

TOWARDS SUSTAINABLE MINING®

Progress Report 2018

Towards Sustainable Mining
Vers le développement minier durable



2018 Progress Report

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Introduction

About Towards Sustainable Mining

Towards Sustainable Mining® (*TSM*®) is an award-winning performance system that helps mining companies evaluate and manage their environmental and social responsibilities. It is a set of tools and indicators to drive performance and ensure that key mining risks are managed responsibly at participating mining and metallurgical facilities.

Mining companies that participate in the *TSM* initiative demonstrate their strong commitment to responsible mining.

By adhering to the *TSM* Guiding Principles, mining companies exhibit leadership by:

Engaging
with communities.

Driving world-leading
environmental practices.

Committing to the
safety and health of
employees and
surrounding communities.

Established in 2004 by the Mining Association of Canada (MAC), *TSM*'s main objective is to enable mining companies to meet society's needs for minerals, metals and energy products in the most socially, economically and environmentally responsible way.

At its core, *TSM* is:

Accountable

Participation in *TSM* is mandatory for all MAC members for their Canadian operations, and many voluntarily apply the program at their operations abroad. Assessments are conducted at the facility level where the mining activity takes place – the only program in the world to do this in our sector.

Credible

TSM is overseen by an independent Community of Interest (COI) Advisory Panel. This multi-interest group helps mining companies and communities of interest foster dialogue, improve the industry's performance and shape the *TSM* initiative for continual advancement.

Transparent

Mining companies publicly report their facilities' performance against the *TSM* indicators in the annual *TSM Progress Report*. Results are externally verified every three years.

Performance driven

Includes a requirement to demonstrate measurable continual sustainability improvement.

TSM Guiding Principles

As members of the Mining Association of Canada, our role is to responsibly meet society's needs for minerals, metals and energy products. To achieve this, we engage in the exploration, discovery, development, production, distribution and recycling of these products. We believe that our opportunities to contribute to and thrive in the economies in which we operate must be earned through a demonstrated commitment to sustainable development.*

Accordingly, our actions must demonstrate a responsible approach to social, economic and environmental performance that is aligned with the evolving priorities of our communities of interest.** Our actions must reflect a broad spectrum of values that we share with our employees and communities of interest, including honesty, transparency and integrity. And they must underscore our ongoing efforts to protect our employees, communities, customers and the natural environment.

We will demonstrate leadership worldwide by:

Involving communities of interest in the design and implementation of our TSM initiative.
Proactively seeking, engaging and supporting dialogue regarding our operations.
Fostering leadership throughout our companies to achieve sustainable resource stewardship wherever we operate.
Conducting all facets of our business with excellence, transparency and accountability.
Protecting the health and safety of our employees, contractors and communities.
Respecting the rights of our workers and not engaging in practices of forced or child labour, as defined in ILO Conventions 29, 138 and 182.
Contributing to global initiatives to promote the production, use and recycling of metals and minerals in a safe and environmentally responsible manner.
Seeking to minimize the impact of our operations on the environment and biodiversity, through all stages of development, from exploration to closure.
Working with our communities of interest to address legacy issues, such as orphaned and abandoned mines.
Practising continuous improvement through the application of new technology, innovation and best practices in all facets of our operations.

In all aspects of our business and operations, we will:

Respect human rights and treat those with whom we deal fairly and with dignity.
Respect the cultures, customs and values of people with whom our operations interact.
Recognize and respect the unique role, contribution and concerns of Aboriginal peoples (First Nations, Inuit and Métis) and Indigenous peoples worldwide.
Obtain and maintain business through ethical conduct.
Comply with all laws and regulations in each country where we operate and apply the standards reflecting our adherence to these guiding principles and our adherence to best international practices.
Support the capability of communities to participate in opportunities provided by new mining projects and existing operations.
Be responsive to community priorities, needs and interests through all stages of mining exploration, development, operations and closure.
Provide lasting benefits to local communities through self-sustaining programs to enhance the economic, environmental, social, educational and health care standards they enjoy.

* MAC draws on the 1987 Brundtland Commission definition of sustainable development: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

** We use the term communities of interest to include all of the individuals and groups who have or believe they have an interest in the management of decisions about our operations that may affect them. This includes employees, contractors, Aboriginal or Indigenous peoples, mining community members, suppliers, customers, environmental organizations, governments, the financial community and shareholders.

Message from the Chair of the TSM Governance Team and MAC's President and CEO

Welcome to the 2018 *TSM Progress Report*. We are pleased to present a detailed look at our members' environmental and social performance for 2017.

HIGHLIGHTS OF 2017 RESULTS

This report includes the 2017 *TSM* performance results for 67 mining facilities belonging to 23 of our member companies. This year, 24 mining facilities had their results externally verified as part of *TSM*'s three-year external verification cycle. Six facilities reported *TSM* performance for the first time and are included in aggregate graphs for each of the Protocols.

Once again, we saw strong performance in many of the *TSM* Protocols:

- 96% report publicly on their engagement and dialogue activities.
- 81% conduct crisis simulation exercises.
- 99% have formal safety and health management systems.
- 75% have senior management commitments to biodiversity conservation in place.
- 92% have implemented a tailings management system that is in conformance with MAC's tailings management guides.
- 96% have implemented energy use and GHG emissions management reporting systems.

On an aggregate basis, we did see a drop in performance in both *Tailings Management* and *Crisis Management and Communications Planning*. These drops are in part due to the addition of new MAC member facilities that are still working to align their systems with *TSM* requirements. In the area of Tailings Management, seven facilities (including six closed facilities) that previously reported Level As for Indicators 3 and 4 were downgraded to Level Cs and Bs during external verification this year. Additionally, five facilities that previously met all criteria of the *Crisis Management and Communications Planning Protocol* reported "No" for Indicator 2.

These results confirm the value and integrity of *TSM*'s internal and external verification requirements. MAC has engaged with the companies that have experienced a drop in performance and, consistent with *TSM*'s intent to drive performance and encourage continuous improvement, these companies have identified corrective actions which are now being implemented.

NEW ELEMENTS OF THE REPORT

In 2017, MAC added a new Protocol, *Preventing Child and Forced Labour*, in light of *TSM*'s growing global presence and the need to contribute to efforts to address these issues. Adherence to this commitment is assessed every three years as part of each facility's external verification and we are pleased to include the first results in the *Communities and People* section of this year's report. We are also pleased to acknowledge that 100% of the facilities undergoing verification this year were able to demonstrate adherence to this Protocol.

In 2017, MAC also adopted a new membership commitment to implement the *Voluntary Principles on Security and Human Rights* (VPs). To demonstrate adherence to this new commitment, this year's report includes statements from each MAC member with international operations describing their approach to risk assessment, how their security-related management systems align with the VPs (when appropriate), the nature of their assurance processes and a link to any additional corporate public reporting related to the VPs. Company statements can be found in the *International Application of TSM* section of the report.

INCREASED UPTAKE OF TSM

MAC continues to help build capacity within the global mining industry by sharing its expertise in sustainable mining practices. One of the most effective ways MAC and its members have been doing this is by freely sharing the *TSM* initiative with mining associations in other countries that are seeking tools to improve the environmental and social performance of their mining industries.

MAC is pleased to welcome Spain as the newest *TSM* partner country. Confederación nacional de empresarios de la minería y de la metalurgia (CONFEDEM) became the fifth national mining association to adopt *TSM* outside of Canada, joining Finland, Argentina, Botswana and the Philippines.

As part of MAC's efforts to continue advancing *TSM*, we are committed to working with our partner countries to ensure that it is successfully implemented. As part of this effort, MAC staff were joined by Dr. Phil Oxhorn, one of MAC's Community of Interest Advisory Panel members, to put on a training workshop in Buenos Aires for the Argentinean Chamber of Mining Entrepreneurs' (CAEM) newly formed advisory panel. The objective of this workshop was to ensure that CAEM's panel is well positioned to provide relevant advice to the Argentinian mining industry and effective oversight of *TSM* implementation.

International interest in *TSM* continues to grow, and MAC is currently being engaged by governments and associations across the globe.

TSM PROTOCOL DEVELOPMENTS

Throughout 2017, MAC continued to work towards completing the implementation of the recommendations of the Independent *TSM* Tailings Management Review Task Force, with a focus on strengthening the guide to *Developing an Operation, Maintenance and Surveillance Manual*. With the review of the tailings management component of *TSM* now complete, including the implementation of all of the recommendations from MAC's Independent Tailings Management Review Task Force, MAC members are now turning their attention to aligning their systems with the updated *TSM Tailings Management Protocol* and guides.

Over the course of 2017 and 2018, water experts from across the industry have worked diligently to develop a set of performance indicators to measure water governance, operational water management, watershed-level planning and water performance and reporting at the mine-site level. The new *Water Stewardship Protocol* will be phased-in over the next few years, with public reporting scheduled to begin in 2021.

In 2018, MAC initiated a review of the *Aboriginal and Community Outreach Protocol*. Work to update the Protocol to ensure it reflects current best practices with respect to community engagement and Indigenous relations will continue through 2019.

The COI Panel provided input into the review of the *Tailings Management Protocol* and guides, the development of the new *Water Stewardship Protocol* and continues to be involved in the review of the *Aboriginal and Community Outreach Protocol*.

We hope you enjoy the 2018 *TSM* Progress Report.



Peter Read
Suncrude Canada
Chair of the *TSM* Governance Team



Pierre Gratton
President and CEO
The Mining Association of Canada

2017 Statement from the Community of Interest Advisory Panel

The Community of Interest Advisory Panel (COI Panel) was established in 2004, and has played a key role in the design, and subsequent implementation and evolution of the TSM initiative. The Panel is composed of individuals who are nominated based on the community of interest they represent, including the mining industry. The communities represented on the Panel are directly or indirectly impacted by the activities of the mining industry. As Panel members, individuals from the mining industry actively engage in Panel discussions, provide company insights, and help connect the Panel's work to the MAC membership. The current COI Panel includes 18 individuals from Indigenous communities, people working in international development, economic and community development organizations, environmental and social NGOs, the finance/investment sector, organized labour, as well as individuals with issue-specific expertise and industry members.

🔗 See here for more information: www.mining.ca/towards-sustainable-mining/community-interest-advisory-panel.

This Panel statement offers an independent reflection from the non-industry members of the COI Panel on key areas of interest and progress since the previous statement. It covers the October 2017 meeting at the site of the Glencore Raglan Mine and the March 2018 meeting in Toronto, as well as interim Panel activities.

MATERIALITY PROCESS

In 2017, a working group was created to clarify the agenda setting process for the COI Panel and enable more transparent decision making around why the Panel prioritizes certain issues. This working group built an online survey for industry and non-industry panel members to identify potential priorities. Based on the intersection of the priorities of industry and the priorities of non-industry Panel members, a matrix was created that ranked the material issues for the COI Panel. The top three issues were: recognizing and respecting Indigenous rights, reconciliation and employment for Indigenous peoples. Climate change-related issues, notably regarding loss and damage and a just transition, were the fourth and fifth most pressing issues out of the 12 issues identified in the 2017 survey.

POST-VERIFICATION REVIEW DISCUSSIONS

The Panel's October 2017 post-verification review (PVR) meeting took place at Glencore's Raglan Mine, located in the Nunavik region of northern Quebec. As part of this meeting PVR's were conducted for both Raglan (see next item) and Rio Tinto's Diavik Diamond Mine, which is similarly located in a subarctic region. Much of the discussion of both mines focused on closure planning, including social and environmental aspects, tailings management and the potential impacts of climate change. Several key points emerged in the discussion. Firstly, while little change in the permafrost had been observed to date, both companies recognized the potential for global climate change to affect the stability of the permafrost in the future. They have both begun aggressively modeling potential future climate scenarios and their implications for post-closure monitoring, with the shared goal of minimizing long-term monitoring and maintenance post-closure. Rio Tinto shared that the scenarios they modeled demonstrate the region will remain an arid Arctic desert climate. Glencore emphasized its efforts to minimize post-closure contamination of local water supplies from tailings and shared that post-closure monitoring will continue for a minimum of 10 years. Glencore also noted that all open pits will be backfilled and contoured back to the natural landscape.

While discussing social aspects of closure, Rio Tinto explained how it was examining the capabilities of local suppliers and contractors to create new business opportunities, including through discussions with the Canadian Council for Aboriginal Business. Rio Tinto also noted that Diavik posted the largest reclamation bond in Canadian mining history when it first submitted its closure plan, which includes two bonds to meet regulatory requirements and a third bond defined through a monitoring agency established by Diavik. The government will release portions of the reclamation bonds back to Rio Tinto as reclamation progresses and liability therefore diminishes. It is in ongoing conversations with the Government of the Northwest Territories and regulators to determine how this relinquishment process will ultimately end.

The general discussion, including the opportunity for Panel members to ask questions of industry that reflect the community interests they represent, was a good example of the rich dialogue Panel meetings can generate. The discussions revolving around mine closure and climate change underscored the importance of viewing relations between mining companies and COI as ongoing processes that will take years to unfold.



Biannual Panel meetings, including fall meetings on the site of at least one of the mines participating in the PVR, are integral to maximising these positive interactions.

THE COMMUNITY AND SITE VISIT AT RAGLAN MINE

As part of Raglan's PVR, the Panel was brought on a tour of the Raglan Mine site and was interested to view first-hand Glencore's wind turbine and energy storage facility. The 3-megawatt facility with a 120-metre tall turbine has saved 7.5 million litres of diesel fuel and reduced GHG emissions by 21 kilotonnes since installation in August 2014, and had won the 2016 TSM award for Environmental Excellence.

The Panel also very much appreciated the opportunity to visit the local Indigenous community. The community had benefitted quite noticeably from the revenues it received from mining as evidenced, for example, by the amount of new construction. The Panel meeting coincided with an annual event in which Glencore engaged in a variety of community activities. Several Panel members had the opportunity to observe a workshop on translating Glencore activity terms and concepts (e.g. tailings) into the local Indigenous language. The workshop highlighted the importance of developing effective communications strategies that minimize potential sources of confusion. It also demonstrated the need for flexibility from company organizers, as community members would occasionally use the public event to voice concerns not originally on the planned agenda.

More generally, the visit contributed to a discussion concerning the quality and extent of community participation and engagement with Glencore. This was particularly important given Glencore's experience of offering incentives such as prizes to encourage community participation, only to discover that community members were more interested in the announcement of the prize winner than the topic of discussion. Panel members were able to offer several suggestions to improve the quality of participation, including having conversations household to household and the importance of Glencore having an ongoing presence in the community to build trust. This was followed by a discussion of how Glencore could help increase local employment and contribute to community development. Finally, several Panel members suggested that future meetings provide an expanded dialogue with local communities of interest in order to better understand their perspectives.

PANEL RENEWAL AND DIVERSITY

The Panel raised the importance of gender equality during the fall 2017 meeting. This topic was discussed at the February 2018 Panel Renewal Working Group meeting, which also addressed the larger theme of Panel member diversity, particularly the importance of youth representation. It was agreed that gender equality would be taken into consideration during the 2018 recruitment and selection process for the environmental and international development community representatives.

INDIGENOUS RECONCILIATION PANEL

As a result of the Panel materiality process, at the March 2018 meeting a panel of Indigenous representatives was convened to share their perspectives on Indigenous reconciliation and the Truth and Reconciliation Call to Action #92, and their implications for the mining sector. The following panelists shared their perspectives with the Panel: Daniel Benoit, Métis COI Panel member; Will David, representative from Inuit Tapiriit Kanatami (ITK); Theresa Baikie, Inuit COI Panel member; and Chief David Walkem, Community COI Panel member, from the Cooks Ferry Indian Band. Several key themes emerged from the presentations and plenary discussions. Panelists stressed the importance of meeting an Indigenous community where they are at, aligning with where they want to go, reflecting on biases, and implementing programs to foster reconciliation. Panelists also discussed the importance of government ensuring Indigenous peoples are treated equally and fairly, despite government often looking to industry to fulfill the Crown's duty to consult and maintain relationships with Indigenous peoples. The need for cultural awareness education and training for mining management and staff was raised as well as the need for gender-balanced relationships between Indigenous communities and mining companies. Certainly, many challenges exist for the mining industry to improve relations with Indigenous communities, but there was a shared resolve for reconciliation.

CLIMATE CHANGE CALLS TO ACTION PROGRESS

In 2016 the COI Panel issued an Advisory Statement on Climate Change, challenging MAC and its members to increase its engagement on climate change-related issues. In October 2017, MAC released its official response to the Panel Statement, noting thirteen specific actions that MAC commits to undertake in response. At the March 2018 meeting, Brendan Marshall, MAC's Vice President of Economic and Northern Affairs, provided an update on these commitments, including the good news that a MAC proposal to Natural Resources Canada for research on climate adaptation was successful.



Brendan also noted the heavy demands for industry engagement on climate change and shared that MAC will prioritize one action at a time with the understanding that once an action was initiated, MAC could reassess available capacity and the need for advancing other commitments.

The Panel noted that demands for industry engagement on climate change will only increase and that resources may need to be shifted or supplemented to meet these demands. Brendan and three Panel members (Joy Kennedy, Nathan Lemphers and Mark Wiseman) were also able to share their experience with the Advisory Statement on Climate Change at the March 2018 Prospectors and Developers Association of Canada Convention, which helped to increase awareness about the value of COI engagement. The Panel looks forward to receiving regular updates on the implementation of MAC's climate change commitments.

ABORIGINAL AND COMMUNITY OUTREACH PROTOCOL UPDATE

At the March 2018 meeting, MAC sought feedback on the proposed scope of a revised *Aboriginal and Community Outreach Protocol*. Much has changed since this Protocol was initially developed, such as the adoption of the United Nations Declaration on the Rights of Indigenous Peoples, the legal principle of free, prior, and informed consent, Canada's Truth and Reconciliation Commission recommendations, as well as a growing number of legal rulings and rising public expectations regarding relations with Indigenous communities. Panel members shared comments on the Protocol broadly, as well as comments specific to the four existing indicators. The Panel looks forward to providing additional feedback on the next iteration of this Protocol.

WATER MANAGEMENT PROTOCOL DEVELOPMENT

A new Protocol for water management is currently under development. At the March 2018 meeting, MAC presented the draft *Water Stewardship Protocol* for review. Advice given to MAC included: incorporating more explicit references to climate change and adaptive management, considering both absolute and intensity targets, suggested improvements for Level AAA criteria, collaborating with Indigenous communities on watershed issues and improving clarity on what constitutes a Level C. Overall, this Protocol will be a very positive addition to TSM and is aligned with the concerns of many stakeholders.

REFLECTIONS FROM EXITING PANEL MEMBERS

Nathan Lemphers, an environmental representative on the Panel, is leaving after serving two terms. He shares the following comments:

"It has been a rewarding experience to serve on the COI Panel. Over the course of six years, I have seen the Panel evolve in the type of advice that it shares with MAC, with less focus on the specifics of the PVR and more focus on alerting and pressing MAC on issues of importance to the COI. MAC has evolved, as well. They have invested in educating Panelists through mine site and community visits and have shown receptiveness in listening to more critical voices from these local communities. I am particularly proud of the commitments made by MAC to increase the scope of its climate change-related work. I look forward to seeing how these and other commitments help to strengthen TSM and the overall sustainability of mining in Canada. Many thanks to Stratos for their excellent facilitation."

Phil Oxhorn, a member of the international development community will also be completing his second term on the Panel. His reflections echo many of the themes mentioned by Nathan:

"I have enjoyed being on the Panel for the past six years. It was an invaluable opportunity to engage in a dialogue not only with the mining industry, but also with the other members of the Panel who represent a rich diversity in experiences related to mining. The Panel provides MAC with a unique resource for addressing a variety of issues revolving around the TSM initiative, and MAC should be proud of the fact that it has created the Panel as an important source of invaluable insights. I was particularly pleased to contribute to the Panel's own evolution, as it began focusing less on the technical aspects of the PVR in favor of broader discussions on the issues of concern to Panel members. Finally, I would also like to thank Stratos, whose facilitation helped make this evolution feasible, and the MAC team for providing me with this enriching opportunity."



TSM Community of Interest Advisory Panel

COI PANEL CATEGORY		REPRESENTATIVES
Social NGO including faith-based groups	Individuals who represent civil society with knowledge of social justice issues.	Joy Kennedy
Aboriginal people	Individuals who represent the interests of Métis, First Nations and Inuit.	Dan Benoit Theresa Hollet
Environmental NGO	Individuals with environmental expertise who advocate for environmental protection, and who have a background in working with the environmental NGO community.	Nathan Lemphers Stephen Hazell
International development	Individuals with expertise in alleviating poverty and improving the standard of living through responsible development.	Dr. Philip Oxhorn
Economic/Community development	Individuals with expertise in business development at the community level and knowledge of community interactions with mining facilities.	Chief David Walkem Tim Johnston
Finance/Investment	Individuals with financial expertise and knowledge of socially responsible investing.	Stephen Kibsey* Stephen Walker**
Labour/Workplace	Individuals with knowledge of the interests, safety, and needs of workers.	Doug Olthuis
Expert	The Panel may choose to select expert categories to be filled as specific issues are identified.	Maya Stano
Industry representatives	Industry participation comprises four MAC Board members, one representative of the exploration sector, and the MAC President and CEO. MAC staff members also participate as resource persons.	Cory McPhee Scott Yarrow Pierre Gratton Peter Read Mark Wiseman Michel Julien Joséé Méthot

*Left the Panel in 2017

**Joined the Panel in 2017

How TSM Works

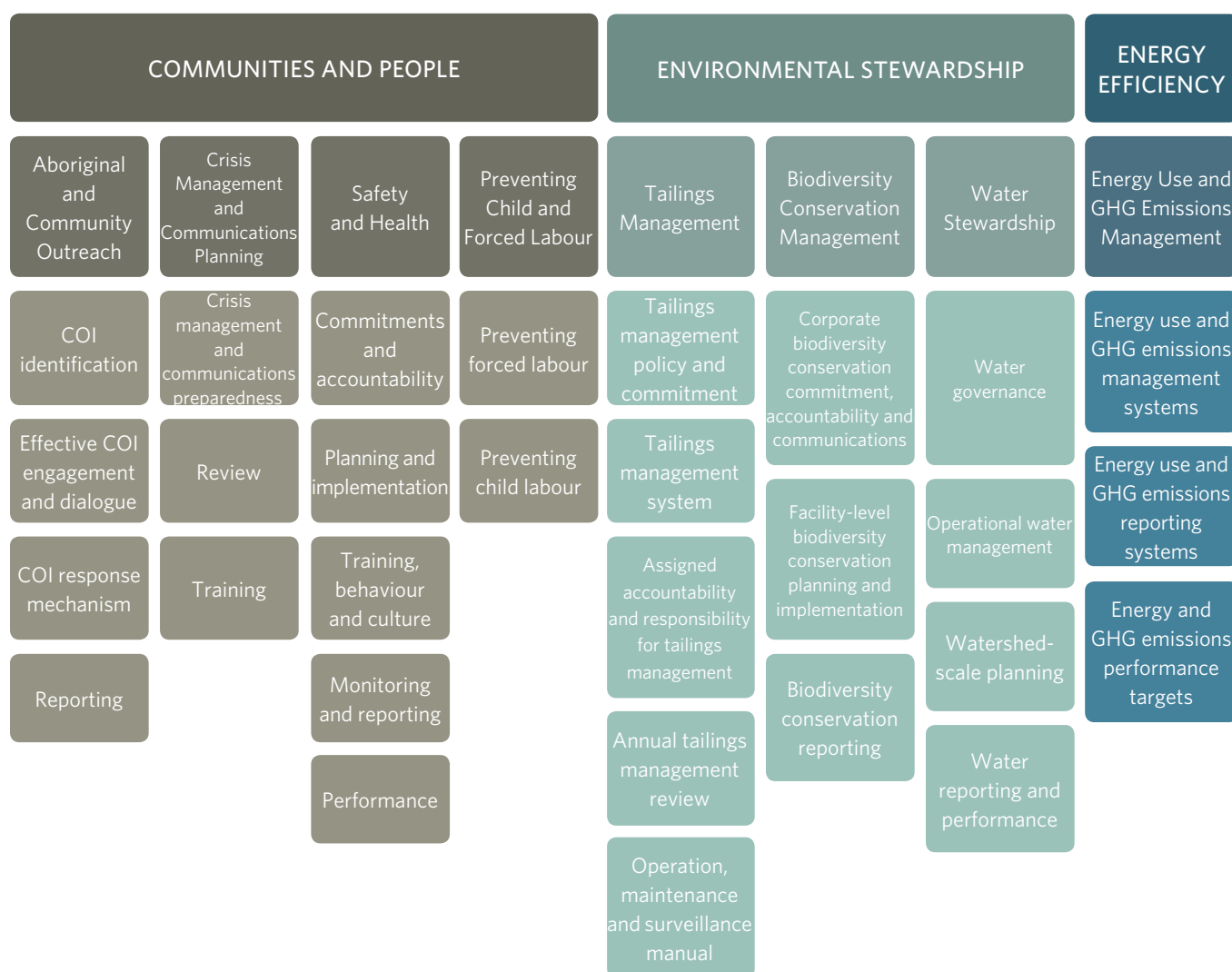
OUR COMMITMENTS

Mining companies that participate in TSM have collectively articulated their commitment to responsible mining through the *TSM Guiding Principles*. The *TSM Guiding Principles* are at the core of the initiative and represent mining companies' commitments pertaining to community engagement, environmental stewardship, and energy efficiency, with the goal of leaving lasting benefits for communities and future generations.

WHAT WE MEASURE

To translate commitments into action at the facility level, TSM employs performance Protocols that focus on three core areas: communities and people, environmental stewardship and energy efficiency. The performance Protocols are designed to help companies build and evaluate their systems and processes for key aspects of mining activity, as well as show Canadians what the industry's current environmental and social performance is and how it can be improved.

TSM Performance Protocols and Indicators



Each performance Protocol is made up of a set of indicators that focus on different components of a management system. Participating facilities are required to assess their management practices against the indicators for each of the seven performance Protocols.



Detailed assessment Protocols for each performance area provide guidance to assist companies in their self-assessments and to facilitate consistent application of *TSM* across companies and their facilities.

For each indicator, facilities receive one of five scores based on the criteria they meet. The scores are described below.

TSM Rating Scale

AAA	Excellence and leadership.
AA	Integration into management decisions and business functions.
A	Systems/processes are developed and implemented.
B	Procedures exist but are not fully consistent or documented; systems/processes planned and being developed.
C	No systems in place; activities tend to be reactive; procedures may exist but they are not integrated into policies and management systems.

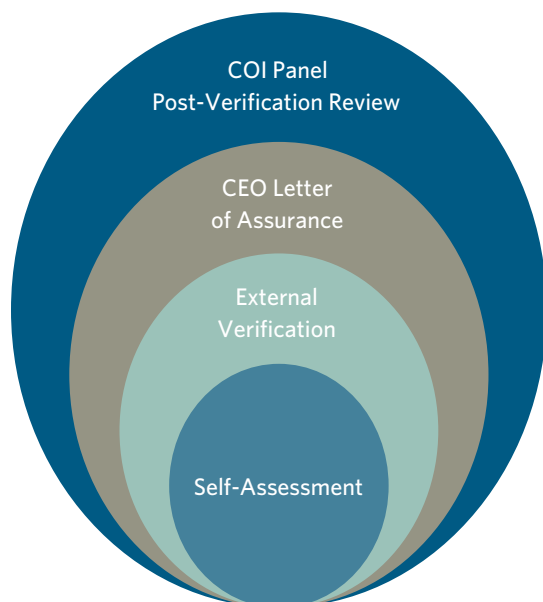
TSM's overarching goal is for all facilities to achieve a Level A or higher, which means they have fully implemented leading practices and procedures to effectively address the *TSM Aboriginal and Community Outreach*, *Safety and Health*, *Tailings Management*, *Biodiversity Conservation Management*, and *Energy Use and GHG Emissions Management* Protocols. For the *TSM Crisis Management and Communications Planning Protocol*, facilities and head offices are assessed based on a "yes" or "no" rating scale; the *TSM Preventing Child and Forced Labour Protocol* similarly assesses facilities based on a "yes" or "no" rating scale.

REPORTING AND EXTERNAL VERIFICATION

TSM's primary objectives are to drive performance improvement and, through demonstration of this improvement, to build trust with communities of interest. This means that communities need to understand *TSM* and trust the performance results that the mining companies report. To build this trust, the program includes a number of checks and balances to ensure that reported results present an accurate picture of each facility's management system and performance.



Layers of TSM External Verification



Self-Assessment: Facilities annually self-assess their performance against the *TSM* indicators.

For each indicator, they assign a letter grade that reflects their performance ranging from Level C to Level AAA. These grades are available in the *TSM Performance by Company* section of this report. New members have three years to start publicly reporting, which allows them the opportunity to train employees for full implementation.

This report includes externally verified performance results for 24 of the 67 facilities assessed in 2017.

External Verification: Every three years, a trained Verification Service Provider (VSP) critically reviews a company's self-assessments to determine if there is adequate evidence to support the performance ratings the facility has reported. The VSPs are experienced auditors who are independent of the company being verified. The VSPs rigorously apply the Protocols and, where required, can change the ratings to ensure they accurately reflect the facility's management practices and performance.

CEO Letter of Assurance: In the year of external verification, the company's CEO, or most senior executive in Canada, submits a letter to

MAC that confirms the external verification has been conducted in accordance with the Terms of Reference for Verification Service Providers. The letter is then posted on MAC's website (www.mining.ca).

COI Panel Post-Verification Review: Each year, MAC's independent COI Advisory Panel invites two companies to appear to present and discuss their *TSM* results. Through these discussions, the Panel tests to see whether and how facility systems are leading to performance improvement. The Panel explores the challenges faced by the facilities and the steps companies are taking to address them.

New Member Phase-In: New members and facilities that have recently entered into production have three years to start publicly reporting *TSM* performance. This phase-in period allows companies to conduct a gap analysis against *TSM* Protocol criteria and train relevant employees.

NEW MEMBER PHASE-IN SCHEDULE

- Year 1: Training and gap analysis
- Year 2: Aggregate-level reporting
- Year 3: Public facility-level reporting
- Year 4: External verification

In 2017, eleven facilities began reporting *TSM* results for the first time and their performance is incorporated into the aggregate graphs for each of the seven Protocols, if applicable.

REPORTING AND VERIFICATION PROCESS FOR HIGH PERFORMERS

In 2014, a revised reporting and verification framework was implemented for facilities that consistently achieve high levels of *TSM* performance. For facilities that follow this optional process, these changes reduce reporting burdens and provide more flexibility to align *TSM* verification requirements with other audit and verification commitments. The new framework is applied as follows:

Externally Verified Level A or AA

When a facility achieves an externally verified Level A or AA across all indicators of a Protocol, or a "yes" in crisis management planning, the annual self-assessment becomes voluntary for three years for the Protocol(s) that reach these levels. The facility must then undergo external verification before the end of that three-year period.

During the three-year period, facilities will remain at the same level for each indicator, but they can voluntarily report annually if they choose to demonstrate improved performance.

Two Cycles of Level A or AA/Externally Verified Level AAA

When a facility achieves a Level A or AA in two consecutive verification cycles, or a Level AAA in one verification cycle, the facility can move to a reduced verification cycle for the Protocol(s) that reach these thresholds. This means that the facility would conduct an internal verification and submit a letter of assurance from its CEO after three years. The facility would then undergo an external verification after six years.

In 2017, several companies were eligible to apply the revised reporting and verification framework for at least one Protocol. Two facilities that had achieved a Level AAA in their previous external verifications conducted internal audits instead of external verification for at least one of the Protocols this year.

COMMUNITY OF INTEREST ADVISORY PANEL

MAC established the COI Advisory Panel in 2004 to advise on the design and implementation of *TSM* and to provide a mechanism for two-way dialogue between MAC and its communities of interest in Canada. To date, the Panel has held 29 formal meetings and discussed a wide range of topics, including biodiversity conservation, tailings management, human rights, international development and, most recently, climate change, water and Aboriginal and community engagement.

The Panel's core functions include:

- Identifying current and emerging priority issues (environmental, social/cultural and economic) for the sector.
- Learning about the industry's performance on issues of interest, including how companies are engaging with local communities.
- Providing a place for rich dialogue and a source of input and guidance for MAC and its members on *TSM* and other work areas.
- Advising and encouraging MAC and its members to improve and raise the bar for environmental, social and economic performance.
- Advising MAC on the ongoing development and implementation of *TSM* and reviewing *TSM* implementation results.

🔗 For more information on the COI Panel, visit www.mining.ca/tsm

Industry Performance

Understanding the Results

TSM assessments are conducted at the facility level, where they are most meaningful. In 2006, 15 companies reported facility-level performance, and in 2017, this number grew to 23 companies, totalling 67 facilities. This report includes externally verified results for eight companies: Agnico Eagle, Cameco, Dominion Diamond Mines, First Quantum Minerals, IAMGOLD, Imperial Metals, Nyrstar and Teck.

In 2006, all reporting MAC members went through external verification of their TSM performance. The graphs that follow compare the percentage of facilities that achieved a Level A or higher in 2006 to the percentage of facilities that achieved a Level A or higher in 2016 and 2017 for the *TSM Aboriginal and Community Outreach Protocol* and the *TSM Tailings Management Protocol*. The graph for the *TSM Crisis Management and Communications Planning Protocol* shows the percentage of companies and facilities that answered “yes” for each indicator. The graphs for the *TSM Biodiversity Conservation Management Protocol* and the *TSM Safety and Health Protocol* compare the aggregate results for 2012, 2016 and 2017, as 2012 is the baseline year for these two Protocols. The graph for the *TSM Energy Use and GHG Emissions Management Protocol* compares the aggregate results for 2013, 2016 and 2017, as 2013 is the baseline year for this revised three-indicator Protocol. Finally, this is the first year for reporting assessments of the *TSM Preventing Child and Forced Labour Protocol*. This Protocol is reported by facilities every three years when they complete external verification. For detailed facility-level results, please see the *TSM Performance by Company* section of this report.



Agnico Eagle's Kittila Mine applies the Supervision Formula, as all of the Company's mine sites.



Industry Performance

Communities and People

Our actions must demonstrate a responsible approach to social, economic, and environmental performance that is aligned with the evolving priorities of our communities of interest.

– TSM Guiding Principles

This section highlights members' performance in the following Protocols: Aboriginal and Community Outreach, Crisis Management and Communications Planning, Safety and Health and Preventing Child and Forced Labour.

ABORIGINAL AND COMMUNITY OUTREACH

The *TSM Aboriginal and Community Outreach Protocol* helps mining facilities evaluate their activities and practices related to engagement with Aboriginal peoples and other Communities of Interest (COI). To achieve a Level A, a facility must identify the parties it should engage with, ensure engagement and dialogue are ongoing and meaningful, effectively respond to community concerns, and report on engagement activities in an open and transparent manner. See Figure 1 for a description of the requirements for achieving Levels A, AA and AAA.

Performance in this Protocol is measured against four indicators:

- Indicator 1: COI identification
- Indicator 2: Effective COI engagement and dialogue
- Indicator 3: COI response mechanism
- Indicator 4: Reporting

In the early years of *TSM*, many facilities' community engagement activities were guided by informal mechanisms. In 2006, approximately half of the participating facilities met the criteria of Level A performance, and only a handful had achieved Level AAA.

FIGURE 1 - ABORIGINAL AND COMMUNITY OUTREACH PROTOCOL: WHAT IS GOOD PRACTICE?

AAA	<ul style="list-style-type: none"> ✓ COI are invited to provide input into the identification of COI. ✓ COI contribute to reviews of engagement processes. ✓ Negotiated agreements with Aboriginal people are in place where appropriate. ✓ Facilities collaborate with COI to establish and achieve common objectives.
AA	<ul style="list-style-type: none"> ✓ COI with indirect and issue-based interests in the operation have been identified (e.g., a national non-governmental organization). ✓ COI capacity-building needs are identified to allow them to engage in effective participation on issues of interest or concern. ✓ Culturally specific engagement training is provided to the appropriate personnel. ✓ COI are invited to provide feedback on public reporting.

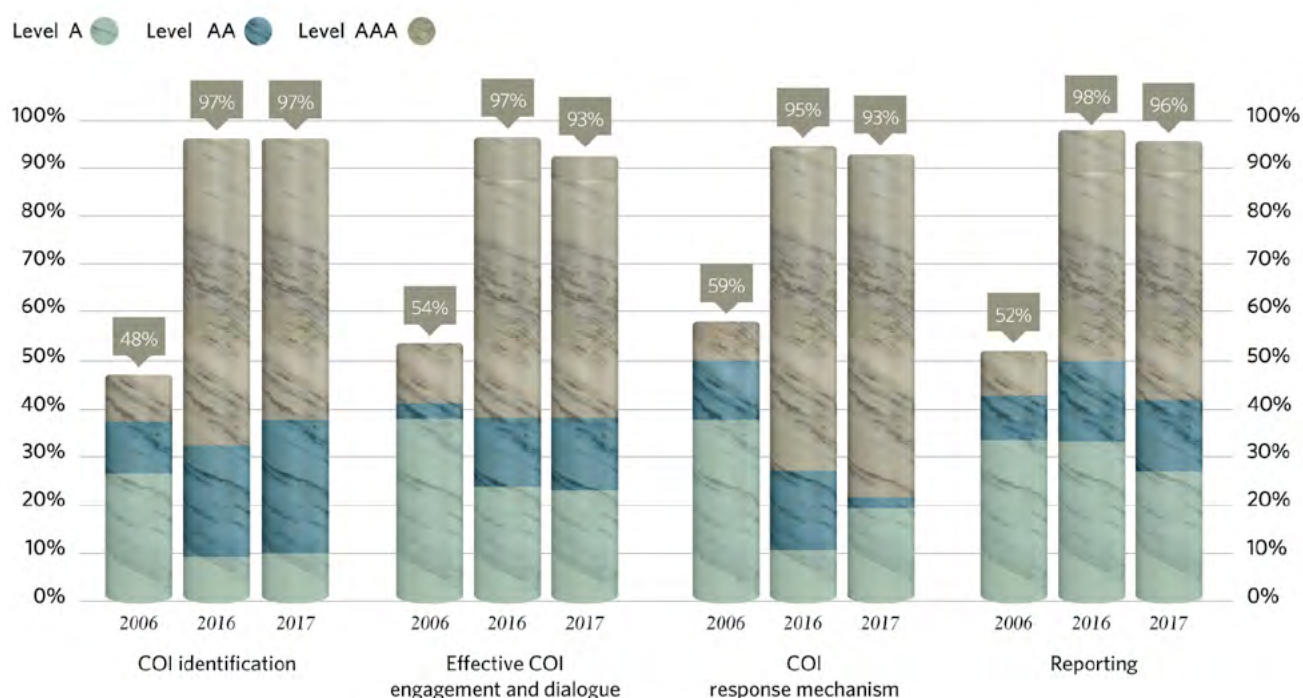


A

- ✓ COI have been identified.
- ✓ Meaningful two-way dialogue with COI occurs on a regular basis.
- ✓ Employees are trained in meeting Aboriginal consultation requirements.
- ✓ Assistance is provided to ensure COI are able to participate in engagement and dialogue processes when appropriate.
- ✓ A complaint and response mechanism provides the facility with an understanding of COI concerns.
- ✓ COI input is considered in decision making.
- ✓ Reporting on COI engagement includes responses to COI concerns.

Carrying on from 2016, performance across all four of the Protocol's indicators has remained strong, with over 90% of facilities continuing to achieve a Level A or higher. Of the facilities achieving a Level A or higher, over half of them are now being assessed at a Level AAA for all indicators. As Figure 2 shows, the results for 2017 are consistent with data presented in previous *TSM Progress Reports*.

FIGURE 2 - ABORIGINAL AND COMMUNITY OUTREACH ASSESSMENTS
PERCENTAGE OF FACILITIES AT A LEVEL A OR HIGHER 2006, 2016 AND 2017



2017 Highlights

- 97% have implemented mechanisms to identify COI.
- 93% have engaged in effective and meaningful two-way dialogue with COI.
- 93% have implemented a COI response mechanism.
- 96% report publicly on their engagement and dialogue activities.

This Protocol is currently undergoing a comprehensive review. Further information on Protocol revisions, in addition to the planned implementation schedule, will be provided in next year's *TSM Progress Report*.

CRISIS MANAGEMENT AND COMMUNICATIONS PLANNING

The *TSM Crisis Management and Communications Planning Protocol* provides mining companies with tools to effectively plan for communications in the unfortunate event of a crisis at one of their facilities or at the corporate level. Where the crisis is caused by a physical emergency, such as a fire or flood, the tools offered in this Protocol are intended to work in conjunction with emergency response plans at the facility.

The Protocol requires both head offices and facilities to develop crisis management plans, as well as establish crisis communications teams to support their execution. Facilities must be able to demonstrate, among other requirements, that they have crisis communications programs in place to effectively alert employees and the public of a crisis, its development and its resolution. They must also be able to demonstrate that their crisis management plan is regularly tested and updated. See Figure 3 for a description of the requirements for this Protocol.

Performance in this Protocol is measured using a “yes” or “no” rating scale against three indicators:

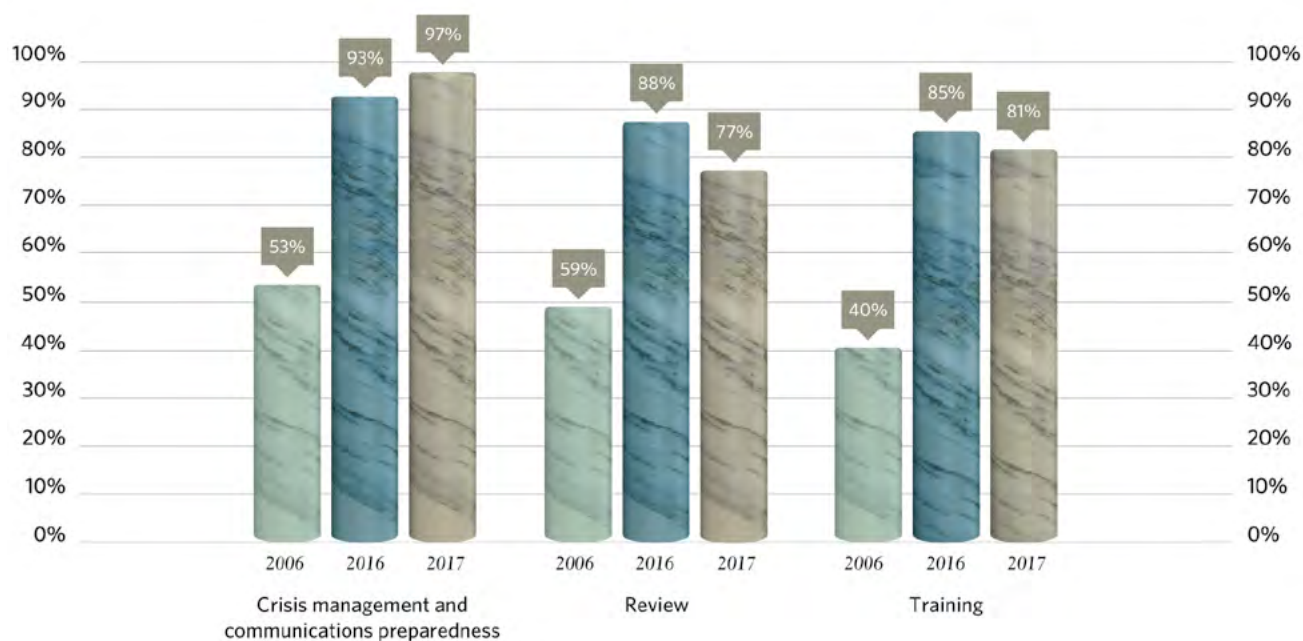
- Indicator 1: Crisis management and communications preparedness
- Indicator 2: Review
- Indicator 3: Training

FIGURE 3: TSM CRISIS MANAGEMENT AND COMMUNICATIONS PLANNING PROTOCOL:
WHAT IS GOOD PRACTICE?

YES	<ul style="list-style-type: none"> ✓ Crisis management and communications plan is implemented and regularly updated. ✓ CEO has endorsed the crisis management and communications plan. ✓ A media spokesperson is trained. ✓ Threats and risks have been identified. ✓ A notification system to activate the crisis management and communications plan is in place. ✓ Key media contact and telephone logs are prepared. ✓ Crisis management team is established and trained. ✓ Crisis control centre is established and equipped. ✓ Meetings with senior members of the local emergency response authorities occur every year. ✓ Mechanisms designed to communicate with employees and key stakeholders in the event of a crisis are tested. ✓ Crisis simulation training exercises are conducted every year.
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In 2006, approximately half of the participating facilities and companies had a crisis management plan that fulfilled TSM requirements. Since then, on an aggregate basis, the results have generally shown steady improvement over time. However, in 2017 we saw a decrease in the percentage of facilities achieving a Yes rating for Indicator 2: Review. This is partially attributed to the addition of over six new facilities to the TSM initiative. Figure 4 shows the results for each indicator.

FIGURE 4: CRISIS MANAGEMENT AND COMMUNICATIONS PLANNING ASSESSMENTS
PERCENTAGE OF COMPANIES AND FACILITIES RESPONDING “YES” 2006, 2016 AND 2017



2017 Highlights

- 97% have a crisis management and communications plan.
- 77% regularly review and update their crisis management and communications plan.
- 81% conduct crisis simulation training exercises.

SAFETY AND HEALTH

The *TSM Safety and Health Protocol* is designed to evaluate a facility's management practices related to occupational safety and health. Protecting the safety and health of employees and contractors is a fundamental component of *TSM* and is deeply engrained in the Canadian mining industry's culture. To achieve a Level A performance, facilities must demonstrate clear accountability for safety and health management, have processes in place that prevent the occurrence of incidents, provide proper training, and report their performance internally and externally. See Figure 5 for a description of the requirements for achieving Levels A, AA and AAA.

Performance in this Protocol is measured against five performance indicators:

- Indicator 1: Commitment and accountability
- Indicator 2: Planning and operation
- Indicator 3: Training, behaviour and culture
- Indicator 4: Monitoring and reporting
- Indicator 5: Performance

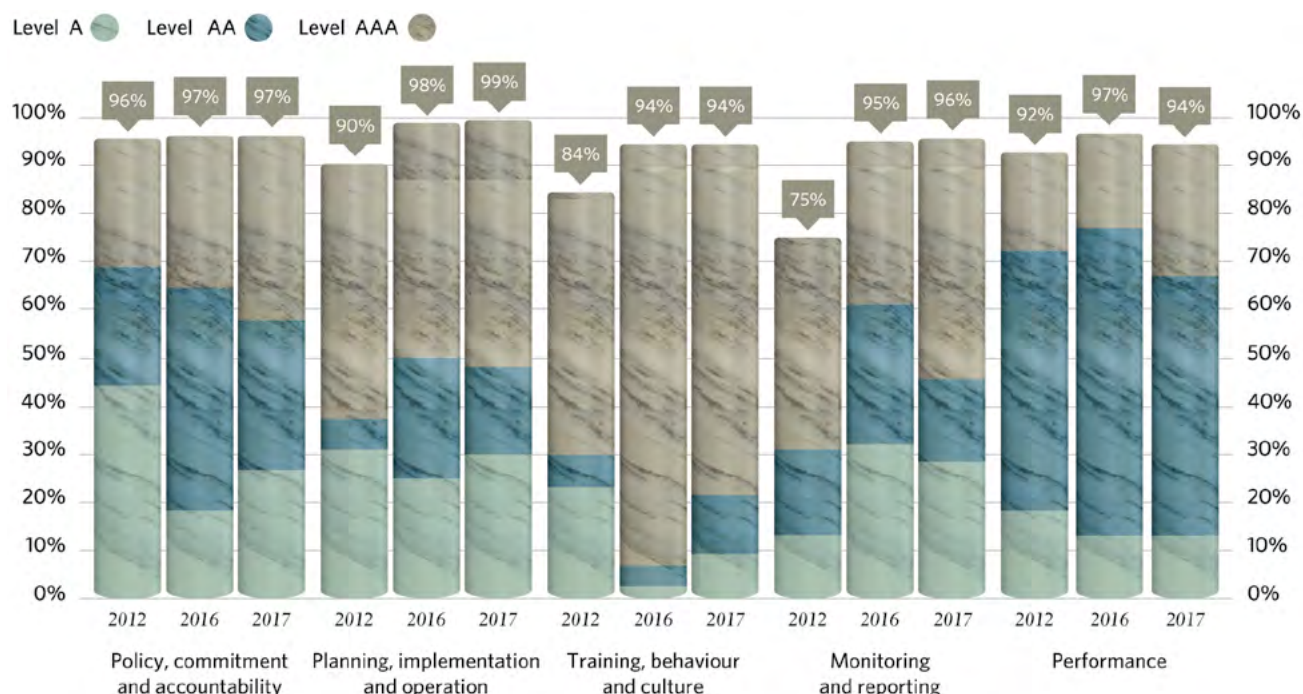
FIGURE 5: TSM SAFETY AND HEALTH PROTOCOL: WHAT IS GOOD PRACTICE?

AAA	<ul style="list-style-type: none"> ✓ External audit of safety and health commitments, management system and reporting mechanisms occurs. ✓ Commitment to safety and health is visibly embedded throughout the facility. ✓ Continual improvement targets are met and the facility is fatality-free for at least four years.
AA	<ul style="list-style-type: none"> ✓ Internal audit of safety and health commitments, management system and reporting mechanisms occurs. ✓ Safety-based culture is encouraged by integrating safety and health criteria into business processes (e.g., in purchasing decisions). ✓ Benchmarking of safety and health performance against peers is conducted. ✓ Performance targets are set for leading and lagging indicators.
A	<ul style="list-style-type: none"> ✓ Commitments to safety and health are endorsed by senior management and communicated facility-wide. ✓ Documented safety and health standards and procedures are implemented. ✓ Workplace inspections occur. ✓ Roles and responsibilities for safety and health are understood by all. ✓ Risk-based training as well as orientation for all personnel is conducted. ✓ Training is focused on hazard identification and presentation measures. ✓ Safety and health performance is monitored and tracked against leading and lagging indicators. ✓ Safety and health performance is publicly reported. ✓ Safety and health performance targets are established and communicated to the workforce.

On an aggregate basis, the results for this Protocol have been strong since public reporting began in 2012. Over 90% of facilities have achieved a Level A or higher across all five indicators, with many facilities assessed at Levels AA and AAA. In particular, improvements since 2016 are demonstrated for Indicator 2, where 99% of facilities have achieved a Level A or higher. At these performance levels, facilities have a documented health and safety management system that is established, implemented and maintained, there is a planned, documented and functional safety and health training program, and documented safety and health monitoring and reporting occurs.

As Figure 6 shows, the results for 2017 are consistent with data presented in previous *TSM Progress Reports*.

FIGURE 6: SAFETY AND HEALTH ASSESSMENTS
PERCENTAGE OF FACILITIES AT A LEVEL A OR HIGHER 2006, 2016 AND 2017



2017 Highlights

- 97% demonstrate commitment and accountability to safety and health.
- 99% have formal safety and health management systems.
- 94% have safety and health training programs.
- 96% monitor and report safety and health performance.
- 94% have established safety and health performance targets.

In 2016, the *TSM Safety and Health Protocol* was updated to include new criteria focused on industrial hygiene along with other minor amendments to incorporate lessons learned over the Protocol's first four years of implementation. Facilities began reporting against the revised Protocol this year. The next comprehensive review of the *TSM Safety and Health Protocol* is scheduled for 2023, with an interim review planned for 2020.

PREVENTING CHILD AND FORCED LABOUR

In 2017, the TSM Guiding Principles were revised to incorporate commitments consistent with the International Labour Organization conventions on forced and child labour with the objective of preventing child labour and forced labour at mining operations:

MAC members are committed to respecting the rights of our workers and not engaging in practices of forced or child labour, as defined in the International Labour Organization Conventions 29, 238 and 182.

Member companies' adherence to this commitment is assessed every three years as part of the external verification process. Recognizing that the level of risk associated with these issues varies considerably by jurisdiction and that the complexity of company processes should be based on risk, processes will vary from company to company and will range from ensuring human resources practices are consistent with national/sub-national labour laws to sophisticated due diligence processes necessary in higher risk jurisdictions.

Performance in this Protocol is measured using a "yes" or "no" rating scale against two indicators:

- Indicator 1: Preventing Forced Labour
- Indicator 2: Preventing Child Labour

FIGURE 7: TSM PREVENTING CHILD AND FORCED LABOUR PROTOCOL: WHAT IS GOOD PRACTICE?

YES Preventing Forced Labour	<ul style="list-style-type: none"> ✓ There are processes in place that are commensurate to jurisdictional risks to ensure that forced labour is not used. ✓ Where there is a high risk of forced labour, supply chains and recruitment agencies are monitored for human trafficking and forced labour.
YES Preventing Child Labour	<ul style="list-style-type: none"> ✓ There are processes in place that are commensurate to jurisdictional risks to ensure that no child under 18 years of age engages in work that is likely to jeopardize the health, safety or morals of young persons. ✓ There are processes in place that are commensurate to jurisdictional risks to ensure that no child under 15 years of age is employed.



Haul trucks are lined-up and ready to go at Agnico Eagle's Kittila Mine in Finland.

In the first year of reporting, all facilities undergoing external verification have demonstrated they have processes in place to prevent child and forced labour and any associated risks; these facilities are listed in Figure 8 below.

FIGURE 8: FACILITIES VERIFYING 'YES' TO PREVENTING CHILD AND FORCED LABOUR INDICATORS

COMPANY	FACILITY
Agnico Eagle	Goldex Kittila La India LaRonde Meadowbank Mine Canadian Malartic Pinos Altos
Cameco	Key Lake Operations McArthur River
Dominion Diamond Mines	Ekati Diamond Mine
First Quantum Minerals	Cayeli Bakir Isletmeleri Copper Range Company White Pine Mine Lac Dufault Samatosum Mine Sturgeon Lake Project Troilus Mine Winston Lake Mine
IAMGOLD	Essakane Rosebel Gold Mines Westwood
Imperial Metals	Mount Polley
Nyrstar	Langlois
Teck	Coal Mountain Operations Line Creek Operations

Over the course of the next two years, the remaining facilities will undergo external verifications that will include the *Preventing Child and Forced Labour Protocol*. Additionally, in 2018 MAC will be adding additional guidance to the Protocol in the form of a series of Frequently Asked Questions to ensure that lessons learned through the first year of application are incorporated.

The following case studies illustrate what TSM excellence and leadership look like in practice. The initiatives described below are in the spirit of the TSM Guiding Principles and Protocols related to communities and people.



Vale Case Study

Sudbury Alerts Program Supports Community Safety

The City of Greater Sudbury, with a population of 150,000, has grown up around Vale's facilities over more than 100 years of operation. Vale's Sudbury operations currently include five operating mines, a mill, a smelter, a nickel refinery and a large tailings facility. In early 2017, Vale funded and launched Sudbury Alerts in partnership with the City, which has greatly improved the region's emergency preparedness.

The mass public notification service enables Vale and the City to instantly send safety messages to the public, regardless of whether the emergency is associated with Vale's operations. Sudbury Alerts is fully integrated into the local 911 command centre and communications network.

It took considerable community and stakeholder involvement to develop and implement Sudbury Alerts. Vale worked closely with Greater Sudbury's emergency services, utilities and health unit, as well as another local mining company, Glencore. To prepare for its launch, Sudbury Alerts was pre-loaded with 60,000 white page listings. A comprehensive campaign was also undertaken to make residents aware of the service and to encourage them to sign up. During Emergency Preparedness Week, Vale hosted an open house to promote the new service and to show residents how Vale responsibly mitigates hazards associated with its operations.

Residents can register multiple phone numbers and methods of contact. They can also specify locations where they would like to receive notifications such as at home, at work, their child's school, and more. The benefits of Sudbury Alerts were clearly felt during its first use in November 2017 during a gas leak emergency at a local shopping mall. The building was quickly evacuated and residents across the city were instructed to stay out of the affected area.



Vale's Nikki Lefebvre, Emergency Preparedness Coordinator, during the Emergency Preparedness Week Open House in May 2017.





New Gold Case Study

Closure Plan Prioritizes Community Needs

After more than two decades of planning, constructing and operating, New Gold's Cerro San Pedro Mine in Mexico initiated closure in 2016. However, the mine's Integrated Closure Plan was launched years before that to help workers and local communities plan for a transition to a post-mining economy.

The mine is located within the municipality of Cerro de San Pedro, with a population of about 5,000 people. The mine employed a collaborative approach so that community members and employees had a voice in the plan's development and implementation. The objective was to ensure the mine's legacy was a positive one concerning the environment and the sustainability of the 13 communities surrounding it.

The plan's measures go beyond regulatory requirements and focus on several core areas: helping community members and workers find new employment opportunities, improving the region's prospects for economic development, and restoring and protecting the environment.

The closure plan launched the Entrepreneurial Development Program, which is focused on diversifying the region's economy. This multi-stakeholder, community-driven program has generated a wave of entrepreneurship and helped create several new small businesses. The mine also partnered with local communities, training institutions and government agencies to deliver other valuable types of training, such as budgeting and financial planning, computer skills, and certification programs in various trades. In 2016, these training programs offered a total of 520 positions, of which 84% were occupied by local women.

New Gold invested in important community infrastructure, a key aspect to economic development. This included roads, power lines, potable water facilities, schools, clinics, and more. The company also invested in the rehabilitation and restoration of historical buildings in the municipality.

At the mine site, the Integrated Closure Plan included significant commitments to restore and protect the environment. For example, nearly 400 hectares of land were reforested with local plant species with assistance from community volunteers. The mine also dismantled mine infrastructure and instituted long-term monitoring of the site.



Community Scholarship Program, supported by New Gold's Cerro San Pedro Mine in Mexico.





Industry Performance

Environmental Stewardship

A goal of TSM is to minimize the impact of mining activity on the environment and biodiversity through all stages of development, from exploration to closure.

– TSM Guiding Principles

This section describes how facilities have developed systems to bolster environmental stewardship through best practices in both tailings and biodiversity conservation management. In addition to tailings and biodiversity, MAC recently finalized a new Water Stewardship Protocol that will be phased-in over the next few years, with public reporting scheduled to begin in 2021.

TAILINGS MANAGEMENT

The current *TSM Tailings Management Protocol* is designed to go beyond adherence to technical standards and to ensure responsible tailings management. Currently, in order to achieve a Level A or higher, facilities must demonstrate adherence to the tailings management guides. This includes having a policy in place, in addition to demonstrating commitment, to responsibly manage tailings. Achieving a Level A or higher also includes implementing a robust tailings management system, in addition to operation, maintenance, and surveillance activities. This is necessary to ensure effective implementation through conducting annual reviews of tailings management performance and assigning accountability for tailings management to the most senior officer of the company (e.g., the CEO). See Figure 7 for a description of the requirements for achieving Levels A, AA and AAA.

Performance in this Protocol is measured against five indicators:

- Indicator 1: Tailings management policy and commitment
- Indicator 2: Tailings management system
- Indicator 3: Assigned accountability and responsibility for tailings management
- Indicator 4: Annual tailings management review
- Indicator 5: Operation, maintenance, and surveillance (OMS) manual and emergency preparedness

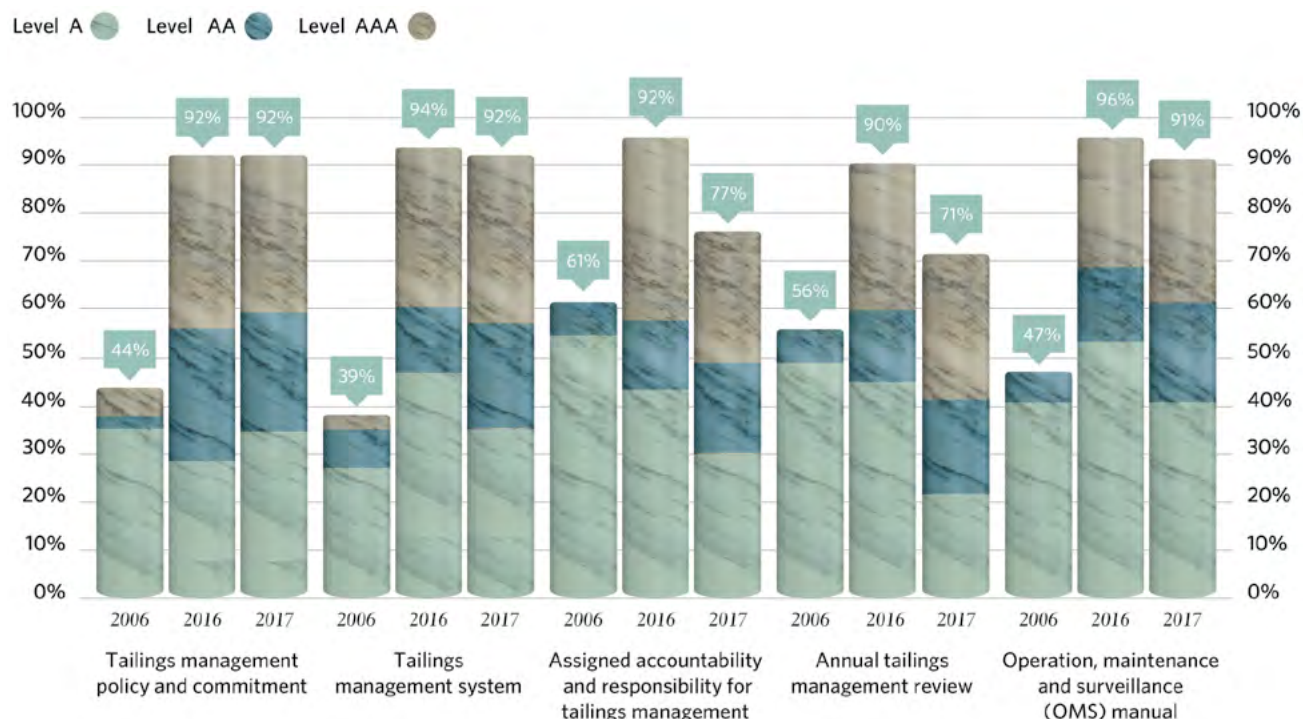
FIGURE 7 - TAILINGS MANAGEMENT PROTOCOL: WHAT IS GOOD PRACTICE?

AAA	✓ The facility's tailings management policy, system and procedures are evaluated for effectiveness.
AA	✓ Independent external audit or assessment of the facility's tailings management policy, system and procedures occurs.
A	<ul style="list-style-type: none"> ✓ Tailings management policy and/or commitments are implemented. ✓ Independent review of tailings management is conducted on a routine basis. ✓ Processes to manage critical controls. ✓ Overall accountability for tailings management is assigned to the company's CEO or COO. ✓ Risk assessment is conducted. ✓ Emergency preparedness plans are developed and tested. ✓ Annual review of tailings management system occurs. ✓ Operation, maintenance and surveillance manual is in place.



Overall, Figure 8 demonstrates a continual strong performance for the Protocol's Indicator 1: Policy and commitment, Indicator 2: Management system and Indicator 5: OMS manual, with over 90% of facilities assessed at a Level A or higher. On the other hand, there has been a decrease in facilities reporting Level A or higher for Indicator 3: Assigned accountability and responsibility and Indicator 4: Annual review. This drop can be partially attributed to facilities new to TSM who are still working to align their systems with the program criteria. In addition, seven facilities (including six closed sites), that previously reported Level As were downgraded to Level Cs for Indicator 3 and Level Bs for Indicator 4 during external verification.

FIGURE 8: TAILINGS MANAGEMENT ASSESSMENTS
PERCENTAGE OF FACILITIES AT A LEVEL A OR HIGHER 2006, 2016 AND 2017



2017 Highlights

- 92% have implemented a management policy for and demonstrated commitment to responsible tailings management.
- 92% have implemented a tailings management system.
- 77% have assigned accountability for tailings management to the company's CEO or COO.
- 71% have conducted an annual tailings management review.
- 91% have developed and implemented an operation, maintenance and surveillance manual.

TAILINGS MANAGEMENT REVIEW

Immediately following the Mount Polley tailings dam breach in 2014, the MAC Board of Directors launched a thorough review of the *TSM Tailings Management Protocol* and associated guidance documents. As part of this review, MAC commissioned an independent TSM Tailings Management Review Task Force in March 2015 to perform an external review of TSM's requirements and guidance for tailings management. In November 2015, the Task Force provided MAC with its final report containing 29 recommendations to enhance the Protocol and guides. The full Task Force report can be downloaded at www.mining.ca/reports.

Since the release of the Task Force's report in 2015, MAC and its members have been working to implement the 29 recommendations, which resulted in an updated *TSM Tailings Management Protocol* in addition to the third edition of *A Guide to the Management of Tailings Facilities (the Tailings Guide)*, released in late 2017.

In 2018, MAC made additional enhancements to the Tailings Guide. The revisions provide detailed guidance on the development and testing of emergency preparedness plans and emergency response plans, based on the Canadian Dam Association's *Dam Safety Guidelines*, but tailored to tailings facilities. The *TSM Tailings Management Protocol* has been updated to ensure alignment with these changes.

Throughout 2018, the primary focus was on strengthening MAC's *Developing an Operation, Maintenance, and Surveillance Manual for Tailings and Water Management Facilities* (the OMS Guide). The OMS Guide has been substantially re-worked and modernized, while retaining the strengths of the current version, which was originally written in 2003. It responds to the recommendations of the external TSM Tailings Review Task Force and builds on lessons learned over the last 15 years of developing and implementing site-specific OMS manuals.

The second edition of the OMS Guide integrates a risk-based approach and strongly emphasizes the critical role that OMS activities play in the management of risk. A recurring theme of the OMS Guide is that OMS activities must be based on the performance objectives, risk management plan and critical controls of the tailings facilities to which they are applied. As such, it is essential that OMS manuals be developed in a site-specific manner.

In addition, the second edition of the OMS Guide:

- Is aligned with the third edition of the Tailings Guide, establishes clear linkages with the tailings management framework described in the Tailings Guide, and emphasizes that OMS activities are essential to the effective implementation of site-specific tailings management systems.
- Emphasizes that to be effective, OMS manuals must be:
 - Developed on a site-specific basis.
 - Up-to-date.
 - Readily accessible to all personnel involved in tailings management.
- Helps to ensure that OMS manuals are effective tools for managing change.
- Reflects a life cycle approach to OMS manual development and evolution.
- Reflects current approaches to surveillance, with greater emphasis on:
 - Identification of surveillance parameters and frequencies based on risk and critical controls.
 - Analysis of surveillance data and the use of data in decision making.

Amendments to the Protocol and indicators introduced in 2017 will take effect in 2019.

BIODIVERSITY CONSERVATION MANAGEMENT

Adopting best practices in biodiversity conservation management through all stages of a mine's life cycle is an industry priority. The *TSM Biodiversity Conservation Management Protocol* evaluates and confirms a facility's commitment to biodiversity conservation. Facilities that achieve Level A performance in this Protocol engage with key communities of interest – government, Aboriginal communities and conservation organizations – to develop biodiversity objectives and strategies. They also put in place mechanisms to assess, mitigate and compensate for impacts on biodiversity. See Figure 9 for a description of the requirements for achieving Levels A, AA and AAA.

Performance in this Protocol is currently measured against three indicators:

- Indicator 1: Corporate biodiversity conservation commitment, accountability and communications
- Indicator 2: Facility-level biodiversity conservation planning and implementation
- Indicator 3: Biodiversity conservation reporting

FIGURE 9: TSM BIODIVERSITY CONSERVATION MANAGEMENT PROTOCOL: WHAT IS GOOD PRACTICE?

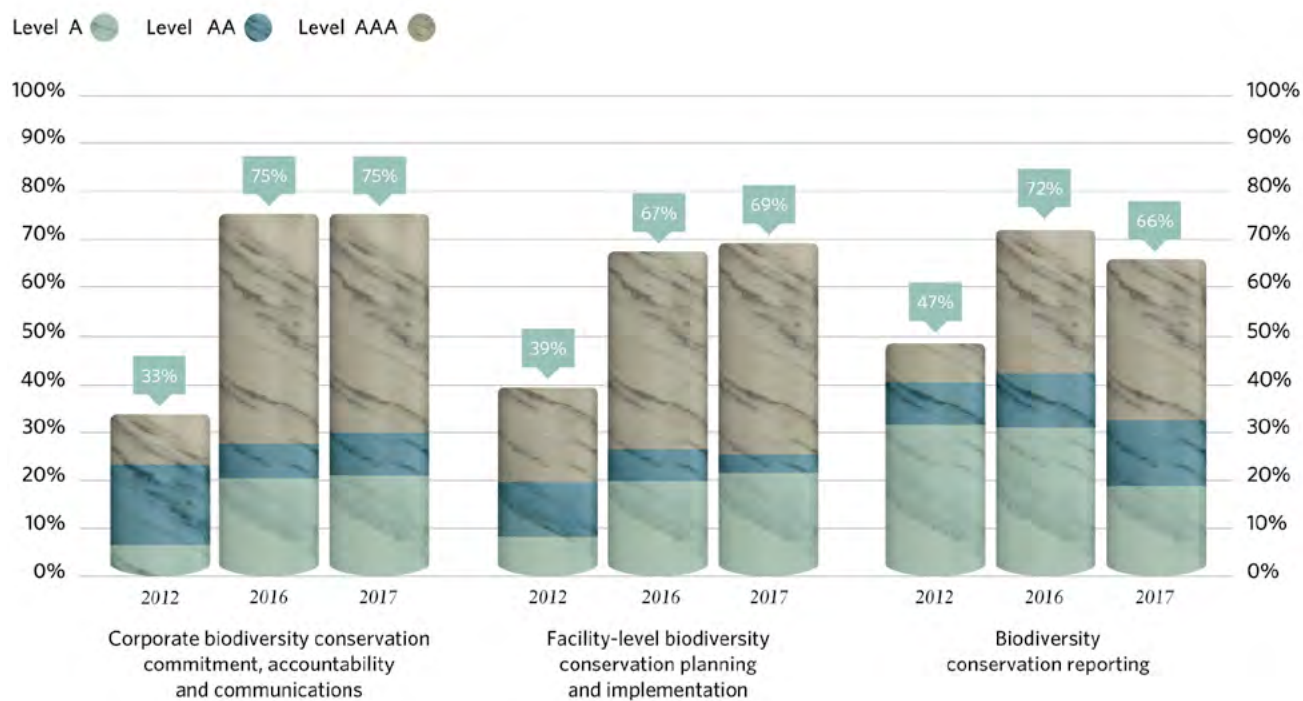
AAA	<ul style="list-style-type: none"> ✓ Partnerships are sought with other organizations (e.g., an environmental non-governmental organization) to achieve conservation objectives. ✓ Investments in research and development enhance understanding of and contribution to biodiversity conservation, science and Traditional Knowledge. ✓ Enhancements to biodiversity are made beyond the facility. ✓ Employee volunteerism in community-based biodiversity initiatives is encouraged. ✓ Community of interest feedback on public reporting is actively sought and publicly reported.
AA	<ul style="list-style-type: none"> ✓ Biodiversity conservation management is integrated into core business planning processes (e.g., the annual budget process). ✓ Internal verification of biodiversity conservation commitments, management and public reporting occurs.
A	<ul style="list-style-type: none"> ✓ Senior management commitment to biodiversity conservation is demonstrated. ✓ Impacts and risks to biodiversity are assessed and mitigated. ✓ Key communities of interest (e.g., governments, Aboriginal communities and conservation groups) are involved in biodiversity conservation efforts. ✓ Awareness for biodiversity conservation is included in facility training programs. ✓ Biodiversity conservation activities and performance are publicly reported.

MAC members have continued to make significant improvements across the three indicators since 2012, the first year of public reporting for this Protocol. As Figure 10 shows, on an aggregate basis, the results for the first two indicators have improved over the past year, while Indicator 3, which focuses on reporting, declined. This decrease is attributed to facilities new to TSM that are still working to align their systems with the program criteria.



Caribou monitoring at Dominion Diamond's Ekati Diamond Mine.

FIGURE 10: BIODIVERSITY CONSERVATION MANAGEMENT ASSESSMENTS
PERCENTAGE OF FACILITIES AT A LEVEL A OR HIGHER 2012, 2016 AND 2017



2017 Highlights

- 75% have senior management commitment to biodiversity conservation in place.
- 69% have implemented a biodiversity conservation management system.
- 66% report publicly on biodiversity conservation activities and performance.

 The following case studies illustrate what TSM excellence and leadership look like in practice. The initiatives described below are in the spirit of the TSM Guiding Principles and Protocols related to environmental stewardship.



Vale Case Study

A SLAM Dunk in Waste Management

SLAM Dunk is an innovative program at Vale's Manitoba operations with an ambitious goal of diverting 100% of waste materials from landfill by adhering to the three R's: reduce, reuse and recycle.

The SLAM Dunk program relies on employees, contractors and visitors to do their part in reducing waste at the mine site. The system involves segregating waste at the source into 13 streams, 10 of which are separated into colour-coded containers on-site. These bins are located throughout the facilities and, once full, are emptied into larger receptacles and then processed for reuse or proper disposal. This process eliminates the need to sort materials after collection, making waste management safer, faster and more cost effective. Some of the sorted materials have even generated revenue for Vale. Rebates from pallets, recycling and wet cell batteries have been reinvested into the SLAM Dunk program.

This program provides a simple and highly effective way to reduce waste while promoting both environmental awareness and concurrently demonstrating the company's values. When it launched in 2013, it had an immediate impact, diverting 50% of Vale's waste from landfills. In 2017, this number grew to 76% across Vale's Manitoba operations.

Another indicator of the program's success is the level of waste segregation achieved by the various work sites. This is based on how much of the waste placed into SLAM Dunk's 13 waste streams is put into the right location, allowing for the efficient disposal or reuse of materials. In 2014, two Thompson work sites achieved 100% waste segregation, while three other sites achieved 90% segregation. In 2017, Vale's Manitoba work sites achieved an average of 98% proper waste segregation. These are impressive figures that underscore employee ownership, and the fact that every person on the plant site is a member of the waste management team.

The SLAM Dunk Program can be easily replicated, and Vale staff promote the program within the community. Vale has engaged with youth to highlight the importance of waste management and to encourage them to find ways to reduce waste in their own lives. The learning has been reciprocal as green teams in schools have learned from SLAM Dunk, and Vale has learned from the students.



Vale's Manitoba operations' waste management program, SLAM Dunk.



Ekati Diamond Mine Case Study

Innovative Reclamation Research at Ekati Diamond Mine

Ekati Mine's Long Lake Containment Facility (LLCF) is where most of the kimberlite is stored after the extraction of diamonds from the kimberlite ore. Since 2012, Ekati has been assessing methods to stabilize the processed kimberlite while producing a viable, self-sustaining ecosystem that is compatible with a healthy environment, human activities, and the surrounding community.

Rather than applying the standard method of capping the area with clean granite, Dominion Diamond has favoured an approach that combines vegetation and rock formations in a way that more closely resembles the natural surroundings. A reclamation research project at Ekati has been focusing on examining the use of mine-generated organic matter for a site-based composter, evaluating combinations of rock and vegetation, mycorrhizae inoculation and bioengineered streambank stabilization.

Substantial effort and resources have been invested in this pilot program over the past six years, and results have been shared with the community and regulators for their input. As a result of this work, Ekati has evaluated a very wide range of potential options to optimize use and storage of processed kimberlite in the Arctic.

This project was the first of its kind in Canada's North, and the information and innovations produced could establish Protocols suitable for application in similar Arctic operations across the circumpolar globe. Findings and updates from the LLCF pilot program are presented annually through the Annual LLCF Research Report.

Directly transferrable information includes:

- How and where to employ processed kimberlite stabilization measures such as vegetation, rock additions, and streambank development and stabilization.
- What species may be best suited to specific goals.
- The usefulness of mycorrhizae (i.e. root fungi) in promoting re-vegetation.
- How to facilitate native vegetative growth through practical and implementable strategies, such as soil amendment, erosion reduction, and water retention.

Dominion Diamond's research has produced reliable evidence of both the ability and efficacy of these measures to attain reclamation endpoints in an unexpectedly short timeframe given the harsh environment. Birds, hares, sik-siks, wolves, caribou and grizzly bear have all been observed using the trial vegetation areas.

The benefits of Dominion Diamond's research may also extend beyond diamond mines. Many mines and exploration projects produce fine-grained tailings and drill cuttings which may be difficult to reclaim in the cold, arid, low-productivity and unique to the Arctic environment. For sites with tailings which do not chemically require a rock or water cap (e.g. where metal leaching or acid rock drainage is not anticipated to be a concern), broadly transferrable aspects of Dominion Diamond's findings include: methodologies for native Arctic seed collection and re-distribution; natural and cultivated establishment/colonization abilities of different native plants; evaluation of suitable equipment for tilling and planting in fine tailings; optimal conditions for vegetation grown on fine-grained tailings; use of remote cameras to document wildlife use of reclaimed areas; and benefits of using a site-based composter to generate remediation material and reduce costs and project emissions.

Outcomes of the LLCF pilot study have already influenced remediation planning and efforts at other Canadian Arctic mine sites. One example is the Hope Bay gold mine which used Ekati as a case study when determining how to reclaim old drill cuttings. Although the results of the compost-amended processed kimberlite are still being gathered, Dominion Diamond has already noted a keen interest from other mines in the outcomes of this research project. Dominion Diamond aims to set industry standards with the LLCF pilot study and has presented at a number of international conferences and local workshops since 2013.



Industry Performance

Energy Efficiency

Mining companies that participate in TSM practice continuous improvement by applying new technology, innovation and best practices in all facets of their operations.

– TSM Guiding Principles

This section highlights members' performance in energy use and GHG emissions management.

ENERGY USE AND GHG EMISSIONS MANAGEMENT

Improving energy efficiency and reducing GHG emissions are priorities for the Canadian mining industry as a way to limit impacts to the environment, address climate change and help reduce operational costs at a facility. The *TSM Energy Use and GHG Emissions Management Protocol* helps facilities evaluate their practices and processes related to energy conservation and GHG emissions reduction. To achieve a Level A in this Protocol, facilities must ensure energy data are reviewed regularly and are well integrated into operator actions. They must also set and achieve performance targets. See Figure 11 for a description of the requirements for achieving Levels A, AA and AAA.

Performance in this Protocol is measured against three indicators:

- Indicator 1: Energy use and GHG emissions management systems
- Indicator 2: Energy use and GHG emissions reporting systems
- Indicator 3: Energy and GHG emissions performance targets

FIGURE 11: TSM ENERGY USE AND GHG EMISSIONS MANAGEMENT PROTOCOL: WHAT IS GOOD PRACTICE?

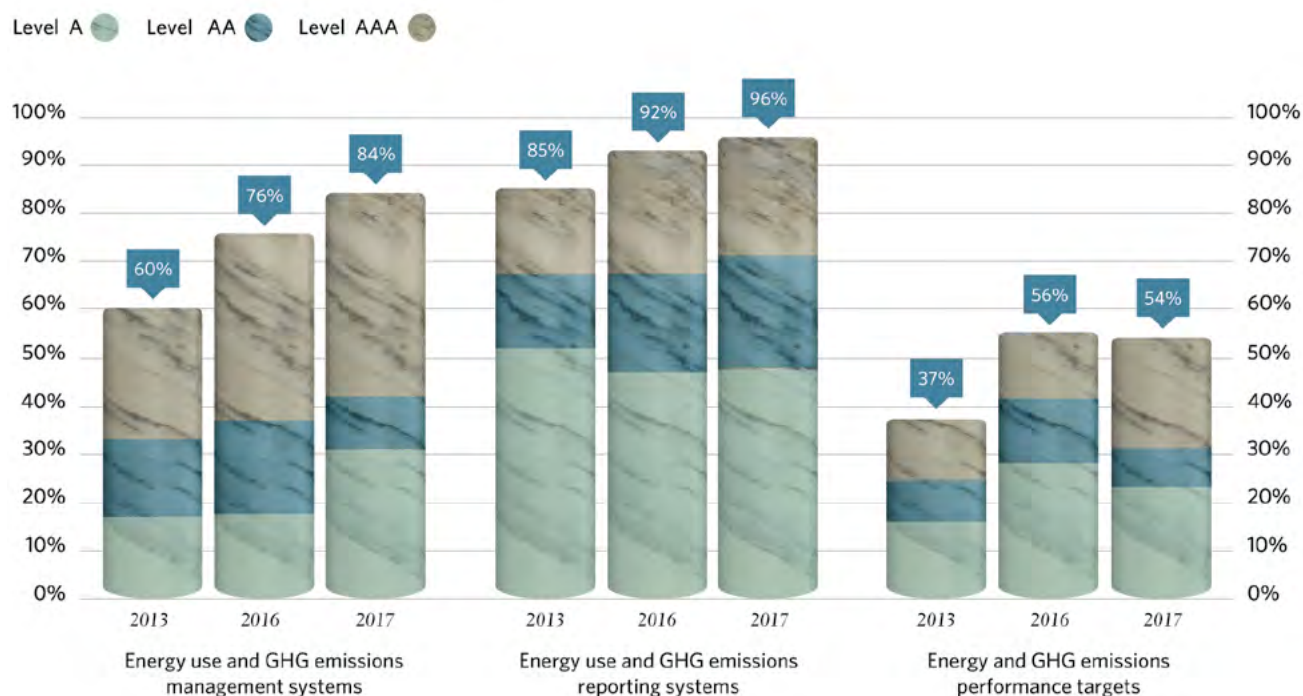
AAA	<ul style="list-style-type: none"> ✓ Procurement policies incorporate energy efficiency and GHG emissions reduction elements. ✓ Investments in renewable energy and research and development occur. ✓ Energy use and GHG emissions reporting and performance is externally verified ✓ Some Scope 3 emissions are included in public reporting. ✓ Continuous improvement targets are used to demonstrate reductions against historical trends.
AA	<ul style="list-style-type: none"> ✓ Energy use and GHG emissions are factored into business planning. ✓ Energy use and GHG emissions reporting and performance is internally verified. ✓ Corporate energy use and GHG emissions strategy is publicly available. ✓ Energy use and GHG emissions performance targets are consistently met.
A	<ul style="list-style-type: none"> ✓ Comprehensive procedures and practices related to energy use and GHG emissions are in place. ✓ Energy consumption and GHG emissions data are monitored, tracked and publicly reported. ✓ Energy and GHG emissions data are used to support senior management decision making. ✓ Accountability for energy use and GHG emissions is assigned to operational managers. ✓ Training on energy efficiency is provided to personnel. ✓ Energy use and GHG emissions performance targets are set and achieved.

Recognizing that energy use and GHG emissions are not a material business risk for all companies and facilities, MAC has incorporated a materiality threshold into the Protocol. Facilities whose GHG emissions are less than 25 kilotonnes of CO₂ equivalent, or whose on-site energy usage is less than 25,000 gigajoules, are not required to report on Indicators 1 or 3 of this Protocol.



In 2013, MAC revised this Protocol, condensing the number of indicators from six to three. This change acknowledged that in the mining sector, facilities produce GHGs primarily through the burning of fossil fuels for energy and, as a result, GHG emissions are controlled by managing energy consumption. Historical data from 2006 to 2012 can be found in the 2014 *TSM Progress Report*. Figure 12 presents the 2013, 2016 and 2017 performance for the three indicators and shows the steady improvements that have been made since 2013 for all three. In particular, Indicator 1, which requires a comprehensive energy use and GHG emissions management system, has seen a 9% increase in facilities reporting a Level A or higher.

**FIGURE 12: ENERGY USE AND GHG EMISSIONS MANAGEMENT ASSESSMENTS
PERCENTAGE OF FACILITIES AT A LEVEL A OR HIGHER 2013, 2016 AND 2017**



2017 Highlights

- 84% have comprehensive energy use and GHG emissions management systems.
- 96% have implemented energy use and GHG emissions management reporting systems.
- 54% have established and met performance targets.

🔍 The following case study illustrates what TSM excellence and leadership look like in practice. The initiatives described below are in the spirit of the TSM Guiding Principles and Protocols related to energy efficiency.



Agnico Eagle Case Study

New Rail-Veyor System Delivers Environmental Benefits

In a recently expanded area of Agnico Eagle's Goldex Mine in Quebec, an innovative Rail-Veyor system transports ore and, at the same time, generates significant environmental benefits for the mine. Operated remotely, the Rail-Veyor system, produced by a Canadian company, consists of six trains powered by 90 electric drive-stations along the rail line. A total of 408 two-wheeled cars move the ore on light tracks installed between 730 and 1,200 metres underground.

The Goldex Mine was the first in North America to deploy the Rail-Veyor system in an active industrial setting. Thanks to the Rail-Veyor system, the mine was able to restrict its mobile, diesel-powered heavy equipment fleet to just four trucks in the Deep Zone, rather than 14. As with the wider industry, diesel is one of the main sources of GHG emissions at the Goldex Mine. Through this Rail-Veyor system, the mine is significantly reducing its GHG emissions by having 10 fewer trucks in operation. The mine estimates that its GHG emissions for this process are 40% lower than they would have been under a business-as-usual scenario. Agnico Eagle's successful deployment of this technology has challenged the generally accepted rule that deepening an underground mine leads to an increase in fuel consumption.

This innovation has also created a safer working environment by considerably reducing noise, dust, carbon monoxide and other emissions. Having fewer underground trucks also reduces the risk of accidents. While the Rail-Veyor system has increased electricity consumption by about 5% annually, it has also reduced the need for ventilation as less heat and fewer contaminants are generated in comparison to trucks.

From the start, employees were consulted on the technology. Now in operation, it is proving to be a popular attraction for visitors.



The new Rail-Veyor ore transportation system at Agnico Eagle's Goldex Mine in Quebec.

International Application of TSM

While mandatory for their Canadian facilities, a growing number of MAC members are voluntarily applying TSM and publicly reporting performance for their international operations. These include First Quantum Minerals, Agnico Eagle Mines Limited, Hudbay Minerals, IAMGOLD Corporation, New Gold and Excellon Resources. By adopting TSM at their operations abroad, these companies demonstrate that they are managing mining risks responsibly throughout the world at the same high standard as their Canadian operations.

International application of TSM, however, is not always feasible for companies. Many MAC members follow other standards and participate in various international initiatives that drive environmental and social performance in the mining sector and foster performance improvement. The table below summarizes the implementation of these standards globally.

GLOBAL UPTAKE OF TSM

MAC is helping to build capacity within the global mining industry by sharing its expertise in sustainable mining practices. One of the most effective ways MAC and its members have been doing this is by freely sharing the TSM initiative with countries seeking tools to improve the performance of their mining industries.

In 2015, TSM achieved an important milestone with the Finnish Mining Association's (FinnMin) adoption of the program for its members' operations in Finland. Since then, Cámara Argentina de Empresarios Mineros (CAEM), the national mining association in Argentina, the Botswana Chamber of Mines (BCM), the Chamber of Mines of the Philippines (COMP), and Confederación nacional de empresarios de la minería y de la metalurgia (CONFEDEM), the national mining association in Spain, have formally adopted TSM. All five associations are working towards full implementation of the program.

While TSM can be applied to any mining operation regardless of jurisdiction, the priorities of each adopting country may vary and, as such, implementation of TSM may need to be modified to suit the local context. For example, FinnMin has modified the *TSM Aboriginal and Community Outreach Protocol* to reflect the Finnish mining sectors relationship with the Sami community. However, each association is required to establish a Community of Interest Advisory Body similar to that of MAC's, and must also implement the following fundamental components of TSM:

1. **Guiding Principles:** Associations must commit to a set of Guiding Principles that reflect the environmental and social goals of the industry and its communities of interest.
2. **Performance Indicators:** Associations must develop performance indicators to measure success in adhering to those Guiding Principles.
3. **Facility-Level Reporting:** Associations must have measures to track progress against the performance indicators at the facility level, where the mining activity takes place.
4. **Independent Verification:** Associations must implement an appropriate framework for independent verification of performance to ensure that reported self-assessed results accurately reflect performance.
5. **Public Disclosure of Facility-Level Reporting:** A mechanism must facilitate the public reporting of facility-level performance results.
6. **Condition of Membership:** TSM must be a condition of membership in the implementing association.
7. **Community of Interest Advisory Body:** Associations must ensure that a Community of Interest Advisory Body, which represents challenging interests and a broad spectrum of societal perspectives, is in place.

International interest in TSM continues to grow and MAC will continue to meet with interested mining company representatives internationally to discuss opportunities associated with the program.

VOLUNTARY PRINCIPLES ON SECURITY AND HUMAN RIGHTS

In March 2017, MAC adopted a new membership commitment to implement the Voluntary Principles on Security and Human Rights (VPs).



Created in 2000, the VPs are standards to help extractive sector companies fulfil the obligation to respect human rights while protecting the assets and people at their operations. The Government of Canada has identified the VPs as one of six leading standards in Canada's Corporate Social Responsibility (CSR) Strategy for the Extractive Sector. More information on the VPs can be found at www.voluntaryprinciples.org.

MAC's commitment is as follows:

As members of the Mining Association of Canada, all participating companies that rely upon private or public security forces commit to implementing a human rights and security approach consistent with the Voluntary Principles on Security and Human Rights (VPs) and based on a determination of risk at facilities that they control.

In order to fulfil this commitment for mines in Canada, MAC has assessed security-related human rights risks at members' facilities in Canada. Based on MAC's assessment of security-related risks in Canada combined with the nature of the rule of law, rigorous police training, and accreditation mechanisms for third-party security providers, no risk factors have been identified at the current time for Canadian-only operations that would signal a need to implement the VPs. As well, risks are further mitigated at members' Canadian facilities through the implementation of the *TSM Crisis Management and Communications Planning Protocol*, which contains two relevant criteria. The first criterion requires that "credible threats and risks have been identified and protocols established to address them." The second criterion requires that "facilities meet annually with senior members of the local emergency response authorities." Together, these criteria provide the effective basis for implementing the VPs in low-risk situations. Individual facility level results related to the application of the *Crisis Management and Communications Planning Protocol* can be found in the *TSM Performance by Company* section of this report.

For MAC members with international operations, adherence to the membership commitment is demonstrated through the subsequent company statements describing their approach to risk assessment, how their security-related management systems align with the VPs (if their risk assessments deem it appropriate to implement the VPs), the nature of their assurance processes and a link to any additional corporate public reporting related to the VPs. As part of our commitment, MAC has recognized that participation in any of the VPs, the International Council on Mining and Metals (ICMM), or the World Gold Council Conflict Free Gold Standard, satisfies this commitment through their adherence to each organization's respective accountability systems. For reference, these companies, listed in the table below, are deemed to have met the MAC commitment and the choice to include a statement regarding their application of the VPs in this report is voluntary:

MEMBERS OF THE VOLUNTARY PRINCIPLES INITIATIVE		
Agnico Eagle BHP Newmont Vale	Anglo American (De Beers) Glencore Rio Tinto	Barrick Gold Corporation Goldcorp Sherritt International
MEMBERS OF THE WORLD GOLD COUNCIL CONFLICT FREE GOLD STANDARD		
Agnico Eagle Goldcorp Newmont	Barrick Gold Corporation IAMGOLD New Gold	Eldorado Gold Kinross
MEMBERS OF THE INTERNATIONAL COUNCIL ON MINING AND METALS		
Anglo American (De Beers) Glencore Newmont Vale	Barrick Gold Corporation Goldcorp Rio Tinto	BHP MMG Teck

The following list includes the MAC member companies with international operations that have included statements in this report to demonstrate their commitment to managing security in a manner consistent with the VPs:

ArcelorMittal Eldorado Gold IAMGOLD Mandalay Resources Pan American Silver	B2Gold First Quantum Minerals Kinross New Gold Sheritt	Excellon Hudbay Lundin Nyrstar
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ArcelorMittal aims to provide a safe and secure working environment for its employees and contractors and to protect its property. This is achieved in part through the use of public or private security forces in the locations where local conditions make this necessary.

Respect for human rights is fundamental to ArcelorMittal's approach to business. The ArcelorMittal Human Rights Policy is aligned with the UN and International Labour Organization's standards, and supports the UN Guiding Principles on Business and Human Rights (VPSHR) introduced in 2011. It includes commitments to our workforce, local communities and business partners, and covers health and safety, labour rights, and the rights of communities and Indigenous peoples. Our policy was developed in collaboration with NGOs, investors, and academic experts with experience in business and human rights, and was published in 2010, and updated in 2016.

ArcelorMittal's human rights policy states that 'ArcelorMittal aims to ensure that the provision of security to our operations and our engagement with public and private security forces is consistent with the laws of the relevant country and relevant international standards and guidelines, such as the VPSHR. We will adapt our security arrangements to balance the need for safety while respecting human rights'.

At present, ArcelorMittal is not an official member of VPSHR, however, we are supportive of this initiative and aim to align our activities to be these principles and good practice.

POLICIES AND PROCEDURES

Further to the ArcelorMittal Human Rights Policy, ArcelorMittal has a detailed security policy which sets out how and when our security personnel can use force, arms or firearms. We expect our officers to act in a way that respects human rights at all times, and to comply with all applicable national, state and local laws. Our policy is based on the Voluntary Principles for Security and Human Rights and the UN Code of Conduct for Law Enforcement Officials.

High risk countries in which we operate are required to maintain an up-to date security threat and risk assessment. This includes an assessment of security and human rights risks and means for developing appropriate plans to address risks of human rights infringements.

Every ArcelorMittal subsidiary is required to provide local stakeholders an effective channel to raise any grievance – this includes those related directly or indirectly to security matters.

COUNTRY IMPLEMENTATION EXAMPLE: ARCELOMITTAL LIBERIA

In Liberia, one of our higher risk countries of operation, we have established management systems for adherence to the VPSHR. Private security contracts include a requirement for adherence to VPSHR. Training and awareness raising is

provided to both our own staff and our security providers. All contracts with private security include a clause related to adherence to VPSHR. All of our security guards are trained on VPSHR as part of their induction. ArcelorMittal Liberia has conducted a risk assessment which includes a focus on security and human rights to identify where the key risks could exist and focus management attention. In addition, there is regular community engagement and discussions with the government on topics related to security and any concerns that may exist. Local internal assurance reviews are conducted to check implementation against these activities.



As a company that operates in areas where there is significant risk of human rights impacts related to the presence of extractive companies, we recognize our responsibility to identify our human rights risks and impacts and actively work to manage them – at all of our sites and through our partnerships and business relationships. Our approach is outlined in our Human Rights Standard, which is aligned with the Universal Declaration of Human Rights and other international human rights law, the United Nations Guiding Principles on Business and Human Rights (UNGPs) and the Voluntary Principles on Security and Human Rights (VPs).

In 2017, a human rights risk assessment was conducted at our Fekola site in Mali, and a human rights impact assessment was carried out at Masbate in the Philippines, led by an independent experienced human rights lawyer and security and human rights consultant. VPs-based risk assessments were carried out in collaboration with our security departments in Mali and the Philippines as part of these human rights assessments. The VPs risk assessments were based on ongoing formal and informal engagement internally with our Community Relations departments as well as externally with local residents, officials and public security, monitoring and patrols, and community grievance mechanisms. Action plans were developed and integrated into plans and systems at those sites, and annual VPs risk assessments and planning will be carried out going forward. Similar assessments will be conducted in Namibia and Nicaragua in 2018. With the recommendations from the human rights assessments and VPs risk assessments built into site-level plans and systems, our existing annual audits of site social management systems will include security and human rights risks and actions. In the future, B2Gold will consider engaging a third party to conduct these audits.

B2Gold takes a proactive approach to managing relationships with public security providers. In both Mali and the Philippines, our security and human rights expectations have been communicated to relevant public security and government officials, and regular engagement occurs. Actions planned for 2018 include updating agreements, conducting joint training where possible, and continuing regular coordination and engagement.

Private security providers are coordinating with our security management teams in Mali and the Philippines to implement the VPs. Training based on the VPs was carried out in 2017 for B2Gold and private security personnel in Mali and the Philippines and has been built into ongoing security training. As of the end of 2017, 100% of private security staff in the Philippines and 92% in Mali had received training on the VPs. Ongoing work includes ensuring that B2Gold standards for human rights and security are built into all private security contracts, training, and operating procedures.

Further information on B2Gold's implementation of the VPs is contained in our 2017 Responsible Mining Report, accessed at: www.b2gold.com/_resources/B2Gold_RMR2017_Interactive.pdf.



Eldorado Gold Corporation and its subsidiaries (together “Eldorado”) are committed to providing a safe and secure working environment for our employees, contractors and visitors. Through our participation in the International Social Responsibility Committee of the Mining Association of Canada (MAC), Eldorado was part of a 2017 membership commitment made by MAC to implement a human rights and security approach consistent with the Voluntary Principles on Security and Human Rights (VPs).

We are responsible for the security of our people, property and products so when our locations’ context warrants extra protection we enter into relationships with public and private consultants to provide this security. We acknowledge that security and human rights can, and should, be consistently applied across the organization, and we seek to operate in a manner that promotes and protects human rights.

Eldorado retained an independent consultant to conduct a long-term project to review existing security arrangements and to address performance gaps and training needs in accordance with the VPs. The assessment included a review of management policies, site actions, and stakeholder perceptions related to security and human rights. In November 2017, training on the VPs was provided to Eldorado’s leadership team including Officers, country Vice Presidents and mine managers, and in early 2018 a pilot project was undertaken at Eldorado’s Tocantinzinho project in Brazil. Key gaps and recommendations from the review will inform the development of security and human rights training materials that will be adopted, adapted and applied across all Eldorado sites. A human rights training video was also rolled-out for use in employee and contractor induction and refresher training.

Eldorado’s Human Rights Policy was updated in 2017, stating that all of our mine sites are required to align their security practices with the VPs, and follow all laws in the jurisdiction of operation when engaging with private or public security forces. The VPs are an important part of our commitment to protecting and respecting the human rights and safety of all our stakeholders while maintaining the security of our employees, contractors and assets.

Formal complaints and grievances pertaining to security and human rights are managed through our Whistle Blower Reporting Agency.

In 2017, we published our fourth annual Conflict-Free Gold Report. The Report details our findings that Eldorado’s operations, and all gold and gold-bearing material produced by our operations, conform to the World Gold Council’s Conflict-Free Gold Standard. The Standard creates a framework for assurance that the production of gold by a company does not contribute to unlawful armed conflict or human rights abuses. Eldorado’s conformance with the Standard was subject to independent assurance.

Eldorado is a gold and base metals producer with mining, development and exploration operations in Turkey, Greece, Romania, Serbia, Canada and Brazil. The company has a highly skilled and dedicated workforce, safe and responsible operations, a portfolio of high-quality assets, and long-term partnerships with local communities. Eldorado’s common shares trade on the Toronto Stock Exchange (TSX: ELD) and the New York Stock Exchange (NYSE: EGO).





Excellon Resources Inc. is a TSX-listed silver and base metals producer headquartered in Toronto, Canada. We mine Ag-Pb-Zn ore from our Platosa underground mine located near the town of Bermejillo, Durango, Mexico. Ore is crushed at Platosa and then trucked approximately 230 km to our wholly-owned concentrator facility located in the town of Miguel Auza, Zacatecas, Mexico. We are committed to meeting the requirements of the Voluntary Principles on Security and Human Rights (VPs) in our business.

In 2017 we began the development and implementation of our Corporate Responsibility Management System (CRMS), consisting of a series of 51 standards covering safety, health, security, environmental protection, community relations and development and human rights. As part of this process, we are assessing our vulnerability to security-related incidents, and the risk of potential human rights issues associated with our business and between our business and the communities surrounding our operations. Furthermore, we are developing a gap analysis against the requirements of the VPs; this will serve as a roadmap as we move forward.

We have contract security personnel at both locations to protect our property and assets; these personnel are unarmed. As part of our commitment to the VPs we will confirm that all such personnel have basic human rights-related training to ensure that our expectations vis-à-vis human rights are understood.

Since we are in the initial stages of developing and implementing a common approach to security across the business as part of our CRMS we have not undertaken assurance of our conformance against the VPs.



First Quantum Minerals Ltd. (the "Company") respects human rights, which means First Quantum acts to avoid infringing on the rights of others and commits to addressing impacts that occur as a result of our business activities. In developing this policy we are guided by the principles of the internationally recognized human rights norms:

- The Universal Declaration of Human Rights
- The Voluntary Principles on Security and Human Rights
- ILO Declaration on Fundamental Principles and Rights at Work
- UN Declaration on the Rights of Indigenous Peoples
- Guiding Principles on Business and Human Rights
- Implementing the UN "Protect, Respect, and Remedy" Framework

We are also subject to the laws of the countries in which we operate and are committed to complying with all such laws, while abiding by the international human rights norms described above.

We strive to protect our people and assets and provide a secure environment in which our businesses can operate. Our security policies, systems, guidelines and practices, to the extent reasonable, are consistent with international standards, including the Voluntary Principles on Security and Human Rights, and the laws of the jurisdictions where we operate.

Our focus to date has been on implementing strong policies and have not yet implemented a review or assurance program.





In 2011, through incorporation in Hudbay's Human Rights Policy, we formally adopted the Voluntary Principles on Security and Human Rights to guide our security and human rights risk assessment process, management of private security, and relationships with public security. Our implementation of this commitment includes:

- All security contracts entered into by Hudbay require adherence to the Voluntary Principles.
- Hudbay conducts education sessions for its employees and contractors involved in security activities in respect of the United Nations' Code of Conduct for Law Enforcement Officials (www2.ohchr.org/english/law/codeofconduct.htm) and in particular the Basic Principles on the Use of Force and Firearms by Law Enforcement Officials (www2.ohchr.org/english/law/firearms.htm).

The nature and level of our efforts in this area are guided by our assessment of nature of security risks and the public institutions overseeing public and private security forces at each of our locations. Our 2017 Annual and CSR Report further describes our activities under "CSR Approach" / "Human Rights and Security" (www.s1.q4cdn.com/305438552/files/2017/en/human-rights.html).

For the audits of security policies and practices at Hudbay Peru that are mentioned in our report we utilize the framework provided in the Global Compact Network Canada document "Auditing Implementation of the Voluntary Principles on Security and Human Rights".



IAMGOLD has operations in Burkina Faso, Suriname and Canada. As MAC has assessed the security-related human rights risks at the domestic-level in Canada to be low, the following is IAMGOLD's approach to implementation and compliance with the Voluntary Principles on Security and Human Rights at our operations abroad.

At each of our sites, IAMGOLD's approach to risk management includes annual security risk reviews which are then incorporated into the security risk register. The register is maintained on a continuous basis as new and emerging security risks are identified and managed. Statistics are kept on incidents that occur in the regions where our operations are based and all sites regularly monitor social and traditional media to identify any potential criminal activities. IAMGOLD also engages in information sharing on security and risk through various local industry forums. For new satellite sites near our existing operations, formal security threat and risk assessment is conducted by third party consultants.

All our security-related management systems are developed and implemented to be in compliance with VPSHR. For example, security procedures such as Use of Force, Firearms Control, Security Emergency Response Procedure and others incorporate specific requirements from the VPSHR framework. All agreements with private security providers have mandatory compliance with VPSHR provisions. Any MOUs signed by IAMGOLD will reference human rights requirements and state IAMGOLD's commitment to VPSHR. In addition, all security forces must undergo VPSHR training at each rotational change. Equipment transfers remain on IAMGOLD property, maintained and regularly inspected by IAMGOLD. Our in-house security response personnel receive annual recertification training with reference to VPSHR compliance conducted by a third-party organization. IAMGOLD also conducts an annual inspection of private security provider training records to ensure compliance with foundational and refresher VPSHR training. Training is provided to key management and superintendents on VPSHR awareness by a third party.

IAMGOLD monitors and addresses potential grievances from the local community related to our security operations through our community relations department. Our human resources grievance process also provides a platform for reporting issues related to our security operations. Further, our ICAM process aids investigations on significant incidents related to illegal miner pit intrusions, small scale mining equipment invasion/removal operations and use of force during encounters with external hostile elements. At a broader level, our Corporate Security Standard ensures that an annual audit is conducted to ensure our security procedures are compliant with corporate strategy, standards and relevant local legislation and regulations. IAMGOLD publishes details related to our security practices through the annual Sustainability Report available on the IAMGOLD website.



KINROSS

Kinross supports the Voluntary Principles on Security and Human Rights and has established an internal Human Rights Adherence and Verification Program (HRA & VP) to implement this commitment. Maintaining safety and security at our operations, in a manner which respects human rights and recognized freedoms is an imperative for Kinross. Through our HRA & VP, we work to ensure the safety and security of our employees, people and our property and mitigate potential security, safety and human rights risks that may arise in our operations, development projects, and exploration concessions.

The HRA & VP program establishes procedures and training at all Kinross operating mines on an annual basis to help ensure that all security personnel, as well as key site management, understand and are consistently compliant with human rights best practices and standards as related to security. This includes specific training on the use of force in line with Kinross' weapons policy, and provides guidance in such areas as reporting incidents and fostering a well-developed security relationship with public security forces. The training is required for all private security personnel and Kinross management teams. Public security forces are invited and encouraged to attend. In 2016 and 2017, 751 and 908 security people were trained respectively, representing 100% and 98% of Kinross' security personnel respectively and an average of 2,500 training hours each year.

Through the HRA & VP, we also monitor the human rights records of security providers (private and public) used by the company. Monitoring includes information gathered through various international, regional and local agencies. All Kinross agreements now include respect for human rights as a major component.

The HRA & VP also includes comprehensive annual audits to assess risks and measure private and public security compliance across all Kinross sites. Human Rights Risk Assessments are carried out as part of our site security audits at each site.

Each Kinross location has robust systems for allegation reporting and verification, investigation and resolution, monitoring of investigations by public officials, and other essential elements of security oversight.

Grievances pertaining to security and human rights are managed through our Whistleblower reporting mechanism.

Through our active participation in the International Social Responsibility Committee of the Mining Association of Canada (MAC), Kinross was part of a 2016 public declaration made by MAC regarding a commitment to implement a human rights and security approach consistent with the Voluntary Principles on Security and Human Rights.

lundin mining

Lundin Mining Corporation (LMC) is committed to operating in accordance with the Mining Association of Canada's (MAC) principles pertaining to security practices and human rights. We prioritize these goals at our global operations located in Portugal, Sweden, the United States and Chile, and at our exploration projects.

LMC strives to ensure that its business activities are always conducted in accordance with the company's mission and values, which are aligned with and support the expectations established by the Voluntary Principles on Security and Human Rights (VPs). Our company values are safety, respect, integrity and excellence, and our commitment to upholding and respecting human rights is stated in the following documents: Code of Conduct, Ethical Values and Anti-Corruption Policy (Code of Conduct); Responsible Mining Policy; annual Sustainability Report; and, annual United Nations Global Compact Communications on Progress.

At each of our sites, local security is important to the success of our operations, and we have an ongoing process of engagement and coordination with regional authorities and emergency responders. Proactive relationships have been established with our private security providers to ensure that processes are in place to work directly with relevant authorities to report any issues, and to ensure LMC's workforce is protected from circumstances associated with legal infringements or public disturbances that could affect their safety and well-being. These security services are reviewed on a periodic basis to ensure performance is held to the highest standards. At this time, LMC is not aware of any alleged or reported events or complaints related to human rights abuses involving private or public security services at our operations or sites.

Stakeholder engagement is a priority for LMC; we are committed to ensuring any issues or concerns that might arise related to actual or perceived human rights breaches or violations are taken seriously. Stakeholders have access to grievance mechanisms at all our operations; employees and on-site contractors working for LMC's mines have access to a third-party administered confidential and, if desired, anonymous ClearView Connects reporting system, accessible by telephone and the internet. In accordance with the Company's Code of Conduct and Whistleblower Policy, concerns related to discrimination or infringements on human rights are to be reported on that basis, via ClearView Connects or otherwise, to the Chair of the Corporate Governance Committee for timely review and follow-up.

With respect to assuring that our practices align with the VPs, in 2019, LMC will be conducting a comprehensive Human Rights Impact Assessment for all operations and exploration sites. The assessment Protocols and methodology will be based on international best practice including the VPs and the United Nations Guiding Principles on Business and Human Rights. In addition, we plan to conduct a formal risk assessment at each operation using the Voluntary Principles on Security and Human Rights Implementation Guidance Tools.

We are proud to be members of MAC and affirm our commitment to upholding and respecting human rights in the areas where we operate.



New Gold supports the Voluntary Principles on Security and Human Rights and has established a Human Rights Policy to articulate and support this commitment. At New Gold, our expectation is that safety and security at our operations is conducted in a manner which respects human rights and our company values. Wherever we operate, we work to ensure the safety and security of our employees, people and our property and mitigate potential security, safety and human rights risks.

Our Human Rights Policy establishes the expectations at our operating mines to help guide all security personnel, as well as key site management and to make them aware that they are expected to be compliant with human rights best practices and standards as related to security. This is particularly important at our Cerro San Pedro operation where human rights are at greatest risk relative to our Canadian and US operations. Training is required for all private security personnel and New Gold management teams. Public security forces are invited and encouraged to attend. In 2016 and 2017, 37 and 28 security people were trained respectively, representing 100% of New Gold's security personnel respectively and an average of 761 training hours each year, which represents an average of 2.33% each year of the total training percentage.

We have also monitored the human rights records of security providers (private and public) used by Cerro San Pedro by auditing against the Voluntary Principles using an external auditor in 2013. The audit included information gathered through various international, regional and local agencies.

New Gold also includes comprehensive annual external audits to assess risks of our gold being used to fund conflict. As part of these audits private and public security compliance across at our Cerro San Pedro site is assessed. Internal Human Rights Risk Assessments are carried out as part of our site security audits at this site.

Each New Gold location has robust, anonymous "whistleblower" mechanisms and systems for allegation reporting and verification, investigation and resolution, monitoring of investigations by management, and other essential elements of security oversight. External grievances pertaining to security and human rights are recorded and managed through our site-specific or corporate grievance and feedback reporting mechanisms.

Through our active participation in the International Social Responsibility Committee of the Mining Association of Canada (MAC), New Gold was part of a 2016 public declaration made by MAC regarding a commitment to implement a human rights and security approach consistent with the Voluntary Principles on Security and Human Rights.



Protection of human rights is fundamental to Nyrstar's core values and we are committed to respecting fundamental human rights wherever we operate. The commitment to human rights is documented in our Code of Business Conduct which forms the basis for all our dealings with employees, communities and other stakeholders. At our mining operations in Canada and the US, security forces are unarmed and are primarily engaged in controlling access to the operating sites. This reflects the low security risks in these operating locations as confirmed by our risk assessment processes.

The implementation of the Voluntary Principles on Security and Human Rights (VPSHR) has been adapted to this low risk operating context and has not warranted the development of VPSHR-specific standards or procedures. Instead, human rights risks are managed through our enterprise risk management system and the ethical framework for decision-making established under the Code of Business Conduct. Examples of management processes implemented under these governance systems as relevant to security forces include: crisis management and emergency response arrangements, contractor management processes, workplace safety systems and conflict resolution mechanisms.



Pan American Silver Corp. (the "Company") is a primary silver producer with six operating mines, projects, and exploration projects in Argentina, Bolivia, Mexico, and Peru. The Company has initiated a number of activities under the framework of the Voluntary Principles on Security and Human Rights, as part of its Mining Association of Canada commitments.

The priority for all security programs at Pan American Silver is to mitigate security risks to protect our people, and provide a secure and safe workplace, by acting in accordance with local laws while being mindful of international practices and principles, particularly with regard to the use of force. As with our safety programs, senior management provides oversight of our security program, with each site or project manager providing day-to-day oversight of specific programs. Under circumstances where there is an increased security risk or security incidents have occurred, our Corporate Crisis Management Committee may become involved to oversee additional activities, coordination, or incident investigations. The Company assesses security risks at our operations and projects through a collaborative effort between our senior and local management. As part of the risk assessment, we consider the site-specific incident history, international management practices, a wide range of possible security events, local intelligence & media reports and/or events that may have high risk potential.

In addition to the risk assessment, the Company has implemented a review process of its security program and site security operations. The first level of our review process is a five-point site self-assessment. Based on responses from the self-assessment, security risks, and insurance requirements, the Company may conduct additional security practice reviews and site visits.

The Company's grievance mechanisms, whistleblower policy, anti-corruption and anti-money laundering, as well as financial reporting compliance programs are also key elements of the security process, providing additional guidance and verification of the Company's relationships, support, and interface with public security forces.



Sheritt International Corporation (Sheritt or the Company) began to implement the Voluntary Principles on Security and Human Rights (the Voluntary Principles or the VPSHR) in 2009 at its Ambatovy nickel operation in Madagascar. In 2013, the Company was interested in formally joining the Voluntary Principles Initiative and carried out a series of independent, external risk assessments on security and human rights at Ambatovy as well as its Oil and Gas, and Power (OGP) operations in Cuba, and the Moa Joint Venture nickel operations in Fort Saskatchewan, Alberta, Canada, and Moa, Cuba. Following these assessments, Sheritt began developing a comprehensive management system to assist its operations in the identification and mitigation of human rights and security-related risks, in alignment with the expectations of the Voluntary Principles. Sheritt formally applied and was accepted to join the Voluntary Principles Association in late 2014.

Sheritt formalized its commitment to the VPSHR in 2015 with the President and Chief Executive Officer's approval of the Company's Security Policy and the Chief Operating Officer's approval of the Security and Human Rights Standard, both of which are aligned with the Voluntary Principles. Additional procedures and guidance have been developed to implement specific elements of the Voluntary Principles into Sheritt's internal security practices.

Sheritt endeavors to apply the Voluntary Principles at all of its sites; however, the speed and extensiveness of implementation is based on the individual site's risk profile and operating context. Application of the Voluntary Principles at the Company's operations in Cuba requires a longer-term approach to familiarize Sheritt's joint-venture partners – which are state-owned enterprises – and other government stakeholders with the VPSHR. In Canada, Sheritt recognizes that security and human rights-related risks are relatively low and good governance practices are relatively mature; therefore, few additional measures need to be put in place to ensure compliance with the Voluntary Principles. In Madagascar, where the security and human rights-related risks are considered higher, Sheritt has conducted the majority of its work on the VPSHR to date.

Sheritt has a system of internal reviews at the sites where the Voluntary Principles are applied. In 2019, we are endeavoring to have a third-party review conducted to identify any continuing gaps in implementation and/or new or existing human rights risks to be addressed.

Our 2017 annual report on the Voluntary Principles is the Company's third to the VPSHR Plenary and focuses primarily on initiatives carried out over the past year at Sheritt's sites in Canada, Cuba, and Madagascar.

Some highlights from 2017 include:

- Participation in the development of UNICEF Canada's Child Rights and Security Checklist.
- Signing on as a formal member of the Mining Association of Canada, an industry association that requires its members to align their security practices with the Voluntary Principles.
- Incorporation of Voluntary Principles related requirements into Sheritt's Fort Saskatchewan site's contract with its private security provider.
- Meeting with Cuban government officials to present the Voluntary Principles and receiving no objections to engage directly with the state-run security provider to introduce them to the Voluntary Principles.

INTERNATIONAL INITIATIVES

**MAC MEMBER
COMPANY
APPLICATION
OF INTERNATIONAL
STANDARDS AND
PROGRAMS**

*Applied at international facilities.

**TSM is applied at international facilities, but results are not reported publicly.

***Applies only to select international facilities.

MAC Towards Sustainable Mining*	Industry Sustainability Initiatives	Management System Standards	International Voluntary Initiatives	Reporting, Disclosure and Transparency Standards	Financing Standards	Listed on Socially Responsible Investing Indices	Commodity Specific Standards
ICMM Sustainable Development Framework	WGC Conflict Free Gold Standard	ISO 14001: EMS Standard	UN Global Compact Extractive Industries Transparency Initiative Voluntary Principles on Security and Human Rights OECD Guidelines for Multinational Enterprises	AA 1000	IFC Social and Environmental Performance Standards	Dow Jones Sustainability Index Jantzi Social Index Responsible Jewellery International Cyanide Code Kimberley Process	
		OHSAS 18001		Global Reporting Initiative			
				Carbon Disclosure Project			
				Water Disclosure Project			
				Carbon Pricing Leadership Coalition			

COMPANIES/BUSINESS UNITS HEADQUARTERED IN CANADA WITH INTERNATIONAL OPERATIONS:

Agnico Eagle Mines Ltd.	✓		✓								✓	✓	✓			✓		✓	✓	
Barrick Gold Corporation		✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓		✓			✓	
IAMGOLD Corporation	✓		✓				✓		✓		✓	✓			✓		✓			
Kinross Gold Corporation			✓	✓	✓	✓	✓	✓			✓	✓	✓		✓		✓		✓	
HudBay Minerals Inc.	✓			✓	✓		✓	✓	✓		✓	✓	✓		✓	***				
First Quantum Minerals Inc.	✓					✓	✓	✓				✓			✓					
Teck Resources Limited **	✓	✓		✓		✓	✓		✓		✓	✓	✓	✓	✓	✓				
Vale (Base Metals)				✓	✓	✓	✓	✓			✓	✓	✓	✓	✓					
New Gold Inc.**	✓		✓	✓	✓	✓		✓			✓	✓	✓						✓	
Eldorado Gold			✓	✓	✓	✓					✓	✓	✓						✓	
Goldcorp**	✓	✓	✓		✓	✓	✓	✓			✓	✓	✓		✓				✓	
Lundin				✓	✓	✓		✓	✓	✓	✓	✓	✓							

COMPANIES HEADQUARTERED OUTSIDE OF CANADA WITH CANADIAN OPERATIONS:

Glencore		✓		✓	✓	✓	✓	✓			✓	✓	✓		✓	✓				
De Beers Canada Inc.**	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			✓		✓
Newmont Mining Corporation		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	
Rio Tinto		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓		✓		✓
ArcelorMittal				✓	✓		✓				✓									
Excellon	✓																			
Sherritt						✓	✓	✓	✓		✓				✓	***				





TSM Awards

TSM Excellence Awards

The *TSM Community Engagement Excellence Award* and the *TSM Environmental Excellence Award* honour companies, facilities and individuals that have implemented projects and initiatives that expand and promote sustainable development within the mining sector.



2018 Winner and Finalists

TSM Community Engagement Excellence Award

(WINNER)

IAMGOLD: Scrap Metal Program Supports Women Entrepreneurs

Vale: Sudbury Alerts Program Supports Community Safety

New Gold: Closure Plan Prioritizes Community Needs



2018 Winner and Finalists

TSM Environmental Excellence Award

(WINNER)

Vale: Sudbury Biodiversity Program Restores Land and Waterways

Vale: A SLAM Dunk in Waste Management

Agnico Eagle: New Rail-Veyor System Delivers Environmental Benefits

2018 TSM EXCELLENCE AWARD WINNERS

On May 7, MAC awarded Vale's Sudbury Operations in Ontario and IAMGOLD's Essakane Gold Mine in Burkina Faso with the 2018 *TSM Excellence Awards* for their innovative sustainability projects.

This year, a total of 11 nominations were submitted by mining companies that participate in the *TSM* initiative. The selection committee, composed of members from the COI Advisory Panel, selected the finalists and winners based on criteria such as innovation, involvement of and engagement with communities, and project outcomes. *TSM* performance was also considered as an indicator of the company's ongoing commitment to corporate responsibility.

TSM COMMUNITY ENGAGEMENT EXCELLENCE AWARD 2018 WINNER: IAMGOLD

In Burkina Faso where IAMGOLD's Essakane Mine is located, the company has long supported local economic development. One of the ways it does this is by giving the mine's scrap metal a second life through the ingenuity and initiative of local entrepreneurs. The program, known as "Fonds Fer" or "Iron Fund", involves the mine selling its leftover scrap metal at auction and then using the revenues to fund local business ideas. The program has evolved through community input to ensure it meets local needs.

A good case study of the program's success is a peanut butter production unit run by a group of 11 local women. It is one of 34 projects this fund has supported. In Burkina Faso, peanut butter is a staple ingredient in many meals. It is traditionally produced manually by women and requires a lot of time and physical strength. This unit, the first in the region, produces high-quality and affordable peanut butter, directly serving the needs of residents and local businesses.

The unit stores the raw material and finished product and houses the electric-powered mill and generator. The use of a mill has several advantages over the traditional method of producing peanut butter. It improves the product's quality, increases its quantity and dramatically cuts down the time it takes to produce it. Additionally, the unit is powered by electricity, whereas the artisanal method uses wood as its energy source, which contributes to the overcutting of forests and accelerates desertification.

The unit's main customers are households and restaurants, but the mine will soon be added to its client roster. With the business poised to grow, the association is planning to hire more people, both to process the peanut butter and to distribute it. This processing unit represents a major advancement in agricultural product processing and can serve as a platform for products beyond peanut butter. Its success in revenue and job creation serves as a benchmark for other entrepreneurs. In fact, it has already inspired other women's associations in the area to submit their business ideas.

"IAMGOLD is thrilled that its efforts towards improved community engagement are recognized through this prestigious award," said Ben Little, Senior Vice President of Corporate Affairs, HSS & People. "We have to, however, give credit where it is due: to the incredible dedication and resilience of the Women Entrepreneurs of the Sahel region, who took this opportunity to partner with IAMGOLD and build a sound, sustainable and innovative business that will benefit the entire region and hopefully serve as a model for similar projects in the future. We are committed to continued engagement and investment in the communities where we operate to ensure they can take advantage of our various programs to achieve self-sustainability and long-term economic development."



Peanut butter production unit run by a group of 11 women and supported by IAMGOLD's Essakane Mine in Burkina Faso.

TSM ENVIRONMENTAL EXCELLENCE AWARD 2018 WINNER: VALE

After more than a century of mining and logging activities, significant biodiversity initiatives are well underway at Vale's Sudbury operations. The goal is to return historically stressed lands and waterways back to their natural states. At the root of the Sudbury Biodiversity Program's success is Vale's use of restorative processes that improve biodiversity. The program is also bolstered by input and involvement from stakeholders, communities and experts, including government, students and conservationists.

Through Vale's aerial seeding program, the company has reclaimed 8,600 acres of land since 1990. Additionally, the company invests \$250,000 and donates 50,000 tree seedlings annually to the City of Greater Sudbury's Biodiversity Action Plan. Reclaiming tailings areas is also a top priority and Vale undertakes an innovative approach by using dewatered municipal biosolids that are blended with leaf and yard waste. In 2017, Vale reclaimed 40 acres with biosolids in its central tailings area with hay for dust suppression.

Vale is also working to improve biodiversity at its revegetated slag pile in Copper Cliff by planting milkweed seeds, which are grown at the company's greenhouse with the help of local school children. Milkweed is the sole food source for monarch butterflies, a species in decline across North America. As the butterflies feed on the milkweed, they pollinate the wildflowers on the regreened slag pile, further enhancing biodiversity in the area. A few years ago, Vale also introduced bee colonies to its revegetated slag hills in Copper Cliff and later introduced them to its central tailings area. There are now more than 20 beehives, which help to restore declining bee populations in the area. The bees aid pollination, improve biodiversity, and produce honey for visitors to Vale's operations.

Vale's Biodiversity Program also focuses on restoring local rivers and lakes and boosting their fish populations. Since 2011, Vale has raised rainbow trout and walleye and has released more than 100,000 fish into Ramsey Lake and the Onaping River.

"We are proud to be acknowledged for Vale's biodiversity program in Sudbury," said Lisa Lanteigne, Environment Manager for Vale's Ontario Operations. "The program has been successful because of a sustained commitment to community collaboration and an innovative approach to environmental stewardship. The program exemplifies one of our core company values of 'Prize Our Planet'."



Vale raises bees in reclaimed areas of its Central Tailings Area in Sudbury, Ontario to enhance biodiversity.

2018 Recipients

TSM Leadership Awards

A *TSM Leadership Award* is granted only when a facility meets or exceeds a Level A ranking for all indicators under the *TSM Tailings Management, Energy Use and GHG Emissions Management, Aboriginal and Community Outreach, Biodiversity Conservation Management and Safety and Health Protocols* and meets all requirements of the *TSM Crisis Management and Communications Planning, and Child and Forced Labour Protocols*.

To be eligible for a *TSM Leadership Award*, a facility's results must have been externally verified.

The following facilities were granted *TSM Leadership Awards* for their 2017 results:

Agnico Eagle, La India

Agnico Eagle, Goldex

Agnico Eagle, Kittila

Agnico Eagle, Meadowbank

Agnico Eagle, Pinos Altos

Agnico Eagle, LaRonde

Dominion Diamond Mines, Ekati Diamond Mine

IAMGOLD, Essakane



Agnico Eagle's Kittila Mine collects water samples from the adjacent Seurujoki River in Lapland, Finland.

TSM Performance by Company

Measuring Company Performance



Lisa Lanteigne, Environment Manager for Vale's North Atlantic Operations, inspects hay grown on reclaimed area of Vale's Central Tailings Area in Copper Cliff, Ontario-photo credit: Vale Canada archive.

This section of the report presents facility-level results for all companies participating in TSM. The number of facilities participating in TSM continues to grow. In 2006, 49 facilities publicly reported performance, and in 2017, this number grew to 67 facilities. This section includes externally verified results for eight companies: Agnico Eagle, Cameco, Dominion Diamond, First Quantum Minerals, IAMGOLD, Imperial Metals, Nyrstar and Teck*.

Besides being MAC members, some companies in this report belong to the Québec Mining Association, which is also a formal participant in TSM. A company's affiliation is indicated by the following logos:



*Teck Resources Limited conducts external verification for a sample of its facilities on an annual basis. In 2017, Teck's Coal Mountain and Line Creek operations underwent external verification.

TSM Performance by Company

Agnico Eagle Mines Limited



Agnico Eagle is a senior Canadian gold mining company that has produced precious metals since 1957. Our eight mines are located in Canada, Finland and Mexico, with exploration and development activities in each of these regions, as well as in the United States and Sweden. Agnico Eagle is listed on both the Toronto and New York stock exchanges (AEM) and employs more than 7,800 people worldwide.

Throughout our 60 years in business we have consistently created value for our shareholders, while striving to improve employee conditions and making a significant contribution to our communities. We have built a strong culture of responsible behaviour, achieving high standards of sustainability performance with a long-term goal of distinguishing ourselves as responsible miners.

In 2017, we continued to integrate sustainable development considerations into our business strategy and in the way we plan and manage our activities. Our Sustainable Development policy reflects an emphasis on health and wellness, our commitment to the protection of Human Rights, and a commitment to minimizing impacts to environment and risks associated with the management of tailings and water. During the year, we committed to the implementation of measures to reduce our energy consumption and greenhouse gas emissions and address climate change in developing an energy and greenhouse gas management strategy.

SUMMARY OF TSM PERFORMANCE

During the second external verification, Agnico Eagle's operations achieved at least a Level A performance under all TSM Protocols and met all of the requirements of the *TSM Crisis Management and Communications Planning Protocol* and of the *Preventing Child and Forced Labour Protocol*.

Aboriginal and Community Outreach

Agnico Eagle's results in this area are strong, with all facilities reporting at least a Level A performance across all four indicators of the *TSM Aboriginal and Community Outreach Protocol*. All of our six audited facilities achieved a triple A in the first three indicators. Goldex and La India facilities achieved a perfect score in all indicators.

Crisis Management and Communications Planning

Agnico Eagle's corporate office and facility-level operations have consistently met all of the requirements of the *TSM Crisis Management and Communications Planning Protocol*.

Safety and Health

Agnico Eagle's operations achieved at least a Level A performance under the *TSM Safety and Health Protocol*. In 2017, Agnico Eagle's combined lost time and restricted work frequency was 0.91 – a 6% reduction from the previous year's performance and substantially below the company's target rate of 1.25. This is the eighth consecutive year that the company has posted its lowest ever combined rate.

In 2017, the Lapa Mine received the Canadian Institute of Mining, Metallurgy and Petroleum's (CIM) John T. Ryan trophy for the Québec/Atlantic region for experiencing the lowest reportable injury frequency per 200,000 hours worked in 2016.

Tailings Management

All of Agnico Eagle's tailings facilities achieved a Level A across all indicators under the *TSM Tailings Management Protocol*. The company also contributed its technical expertise to the review and update of MAC's Guide to the Management of Tailings Facilities and is working to ensure all facilities have implemented the new criteria of the revised Protocol. For example, an Engineer of records was assigned to our facilities.

Biodiversity Conservation Management

Agnico Eagle's results in this area are also strong, with all facilities reporting at least a Level A performance across all three indicators of the *TSM Biodiversity Conservation Management Protocol*. Meadowbank and Pinos Altos facilities achieved a perfect score in all indicators.

Energy Use and GHG Emissions Management

Agnico Eagle's operations achieved at least a Level A performance under the *TSM Energy Use and GHG Emissions Management Protocol*. Goldex does not report performance for Indicators 1 and 3 because its annual emissions are under 25,000 tonnes of CO₂ equivalent. Agnico Eagle's average GHG emission intensity (tonnes of CO₂ equivalent per tonne of ore processed) for all of our operating mines increased by 3% from 0.0189 in 2016 to 0.0195 in 2017. This is due to an increase in hauling distance.

Preventing Child and Forced Labour

Agnico Eagle's corporate office and facility-level operations have processes in place to ensure that neither it, nor its suppliers and contractors, use forced or child labour.

Other notable achievements include:

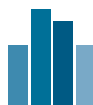
- Agnico Eagle formally adopted the Voluntary Principles on Security and Human Rights (VPSHR), one of a series of standards created to help extractive sector companies balance the obligation to respect human rights while protecting the assets and people at their operations.
- Agnico Eagle Mexico was recognized for the tenth year in a row – and Agnico Sonora (La India) was proudly recognized for the second year – with the prestigious Corporate Social Responsibility (CSR) Award, an honour that is presented annually by the Mexican Center of Philanthropy (CEMEFI) and the Alliance for Corporate Social Responsibility (AliaSRE) and recognizes companies that incorporate a commitment to being socially responsible into their corporate culture by showing respect for people, ethical values, community and the environment.
- For the fifth year in a row, Agnico Eagle Mexico was recognized in the "Great Place to Work" program for northwest Mexico region where we ranked sixth overall for employers with more than 1,000 employees. The La India Mine also won a Diversity and Inclusion Award which recognizes companies seeking to improve the quality of their workplace.

- Pinos Altos obtained its fourth certification under the Industria Limpia-Clean Industry designation of the Mexican environmental authority, PROFEPA. This follows an audit confirming the mining complex operates in full compliance with all environmental regulations.
- Agnico Eagle Mexico was also recognized with the Mexico Without Child Labour Award, which is presented annually by the Secretaria del Trabajo y Previsión Social department of the Mexican government. The award recognizes workplaces that design and implement employment practices aimed at preventing and eliminating child labour and protecting employees and young workers in Mexico by ensuring that no child labour, or any form of forced or compulsory labour, is permitted in the workplace.
- The Quebec Mining Association recognized our strong safety performance, honouring 45 of our front line supervisors for achieving 50,000 hours and more without any compensable accidents on their work teams between July 2016 and June 2017: 32 of the supervisors were from the LaRonde, Lapa and Goldex Mines, while the remaining 13 were from Canadian Malartic Mine.
- Agnico Eagle's Val-d'Or exploration team won the prestigious Bill Dennis Award at the annual Prospectors and Developers Association of Canada Awards for its discovery of the Amaruq gold deposits in Nunavut between 2013 and 2016. This discovery ensures Agnico Eagle's future in Nunavut for many decades to come, and will provide a major boost to Nunavut's economy and communities.
- Agnico Eagle's Mining Reclamation team won the Tom Peters award for outstanding achievement in the practice of mine reclamation in Ontario. The award was presented by the Canadian Land Reclamation Association for their innovative work on safely rehabilitating a decades old mineshaft without disturbing the site's designation as an important historical resource as part of the Cobalt Mining District National Historic Site of Canada.

🔗 For more information, please visit agnicoeagle.com



Agnico Eagle's Goldex Mine in Val-d'Or, Québec, has local mechanisms in place, including a monitoring committee, to address community concerns.

Externally
Verified Results

2017 TSM Results

Agnico Eagle Mines Limited



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
GOLDEX	✓	✓	✓
KITTILA	✓	✓	✓
LA INDIA	✓	✓	✓
LARONDE	✓	✓	✓
MEADOWBANK	✓	✓	✓
PINOS ALTOS	✓	✓	✓

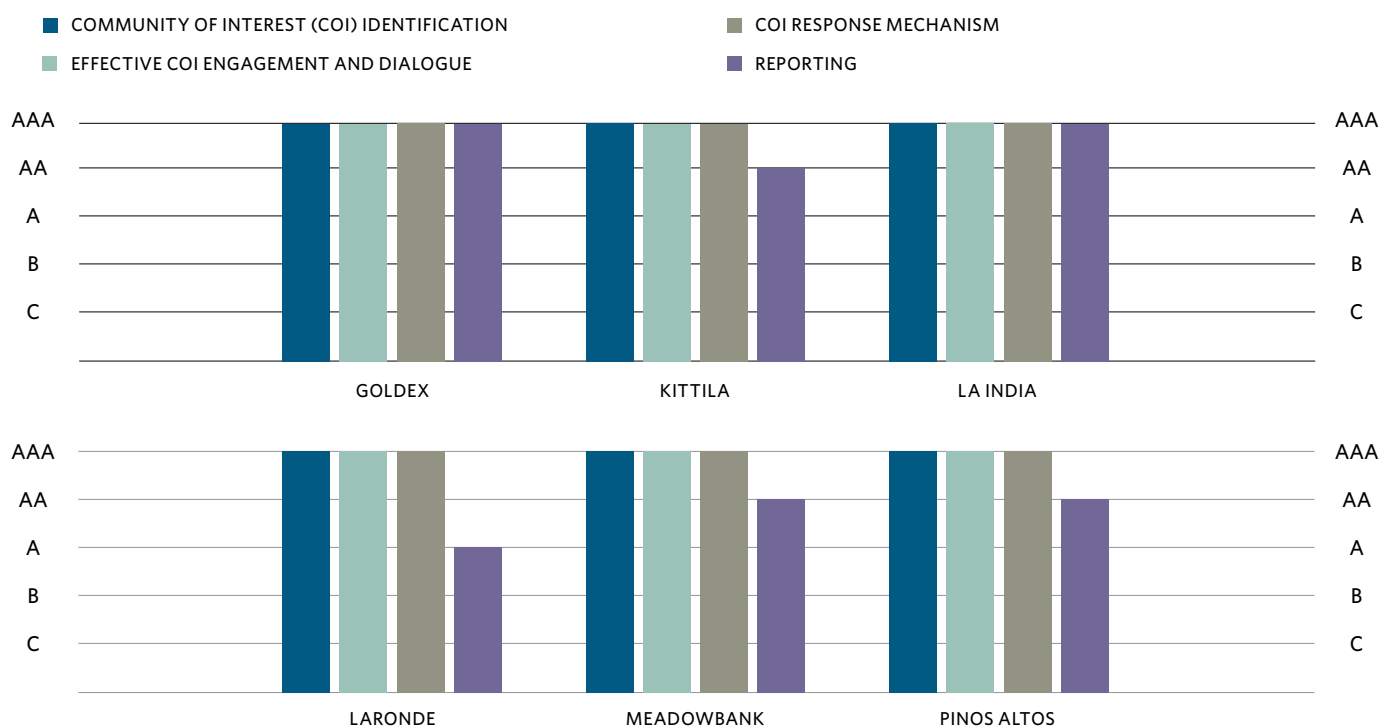


Preventing Child and Forced Labour

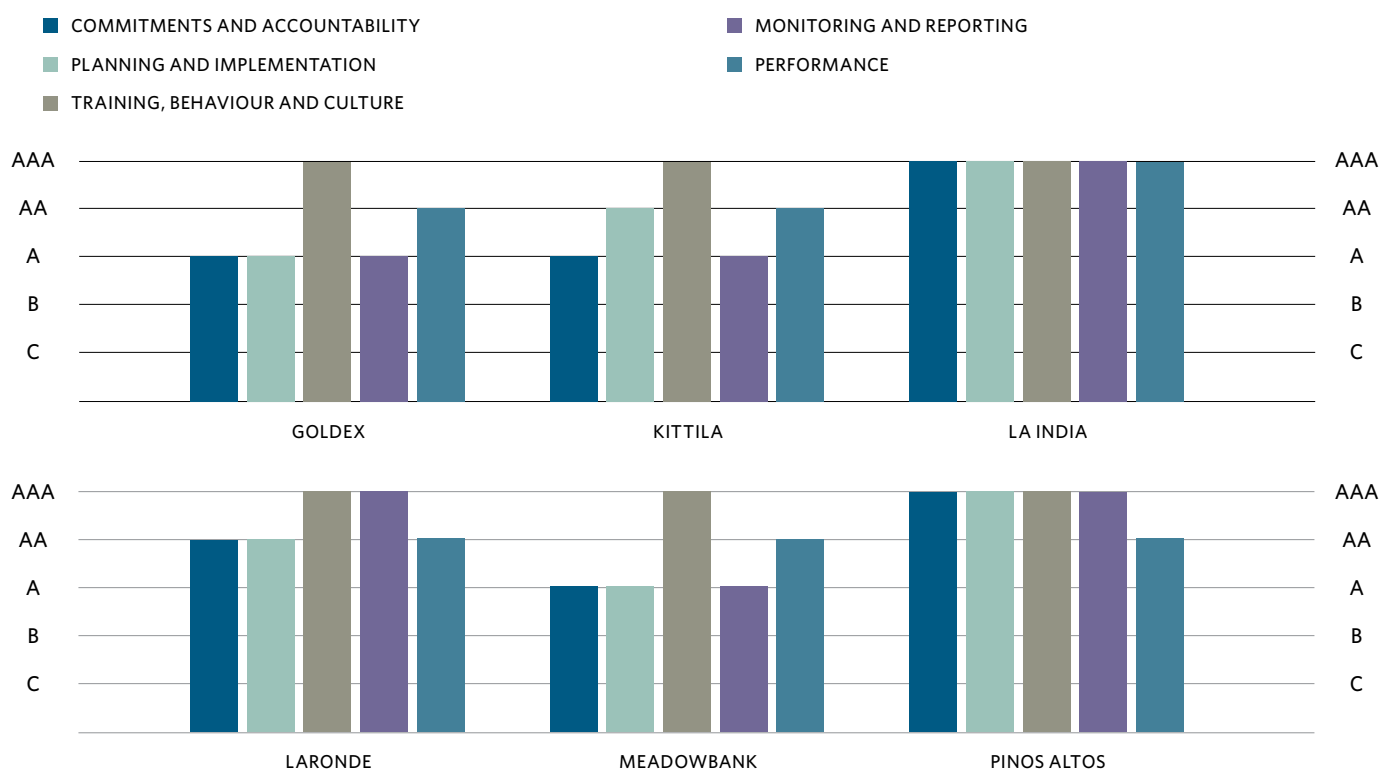
FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
CORPORATE	✓	✓
GOLDEX	✓	✓
KITTILA	✓	✓
LA INDIA	✓	✓
LARONDE	✓	✓
MEADOWBANK	✓	✓
PINOS ALTOS	✓	✓



Aboriginal and Community Outreach Assessment



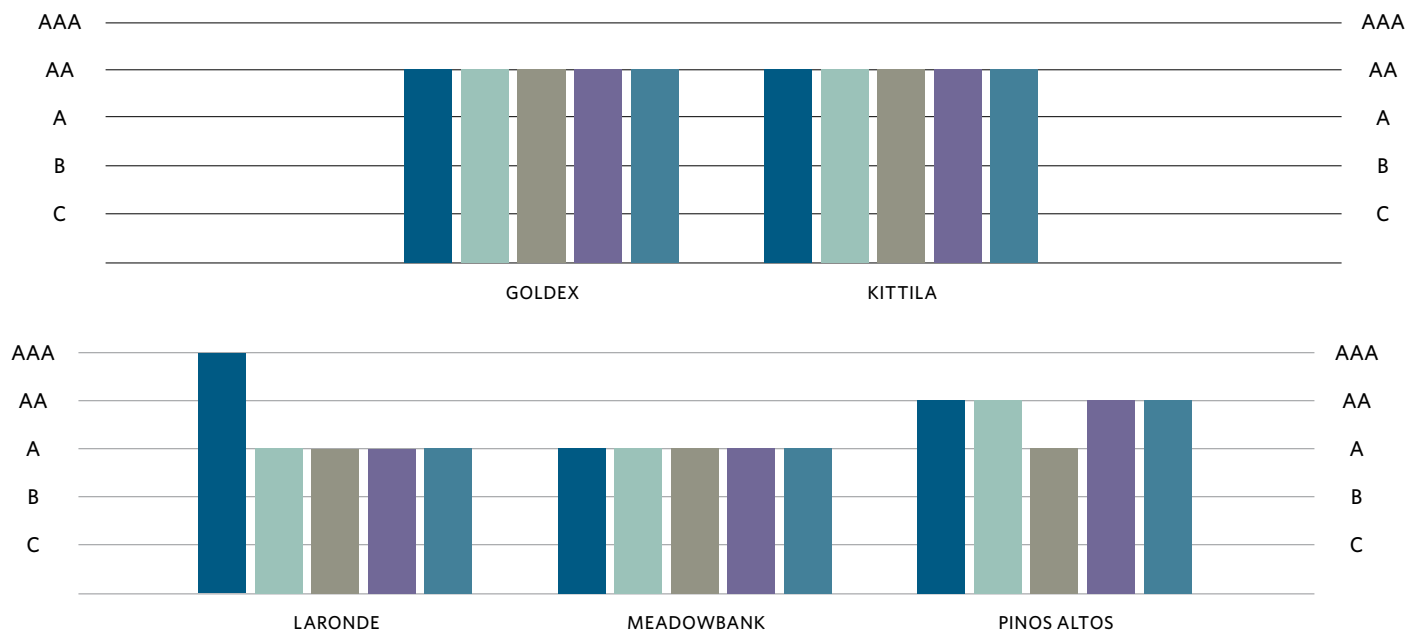
Safety and Health Assessment





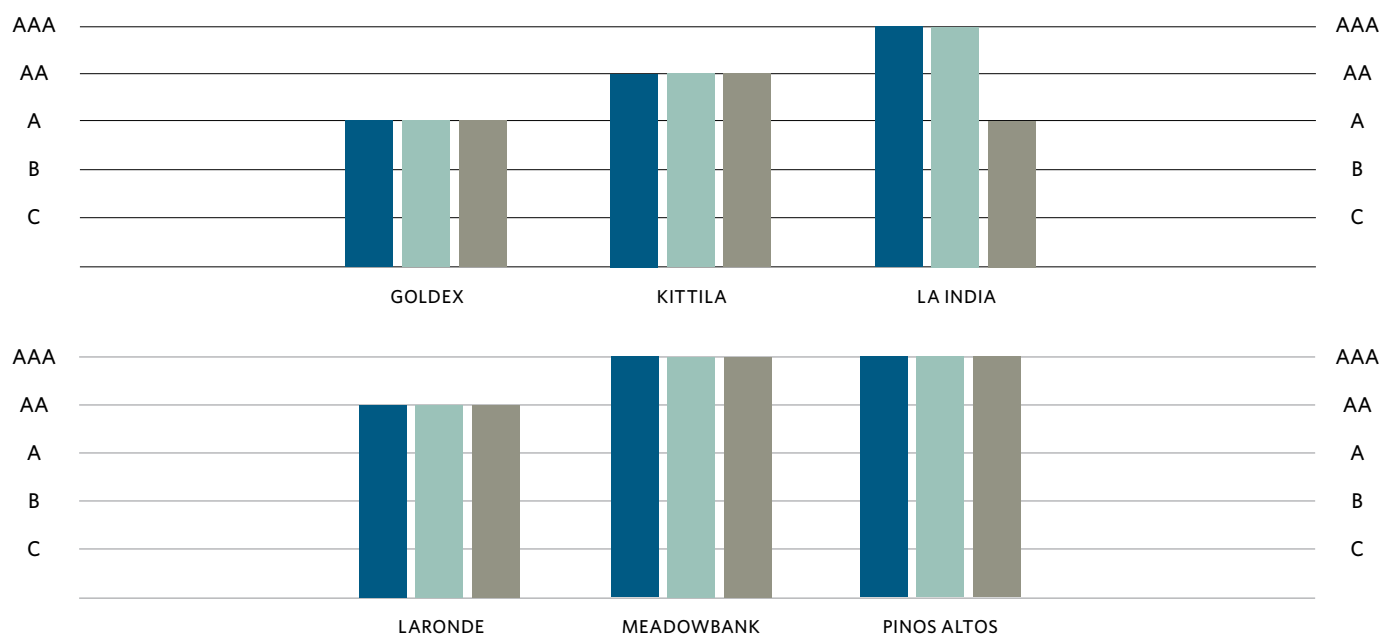
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL

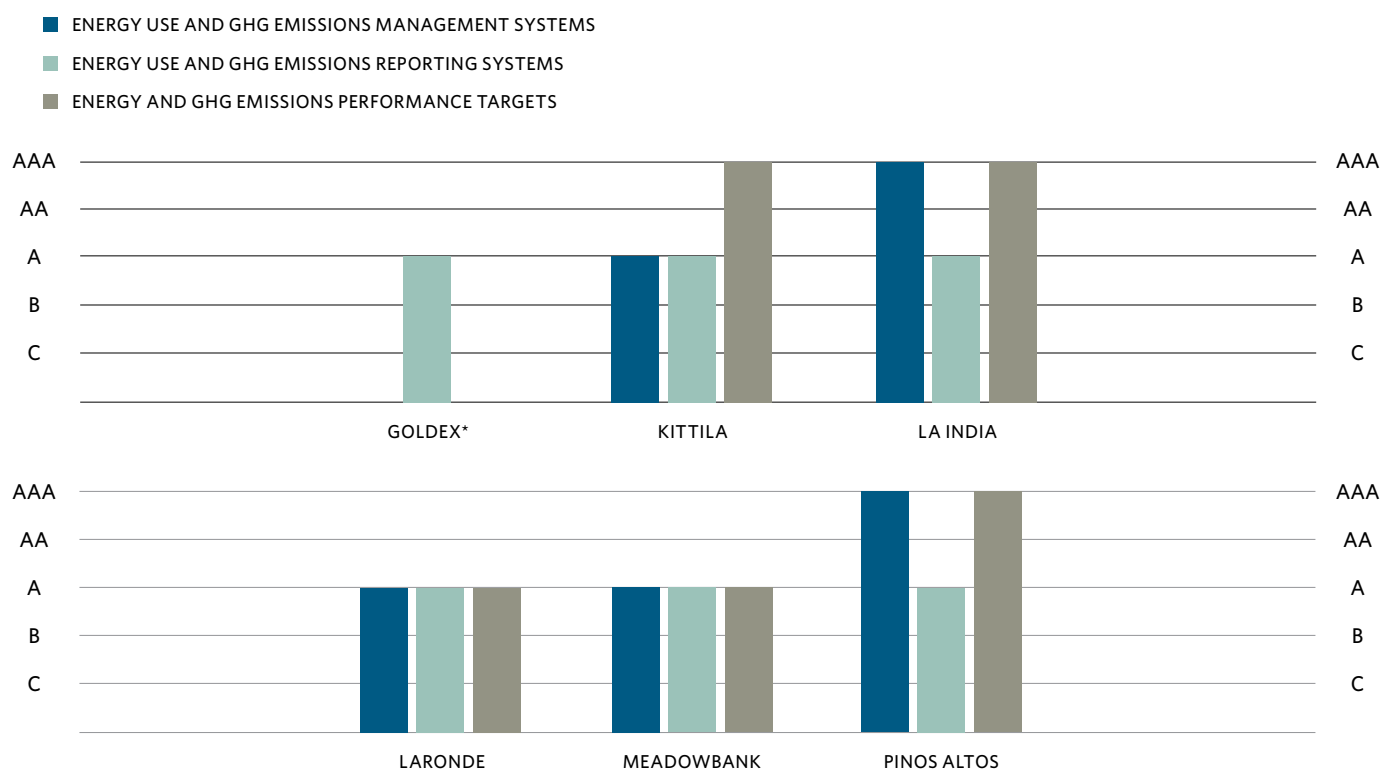


Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment



*Goldex's total GHG emissions are under 25 kt CO₂ and therefore are not required to report performance for Indicators 1 and 3 of the Energy Use and GHG Emissions Management Protocol.

TSM Performance by Company

ArcelorMittal Mines Canada



ArcelorMittal Mining Canada G.P. is the largest mining subsidiary of ArcelorMittal involved in the extraction of iron ore and is the main Canadian supplier of iron ore products for the global steel market. With activities in both the mining and primary processing sectors, the company produced 26 million tonnes of iron ore concentrate in its Quebec facilities in 2016. ArcelorMittal operates a mining complex at Mont-Wright, a mine at Fire Lake, a crusher-concentrator, as well as a 420-kilometre railway, a pellet plant, a port and rail workshops in Port-Cartier. In 2016, ArcelorMittal Infrastructure Canada G.P. shipped 25.3 million tonnes of concentrate and iron oxide pellets to clients in America, Europe, Africa and Asia.

As a MAC member, the company supports the TSM initiative and is continuously improving its application of various Protocols. ArcelorMittal is committed to protecting the health and safety of its employees and the environment, as demonstrated by its adoption of other standards related to management systems. As well, the company is implementing the measures required to maintain certification for its environmental management system under the updated ISO 14001:2015 standard and for its quality management system under ISO 9001:2015.

ArcelorMittal's occupational health and safety system received OHSAS 18001:2007 standard certification in 2011. The company has been practising Courageous Leadership in occupational health and safety for several years. The words "in action" were added to the company's policy to encourage ongoing dialogue between management and employees with the aim of reducing hazards in the workplace. Everyone has the right to return home safe every day. The Courageous Leadership initiative has contributed greatly to reducing the rate of injury causing loss in working time, which fell from 4.1 in 2011 to 0.8 in 2016. ArcelorMittal is continuing its efforts to reduce this rate to zero.

As a responsible company, ArcelorMittal has established a stringent management system for its tailings sites at Mont-Wright and Port-Cartier.

The company achieved a Level AAA for all indicators under the *TSM Tailings Management Protocol* at both sites during its external verification. In summer 2016, the company hired world-renowned external consultant SRK Consulting to perform a technical audit of its largest tailings site at Mont-Wright. The company is also currently working on a revegetation project at this site. So far, 150 hectares have been permanently greened and turned into grasslands.

ArcelorMittal is continuously improving its energy efficiency and reducing its overall GHG emissions. In order to diversify the company's energy portfolio, ArcelorMittal has secured investments from the Government of Quebec of up to \$4.5 million. These funds are used to finance a pilot project, launched in 2017, to switch part of the pellet production process over to liquefied natural gas. This project is yet another step towards achieving the company's energy-related goals, and is in addition to its efforts to introduce biomass-based energy sources. As well, since November 2016, ArcelorMittal staff who drive electric vehicles have been charging them for free at the Port-Cartier site, where rapid-charging stations have been installed.

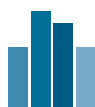
From the outset, ArcelorMittal has been very involved in its communities. Current activities include donations to non-profit organizations and employee volunteer initiatives. The company also works with two official joint committees that provide a forum for local community representatives to discuss challenges directly with it. In 2012, ArcelorMittal signed an impact and benefit agreement with the Uashat mak Mani-Utenam Inuit community, which is now being jointly implemented.

Now more than ever, ArcelorMittal is committed to improving its approach to the TSM initiative.

🔗 For more information, please visit www.transformerlavenir.com



ArcelorMittal Mining Canada G.P.'s team with their new production truck.



2017 TSM Results

ArcelorMittal Mines Canada



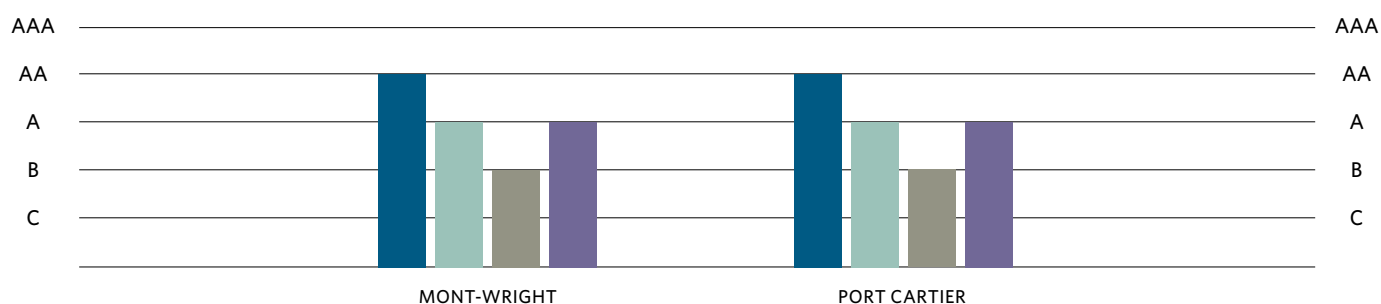
Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	×	×
MONT-WRIGHT	✓	×	×
PORT CARTIER	✓	×	✓



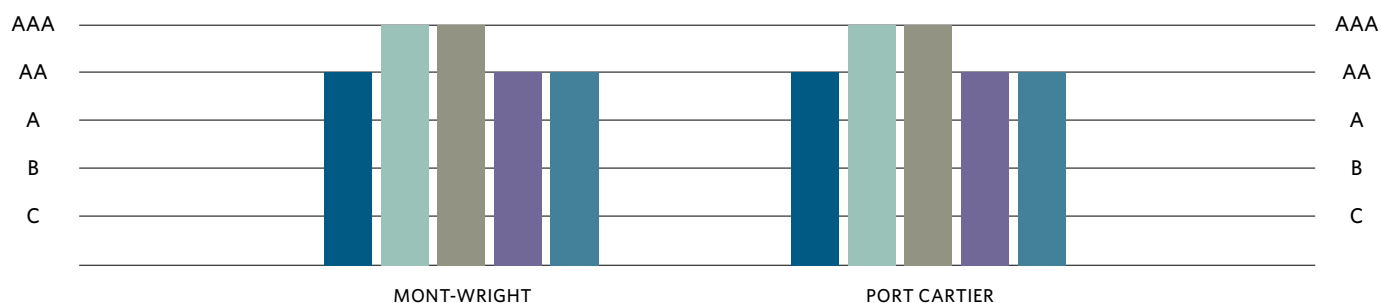
Aboriginal and Community Outreach Assessment

- COMMUNITY OF INTEREST (COI) IDENTIFICATION
- COI RESPONSE MECHANISM
- EFFECTIVE COI ENGAGEMENT AND DIALOGUE
- REPORTING



Safety and Health Assessment

- COMMITMENTS AND ACCOUNTABILITY
- MONITORING AND REPORTING
- PLANNING AND IMPLEMENTATION
- PERFORMANCE
- TRAINING, BEHAVIOUR AND CULTURE

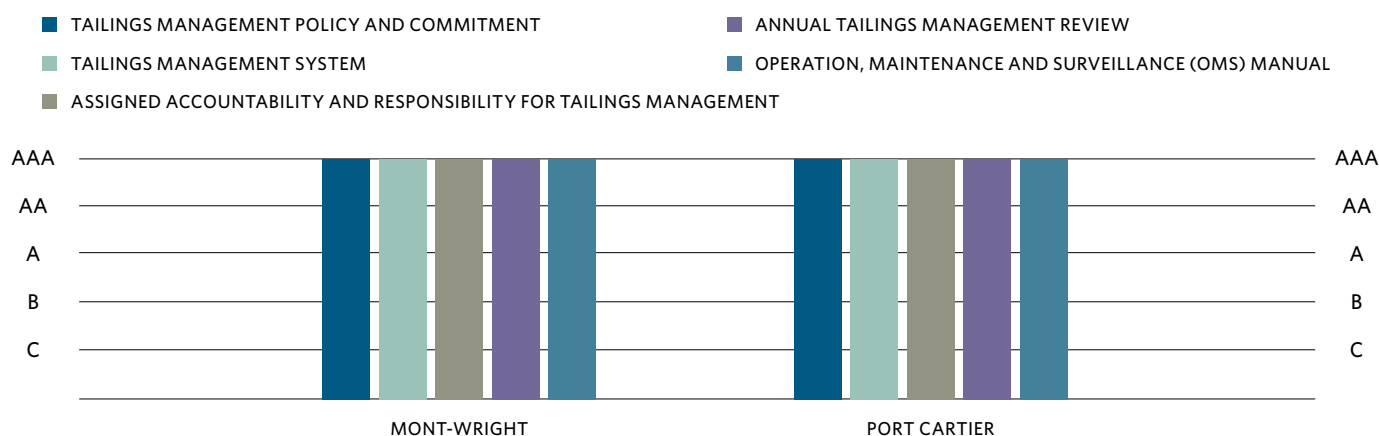


Self-assessed results; last external verification: 2017; next external verification: 2020.

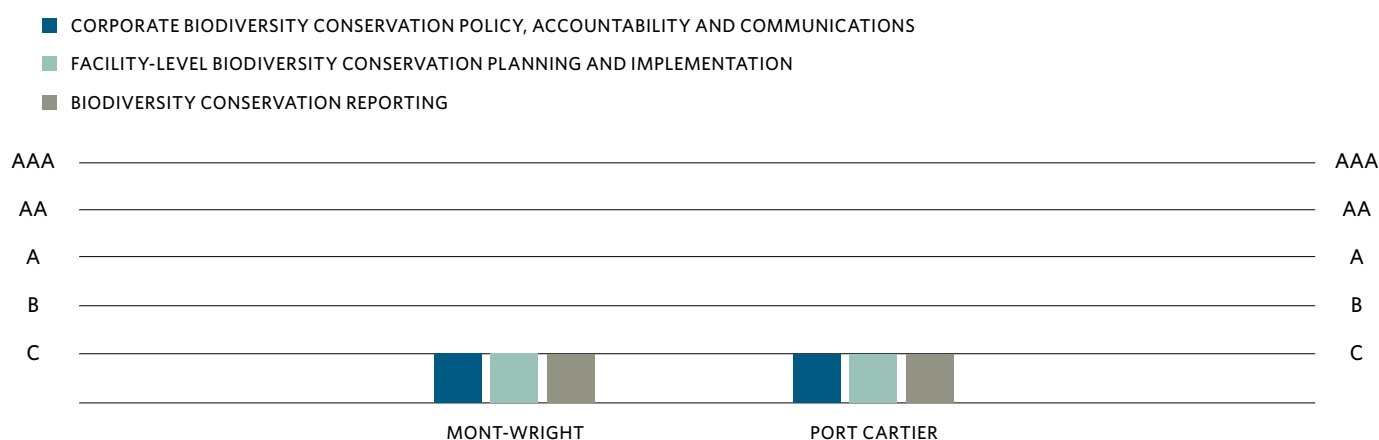




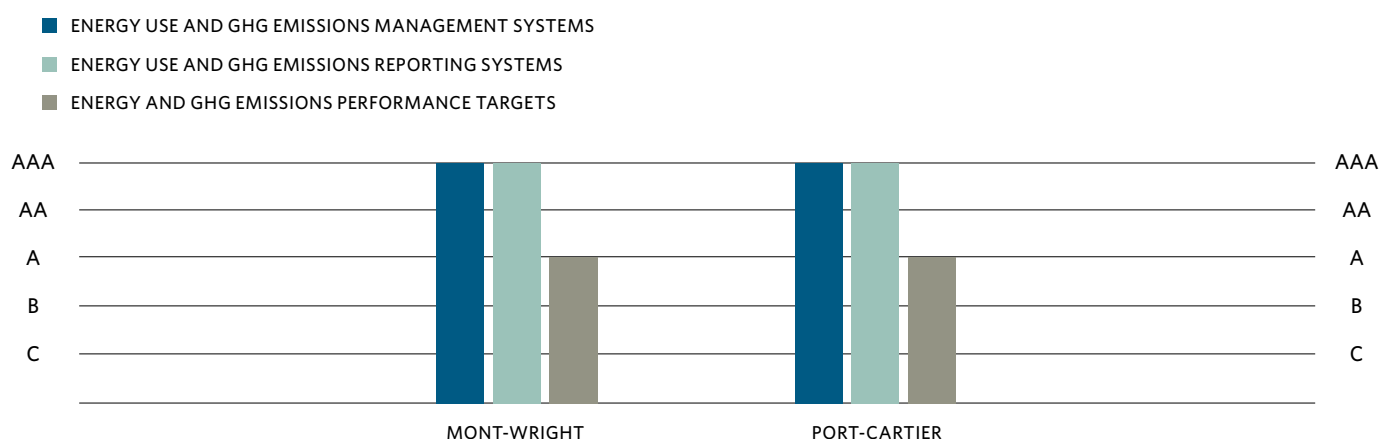
Tailings Management Assessment



Biodiversity Conservation Management Assessment



Energy Use and GHG Emissions Management Assessment



Self-assessed results; last external verification: 2017; next external verification: 2020.



TSM Performance by Company

Avalon Advanced Materials



Avalon Advanced Materials is a Canadian mineral development company specializing in critical metals and minerals with growing demand in new technology. The company has three advanced-stage projects across Canada, all 100% owned, with exposure to lithium, tin, indium, zirconium and the rare earth elements. Avalon is currently focusing on its Separation Rapids Lithium Project near Kenora, Ontario, and its East Kemptville Tin-Indium Project in Yarmouth, Nova Scotia.

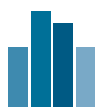
Avalon believes that a strong sustainability framework is fundamental to its long-term success. The company has implemented the *TSM Guiding Principles* in order to meet or exceed industry best practices, and to continuously improve on its social, environmental, and health and safety performance. As Avalon is a development stage company, its annual TSM self-assessment is voluntary.

Avalon has demonstrated leadership among junior companies in the mineral development sector by producing an annual sustainability report compliant with the Global Reporting Initiative's (GRI) guidelines. Avalon reports on its activities to hold itself accountable; drive innovation; improve company performance; develop management systems and governance for future operations; and to demonstrate the benefits of sustainable practices to its stakeholders. In November 2017, Avalon published its sixth annual sustainability report and its first in accordance with the new GRI Standards, core option.

Avalon has placed among Corporate Knights' Future 40 Responsible Corporate Leaders in Canada in 2015, 2016 and 2018.

During the 2017 reporting period (September 1, 2016 to August 31, 2017), Avalon continued to advance its projects openly and transparently, with a commitment to the economic and social well-being of its projects' local communities.

🔗 For more information, please visit www.avalonadvancedmaterials.com



2017 TSM Results

Avalon Advanced Materials

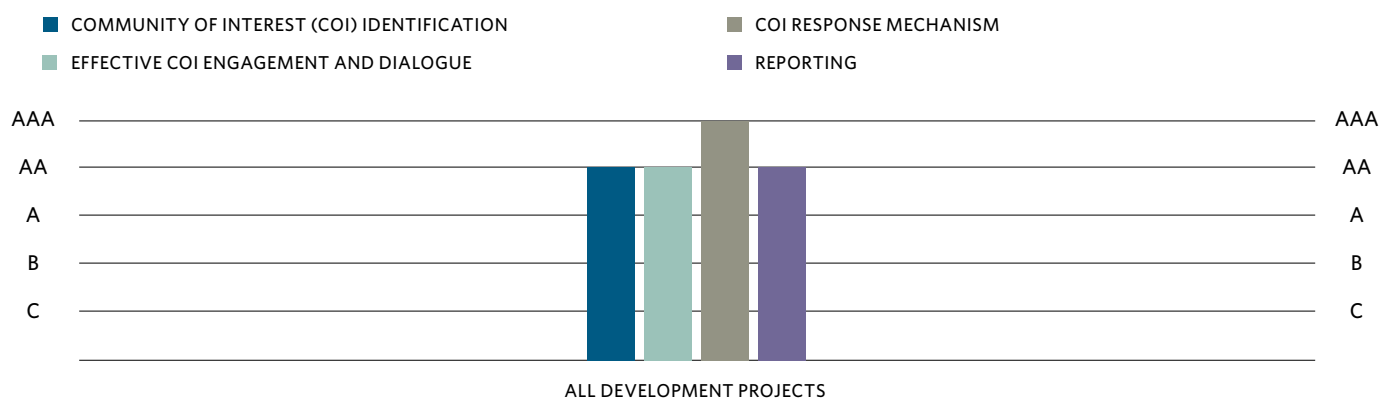


Crisis Management and Communications Planning Assessment

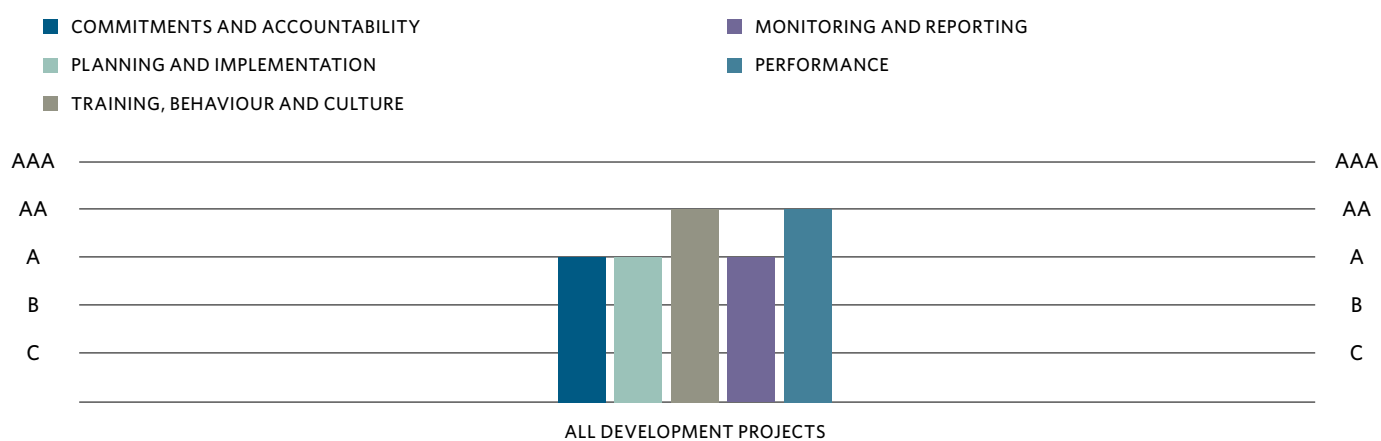
FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
ALL DEVELOPMENT PROJECTS	✓	✓	✓



Aboriginal and Community Outreach Assessment



Safety and Health Assessment



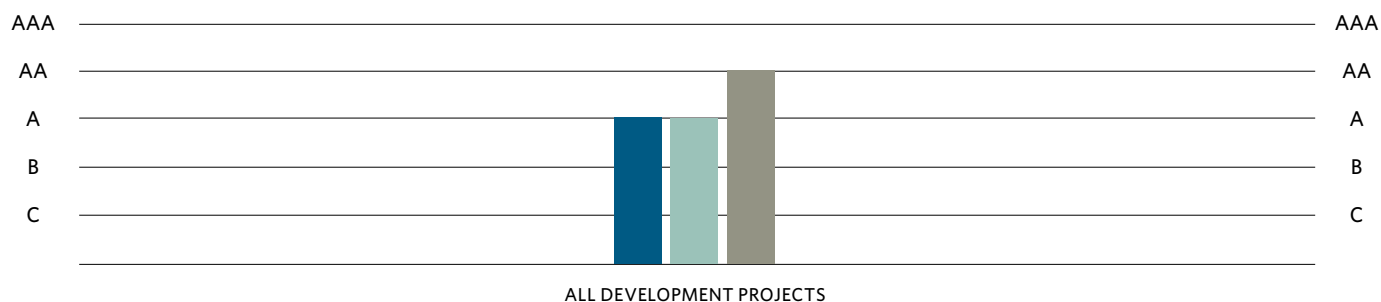
Voluntary self-assessment.





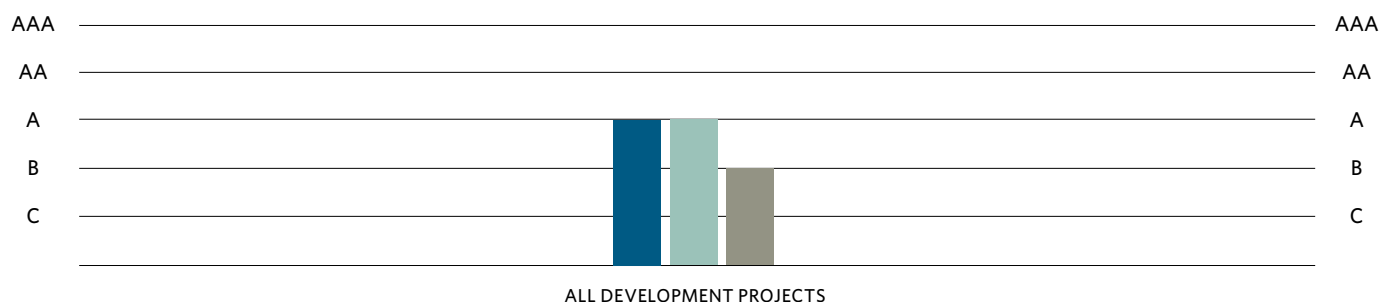
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



Voluntary self-assessment.



TSM Performance by Company

Baffinland Iron Mines Corporation



Baffinland Iron Mines Corporation (Baffinland) is a Canadian mining company, mining iron ore at the Mary River operation in the Qikiqtani region of North Baffin, Nunavut, Canada. At Baffinland, most of our employees work beyond the Arctic Circle, in one of the world's most captivating and seldom-seen destinations.

ABOUT BAFFINLAND

Baffinland is jointly owned by ArcelorMittal and Nunavut Iron Ore. Our head office is located in Oakville, Ontario, Canada and our Northern Headquarters are located in Iqaluit, the capital of Nunavut.

We also maintain a year-round presence in the North Baffin communities near our operation, with community liaison offices in Arctic Bay, Clyde River, Hall Beach, Igloolik, and Pond Inlet.

THE MARY RIVER OPERATION

The Mary River Property is located at approximately 72 degrees north by 79 degrees west on Baffin Island and consists of nine high-grade iron ore deposits. We've been working on the development of the property and in 2015, we moved into operations. Since then, we've been mining Deposit No. 1. Because of the high grade of the iron ore, we simply mine, crush, and screen the ore on site, and then ship it directly to markets – no concentrating or processing needed. That means significantly less impact on the environment than typical iron ore operations.

COMMITTED TO THE NORTH

Since 1986, we've been working to develop the Mary River Property, safely, sustainably, and in accordance with agreements made with Inuit birthright corporations Nunavut Tunngavik Inc. (NTI) and the Qikiqtani Inuit Association (QIA), as well as to the Government of Nunavut. We've also been regularly collecting and incorporating feedback from the local communities.

With our partners, we've been contributing to infrastructure developments, skills training, and employment and business opportunities for the people of Nunavut and have been providing revenues to NTI and QIA.

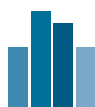
BUILDING FOR THE FUTURE

Baffinland is committed to building and operating the Mary River Mine in an environmentally and socially responsible manner that will benefit all stakeholders. Given the significant wealth-generating potential of the deposits, the benefits are not just our generation, but for generations to come.

🔗 For more information, please visit www.baffinland.com



In 2017, Baffinland shipped an Arctic record 4.1 million tonnes from its Milne Inlet Port to markets in Germany, the United Kingdom and Japan.



2017 TSM Results

Baffinland Iron Mines Corporation

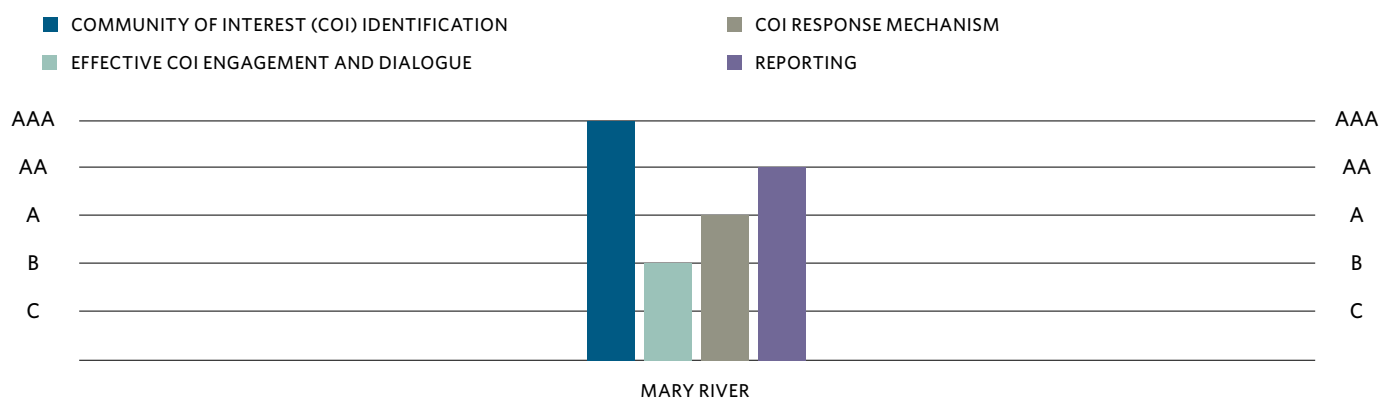


Crisis Management and Communications Planning Assessment

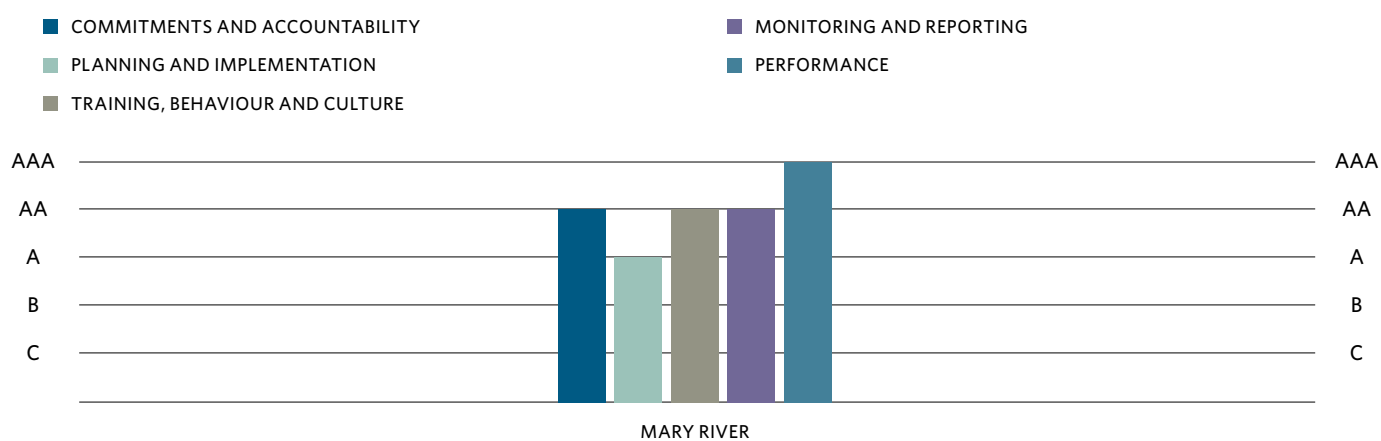
FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	×	✓
MARY RIVER	✓	×	✓



Aboriginal and Community Outreach Assessment



Safety and Health Assessment



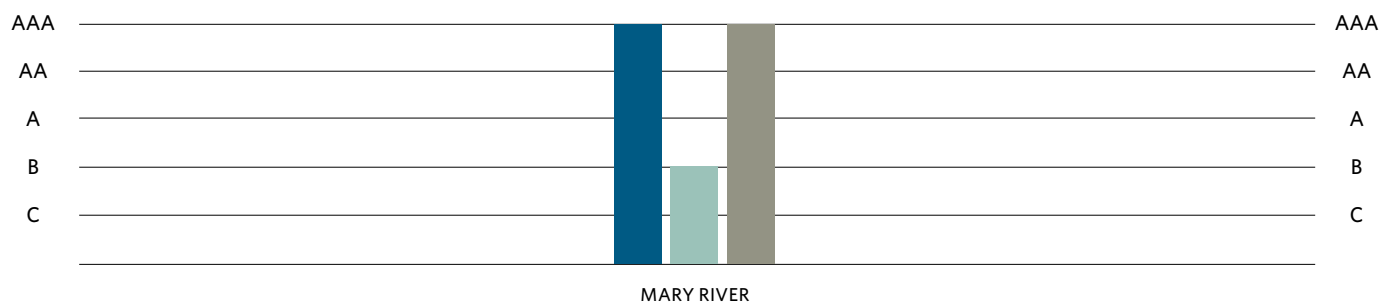
Self-assessed results; first external verification: 2020.





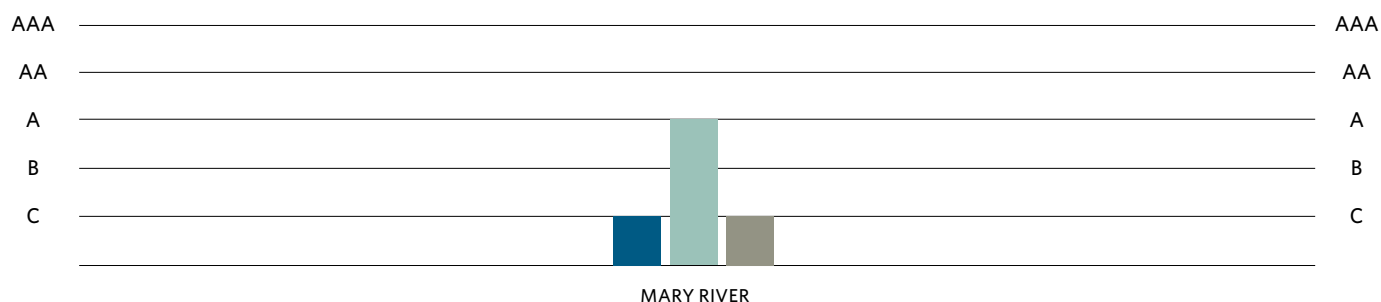
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



Self-assessed results; first external verification: 2020.



TSM Performance by Company

Barrick Gold Corporation



Barrick has mining operations in Argentina, Australia, Canada, Chile, Dominican Republic, Papua New Guinea, Peru, Saudi Arabia, the United States, and Zambia. More than 75% of its gold production comes from the Americas. The company was founded in 1983 by Canadian entrepreneur and philanthropist, Peter Munk, and is headquartered in Toronto. Barrick's shares trade on the New York Stock and Toronto Stock Exchanges under the symbol ABX.

Barrick's vision is the generation of wealth through responsible mining – wealth for the company's owners and people, and for the countries and communities with which it partners.

Barrick aims to be the leading mining company focused on gold, growing its cash flow per share by developing and operating high-quality assets, through disciplined allocation of human and financial capital, and operational excellence.

The Hemlo mining operation is located approximately 46 kilometres east of Marathon, Ontario, and has produced gold continuously since 1985. The operation includes an underground mine and open-pit mine complex with a processing facility. Several years ago, the Hemlo operation entered a new phase of its productive life with the purchase of adjacent lands, increasing the site's mineable reserves. The site's mine life is now extended until 2027 with the possibility of additional expansions.

Hemlo's original TSM goal was to achieve and maintain a minimum ranking of a Level A within each Protocol. The site's extended mine life provides new opportunities for further enhancements to Hemlo's practices and operating standards. As a result, the site is now seeking higher rankings through continued diligence and the application of TSM, coupled with other international practices and standards.

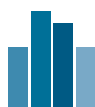
Hemlo's commitment to improve is further demonstrated by the site's continued certification by independent third-party auditors under the International Cyanide Management Code and ISO 14001:2015 for environmental management systems. These certifications, together with TSM, reinforce Barrick's commitment to the environment and continued sustainability. Hemlo has been recognized by Canada's Department of Natural Resources for its innovative energy conservation program. It received a Canadian Industry Program for Energy Conservation (CIPEC) Leadership Award for implementing a project that reduced greenhouse gas emissions by 24% and lowered energy consumption by 10% between 2013 and 2015.

As part of its commitment to sustainability, Hemlo continues to expand its external engagement and partnerships. The site was the first in Canada to receive the Mining Essentials and Environmental Monitoring training program for Aboriginal people. This program enabled 10 members of the Pic River First Nation and Pic Mobert First Nation to receive training. Hemlo continues to work on several initiatives with both First Nation communities and other communities of interest.

🔗 For more information, please visit www.barrick.com



Barrick's Hemlo operation near Marathon, Ontario.



2017 TSM Results

Barrick Gold Corporation

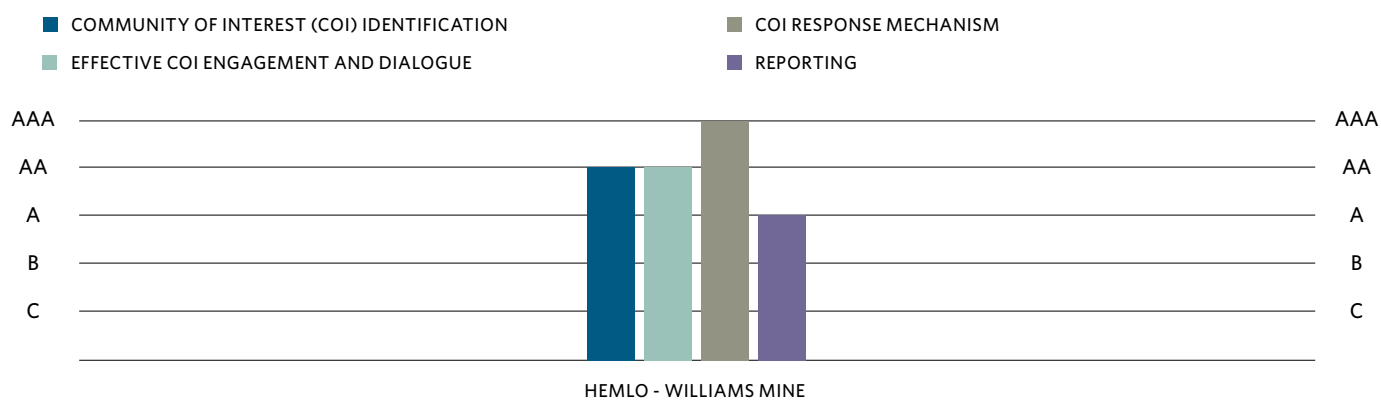


Crisis Management and Communications Planning Assessment

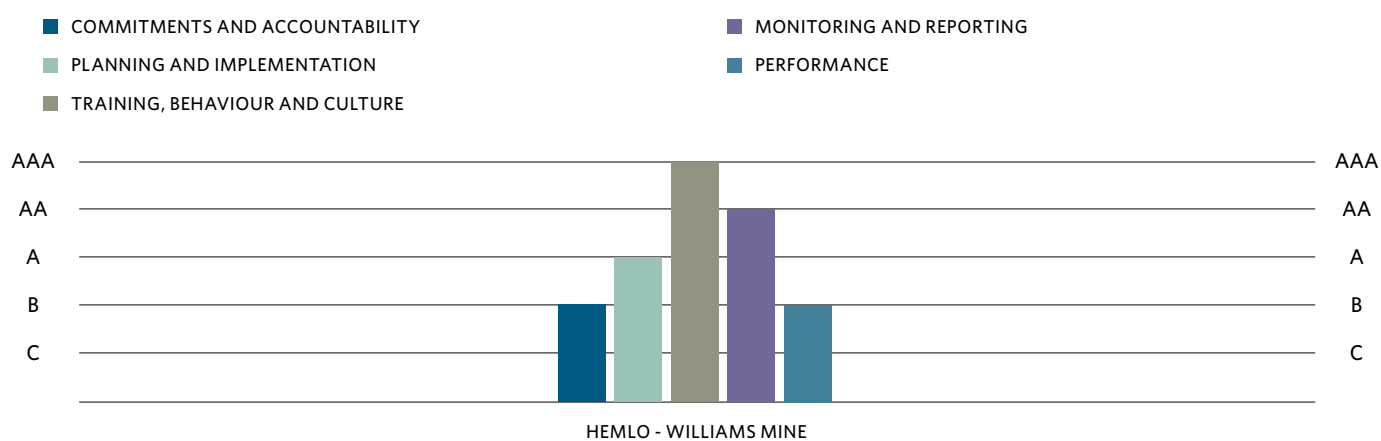
FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	×
HEMLO - WILLIAMS MINE	✓	✓	✓



Aboriginal and Community Outreach Assessment



Safety and Health Assessment



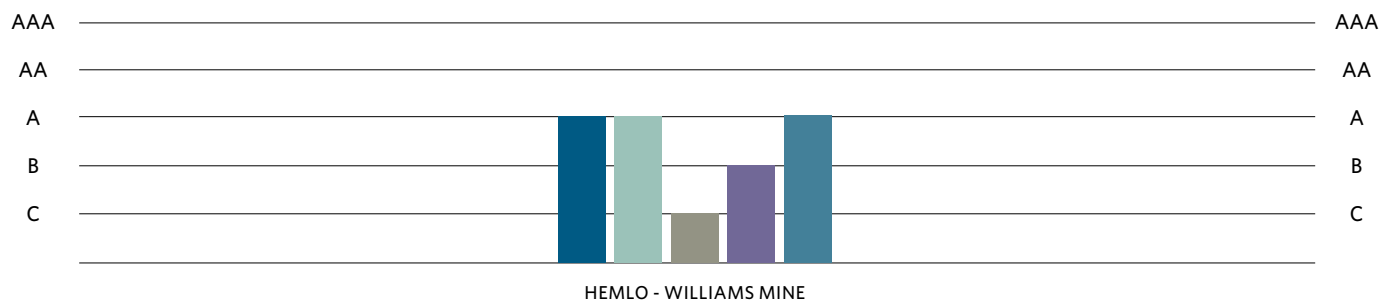
Self-assessed results; last external verification: 2017; next external verification: 2020.





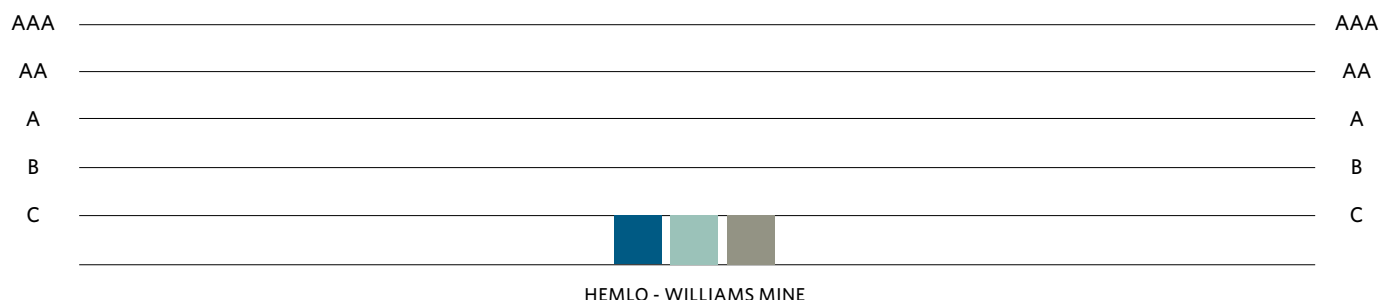
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL



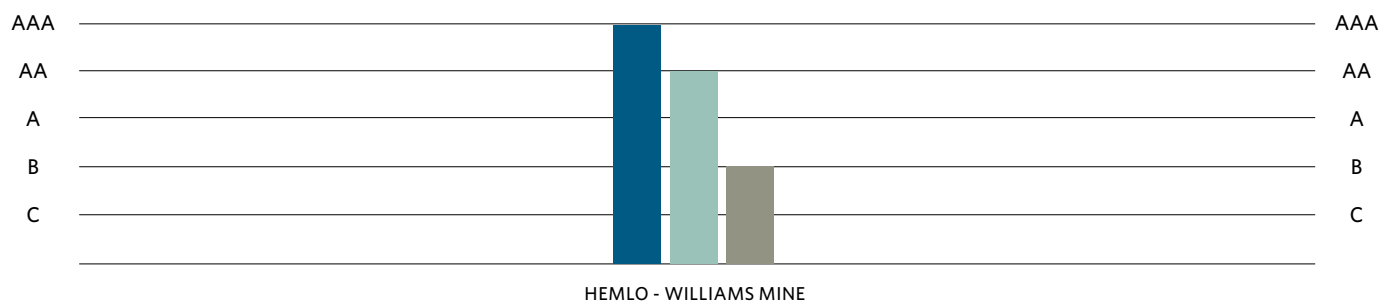
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



Self-assessed results; last external verification: 2017; next external verification: 2020.

TSM Performance by Company

Cameco Corporation



Cameco Corporation is one of the world's largest uranium producers. Nuclear energy plants around the world use its uranium products to generate one of the cleanest sources of electricity available today. Cameco is committed to delivering its products safely and responsibly. Sustainable development principles and practices are integrated at each level of Cameco's organization, from overall corporate strategy to individual employee practice in day-to-day operations.

Cameco's corporate objectives are set out under four measures of success: a safe, healthy and rewarding workplace, a clean environment, supportive communities, and outstanding financial performance.

SAFE, HEALTHY, REWARDING WORKPLACE

Cameco is committed to living a strong safety culture, while looking to continually improve. As a result of this commitment, the company has a long history of strong safety performance at its operations and across the organization.

2017 Highlights:

- Several operations reached significant safety milestones, including the Blind River refinery and the Crow Butte operation passing 11 and 10 years, respectively, without a lost-time incident.
- The Key Lake mill, Port Hope Conversion Facility and Cameco Fuel Manufacturing made significant improvements in their safety performance over 2016.
- Continued low average dose radiation to workers, including at the Cigar Lake operation as it increased production to license capacity.

CLEAN ENVIRONMENT

Cameco is committed to being a leading environmental performer. This is done by keeping risks as low as reasonably achievable and looking for opportunities to move beyond regulatory requirements. Progress is tracked by monitoring the air, water and land near the company's operations, and by measuring the amount of energy used and the amount of waste generated. This information helps Cameco identify opportunities to improve.

2017 Highlights:

- Successfully managed extended summer shutdowns at Key Lake, McArthur River and Cigar Lake with no significant environmental incidents.
- Continued efforts to systematically improve energy conservation and efficiency in its Saskatchewan and Ontario facilities.
- Completed the multi-year implementation of an environmental monitoring database for all of its operations.
- Brought Cigar Lake up to full production without exceeding an environmental limit or having a significant environmental incident.
- Continued to carry out industry leading research and innovation in groundwater restoration at the company's US in situ recovery operations.

SUPPORTIVE COMMUNITIES

Gaining the trust and support of communities, Indigenous people, and governments is necessary to sustainable mining. Cameco earns support and trust through excellent safety and environmental performance, by proactively engaging with stakeholders in an open and transparent way, and by making a difference in communities wherever the company operates.

2017 Highlights:

- Over \$170 million in procurement from locally-owned northern Saskatchewan companies (80% of total).
- 954 local personnel from northern Saskatchewan (603 Cameco employees, 351 contractors).
- Signed a collaboration agreement, the company's fourth in northern Saskatchewan, with the seven communities of the Athabasca Basin, including four First Nations.
- Held a northern leaders roundtable – featuring nearly 50 northern Saskatchewan leaders

TSM PERFORMANCE

Due to difficult uranium market conditions, Cameco has undergone a number of changes to its operations and support functions in recent years, including the temporary suspension of production at McArthur River and Key Lake in early 2018, and the suspension of production at Rabbit Lake and curtailment of US production in 2016. Nonetheless, Cameco remains committed to effective management systems, which is reflected in its strong TSM scores.

Aboriginal and Community Outreach

Cameco's commitment to meaningful community engagement is reflected in the TSM results for its facilities. Key Lake and McArthur River achieved Level AAA performance for all indicators of the *Aboriginal and Community Outreach Protocol*.

Crisis Management and Communications Planning

Cameco's corporate office and participating facilities met all of the criteria of the *Crisis Management and Communications Planning Protocol*.

Safety and Health

Cameco continued to demonstrate high levels of performance in the area of safety and health. Key Lake and McArthur River achieved at least Level AA performance for all of the *TSM Safety and Health Protocol's* five indicators.

Tailings Management

Cameco has maintained Level A performance in tailings management for both its Key Lake and Rabbit Lake operations. The company has been engaged in MAC's review of the *TSM Tailings Management Protocol* and is working to implement the new criteria at its facilities.

Biodiversity Conservation Management

Key Lake and McArthur River maintained strong performance in biodiversity conservation management as well, with at least Level AA performance for all three of the Protocol's indicators.

Energy Use and GHG Emissions Management

The area of energy use and GHG emissions management represents an opportunity for improvement for Cameco's facilities. The company is working to improve its energy management and expects performance for this Protocol to improve in the coming years.

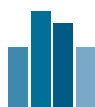
ACHIEVEMENTS

Cameco is a five-time Gold award winner through the Progressive Aboriginal Relations program, as judged by the Canadian Council for Aboriginal Business. It was named one of Canada's Top 100 Employers, Saskatchewan's Top Employers, Canada's Best Diversity Employers and Canada's Top Employers for Young People for 2017. It is a leading employer of Indigenous peoples in Canada, and has procured nearly \$3.6 billion in services from local suppliers in northern Saskatchewan since 2004. For more information on Cameco's social and environmental performance, please review its Sustainable Development report at www.cameco.com/about/sustainability.

🔗 For more information, please visit www.cameco.com



Cameco water samples being collected at Key Lake as part of the environmental management system.

Externally
Verified Results

2017 TSM Results

Cameco Corporation



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
KEY LAKE OPERATIONS	✓	✓	✓
MCARTHUR RIVER	✓	✓	✓



Preventing Child and Forced Labour

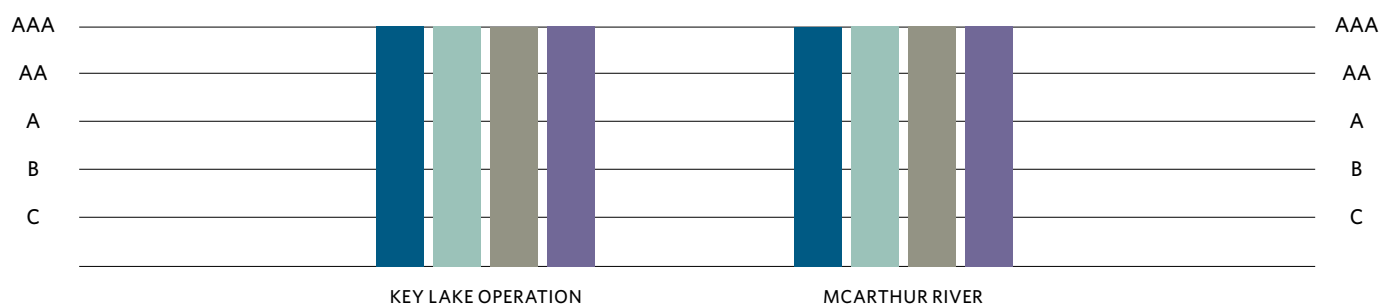
FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
KEY LAKE OPERATIONS	✓	✓
MCARTHUR RIVER	✓	✓



Aboriginal and Community Outreach Assessment

- COMMUNITY OF INTEREST (COI) IDENTIFICATION
- EFFECTIVE COI ENGAGEMENT AND DIALOGUE

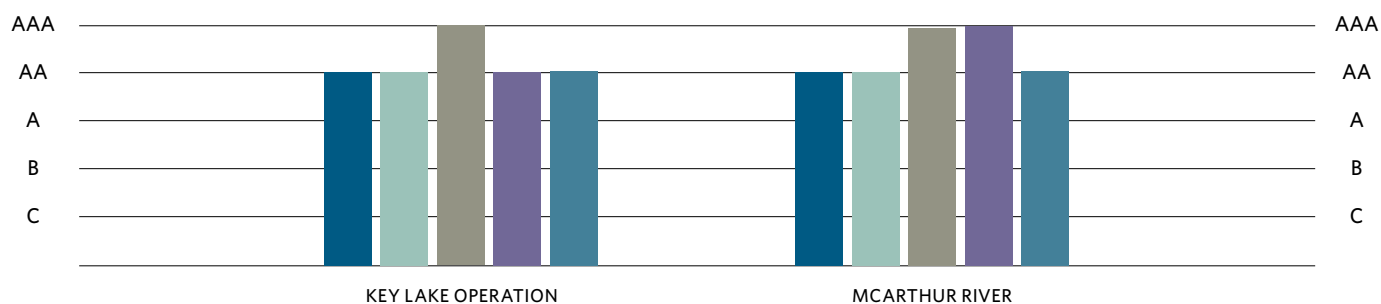
- COI RESPONSE MECHANISM
- REPORTING



Safety and Health Assessment

- COMMITMENTS AND ACCOUNTABILITY
- PLANNING AND IMPLEMENTATION
- TRAINING, BEHAVIOUR AND CULTURE

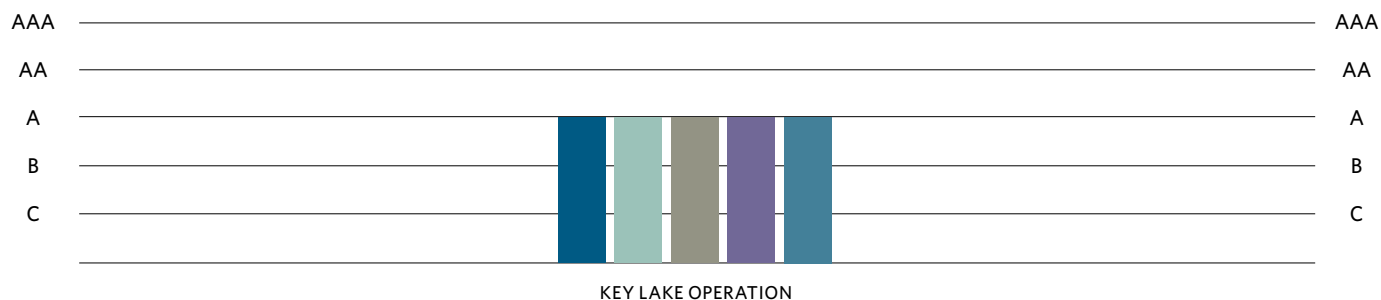
- MONITORING AND REPORTING
- PERFORMANCE





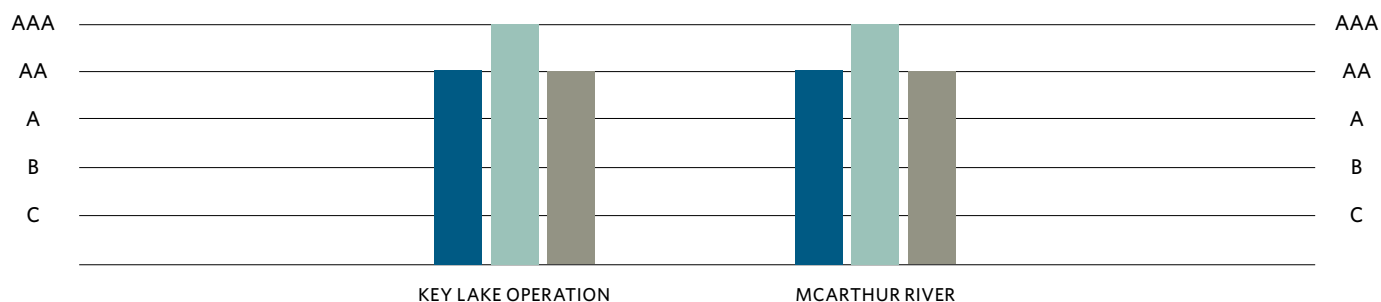
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
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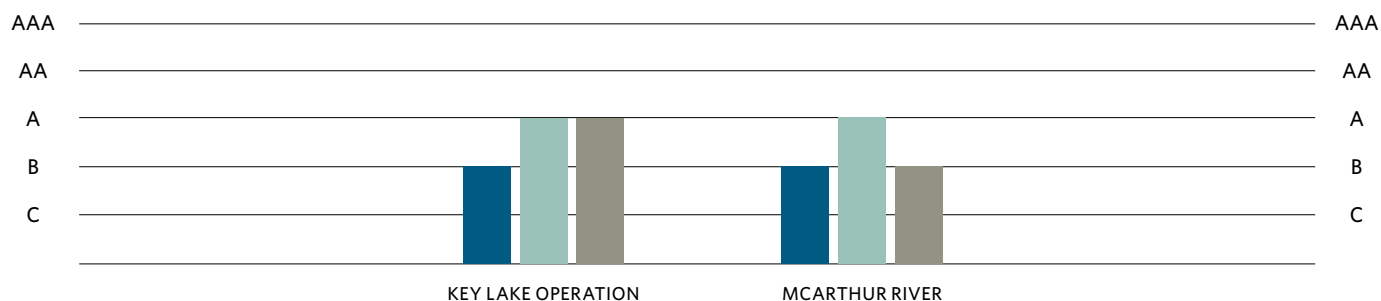
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



TSM Performance by Company

Canadian Natural Resources Limited



2017 was a year of transition for the Athabasca Oil Sands Project (AOSP). Up to May 31, 2017, Shell Canada Energy (Shell) operated the Muskeg River and Jackpine mines, located 75 kilometres north of Fort McMurray, Alberta, on behalf of the owners of the AOSP: Shell Canada Energy (60%), Chevron Canada Limited (20%) and Marathon Oil Canada Corporation (20%). In June 2017, Canadian Natural acquired 70% ownership of the AOSP, becoming operator of Albion Sands and its oil sands mines. For the *TSM* performance in 2017, the following is a combined summary of the former Shell oil sands mining operations' *TSM* performance for the first six months of the year and Canadian Natural's for the remainder.

INDIGENOUS COMMUNITIES

Canadian Natural and Shell have worked closely with Indigenous peoples in Canada for decades. Engagements include direct consultation on projects and operations, ongoing interaction and collaboration through industry relations committees, and formal engagement with Elders and First Nations and Métis leaders.

Both companies greatly value the perspectives and input of Indigenous communities, and with the change in operatorship pre-existing agreements with several local First Nations and Métis groups related to AOSP were successfully transitioned to Canadian Natural. Throughout 2017, there was a consistent focus on ensuring opportunities were shared with qualified local businesses and residents for participation in the contracting and employment processes at AOSP, with an emphasis on Indigenous-owned businesses and contractors.

INVESTING IN THE COMMUNITY

The two companies seek to initiate and support programs relevant to business activities and focus social investment around health and wellness, education and training, social programs, cultural events, and traditional practices. In 2017, for example, the companies contributed to renovations of the Continuing Care Unit at the Northern Lights Regional Health Centre in Fort McMurray, and the refurbishment of the Community Clinic in Conklin.

The AOSP continued to support Indspire, an Indigenous-led charitable organization that invests in the education of Indigenous youth in Canada, with investments in Kindergarten to Grade 12 programs, post-secondary scholarships and events that recognize Indigenous leaders.

ENVIRONMENTAL PERFORMANCE

Producing oil sands safely and in a manner that minimizes impact to the environment and society is of the utmost importance to Canadian Natural and Shell.

AOSP continues to follow the principles and framework of ISO: 14000: 2015 which fosters an effective and robust environmental management system.

As part of Canada's Oil Sands Innovation Alliance (COSIA), a first-of-its-kind alliance of oil sands producers, AOSP is participating in collaboration on innovation and technology to drive accelerated environmental performance improvement. Leveraging technical expertise and taking part in collaborative industry associations like COSIA helps to identify and act on promising opportunities and conduct research, both cost effectively and efficiently.

The companies strive to reduce the GHG footprint of its oil sands operations. On a well-to-wheels basis, GHG emissions from oil sands crudes are greater than the average emissions of crudes refined in the United States, according to research by IHS Markit. However, the GHG intensity of oil sands operations has been improving for several years due to operational enhancements, and the successful operation of the Quest carbon capture and storage (CCS) project has improved performance even further.

The Quest CCS project in Alberta was launched in 2015, and in 2017 continued to capture over one million tonnes of CO₂ from the Scotford Upgrader for storage deep underground – the equivalent to emissions from about 250,000 cars. Quest has a rigorous monitoring program to ensure that the CO₂ remains safely and securely in place. This includes continuous monitoring and early warning systems, groundwater sampling and 3-D seismic surveying.

By capturing one-third of direct CO₂ emissions from the Scotford Upgrader, Quest helps decrease the GHG intensity of our operations. This brings oil sands products more in line with the average emissions of North American crude oil. Quest is the first CCS project in the oil sands and serves as a model for advancing and deploying more CCS facilities in other industrial settings worldwide.

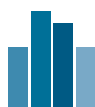
Additional GHG improvement efforts were made when both oil sands mines were granted approval to fully implement the Resource Optimization Program in 2017 which is now part of operational planning. This avoids low quality, poor processing material, leading to improvements in energy efficiency and reduced emissions. Through operational excellence, the mines continue to show improvement approximately 1 to 3% each year over the past seven years for a total 18% decline in GHG intensity. In 2017 the extrication plant had its strongest year and showed a ~9% improvement since 2014.

To better manage tailings from mine operations, tailings management initiatives continued in 2017, focusing on advancing technologies to treat fluid fine tailings to meet the Alberta Tailings Management Framework and associated regulations.

TSM PERFORMANCE

The Albian Sands mining operation continued to maintain high standards in the TSM Protocols of *Crisis Management and Communications Planning, Aboriginal and Community Outreach, Tailings Management and Biodiversity Conservation Management* with management programs in place that are reviewed, tested and documented. Our Environment and Stakeholder teams continue to proactively inform stakeholders about environmental performance through engagement meetings and Canadian Natural's Annual Stewardship Report to Stakeholders.

🔗 For more information, please visit www.cnrl.com and www.shell.ca



2017 TSM Results

Canadian Natural Resources Limited

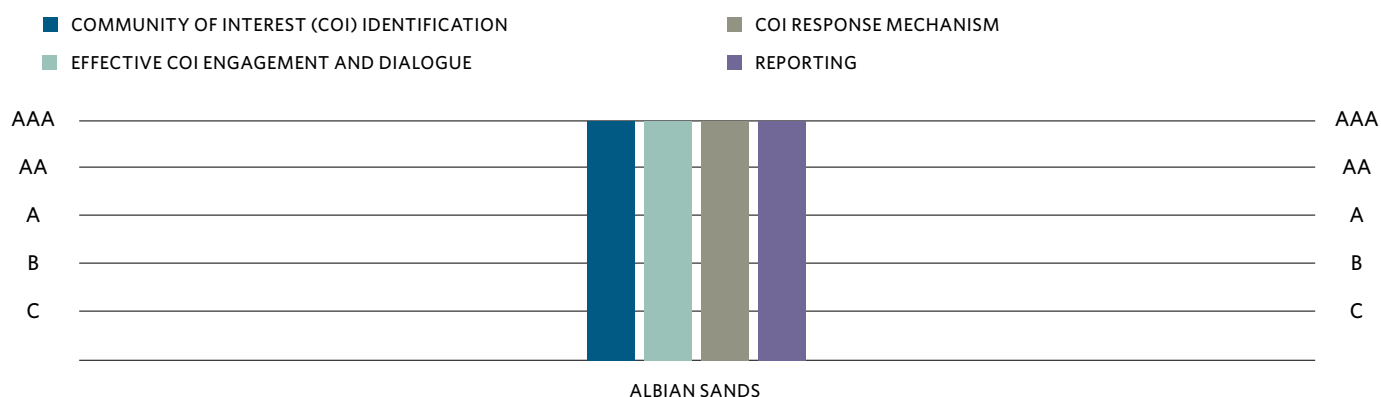


Crisis Management and Communications Planning Assessment

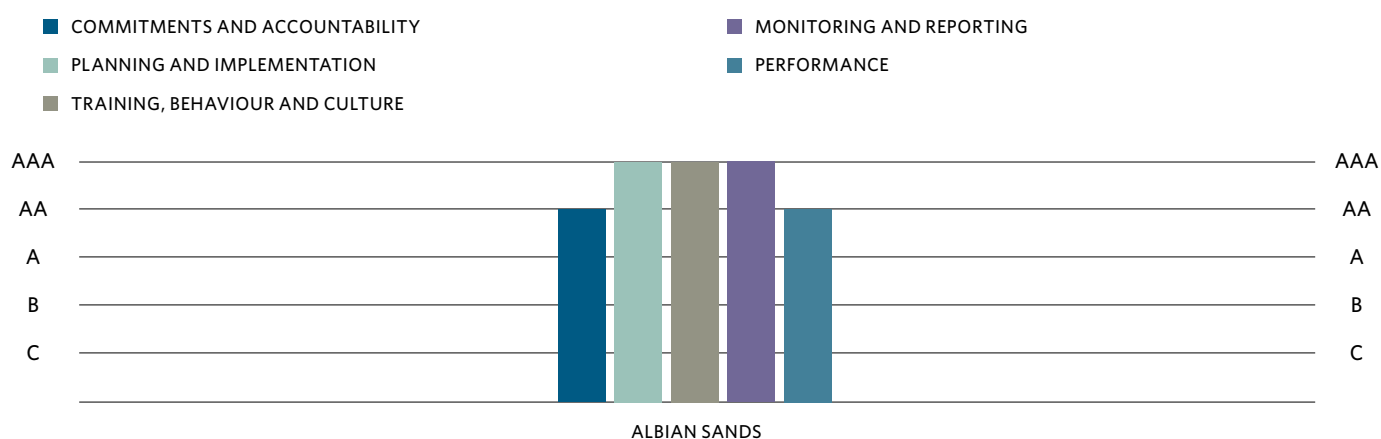
FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
ALBIAN SANDS	✓	✓	✓



Aboriginal and Community Outreach Assessment



Safety and Health Assessment



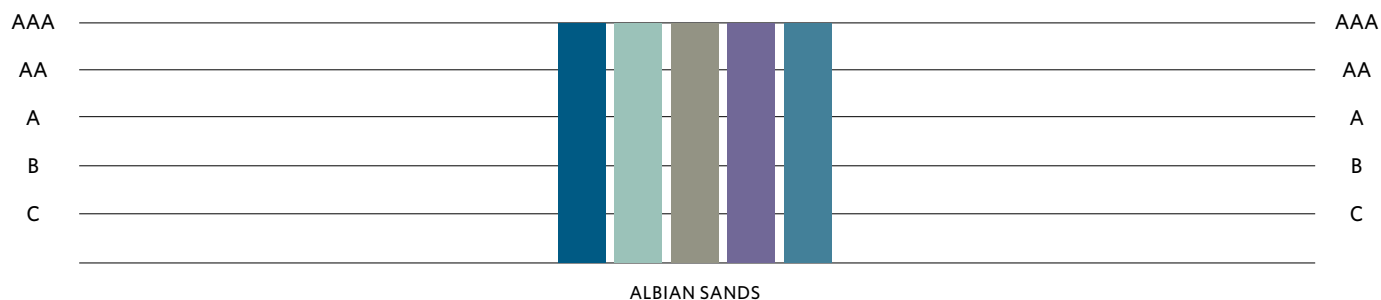
Self-assessed results; last external verification: 2016; next external verification: 2020.





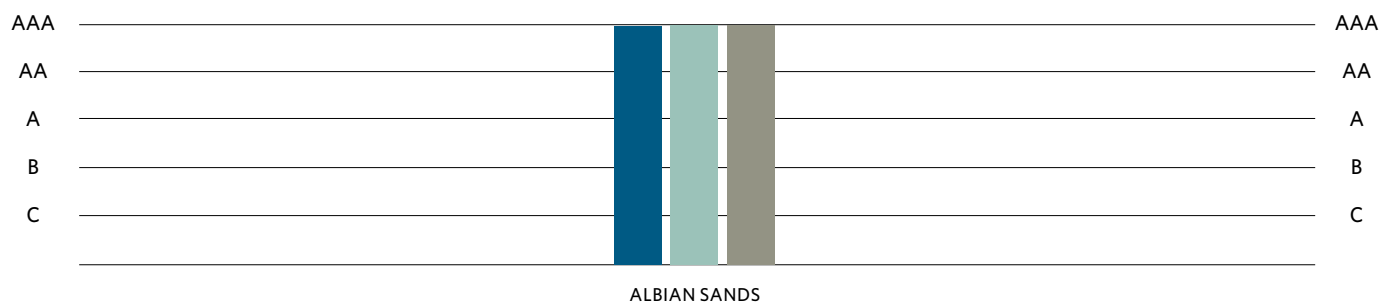
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
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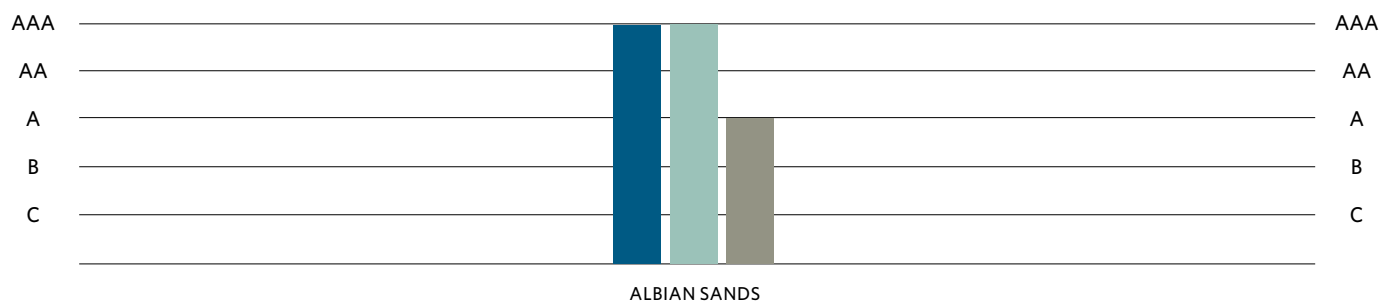
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS

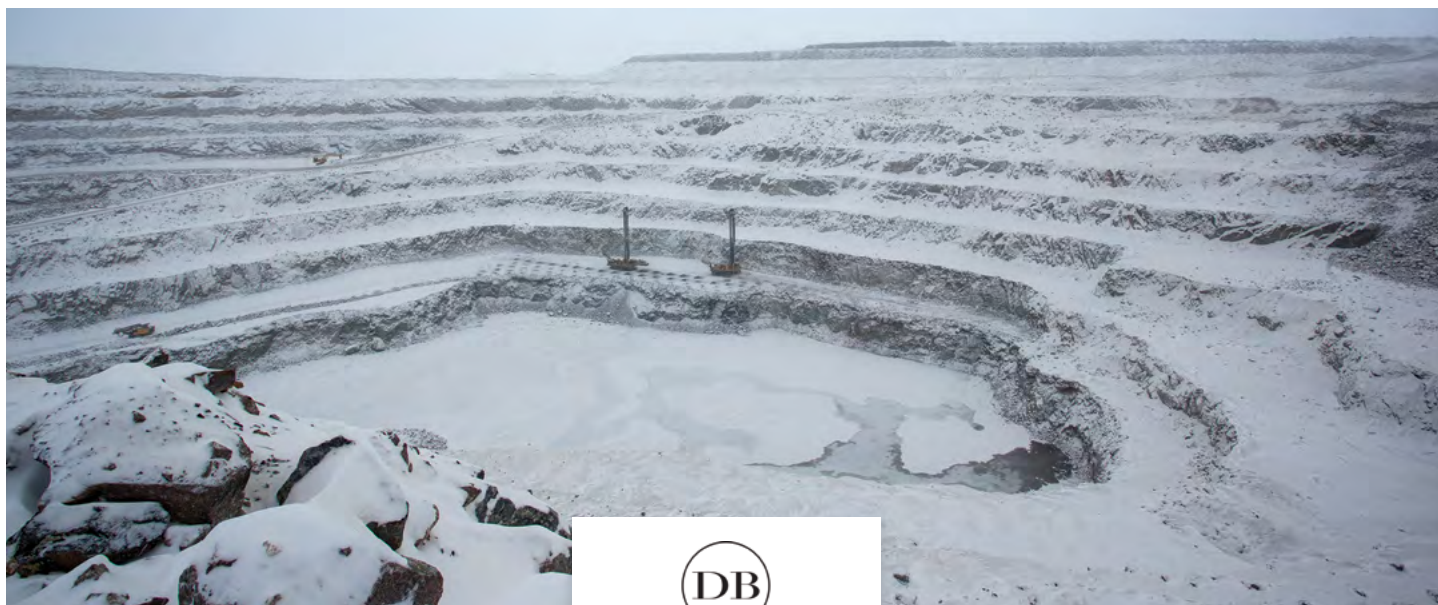


Self-assessed results; last external verification: 2016; next external verification: 2020.



TSM Performance by Company

De Beers Canada Inc.

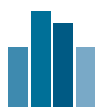


De Beers is a member of the Anglo American group. Established in 1888, De Beers is the world's leading diamond company with unrivalled expertise in the exploration, mining and marketing of diamonds. Together with its joint venture partners, De Beers employs more than 20,000 people (directly and as contractors) across the diamond pipeline, and is the world's largest diamond producer by value, with mining operations in Botswana, Canada, Namibia and South Africa.

As part of the company's operating philosophy, the people of De Beers are committed to *Living up to Diamonds* by making a lasting contribution to the communities in which they live and work, and transforming natural resources into shared national wealth.

De Beers has been operating in Canada since it carried out its first exploration programme in 1961. The De Beers Victor kimberlite cluster discovery in 1987 by De Beers Exploration was the first economic diamond discovery in Canada, four years before the discoveries in the Northwest Territories. De Beers currently operates the Victor Mine in northern Ontario and the Gahcho Kué Mine in the Northwest Territories. The Snap Lake Mine, Canada's first fully underground diamond mine, is currently in extended care and maintenance.

🔗 For more information, please visit www.debeersgroup.com



2017 TSM Results

De Beers Canada Inc.



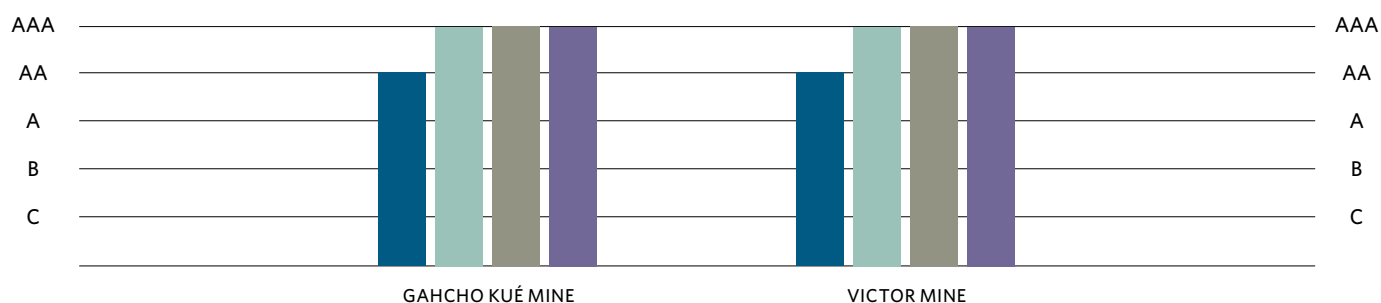
Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
GAHCHO KUÉ MINE	✓	✓	✓
VICTOR MINE	✓	✓	✓



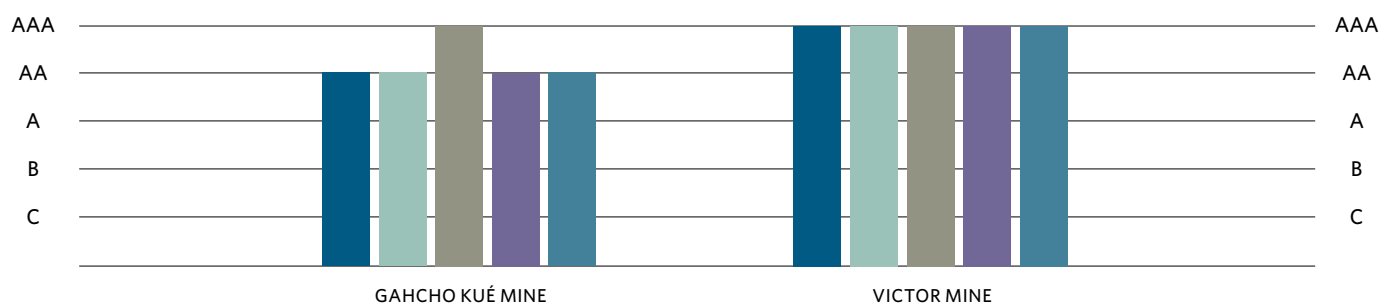
Aboriginal and Community Outreach Assessment

- COMMUNITY OF INTEREST (COI) IDENTIFICATION
- COI RESPONSE MECHANISM
- EFFECTIVE COI ENGAGEMENT AND DIALOGUE
- REPORTING



Safety and Health Assessment

- COMMITMENTS AND ACCOUNTABILITY
- PLANNING AND IMPLEMENTATION
- TRAINING, BEHAVIOUR AND CULTURE
- MONITORING AND REPORTING
- PERFORMANCE

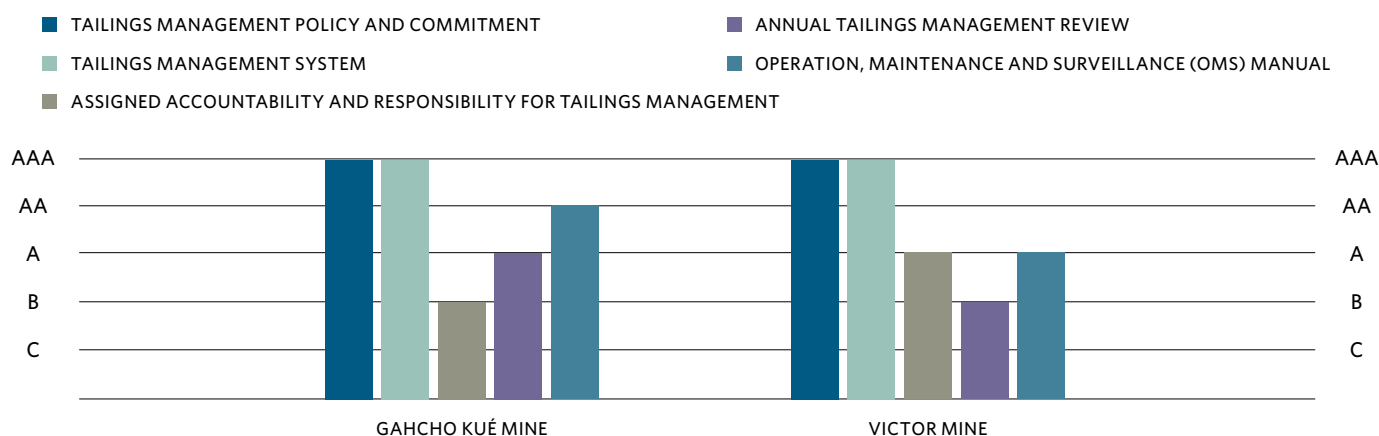


Self-assessed results; last external verification: 2017; next external verification: 2020.

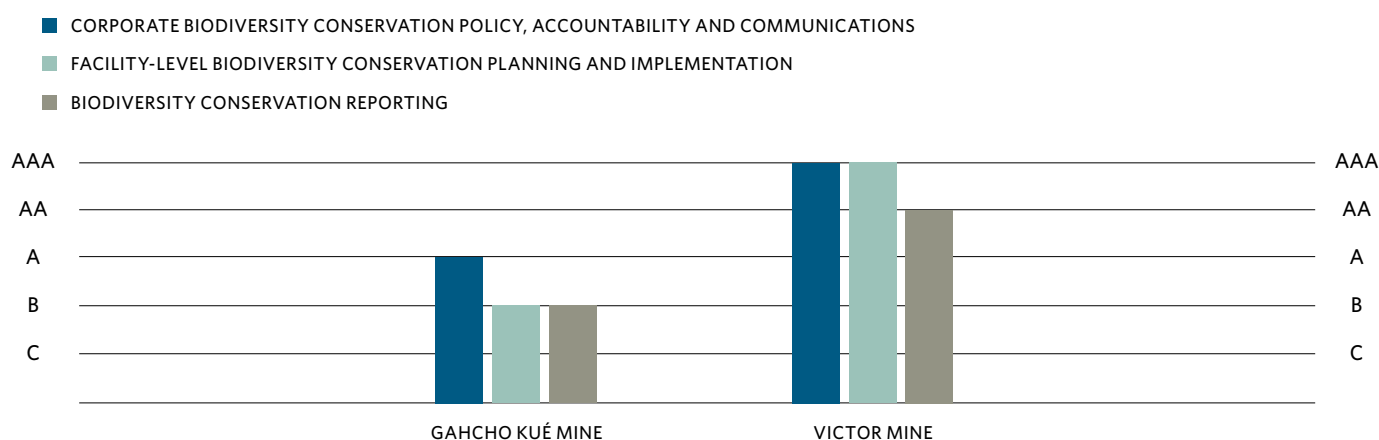




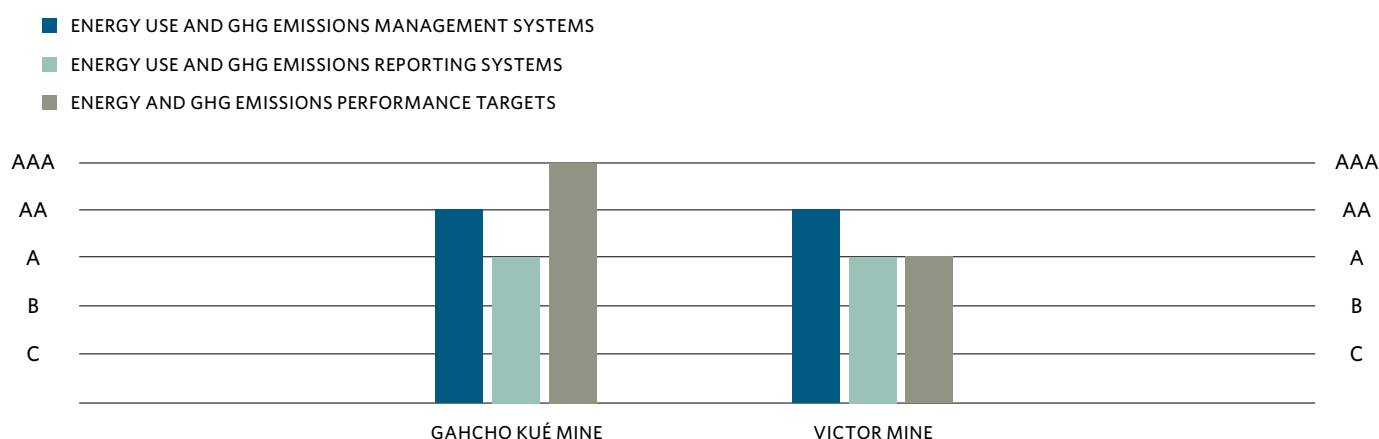
Tailings Management Assessment



Biodiversity Conservation Management Assessment



Energy Use and GHG Emissions Management Assessment



Self-assessed results; last external verification: 2017; next external verification: 2020.

TSM Performance by Company

Dominion Diamond Corporation



Dominion Diamond Mines ULC (Dominion) is a Canadian diamond mining company with ownership interests in two major producing diamond mines situated approximately 200 kilometers south of the Arctic Circle in Canada's Northwest Territories. The company owns and operates the Ekati Diamond Mine and owns 40% of the Diavik Diamond Mine. It supplies rough diamonds to the global market through its sorting and selling operations in Canada, Belgium and India.

The Ekati Mine site is located roughly 300 kilometres northeast of Yellowknife and can only be accessed by air and by a 400-kilometre ice road for approximately two months in the winter. Diavik Diamond Mines Inc., a subsidiary of Rio Tinto plc, operates the Diavik Diamond Mine. *TSM* results for Diavik are provided by Rio Tinto.

At Dominion, performance means delivering sustainable growth by investing in the future. This involves supporting excellence in leadership and delivering on the commitment of zero harm: to the company's own people, through consistent and risk-based work practices; to its host communities, through communication and the inclusion of their opinions and concerns in mine plans and mine-life extension projects; and to the environment, through innovative adaptive management and intensive monitoring of the mine's impact.

Dominion is proud of the Ekati Mine's performance and is dedicated to building on its legacy. The company will continue to work closely with its impact benefit agreement (IBA) groups, maintaining a focus on the empowerment and sustainability of the northern communities. With such a solid foundation, Dominion will concentrate on making improvements and enhancements.

Dominion uses *TSM* reporting as part of a suite of tools that drive continuous improvement across the company's operations. The company conducts extensive internal and external monitoring and auditing of all sustainable development practices, and the *TSM* initiative draws many of these processes into a forum for wider reporting across Canada.

This extra level of self-regulation adds value because processes are reviewed from a different reporting perspective than would be the case under other HSEC (health, safety, environment and community) and ISO audits.

Biodiversity Conservation Management and *Aboriginal and Community Outreach* are two areas where the Ekati Mine has consistently scored high, and that trend continued in 2017. The company meets regularly with stakeholders to share information about its operations and future plans and to hear feedback on decisions that may affect them. The Ekati Mine has created community development plans that focus the company on where its efforts will make the most difference. While the company inherited the IBAs, which are in place until the end of mine life, Dominion is in ongoing dialogue with its IBA partners to explore additional community development initiatives.

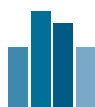
Dominion continues to make considerable effort in the stewardship of the environment. The results achieved in 2017 verify that those efforts are on track in terms of understanding and conserving biodiversity, effectively disposing of processed kimberlite, executing energy reduction projects, and managing water quality.

Dominion's results illustrate that the company is committed to fulfilling its vision of strengthening and deepening its relationships with community stakeholders and extending mine life. The company is striving to make developments to the Ekati Mine's socioeconomic and environmental records where sustainable resource development and community growth are paramount. By incorporating Traditional Knowledge and feedback from community partners, Dominion will become better at what it does. The company genuinely cares about its people and wants to make investments that have long-lasting benefits.

🔗 For more information, please visit www.ddmines.com



Wind farm at Diavik Diamond Mines Inc.

Externally
Verified Results

2017 TSM Results

Dominion Diamond Corporation



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
EKATI DIAMOND MINE	✓	✓	✓



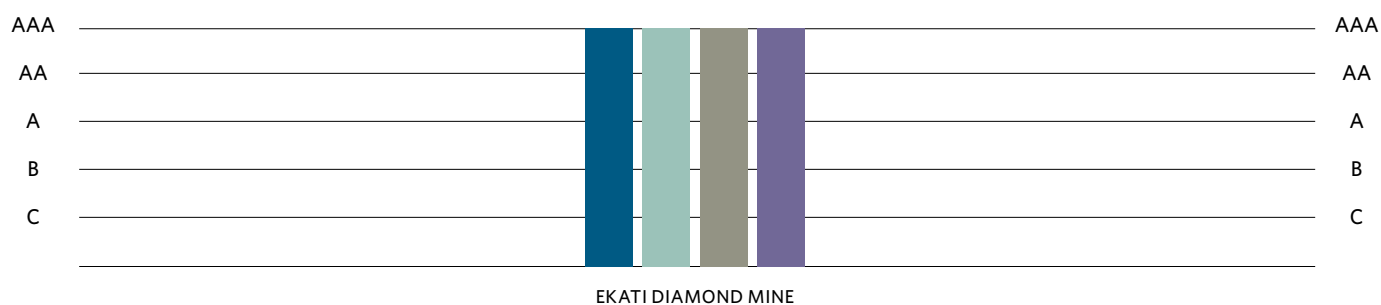
Preventing Child and Forced Labour

FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
EKATI DIAMOND MINE	✓	✓



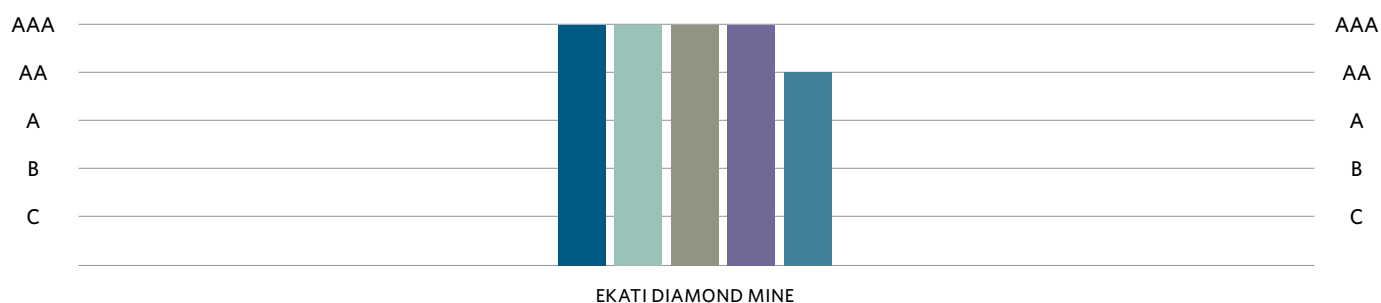
Aboriginal and Community Outreach Assessment

- COMMUNITY OF INTEREST (COI) IDENTIFICATION
- COI RESPONSE MECHANISM
- EFFECTIVE COI ENGAGEMENT AND DIALOGUE
- REPORTING



Safety and Health Assessment

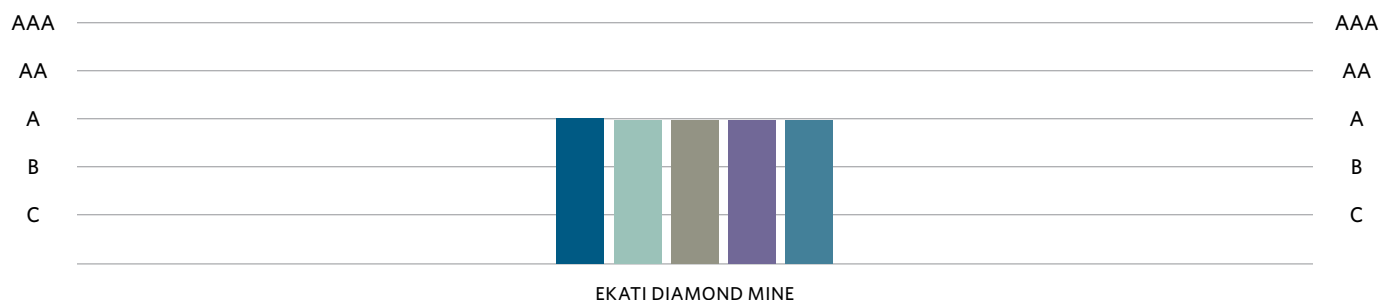
- COMMITMENTS AND ACCOUNTABILITY
- PLANNING AND IMPLEMENTATION
- TRAINING, BEHAVIOUR AND CULTURE
- MONITORING AND REPORTING
- PERFORMANCE





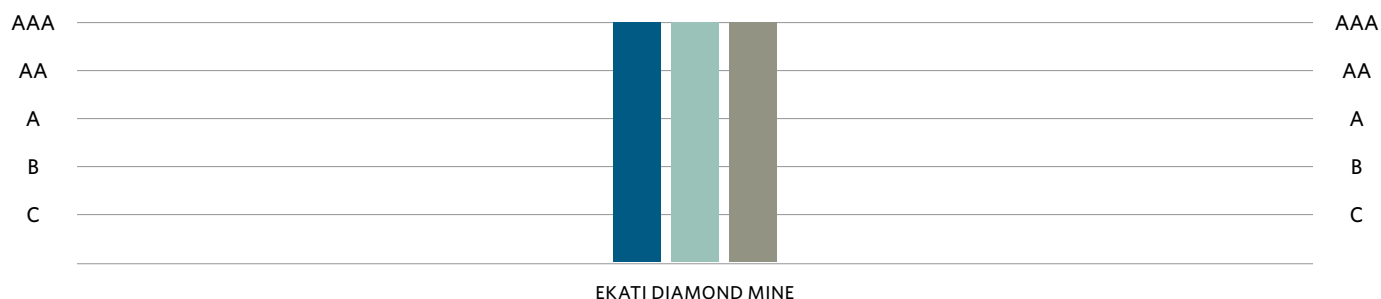
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL



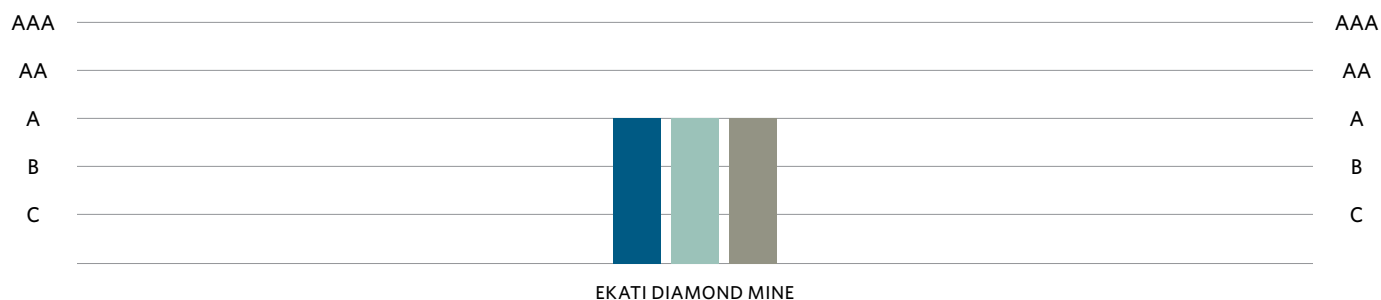
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



TSM Performance by Company

Excellon Resources Inc.



Excellon Resources Inc. is a TSX-listed silver and base metals producer headquartered in Toronto. We mine Ag-Pb-Zn ore from our Platosa underground mine located near the town of Bermejillo, Durango, Mexico. Ore is crushed at Platosa and then trucked approximately 230 km to our wholly-owned concentrator facility located in the town of Miguel Auza, Zacatecas, Mexico.

This is our first reporting of our *TSM* performance – as a MAC member with no Canadian operating locations we are not required to report our *TSM* performance. The decision to begin *TSM* reporting is an important step for us since we are at an early stage in our CR journey. We report because we believe that these indicators drive CR excellence and because openness and transparency are core values.

In 2017 we began in our CR journey by developing and commencing implementation of our CR management framework, a best-in-class, fit for purpose system that incorporates elements of evolving international best practice. This allows us to demonstrate CR leadership and excellence, despite our relatively small size. The management framework is the link between our material CR risks and impacts and on-the-ground performance. We believe that values and CR performance matter to investors, and reflect the quality of management.

Our priorities in 2017 included improving our safety performance, and bringing more structure and discipline to community relations efforts.

We report our performance against 31 discrete indicators based on a self-assessment performed by our Vice President-Corporate Responsibility, who has considerable experience with *TSM* and with the degree of implementation of our management system elements. The self-assessment has not been subjected to *TSM* verification.

Improving our operational safety culture and performance was a top priority in 2017. This was reflected in the development and implementation of our Life Saving Rules, HCH Standards and the first element of visible felt leadership.

Our gaps include developing a structured occupational health program, fully embedding competence assessments into our nascent training programs and developing a broader set of performance metrics.

Improving our community relations systems and performance was a high priority for us in 2017. Processes to identify and map COI at both Platosa and Miguel Auza were implemented; these are at a level greater than the baseline Level A. Our community dialogue is evolving. Our community response (grievance) mechanism has been designed at both Miguel Auza and Platosa and we expect these to be in place by mid-year 2018.

We began the process of bringing more structure and discipline to our tailings management practices. We developed a CR Policy that includes aspects related to tailings management. We developed a standard on mine waste management that establishes executive- and business unit-level accountability for tailings management and codifies our commitment to implementing the MAC Tailings Guide and OMS Manual.

We made considerable progress in 2017 by creating a corporate-level crisis management and communications plan and performing a tabletop simulation. Platosa and Miguel Auza have developed emergency preparedness and response plans but do not yet meet all of the TSM criteria.

Mexican labour laws prohibit anyone less than 18 years of age from working in a mine. We reviewed our processes to ensure that we do not employ persons less than 18 years of age at both Platosa and Miguel Auza. To ensure that we do not facilitate forced (compulsory) labour in our workforce, we confirmed that when workers join the company we only retain copies of identity documentation.

The energy and greenhouse gas (GHG) management performance area is at a Level C because we do not feel that this is a priority for us at this stage in our growth. We have, for the first time, collected energy consumption data and reported our GHG emissions and intensity.

Like the *Energy Use and GHG Emissions Management Protocol*, biodiversity conservation management was not rated as a priority performance area for us in 2017. Our business unit footprints are small and we do not have significant biodiversity considerations or impacts. Nevertheless, biodiversity will be the subject of a future CR standard to ensure that we are achieving a minimum level of performance in this area.

If you have questions about this report, please contact Craig Ford, Vice-President, Corporate Responsibility (cford@excellonresources.com).

 For more information, please visit www.excellonresources.com



2017 TSM Results

Excellon Resources Inc.



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	×	✓	✓
PLATOSA MINE	×	×	×



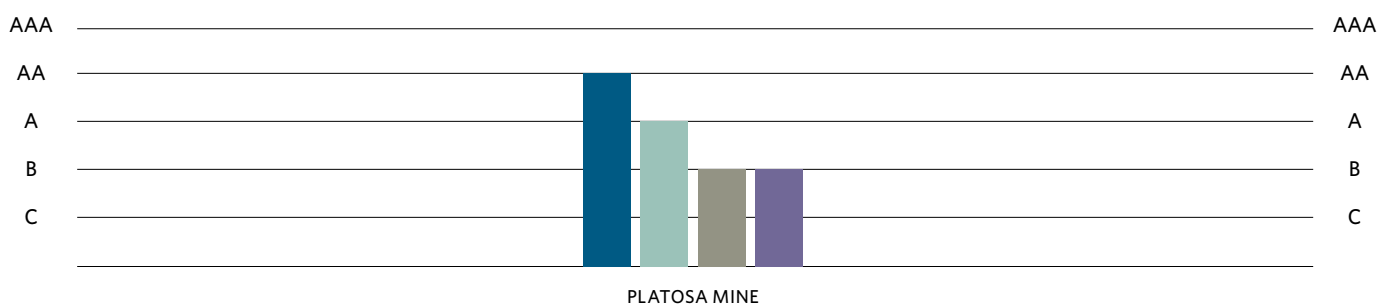
Preventing Child and Forced Labour

FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
PLATOSA MINE	✓	✓



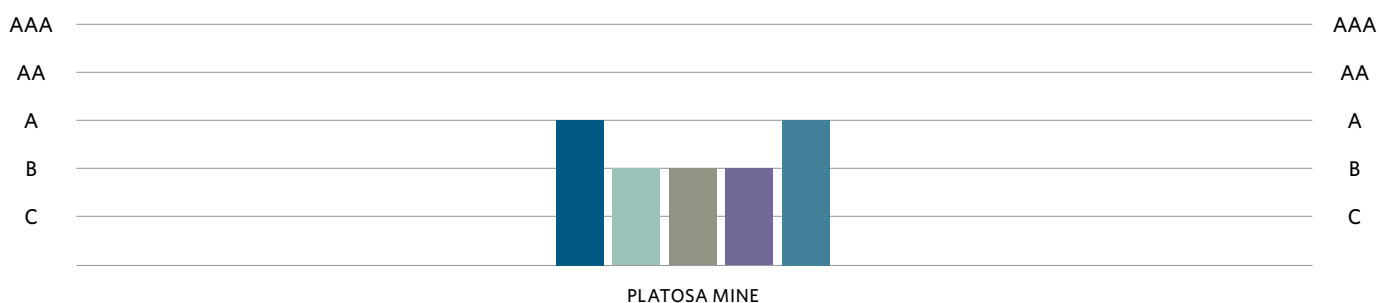
Aboriginal and Community Outreach Assessment

- COMMUNITY OF INTEREST (COI) IDENTIFICATION
- COI RESPONSE MECHANISM
- EFFECTIVE COI ENGAGEMENT AND DIALOGUE
- REPORTING



Safety and Health Assessment

- COMMITMENTS AND ACCOUNTABILITY
- PLANNING AND IMPLEMENTATION
- TRAINING, BEHAVIOUR AND CULTURE
- MONITORING AND REPORTING
- PERFORMANCE



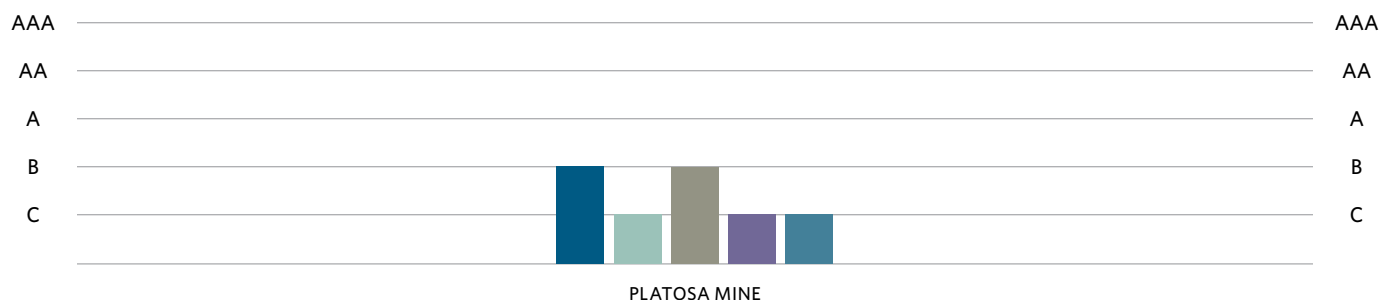
Self-assessed results.





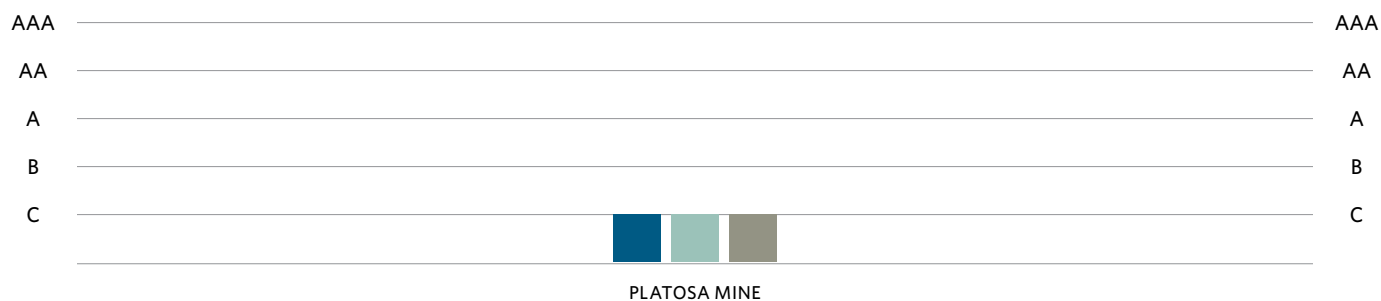
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL



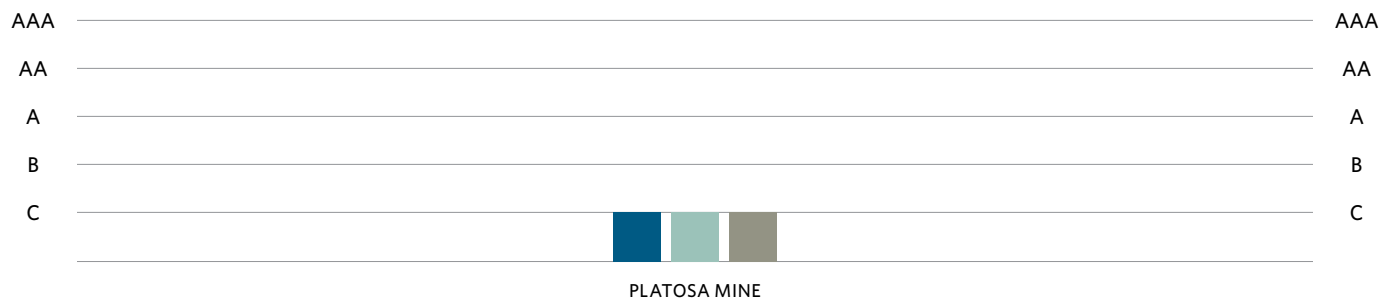
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



Self-assessed results.



TSM Performance by Company

First Quantum Minerals Ltd.



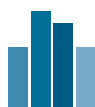
First Quantum Minerals Ltd., is a well-established and rapidly growing mining and metals company engaged in mineral exploration, development and mining. The company produces copper, gold, nickel, platinum, palladium, zinc and sulphuric acid. All of First Quantum's Canadian facilities, which are closed mines, participate in *TSM*. In addition, the company's operations in Turkey voluntarily participate in *TSM* and have reported on their progress.

When combined, all participating facilities achieved a conformance rate of 77% at a Level A or better across all *TSM* indicators.

In the area of tailings management, all of First Quantum's facilities previously reported Level A for Indicators 2 and 3. However, this year's external verification identified important gaps and all seven facilities were assessed at Level C for Indicator 2 and Level B for Indicator 3. First Quantum's facilities are already working to implement corrective actions to meet the criteria of Level A performance.

First Quantum is committed to continuous improvement and has put measures in place to continue pursuing excellence in all areas. In addition to tailings management, the company aims to improve its performance in the area of setting targets for energy use and GHG emissions management and in biodiversity conservation management at its closed properties in Canada.

🔗 For more information, please visit: www.first-quantum.com

Externally
Verified Results

2017 TSM Results

First Quantum Minerals Ltd.



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
ÇAYELI MINE	✓	✓	✓
COPPER RANGE COMPANY (CLOSED)	✓	✓	✓
NORBEC (CLOSED)	✓	✓	✓
SAMATOSUM (CLOSED)	✓	✓	✓
STURGEON LAKE (CLOSED)	✓	✓	✓
TROILUS (CLOSED)	✓	✓	✓
WINSTON LAKE (CLOSED)	✓	✓	✓

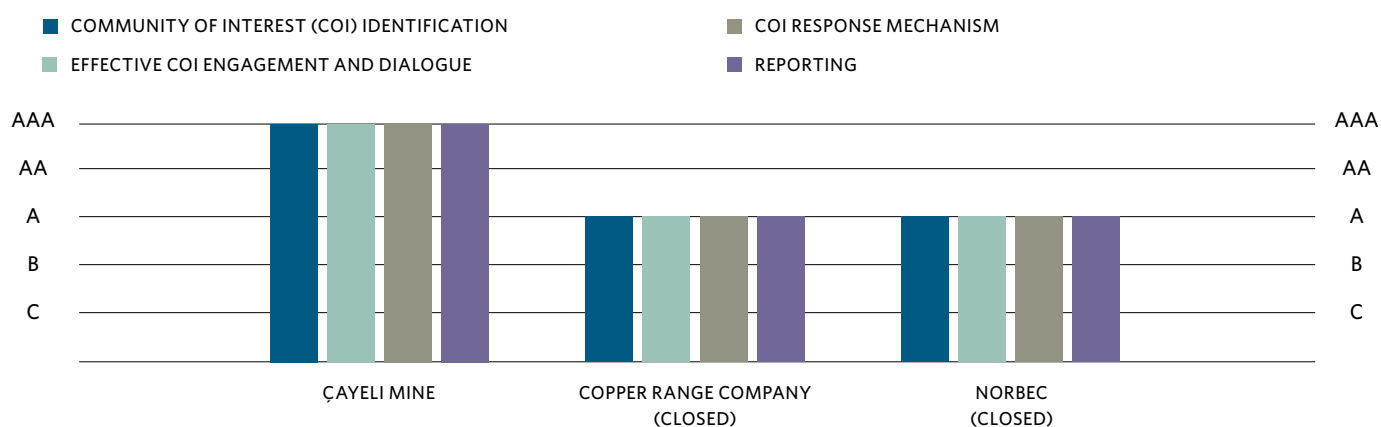


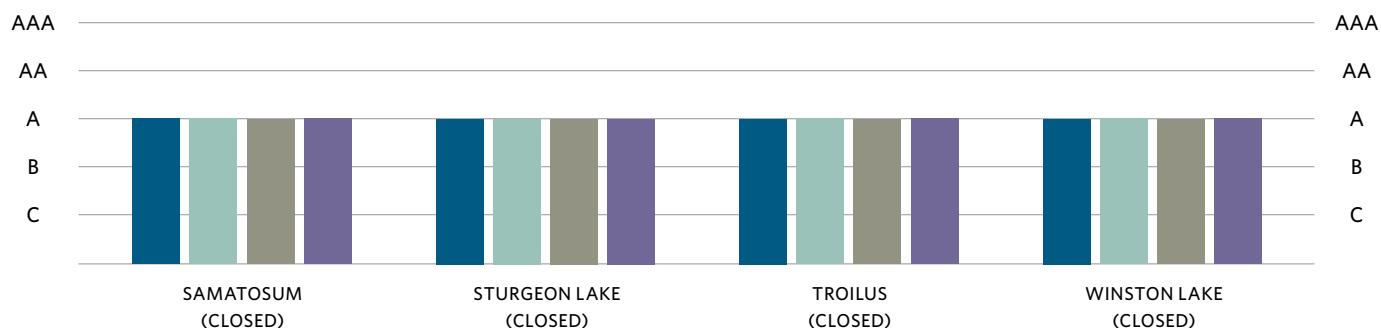
Preventing Child and Forced Labour

FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
ÇAYELI MINE	✓	✓
COPPER RANGE COMPANY (CLOSED)	✓	✓
NORBEC (CLOSED)	✓	✓
SAMATOSUM (CLOSED)	✓	✓
STURGEON LAKE (CLOSED)	✓	✓
TROILUS (CLOSED)	✓	✓
WINSTON LAKE (CLOSED)	✓	✓



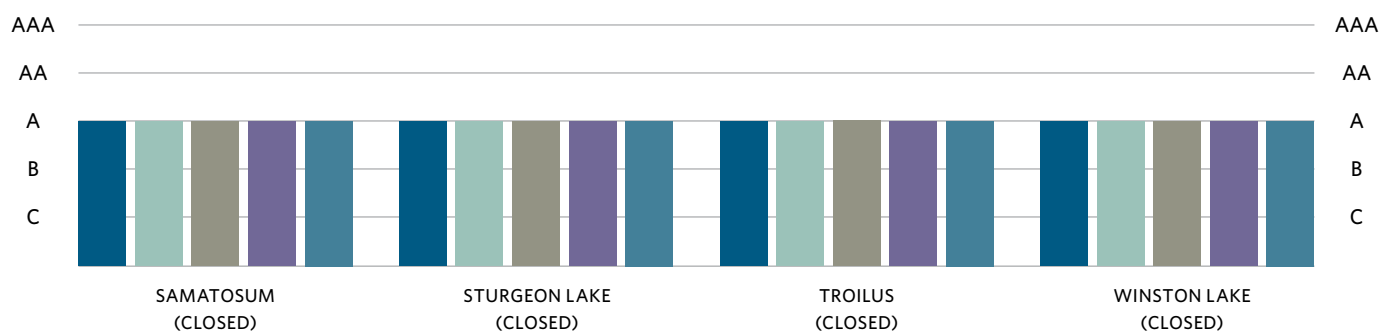
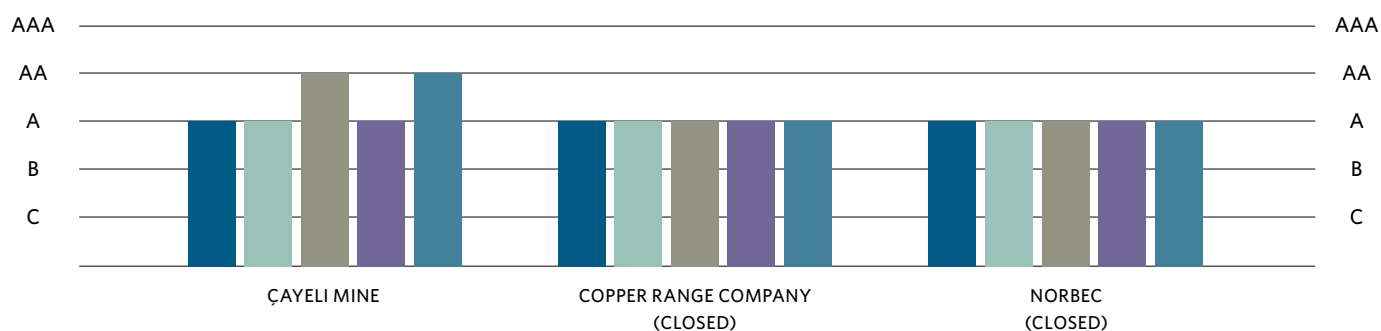
Aboriginal and Community Outreach Assessment





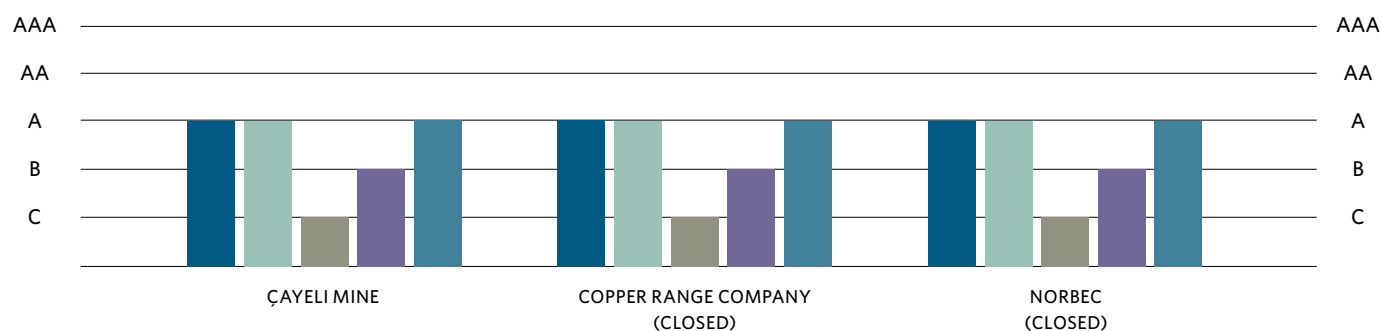
Safety and Health Assessment

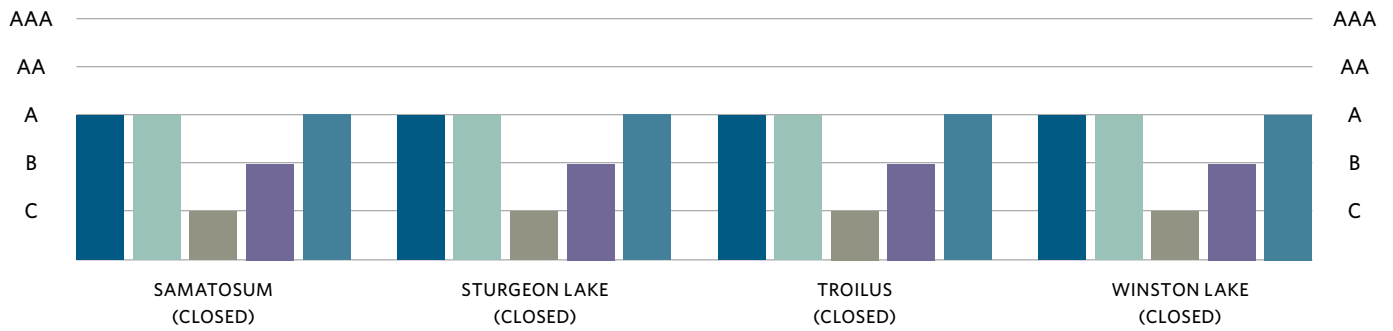
- COMMITMENTS AND ACCOUNTABILITY
- PLANNING AND IMPLEMENTATION
- TRAINING, BEHAVIOUR AND CULTURE
- MONITORING AND REPORTING
- PERFORMANCE



Tailings Management Assessment

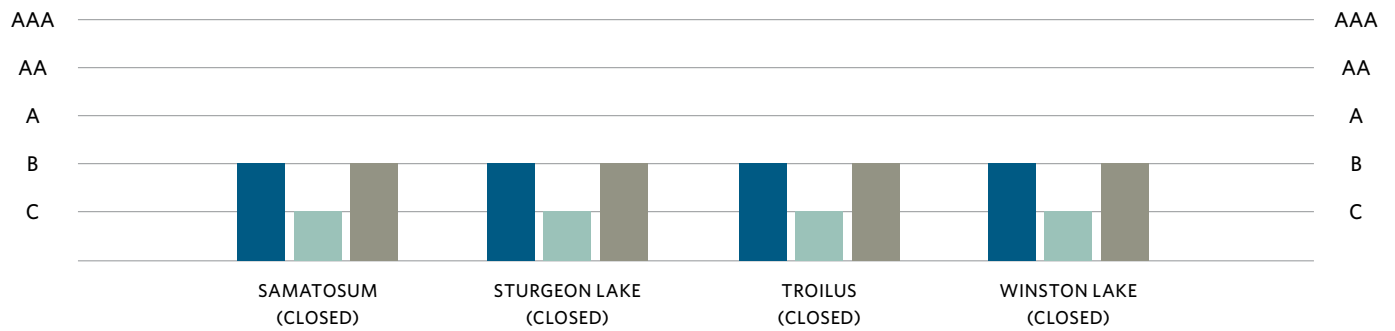
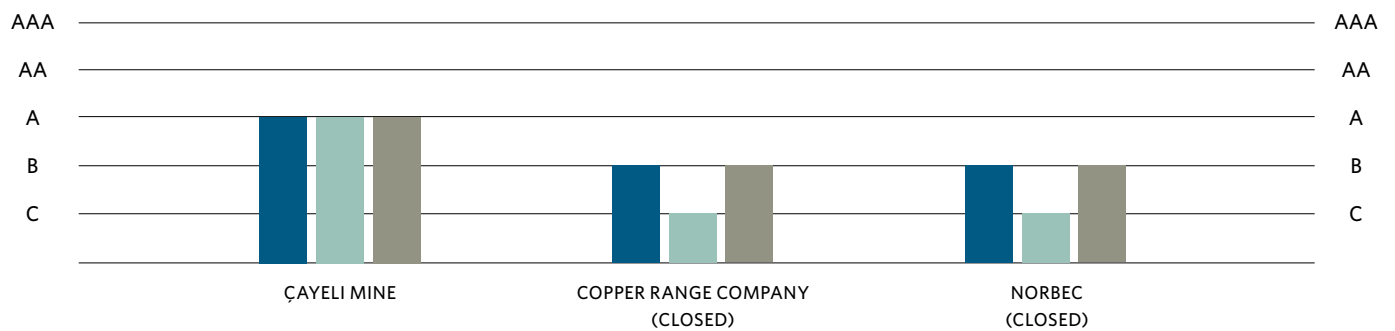
- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL





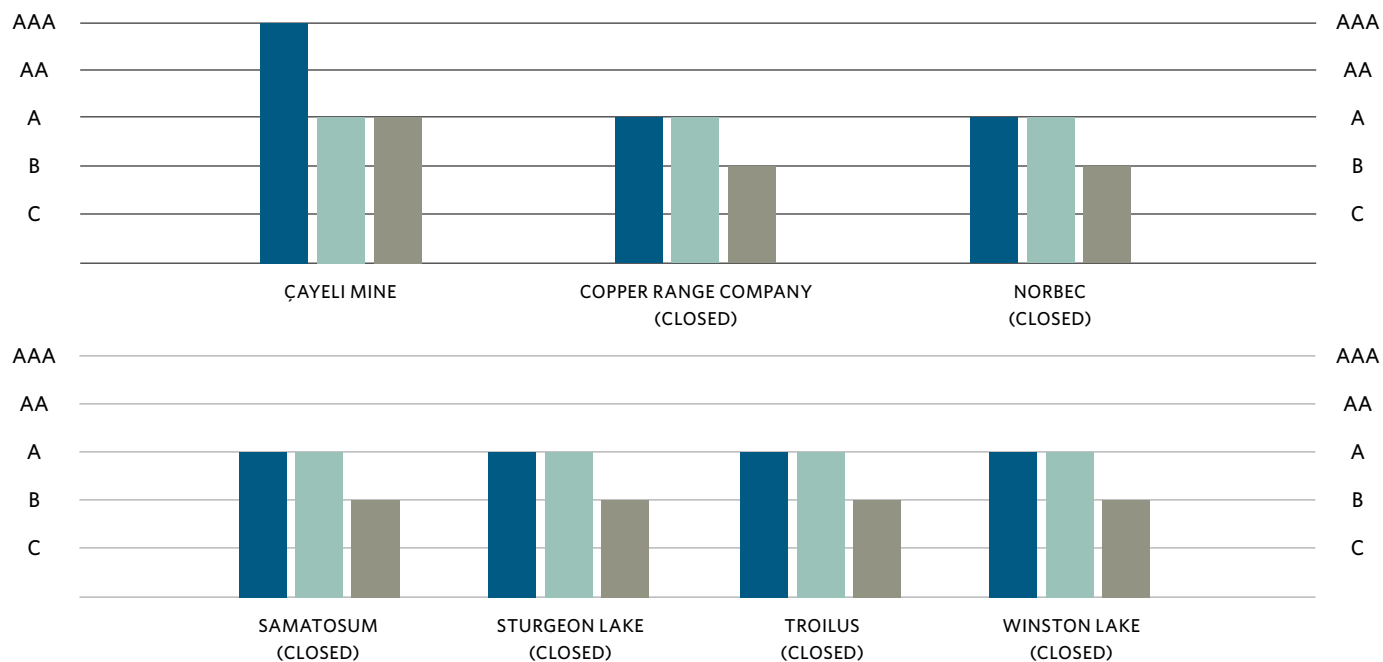
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



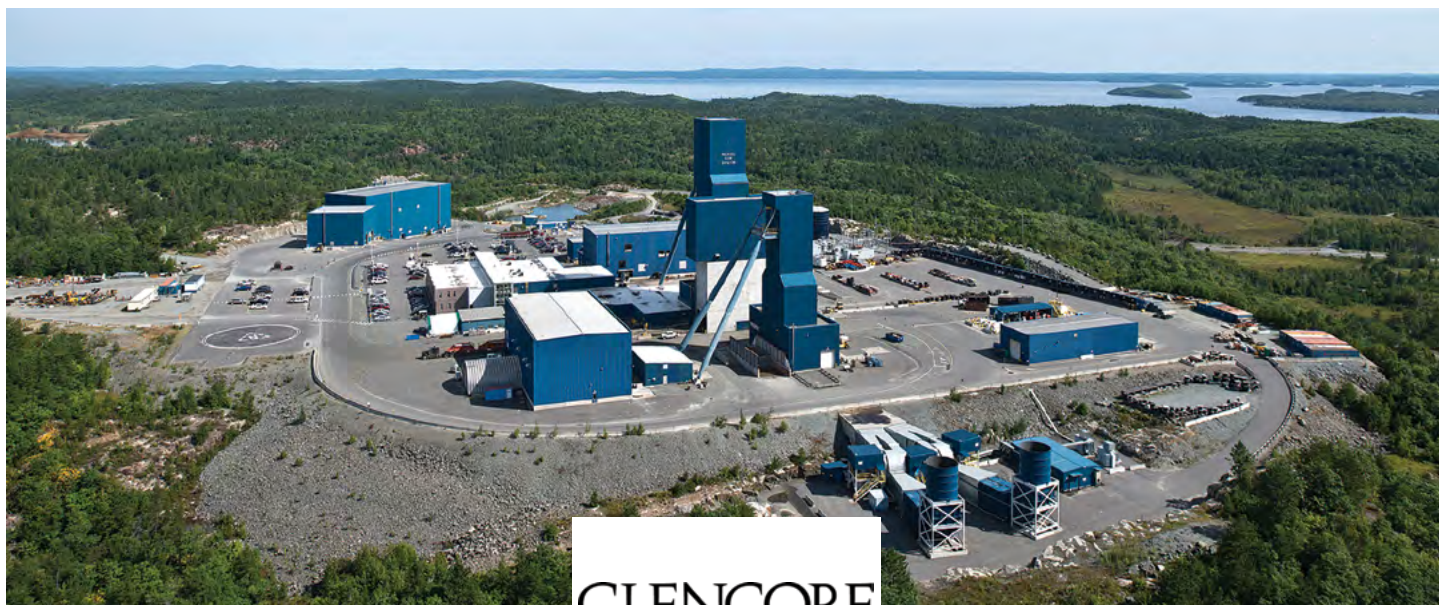
Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



TSM Performance by Company

Glencore



Glencore is one of the world's largest global diversified natural resource companies and a major producer and marketer of more than 90 commodities. The company's operations comprise more than 150 mining and metallurgical sites, oil production assets and agricultural facilities.

Glencore's Canadian mining operations are guided by the TSM initiative and have participated since 2004. The following Glencore facilities have implemented TSM:

Glencore Copper

Horne Smelter, Rouyn-Noranda, Quebec

Canadian Copper Refinery (CCR), East Montreal, Quebec

Glencore Nickel

Sudbury Integrated Nickel Operations (INO), Sudbury, Ontario

Raglan Mine, Nunavik region, Quebec

Glencore Zinc

Brunswick Smelter, Bathurst, New Brunswick

Kidd Operations, Timmins, Ontario

CEZinc Refinery, Valleyfield, Quebec

Matagami Mine, Matagami, Quebec

Sustainability lies at the foundation of Glencore's business strategy and activities. Sustainability requires meaningful engagement with communities of interest (COI). At the same time, it requires maintaining the highest regard for environmental stewardship, social responsibility, corporate governance and transparent reporting, while delivering superior shareholder returns.

2017 TSM RESULTS

The only Glencore facility that completed an external audit in 2018 for their 2016 performance was CEZinc; they were in an extended work stoppage in 2017 when Glencore coordinated external audits for all of its facilities. As such, the remaining of Glencore's facilities completed internal assessments in 2018 for their 2017 performance. Matagami is still in the phase-in period for TSM and will be reporting self-assessed and externally verified results in future TSM Progress Reports.

Aboriginal and Community Outreach

All of Glencore's facilities have achieved at least a Level A performance in all of the indicators under the TSM Aboriginal and Community Outreach Protocol. Notably, Horne Smelter, Raglan Mine, Kidd Operations and Brunswick Smelter achieved a Level AAA performance for all four of the Protocol's indicators. Glencore's performance in the area of community outreach was highlighted in 2016, when the company was presented with the TSM Community Engagement Excellence Award for Kidd Operations' Community Partnerships Initiative. In 2017, Raglan Mine was selected as a finalist for the 2017 TSM Community Engagement Excellence Award for the Tamatumani program, a skills development initiative that has contributed to the training and hiring of hundreds of Nunavimmiut.

Crisis Management and Communications Planning

Glencore reports corporate performance in this area for Glencore Copper, Glencore Nickel and Glencore Zinc, as well as facility-level performance for each of its participating facilities. Glencore's corporate results for the TSM Crisis Management and Communications Planning Protocol are strong with a few areas where improvement is needed. Glencore Copper and Zinc corporate met all of the requirements of the Crisis Management and Communications Planning Protocol. Glencore Nickel corporate met all of the requirements for Indicators 1 and 3, but did not meet all of the requirements for Indicator 2. As such, Glencore's remaining facilities met all of the criteria for the Protocol's three indicators, except Brunswick Smelter, which missed Indicator 3.

Safety and Health

In the area of safety and health, the company's results remain strong. All of Glencore's facilities achieved at least a Level A performance for all five of the TSM Safety and Health Protocol's indicators.

Tailings Management

Glencore's results in this area remain strong with each participating facility achieving a Level AAA performance for all five indicators of the TSM Tailings Management Protocol. Glencore is working to ensure that the criteria of the revised Protocol are integrated within the company.

Biodiversity Conservation Management

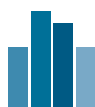
Results in this area are strong with a few areas identified for improvement. Both the CCR Refinery and the Horne Smelter are working to improve performance in this Protocol to achieve a Level A for all three indicators. CEZinc and Kidd Operations achieved at least a Level A performance for this Protocol, and Raglan and Sudbury Integrated Nickel Operations achieved a Level AAA performance, with Brunswick Smelter achieving AAA on Indicators 1 and 3 and A on Indicator 2.

Energy Use and GHG Emissions Management

All of Glencore's facilities achieved at least a Level A on Indicators 1 and 2 for the TSM Energy Use and GHG Emissions Management Protocol, with Brunswick Smelter, the Horne Smelter and Sudbury Integrated Nickel Operations achieving a Level B for Indicator 3. To achieve a Level A on Indicator 3 a facility must demonstrate that it has met its energy use and GHG emissions performance targets in the reporting year. In 2018, these facilities will focus on ensuring set targets are achieved.

🔗 For more information, please visit www.glencore.com





2017 TSM Results

Glencore Copper



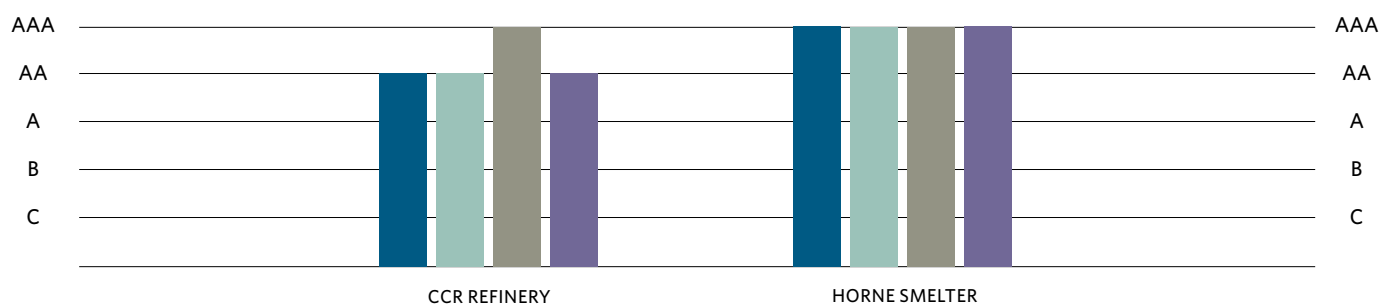
Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
CCR REFINERY	✓	✓	✓
HORNE SMELTER	✓	✓	✓



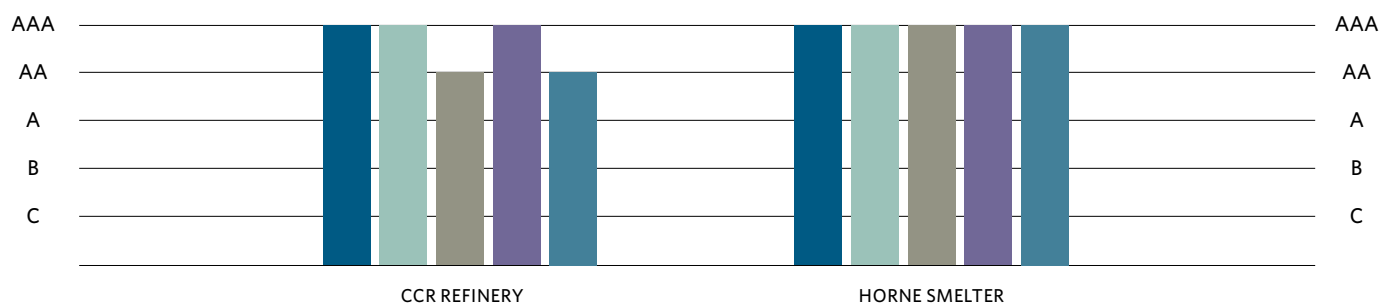
Aboriginal and Community Outreach Assessment

- COMMUNITY OF INTEREST (COI) IDENTIFICATION
- COI RESPONSE MECHANISM
- EFFECTIVE COI ENGAGEMENT AND DIALOGUE
- REPORTING



Safety and Health Assessment

- COMMITMENTS AND ACCOUNTABILITY
- PLANNING AND IMPLEMENTATION
- TRAINING, BEHAVIOUR AND CULTURE
- MONITORING AND REPORTING
- PERFORMANCE

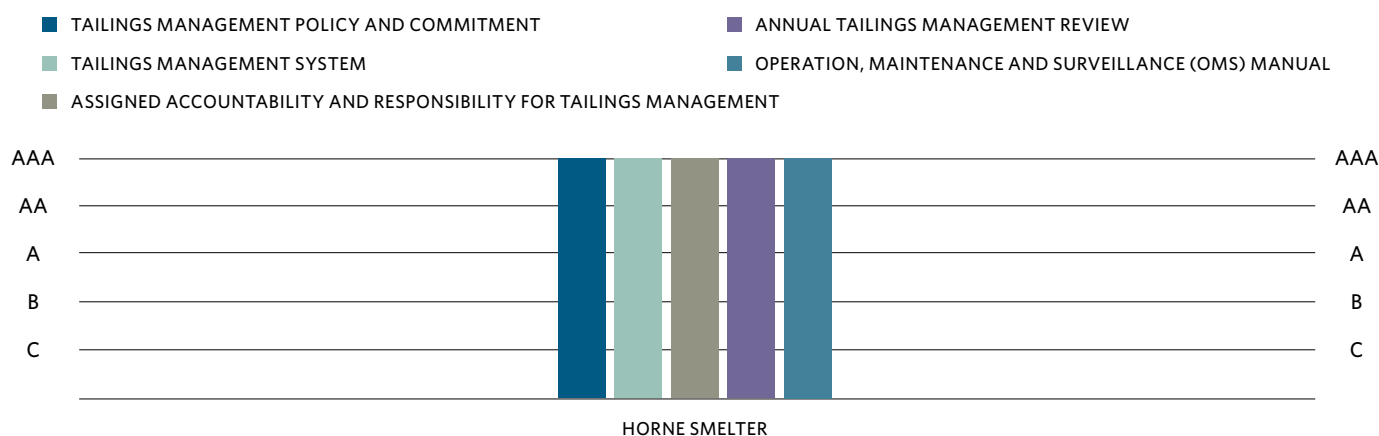


Self-assessed results; last external verification: 2017; next external verification: 2020.

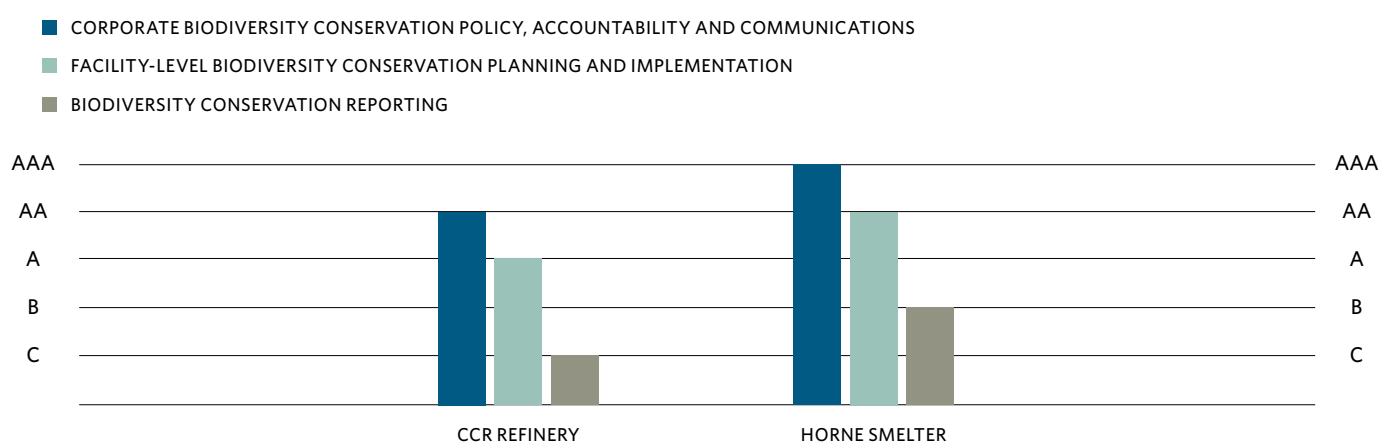




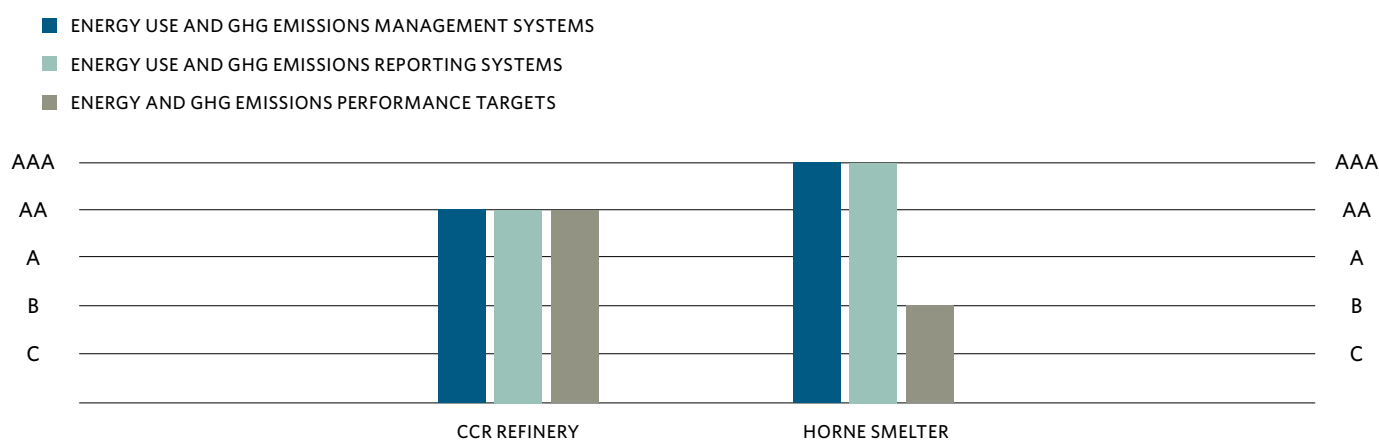
Tailings Management Assessment



Biodiversity Conservation Management Assessment

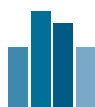


Energy Use and GHG Emissions Management Assessment



Self-assessed results; last external verification: 2017; next external verification: 2020.





2017 TSM Results

Glencore Nickel



Crisis Management and Communications Planning Assessment

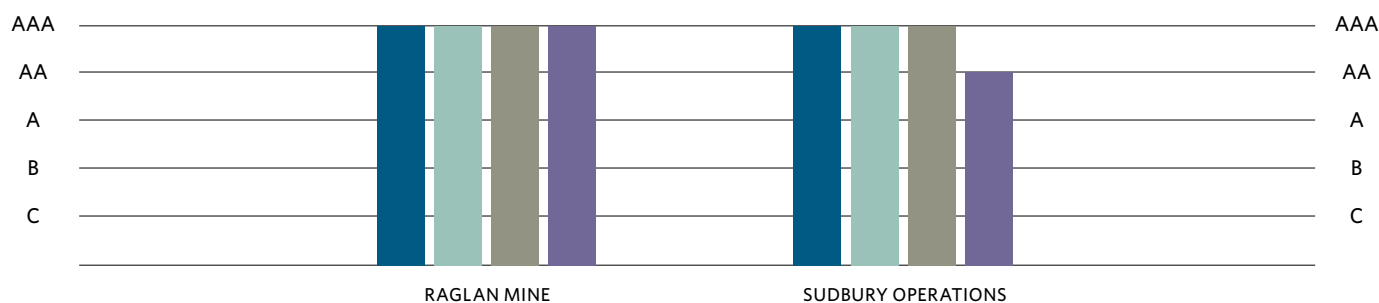
FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
RAGLAN MINE	✓	✓	✓
SUDBURY OPERATIONS	✓	✓	✓



Aboriginal and Community Outreach Assessment

■ COMMUNITY OF INTEREST (COI) IDENTIFICATION
■ EFFECTIVE COI ENGAGEMENT AND DIALOGUE

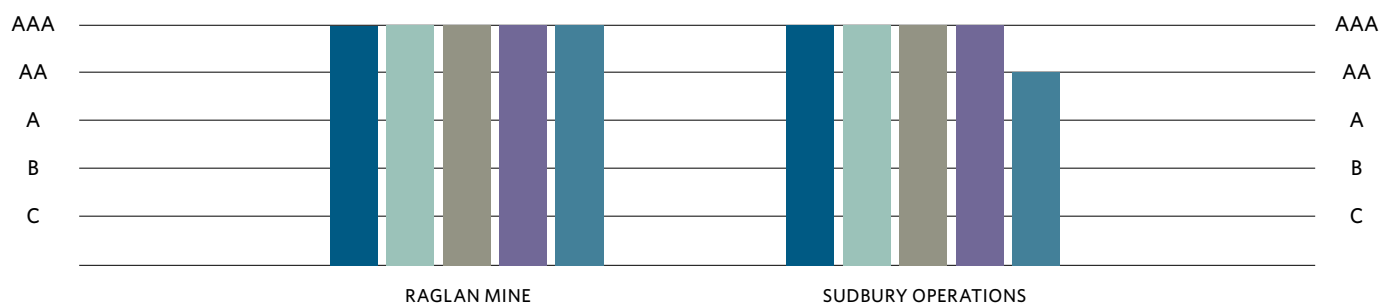
■ COI RESPONSE MECHANISM
■ REPORTING



Safety and Health Assessment

■ COMMITMENTS AND ACCOUNTABILITY
■ PLANNING AND IMPLEMENTATION
■ TRAINING, BEHAVIOUR AND CULTURE

■ MONITORING AND REPORTING
■ PERFORMANCE

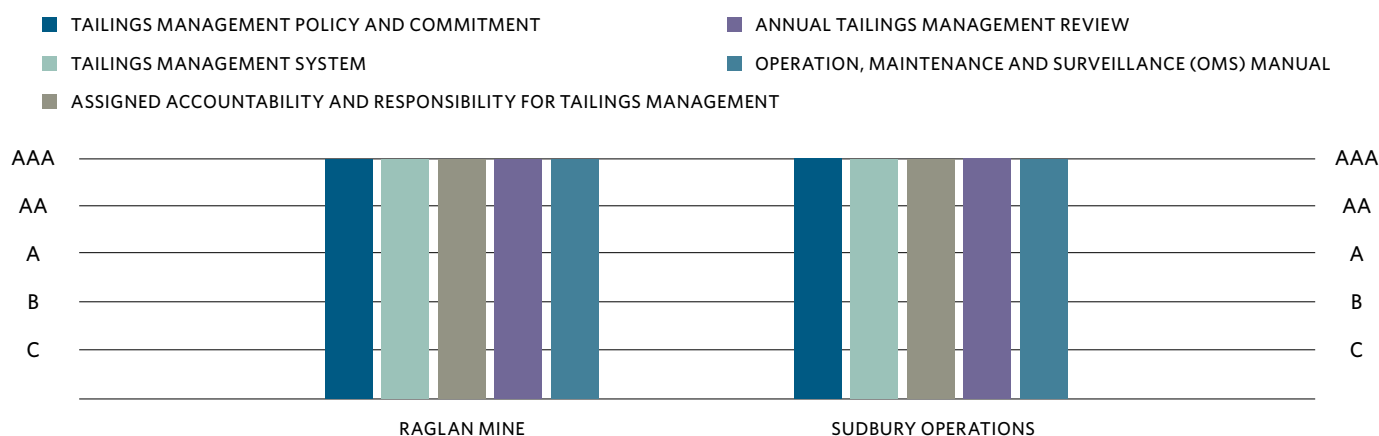


Self-assessed results; last external verification: 2017; next external verification: 2020.

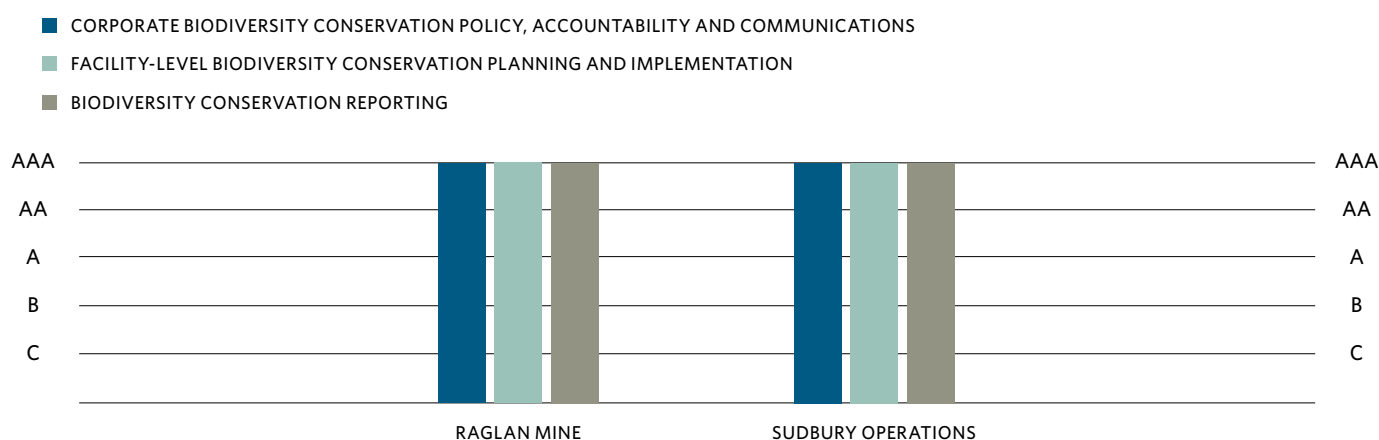




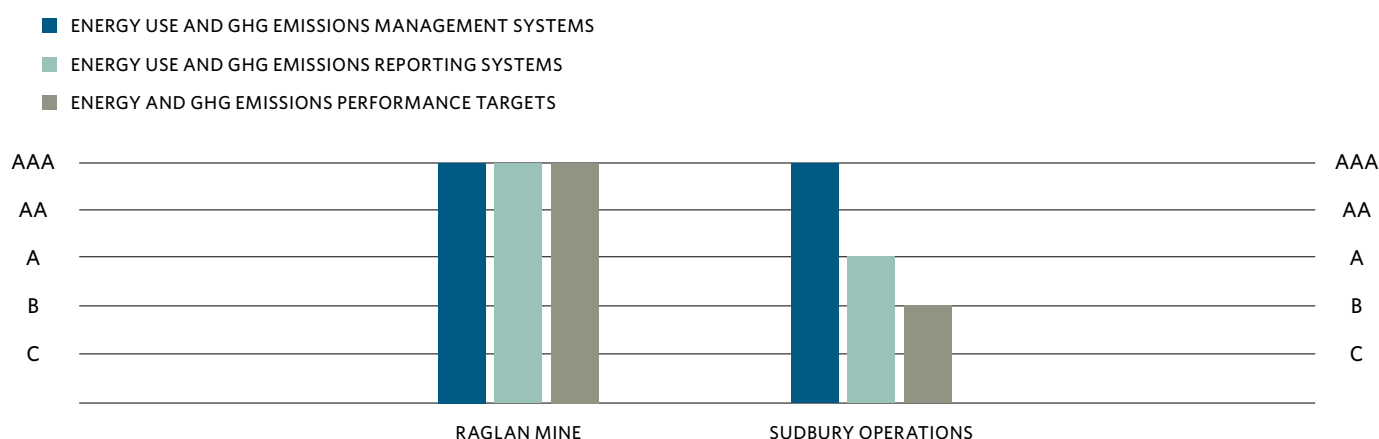
Tailings Management Assessment



Biodiversity Conservation Management Assessment

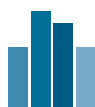


Energy Use and GHG Emissions Management Assessment



Self-assessed results; last external verification: 2017; next external verification: 2020.





2017 TSM Results

Glencore Zinc

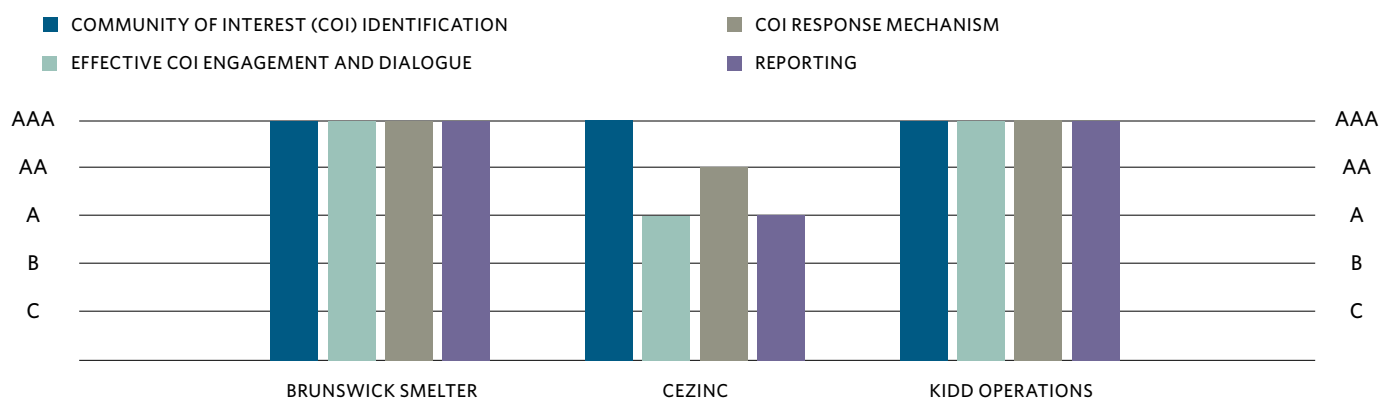


Crisis Management and Communications Planning Assessment

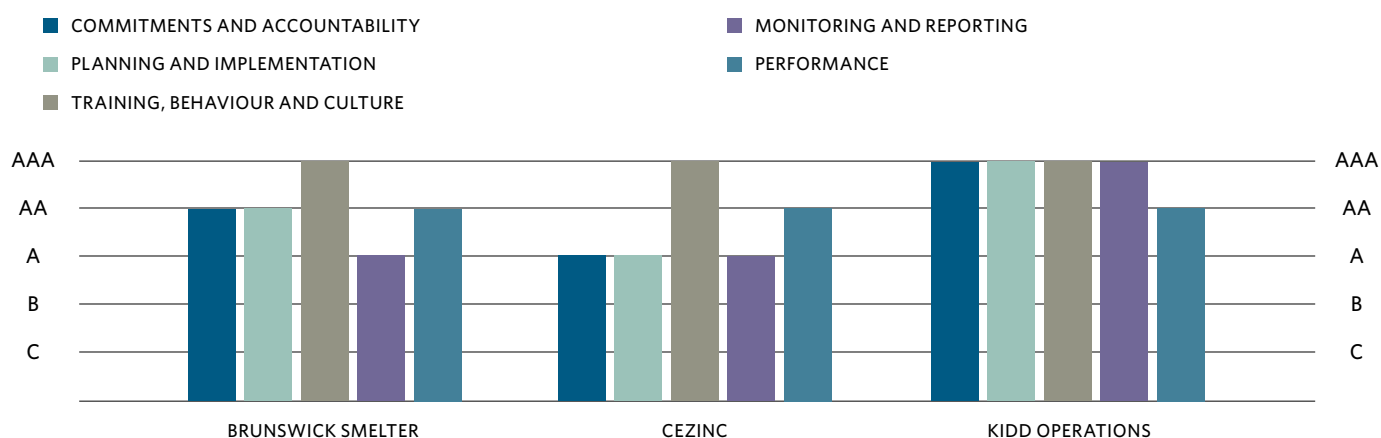
FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
BRUNSWICK SMELTER	✓	✓	✗
CEZINC	✓	✓	✓
KIDD OPERATIONS	✓	✓	✓



Aboriginal and Community Outreach Assessment



Safety and Health Assessment

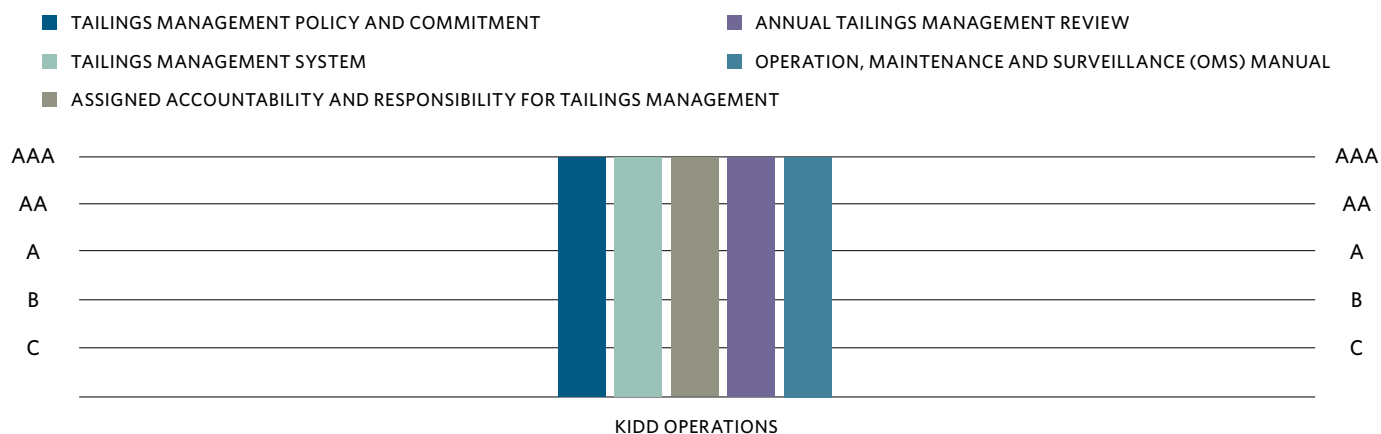


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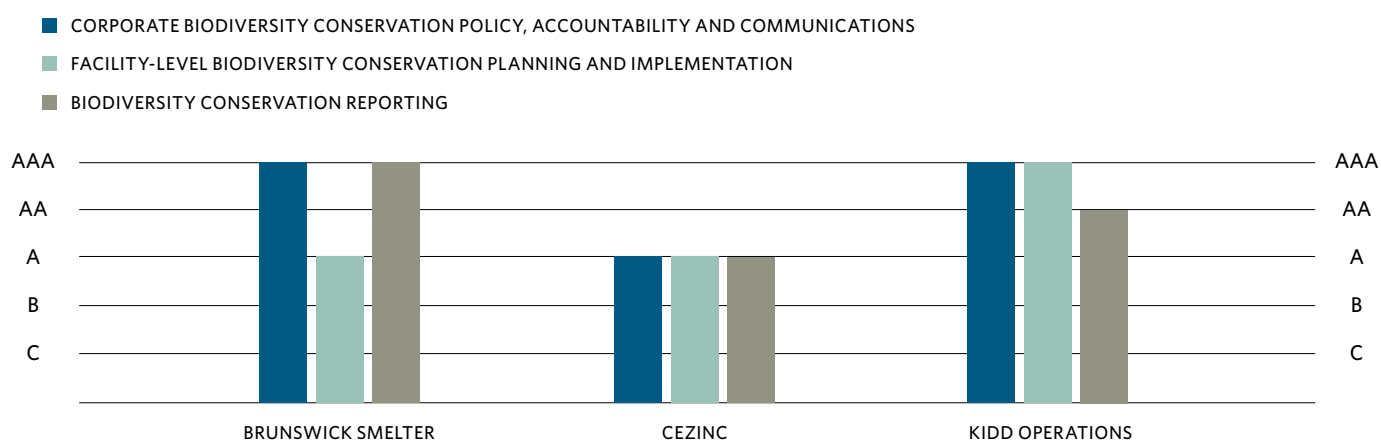




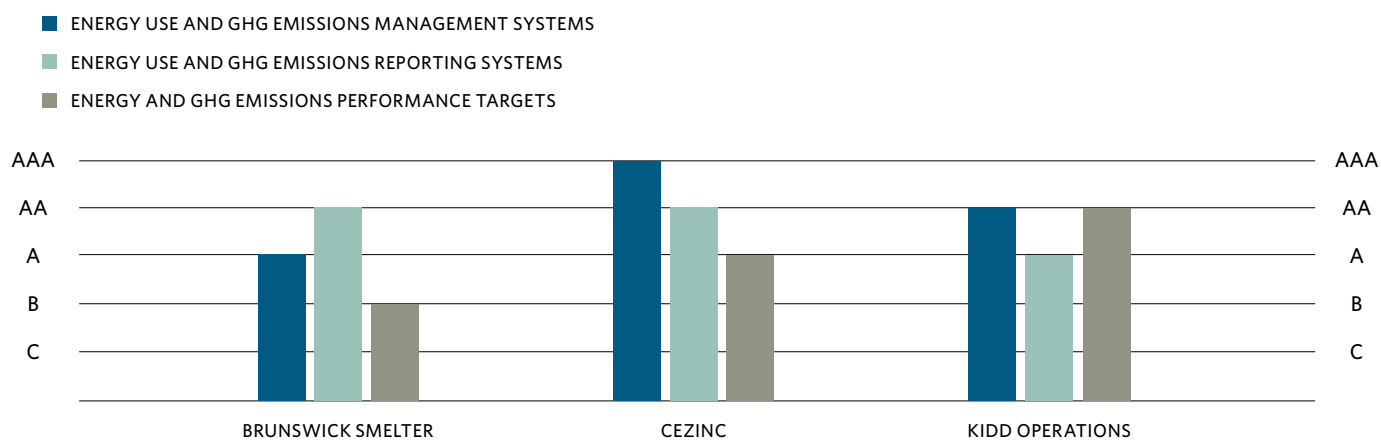
Tailings Management Assessment



Biodiversity Conservation Management Assessment



Energy Use and GHG Emissions Management Assessment



Self-assessed results; last external verification: 2017; next external verification: 2020.

TSM Performance by Company

Goldcorp



At Goldcorp, we're striving to be the world's best gold producer. The company is active in nine large-scale districts throughout the Americas, with six mines, four development projects and three joint ventures. Being a world-class gold producer means collaborating with our partners to achieve our vision of Together, Creating Sustainable Value. We're constantly looking for ways to innovate – to be safer, more productive and responsible in the way we conduct our operations. We believe that our business should create economic and social benefits, and that the places where we mine should be better off because of our presence in those communities.

Our values are simple.

- **Be Safe.** Make sure every one of our people goes home safe at the end of every shift, and that our mines are Safe Enough for our Families.
- **Be Productive.** Deliver consistent, reliable financial and operational performance by ensuring our asset portfolio is world-class, sustainably developed, and operating to the highest standards of excellence.
- **Be Responsible.** Do the right thing and honour our commitments. Be respectful and ethical, and invest in the well-being of our people, our communities and our planet.

Part of being a responsible company means participating in national and international organizations (such as the Mining Association of Canada) that align with our values. In 2018, Éléonore completed a 3rd party verification of its TSM results and our company profile will focus on this achievement.

COMMUNITIES AND PEOPLE

Located in Eeyou Istchee/James Bay about 800 kilometres north of Montreal, Canada, Éléonore is Goldcorp's newest Canadian gold mine. Its first gold pour was on October 1, 2014, and it achieved commercial production on April 1, 2015.

Goldcorp's collaboration agreement with the Cree Nation of Wemindji, the Grand Council of the Crees (Eeyou Istchee) and the Cree Nation Government (formerly the Cree Regional Authority) includes provisions for training and employment, developing business opportunities and improving access and quality of technical skills training and education. It also outlines a dispute resolution mechanism and integrates Cree Traditional Knowledge into the mine's environmental management process.

Éléonore employs a diverse workforce, with approximately 20% of employees identifying as First Nations. The mine's Summer Student Employment Program gives post-secondary Cree students a chance to learn more about the mining industry as they gain new skills and hands-on work experience. Éléonore also actively supports Goldcorp's efforts to recruit and integrate more women into all aspects of mining.

Éléonore has an impressive, award-winning safety record. In 2016, it had the lowest injury rate among metal mines in Canada, earning the John T. Ryan and F. J. O'Connell trophies for its national and provincial safety records. The operation also won regional safety awards in 2015 and 2014.

ENVIRONMENTAL STEWARDSHIP AND ENERGY EFFICIENCY

Éléonore works hard to minimize its impact on the environment, and has water, biodiversity, energy, tailings and waste treatment management plans in place. The tailings management area is a modern dry tailings storage facility, as part of Goldcorp's Towards Zero Water (H2Zero) strategy to dramatically reduce freshwater consumption at all of its mines.

It has also developed several projects that reduce energy consumption, like its automated Ventilation on Demand system. The system adjusts air requirements based on work intensity, increasing worker safety and reducing costs.

Case Study: The Interconnected Mine: Creating Efficiencies and Reducing Costs

The interconnected mine integrates many TSM principles that improve both people's wellbeing and our environmental footprint. At Éléonore, all underground workers, vehicles and other heavy equipment are outfitted with radio frequency identification (RFID) tags that transmit their identity and location via a WiFi connection at the Cisco access point throughout the mine. Telemetry units integrated into vehicles also monitor the functions and systems in the vehicle's engine and issue an alert to the maintenance team when something needs attention.

This allows the operation to:

- Make decisions using real-time information.
- Monitor the location of people and equipment.
- Operate equipment from surface between shifts.
- Lower energy consumption by ventilating on demand.

The ventilation on demand system measures air quality to make sure the right amount of air is sent only to where it's needed – where work is being done or machines are in operation. The system has cut Éléonore's electrical and propane consumption in half, and also significantly reduced costs.

🔗 This can be seen at www.youtube.com/watch?v=o7qUny6tNJc

TSM IMPLEMENTATION AT GOLDCORP

In 2019, our three other Canadian facilities will undergo verification.

- **Musselwhite Mine:** A fly-in, fly-out operation located approximately 500 kilometres north of Thunder Bay, Ontario.
- **Red Lake Gold Mine:** The Red Lake district is located 180 kilometres north of Dryden about 100 kilometres from the Manitoba border in northwestern Ontario.
- **Porcupine Gold Mines:** One of the world's great gold districts, Porcupine is located in and around the City of Timmins.

International Application:

Goldcorp has supported the adoption of *TSM* in Argentina and is in the process of implementing the standards in its Cerro Negro Mine site.

Goldcorp looks forward to introducing these facilities in future editions of the annual *TSM Progress Report*.

🔗 For more information, please visit www.goldcorp.com



Externally
Verified Results

2017 TSM Results

Goldcorp



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	×	✓
ÉLÉONORE	✓	×	✓

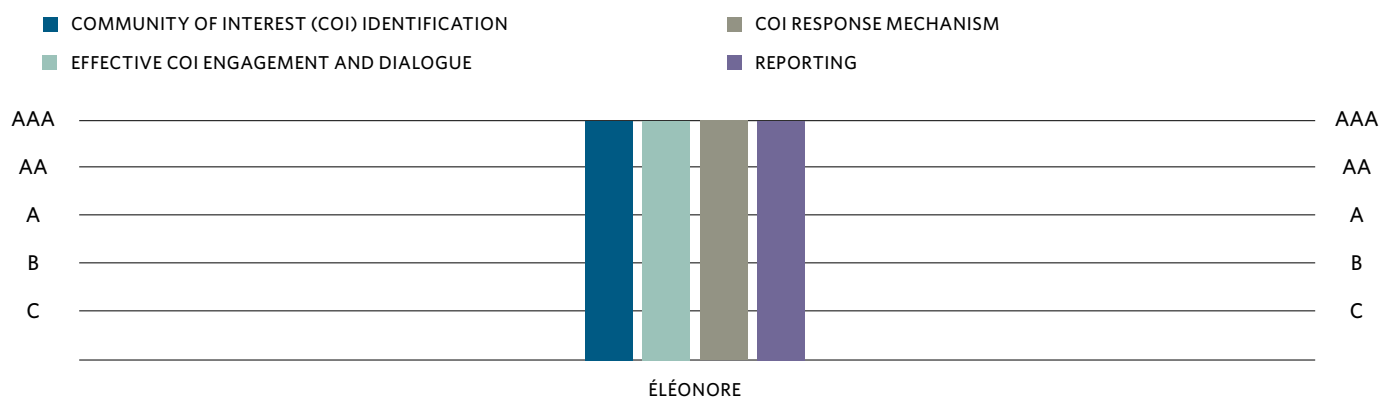


Preventing Child and Forced Labour

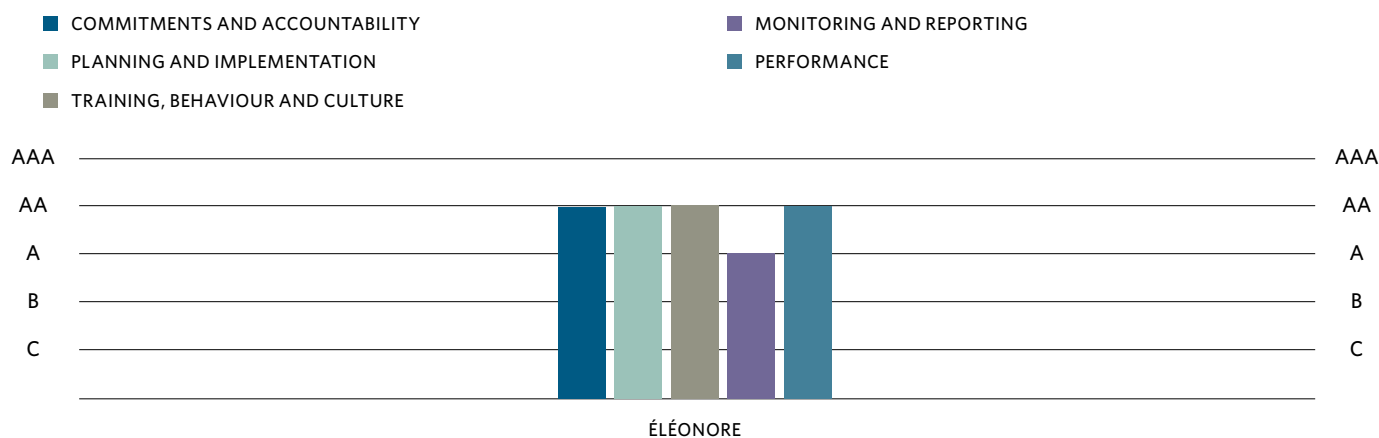
FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
ÉLÉONORE	✓	✓



Aboriginal and Community Outreach Assessment



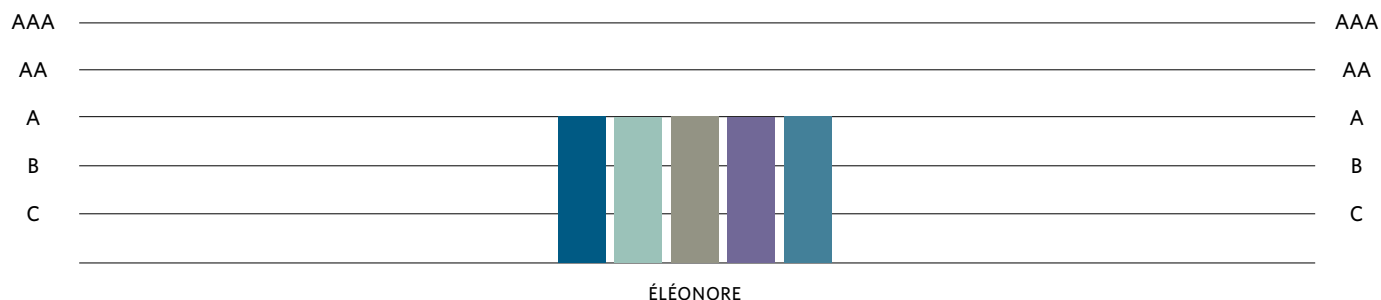
Safety and Health Assessment





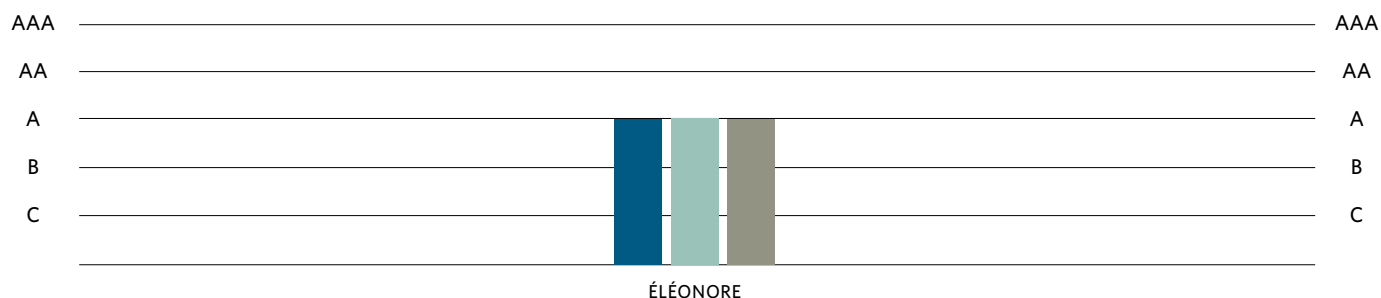
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL



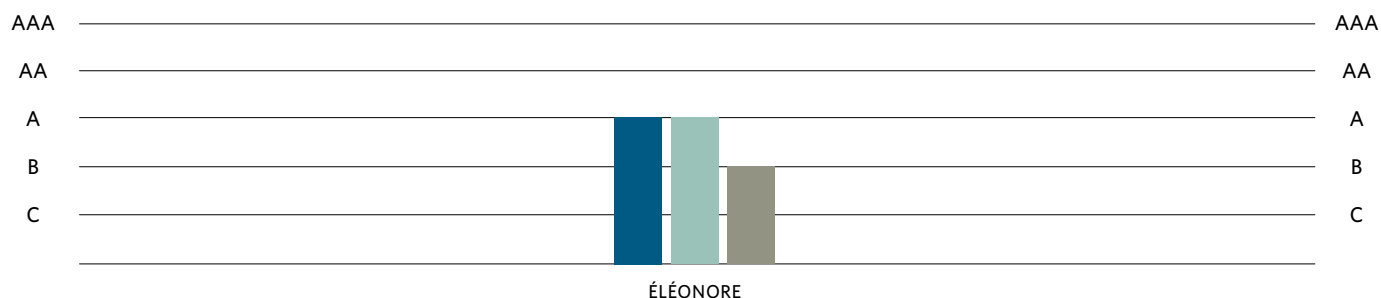
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



TSM Performance by Company

Hudbay Minerals Inc.



Hudbay is an integrated mining company that produces copper concentrate (containing copper, gold and silver) and zinc metal. The company is headquartered in Toronto, and is listed on the Toronto, New York and Lima stock exchanges under the symbol “HBM.” Hudbay has operating mines in Manitoba and the Cusco Region of Peru, and has a development project in Arizona.

For 90 years, Hudbay has worked toward the goal of translating responsible mining into positively impacting people’s lives, local communities and broader regional economies. Our experience in building strong relationships and making a valuable contribution wherever we do business guides us as we expand our presence in the Americas.

When Hudbay started in 1927, our operations were based in Manitoba and our primary market was North America. Today, our company is international and our market is global.

This report provides *TSM* performance results for both of our current operating business units. The Manitoba Business Unit (MBU) is located in Flin Flon and Snow Lake, Manitoba. Our South American Business Unit (SABU) operation is located in the Chumbivilcas province of Peru.

In 2017, the MBU improved its performance for one indicator within the *Safety and Health Protocol* and maintained its rating across all tailings management and biodiversity indicators. Full adherence to some of the requirements within the *Aboriginal and Community Outreach Protocol* was not maintained due to gaps in stakeholder engagement recordkeeping. Despite these shortcomings, there are several components of best practice (AAA) activity which have been implemented within the same two indicators, such as providing culturally specific training to employees. Several other examples of engagement activity can be found in our annual CSR report.

The MBU did not achieve their energy use and GHG emission reduction target, primarily due to an increase in propane usage associated with building heat. As such, the performance against Indicator 3 was a B. Hudbay Corporate plans to initiate a project to improve eco-efficiency performance. Once this project is implemented, performance barriers at the Business Unit level should be reduced.

At the Constancia operation in Peru, the assessment has determined a Level A or higher for the letter-graded *TSM* indicators. Performance is particularly good in the areas of community outreach, biodiversity management and health and safety management. A few gaps remain to enable a “yes” across all required components of crisis management planning.

Both business units have begun working with a new corporate process for tailings management that has been designed to comply with the updated guidance. Additional work is planned to implement the other best management practices outlined in the guide.

For 2018, Hudbay will be anticipating that its *TSM* performance results will be restored at the MBU and that a minimum of Level A will be maintained at our Peru facility. These goals are in addition to implementing items to address the emerging new requirements of the *TSM* program.

Hudbay's annual sustainability reports are available on its website.

🔗 For more information, please visit www.hudbayminerals.com



Open Pit at Constancia, Peru.



2017 TSM Results

Hudbay Minerals Inc.

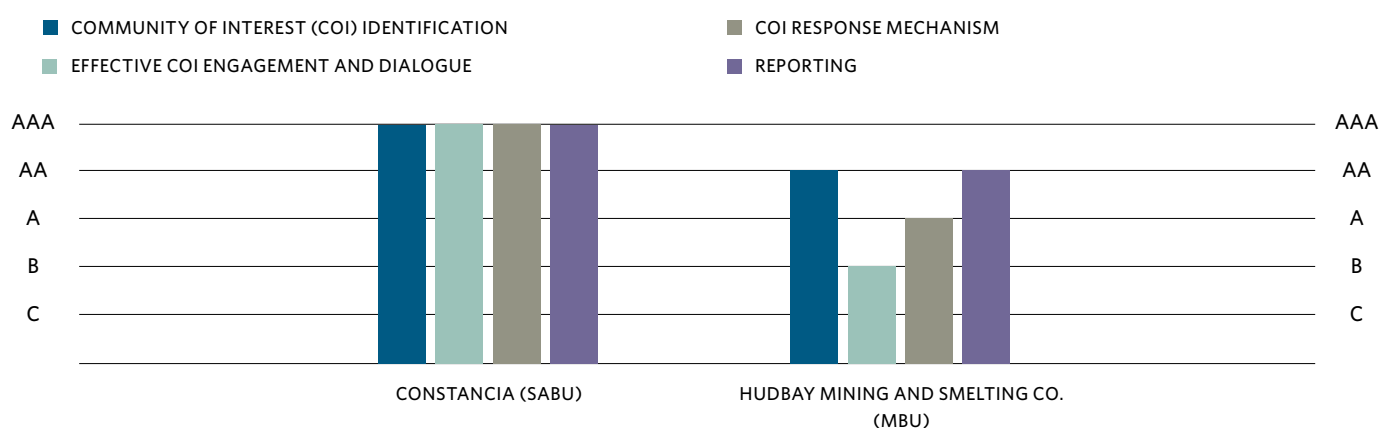


Crisis Management and Communications Planning Assessment

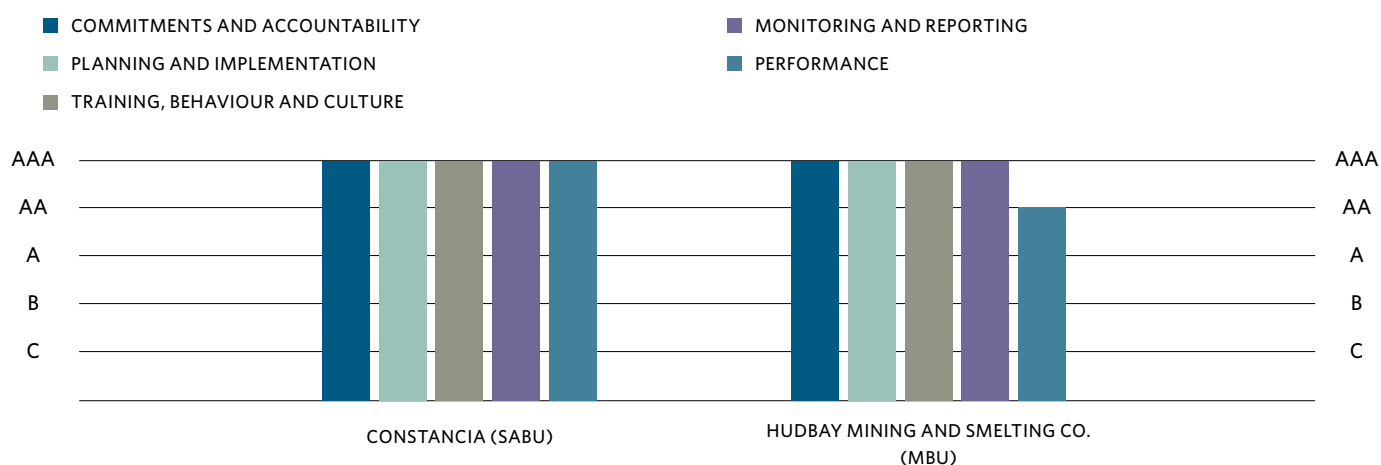
FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
CONSTANCIA (SABU)	✓	×	×
HUDBAY MINING AND SMELTING CO. (MBU)	✓	✓	✓



Aboriginal and Community Outreach Assessment



Safety and Health Assessment



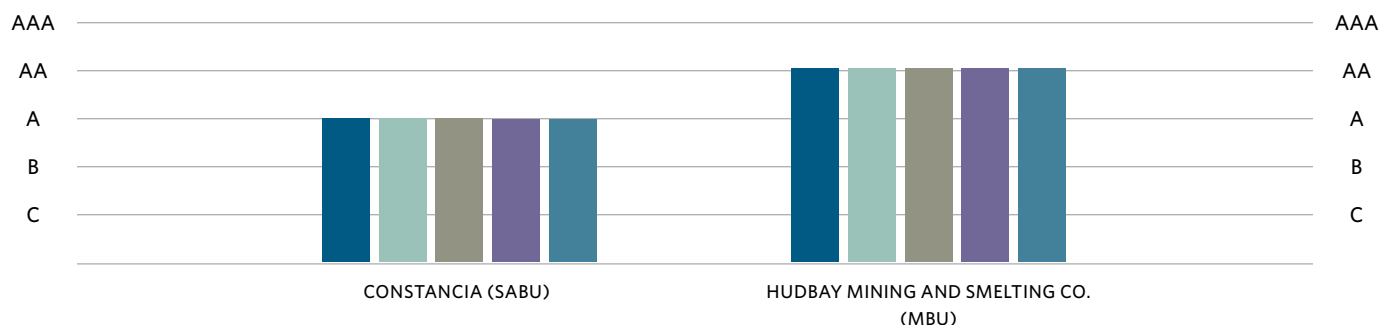
Self-assessed results; last external verification: 2016; next external verification: 2019.





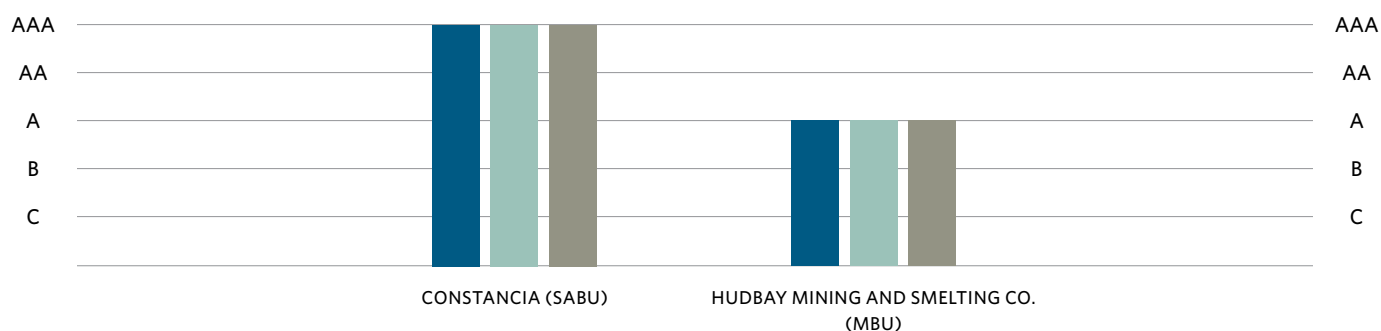
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL



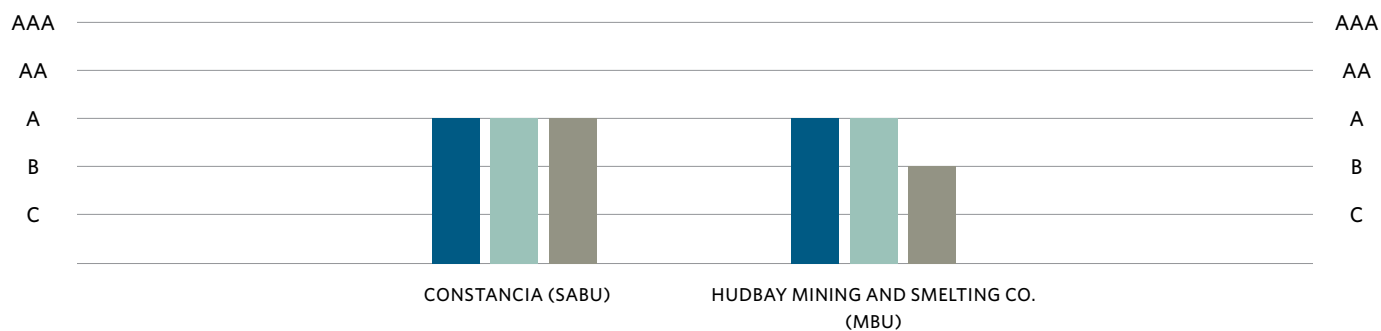
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS

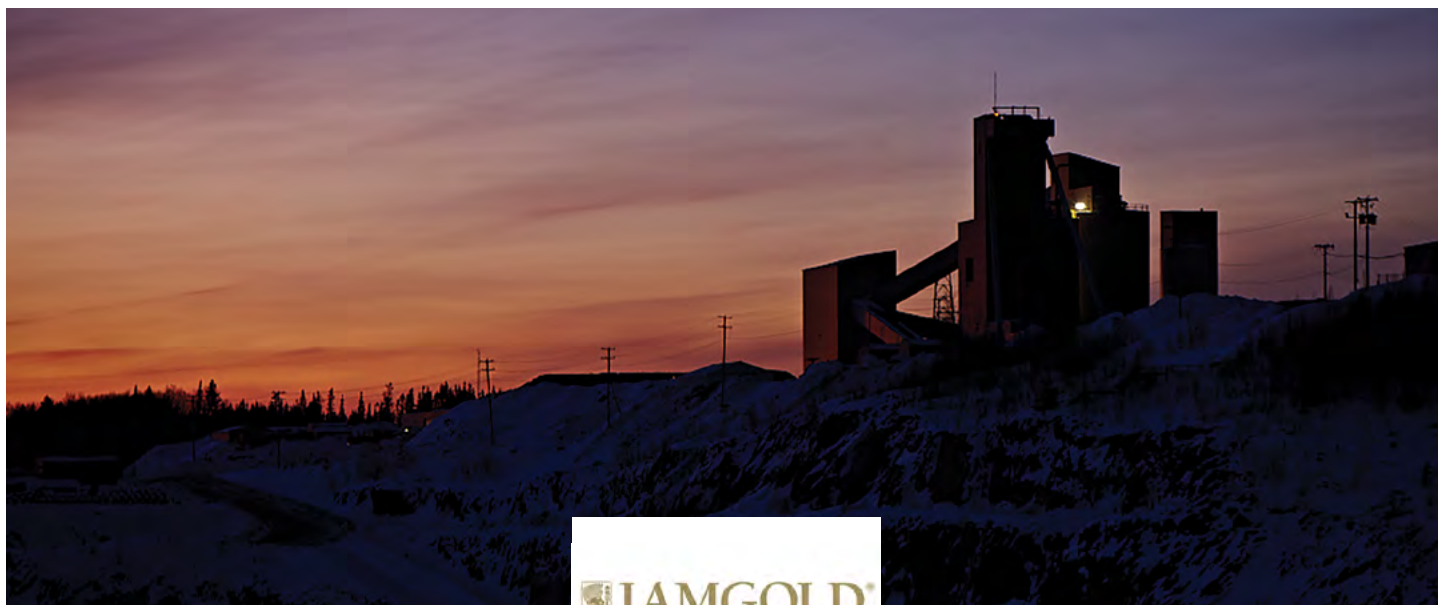


Self-assessed results; last external verification: 2016; next external verification: 2019.



TSM Performance by Company

IAMGOLD Corporation



IAMGOLD is a mid-tier mining company with four operating gold mines on three continents (including one joint venture). A solid base of strategic assets in North and South America and West Africa is complemented by development and exploration projects and continued assessment of accretive acquisition opportunities. IAMGOLD is in a strong financial position with extensive management and operational expertise.

Guided by the vision to achieve Zero Harm, IAMGOLD conducts mining activities with a commitment to reaching the highest standards in human health and safety, minimize impacts on the environment, and work co-operatively with host communities. The TSM initiative is strongly embedded in IAMGOLD's Sustainability Standard, operating practices and pursuit of excellence.

IAMGOLD has participated in the TSM initiative in Canada and at the company's international operations since 2007. This year, external verification of the company's 2017 TSM performance was completed for the three IAMGOLD-managed operations (Essakane, Rosebel and Westwood) as well as the corporate head office in Toronto.

The verification highlighted several opportunities for continuous improvement, which will be incorporated into the company's Health, Safety and Sustainability program.

TSM PROTOCOLS

Aboriginal and Community Outreach

All three mines were verified at Level AAA across all four indicators of this Protocol. In addition, IAMGOLD was selected as the 2018 TSM Community Engagement Excellence Award winner for Essakane's Scrap Metal Program Supporting Women Entrepreneurs.

Energy and GHG Emissions Management

All three mines were verified to meet or exceed Level A across the three indicators of this Protocol. IAMGOLD is committed to renewable energy as exemplified by the development of the world's largest hybrid photovoltaic plant heavy fuel oil (PV-HFO) of 15 MW at Essakane and a 5 MW solar power plant at Rosebel as well as several smaller solar projects in support of local communities in Suriname.

Tailings Management

All three mines were verified to meet or exceed Level A across the five indicators of the 2011 version of this Protocol. The Westwood Mine has minimized its overall environmental footprint by reducing the amount of newly disturbed land by using the former Doyon open pit for tailings storage. Opportunities to continuously improve governance and management of tailings across the company were identified.

Biodiversity Conservation Management

All three mines were verified to meet or exceed Level A across the three indicators. IAMGOLD is focused on enhancing facility level biodiversity management plans.

Safety and Health

All three mines were verified to meet or exceed Level A across the five indicators with the exception of Westwood for indicator 5 due to an accident resulting in a fatality.

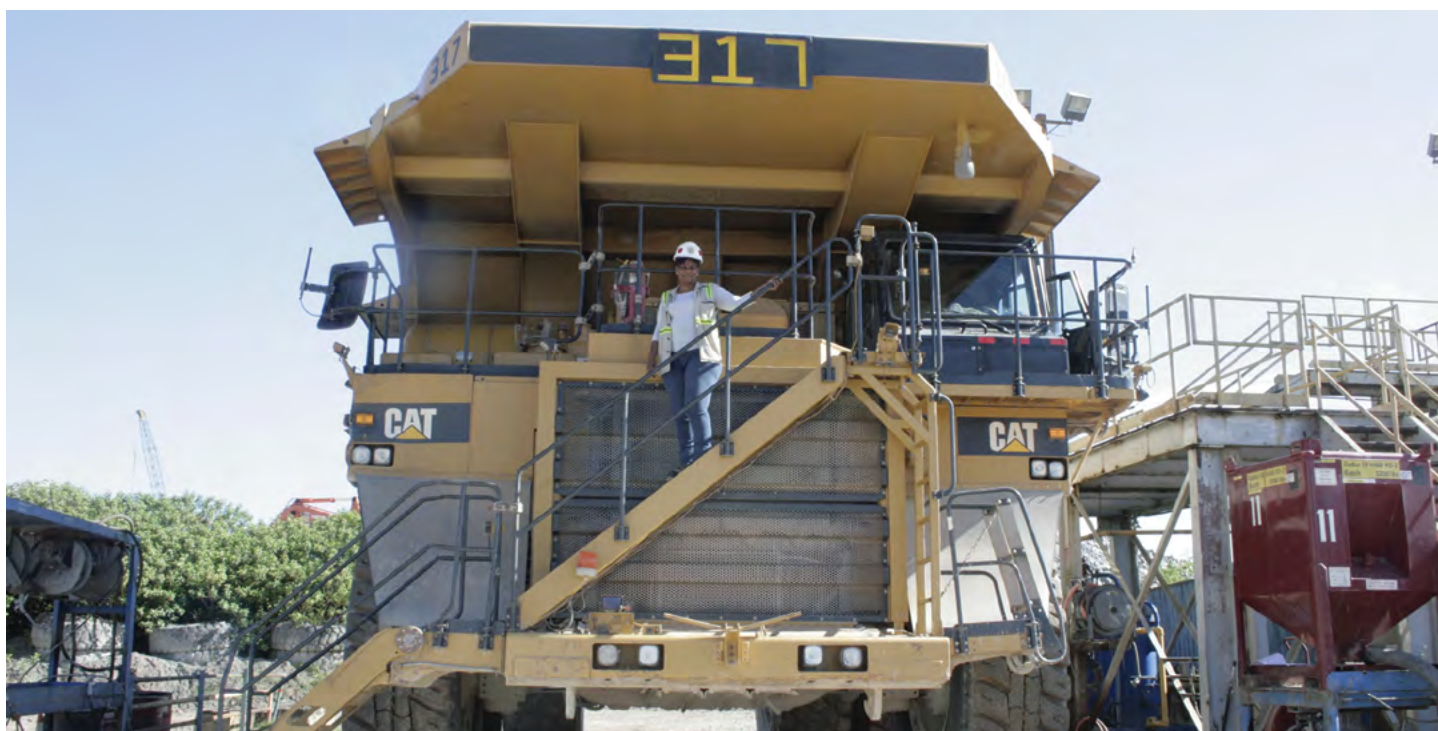
Crisis Management and Communications Planning

All three mines and corporate were verified as "yes" for the three indicators with the exception of indicators 2 and 3 for Rosebel and corporate.

Preventing Child and Forced Labour

All three mines were verified to have processes in place to meet the requirements of this Protocol.

🔗 For more information, please visit www.iamgold.com



Monique Boedhai, the first woman to drive an excavator for IAMGOLD Corporation, at its Rosebel Gold Mine in Suriname.

Externally
Verified Results

2017 TSM Results

IAMGOLD Corporation

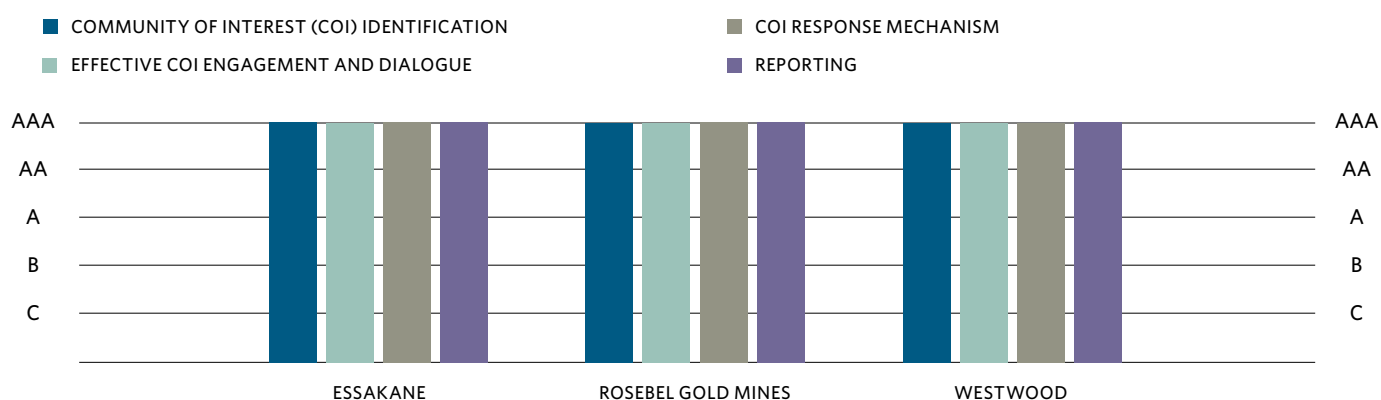
Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	×	×
ESSAKANE	✓	✓	✓
ROSEBEL GOLD MINES	✓	×	×
WESTWOOD	✓	✓	✓

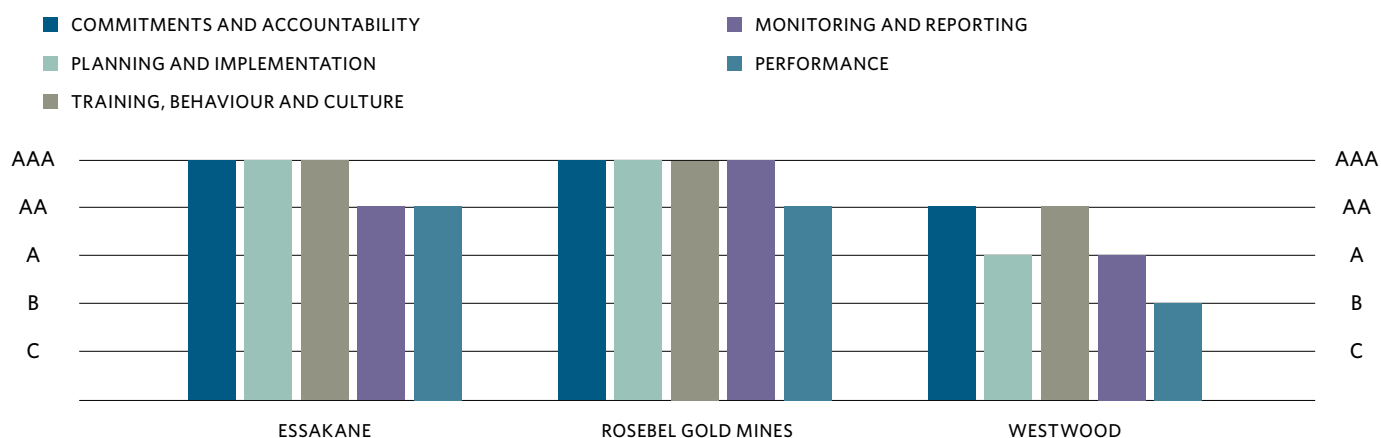
Preventing Child and Forced Labour

FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
ESSAKANE	✓	✓
ROSEBEL GOLD MINES	✓	✓
WESTWOOD	✓	✓

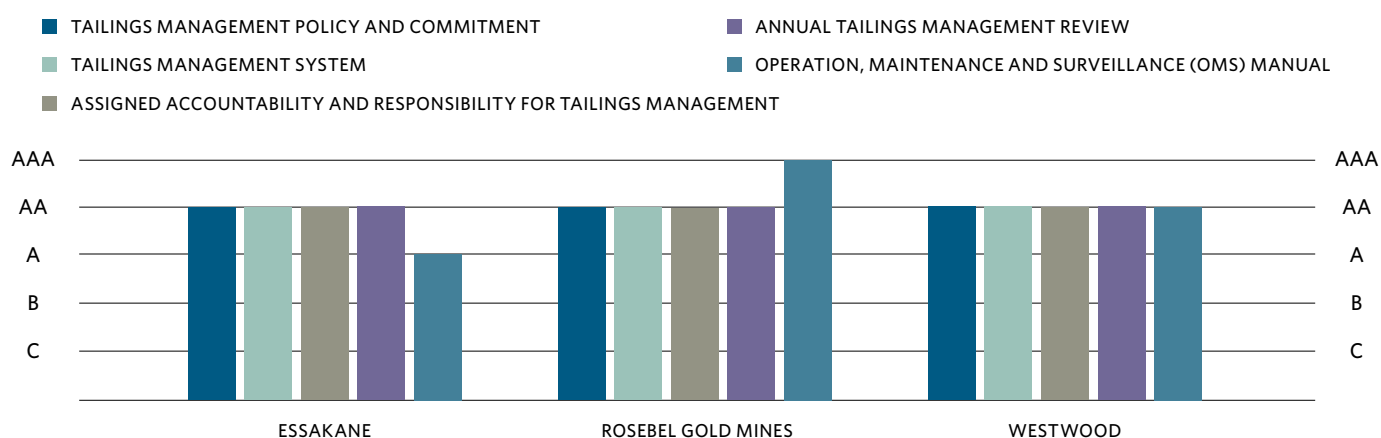
Aboriginal and Community Outreach Assessment



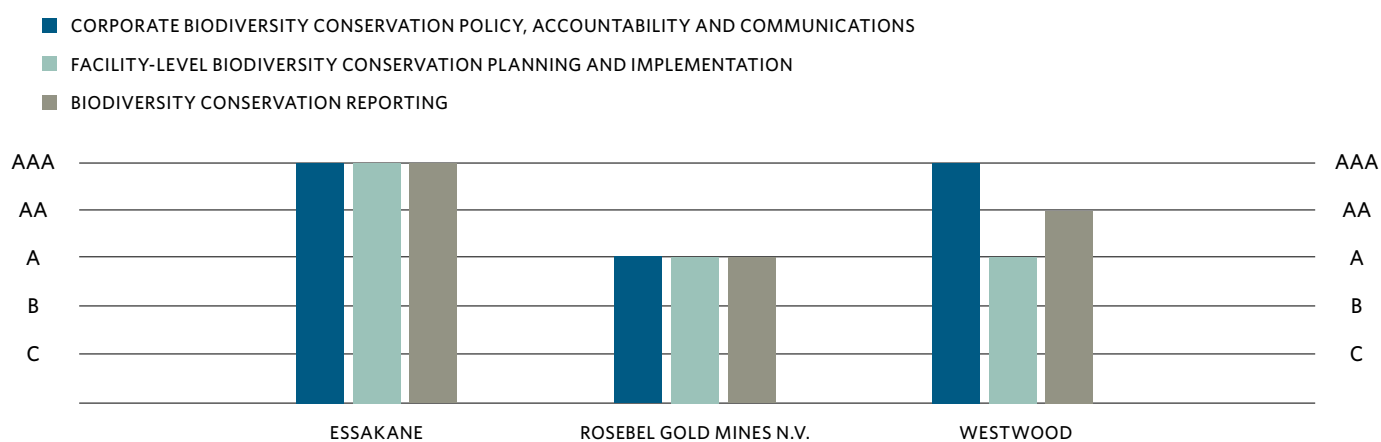
Safety and Health Assessment



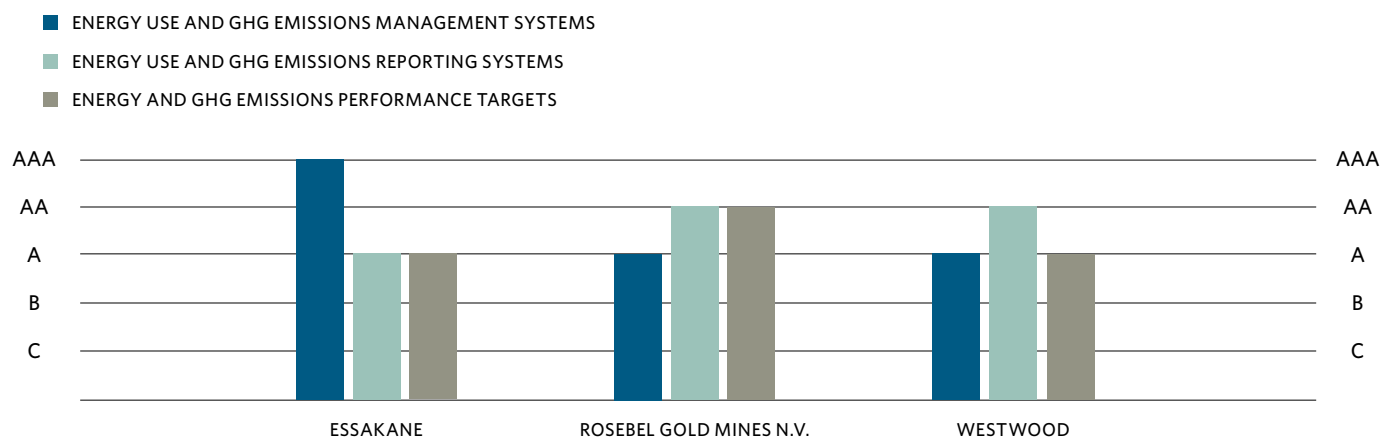
Tailings Management Assessment



Biodiversity Conservation Management Assessment



Energy Use and GHG Emissions Management Assessment



TSM Performance by Company

Imperial Metals Corporation



Imperial Metals Corporation (Imperial) is a BC mining company active in base and precious metal acquisition, exploration, development and mine operation. Imperial has three mine operations in BC producing copper and gold, with silver and molybdenum as by-products. Imperial's property portfolio includes Red Chris (100%), Mount Polley (100%), Huckleberry (50% interest, non-operating partner; currently under care and maintenance), Ruddock Creek (50% interest), and Sterling (100%) in Nevada.

MOUNT POLLEY MINE

Imperial's Mount Polley Mine, operated by Mount Polley Mining Corporation (MPMC), is an open-pit copper and gold mine with a developing underground project. It is located in south-central BC.

Following a period of care and maintenance from August 2014 to July 2015, the Mount Polley Mine returned to modified operations in August 2015 and transitioned into full operations in June 2016.

Aboriginal and Community Outreach

The Mount Polley Mine is in the traditional territory of the Soda Creek Indian Band (Xat'sül First Nation) and the Williams Lake Indian Band. MPMC has participation agreements in place with both First Nations, and those agreements were the first to be completed by any mining company in the province at a brownfields site.

Mount Polley also has a Public Liaison Committee (PLC), which includes representatives of government regulators, First Nations, and local communities and business organizations, including the communities of Likely, Horsefly, Big Lake and Williams Lake, and residents of Mitchell Bay area on Quesnel Lake. The PLC meets on a quarterly basis as an information sharing body for the mine to provide updates to local stakeholders and First Nations representatives, and to receive input and questions from these representatives.

Tailings Management

In the area of tailings management, MPMC maintained a Level A for all five indicators of this Protocol. The facility is reviewing its tailings management system to ensure that it meets Level A requirements of the revised *TSM Tailings Management Protocol* and associated guidance documents.

Safety and Health

MPMC's health and safety management system has a strong alignment with the *TSM Safety and Health Protocol*. For this Protocol, MPMC has achieved a Level A or better for all five indicators.

Energy Use and GHG Emissions Management

MPMC reports in accordance with the GHG requirements at both the provincial (mandatory) and federal (voluntary) levels. Integration of energy use and GHG emissions requirements management systems into the operation represents a new focus area for MPMC, and this, along with not setting and achieving energy and GHG emissions performance targets, limits the TSM-assessed level for this Protocol to a Level C. Imperial has recruited a Manager of Energy, GHG Emissions, and Electrical Asset Health (an "Energy and GHG Manager"), who will support MPMC's efforts on site and assist in improving its performance in this area in the coming year.

Crisis Management and Communications Planning

MPMC has site-level mine emergency response and tailings management emergency response plans that are established and regularly tested. A corporate crisis management and communication plan (CMCP) is presently in development and is expected to be completed by August 2018.

Biodiversity Conservation Management

The Mount Polley Mine has an extensive progressive reclamation program on site which, combined with much of the remediation effort undertaken since the breach of the TSF in 2014, as well as a number of research initiatives, contributes to a significant effort to promote biodiversity on the site. MPM has initiated a project to formalize descriptions of its biodiversity activities that will be undertaken this fall to meet TSM's indicator reporting requirements and capture this information for future TSM reporting. The TSM reporting and assessment process will provide an opportunity for Mount Polley to showcase a significant amount of work related to biodiversity that has not been highlighted before.

Child and Forced Labour

The Mount Polley Mine does not practice or condone any forced or child labour practices. The mine has a formal Policy Statement for Hiring that includes reference to applicable regulatory laws and the Human Rights Code. The Mount Polley Mine also has formalized human resource procedures for managing hiring within the regulatory requirements of BC and within Canadian Federal Regulation.

🔗 For more information, please visit www.imperialmetals.com

Externally
Verified Results

2017 TSM Results

Imperial Metals Corporation



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	×	×	×
MOUNT POLLEY	✓	✓	✓



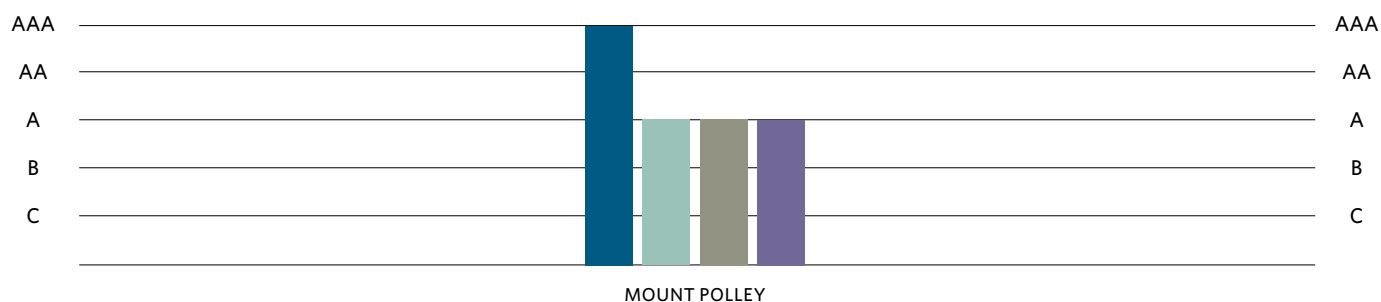
Preventing Child and Forced Labour

FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
MOUNT POLLEY	✓	✓



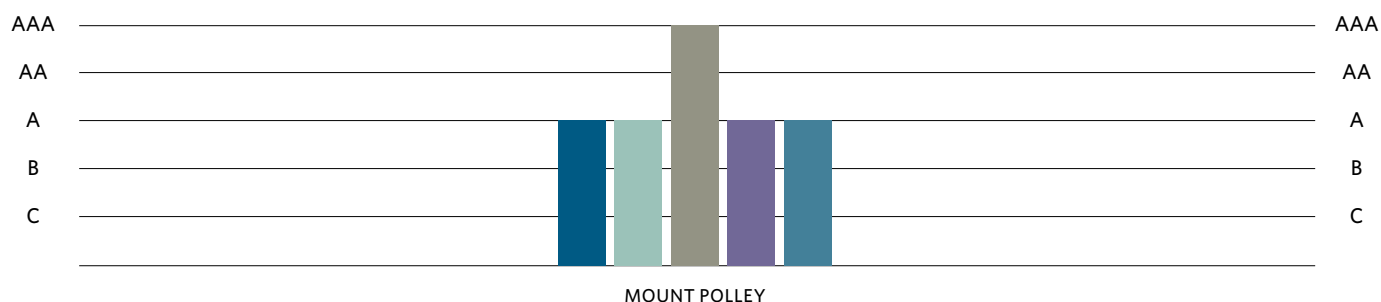
Aboriginal and Community Outreach Assessment

- COMMUNITY OF INTEREST (COI) IDENTIFICATION
- COI RESPONSE MECHANISM
- EFFECTIVE COI ENGAGEMENT AND DIALOGUE
- REPORTING



Safety and Health Assessment

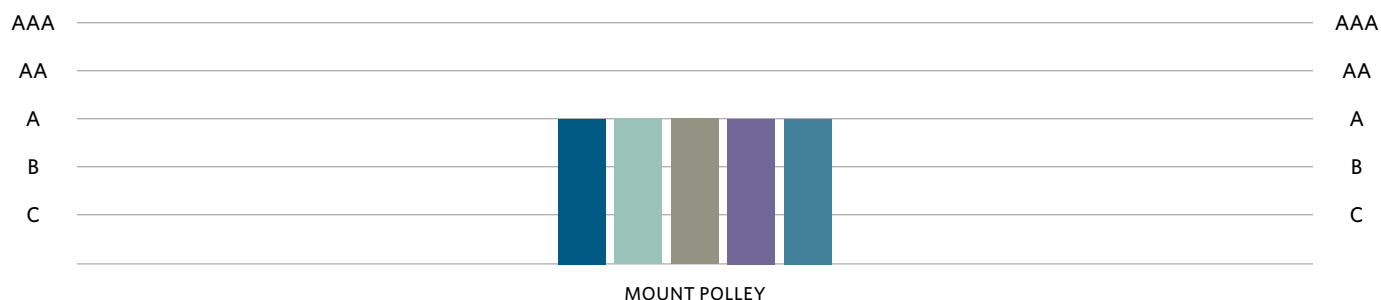
- COMMITMENTS AND ACCOUNTABILITY
- MONITORING AND REPORTING
- PLANNING AND IMPLEMENTATION
- PERFORMANCE
- TRAINING, BEHAVIOUR AND CULTURE





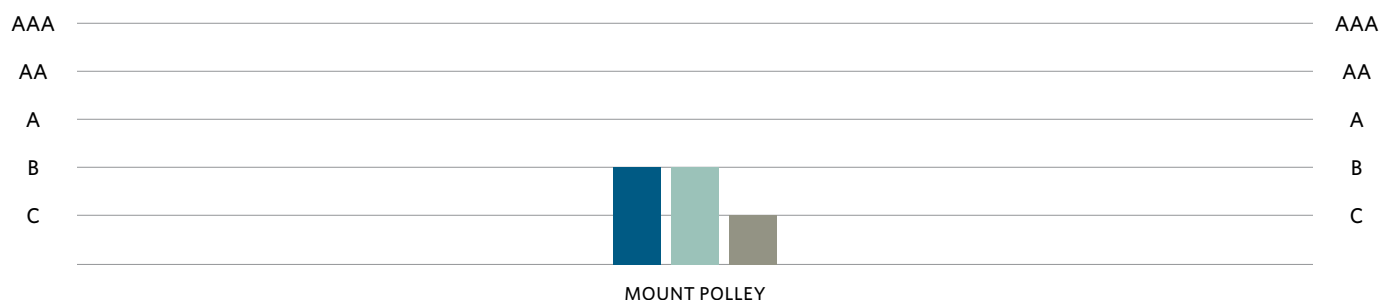
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL



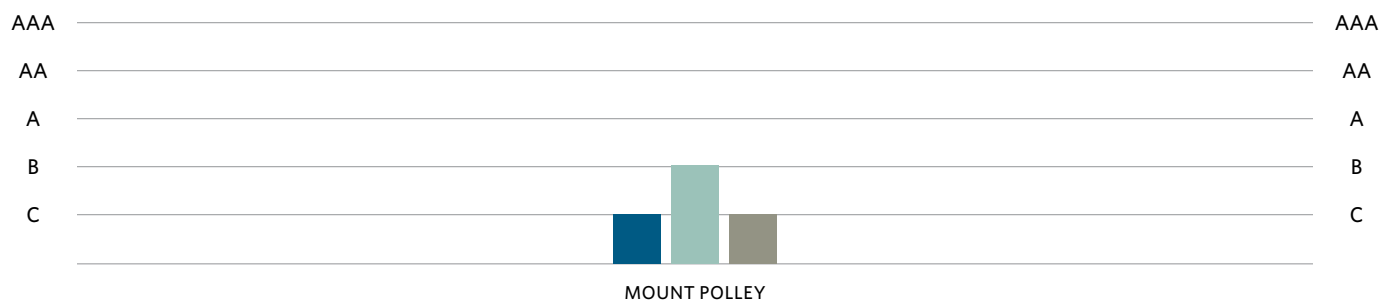
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



TSM Performance by Company

New Gold Inc.



New Gold is an intermediate gold producer with operating mines in Canada (New Afton Mine – British Columbia and the Rainy River Mine – Ontario), the United States (Mesquite Mine), and Mexico (Cerro San Pedro Mine). In addition, New Gold's principal development project is its 100% owned Blackwater project in British Columbia. New Gold sold its operation in Australia, the Peak Mine, in early 2018.

New Gold is committed to excellence in corporate social responsibility. We consider our ability to make a lasting and positive contribution to our host communities a key driver to achieving a productive and profitable business. At New Gold, we contribute to sustainable development by ensuring we have a detailed understanding of the impacts, and potential impacts, of our activities on communities and the environment. With this understanding we can minimize or prevent these impacts. We apply this risk-based approach throughout the mine life cycle, from early exploration through development and operation, to decommissioning and mine closure.

New Gold believes in positively contributing to the mining industry. As part of this commitment, New Gold is an active member of the World Gold Council, Business for social responsibility, the Mining Association of Canada, the Prospectors and Developers Association of Canada, the Mining Association of Ontario and the Mining Association of British Columbia. We also take part in the Mexican Mining Chamber, the Canadian Chamber of Commerce in Mexico and the American Exploration and Mining Association in the United States. We are also committed to the United Nations Global Compact's principles on human rights, labor standards, the environment and anti-corruption.

New Gold is committed to achieving the highest possible level of performance with regards to safety, environmental protection and sustainable community development. This commitment drives New Gold to seek out those standards, Protocols and performance indicators that assist our operations in achieving these goals. As a result, New Gold has adopted the following standards and added them to the New Gold *Environmental Management Standards and Community Management Standards*:

- The International Cyanide Management Code
- ISO 14001:2015 Environmental Management



- The Mining Association of Canada's *TSM*
- ISO 26000 – Social Responsibility.

New Gold also adopts the UN Global Compact 10 Principles and follows the guidelines of the Global Reporting Initiative and the Carbon Disclosure Project for both carbon and water disclosures to ensure relevant information is made known to its communities of interest. As part of the World Gold Council, New Gold fulfills its obligations under the *Conflict-free Gold Standard*.

New Afton enthusiastically adopted *TSM* Protocols, in addition to implementing ISO 14001, as it moved from the project development phase through commissioning and into production in July 2012. 2013 was the first full year of operation at New Afton and the first year of mandatory *TSM* reporting. New Gold has used *TSM* as a tool of disclosure to assure our local communities and First Nations partners that there has been progress and improvement in the areas that are important to them.

This is New Afton's fifth year of reporting to *TSM* and the site conducted a self-assessment against the Protocols. We look forward to verifying these self-assessed results in the future.

The results have shown improvement in several key areas, namely:

- Tailings Management; moved from A to AAA for the OMS Manual indicator.
- Energy Use and GHG Emissions Management; all indicators moved to AAA.
- Biodiversity Conservation Management; two of the three indicators moved to AAA.
- Aboriginal and Community Outreach; moved from AA to AAA for COI engagement.
- Health and Safety; two indicators moved to AAA making it three in total.

In 2013, New Afton made significant progress toward a vision of sustainable energy management and in early 2014, it was the first mine in North America to be certified under ISO 50001 - Energy Management Systems. We have met the criteria for AAA across the entire Protocol, but more importantly we have met or exceeded our energy targets which leads to dollar savings and lower GHG emissions and has yielded 35 GWh in energy conservation, enough to power 3,500 homes for a full year. In 2018, New Afton won a Canadian Industry Partnership for Energy Conservation (CIPEC) Leadership Award for Employee Awareness and Training.

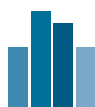
As part of our commitment to being a socially responsible partner of choice, New Gold has adopted *TSM* at all of our sites, including those in other countries. In 2017, our Cerro San Pedro Mine received a *TSM Leadership Award* from the Mining Association of Canada for reaching a minimum of Level A across all indicators during external verification. As the site is undergoing a phased closure due to exhaustion of ore, one particularly pleasing aspect of the results was the achievement of AAA across all indicators of the *Aboriginal and Community Outreach Protocol*. Cerro San Pedro has maintained the good results that it achieved for the last reporting period. Although this will be the last time Cerro San Pedro will report its *TSM* results externally, the site will continue to use the *TSM* Protocols to guide activities through the remainder of the closure process.

Mesquite Mine, in eastern California, also self-assessed against the Protocols. While the site scored particularly high in *Safety and Health*, it unfortunately saw a drop in other results, including: *Aboriginal and Community Outreach*, *Energy Use and GHG Emissions Management* and *Biodiversity Conservation Management*. The results have been reviewed and action plans compiled to address the priority areas that saw a reduction in performance indicator scores.

The increase in scores in safety and health is particularly pleasing for New Gold and the Level AAA rating for every indicator is reflective of the great efforts of the Mesquite team. The site was able to achieve six consecutive months without a single safety incident.

With Rainy River Mine now operating, New Gold intends to implement *TSM* and report on performance next year as part of consolidated data. External reporting of the results will commence in two years.

🔗 For more information, please visit www.newgold.com or contact Dennis Wilson: dennis.wilson@newgold.com



2017 TSM Results

New Gold Inc.



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	×	×
CERRO SAN PEDRO	✓	✓	✓
NEW AFTON MINE	✓	✓	✓
WESTERN MESQUITE MINE	✓	✓	✓

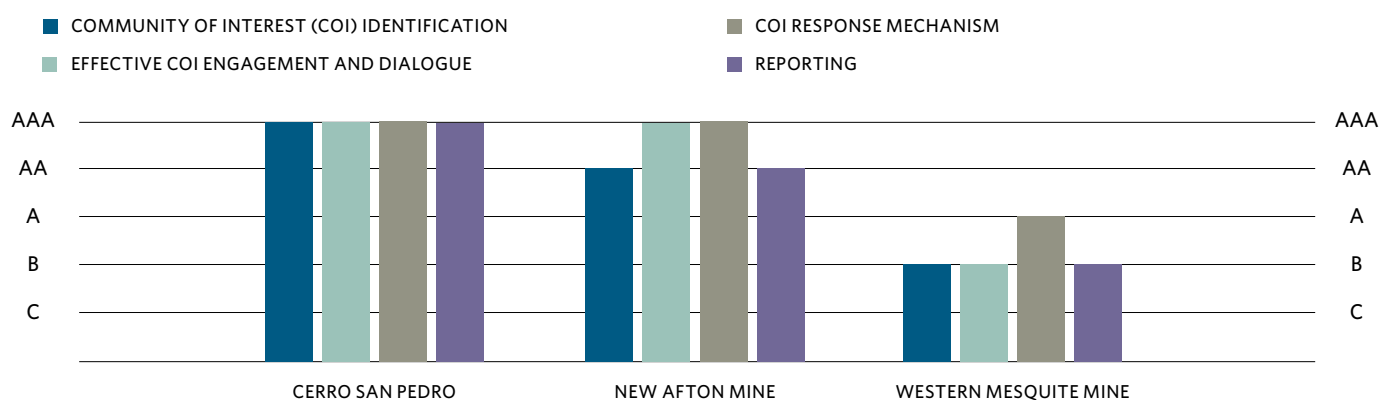


Preventing Child and Forced Labour

FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
CERRO SAN PEDRO	✓	✓
NEW AFTON MINE	✓	✓
WESTERN MESQUITE MINE	✓	✓



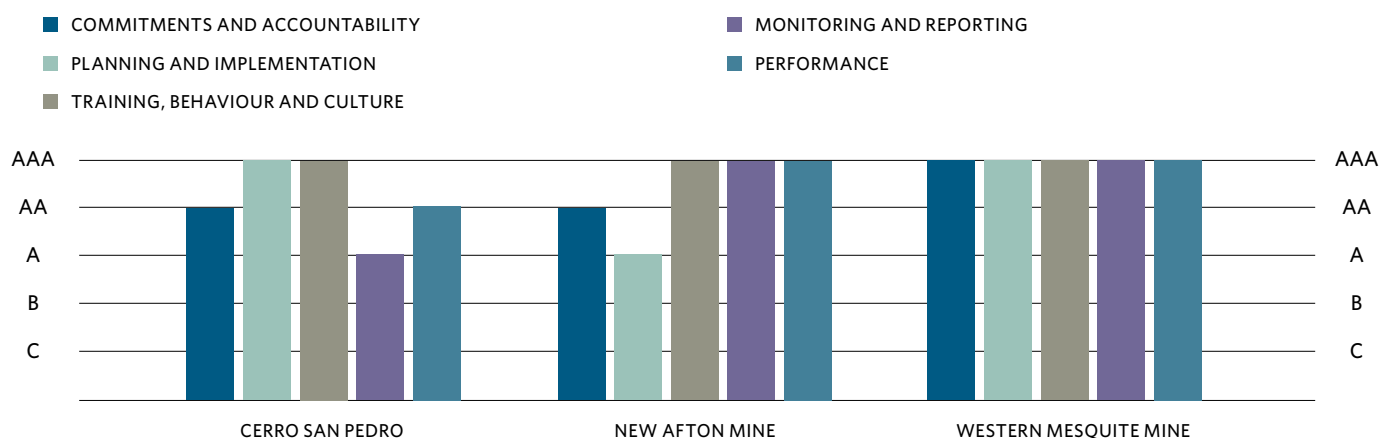
Aboriginal and Community Outreach Assessment



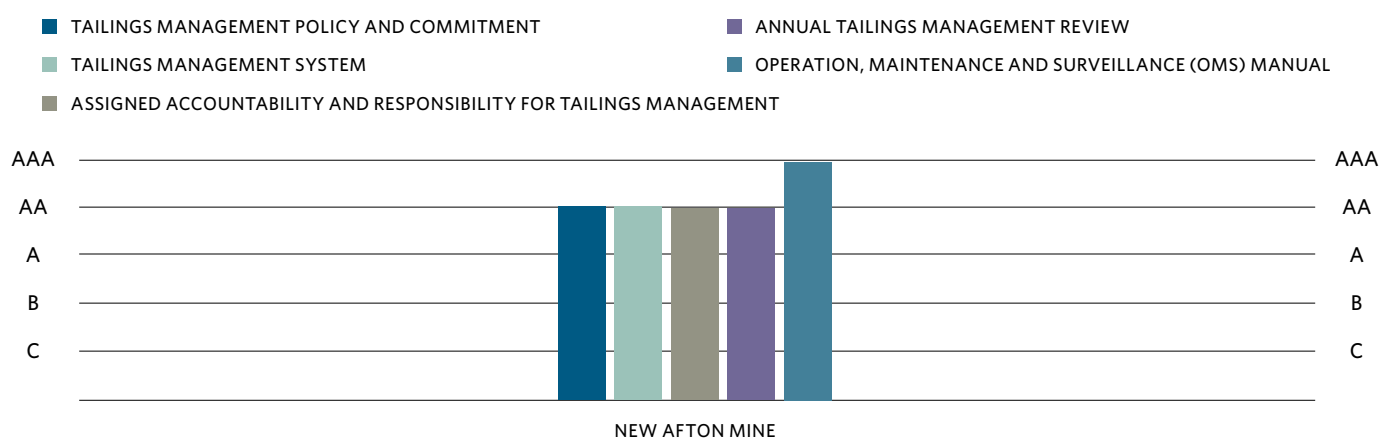
Self-assessed results; last external verification: 2017; next external verification: 2020.



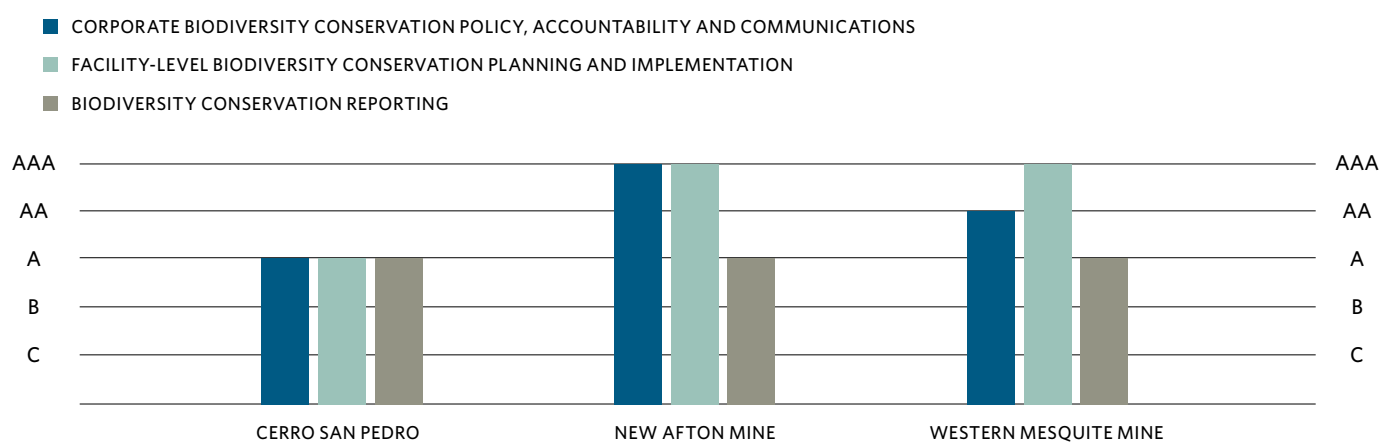
Safety and Health Assessment



Tailings Management Assessment

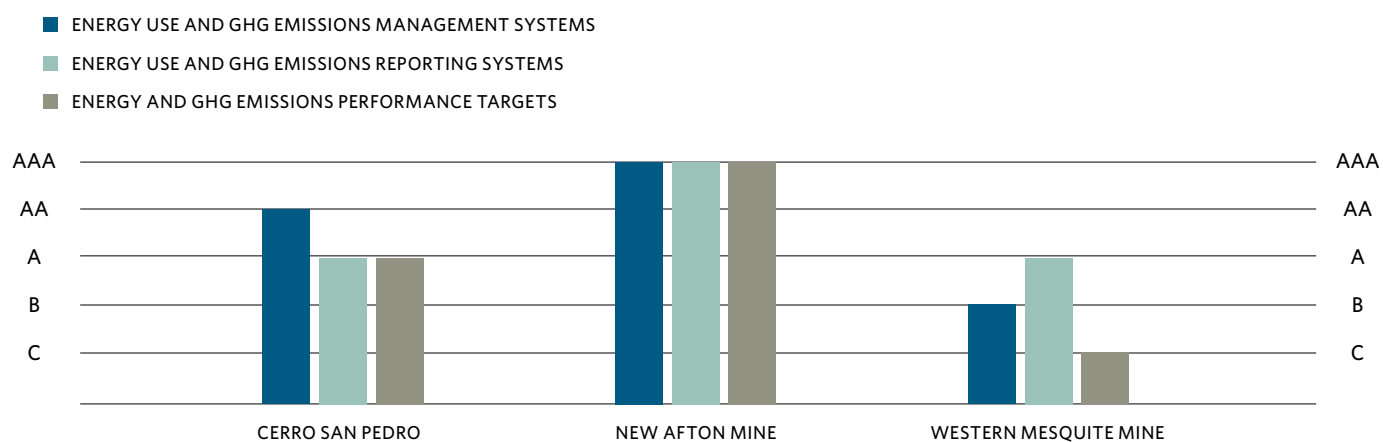


Biodiversity Conservation Management Assessment



Self-assessed results; last external verification: 2017; next external verification: 2020.

Energy Use and GHG Emissions Management Assessment



Self-assessed results; last external verification: 2017; next external verification: 2020.

TSM Performance by Company

Nyrstar



Nyrstar is a global multi-metals business with market leading positions in zinc and lead, and growing positions in other base and precious metals. Nyrstar employs approximately 4,100 people and has mining and smelting operations located in North America, Australia and Europe. This includes two mines located in Canada: Myra Falls in British Columbia and Langlois in Quebec. The company's corporate office is located in Zurich, Switzerland.

At Nyrstar, sustainability is viewed as a key driver of business success, and the company is committed to working with its stakeholders to achieve continual improvement in safety, health, environment and community (SHEC) performance. Nyrstar's Group SHEC Management Framework sets the direction for all SHEC activities and establishes a common approach to the management of SHEC risks at Nyrstar's sites. The Framework is aligned with ISO 14001 and OHSAS 18001, and most of Nyrstar's sites are certified to these standards. The *TSM* performance Protocols help Nyrstar's Canadian sites address key safety, health and environmental risks and processes responding to the *TSM* requirements and ensure they are integrated into the sites' SHEC management systems.

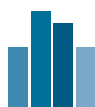
The Myra Falls and Langlois operations joined Nyrstar in 2011 as part of the acquisition of Breakwater Resources. Nyrstar Myra Falls is an underground base metal mine located on Vancouver Island, 90 kilometres southwest of Campbell River, British Columbia. The mine's location inside Strathcona Provincial Park on Vancouver Island presents unique challenges that heighten the importance of robust environmental and community management programs. The Myra Falls operation has been on care and maintenance since 2015 but is set to restart operations in mid-2018. As *TSM* applies to operating facilities, public reporting of *TSM* performance will resume once the mine recommences production activities. In the meantime, the mine is working to address gaps identified during its internal self-assessment.

The Langlois Mine is located in northwest Quebec near the town of Lebel-Sur-Quévillon. Following a period of care and maintenance, the mine resumed commercial production in 2012 and has been reporting *TSM* results publicly since 2015. The externally verified self-assessment results for 2017 confirmed the implementation of prioritized SHEC control processes such as health and safety management systems and an operation, maintenance and surveillance (OMS) manual for the site's tailings storage facility. However, it also revealed several improvement opportunities related to the mine's management programmes for crisis preparedness, safety and health, environment and community engagement. These opportunities are being addressed through focused action plans, training and other efforts aimed at strengthening the SHEC performance of the site.

🔗 For more information, please visit www.nyrstar.com



The Nyrstar Langlois Mine in Quebec.



2017 TSM Results

Nyrstar

Externally
Verified Results



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	×	×
LANGLOIS	✓	×	×



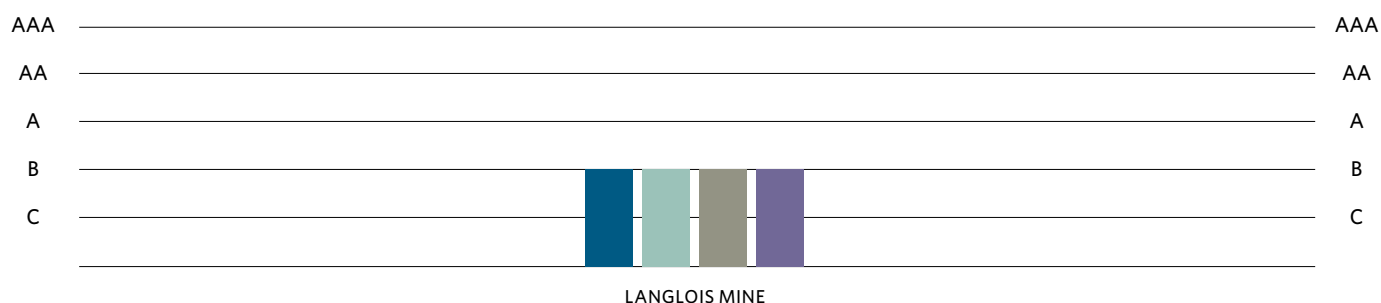
Preventing Child and Forced Labour

FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
LANGLOIS	✓	✓



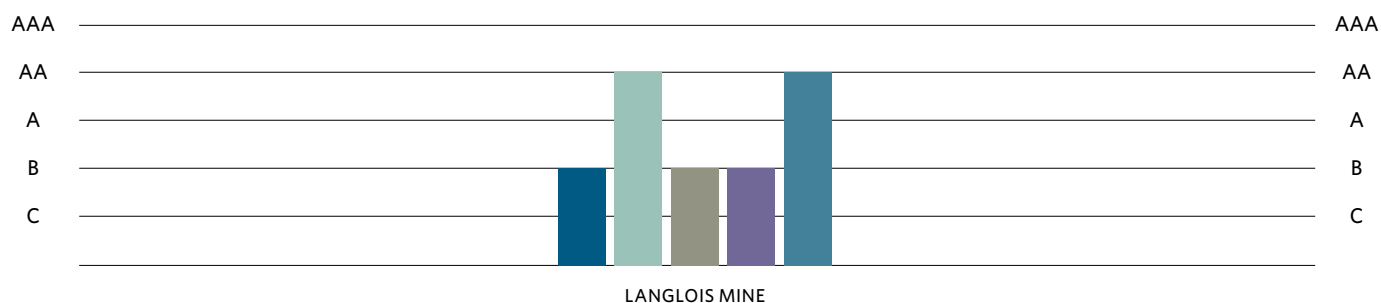
Aboriginal and Community Outreach Assessment

- COMMUNITY OF INTEREST (COI) IDENTIFICATION
- COI RESPONSE MECHANISM
- EFFECTIVE COI ENGAGEMENT AND DIALOGUE
- REPORTING



Safety and Health Assessment

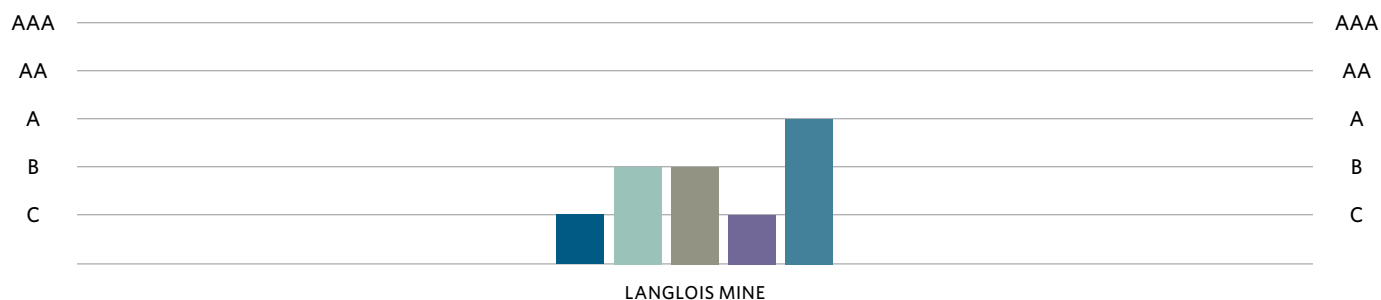
- COMMITMENTS AND ACCOUNTABILITY
- PLANNING AND IMPLEMENTATION
- TRAINING, BEHAVIOUR AND CULTURE
- MONITORING AND REPORTING
- PERFORMANCE





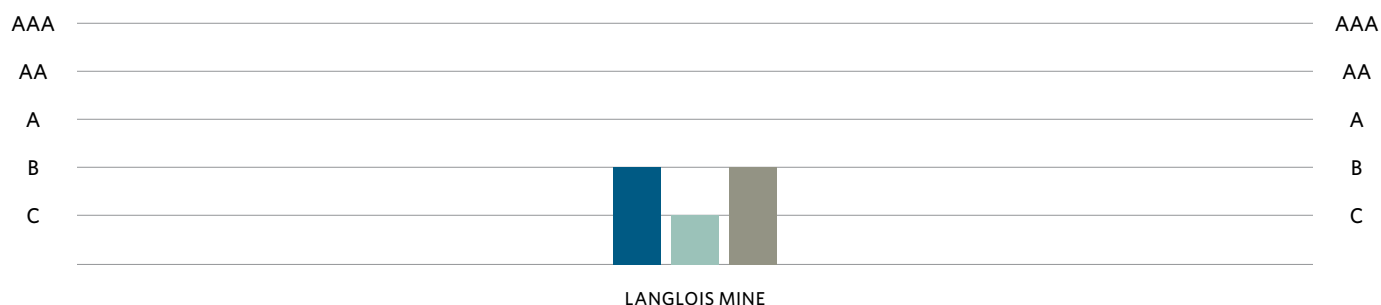
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL



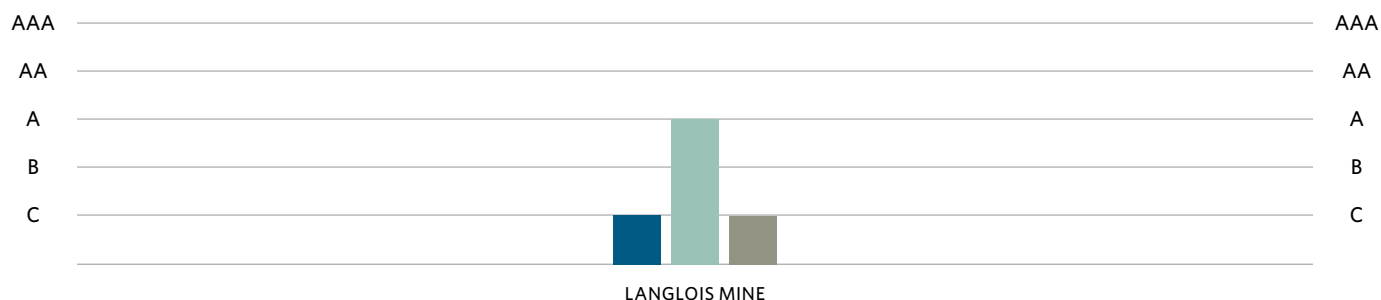
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



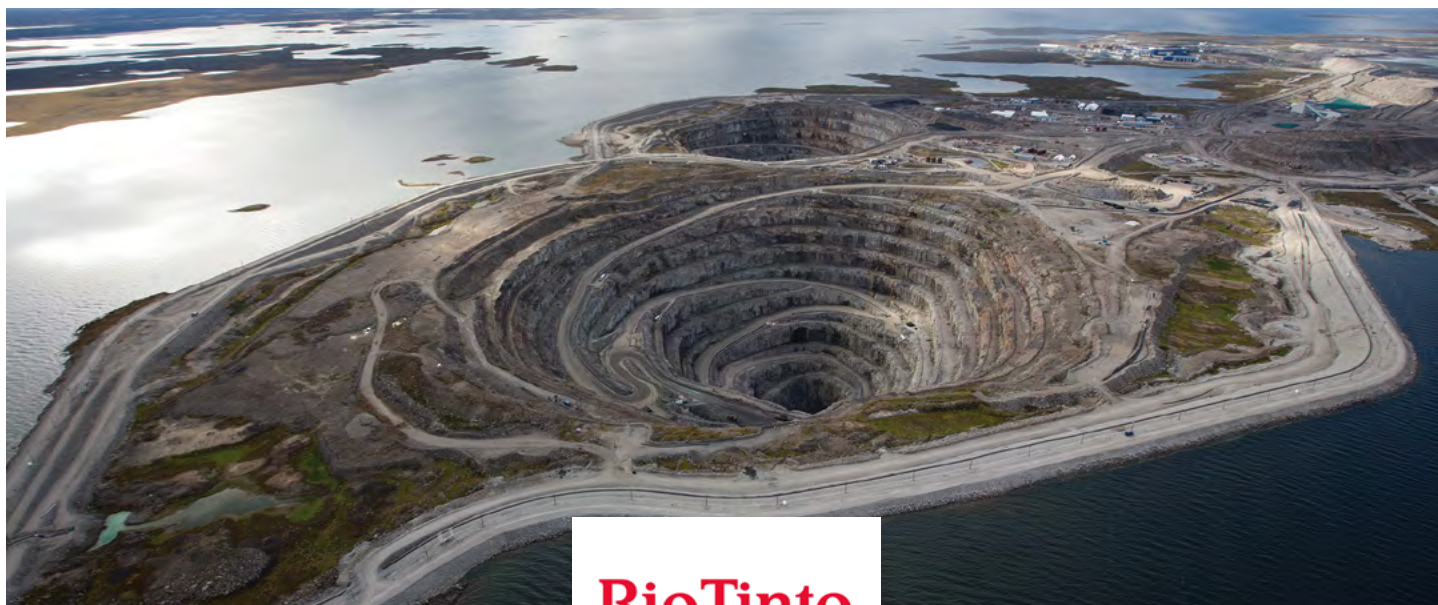
Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



TSM Performance by Company

Rio Tinto



For 145 years, Rio Tinto has been pioneering the production of materials essential to human progress. The minerals and metals Rio Tinto produces play a vital role in meeting consumer needs. They're used in a diverse range of everyday items and innovative technologies that help make modern life work.

With around 15,000 people working across 35 plus locations, Rio Tinto is the biggest mining and metals company operating in Canada, and is committed to creating value and opportunity that reaches far beyond Rio Tinto's operations. Rio Tinto hires local people, and partners with leading Canadian business and community organizations. Rio Tinto works hard to be good neighbours and to take good care of its people, natural surroundings, and Canada's rich cultural heritage.

Rio Tinto has longstanding partnerships with communities, businesses, customers and institutions across Canada to create mutual value, improve our business performance, and demonstrate responsible leadership.

Rio Tinto recently announced that its Montreal office, currently the global headquarters for the aluminum business, would also serve as a global hub for Rio Tinto operations.

Rio Tinto strives to achieve long term partnerships with communities where we operate, to develop shared objectives, and deliver mutual value and benefits.

Our Statement of Commitment to Indigenous peoples outlines our focus on continued partnership in the areas of:

- Education, skills and training
- Cultural education and preservation
- Economic development
- Environmental stewardship

The company's Canadian assets that currently report on TSM performance include the Iron Ore Company of Canada (IOC), the Diavik Diamond Mine, and Rio Tinto Fer et Titane (RTFT).

Iron Ore Company of Canada (IOC)

The Iron Ore Company of Canada (IOC) is a leading Canadian producer of iron ore pellets and concentrate, serving customers worldwide. The company operates a mine, a concentrator and a pelletizing plant in Labrador City, Newfoundland and Labrador, as well as port facilities located in Sept-Îles, Quebec. It also operates a 418 kilometre railway that links the mine to the port.

IOC has a workforce of 2,500 and is the largest private-sector employer in Newfoundland and Labrador. IOC is a joint venture of Rio Tinto, Mitsubishi Corporation, and Labrador Iron Ore Royalty Corporation.

One of the biggest milestones in 2017 was receiving board approval to move forward with the Wabush 3 project. Wabush 3 is a new pit that is being developed within IOC's existing mine operations to extend the life of the mine, reduce operating costs, and sustain production of quality grade iron concentrates and pellets.

IOC was recognized for its commitment to safety by the Quebec Transport Excellence Awards for the creation of a geotechnical risk management database for the railway operations. Since the database's implementation in 2017, IOC has been able to anticipate and prevent dangerous events that occur as a result of erosion created by adverse weather conditions.

Diavik Diamonds Mine

The Diavik Diamond Mine in the Northwest Territories is a joint venture between Rio Tinto (60%) and Dominion Diamond Corporation (40%). Diavik began producing in 2003, and has an annual production of six to seven million carats of predominantly large, white gem-quality diamonds. Diavik has been recognized for its efforts and successes in providing socio-economic benefits to local Indigenous communities over the last 18 years. Since 2000, Diavik has spent \$5.4 billion on northern businesses, or 71% of the company's total business expenditures. Half of its northern expenditures have supported northern Indigenous businesses and their joint ventures.

At Diavik, sustainable development is integrated into everything it does. Diavik's operations provide benefits and opportunities for local communities, businesses, and governments. Diavik works with all its stakeholders to deliver substantial and lasting benefits.

Through a responsible approach to mineral development, Diavik ensures it maintains its licence to operate. This also creates the opportunity to plan, implement, and deliver sustainable contributions to social well-being, environmental stewardship, and economic prosperity, within strong governance systems.

Diavik employs 1,187 people. Of these, 327 are non-Indigenous northerners and 222 are Indigenous northerners. In 2017, Diavik supported 24 apprentices, including eight northern Indigenous students and nine non-Indigenous students from local communities.

Diavik maintains a strong relationship with its community partners and is committed to supporting sustainable northern and Indigenous economic development, with a focus on improving the quality of life for local residents. It does so through direct support for local businesses and a continued commitment to training and innovation.

Havre Saint Pierre

Rio Tinto Fer et Titane (RTFT), which is wholly owned by Rio Tinto, operates a world-class ilmenite deposit at Lac Tio near Havre-Saint-Pierre, Quebec. RTFT is one of the leading manufacturers of raw materials for the titanium dioxide industry and a leader in the production of iron, steel and high-quality metal powders. It pioneered the process of removing iron from ilmenite and has operated in Quebec for 65 years.

RTFT employs approximately 165 people at Havre-Saint-Pierre.

In 2017, RTFT continued to focus on strengthening its relationship with its Indigenous partners in the region. Both the mine and metallurgical complex continued to focus on health and safety, implementing its Critical Risk Management Framework. RTFT continues to invest in projects aimed primarily at improving environmental performance, while advancing

its management practices. RTFT improved its effluent water treatment system in 2017 with a new water management plan, and has set a voluntary target to reduce nickel concentration in the Petit-Pas Lake watershed.

ABORIGINAL AND COMMUNITY OUTREACH

IOC has been partnering with communities in Labrador West and Sept-Îles for more than five decades. Rio Tinto is a strong believer in developing and maintaining meaningful partnerships with local Indigenous groups, which is reflected by its strong performance in stakeholder outreach. In 2017 IOC launched a revised Community Investment Program which focuses on developing strong, long term partnerships within local communities, as well as supporting IOC's employees who give their time and talents to the organizations that benefit our communities in such a positive way.

The Traditional Knowledge Panel operating in Diavik brings together Indigenous elders and youth selected by their community to engage in environmental management and monitoring, most notably as it relates to closure planning for the mine. The Traditional Knowledge Panel applies their knowledge of historical caribou migrations and behaviour, water quality and flow patterns, vegetation and the interaction of all aspects of the environment to identify concepts, values, understandings, and complexities to be considered for closure options across the site. The mine has consistently reported a Level A or above under the *Aboriginal and Community Outreach Protocol* since implementing the TSM program.

RTFT worked hard in 2017 to strengthen its engagement with its community stakeholders, including its Indigenous partners near the mine. Despite the economic conditions, RTFT maintained its commitment to community investment in 2017, which helped to mitigate impacts on the community from the downturn in the sector.

During the last several years, RTFT has worked very diligently on forging positive and productive working relations with the Indigenous community near its mining operations. The results of this outreach are demonstrated in Havre-Saint-Pierre's first externally verified TSM assessment. It achieved a Level AAA for COI identification and effective COI engagement and dialogue, a Level AA for COI response mechanism, and a Level A for reporting.

CRISIS MANAGEMENT AND COMMUNICATIONS PLANNING

Rio Tinto meets the requirements of the *Crisis Management and Communications Protocol* at the corporate level, as well as at all of its sites, including Labrador City, Sept-Îles, Havre-Saint-Pierre, and Diavik.

TAILINGS MANAGEMENT

Responsible tailings management is a priority for Rio Tinto. For example, after the Mount Polley and Samarco tailings incidents, Rio Tinto further strengthened its tailings controls. It checked the integrity of all its tailings facilities across the group, and critically reviewed its tailings standard to ensure that it is up to date and world class. Rio Tinto also worked very closely with its peer companies through MAC's Tailings Working Group and the International Council on Mining and Metals to ensure that it shares a common platform and a common way forward in tailings management across the industry.

ENERGY USE AND GHG EMISSIONS MANAGEMENT

The Diavik Diamond Mine operates the largest hybrid wind-diesel power facility at a remote mine site in the world. Since coming on line in 2012, the windfarm has offset Diavik's diesel use by over 18 million litres and reduced the overall GHG emissions by 51 thousand tonnes.

SAFETY AND HEALTH

A priority for all Rio Tinto operations is the safety and health of its employees. The company has undertaken several initiatives to help foster education and awareness. In 2017, Critical Risk Management was embedded across all of the company's global sites, including those in Canada. Rio Tinto's commitment to safety is reflected in this year's TSM results, with strong performance across the four indicators.

BIODIVERSITY CONSERVATION MANAGEMENT

Rio Tinto's corporate biodiversity strategy governs biodiversity management systems across its business. The operations have focused their attention on implementing Rio Tinto's strategy and furthering understanding of the requirements of this TSM Protocol.

🔗 For more information, please visit www.riotinto.com





2017 TSM Results

Rio Tinto

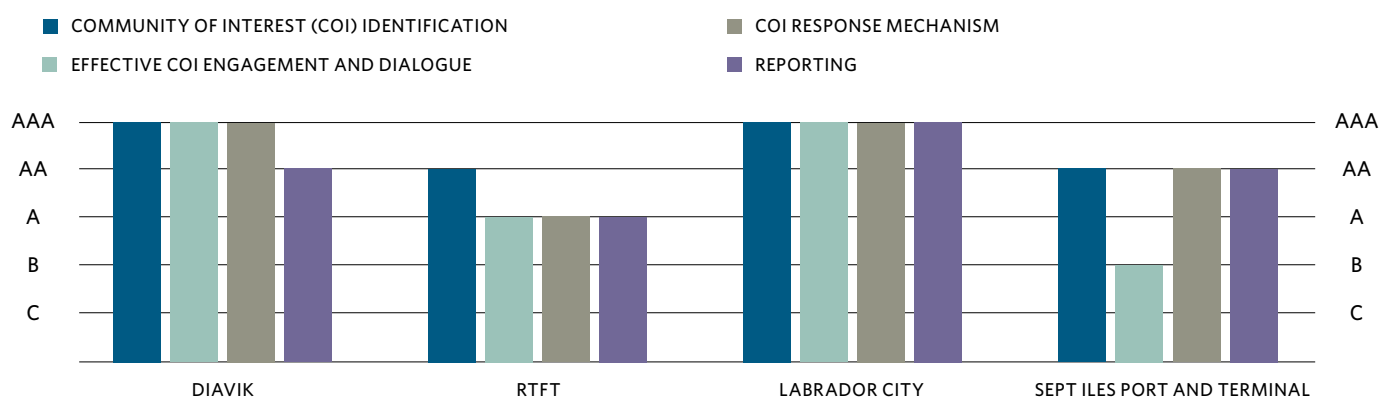


Crisis Management and Communications Planning Assessment

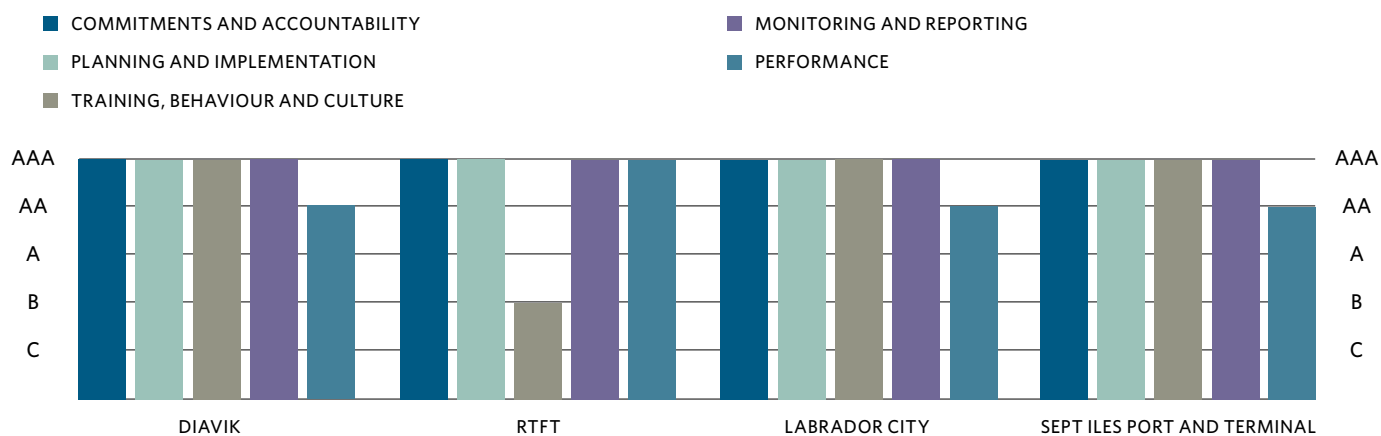
FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
DIAVIK	✓	✓	✓
RTFT	✓	✓	✓
LABRADOR CITY	✓	✓	✓
SEPT ILES PORT AND TERMINAL	✓	✓	✓



Aboriginal and Community Outreach Assessment



Safety and Health Assessment

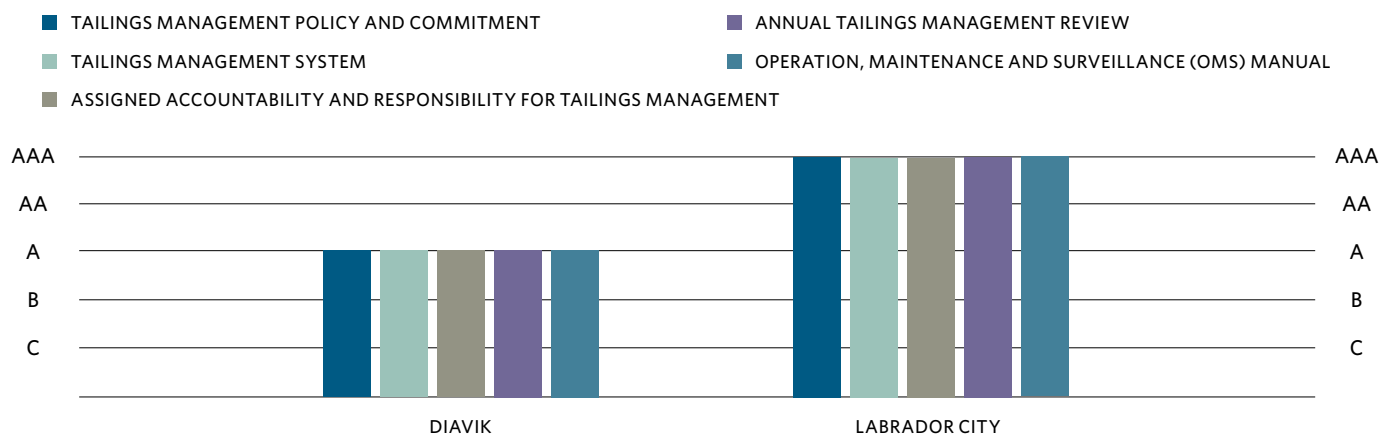


Self-assessed results; last external verification: 2017; next external verification: 2020.

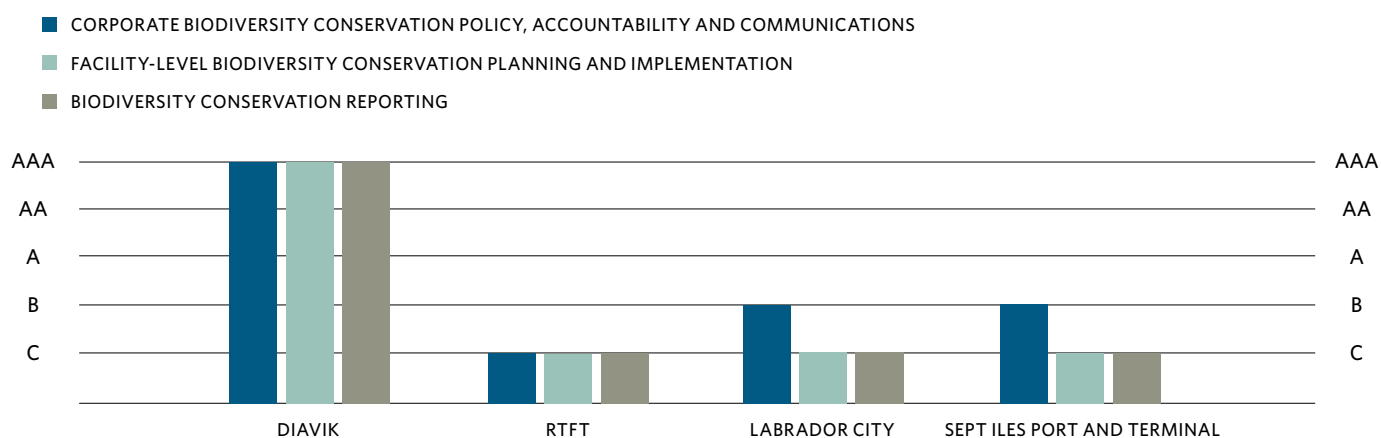




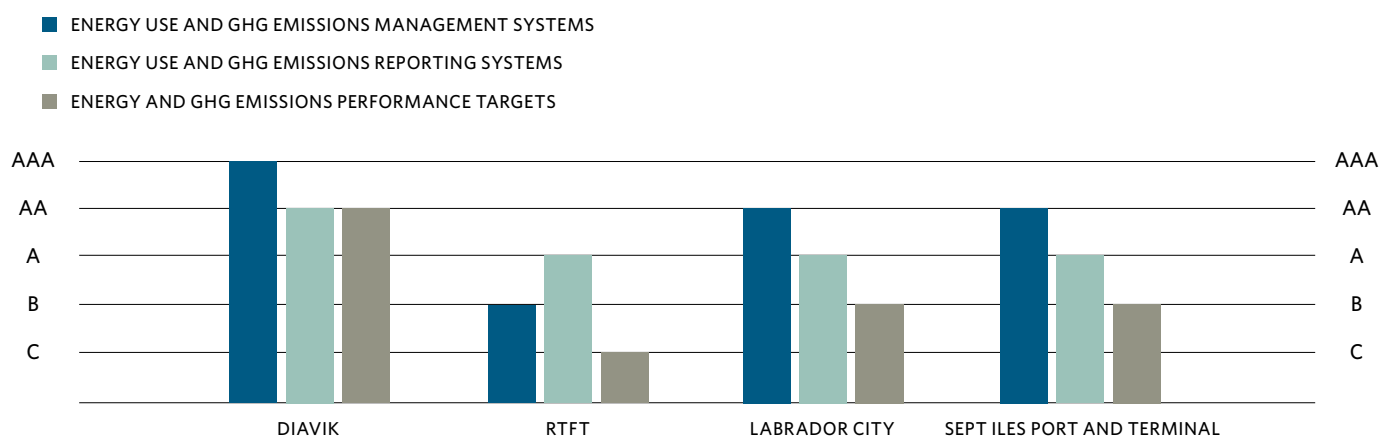
Tailings Management Assessment



Biodiversity Conservation Management Assessment



Energy Use and GHG Emissions Management Assessment



Self-assessed results; last external verification: 2017; next external verification: 2020.



TSM Performance by Company

Suncor Energy



Suncor Energy, Canada's largest integrated energy company, recovers bitumen from oil sands near Fort McMurray, Alberta, and upgrades it to refinery-ready feedstock and diesel fuel. Suncor is focused on being a low-cost, low-carbon producer and demonstrating leadership in environmental performance and social responsibility, while contributing to a strong economy.

SUNCOR'S 2017 TSM RESULTS

Suncor's oil sands base mining operation reported internal self-assessment results against TSM performance indicators for the year-ended December 31, 2017. Results were largely consistent with the externally verified results from 2015.

Tailings Management

Level AAA results for all indicators were achieved for this Protocol. Thanks to breakthroughs that have come from research and development, Suncor continues to make progress in tailings management and has worked hard in this area to ensure compliance with the Protocol. Work progresses to ensure the company can continue to maintain a high level of compliance in the future, as guidelines, regulations and stakeholder expectations are revised to incorporate recommendations from recent industry incidents.

Aboriginal and Community Outreach

Suncor has consistently performed well in this area, and achieved Level AAA for all indicators. External outreach has always been a key part of maintaining Suncor's social license to operate, and they regularly engage with communities of interest (including several Aboriginal communities). Its stakeholder relations framework outlines the company's commitment to collaboration, transparency and respect for all views. This guides development of long-term relationships with those affected by its business, including employees, community members, shareholders, customers, organizations and governments.

Biodiversity and Conservation Management

The facility was able to maintain and achieve Level AAA for all three indicators. To minimize impacts in the boreal region, Suncor leverages scientific research and best management practices while working with neighboring companies to reduce cumulative effects of development. The company also collaborates with industry peers and multi-stakeholder organizations on initiatives to conserve and reclaim habitat for birds, mammals, fish and other species.

Crisis Management and Communications Planning

Suncor completed all requirements for this Protocol and maintained a “yes” score for all indicators.

Safety and Health

The company's safety performance met all requirements for Level AAA rating for indicators 1 through 4. Level B for Indicator 5 of this Protocol reflects the tragic fatality of a contractor in 2017. Safety remains a key aspect of Suncor's operations, and the company is committed to its Journey to Zero program for all employees and contractors to put safety above all else.

Energy Use and GHG Emissions Management

Suncor achieved Level AAA for indicators 1 and 2 related to energy use and GHG emissions management and reporting systems. Indicator 3 remained at a Level B. The company does have an ambitious long-term GHG goal focused on GHG emissions intensity reductions out to 2030 and continues to integrate aspects of this goal into decision-making and technology development.

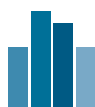
The Fort Hills Mine, owned through the Fort Hills LP and operated by Suncor, will be evaluated for the company's 2019 TSM assessment.

TSM's Protocols reinforce continuous improvement opportunities for Suncor and support the company's emphasis on sustainability throughout the organization.

🔗 For more information, please visit suncor.com or sustainability.suncor.com



On September 23, 2010 Suncor became the first oil sands company to reclaim a tailings pond to a trafficable surface.



2017 TSM Results

Suncor Energy



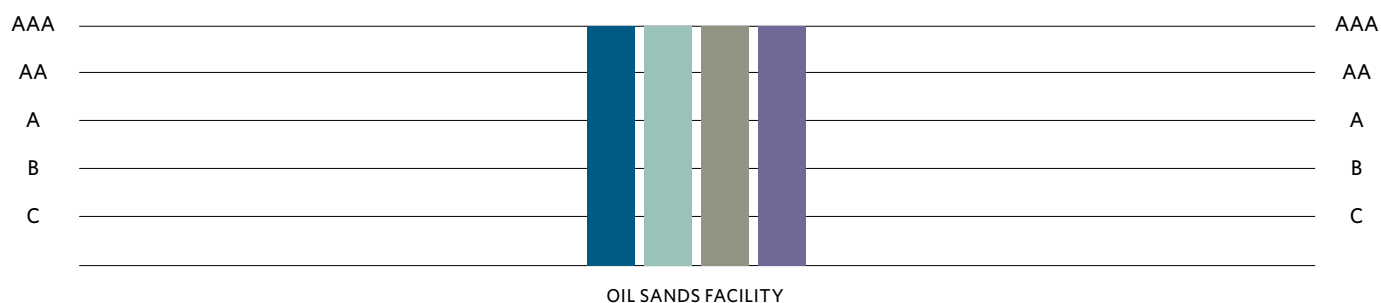
Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
OIL SANDS FACILITY	✓	✓	✓



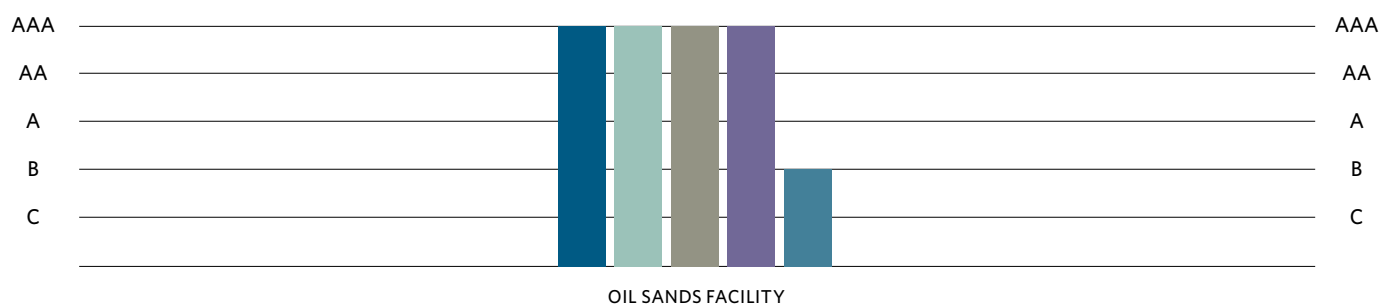
Aboriginal and Community Outreach Assessment

- COMMUNITY OF INTEREST (COI) IDENTIFICATION
- COI RESPONSE MECHANISM
- EFFECTIVE COI ENGAGEMENT AND DIALOGUE
- REPORTING



Safety and Health Assessment

- COMMITMENTS AND ACCOUNTABILITY
- MONITORING AND REPORTING
- PLANNING AND IMPLEMENTATION
- PERFORMANCE
- TRAINING, BEHAVIOUR AND CULTURE



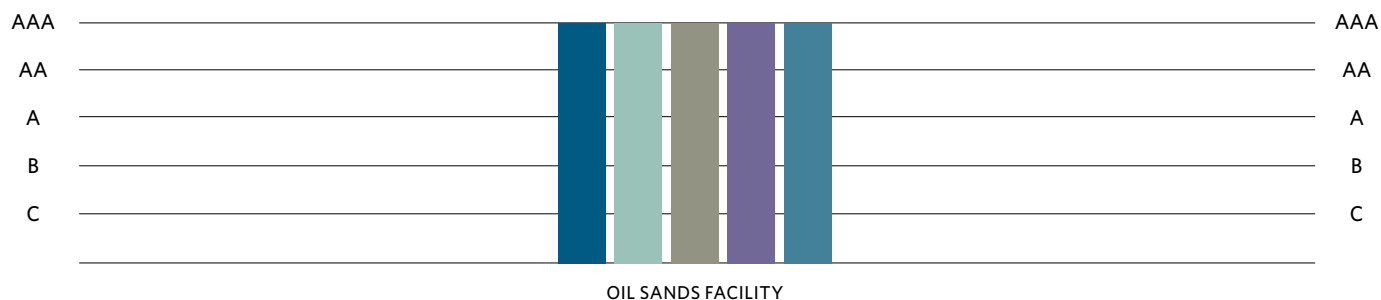
Self-assessed results; last external verification: 2016; next external verification: 2019.





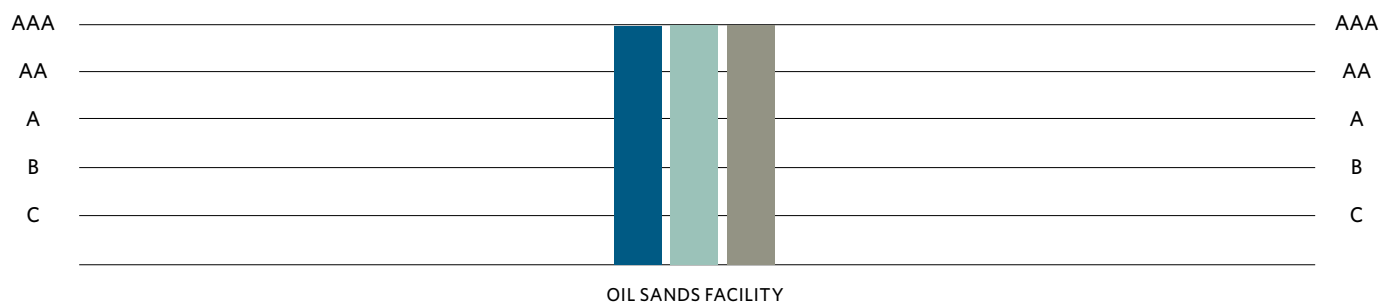
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL



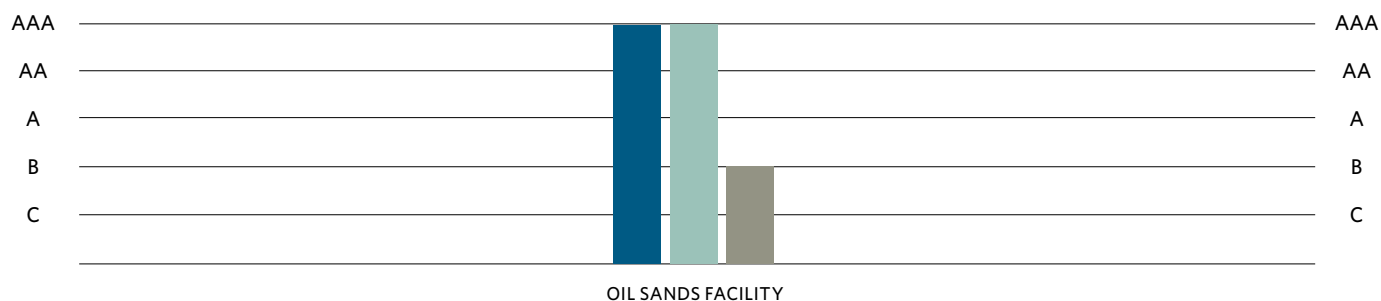
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



Self-assessed results; last external verification: 2016; next external verification: 2019.



TSM Performance by Company

Syncrude Canada Ltd.



Syncrude is one of the largest producers of crude oil from Canada's oil sands. The company operates large oil sands mines, a utilities plant, a bitumen extraction plant and upgrading facility that processes bitumen and produces value-added light, sweet crude oil for domestic consumption and export. In 2017, 91.2 million barrels of Syncrude Crude Oil (SCO) were shipped from the company's operations, approximately 40 kilometres north of Fort McMurray, Alberta.

Syncrude is committed to excellence in environment, health and safety performance, and strong relationships with its communities of interest. The company is one of Canada's largest industrial employers of Indigenous people, who comprise 10 per cent of its employee workforce. Syncrude has also conducted over \$3 billion in business with Indigenous-owned and operated companies over the last 25 years.

Toward returning the land disturbed by mining activities to equivalent ecosystem capability, Syncrude has to date reclaimed over 3,600 hectares of land and planted over eight million tree and shrub seedlings. Syncrude is also the first company in the Canadian oil sands industry to receive certification for a reclaimed area.

Syncrude's performance has been strengthened by its participation in *TSM* and the company's 2017 self-assessment shows continued progress and positive results.

Level AAA ratings for the *Aboriginal and Community Outreach Protocol* were achieved in all indicators. Syncrude is accredited at the Gold Level in the Progressive Aboriginal Relations program of the Canadian Council for Aboriginal Business. A management-level group oversees Syncrude's Aboriginal engagement plan and COI input is sought to drive future performance.

Syncrude scored "Yes" in all areas of the *Crisis Management and Communications Planning Protocol*. The company regularly conducts emergency response simulations, including desktop and site-wide simulations, to ensure all personnel are properly trained and tested.

Pre-plans exist for all medium- and high-level risks, and spokespeople are identified and trained.

Syncrude is committed to protecting and promoting the safety and well-being of employees, contractors, communities, and the environment. This was evident in AAA ratings across all indicators of the *Safety and Health Protocol* for 2017.

Level A ratings were achieved in all areas of *Tailings Management Protocol*, demonstrated through senior management endorsement, accountabilities, budget allocation, annual reviews, and formal reporting systems.

Syncrude achieved AAA in all indicators of the *Biodiversity Conservation Management Protocol*. The company continues to have strong systems in place to manage biodiversity throughout the lifecycle of its mining areas, from pre-disturbance to reclamation.

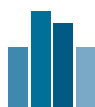
For *Energy Use and GHG Emissions Management Protocol*, Syncrude attained Level AAA ratings in the management and reporting systems indicators, however due to reliability issues and lower than anticipated production levels, the company did not meet its targets in 2017. This resulted in a Level B for the performance indicator.

The Syncrude Project is a joint venture undertaking among Imperial Oil Resources Limited; Nexen Oil Sands Partnership; Sinopec Oil Sands Partnership; and Suncor Energy Inc. (with the Suncor interest held by Canadian Oil Sands Partnership #1 and Suncor Energy Ventures Partnership, both wholly owned affiliates of Suncor Energy Inc.), as the project owners, and Syncrude as the project operator.

For more information, please visit www.syncrude.ca



South Bison Hills, a reclaimed area at Syncrude's oil sands mining operations in northern Alberta.



2017 TSM Results

Syncrude Canada Ltd.



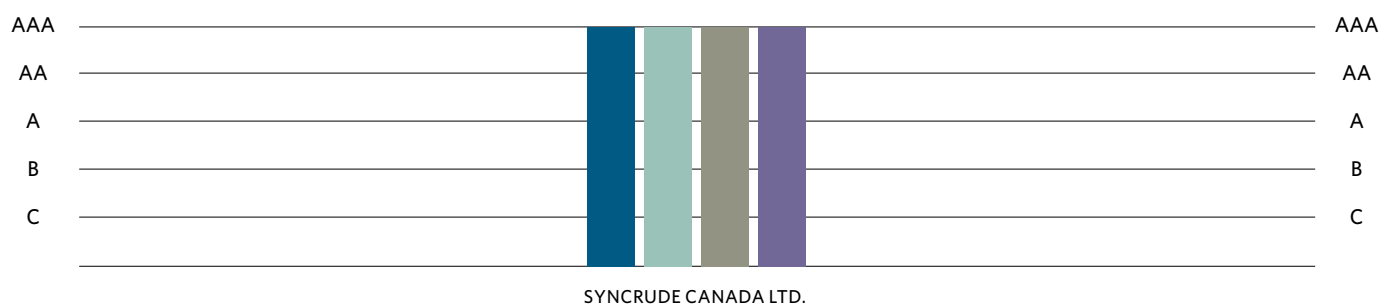
Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
SYNCRUDE CANADA LTD.	✓	✓	✓



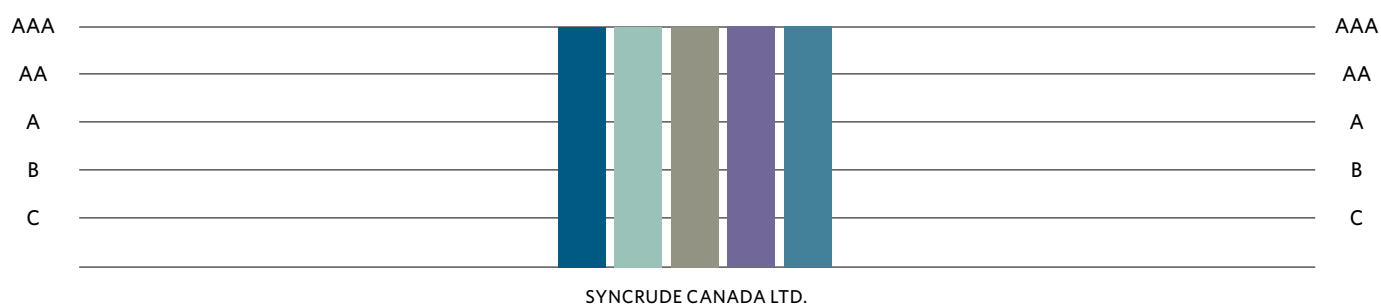
Aboriginal and Community Outreach Assessment

- COMMUNITY OF INTEREST (COI) IDENTIFICATION
- COI RESPONSE MECHANISM
- EFFECTIVE COI ENGAGEMENT AND DIALOGUE
- REPORTING



Safety and Health Assessment

- COMMITMENTS AND ACCOUNTABILITY
- MONITORING AND REPORTING
- PLANNING AND IMPLEMENTATION
- PERFORMANCE
- TRAINING, BEHAVIOUR AND CULTURE



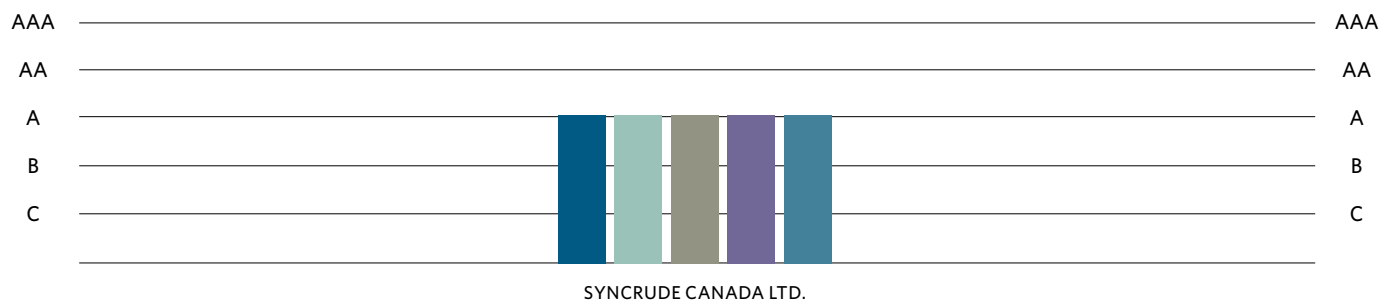
Self-assessed results; last external verification: 2017; next external verification: 2020.





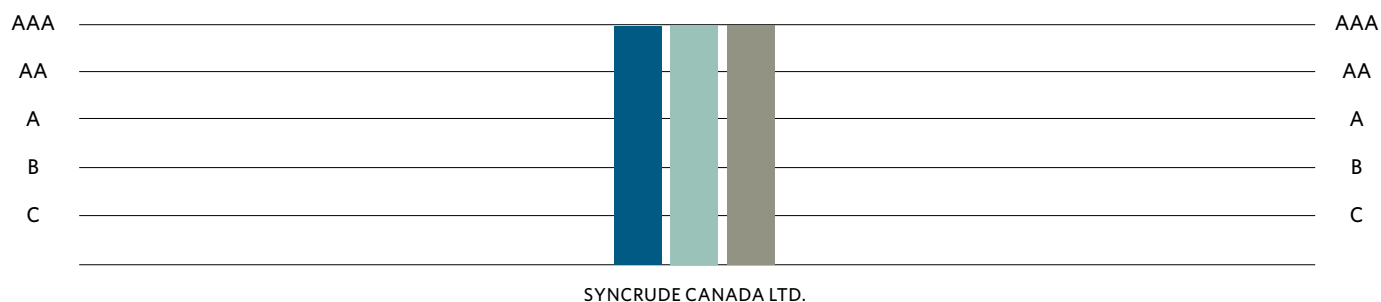
Tailings Management Assessment

- TAILINGS MANAGEMENT POLICY AND COMMITMENT
- TAILINGS MANAGEMENT SYSTEM
- ASSIGNED ACCOUNTABILITY AND RESPONSIBILITY FOR TAILINGS MANAGEMENT
- ANNUAL TAILINGS MANAGEMENT REVIEW
- OPERATION, MAINTENANCE AND SURVEILLANCE (OMS) MANUAL



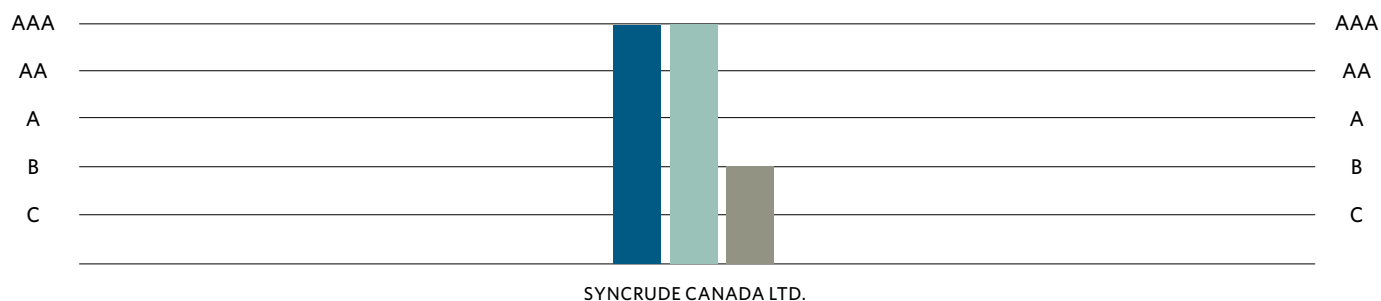
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS

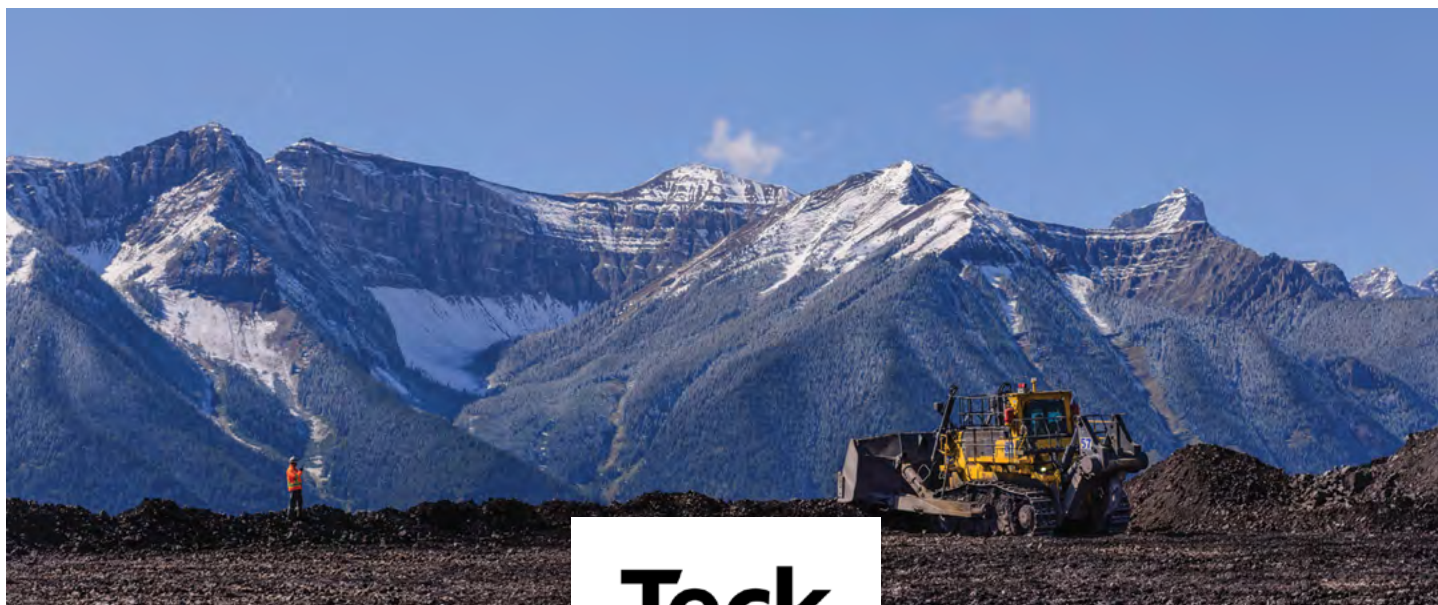


Self-assessed results; last external verification: 2017; next external verification: 2020.



TSM Performance by Company

Teck Resources Limited



Teck is a diversified resource company committed to responsible mining and mineral development, with business units focused on copper, steelmaking coal, zinc and energy. Headquartered in Vancouver, British Columbia, Teck owns or has an interest in 12 mines in North and South America, as well as one large metallurgical complex and an oil sands mining and processing operation, both in Canada. Teck has expertise across a wide range of activities related to exploration, development, mining and minerals processing, smelting and refining, safety, environmental protection, materials stewardship, recycling and research.

TSM RESULTS

All of Teck's operations apply TSM, and all Canadian operations publicly report their TSM results. Teck's Canadian operations include Highland Valley Copper and Trail operations in British Columbia as well as six steelmaking coal operations in British Columbia and Alberta: Cardinal River, Coal Mountain, Elkview, Fording River, Greenhills and Line Creek.

In 2017, the Vancouver head office and two of Teck's operations, Coal Mountain and Line Creek, underwent TSM verification. The verification process included either an external verification performed by PwC or an internal verification performed by Teck*. The reviews assessed Teck's reported performance results for the year ending December 31, 2017, as measured against the requirements of the TSM performance indicators.

Teck's overall results for 2017 were strong, and the company achieved high levels of performance across all six TSM Protocols. All eight of Teck's Canadian operations achieved a Level AAA for all indicators of the *Biodiversity Conservation Management, Energy Use and GHG Emissions Management, and Aboriginal and Community Outreach Protocols*.

*Undertaken as per the reporting and verification process for high performers, described on page 12.

Teck's performance in TSM is part of its overall approach to sustainability and responsible resource development. Through their sustainability strategy, Teck has identified six areas that represent the most significant challenges and opportunities for its work in sustainability: community, people, water, biodiversity, energy and climate change, and air. Within each area, Teck has set short-term (2020) and long-term (2030) goals and targets to continually enhance sustainability performance and assess progress, which the company reports on in its annual sustainability report.

🔗 For more information, please visit www.teck.com/responsibility



Haul truck at Teck's Highland Valley Copper Operations in south central British Columbia.

Externally
Verified Results

2017 TSM Results

Teck Resources Limited



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
CARDINAL RIVER OPERATIONS	✓	✓	✓
COAL MOUNTAIN OPERATIONS	✓	×	×
ELKVIEW OPERATIONS	✓	✓	✓
FORDING RIVER OPERATIONS	✓	✓	×
GREENHILLS OPERATIONS	✓	✓	✓
HIGHLAND VALLEY COPPER OPERATIONS	✓	✓	✓
LINE CREEK OPERATIONS	✓	×	✓
TRAIL OPERATIONS	✓	×	✓

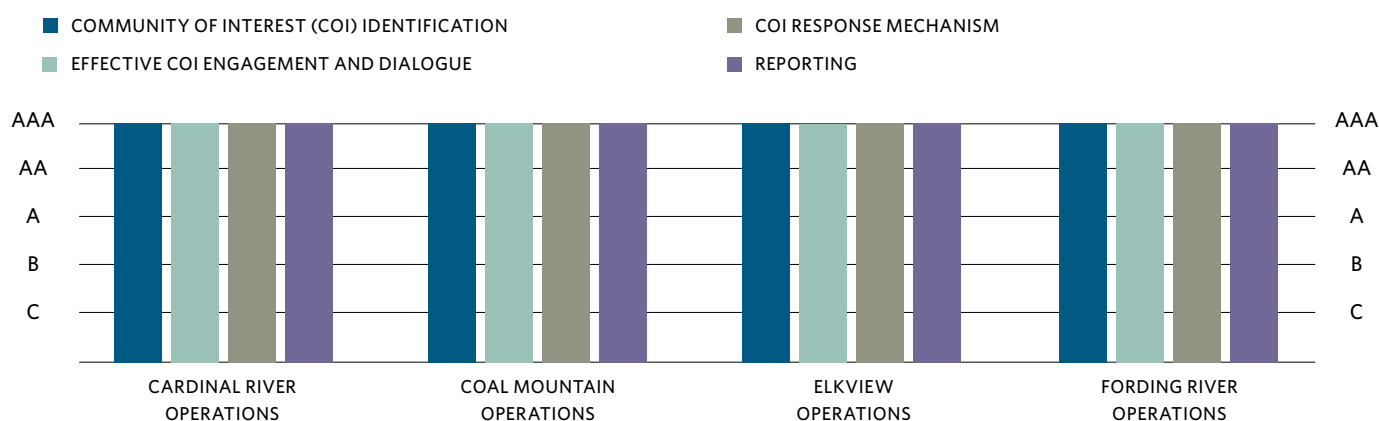


Preventing Child and Forced Labour

FACILITY	PREVENTING FORCED LABOUR	PREVENTING CHILD LABOUR
COAL MOUNTAIN OPERATIONS	✓	✓
LINE CREEK OPERATIONS	✓	✓

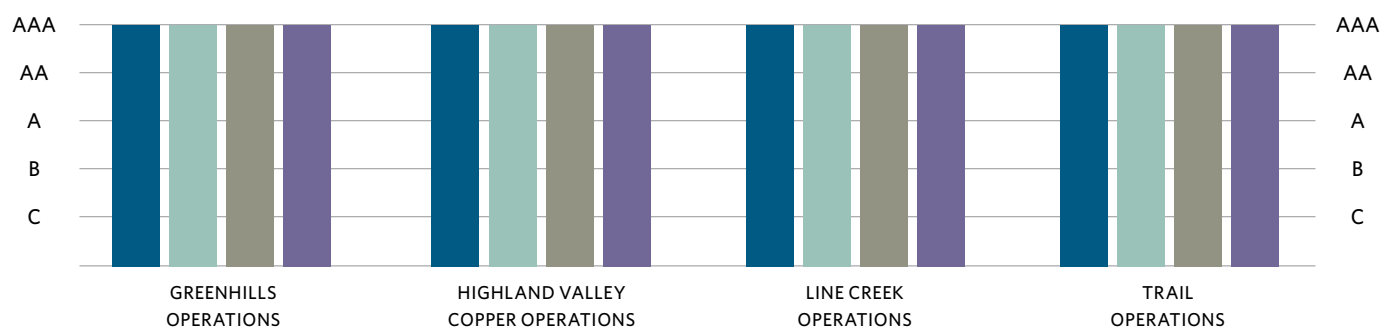


Aboriginal and Community Outreach Assessment



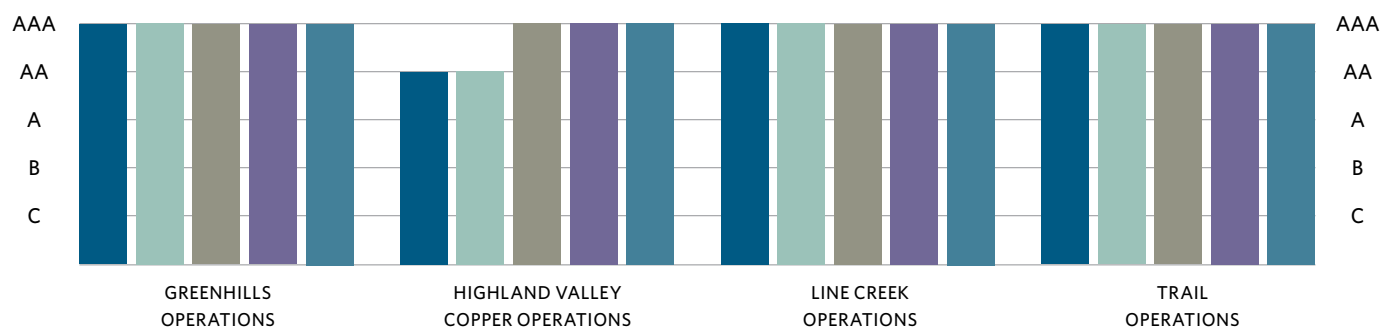
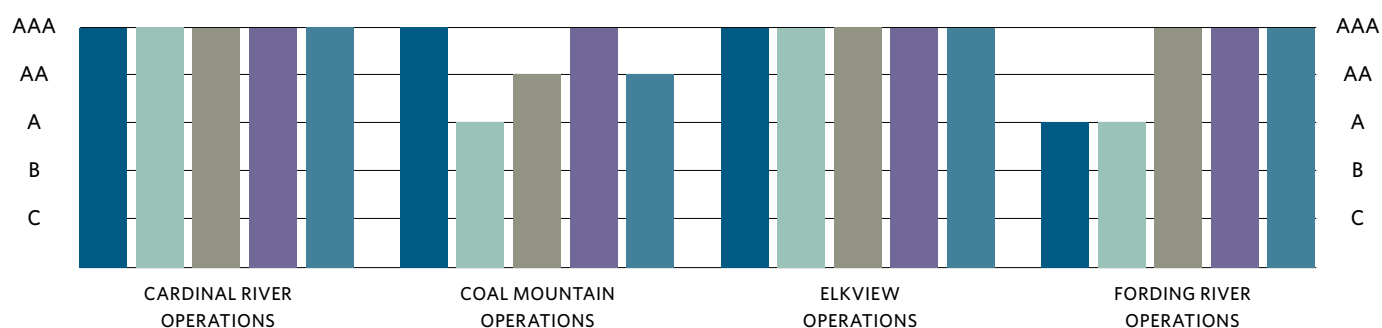
In 2018, Teck Resources' Coal Mountain Operations and Line Creek Operations were externally verified.





Safety and Health Assessment

- COMMITMENTS AND ACCOUNTABILITY
- PLANNING AND IMPLEMENTATION
- TRAINING, BEHAVIOUR AND CULTURE
- MONITORING AND REPORTING
- PERFORMANCE

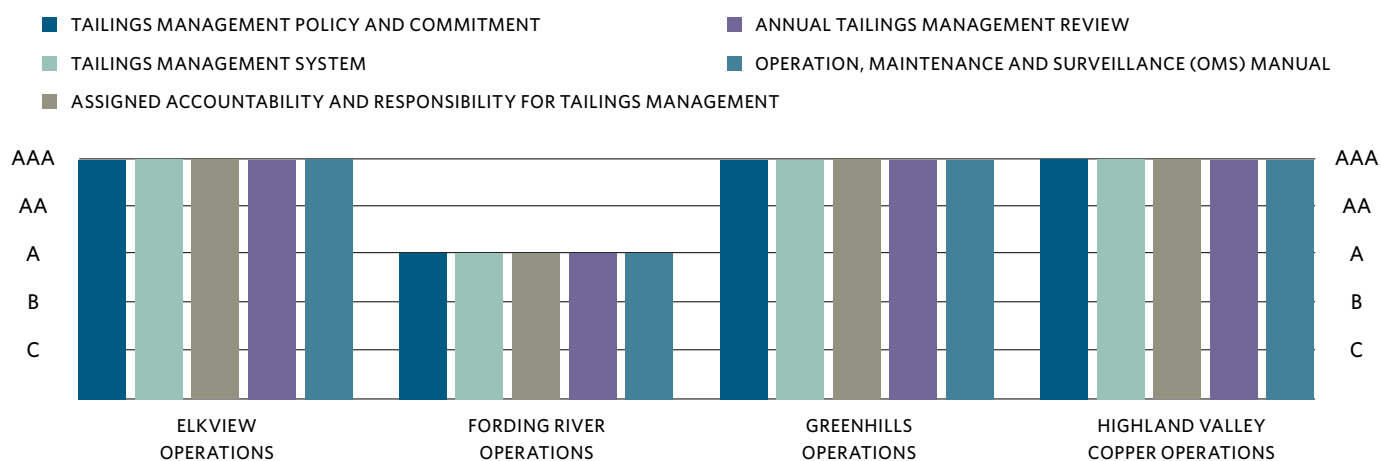


In 2018, Teck Resources' Coal Mountain Operations and Line Creek Operations were externally verified.

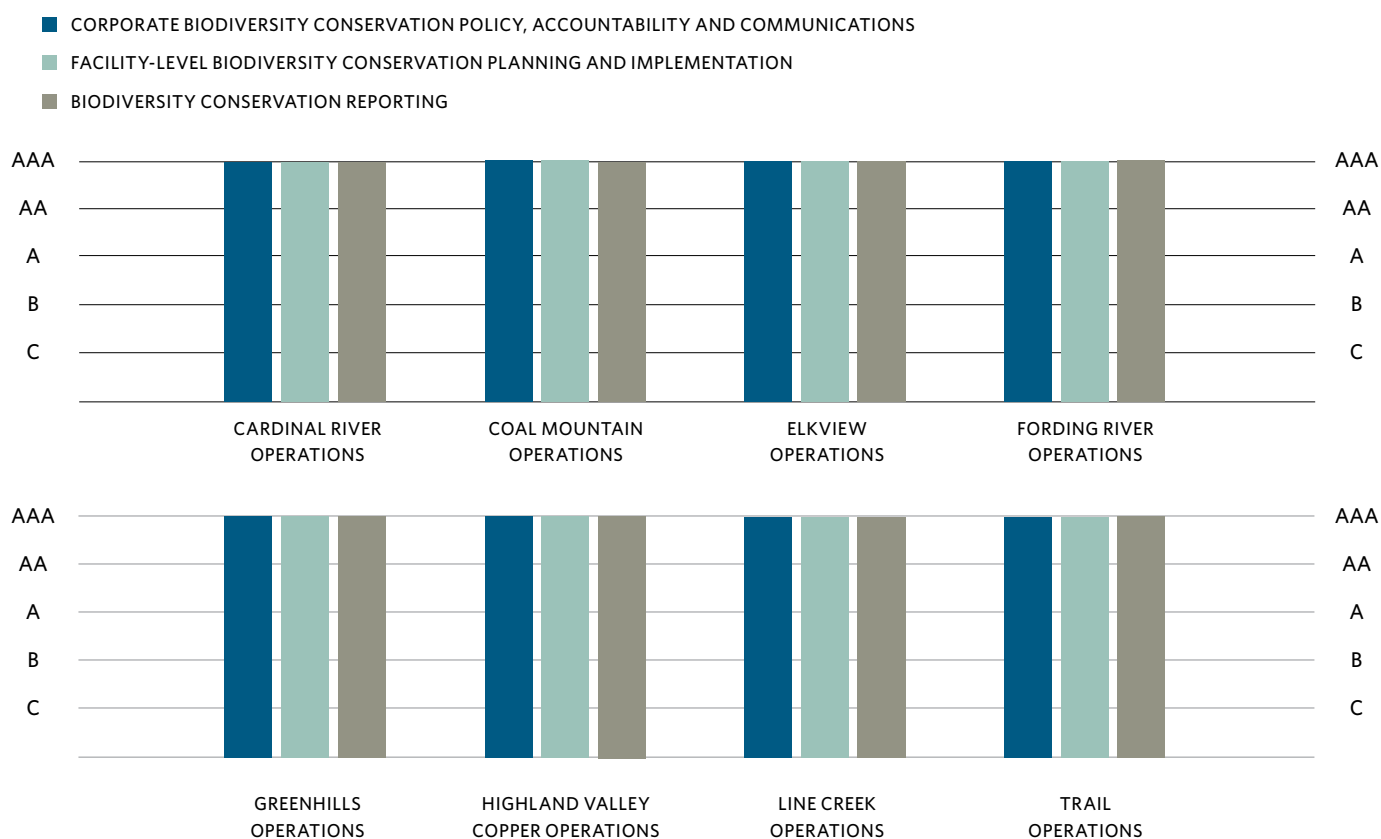




Tailings Management Assessment



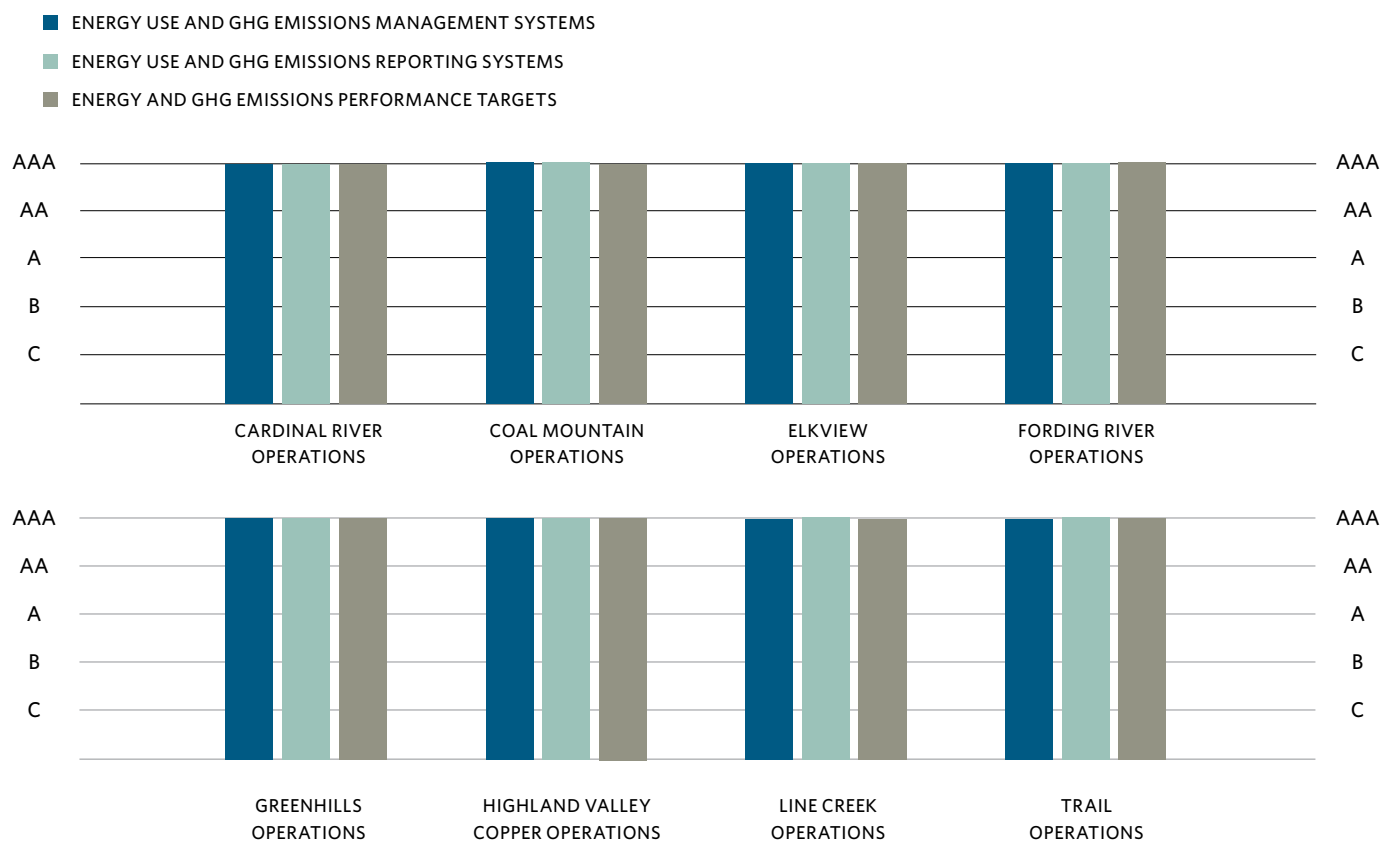
Biodiversity Conservation Management Assessment



In 2018, Teck Resources' Coal Mountain Operations and Line Creek Operations were externally verified.



Energy Use and GHG Emissions Management Assessment



In 2018, Teck Resources' Coal Mountain Operations and Line Creek Operations were externally verified.



TSM Performance by Company

Vale



Vale is a global leader in the sustainable development of natural resources and is one of the world's largest and most diverse mining companies. Vale's Base Metals Division, headquartered in Toronto, is the industry's largest producer of nickel. Operating in Canada for more than 100 years, with more than 5,000 employees, Vale's goal is to continue its growth profitably in a safe, environmentally respectful and sustainable environment.

Vale is committed to meeting or exceeding MAC's recommended *TSM* targets and is pleased to submit this summary of its 2017 performance.

ABORIGINAL AND COMMUNITY OUTREACH

Open and transparent communication, respectful engagement on concerns and issues, and diligent reporting to stakeholders are firmly entrenched at Vale in our interactions and relationships with Aboriginal communities. Vale proudly operates Aboriginal and community outreach activities and management programs that meet *TSM*'s performance expectations in all its Canadian facilities, each tailored to the site and the neighbouring communities' requirements.

Vale's Thompson, Sudbury and Voisey's Bay sites have achieved a Level AAA for all indicators under the *TSM Aboriginal and Community Outreach Protocol*. The Port Colborne Refinery earned a Level AAA for three of the four indicators; and a Level A for Indicator 4. In addition, our Sudbury site was proud to be a finalist for the *TSM Community Engagement Excellence Award* for its partnership role in the Sudbury Alerts program designed to alert residents to potential hazards or concerns that are considered an imminent threat to public safety.

In Sudbury, Vale continues to collaborate with local First Nations and Métis communities to identify traditional lands and treaty rights potentially affected by its operations. The company provides engagement, dialogue and cultural training to employees and seeks traditional Aboriginal knowledge to support decisions and inform practices such as environmental monitoring.

At Voisey's Bay, Vale's COI identification process involved extensive community consultations for the environmental assessment of the mine and concentrator project, and the negotiation of separate Innu and Inuit impact and benefit agreements.

In Long Harbour-Mount Arlington Heights where Vale has a new nickel processing plant and port facility, a community liaison committee connects the company and local residents quarterly, and a fisheries and aquaculture liaison committee communicates regularly with local fisheries and aquaculture stakeholders.

In addition, Vale is committed to supporting national outreach programs that also operate within the communities in which it operates, including Skills Canada, the Advanced Coronary Treatment (ACT) Foundation and Threads of Life.

Energy Use and GHG Emissions Management

Vale continues to improve its performance under the *TSM Energy Use and GHG Emissions Management Protocol*. In 2017, all sites are at a Level A or higher, except Thompson, with two indicators below Level A, and Sudbury, with one below Level A.

Globally, Vale is committed to reducing its projected 2020 GHG emissions by 5% (its carbon target).

TAILINGS MANAGEMENT

In the *TSM Tailings Management Protocol* Vale continues to improve with all sites now at Level AA or higher. In Sudbury, Vale maintained its Level AAA performance across all indicators. Vale continues to implement and work with third-party expert Tailings Review Boards. The company has reviewed all tailings management policies with its COI, and senior management has endorsed and implemented the policies within budget allocations.

CRISIS MANAGEMENT AND COMMUNICATIONS PLANNING

All sites, as well as Vale's corporate offices, satisfied the requirements of the *TSM Crisis Management and Communications Planning Protocol*. Crisis management planning and preparedness is a critical component of Vale's risk management activities. Vale's crisis management teams are well trained, and are willing to respond to internal emergencies and help the community when possible. Testing of the crisis management systems was conducted at all sites.

SAFETY AND HEALTH

At Vale, life matters most, and the company's commitment to this core value is reflected in its *TSM Safety and Health Protocol* assessments, which confirm continued high performance at all sites. Vale achieved a Level AAA for all operations in indicators 2 and 3 and showed general improvement across all sites.

The exception was Indicator 5 for the Sudbury operations, which fell from AA to B as a result of a contractor fatality in 2017.

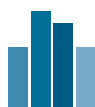
In 2017, Vale committed to an additional three years of national-level support for Threads of Life, a charity dedicated to promoting workplace health and safety and helping families touched by a work-related fatality, injury or occupational disease.

BIODIVERSITY

Vale maintains a commitment to continuous improvement under the *TSM Biodiversity Conservation Management Protocol*. Operations at Voisey's Bay maintained a AAA rating across all indicators while Ontario showed improvements on indicators 1 and 2, moving to AAA from B and B from C respectively. The company's performance is assessed at Level A in Port Colborne while Thompson reports two indicators at level B and one at Level C.

Vale's biodiversity protection projects demonstrate how much the company prizes the planet. In 2017, the Ontario Operations were awarded the *TSM Environmental Excellence Award* for its biodiversity work in Sudbury, which focuses on regreening and reclamation efforts to transform lands and waterways back to their natural states. Our Manitoba operations were also recognized as a *TSM Environmental Excellence Award* finalist for their SLAM Dunk program, which aims to divert 100 per cent of waste from landfills.

🔗 For more information, please visit www.vale.com/canada



2017 TSM Results

Vale



Crisis Management and Communications Planning Assessment

FACILITY	PREPAREDNESS	REVIEW	TRAINING
CORPORATE	✓	✓	✓
LONG HARBOUR OPERATIONS	✓	×	✓
MANITOBA OPERATIONS	✓	✓	✓
PORT COLBORNE REFINERY	✓	✓	✓
SUDBURY OPERATIONS	✓	✓	✓
VOISEY'S BAY MINE SITE	✓	✓	✓



Aboriginal and Community Outreach Assessment

■ COMMUNITY OF INTEREST (COI) IDENTIFICATION
■ EFFECTIVE COI ENGAGEMENT AND DIALOGUE

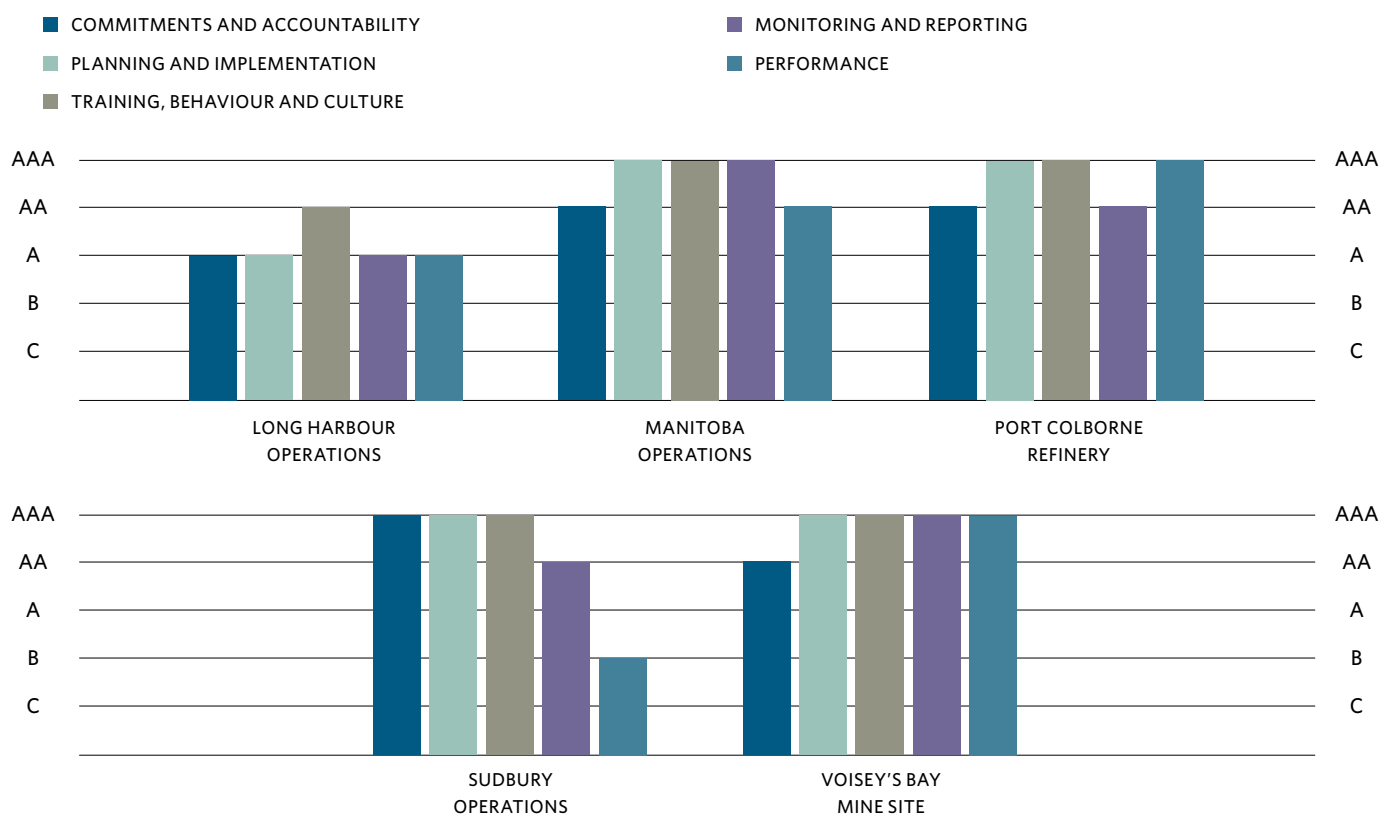
■ COI RESPONSE MECHANISM
■ REPORTING



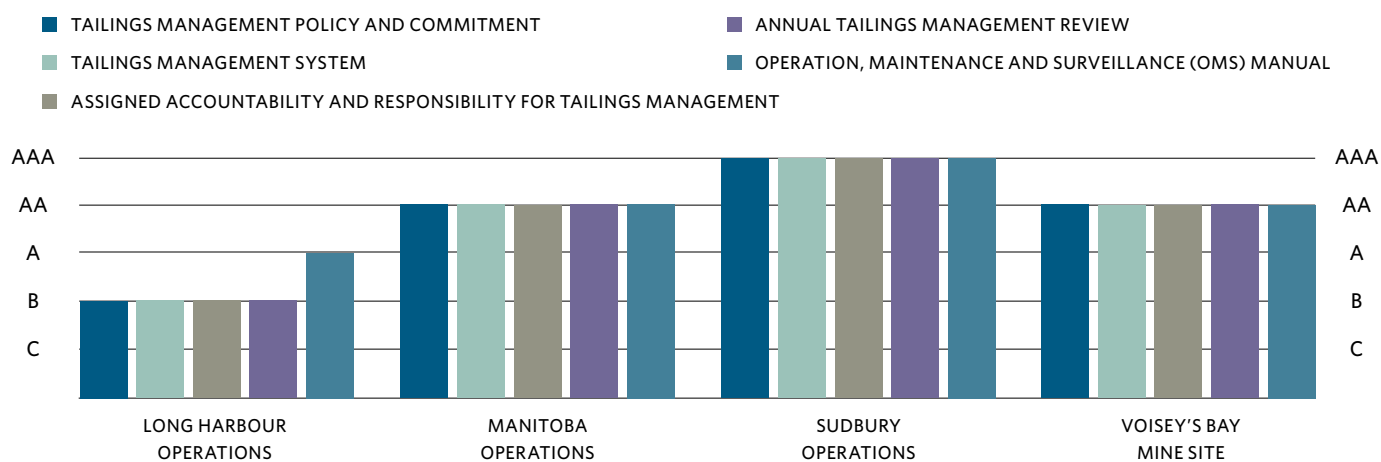
Self-assessed results; last external verification: 2016; next external verification: 2019.



Safety and Health Assessment



Tailings Management Assessment

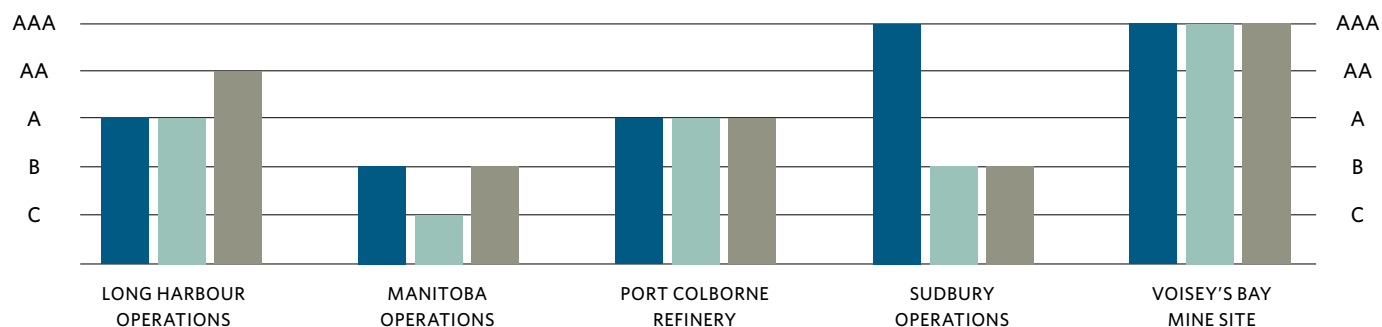


Self-assessed results; last external verification: 2016; next external verification: 2019.



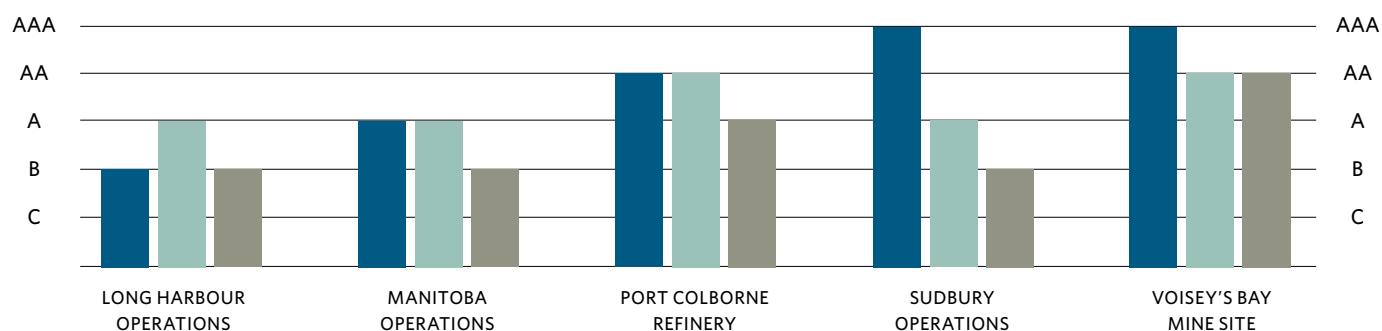
Biodiversity Conservation Management Assessment

- CORPORATE BIODIVERSITY CONSERVATION POLICY, ACCOUNTABILITY AND COMMUNICATIONS
- FACILITY-LEVEL BIODIVERSITY CONSERVATION PLANNING AND IMPLEMENTATION
- BIODIVERSITY CONSERVATION REPORTING



Energy Use and GHG Emissions Management Assessment

- ENERGY USE AND GHG EMISSIONS MANAGEMENT SYSTEMS
- ENERGY USE AND GHG EMISSIONS REPORTING SYSTEMS
- ENERGY AND GHG EMISSIONS PERFORMANCE TARGETS



Self-assessed results; last external verification: 2016; next external verification: 2019.





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