



# REPORTING ON CLIMATE CHANGE, ENERGY AND EMISSIONS

# IMPLEMENTING THE TCFD RECOMMENDATIONS

## Q&A WITH ROB DOYLE, CFO

### Why is aligning with the Taskforce on Climate-related Financial Disclosures important for Pan American Silver?

Climate change presents a huge systemic risk to most, if not all, businesses. For this reason it is becoming an increasing focus of the financial markets. In early days, we knew there was reputational value in adopting TCFD to demonstrate to the investment community and other stakeholders that we are taking steps to manage climate risks. But the more we use the framework internally and understand the rational and thinking behind it, the more value we find in it. It has been a driver for meaningful discussions around climate risks and what those risks mean for Pan American Silver. It has also been a catalyst for our in-depth review of our risk assessment and decision-making processes and for our ongoing work to improve our governance of climate risks. Having a better understanding of the climate-related risks facing the company means that we can incorporate this knowledge into our strategic planning. This makes us better positioned to identify new opportunities and develop appropriate mitigation strategies.

In terms of externally reporting on TCFD, we recognize that we have more work to do before we are fully aligned with the framework. In the spirit of TCFD, however, we feel it is important to be transparent about where we are in our journey and what gaps remain. That is why I am pleased that we are reporting our TCFD progress for the first time in this sustainability report.

### How is Pan American Silver managing climate risks?

At the operations level, our focus has been on climate change mitigation through reducing our emissions. Over the last few years, we have been improving our ability to measure and manage our energy performance and build a complete picture of our climate footprint. We are also building climate risk management into many of our processes. For example, during 2020, we began work to embed climate risk into the operations-level budgeting process by requiring all operations to include energy consumption metrics in their annual budgets. This will help us incorporate a projected energy profile in our long-term plans. Transition risks related to climate change, such as regulatory changes and carbon pricing, are now considered through our country-level risk assessments.

At the corporate level, we are becoming more sophisticated in our understanding and management of climate risk, and the TCFD framework is certainly playing a role in this evolution. Our approach is multidisciplinary, cross-functional, and collaborative. We have expanded the charter of the HSEC Committee of the Board to include oversight of climate risk. Our ESG Committee, which is comprised of cross-departmental, senior-level leadership, oversees implementation of the TCFD recommendations. Very significantly, we have revised our capital allocation process. The nature and purpose of any proposed capital project now determines which individuals or departments are required to review and approve the project. This is allowing us to harness the expertise of our internal subject matter experts and involve those who are primarily responsible for managing risks. In other words, we are conscientiously and proactively addressing climate related risks early in the planning process and consider risk-reduction measures, such as alternative energy sources and opportunities to reduce water use.



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# CLIMATE, ENERGY AND GREENHOUSE GAS EMISSIONS

## WHY IS CLIMATE CHANGE, ENERGY AND GREENHOUSE GAS EMISSIONS IMPORTANT?

Climate change driven by carbon emissions is an issue of global concern that will affect society, the environment, and economic development over the coming decades. We recognize that climate change is a potential threat to our business and many of our COIs, and we are committed to action to reduce climate risks through innovative solutions to reducing emissions, transforming energy supply, and optimizing land use.

Mining is an energy-intensive industry, consuming energy through extraction, processing, and transportation of products. Energy use, particularly through fuel combustion and electricity consumption, causes direct (Scope 1) and indirect (Scope 2) GHG emissions, which contribute to climate change. COI expectations around climate action in the mining industry include reducing carbon footprint and responding to potential climate-related risks. For Pan American Silver, innovatively reducing emissions and energy use can provide us with: cost savings; operational efficiencies, including expedited permitting and improved social acceptance; and environmental benefits beyond our operating boundaries, while at the same time contributing to the global response to climate change.

While we have been gradually improving our climate-related disclosure since our Scope 1 and 2 emissions were first publicly reported in 2010, we recently determined that adopting the climate-related recommendations of the Financial Stability Board is the most effective way to drive our strategy and respond to our stakeholders. In 2020, we became supporters of the TCFD reporting recommendations. The following section of this report reflects our first reporting under the TCFD framework. This is the latest step in a continuous process of enhancing insights, information and analysis provided through our public disclosures.

### ANALYST CENTER MATERIAL TOPIC – CLIMATE CHANGE, ENERGY AND GREENHOUSE GAS EMISSIONS

#### What's included in this section:

- CEO's statement on climate change and support of TCFD
- Governance and climate change
- Climate risks
- Opportunities and mitigation strategies
- Performance – metrics and targets

**GRI indicator:** 302-1; 302-103; 305-1; 305-103; 305-2; 305-3; 305-4

**SASB indicator:** SASB EM-MM-130a.1; SASB EM-MM-110a.1; SASB EM-MM-110a.2

**Prioritized SDGs:**13

**See these data tables for additional information:** TCFD physical risks table, GRI 302-1/SASB EM-MM-130a.1; GRI 305-1; GRI 302-2; SASB EM-MM-110a.1

*“The priority for all our sites is reducing their emissions footprint. We have been facilitating the sharing of best practices across operations, and this has led to the identification of energy-saving initiatives. We will also continue working with mine management and technical teams to provide them with the information and tools they need to develop meaningful emission reduction targets and initiatives.”*

Steve Busby, Chief Operating Officer

## CHIEF EXECUTIVE OFFICER'S STATEMENT

### Taking Action on Climate Change at Pan American Silver

Climate change is a threat to the global environment, society, our stakeholders and our business. We are committed to action to ensure an orderly transition to a prosperous low-carbon world.

As one of the largest primary producers of silver in the world, sustainable solutions to climate change are embedded in our purpose as a company. The silver we produce is a key material in solar energy applications and other carbon-efficient energy solutions.

We recognize that mining is an energy-intensive activity that generates GHG emissions and we are committed to doing our part to reduce our GHG emissions by setting realistic short and medium term reduction targets. Our strategy also includes improving our existing public disclosure, ensuring that physical and transition climate risks are considered in our strategic long-term plans, conducting stakeholder engagement on climate change, increasing our use of renewable energy, and supporting research and climate action both near our operations and globally. Our executive team, and each of our operations, are responsible for implementing this climate action strategy.

We support the approach presented in the TCFD recommendations, and have signed on as a supporter of the TCFD. We will also continue to report on our emissions, reduction targets, climate risks and climate action in our annual Sustainability Reports.

The Climate Change, Energy and Greenhouse Gas Emissions section is structured to follow TCFD recommendations and includes: Governance; Climate Risks, Opportunities and Mitigation Strategies; Performance - Metrics and Targets; and Next Steps.



“We continue our journey to better understand the climate-related risks and opportunities facing Pan American Silver. Our primary objective is to integrate climate issues and impacts into our risk assessments, to innovatively enhance our business strategy in light of this global challenge, and to continually improve our climate-related public disclosures.”

**Michael Steinmann, Chief Executive Officer**

## GOVERNANCE

### Board level

The structure of our Board of Directors and committees is described in the Sustainability Governance and Management section of the 2020 Sustainability Report. Our Board is advised on climate-related issues by its HSEC Committee and directly by management. The Board and HSEC Committee review energy and emissions performance against targets, climate-related risks and opportunities, and overall climate policy and strategy on a quarterly and annual basis.

### Management level

We formed a Climate Change Committee with senior management in 2019 to oversee implementation of the TCFD recommendations.

In 2020, the Company expanded this Committee and re-formed it as the ESG Committee.

The ESG Committee directs policy and standards for our management of climate change matters affecting our business, reviews the results of our current performance, evaluates risks and strategy, and agrees on metrics and targets.

Our management approach involves all levels of the organization as we continually search for ways to improve energy efficiency at our operations and development projects. Interactions between our Corporate Environmental team and the respective country and environmental leadership at each site, help identify and define priority projects to address energy use and climate change issues.

### Affiliations and memberships

We strive to align our Company climate strategy with globally recognized frameworks

and associations with other companies in our sector. Our governance around climate issues is guided through the following affiliations and memberships:

- Supporter of TCFD
- Member of World Economic Forum (WEF) Alliance of CEO Climate Leaders
- Member of UN Global Compact
- Member of Mining Association of Canada
- Participant in Peru Carbon Footprint program

## CLIMATE RISKS, OPPORTUNITIES, AND MITIGATION STRATEGIES

Climate change is a global challenge that may have both favorable and adverse effects on our business in a range of possible ways. As part of our adoption of recommended TCFD disclosure, we have started developing a framework to identify these risks and opportunities, and where possible, determine mitigation strategies to ultimately ensure the resilience of our business to climate change. This includes physical and transitional risks and opportunities with their associated potential to impact the financial results of our business.

As part of our strategic review, we have also started evaluating our short (1 - 5 years), medium (5 - 10 years) and long (10+ years) term strategy relative to our assessment of risks and opportunities, which is further described in the sub-sections below. This is a dynamic process that continues to develop over time, as described in the "Next Steps" sub-section below.

Pan American Silver's approach to risk management is constantly evolving in order to adapt to a dynamic environment. In addition to the standardized country risk assessment processes discussed in the Sustainability Risk Management section in the 2020 Sustainability

Report, we view each manager, whether in operations or at the corporate office, to be a risk manager. We have clear lines of communication whereby risks and opportunities are identified and properly reported up through management and ultimately to the Board of Directors. This process has served us well over the years, empowering our employees and providing the base for our success.

Climate change is an emerging area within our risk management framework, and the preliminary analysis around risks and opportunities was tasked to a group within management's ESG Committee. Over recent years, this interdisciplinary and inter-jurisdictional group has been engaged in developing the Company's climate change risk and opportunity registry with its findings described in detail below. These have been discussed and evaluated with our senior leadership and form the basis for our ongoing short, medium, and long-term strategic scenario analysis.

Based on the Company's climate-related risks, opportunities, and vulnerability assessments to date, we believe that the most relevant risk and opportunity categories that could potentially impact our business are as follows:

### Physical Risks and Opportunities

In 2019 and 2020, we conducted a study to evaluate the potential physical risks of climate change on our operations due to extreme weather events, impacts on water availability or scarcity, and changes in rainfall and temperature patterns. The study was completed in-line with TCFD scenario analysis recommendations, and considered a range of scenarios for each of our current operations and projects. The climate model scenarios considered in our study included: a Paris agreement-aligned two degree change scenario (International Panel on Climate Change (IPCC) Representative Concentration Pathways(WCP) 2.6); and an extreme case six degree change scenario (IPCC, RCP 8.5).

The primary conclusion derived through analysis of regional climate estimates is that temperatures have been generally increasing at all our sites, except for the San Vicente Mine, where temperatures have shown no trend over the last 80 years, and the Timmins and Bell Creek operations, where temperatures have been historically high over the last 20 years but with a decreasing trend. Climate change projections based on modelling indicate that temperature increases are expected in the future at all mines. Such increases will likely result in an increase in evaporation and a net reduction of future water availability, although this will depend on future precipitation conditions, which are highly uncertain. Given this uncertainty, the projections of future water decreases, and their quantification, are highly indeterminate. Only the San Vicente operation in Bolivia currently operates with any reliance on external water supply and is therefore potentially exposed to water supply risks. All our other operations are supplied from mine dewatering or secure, adaptable water supplies within our sites. Nonetheless, even at San Vicente, any changes in climate conditions during the current mine-life are expected to be minor. Since existing operational mine water management plans already account for annual and seasonal variability within the current climate, any future changes should not pose a notable risk to our mines during operations.

There is limited information available regarding the prediction of future extreme weather events. As a result, at the time of mine closure, information available at that time should be used to complete additional analysis to assess the potential for increased extreme precipitation and associated design flows well into the future. If no or very limited extreme precipitation information is available, Engineers and Geoscientists of British Columbia (EGBC) recommends adopting an increase in design flood magnitude of between 10% and 20% (APEGBC, 2012)<sup>15</sup>. This approach is generally consistent with current standard industry practice and reflects the large uncertainty associated with projections of future changes to extreme precipitation patterns. We have

<sup>15</sup> APEGBC (APEG, 2012). Professional Practice Guidelines – Legislated Flood Assessments in a Changing Climate in BC, June 2012.

adopted this approach at our closed Alamo Dorado mine and conducted sensitivity analysis of water management structures for 15% increases in design flood magnitude. We will continue to monitor the performance of surface water management structures and the site water balance over the post-closure period. The table below summarizes the physical risks to our mines and the regions where we operate. The full table of modelling results is included in the appendix under [TCFD physical risks table](#).

## Transition Risks and Opportunities

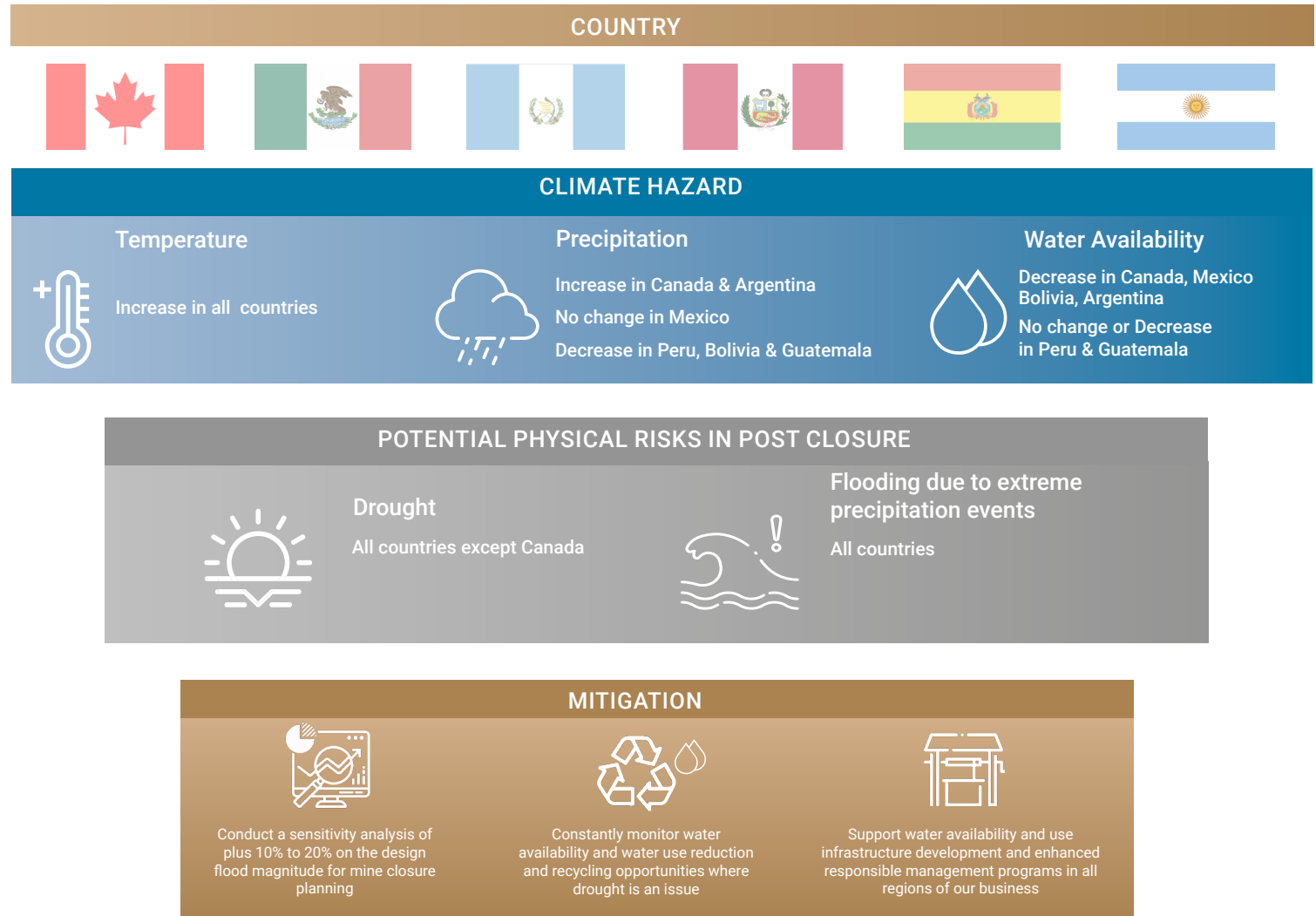
As defined by TCFD, transitional risks arise from policy, regulatory, legal, technological, reputational, and market changes to address mitigation and adaptation requirements to transition to a low carbon economy. These may have varying levels of adverse financial and reputational impacts to the Company.

### Regulatory risk

Government policy and regulation is expected to be a primary driver for decarbonization around the world. All the countries in which we operate are signatories of the 2015 United Nations Framework Convention on Climate Change on climate change mitigation, adaptation and finance (the "Paris Agreement"), which aims to limit the increase in global average temperatures to below two degrees Celsius above that of pre-industrial levels.

Signatory countries have agreed to reduce GHG emissions and announced Nationally Determined Contributions (NDC) to that effect. Many countries have already started instituting new policies and regulations expected to limit harmful emissions and promote adaptation to climate change. As the world transitions to a low carbon economy and countries deliver on their respective NDCs, there will be new financial and reputational risks to businesses. With the expected increase in policy and regulation, increased legal related risks are also anticipated, as Companies are held responsible for any actual or perceived shortfalls in their

# Pan American Silver's Physical Risks



performance related to mitigating climate change.

We have identified the following key regulatory, policy and legal related risks to Pan American Silver:

- Regulatory change that results in increased costs and/or constrains on our operating activities. In particular, we see the widespread introduction of carbon pricing as a likely driver of increasing costs. Two jurisdictions in which we operate have already introduced environmental taxes related to carbon emissions
- Climate-related legal claims against us or our stakeholders could result in compensation claims for damages
- Required permitting and licenses may become more difficult to obtain as regulations and/or COI expectations around extractive industries become more onerous, which could adversely impact our future mine plans at existing operations, and the successful progression of our exploration and development stage properties
- Changes in regulations that impact past and future closure and reclamation activities, which result in increased closure and decommissioning liabilities

As a Company we have identified and started implementing the following mitigation strategies to enhance our resilience to these potential regulatory, policy and legal risks:

- Strive to reduce our carbon emissions, replace direct fuel consuming activities with electric grid-connected systems, and transition energy supply to renewable sources, where appropriate. We have secured power contracts from renewable energy providers at two of our operations and are evaluating them elsewhere

- Our diversified portfolio and decentralized organizational structure enable us to make well-informed decisions and manage legal and policy risks
- We continuously engage with local and federal governments in all jurisdictions we are active in, and ensure we are aware, to the best extent possible, of any potential regulatory or policy changes and their impacts to our business
- We continue to increase management resources and processes, including but not limited to our standardized country risk assessments, to assess and address climate-related risks

### Market risks and opportunities

Climate change will impact markets in unpredictable ways, including potential disruptions to supply chains, changes in consumer choices, and impacts to capital markets upon which the Company relies. The changes to both the supply and demand equilibrium for goods and services the Company depends on for its production processes as well as for the commodities that we produce may have material impacts to the Company's cost structure, the value or recoverability of its reserves, and revenue potential. The Company may benefit from increased prices for the metals it produces that are used in low-carbon technologies, as further described in the section on technology opportunities below. This could drive changes to the value of the Company's assets and liabilities, ability to deliver in its long-term plans, and ultimately the value of its shares.

In addition to the potential risks to input and output prices described above, the Company has identified the following risks related to market changes:

- Competition for renewable energy is likely to increase, which would impact costs and/or reduce our ability to procure energy from such sources. Further, we depend on our host countries investing in renewable

power generation, which may ultimately limit our ability to switch to low-carbon energy supply. With that said, supply of renewable energy is expected to grow and could result in reduced costs of procuring renewable energy as we have seen in the last several years

- Capital markets are increasingly directing money towards low carbon-intensity businesses, which creates a risk of reduced access, or increased costs, to finance, investment, and insurance services
- Supply of labor may be impacted by changing demographics related to climate conditions
- Logistical complications may arise due to physical impacts on infrastructure not controlled by us such as roads, ports and downstream smelting and refining facilities

As a Company we have identified and commenced enacting mitigation strategies to enhance our resilience to market changes:

- We constantly monitor global markets, update our forecasts, and engage with stakeholders
- We calculate and disclose our annual Scope 1, 2 and 3 emissions to ensure that we are aware of the scale and sources of our direct and indirect supply chain emissions
- Our planning and approval processes incorporate an assessment of climate-related impacts of each investment we make
- We proactively pursue energy supply contracts from renewable sources where available

### Reputational risks and opportunities

Climate change has been identified as a potential source of reputational risk tied to

changing stakeholder perceptions of an organization's contribution to or detractor from the transition to a lower-carbon economy. Shifts in perceptions and preferences could result in the stigmatization of the mining sector, increased stakeholder concern or negative stakeholder feedback. This in turn could make it more difficult to obtain and maintain our social acceptance at existing sites or in developing new projects. Further, it may result in a reduced talent pool from which to recruit. Conversely, as further described below, the opportunity for the metals that we produce to play an integral part of technologies deployed to combat climate-change can enhance our reputation and related business opportunities.

Our strategy in mitigating these risks and actualizing opportunities is to continue to value and prioritize regular and open dialogue with all our stakeholders on ESG matters, including climate change. This helps us better understand what stakeholders want and expect related to these critically important issues. We also mitigate reputational risks through partnerships with industry organizations like the Silver Institute and the Mining Association of Canada. We are striving to continually improve and expand our engagement and ESG reporting and intend this to be a dynamic process with an open feedback loop.

### Technological risks and opportunities

New technologies can be disruptive in nature, and have the potential to dramatically alter the landscape of our industry, which is highly capital intensive. Through our strategic focus on innovation, we are constantly evaluating new proven technologies to ensure that we are capturing the benefits of technological advancements in our industry. We see the adoption of new proven technologies and enhancing energy efficient operations as an opportunity to improve productivity and to find solutions to carbon emission reduction challenges, such as ventilation in the deeper underground operations and equipment selection for upgrades and new projects. The incorporation of innovative technological solutions into our new projects can also

facilitate streamlined permitting processes and social acceptance.

In addition to changing the production process, new technologies may have an unpredictable impact on the demand for the commodities we produce. It is expected that limiting rising temperatures will require significant investments in low-carbon technologies, which are often metal-intensive. According to the World Bank report from 2017 on "The Growing Role of Minerals and Metals for a Low Carbon Future", demand for silver, copper, zinc and lead, are all expected to increase materially should the world achieve the objectives of the Paris Agreement. This provides significant opportunity to the Company, as nearly 68% of the Company's reserves by value (as referenced in the Company's 2020 Annual Report) is represented by these metals.

Silver will play an increasingly important role in the energy transition away from fossil fuels. Silver paste is a key ingredient of photovoltaic cells used in solar panels. Transparent silver-coated windows and silver-coated polyester sheets used to retrofit windows reflect the sun's rays and significantly reduce cooling costs and energy usage. We are working with the Silver Institute on a new study to assess and communicate on silver's unique role in low-carbon energy solutions.

Silver is a critical element for reducing global carbon emissions and thus plays a key role in limiting climate change. However, the carbon benefits generated by our products do not in any way reduce our commitment to minimize the direct and indirect carbon footprint of our activities. We will continue to build and adapt our climate strategy to contribute to achieving the goals of the Paris Agreement, net zero emissions, and a sustainable low carbon economy. We constantly assess opportunities to make our energy use more efficient, reduce GHG emissions, and minimize the use of water and other resources in our processes, with associated financial benefits.

## Short-term Strategy

In order to establish appropriate and realistic medium and long-term climate-related strategic objectives, we will first quantify our water, energy and carbon footprints under various strategic business scenarios. We have commenced, and will continue to progress, the integration of ESG and climate-related risks into our strategic planning.

Highlights of this integration include: enhanced climate-related risk assessments; incorporating climate-related targets into our annual budgets; including climate-change considerations into our capital budgeting process; investigating the inclusion of ESG metrics into future financing arrangements, and, developing life of mine (LOM) energy profiles for each of our operations to determine baselines for future scenario analysis. These planning strategies will enhance our ability to quantify the longer-term climate change impacts on each of our assets, which will enable us to develop specific long-term climate-change goals.

## Risk Assessments

We plan to continue developing our climate-related risk and opportunity assessments. Physical risk assessments will be updated as new climate models become available and individual mines approach closure. We will continue to focus on risks related to extreme weather events, precipitation, temperature and water scarcity. Transition risks and opportunities are continually evolving and we plan to develop more detailed assessments for each of our operating jurisdictions to support expanded TCFD disclosure over the next three years.

## Annual Budget Plans

We started developing ESG goals as part of our annual budget preparation and approval process in 2017. Many of our annual ESG targets are relevant to climate change including: energy use, GHG emissions, water use,

biodiversity, and waste management. Annual budgets and targets are developed between August and November each year and approved by our Board of Directors in December. We report on targets and progress in annual sustainability reports published in May. This process builds meaningful targets organically from the operators and supervisors at our sites, right through the entire organization. Targets are derived from real, viable projects and initiatives generated through the creativity and innovation of our teams. Over the past few years, the quality and traceability of our targets have gradually improved and we will continue to implement this system going forward. 2020 performance and 2021 targets are discussed in our Goals and Performance Section in the 2020 Sustainability Report.

## Capital Budgeting Process

Our internal process for preparing requests for funding, the approval of such requests and the ongoing monitoring of approved spending has been designed with our ESG values in focus. Our decentralized organizational structure and delegated authority facilitates our decision-making process. The purpose, rationale and magnitude of any proposed spending establishes the required approvals from subject matter experts within our organization. This decentralized approach brings many benefits, including high degrees of understanding of and commitment to the Company's policies and values.

We have established rigorous monitoring and oversight mechanisms to ensure that our approval process is operating as designed and that approved spending is expended within acceptable parameters and that our objectives are achieved. These oversight mechanisms include monthly reporting and quarterly reviews by a committee of senior management.

Specific to climate change related projects, the process described above requires review and approval from environmental experts at each level of the Company, beginning with those tasked with the execution and implementation

of such projects. In this manner, climate change initiatives are constantly being generated from both a bottom-up and a top-down perspective. Environmental projects of significant magnitude require approval of and regular reporting to our Board of Directors.

Last year we implemented a new set of metrics, based on our SPLs, within the funding approval process where all new projects must estimate their potential impact on energy use, GHG emissions, water use, and biodiversity. This new process allows deeper evaluation of the potential climate effects of new projects within our existing decision-making framework.

## Energy Profile Assessments

In addition to reporting GHG emissions setting goals through our annual budget process, we have begun a process to estimate our energy demand profiles for all mines based on current life of mine plans. This process will provide a baseline for our future energy consumption in a business as usual scenario. With this exercise, we will be able to accurately estimate the future financial impact of the various risks and opportunities described in this document, as well as establish meaningful and specific GHG emissions reduction goals compared to this baseline scenario.

The life of mine of our assets ranges from as few as three years to as many as fifteen plus years. We expect that the impact to our business from climate change will increase over the longer term outlook, and as such, not all of our mines will be affected in the same rate from the transitional risks to a low carbon economy. In future TCFD reports, we expect to be able to determine the financial impact of various future scenarios, with varying levels of potential decarbonization at our operations.

## Medium & Long-Term Strategy

We plan to develop medium-term climate and GHG emission reduction targets based on the energy profile and transition risk assessments described above. We expect to set science-based targets for the year 2030 based on that evaluation of our assets and the potential



availability of renewable energy through the transition to a low-carbon economy in the countries where we operate.

Longer term goals such as net zero emissions in our industry are, at this time, highly dependent on the emergence of new technologies, carbon capture use and storage (CCUS), and valid, transparent carbon offsets. While we fully support and are committed to advancing efforts towards the global achievement of net-zero carbon emissions, we recognize that many of these factors are beyond the control of our Company and are highly uncertain. We will continue to monitor the development of technological and offset solutions to climate change with the intention of reaching net zero emissions in 2050 or much earlier.

## PERFORMANCE - METRICS AND TARGETS

We use energy to mine, move, and process ore and waste rock as well as for mine ventilation and dewatering. The type and quantity of emissions from our operations are determined by the energy source and the nature of the way we mine and process ores that is largely dependent on the geology and mineralogy of the deposits. The energy used at our sites comes principally from diesel fuel for powering heavy mobile mine equipment and in some limited cases electrical power generation or purchased electricity from regional or national power supply grids. The grid energy we use is becoming cleaner and more efficient each year since the jurisdictions where we operate increase renewable energy generation. Grid electricity has a lower carbon footprint than onsite electricity generation.

### 2020 Highlights

- **Obtained renewable energy certification for our purchased electricity at our**

### Morococha mine, making Morococha our first mine to operate on 100% renewable purchased electricity

- **Achieved 35% reduction in electrical energy consumption for freshwater pumping and 27% reduction in gasoline consumption at San Vicente mine**
- **Installed national electricity grid connection of remote equipment at La Arena and Shahuindo**
- **Developed our Energy, Emissions and Climate Change Standard (the "EECC Standard"). The EECC Standard covers activities potentially affecting energy use and emissions at all our operating mines, advanced projects, and closed mines**
- **Our Timmins operation has a dedicated Energy Manager who leads energy efficiency and GHG emission reduction programs at that operation and maintains our participation in provincial energy incentive programs**
- **Shahuindo is the only mine to receive the third star from the Peruvian Government's voluntary Carbon Footprint program for its 2018-2019 "reduction report". We are one of 13 companies in the program to get the third star and the only mine to achieve such recognition in Peru**

Greenhouse gas emission trends for our operations generally track our energy use. However, in periods such as 2017-2018, when we connected the Dolores mine to the national grid and supplemented the La Colorada electrical supply connection, we experienced a decrease in total GHG emissions as direct (Scope 1) emissions were transferred to cleaner grid electricity (Scope 2). Our total energy use and GHG emissions increased in 2019 following the acquisition of Tahoe Resources and the

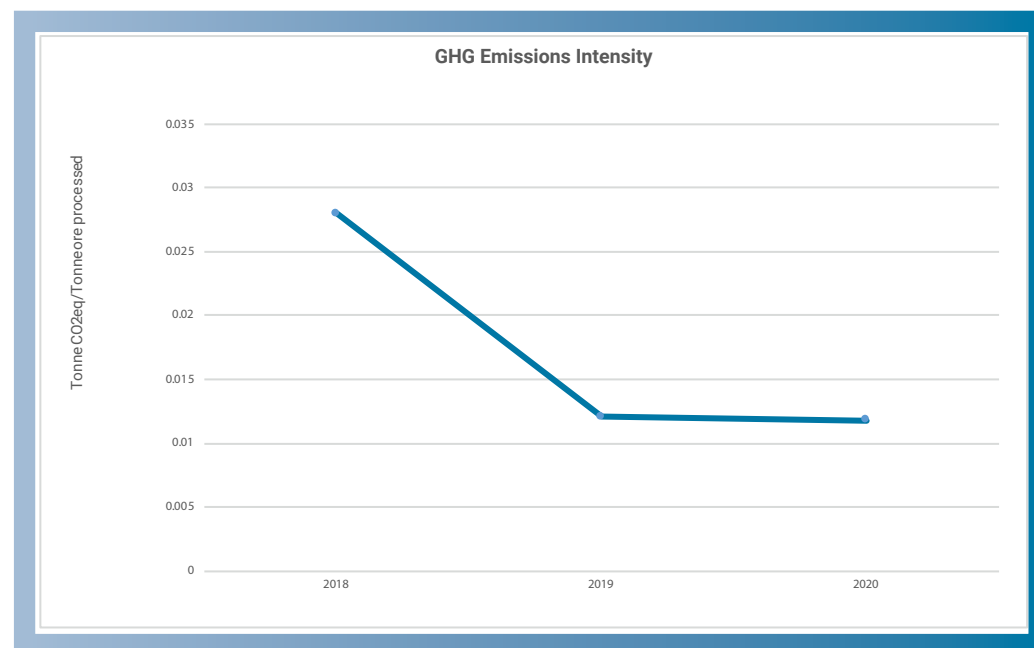
GHG Emissions (Tonnes CO <sub>2</sub> eq)	2020	2019	2018
Scope 1- Direct	274,522	313,361	164,726
Scope 2- Electricity	111,895	143,863	123,880
Total Scope 1 and 2	386,418	457,224	288,606
Scope 3-Value Chain	618,332	668,098	

addition of three operating mines. In 2020 our Scope 1 and 2 GHG emissions declined relative to 2019 due to reduced energy use during the pandemic-related mine suspensions.

We commenced using the Quantis Scope 3 Evaluator tool in 2019 to estimate part of our Value Chain (Scope 3) emissions. This tool is in accordance with the Greenhouse Gas Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard. We use this tool for all 15 categories except downstream processing

of metal concentrates, which we found to be underestimated by the Evaluator. We instead obtain direct emissions data from our partner smelters in Peru and Mexico that process zinc and lead concentrates from our mines. These data allowed us to calculate more accurate downstream emissions for processing of our metal concentrates sold (69,232 tonnes CO<sub>2</sub>eq for 2020), which was used to complete the Scope 3 estimate.

We track GHG emissions intensity at our



#### Notes:

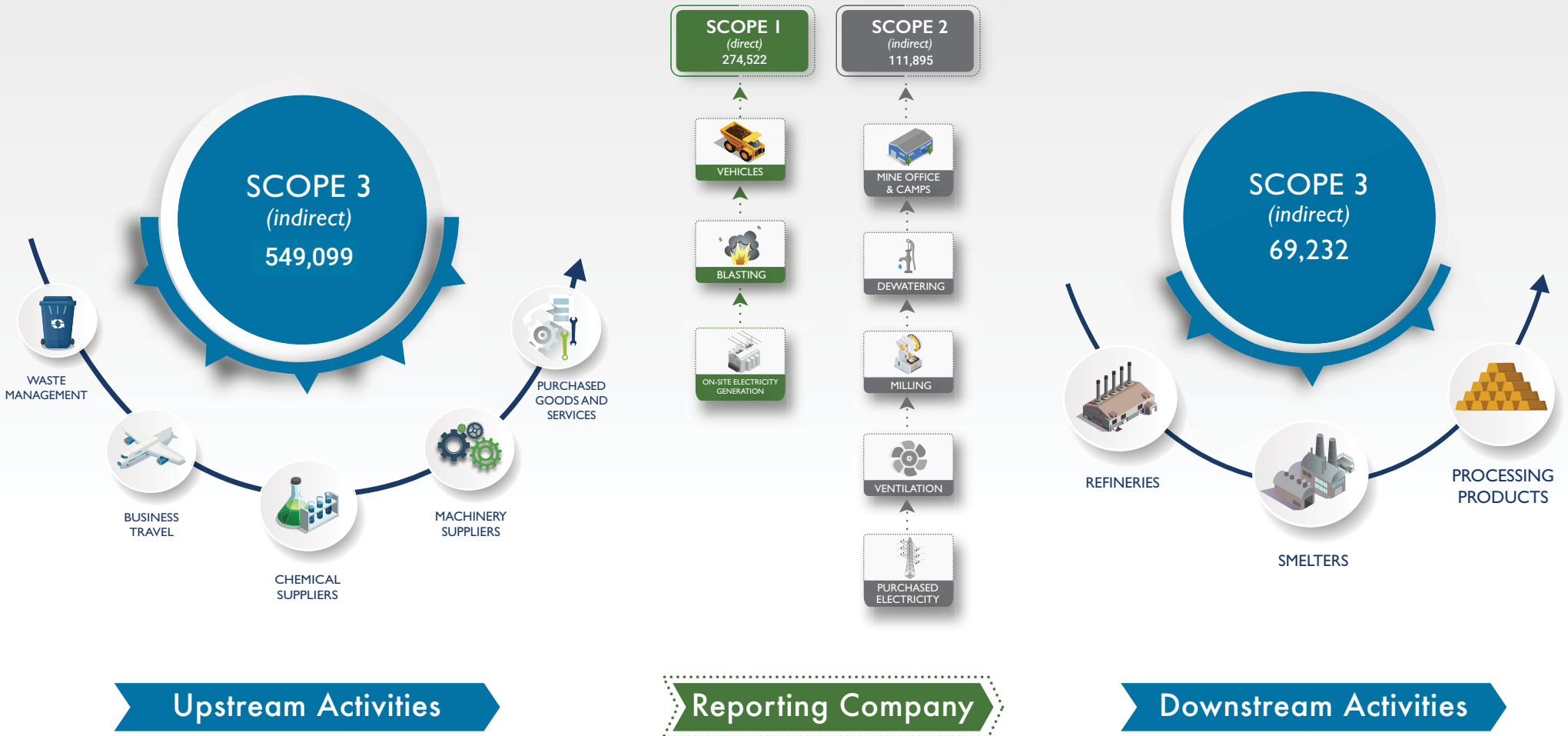
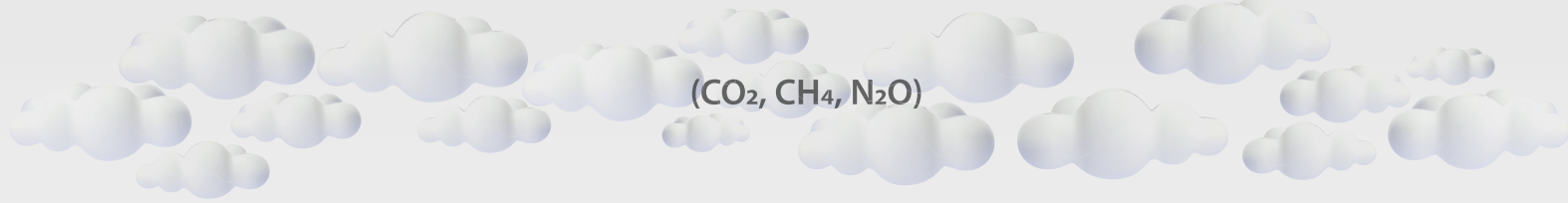
(1) Pan American Silver used National Inventory Report Canada 2020 to calculate Direct (Scope 1) GHG emissions. The global warming potential (GWP) used for calculations is based on the information provided by the Government of Canada. Emissions from purchased electricity have been calculated according to the GHG Protocol. The location-based method uses the IEA 2020 tool for all mines. Gases included in this calculation are CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O.

(2) The GHG Protocol purchased IEA tool 2020 for energy indirect (Scope 2) GHG emissions. Gases included in this calculation are CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O.

(3) Where available, the market-based method uses supplier specific emission factors. The difference in market- and location-based is mainly attributed to the purchase of hydroelectric power at our Morococha operation. Unless otherwise noted, all scope 2 emissions refer to the market-based method. A residual mix is not available to account for voluntary purchases and may result in some double counting among consumers.

(4) We have restated the 2019 and 2018 GHG emissions based on minor adjustments on explosives and electricity data from Morococha and La Arena, and inclusion of COSE and Joaquin 2019 site data within the Manantial Espejo usage.

# SCOPE 1,2 AND 3 GREENHOUSE GAS EMISSIONS



sites as a useful metric to assess ongoing performance. In general, the more ore we process at our sites, the more energy we use. Also, as our mines become deeper and spatially more distant, more energy is required for mine ventilation and dewatering, and more fuel is required to haul ore and waste rock over greater vertical and horizontal distances. We measure GHG emissions intensity (tonnes of Scope 1 and 2 CO2 equivalent per tonne of ore processed) to help us understand the energy efficiencies of our processes and the effects of using cleaner grid energy although it is also very important for us to assess the amount of waste mined, underground development meters advanced and distances we move material. These factors and overall mine sequencing can result in significant variability to our annual emissions and emission intensities.

In 2020 our GHG emission intensity was essentially flat compared to 2019, reflecting slight increases in non-productive energy use during the COVID 19 pandemic related mine suspensions that were offset by increased efficiency at our mines during the operating period.

## 2021 Targets

Our targets for 2021 were developed through our annual budget development process described above:

- Reduce GHG emissions by 11% compared to the 2021 base case
- Reduce energy use by 0.3% compared to the 2021 base case
- Reduce water use by 6% compared to 2021 base case

## NEXT STEPS

We will continue our efforts to ensure climate-related issues receive the appropriate attention from our Board and management so that an effective strategic response can be established and implemented accordingly, and sufficient,

transparent and timely climate-related disclosures can be made to our stakeholders. Over the next twelve months, we will focus on the following key next steps to improve how we address climate-change and related disclosures:

- Continue to monitor the development of long-term climate models as part of our ongoing physical risk assessments
- Completing our long-term energy profile quantification, and setting targeted medium-term emissions reductions
- Preparing a scenario analysis along with financial impact sensitivity analytics on contemplation of the quantified energy profile targets and different climate change scenarios
- Performing a comprehensive jurisdictional and operation specific climate change vulnerability and risk assessment to inform our iteratively established mitigation strategies
- Define Pan American Silver's Climate Change Policy Statement
- Investigate, and where appropriate include, ESG performance metrics into future financing arrangements, and into our key stakeholder agreements
- Continue monitoring our scope 1, 2 and 3 emissions yearly and improving on our target setting
- Continue to implement our Energy, Emissions and Climate change Standard
- Work with the Silver Institute to improve the general understanding of silver's role in the transition to a low-carbon economy
- Publish a stand-alone TCFD climate change report which, where available and appropriate, will include disclosures on our progress on the aforementioned next steps



# TCFD Glossary

**CLIMATE-RELATED OPPORTUNITY** refers to the potential positive impacts related to climate change on an organization. Efforts to mitigate and adapt to climate change can produce opportunities for organizations, such as through resource efficiency and cost savings, the adoption and utilization of low-emission energy sources, the development of new products and services, and building resilience along the supply chain. Climate-related opportunities will vary depending on the region, market, and industry in which an organization operates.

**CLIMATE-RELATED RISK** refers to the potential negative impacts of climate change on an organization. Physical risks emanating from climate change can be event-driven (acute) such as increased severity of extreme weather events (e.g., cyclones, droughts, floods, and fires). They can also relate to longer-term shifts (chronic) in precipitation and temperature and increased variability in weather patterns (e.g., sea level rise). Climate-related risks can also be associated with the transition to a lower-carbon global economy, the most common of which relate to policy and legal actions, technology changes, market responses, and reputational considerations.

**SCOPE 1** refers to all direct GHG emissions.

**SCOPE 2** refers to indirect GHG emissions from consumption of purchased electricity, heat, or steam.

**SCOPE 3** refers to other indirect emissions not covered in Scope 2 that occur in the value chain of the reporting company, including both upstream and downstream emissions. Scope 3 emissions could include: the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g., transmission and distribution losses), outsourced activities, and waste disposal.

**PUBLICLY AVAILABLE 2°C SCENARIO** refers to a 2°C scenario that is (1) used/referenced and issued by an independent body; (2) wherever possible, supported by publicly available datasets; (3) updated on a regular basis; and (4) linked to functional tools (e.g., visualizers, calculators, and mapping tools) that can be applied by organizations.

**SCENARIO ANALYSIS** is a process for identifying and assessing a potential range of outcomes of future events under conditions of uncertainty. In the case of climate change, for example, scenarios allow an organization to explore and develop an understanding of how the physical and transition risks of climate change may impact its businesses, strategies, and financial performance over time.

# TCFD - Physical Risks Table

## MODELLING PREDICTED CHANGES TO TEMPERATURE AND PRECIPITATION - POST CLOSURE SCENARIOS

Facility	Country	Current Water Requirement	Climate Change Scenario	Year	Predicted Change in Temperature	Predicted Change in Precipitation	Water Risk Atlas Results (Projected Change in Water Supply from Baseline)	Estimated Future Water Availability	Information Source	Comments	Management Strategy
Timmins West and Bell Creek	Canada	Surplus	RCP 2.6	2080's	+1.8 °C	+5%	-	Decrease	OCDP Online Tool		<p>Conduct a sensitivity analysis of plus 10-20% on the design flood magnitude for mine closure planning.</p> <p>Constantly monitor water availability and water use reduction and recycling opportunities where drought is an issue.</p> <p>Support water availability and use infrastructure development and enhanced responsible management programs in all regions of our business. Update physical risk assessments for our sites when mine closure plans are updated, new climate models emerge, or at least every five years.</p>
			RCP 4.5		+3.1 °C	+7%	-				
			RCP 8.5		+5.4 °C	+13%	-				
Dolores	Mexico	Balanced, though a surplus is expected with the growth of the leach pad	-	2030	-	-	Near Normal to a 1.2x Decrease	Decrease	WRA Tool		
			-	2040	-	-	1.2x Decrease		WRA Tool		
			RCP 2.6	2100	+1.0 °C	Little to No Change	-		IPCC 2014 Chapter 26 - North America	Estimates of Temperature and Precipitation are based on interpretation of IPCC figures	
			RCP 8.5		+5.0 °C		-				
Alamo Dorado	Mexico	Mine is Closed	-	2030	-	-	1.2x Increase to Near Normal	Decrease	WRA Tool		
			-	2040	-	-	Near Normal to 1.2x Decrease		WRA Tool		
			RCP 2.6	2100	+1.0 °C	Little to No Change	-		IPCC 2014 Chapter 26 - North America	Estimates of Temperature and Precipitation are based on interpretation of IPCC figures	
			RCP 8.5		+5.0 °C		-				
La Colorada	Mexico	Surplus	-	2030	-	-	Near Normal to 1.2x Decrease	Decrease	WRA Tool	Estimates of Temperature and Precipitation are based on interpretation of IPCC figures	
			-	2040	-	-	1.2x Decrease		WRA Tool		
			RCP 2.6	2100	+1.0 °C	Little to No Change	-		IPCC 2014 Chapter 26 - North America		
			RCP 8.5		+4.5 °C		-				

Facility	Country	Current Water Requirement	Climate Change Scenario	Year	Predicted Change in Temperature	Predicted Change in Precipitation	Water Risk Atlas Results (Projected Change in Water Supply from Baseline)	Estimated Future Water Availability	Information Source	Comments	Management Strategy
Escobal	Guatemala	Surplus	-	2030	-	-	Near Normal	Little to no change	WRA Tool		
			-	2040	-	-	Near Normal		WRA Tool		
			A1B	2100	+3 °C to +5 °C	-5 mm/day , while another model notes the change to be around -10% to -30%	-	Decrease	IPCC 2014 Chapter 27 - Central and South America		
			A2		+3 °C to +6 °C	24% to -48%	-				
Shahuindo	Peru	Deficit, though a surplus is expected with the growth of the leach pad	-	2030	-	-	1.2x Increase	Increase	WRA Tool		
			-	2040	-	-	1.2x Increase		WRA Tool		
			A1B	2100	+2.0°C to +4.5°C	-20% to -30%, while another model suggests +1 mm to + 3 mm/day	-	Little to no change	IPCC 2014 Chapter 27 - Central and South America		
			A2		>3°C	-10% to -30%	-				
La Arena	Peru	Surplus	-	2030	-	-	1.2x Increase	Increase	WRA Tool	The IPCC report presents contradictory results for precipitation under the A1B scenario, with one referenced report presenting a decrease and another presenting an increase.	
			-	2040	-	-	1.2x Increase		WRA Tool		
			A1B	2100	+2.0°C to +4.5°C	-20% to -30%, while another model suggests +1 mm to + 3 mm/day	-	Decrease	IPCC 2014 Chapter 27 - Central and South America		
			A2		>3°C	-10% to -30%	-				
Huaron	Peru	Surplus	-	2030	-	-	1.2x Increase to 1.4x Increase	Increase	WRA Tool		
			-	2040	-	-	1.4x Increase		WRA Tool		
			A1B	2100	+2.0°C to +4.5°C	-20% to -30%, while another model suggests +1 mm to + 3 mm/day	-	Decrease	IPCC 2014 Chapter 27 - Central and South America		
			A2		>3°C	-10% to -30%	-				
Morococha	Peru	Surplus	-	2030	-	-	Near Normal	Little to no change	WRA Tool		
			-	2040	-	-	Near Normal		WRA Tool		

Facility	Country	Current Water Requirement	Climate Change Scenario	Year	Predicted Change in Temperature	Predicted Change in Precipitation	Water Risk Atlas Results (Projected Change in Water Supply from Baseline)	Estimated Future Water Availability	Information Source	Comments	Management Strategy
Morococha	Peru	Surplus	A1B	2100	+2.0°C to +4.5°C	-20% to -30%, while another model suggests +1 mm to +3 mm/day	-	Decrease	IPCC 2014 Chapter 27 - Central and South America		
			A2		>3°C	-10% to -30%	-				
San Vicente	Bolivia	Deficit	-	2030	-	-	Near Normal to 1.2x Increase	Increase	WRA Tool		
			-	2040	-	-	Near Normal to 1.4x Increase		WRA Tool		
			A1B	2100	+2.0°C to +4.5°C	-20% to -30%, while another model suggests +1 mm to +3 mm/day	-	Decrease	IPCC 2014 Chapter 27 - Central and South America		
			A2		>3°C	-10% to -30%	-				
Navidad	Argentina	Deficit during construction, then the mine is expected to operate in a surplus	-	2030	-	-	1.2x Decrease	Decrease	WRA Tool		
			-	2040	-	-	1.2x Decrease		WRA Tool		
			A1B	2100	+2 °C to +4 °C	+20 % to +30% while another model suggests +0.3 mm/day to +2.0 mm/day	-	Decrease	IPCC 2014 Chapter 27 - Central and South America		
			A2		+3 °C to +4.5 °C	+0.5 to +1 mm/day	-				
Manantial Espejo	Argentina	Surplus	-	2030	-	-	1.2x Decrease	Decrease	WRA Tool		
			-	2040	-	-	1.2x Decrease		WRA Tool		
			A1B	2100	+2°C to +4 °C	+20 % to +30% while another model suggests +0.3 mm/day to +2.0 mm/day	-	Increase	IPCC 2014 Chapter 27 - Central and South America		
			A2		+3 °C to +4.5 °C	-	-				