Initiative for Responsible Mining Assurance

EXCERPT FROM THE

IRMA Standard

for

Responsible Exploration, Extraction, and Processing of Minerals

2nd DRAFT

for public consultation

CHAPTER 2.7 – **Concurrent Reclamation, Closure, and Post-Closure**

IRMA Standard v2.0 DRAFT 2

July 2025

English Version

Disclaimer and Context on this Draft

The 2nd DRAFT Version of the IRMA Standard for Responsible Exploration, Extraction, and Processing of Minerals V2.0 (hereafter referred to as the "2nd DRAFT") is being released for public consultation, inviting the world to join once again in a conversation around expectations that drive value for greater environmental and social responsibility in mining and mineral processing.

The 2nd DRAFT does not represent content that has yet been formally endorsed by IRMA's equally-governed multi-stakeholder Board of Directors. IRMA's Board leaders seek the wisdom and guidance of all readers to inform this through an inclusive revision process one more time, to improve the Standard.

This draft document builds on the 1st DRAFT Version published in October 2023, and invites a global conversation to improve and update the 2018 IRMA Standard for Responsible Mining V1.0. This 2nd DRAFT is intended to provide as final of a look-and-feel as possible, although input from this consultation will result in final edits, and consolidation to reduce overall number of requirements (more on this on page 6), for a version that will be presented to IRMA's equally-governed multi-stakeholder Board of Directors for adoption and implementation.

This 2nd DRAFT has been prepared and updated by the IRMA Secretariat based on:

- learnings from the implementation of the current IRMA Standard (V1.0)
- experience from the first mines independently audited (as of July 2025, 24 sites have completed audits or are in the process of being audited)
- evolving expectations for best practices in mining to reduce harm
- comments and recommendations received from stakeholders and Indigenous rights-holders
- the input of subject-specific Expert Working Groups convened by IRMA between 2022 and 2024
- all comments and contributions received during the public-comment period of the 1st DRAFT version (October 2023-March 2024)

Please note that Expert Working Groups were created to catalyze suggestions for solutions on issues we knew most needed attention in this update process. They were not tasked to come to consensus nor make formal recommendations. Their expertise has made this consultation document wiser and more focused, but work still lies ahead to resolve challenging issues. We encourage all readers to share perspectives to improve how the IRMA system can serve as a tool to promote greater environmental and social responsibility, and create value for improved practices, where exploration, extraction, and processing of minerals happens.

IRMA is dedicated to a participatory process including public consultation with a wide range of affected people globally and seeks feedback, comments, questions, and recommendations for improvement of this Standard. IRMA believes that diverse participation and input is a crucial and determining factor in the effectiveness of a Standard that is used to improve environmental and social performance in a sector. To this end, every submission received will be reviewed and considered.

This current 2nd DRAFT is based on content already in practice in the IRMA Standard for Responsible Mining V1.0 (2018) for mines in production, and its accompanying normative Guidance document and Supplementary Guidance, combined with the content drafted in the IRMA Standard for Responsible Mineral Development and Exploration ('IRMA-Ready' Standard – Draft v1.0 December 2021) and in the IRMA Standard for Responsible Minerals Processing (Draft v1.0 June 2021), and offers an updated version of the 1st DRAFT Version of the IRMA Standard V2.0 that received over 2,500 unique points of comments between 2023 and 2024.

Please note: The IRMA Standard V2.0 is new in its approach in that it now covers more phases of the mining and mineral supply chain, from exploration and development, through mining, closure, and mineral processing. IRMA also, separately, oversees a Chain of Custody Standard for tracking materials through the supply chain from mine-to-market end use products.

Disclaimer on Language and Corrections

For this public consultation, only an English version is available. A Glossary of Terms used in this Standard is provided at the end of the full version of the document (see below). IRMA reserves the right to publish corrigenda on its web page, and readers of this document should consult the corresponding web page for corrections or clarifications.

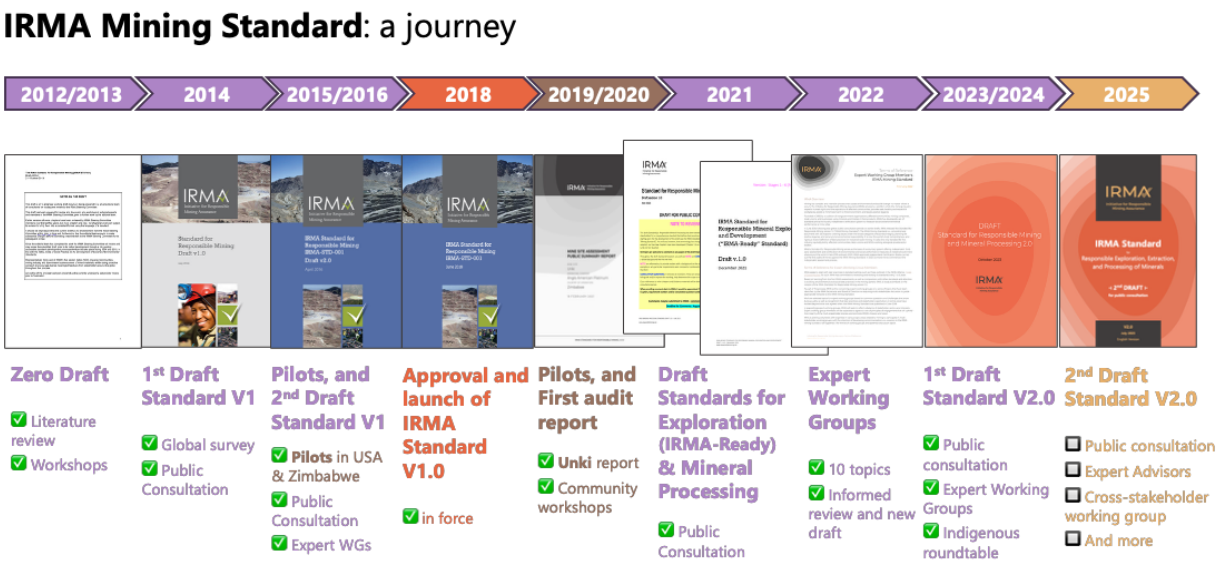
This document provides only one chapter excerpt from the IRMA Standard v2.0 DRAFT 2.

The full version contains 27 Chapters, click here to view it.

Objectives of this 2nd public consultation

Following the release of a 1st DRAFT of the IRMA Standard V2.0 in October 2023 for a 90-day public consultation, the IRMA Secretariat received more than 2,500 points of comments from 82 organizations, then organized additional engagement with stakeholders and Indigenous rights-holders, and solicited complementary guidance from multiple topic-specific Expert Working Groups.

We anticipated release of this 2nd DRAFT for a second round of public consultation as early as Q3 2024, then subsequently announced that more time was needed to support engagement of diverse stakeholders; the revised release date was July 2025. We provided more detailed explanation for the extended process here and here.



The release of this 2nd DRAFT marks a significant milestone on the road to the revision of the IRMA Standard: this public consultation will be the last of this revision cycle on V2.0.

Informed by the outcomes of this public consultation, along with guidance from Expert Advisors and IRMA Working Groups (see more below), and additional engagement with Indigenous rights-holders and stakeholders as requested, the IRMA Secretariat will prepare a final version. This final version will be discussed by the IRMA Board and refined to reach consensus for adoption by all six governing houses of IRMA: Affected Communities including Indigenous Rightsholders; Environmental and Social NGOs; Organized Labor; Finance and Investment Professionals; Mining Companies; Purchasers of Mined Materials.

In IRMA's strategic decision-making, Board members work to achieve consensus. IRMA believes a majority vote is not a model of equal governance. Instead, any motion that results in both of the two representatives from the same governing house voting "no" must go back to the full group for further discussion. In other words, a proposed course of action cannot proceed if both representatives from one of our six governing houses are opposed. Board members will keep talking until a resolution that works for all groups is found. It is a model that has worked for IRMA for nearly two decades and is fundamental to IRMA's credibility, accountability and service to all six houses of governance.

What is IRMA seeking guidance on?

Comments, feedback, and suggestions are welcome on any aspect of this 2nd DRAFT version (including intent and text of the requirements, endnotes, annexes, format and structure, design, readability, etc.).

IRMA is particularly interested in hearing the views of rights-holders and stakeholders on **the provisions in the Standard that are substantially new compared to the IRMA Standard for Responsible Mining V1.0.** These provisions (requirements or at a sub-requirement level) are highlighted in yellow throughout this Draft, to ensure they are easily identifiable.

We ask readers to assist us in weighing these potential new provisions, and also hold awareness that, prior to adoption of the final version, many of these will be consolidated and reduced in overall number.

Although these new requirements have each been drafted in response to lessons learned, the current state of best practices, emerging expectations, and/or in response to requests and suggestions made during the previous public consultation, collectively they represent substantive increased expectations for both implementing entities and audit firms. The IRMA Board of Directors seeks to ensure that the IRMA Standard, while recognized the world's most rigorous and comprehensive mining standard, continue to welcome and support uptake of newcomer companies engaging from the mineral supply chain around the world.

Thus, in this consultation, we seek guidance from all on **the new provisions that seem most urgent** to be integrated in the final version of the Standard V2.0, so that the revised Standard's expectations are paced at a realistic level to support engagement of mineral operations of a range of sizes, materials and global contexts.

It is important to note that all new requirements and sub-requirements, including those not retained in the final V2.0, will serve as the basis for the ongoing review process once the V2.0 is approved and released by our Board, and will provide fodder for future revisions, when it is decided that a V2.1 or V3.0 is needed.

Chapter 2.7
Concurrent Reclamation, Closure, and Post-Closure

SECOND DRAFT (JULY 2025): SUMMARY OF CHANGES

- Emphasized the need for concurrent reclamation and explicitly included "post-closure" throughout language of Sections and Requirements.
- Updated some Section names for clarity and consistency throughout the Standard.
- Several requirements restructured to increase clarity and auditability.
- The critical requirement for a reclamation and closure plan developed prior to the commencement of mine construction activities has been combined with the requirement (former 2.6.2.1 in 2018) that outlined the content of such plan, to avoid an ENTITY "fully meeting" this critical requirement with a plan that does not meet some or all of the content-related requirements. The former 2.6.2.1 in 2018 has been largely expanded thanks to the IRMA Standard Guidance Document, and all the substantial guidance is now integrated into a series of more-detailed requirements, which does not change the workload (and actually likely reduces it as it is now clearer to audit and score).
- Clarified that implementation is assessed through the monitoring and evaluation of implementation and effectiveness.
- Clarified pathway and requirements regarding financial assurance arrangements for Entities operating in jurisdictions where the country of operation does not offer any State-managed instrument for reclamation, closure and post-closure, in the form of cash deposit or trust fund (or equivalent), that is hosted and overseen by the State (2.7.3.1*).
- Moved clauses related to estimated cost to a new dedicated Section (now 2.7.2).
- Moved clauses related to stakeholder engagement to a new dedicated Section (now 2.7.4).
- Moved clauses related to information-sharing and public reporting to a new dedicated Section (now 2.7.7).
- Changed the approach of the long-term post-closure cost calculations requirement: from using long-term NPV calculations to a fixed 500-year time period. (this requirement had never been understood and audited well; difficulties of using NPV approaches are acknowledged by members of the Expert Working Group, and external literature). (2.7.3.3)
- Updated requirement to strengthen joint monitoring and evaluation processes, this is now harmonized throughout the Standard.
- Updated requirements to close the Plan-Do-Check-Act loop to deliver continuous improvement (through regular updates and revised processes and criteria, informed by monitoring, evaluation, and review), this is now harmonized throughout the Standard.

RESPONSE TO CONSULTATION QUESTIONS OUTLINED IN FIRST DRAFT

Question #	Question	Feedback and Proposed Decision
2.6-01	**(2.6.1.2)** **Question:** Do you agree with the addition of this requirement? Are there other activities you would suggest be included in the list of concurrent reclamation activities that can be commenced/undertaken during the operations phase?	**Feedback received**: 5 responses received (3 mining, 1 NGO, 1 finance). All respondents support this requirement for activities to be implemented concurrently to operations, throughout the life of the project/operation. Several of them points out the context specificities which may impede the concurrent reclamation. **Proposed Decision**: Retain the requirement, now made more consistent (see 2.7.1.2), and keep the option for an ENTITY to provide a rationale "when some activities cannot practically be implemented in such a concurrent manner."
2.6-02	**(2.6.1.7)** **Question:** Do you agree that stakeholders should be provided with the opportunity to provide input on reclamation, and reclamation and closure plans, throughout the operation's life cycle? If so, does it make sense to tie this opportunity to when the plans are updated?	**Feedback received**: 8 responses received (4 mining, 4 NGO). All respondents but one support this proposition. One respondent (mining) agrees that stakeholders should be informed, but not given a space for comments. One respondent (mining) mentions that stakeholder engagement on reclamation and closure could be integrated into the overall stakeholder engagement plan. One respondent (NGO) mentions the need for all version of plans and estimated costs to be made publicly accessible. One respondent (mining) flags that minor updates are made on a regular basis, and that stakeholder input should be sought only when significant changes are made. **Proposed Decision**: Retain the requirement to offer space to communities and relevant stakeholders to provide input, not only on the initial versions but whenever significant updates are made. See Section 2.7.4.
2.6-03	**(2.6.3.1)** **Question:** Should IRMA leave the requirement 2.6.4.3 from the 2018 Standard unchanged (i.e., "Self-bonding or corporate guarantees shall not be used")? In that case, if self-bonding is used, the most the ENTITY can score on this requirement would be "partially meets" (and that would only happen if the site fully meets sub-requirement b). Or are there other ways to sufficiently highlight the financial risk of not having government-supported financial assurance in place?	**Feedback received**: 4 responses received (3 mining, 1 NGO). The NGO respondent supports leaving the requirement from the 2018 Standard unchanged. Two mining respondents support the approach of a partial score cap. One mining respondent points outs the lack of state-hosted and state-overseen financial assurance instruments in some countries such as Zimbabwe and Brazil (although IRMA understands that Brazil has been setting up a new mining fund for reclamation and closure, in response to the recent tailings dams catastrophes); making this hard if not impossible to achieve in such countries.

		Proposed Decision: Experience from the first years of independent audits against the IRMA Standard have identified the issue where there is no strong state-hosted and state-overseen financial assurance instruments (i.e. in the form of cash deposits or trust funds) in place for reclamation, closure, and post-closure. IRMA proposes to clarify this situation by separating the two situations, and providing pathways for each scenario (see 2.7.4.1). In practice, this means that when such instrument is available in a country of operation, the ENTITY must adopt and implement it; and when such instrument is not available, the ENTITY must still provide a form of financial assurance, which in this case may be based on a "weaker" mechanism like self-bonding or corporate guarantee. In this case, IRMA adds a sub-requirement to ensure the ENTITY "makes publicly accessible detailed information on the likelihood that funds would be available to the competent authority to cover the cost of reclamation, closure and/or post-closure: 1) at the end of the operation's life; 2) if operations are suspended or unexpectedly ceased; and 3) if the ENTITY were to go bankrupt prior to the planned closure date." Responses received to this question, as well as to 2.6-04, 2.6-05, and 2.6-06 are informing this decision.
2.6-04	**(2.6.3.1)** **Question:** Should IRMA add that that self-bonds or corporate guarantees are not used "unless there is no other option available," and create some requirements that evaluate the credibility of any self-bond or corporate guarantee, so that stakeholders are provided with some information on the likelihood that funds would be available to cover the cost of reclamation and closure either at the end of the operation's life or if the ENTITY were to go bankrupt prior to the planned closure date. There are existing approaches such as 'balance sheet tests,' which require periodic verification of compliance with financial health criteria.	**Feedback received**: 6 responses received (3 mining, 3 NGO). Responses are split on this question. 2 NGO and 1 mining respondents are against this proposition. The other respondents (2 mining, 1 NGO) support it. **Proposed Decision**: See decision on 2.6-03 above.
2.6-05	**(2.6.3.1)** **Question:** Are there realistic options for "Independently guaranteed, reliable, and readily liquid" that do not specifically require a government body to oversee financial management and reclamation execution? What	**Feedback received**: 5 responses received (3 mining, 2 NGO). No practical example was provided. Several respondents mentions that companies could collaborate (including through industry associations) to develop an independent surety mechanism.

	are those options and how have then been implemented to date in practical terms? Are there examples of success? challenges?	**Proposed Decision**: See decision on 2.6-03 above.
2.6-06	**(2.6.3.2)** **Question:** Should IRMA consider provision of guarantees by corporates of sufficient creditworthiness that have secured an independently assessed "investment grade" credit rating by one of the recognized credit ratings agencies? What are the benefits and shortcomings of this approach?	**Feedback received**: 8 responses received (3 mining, 3 NGO, 1 consultancy, 1 audit firm). 2 NGO respondents are against this proposition, while the third NGO respondent questions the benefits and shortcomings of it. 2 mining respondents flag the risks and weaknesses associated with this approach, while the third one fully supports the proposition. The two other respondents (consultancy and audit firm) add contextual information regarding financial assurance instruments held by banks that may face higher credit risk than multinational parent owning company for example. **Proposed Decision**: See decision on 2.6-03 above.
2.6-07	**(2.6.4.1)** **Question:** Sub-requirements 2.6.4.1.d and 2.6.4.1.e allow for the withholding of confidential information (similar to 2.6.4.5 in the 2018 Mining Standard). We are wondering, however, if such a caveat is necessary. Do you believe that there is any information relating to financial assurance that should be considered confidential business information? If so, we would appreciate examples, so that we can consider adding them in our guidance.	**Feedback received**: 4 responses received (4 mining, 1 NGO). 1 NGO and 1 mining respondent are in favor of removing such caveat. The other respondents (3 mining) are in favor of keeping such caveat, in accordance with the approach taken throughout the Standard, i.e. supporting evidence must be provided to the auditors and a rationale made public. **Proposed Decision**: Retain the caveat, which is consistent with the approach taken throughout the Standard. The caveat is moved to the endnotes, with additional clarification.

BACKGROUND

Globally, the industry uses a variety of terms to describe the period following the cessation of mining or mineral processing operations, including "reclamation", "decommissioning", "rehabilitation", and "restoration". As the necessity for post-reclamation activities became evident, some jurisdictions have added the terms closure and post-closure to describe activities that take place separate from and/or following those other measures. At present there is no uniformly accepted terminology, however IRMA has defined and uses the terms reclamation, closure, and post-closure for the purposes of the requirements in this Standard (see full definitions in the Glossary). In short:

Reclamation refers to the process of achieving stability, hydrologic balance, protection of water resources and converting disturbed land to a productive post-mining land use (or establishing the potential for productive use). To the extent possible, reclamation measures and activities take place in a progressive manner, i.e. concurrent with mining operations. While this **concurrent reclamation** reduces a company's long-term liabilities, it also demonstrates to stakeholders that the company is proactive in its approach to mitigating environmental impacts, and in ensuring that closure and post-closure socio-environmental costs are not externalized to the country of operation and its taxpayers.

Closure refers to the post-reclamation activities that are required to close and secure a site to maintain compliance with environmental and health and safety regulations. It includes interim fluid and site management (sometimes referred to as 'care and maintenance') in addition to post-reclamation monitoring and maintenance during the period when the success of reclamation measures to achieve site-safety, stability, revegetation, and water quality as well as other reclamation objectives is measured and maintained. The closure period is finite and often no more than ten years in duration for an industrial mine. It can be shorter for mineral processing, and much shorter for an exploration site (in particular if exploration activities did not result in a mine being built and operated).

Post-closure refers to the period after the reclamation and closure activities in the plan have been completed, and long-term management activities (e.g., ongoing monitoring and maintenance, environmental monitoring, and, if necessary, water management and treatment) are occurring to ensure that a site remains stable and ecological restoration objectives continue to be achieved. This phase continues until final sign-off of site responsibility and relinquishment of post-closure financial assurance can be obtained from the regulator. Although the context and relevant issues may vary between how mining and mineral processing operations can apply post-closure best practices, they share a common rationale. In general, this will not be relevant for an exploration site (in particular if exploration activities did not result in a mine being built and operated).

A concurrent reclamation, closure, and post-closure plan provides an overall framework to guide all measures and decisions taken during the life cycle of a project or an operation. It is now widely recognized that the objectives and impacts of reclamation, closure, and post-closure must be considered from project inception. Such plan should define a vision of the end result of the process and set concrete objectives to implement that vision in a progressive manner, i.e. concurrent to the operations. At any point in time, the plan must include only techniques that rely on proven technologies. Future changes to the plan can be anticipated, but the use of entirely new technologies should not be relied upon until they have been proven.

When evaluating the adequacy of reclamation and closure plans the following should be considered:

1) The final post-reclamation land and other uses that are appropriate for the site;
2) How reclaimed lands should be stabilized, re-vegetated and ecosystem functionality restored;
3) The timing of reclamation processes;
4) Whether open pits should be backfilled with waste if it can be done in a manner that does not degrade the environment; and
5) How much money should be set aside to guarantee that reclamation, closure, and post-closure will be accomplished, how should that money be invested or valued in terms of discount rate, and what form of financial assurance should be required for this guarantee to be effective in practice and to ensure that communities, rights-holders, and ecosystems are effectively protected from closure and post-closure liabilities.

Mining-related activities may also lead to a loss in future soil and land use options as a result of the physical modification of landscapes and the conversion of land uses (e.g., lands being covered in buildings or waste facilities, land deformation from dewatering or underground mining, land alteration due to excavation of pits and changes to geomorphological features) and soil erosion.[1] Soil erosion can occur during construction of roads and facilities, stripping of overburden, excavation of rocks and minerals, disposal of wastes, and even during reclamation and closure. These activities may increase erosion rate up to several hundred times greater than from undisturbed areas.[2] There are, however, measures that can be taken to minimize soil erosion during operations, and to reclaim soils through mitigation and rehabilitation activities.

KEY REFERENCES

This chapter strongly builds on, or aligns with, the following international or multilateral frameworks, conventions, and guidance:

- IFC Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources, 2019 update

OBJECTIVES OF THIS CHAPTER

To protect long-term environmental and social values, throughout the life of operations, and ensure that the costs of site reclamation and closure are not borne by affected communities or the wider public.

SCOPE OF APPLICATION

This chapter is applicable to all exploration, mining and mineral processing projects and operations. For each requirement, the following colors are displayed in the margin to indicate the phases for which it is required:

E1	Exploration – Stage 1
E2	Exploration – Stage 2
E3	Exploration – Stage 3
D	Project Development and Permitting
M	Operating Mine
P	Operating Mineral Processor

CRITICAL REQUIREMENTS IN THIS CHAPTER

Throughout the Standard, critical requirements are identified using a red frame.
There are two (2) **critical requirements** applicable to all projects and operations in this Chapter.

OPTIONAL IRMA+ REQUIREMENTS IN THIS CHAPTER

Throughout the Standard, optional IRMA+ requirements are identified using a dotted blue frame. There is one (1) **optional IRMA+ requirement** in this Chapter.

In this second draft, IRMA introduces a new category of requirements: IRMA+. These requirements are aspirational and forward-looking. They reflect emerging expectations and recommendations from stakeholders, but currently go above and beyond existing and established best practice. IRMA+ requirements are entirely optional, and they will not affect the scores and achievement levels obtained by the entities choosing to be assessed against them.

ISSUES UNDER CLOSE WATCH (EYE ICON)

Financial Assurance:
There are few mining jurisdictions where the country of operation does not offer any State-managed instrument for reclamation, closure and post-closure, in the form of cash deposit or trust fund (or equivalent), that is hosted and overseen by the State. These situations have so far been handled through exceptions to the 2018 IRMA Standard for Responsible Mining V1.0 following a decision made by the IRMA Board Assurance Subcommittee and approved by IRMA's equally-governed multi-stakeholder Board.

Building on years of experience, growing evidence and guidance for best practice, these 'exceptional' circumstances are not fully addressed in the form of an auditable and assessable requirement, adapted and responsive to this challenging reality. This requirement (2.7.3.1*) is signaled with an 'eye icon' to ensure that IRMA closely monitor its relevance, and its implementation as the Standard V2.0 is applied. This is also intended to ensure IRMA will review associated challenges and needed decision more quickly if necessary. Note that this requirement is not 'optional' (unlike IRMA+).

IRMA continues to encourage all governments to establish strong and functioning financial assurance instruments for reclamation, closure and post-closure, in the form of cash deposit or trust fund (or equivalent), that are hosted and overseen by the State.

IRMA Requirements

2.7.1 Planning for Concurrent Reclamation, Closure, and Post-Closure

E3 D M P

2.7.1.1 **Critical Requirement**

Building on the Scoping and the Impact Assessment processes required in Chapter 2.1, a concurrent reclamation, closure, and post-closure plan (or equivalent) is developed by competent professionals, as follows:

a. This plan is appropriate to the level of project development[3];

b. It is developed at the earliest stage possible[4];

c. It includes a general statement of purpose;

d. It includes a description of the post-closure land and facility use objectives that, to the greatest extent possible, align with affected communities' preferred post-closure land and facility uses[5];

e. It includes site location and background site characterization information[6], as well as a description of the entire project/operation, including all associated facilities and individual facility features[7]; and

f. It outlines the role of affected rights-holders and stakeholders in the collaborative development, implementation, and monitoring and evaluation of this concurrent reclamation, closure, and post-closure plan; and

E3 D M P

2.7.1.2 This plan ensures that all reclamation and closure measures and activities required in 2.7.1.3, 2.7.1.4, and 2.7.1.5 are implemented in a **concurrent** manner. When some activities cannot practically be implemented in such a concurrent manner, a rationale is documented and integrated into the plan.

E3 D M P **2.7.1.3** To address **water management**, this plan includes:

a. Source and pathway characterization including modeling of geochemistry and hydrology to identify the potential release of contaminants during closure[8];

b. Source mitigation measures, clear objectives and effectiveness indicators, to prevent the degradation of water resources[9]; and

c. Stormwater runoff/run-on management measures, clear objectives, and effectiveness indicators[10].

E3 D M P **2.7.1.4** To address **earthwork, revegetation, and ecological restoration**, this plan includes:

a. Earthwork measures, clear objectives and effectiveness indicators to ensure a stable landscape, including soil erosion reduction measures, permanent stabilization measures and final topography planned for the reclaimed areas;

b. Revegetation measures, clear objectives and effectiveness indicators to ensure adequate revegetation, including: 1) quantitative revegetation standards based on analogous sites[11]; 2) topsoil salvage to the maximum extent practicable over the lifecycle of the project/operation, and topsoil storage in a manner that preserves its capability to support plant regeneration;

c. Ecological restoration measures, clear objectives and effectiveness indicators to protect and restore ecosystem processes[12], including: 1) plant material selection for the preferred post-closure land use, prioritizing native species as appropriate; 2) plans for control of noxious weeds and alien/non-native species; 3) a defined period, no longer than 10 years after the facility is no longer is used, when all planned revegetation tasks will be completed; and

E3 D M P **2.7.1.5** To address **polluted lands, facilities and hazardous waste** management this plan includes:

a. Polluted soil remediation measures, clear objectives and effectiveness indicators[13];

b. Hazardous material and hazardous waste disposal measures, clear objectives and effectiveness indicators[14]; and

c. Facility and equipment decommissioning measures[15] that prioritize the reuse and recycling of materials, with clear objectives and effectiveness indicators.

E3 D M P **2.7.1.6** To address **post-closure management of facilities (including TSFs) and terrestrial resources**, this plan includes:

a. Measures, clear objectives and effectiveness indicators to ensure post-closure monitoring and maintenance of facilities (including TSFs), including: 1) Inspection of surface stability and/or underground mine workings subsidence; 2) Monitoring and maintenance of waste and tailings facilities including effectiveness of revegetation, stormwater controls, and any cover and/or seepage capture systems;

b. For facilities where long-term risks have not been eliminated (including water treatment, TSFs and other mine waste facilities), mechanisms for contingency and response planning and implementation; and

c. Measures, clear objectives, and effectiveness indicators to ensure post-closure monitoring of terrestrial resources, if necessary[16].

E3 D M P

2.7.1.7 To address **post-closure water management**, and informed by Sections 4.3.3, 4.3.4, and 4.3.6[17], this plan includes:

a. Measures, clear objectives and effectiveness indicators to ensure post-closure operation, inspection and maintenance of water impact mitigation measures, including; 1) Source controls and/or capture and treatment needed to prevent degradation of ground water and surface water, including measures related to pit lake and/or underground mine water quality; 2) Post-closure water capture and treatment using treatment technology proven to be effective for similar water chemistry and under similar conditions and at a similar scale to the water that will need to be treated;

b. Post-closure monitoring of surface waters, groundwaters, and biota, including an appropriate number of sampling and monitoring sites to detect pollution from closed facilities and detect changes in water quality or ecosystem health at compliance and off-site locations; and

c. Post-closure water monitoring for at least 25 years[18] beyond the time when active mitigation ceases. Besides this minimum period, the plan includes any additional time necessary for predicted water quality to be in conformance with IRMA Water Quality Criteria in Annex 4.3-A for at least five consecutive years.[19]

E3 D

2.7.1.8 To ensure adequate and safety reclamation of **exploration** work, this plan[20] includes measures, clear objectives and effectiveness indicators to ensure that open surface features[21] are completely backfilled and regraded to original contours, or to contours that are compatible with the post-closure land use objectives (see 2.7.1.4).

M

2.7.1.9 To address **post-closure safety of open pits**, this plan includes measures, clear objectives and effectiveness indicators to ensure that open pits will be partially or completely backfilled:

a. If, and whenever, a pit lake is predicted to exceed the water quality criteria required in IRMA Chapter 4.2[22];

b. If the ENTITY and key stakeholders have agreed that backfilling would have socioeconomic and environmental benefits; and

c. If it is economically viable.

M

2.7.1.10 To address **post-closure safety of underground mines**, this plan includes measures, clear objectives, and effectiveness indicators to ensure that underground mines will be backfilled if the predicted risk of subsidence will be material and if alternative effective mitigation to address the impact of subsidence are not available/viable.

E3 D M P

2.7.1.11 This plan includes a detailed schedule for all measures and activities indicated in the plan, including concurrent reclamation and closure activities, as follows:

a. The schedule includes when the various reclamation and closure activities will begin, occur, and end, for each facility and for the site overall;

b. It includes time critical items and milestones for each facility and for the site overall; and

c. It includes any anticipated periods of temporary closure during which the interim fluid and site management plan (see 2.7.1.12) will be implemented;

d. It includes provisions for notifying regulators of unplanned or extended temporary closures.

E3 D M P **2.7.1.12** To address situations where operations at a mine/mineral processing site are suspended or unexpectedly ceased, an interim fluid and site management plan (or equivalent)[23] is developed by competent professionals, as follows:

a. This plan includes information on how process-water management systems, interceptor wells, seepage-collection systems and stormwater management systems[24] would be operated and maintained to prevent releases and continue to meet environmental compliance obligations;

b. It includes measures, clear objectives and effectiveness indicators to: 1) stabilize excavations and workings; 2) isolate or control toxic or hazardous materials; 3) store or remove equipment, supplies and structures; 4) maintain the site in a secure, safe and clean condition; and

c. It includes provisions to monitor fluid and site conditions during periods of non-operation.

2.7.2 Estimated Costs

E3 D M P **2.7.2.1** The concurrent reclamation, closure, and post-closure plan includes a detailed determination of the estimated costs of reclamation and closure, and post-closure measures and activities, as follows:

a. These estimated costs are based on the conservative assumption that they would be carried out by a regulatory agency using a third-party contractor[25];

b. They include costs associated with water management (as per 2.7.1.3);

c. They include costs associated with earthwork, revegetation, and ecological restoration (as per 2.7.1.4);

d. They include costs associated with polluted lands, facilities (including TSFs) and hazardous waste management (as per 2.7.1.5);

e. They include holding costs for interim fluid and site management (as per 2.7.1.12) that would be incurred by a regulatory agency if the ENTITY were to declare bankruptcy[26];

f. They include post-closure costs for: 1) post-closure management of facilities (including TSFs[27]) and terrestrial resources (as per 2.7.1.6); and 2) post-closure water management (as per 2.7.1.7); and

g. They include other direct and indirect costs, covering: 1) Mobilization/demobilization; 2) Engineering redesign, procurement and construction management; 3) Contractor overhead and profit; 4) Agency administration; 5) Insurance and performance bond; and 6) Contingency.

E3 D M P **2.7.2.2** The estimated costs required in 2.7.2.1:

a. Take into account inflation, and include a multi-year cost inflation that corresponds to the number of years: 1) until the concurrent reclamation, closure, and post-closure plan and costs are next scheduled to be reviewed (see 2.6.1.6)[28]; and 2) necessary to complete post-closure measures and activities (2.7.3.3);

b. Are calculated by competent professionals using a credible method[29]; and

c. Are reviewed by a competent third-party, or by a competent authority[30].

2.7.3 Financial Assurance

E3 D M P

2.7.3.1 **Critical Requirement**

If the country of operation offers financial assurance instrument/s managed by the State[31] for reclamation, closure and post-closure, in the form of cash deposit or trust fund (or equivalent):

a. The ENTITY adopts and implements it/them, from the earliest stage possible[32], and throughout the project/operation life cycle;

b. The ENTITY ensures this financial assurance is sufficient to cover the costs of interim fluid and site management, all concurrent reclamation, all closure, and all post-closure measures and activities, as estimated in the most current reclamation, closure, and post-closure plan in accordance with Section 2.7.2[33];

c. The ENTITY ensures this financial assurance is independently guaranteed and reliable; and

d. The ENTITY ensures this financial assurance is readily liquid and accessible to the competent authority[34], excluding all forms of self-bonding or corporate guarantees.

OR

E3 D M P

2.7.3.1* **Critical Requirement**

If the country of operation **does not** offer any financial assurance instrument managed by the State[35] for reclamation, closure and post-closure, in the form of cash deposit or trust fund (or equivalent):

a. The ENTITY has some form of financial assurance in place, from the earliest stage possible[36], and throughout the project/operation life cycle;

b. This financial assurance is sufficient to cover the costs of interim fluid and site management, all concurrent reclamation, all closure, and all post-closure measures and activities, as estimated in the most current reclamation, closure, and post-closure plan in accordance with Section 2.7.2[37];

c. This financial assurance is independently guaranteed and reliable; and

d. If self-bonding or corporate guarantees are used, the ENTITY makes publicly accessible detailed information on the likelihood that funds would be available to the competent authority to cover the cost of reclamation, closure and/or post-closure: 1) at the end of the operation's life; 2) if operations are suspended or unexpectedly ceased; and 3) if the ENTITY were to go bankrupt prior to the planned closure date.

E3 D M P

2.7.3.2 The terms of the financial assurance ensure that:

a. For sites where long-term risks[38] have not been eliminated (including risk related to long-term water treatment[39], TSFs and other mine waste facilities), calculations of financial assurance use of 500-year duration for long-term post-closure costs[40];

b. For all sites, the financial assurance instrument/s are not released until all the following have been shown to be effective and stable: 1) final water management (as per 2.7.1.3); final earthwork, revegetation, and ecological restoration (as per 2.7.1.4); and final polluted lands, facilities (including tailings storage facilities) and hazardous waste management (as per 2.7.1.5); and

c. For all sites, the financial assurance instrument/s are not released (partially or in full) until public comment has been received and taken into account, in accordance with 2.7.4.3.

E3 D M P

2.7.3.3 **IRMA+**

If the country of operation does not offer any financial assurance instrument managed by the State[41] for reclamation, closure and post-closure, in the form of cash deposit or trust fund (or equivalent), the ENTITY has financial assurance in place, from the earliest stage possible[42], and throughout the project/operation life cycle, as required in 2.7.3.1* but in a form that is readily liquid and accessible to the competent authority, excluding all forms of self-bonding or corporate guarantees.

2.7.4 Meaningful Engagement with Stakeholders

E3 D M P

2.7.4.1 In accordance with Chapter 1.2, and as per 2.7.1.1, the ENTITY has a system in place to ensure that affected rights-holders and stakeholders, and other relevant stakeholders are:

a. Preemptively provided with relevant and comprehensive information, in accordance with Section 1.2.3, about the development and implementation of the concurrent reclamation, closure, and post-closure plan, including the most recent version, and all previous versions of: 1) the plan; 2) the reviewed estimated costs; and 3) the results of the approved financial assurance review[43];

b. Consulted and involved during the collaborative development and implementation of the concurrent reclamation, closure, and post-closure plan; and

c. Consulted and involved during the collaborative monitoring and evaluation of the concurrent reclamation measures and activities (in accordance with Section 2.7.5).

E3 D M P

2.7.4.2 In accordance with Chapter 1.2, the ENTITY has a system in place to ensure that affected rights-holders and stakeholders, and other relevant stakeholders:

a. Can comment on the initial version of, and any significant update of, the concurrent reclamation, closure, and post-closure plan, at least 60 days prior to the formal finalization process[44];

b. If necessary, are provided with resources for capacity building and training to enable meaningful stakeholder engagement[45]; and

c. Are provided with the opportunity to propose independent experts of their own choosing to provide input to the ENTITY on **the design and implementation of the plan**, and on the adequacy of the **completion of reclamation activities** prior to release of part or all of the financial assurance;

E3 D M P

2.7.4.3 In accordance with Chapter 1.2, the ENTITY has a system in place to ensure that affected rights-holders and stakeholders, and other relevant stakeholders:

a. Are preemptively provided with the results of all approved financial assurance reviews;

b. Can comment on the adequacy of the proposed financial assurance instruments and/or arrangements, at least 60 days prior to the finalization, and to any renewal, of the financial assurance;

c. Are provided with the opportunity to propose independent experts of their own choosing to review the **financial assurance** and provide input to the ENTITY on its adequacy.

2.7.5 Monitoring and Evaluation

E3 D M P

2.7.5.1 To monitor and evaluate the effectiveness and appropriateness of its concurrent reclamation, closure, and post-closure plan, the ENTITY, at least annually:

a. Tracks and documents its performance on water management, over successive time periods, against the objectives and effectiveness indicators defined in 2.7.1.3, and informed by stakeholder engagement as per Section 2.7.4;

b. Tracks and documents its performance on earthwork, revegetation, and ecological restoration, over successive time periods, against the objectives and effectiveness indicators defined in 2.7.1.4, and informed by stakeholder engagement as per Section 2.7.4; and

c. Tracks and documents its performance on polluted lands, facilities and hazardous waste management, over successive time periods, against the objectives and effectiveness indicators defined in 2.7.1.5, and informed by stakeholder engagement as per Section 2.7.4.

E3 D M P

2.7.5.2 The monitoring and evaluation process:

a. Encourages and facilitates joint tracking or joint fact-finding with affected communities, in a manner that is inclusive of different genders, ages, ethnicities, and any potentially underserved and/or marginalized people from affected communities, as per Chapter 1.2[46];

b. Includes continuous feedback from internal and external sources, including from joint tracking and joint fact-finding with affected communities; and

c. Includes safeguards to protect the security and privacy of collected personal data or characteristics of community members and stakeholders[47].

E3 D M P

2.7.5.3 **IRMA+**
To monitor and evaluate the effectiveness and appropriateness of the soil erosion reduction measures required as per 2.7.1.4.a, competent professionals, at least annually:

a. Conduct visual inspections of lands and facilities that may be subject to erosion;

b. Use credible methodologies to measure or estimate soil erosion rates; and

c. Use credible methodologies to measure or estimate soil loss.

2.7.6 Continuous Improvement

E3 D M P **2.7.6.1** At least annually, but without undue delay after a significant change, the ENTITY:

a. Reviews the monitoring and evaluation results, and the ENTITY's effectiveness in meeting the objectives and indicators defined in 2.7.1.3, 2.7.1.4, and 2.7.1.5;

b. Reviews any concurrent reclamation-related or closure-related grievances filed through its grievance mechanism/s, and any relevant notification submitted through its whistleblowing mechanism (see Section 1.6.4);

c. Develops and implements time-bound corrective measures to update, if necessary[48], its concurrent reclamation, closure, and post-closure plan in accordance with Section 2.7.1;

d. Develops and implements time-bound corrective measures to update, if necessary[49], its estimated costs in accordance with Section 2.7.2; and

e. Develops and implements time-bound corrective measures to update, if necessary[50], its monitoring and evaluation processes in accordance with Section 2.7.5.

E3 D M P **2.7.6.2** At least every five years, but without undue delay after a significant change:

a. The ENTITY reviews all financial assurance instruments required in Section 2.7.3 (related to reclamation, closure, and post-closure); and

b. This review is done by competent third-party analysts, using credible accounting methods.

2.7.7 Information-Sharing and Public Reporting

E3 D M P **2.7.7.1** At least annually, the ENTITY makes publicly accessible updated versions of, and maintains[51] publicly accessible all previous versions of:

a. The concurrent reclamation, closure, and post-closure plan;

b. A concurrent reclamation progress report, for the reporting period;

c. Information on the form and terms of financial assurance in place, and whether or not it is sufficient to cover the costs required to achieve all the time-critical items and milestones for each facility and for the site overall, in their current state, as outlined in the most recent concurrent reclamation, closure, and post-closure plan (see 2.7.1.11.b)[52];

d. Key findings of the monitoring and evaluation process required in Section 2.7.5, and of the review process required in 2.7.6.1; and

e. A list of the time-bound corrective measures identified as per 2.7.6.1.

CROSS REFERENCES TO OTHER CHAPTERS

This table will be added when the new content for all chapters is finalized and approved.

CHAPTER ENDNOTES

[1] Bridge, G. 2004. Contested terrain: mining and the environment." Annu. Rev. Environ. Resource. 28-205-259. https://www.annualreviews.org/doi/pdf/10.1146/annurev.energy.28.011503.163434

[2] Ramli, M. et al. "Analysis of soil erosion on mine area," Institute of Physics Conference Series: Materials Science and Engineering. 875:012052. https://iopscience.iop.org/article/10.1088/1757-899X/875/1/012052/pdf

[3] Reclamation and closure plans for exploration and permitting phases may not need all of these elements. For example, if there are no constructed facilities, then demolition and disposal would not be necessary during exploration reclamation. Entities can provide evidence and a rationale to auditors as to why certain sub-requirements are not relevant in their circumstances, and the auditors will make a final determination.

[4] The rehabilitation and closure plan should be developed before or during the permitting stage (for exploration, mining, and processing projects/operations), prior to the commencement of construction activities. Any ENTITY not able to align with this timing needs to provide supporting evidence demonstrating why it could not conform with this timing. If there is no satisfactory evidence, the ENTITY may not achieve "fully meets" on any of the requirements for Section 2.7.1.

[5] Collaborative discussion and consultation on post-closure land use and facility use with affected communities is required as part of the Environmental and Social Impact Assessment (ESIA) process in Chapter 2.1 (see requirements 2.1.4.1.e and 2.1.4.3.e). However, if was not done during ESIA, then to meet this requirement entities must demonstrate that these discussions occurred and were taken into consideration in developing the post-closure land use objectives if appropriate. Alignment with stakeholders' needs and expectations may not be possible when country of operation's laws are in place that designate/decree the post-closure end uses.

[6] Many of the IRMA chapters require elements of site characterization, so this plan should summarize that information. See Chapter 4.1, Section 4.1.1; Chapter 4.2, requirements 4.2.1.2, 4.2.1.3; Chapter 4.3, Section 4.3.1 and 4.3.2; and Chapter 4.4, Section 4.4.1.

[7] This should be informed by IRMA Chapter 4.1, Section 4.1.1 and Chapter 4.2, Section 4.X.1.

[8] This should be informed by IRMA Chapter 4.3 (4.3.2.5 and 4.3.3.2.a on conceptual site models).

[9] This should be informed by IRMA Chapter 4.3, requirement 4.3.6.1.

[10] This should be informed by IRMA Chapter 4.2, Section 4.2.12 and Chapter 4.3, Section 4.3.6.1.

[11] And clear measures to be implemented if these standards and objectives are not met within a specified time.

[12] There may already be indicators for restoration of some areas of (or possibly the entire) site if important biodiversity and/or priority ecosystem services may be or have been affected by mining-related activities. These indicators would be in the biodiversity and ecosystem services management plans in Chapter 4.4 (see Section 4.4.3).

[13] If soil pollution from air emissions is predicted (Chapter 4.5), or polluted soil is identified during the ESIA process, operations (e.g., resulting from materials or waste disposal in Chapter 4.1, or as a result of accidents or spills that require emergency response activities as per Chapter 2.6), and/or decommissioning of equipment/facilities.

[14] This should be informed by IRMA Chapter 4.1 (Waste and Materials Management), Sections 4.1.5 and 4.1.6.

[15] E.g. decontamination, demolition, disposition, clean-up and/or disposal if facilities will not be used for other purposes).

[16] E.g. to determine ongoing impacts or effectiveness of restoration efforts.

[17] See Chapter 4.3 on Water Management for detailed requirements related to Section 4.3.3 (risk assessment), Section 4.3.4 (long-term water treatment), and Section 4.3.6 (Adaptive Management, in particular requirement 4.3.6.1 where source controls and other mitigations are developed to address the operational risks).

[18] Minimum time requirement may depend on applicable laws or regulations. Evidence is required to demonstrate if and how a shorter or longer time period is required by such laws or regulations.

[19] Alternatively, the plan may include any additional time for the predicted water quality to meet baseline or background water quality values, as per Chapter 4.3, for five consecutive years.

[20] For Exploration – Stage 2 projects, the ENTITY is required to demonstrate development and implementation of these measures, though not as part of a formalized concurrent reclamation, closure, and post-closure plan.

[21] Such as trenches and pits used for drilling mud, bulk sampling or geotechnical sampling.

[22] See Chapter 4.3, requirement 4.3.3.2, 4.3.3.3, and 4.3.3.4 for prediction of water quality, and requirement 4.3.8.1 related to maintaining water quality at baseline/background or at levels protective of current and future end uses of water.

[23] This can be a section of the overall reclamation and closure plan. It may also be a standalone plan, or incorporated into the operational plan (e.g, if part of an operation goes on care and maintenance while the rest of the operation continues with production).

[24] Including electrical system requirements and pump operations.

[25] This assumption ensures the highest bracket is factored in, in the event where the ENTITY is not able to carry out the activities (for financial, legal, or other reasons) and an external agency (or equivalent) is responsible for their implementation and monitoring.

[26] These costs are calculated based on the assumption that there would be a two-year period before final reclamation activities would begin.

[27] See also Chapter 4.2, Section 4.2.11 for additional tailings-facility-specific requirement on estimated costs for reclamation, closure, and post-closure.

[28] For example, if the next scheduled review of the reclamation and closure plan (and costs) is not for five years (i.e., the maximum allowed in 2.6.1.6), then the costs in current plan reflect the current cost plus five years x rate of inflation. This is to ensure that the financial assurance at any time during those five years is sufficient to cover the full costs of reclamation and closure (taking into account inflation).

Alternatively, if financial assurance is held by a regulatory body, and they require increases in the amount of financial assurance to account for inflation, then the multi-year cost inflation is not necessary in the plan itself.

[29] I.e., a credible engineering cost estimate method.

[30] E.g., relevant regulatory agency or administrative body.

[31] This could be available at a national/federal or at subnational level. If this is mandated and required by law/regulation, the ENTITY is required to adopt and implement it anyway, as per Chapter 1.1. Note that such instrument may be in place for mining, but not for mineral processing; in this case, refer to requirement 2.7.3.2.

[32] For proposed projects, financial assurance is in place before ground disturbance begins. If an operation did not have financial assurance arrangements in place before ground disturbance began, it needs to provide supporting evidence demonstrating why it could not.

[33] The quality of cost estimating is an essential factor to ensure the adequacy of the financial guarantee that will be provided to the regulatory body. To fully meet this sub-requirement, the Entity must at least substantially meet all requirements in Section 2.7.2.

[34] The intent of this requirement is to ensure that funds will be available, irrespective of the ENTITY's finances at the time of closure, or in the event of bankruptcy that occurs during operations.

[35] See 2.7.3.1.

[36] For proposed projects, financial assurance is in place before ground disturbance begins. If an operation did not have financial assurance arrangements in place before ground disturbance began, it needs to provide supporting evidence demonstrating why it could not.

[37] The quality of cost estimating is an essential factor to ensure the adequacy of the financial guarantee that will be provided to the regulatory body. To fully meet this sub-requirement, the Entity must at least substantially meet all requirements in Section 2.7.2.

[38] I.e. risks that extend beyond mine closure.

[39] See 4.3.3.4.

[40] IRMA acknowledges that few jurisdictions have clear requirements for this in regulation, and only a few more in guidance. Usually, it comes back to precedence as to how regulatory agencies decided to respond when they were confronted with long-term costs for the first time. In the USA, EPA RCRA and Superfund cleanup costs are estimated out for 30 years (representing a low bar). In Alaska, Montana, New Mexico (including in copper regulations) and other US states 100 years has become the norm, same for the US Forest Service, and the US Bureau of Land Management that also use 100 years, but in some cases it has gone out 500 years. The 500-year approach comes very near to achieving the intent of the requirement as in the Standard V1.0 and first public iteration of the draft V2.0 (that instead relied on long-term net present value (NPV) calculations).

[41] See 2.7.3.1.

[42] For proposed projects, financial assurance is in place before ground disturbance begins. If an operation did not have financial assurance arrangements in place before ground disturbance began, it needs to provide supporting evidence demonstrating why it could not.

[43] Confidential business information may be excluded or redacted from the publicly accessible documentation as necessary, but in accordance with Requirement 1.2.3.1.

[44] If not otherwise provided for through a regulatory process. The intent being to ensure that, as the construction phase could not start before the initial plan is finalized, communities and relevant stakeholders are "preemptively" given the opportunity to comment, at least 60 days before construction could theoretically start. Implications for finalizing any update of the plan may vary depending on the jurisdiction.

[45] For more on meaningful stakeholder engagement see Chapter 1.2, in particular Sections 1.2.2 through 1.2.5.

[46] This is especially relevant for contexts where your business and (potentially) affected rights-holders are in dispute about a particular (potential) adverse impact, and rights-holders are unlikely to accept the business' own tracking of the effectiveness of its response to it.

[47] Especially of rights-holders at heightened risk of vulnerability and marginalization, including children, or any other sensitive data.

[48] This will be informed by the monitoring and evaluation process required in the previous Section, and on the review process required in a. to b. Including when major process water system changes occur that would affect the interim actions necessary to prevent fluid releases (see 2.7.1.11).

[49] This will be informed by the monitoring and evaluation process required in the previous Section, and on the review process required in a. to b.

[50] This will be informed by the monitoring and evaluation process required in the previous Section, and on the review process required in a. to b.

[51] All material must remain publicly accessible at least until the completion of all post-closure activities (including any previous versions, iterations and revisions). Note that the intention is not that the reports should be removed from the public domain after that. Rather, where possible, it should be retained indefinitely as the information may be important for legal or other purposes.

[52] This may exclude information that is confidential business information. In this case, only the confidential information is redacted, a rationale us made publicly accessible, and supporting evidence is provided to the auditors.

2025 – Initiative for Responsible Mining Assurance

www.responsiblemining.net

IRMA Initiative for Responsible Mining Assurance