefore recommended as a model.

Governance – in the case of this document, the term is related to governance of environmental and social aspects. Governance provides the structure and processes through which the organization sets its objectives, monitors its progress against performance goals, and evaluates its results. (G20/OECD Principles of Corporate Governance).

As defined by the World Gold Council's *Responsible Gold Mining Principles*, governance includes the following:

- Ethical conduct, to conduct business with integrity including absolute opposition to corruption.
- Understanding impacts through engagement with stakeholders and implementing management systems to ensure impacts are managed, opportunities are realized, and redress provided where needed.
- Supply chain controls that require supplies to conduct their businesses ethically and responsibly as a condition of doing business.

Governmental - relates to a government, which is a political entity that runs a city, state or country potentially including Indigenous group requirements**.**

Human rights - the basic rights and freedoms that belong to every person in the world, from birth until death. They apply regardless of where you are from, what you believe or how you choose to live your life.

Indigenous Peoples - generically refers to a distinct social and cultural group possessing the following characteristics in varying degrees:

- Self-identification as members of a distinct Indigenous cultural group and recognition of this identity by others.
- Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories.
- Customary cultural, economic, social or political institutions that are separate from those of the mainstream society or culture.
- A distinct language or dialect, often different from the official language or languages of the country or region in which they reside. (Performance Standard 7, paragraph 5 (IFC)).

Material/Materiality - information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions. Materiality depends on the nature or magnitude of information, or both. Assessing whether information is material considers the entity's circumstances.

Mineral deposit - naturally occurring accumulations or concentrations of metals or minerals of sufficient size and concentration that might, under favourable circumstances, have economic value.

Mineral reserve - is the economically mineable part of a Measured and/or Indicated Mineral Resource.

Mineral resource - the term "mineral resource" covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling.

Modifying factors - modifying factors are applied to the estimation of mineral resources since resources also should have reasonable prospects of eventual economic extraction and are also important considerations when completing technical studies. The following are some of these factors:

a) mining
b) processing
c) metallurgical

d) **environmental**
e) location and infrastructure
f) market factors
g) legal
h) economic
i) **social**
j) **governmental** (regulatory/permitting requirements set out by local/regional/national governments, potentially including Indigenous group requirements)**.**

Ore - economic concentrations of metals or other mineral commodities.

Regulatory – regulatory and permitting requirements set out by local/regional/national governments, including Indigenous group requirements.

Rights holder - All individuals have human rights. However, in the context of a mineral exploration or mining project, it is important to recognise that there may be situations where individual human rights are placed at risk. These include the loss of access to resources for food production or livelihood, water, health and employment. There are also those with collective rights, such as Indigenous and tribal people, who may be affected by a mineral exploration or mining project or can affect its development. Individuals and groups in these situations are rights holders.

Risk - environmental and social risk refers to the risk of adversely affecting people or the environment through inadequate or failed internal processes, people and systems, or through external events. Environmental and social risk is a combination of the probability of certain hazards and the severity of impacts resulting from such an occurrence.

Social Impact - changes in baseline social conditions that are caused by a specific project-related activity.

Social licence – "social licence" refers to an informal, or perceived, level of approval for a company's operation or activities held by the community (or multiple communities), rights holders and stakeholders. This involves stakeholder and Indigenous engagement, which is considered a critical part of an ESIA process, as well as a critical part of gaining and maintaining a social licence to operate.

Stakeholder - individuals, groups or organizations that are actually or potentially affected by a project and those who can influence the project (Freeman 1984). Examples include government agencies, individuals living in the Area of Influence, non-governmental organizations, service providers, the company and employees. This includes those representing others and groups and individuals who may be, or are perceived to be, marginalized, or affected by a project. It is noted that Indigenous peoples do not consider themselves stakeholders but feel they are rights holders.

Sustainability - the ability to protect the environment, contribute to the social and economic well-being of the people of Canada and preserve their health in a manner that benefits present and future generations.

Transparency - the corporate governance principle of publishing and disclosing information relevant to stakeholders' interests and to shareholders on all relevant matters.

United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) – is about the respect and recognition of the human rights of Indigenous peoples. On June 21st, 2021, the United Nations Declaration on the Rights of Indigenous Peoples Act received Royal Assent in Canada and came into force.

Appendix A – Topic Relationship to Mineral Resources and Mineral Reserves

ESG Guidelines Section Number	Table of Contents - Topic	Potential Effects on MRMR (i.e., how MRMR is modified and/or the ability to develop reserves)				
		Cost	Schedule	Permits	Social Licence to Operate	Ability to Secure Financing*
	Introduction					
	Background					
	Key Principles for ESG					
1	ESGP 1 – Environmental & Social Governance: Establish effective governance and management for ESG matters	x		x	x	x
2	ESGP 2 - Impact and Risk Management: Assess and manage impacts and risks	x	x	x	x	x
2.1	Environmental and Social Impact Assessment	x	x	x		x
2.2	Environmental and Social Management Systems	x		x		x
3	ESGP 3 - Permits: Acquire and maintain compliance	x	x	x	x	x
3.1	Regulatory Setting	x	x	x		
3.2	Permit Acquisitions	x	x	x		x
3.3	Permit Compliance Management	x	x	x	x	x
4	ESGP4 - Environmental Planning: Minimize environmental impacts and long-term liabilities	x	x	x	x	x
4.1	Pollution Prevention	x	x	x		
4.1.1	Management of Tailings Facility	x	x	x	x	x
4.1.2	Mine Waste Management	x	x	x		x
4.1.3	Water Management	x	x	x	x	x
4.2	Resource Efficiency	x		x	x	x
4.3	Biodiversity	x		x		x
4.4	Climate Change and Greenhouse Gases (GHG)	x		x		x
4.4.1	Energy Use and GHG Emissions Management	x		x		x
4.4.2	Climate Forecasting	x				x
4.4.3	Climate Risk Assessment	x				x

ESG Guidelines Section Number	Table of Contents - Topic	Potential Effects on MRMR (i.e., how MRMR is modified and/or the ability to develop reserves)				
		Cost	Schedule	Permits	Social Licence to Operate	Ability to Secure Financing*
4.5	Mine Closure Planning	x	x	x		x
4.5.1	Mine Closure Plan Development and Maintenance	x		x		x
4.5.2	Risks and Opportunities	x				x
4.5.3	Financial Aspects of Closure	x	x	x		x
4.6	Emergency Preparedness and Response	x		x	x	x
5	ESGP 5 – Social Planning: Protect people and benefit communities	x	x	x	x	x
5.1	Engagement	x	x	x	x	x
5.1.1	Relevant International Standards and Guidance			x		x
5.1.2	Research and Stakeholder Analysis		x	x		x
5.1.3	Engagement Planning and Monitoring		x	x		x
5.1.4	Grievance Mechanism				x	x
5.2	Worker and Community Health and Safety			x	x	x
5.2.1	Worker Health and Safety			x		x
5.2.2	Community Health and Safety				x	x
5.3	Economic Development	x	x	x	x	x
5.3.1	Employment	x	x		x	x
5.3.2	Local Procurement	x	x		x	x
5.3.3	Indigenous Community Considerations	x	x	x	x	x
5.4	Land Access, Acquisition, Displacement, and Resettlement	x	x		x	x
5.4.1	Land Access	x	x	x	x	x
5.4.2	Land Acquisition	x	x	x	x	x
5.4.3	Displacement and Resettlement	x	x		x	x
5.4.4	Elements of Resettlement Good Practice				x	x
5.5	Human Rights: Protect and respect human rights	x			x	
5.5.1	Indigenous Peoples and Vulnerable Groups				x	x
5.5.2	Security Forces	x			x	x
5.6	Cultural Heritage: Respect and protect cultural heritage	x		x	x	x
6	Conclusion					

** Ability to Secure Financing refers to factors that investors consider to manage their environmental and social risks.*

Appendix B – Closure Frameworks Comparison

The table in this appendix provides a summary of closure frameworks for leading practice around the world. Colour coding and acronyms are provided in the following legend.

Legend

APEC: Asia-Pacific Economic Cooperation
EPA Aus: Australian Environmental Protection Agency
EPs: Equator Principles
ICMM: International Council on Mining and Metals, Integrated Mine Closure: Good Practice Guide
IFC: International Finance Corporation
IGF-IISD: Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development - International Institute for Sustainable Development
IRMA: Initiative for Responsible Mining Assurance
MAC TSM: Mining Association of Canada, Towards Sustainable Mining, Mine Closure Framework

Table Icons:
Green = Included in Framework; Input Value = 3
Yellow = Partially included or implied in Framework; Input Value = 2
Red = Not included in Framework; Input Value = 1
User guidance: Each cell is formatted conditionally to the produce coloured icons when the corresponding and appropriate value is entered. To expand on evaluation in future, simply add a column and drag cell formatting across as needed.

Global Mine Closure Frameworks - Criteria Guide

Criteria	Mine Closure Framework/Guidance						
	MAC TSM	ICMM	IRMA	APEC	EPA Aus	IGF-IISD	EPs + IFC
CLOSURE PLANNING GOVERNANCE							
1. Develop/maintain closure plans, including post closure activities for new and existing projects, initiated during the design phase of new projects and integrated throughout the lifecycle, updated regularly and at a level of detail appropriate to stage of development.	3	3	1	3	3	3	1
2. Early definition of closure vision, principles, objectives, and measures of success supported by early engagement with stakeholders and development of a knowledge base for data collection, considering potential post-closure land use and identified risks.	3	3	1	3	3	3	1
3. Timing horizons are defined and schedules of closure planning elements are accounted for and integrated, including schedules for regular plan updates, review, approvals and closure activities/implementation.	3	3	1	3	2	2	2
4. Management systems for closure planning documentation are comprehensive, including for maintenance of registries for all legal or other obligations/commitments relevant to the operation's closure, management of relevant data and information, stakeholder feedback and closure activities or trials recordkeeping.	2	2	1	3	3	3	2
SITE CHARACTERIZATION, RISK PROCESSES							
5. Closure planning is technically sound, defines baseline environmental conditions and characterizes the environmental setting, including climate and cultural/socioeconomic values and the relevant constraints, carried out by specialists.	1	3	1	3	3	3	1
6. Formal, proactive identification and assessment of risks and opportunities throughout the mining life cycle and iterations of closure plans, managed in accordance with the mitigation hierarchy.	2	3	3	3	3	3	3
7. Identification of current surrounding land uses as well as the potential post-closure land uses, informed by community engagement and in consideration of their needs and regional development, considering any legacies which may restrict land use.	3	3	1	3	3	3	2
STAKEHOLDER ENGAGEMENT AND PARTICIPATION							
8. Stakeholders connected to closure planning are identified and a strategy for engagement is in place.	2	3	2	3	3	2	3
9. Internal and external stakeholders are involved and engaged with throughout the entire closure planning process, including design, development of objectives and success criteria, plan execution and post-closure, to the degree practical.	3	3	2	3	3	3	3
10. When relevant, additional level of consideration for Indigenous Peoples and their rights, dignity, aspirations, culture, and livelihood and the impact of closure on their community or way of life.	2	3	3	2	2	2	3
ENVIRONMENTAL & SOCIAL CLOSURE							
11. Closure planning addresses key environmental issues and impacts to monitor and manage, striving to achieve adequate site chemical/physical stability requirements related primarily to waste properties and facilities, surface water and groundwater quality, as well as landform interactions such as ARD generation.	3	3	3	3	3	3	3
12. Impacts of climate change on closure planning and activities are considered, a climate risk assessment carried out to evaluate threats to any closure strategy elements.	1	3	1	3	2	3	3
13. Closure planning considers opportunities as well as risks, such as habitat creation and biodiversity improvements.	3	3	3	3	3	3	3
14. Closure planning with stakeholder input identifies and considers the protection of culturally valuable heritage features and the value of regional ecosystem services to communities.	3	3	3	3	2	2	3
15. Closure planning is conducted with communities to develop the plan, strategies to mitigate the socio-economic impacts of mine closure, and to support their planning for a smooth social transition, aligned with their needs, aspirations and regional strategies for long-term economic development.	3	3	3	3	3	3	2
CLOSURE PLANNING EXECUTION							
16. Operators commit to continuous improvement in their closure plans, incorporating risk-based consideration of new technologies, closure techniques and the current state of research and innovation to improve closure and aftercare activities.	3	3	2	2	3	3	1
17. Implementation of various closure activities to facilitate closure, both during the mine life as progressive closure to test and demonstrate the effectiveness, validate success criteria and build trust with communities and regulators, and as part of final closure with respect to rehabilitation, decommissioning, and post-closure requirements.	3	3	1	3	3	3	2
18. Closure planning considers temporary or sudden closure scenarios for operations, including funding mechanisms, maintenance and surveillance programs, as well as identify any data gaps that affect the implementation of closure activities.	3	3	1	3	3	3	1
19. Holistic monitoring and maintenance programs, consistent with closure objectives and based on assessment of human health and ecological risks, are implemented during progressive reclamation, closure and/or post-closure to provide comprehensive information on reclamation progress and success.	3	3	2	3	3	3	2
FINANCIAL CLOSURE							
20. Robust understanding of closure costs for planning, comparing alternatives, understanding financial liabilities and establishment of financial assurance mechanisms in accordance with applicable laws and obligations, including reporting, and supported by expert review.	3	3	3	3	3	3	1
21. Relinquishment of closed sites to a third party are considered at the earliest stage of closure planning, including identification and evaluation of potential pathways, if applicable, and incorporation of regulator and stakeholder feedback.	1	3	1	3	3	2	1