Environmental Management Plan

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

Prepared by:

SLR Environmental Consulting (Namibia) (Pty) Ltd

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Report Sign-off and Approvals

EAP Signature **Proponent Signature**

Revision Record

Revision	Date	Prepared By	Checked By	Authorized By
0	17 Oct 2025	N. Mzilikazi	N. Masawi	A. Kanandjembo

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Acronyms and Abbreviations

Acronym	Full Term
AQMP	Air Quality Management Plan
B2Gold	B2Gold Namibia (Pty) Ltd
CSR	Corporate Social Responsibility
dBA	A-weighted decibels
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
EC	European Commission
ECC	Environmental Clearance Certificate
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMA	Environmental Management Act, 2007
EMP	Environmental Management Plan
EMS	Environmental Management System
GPR	Ground-Penetrating Radar
GPS	Global Positioning System
HSE	Health, Safety and Environment
IFC PS	International Finance Corporation Performance Standards
LGD	Low-Grade Dump
MAWF	Ministry of Agriculture, Water and Forestry
MEFT	Ministry of Environment, Forestry and Tourism
ML	Mining Licence
MME	Ministry of Mines and Energy
NamPower	Namibia Power Corporation
OGM	Otjikoto Gold Mine
PEA	Preliminary Economic Assessment
PPE	Personal Protective Equipment
ROM	Run of Mine
SA NAAQS	South African National Ambient Air Quality Standards
SCC	Species of Conservation Concern
SLR	SLR Environmental Consulting Namibia (Pty) Ltd
TSF	Tailings Storage Facility
WHO AQG	World Health Organization Air Quality Guidelines
WRD	Waste Rock Dump

Glossary of Terms

Term	Definition
Activity	An activity is defined as a distinct process undertaken by an organisation for which a responsibility can be assigned. It is the physical activity involved.
Closure Phase	The closure phase refers to the period when maintenance and aftercare of rehabilitated areas and facilities are required to ensure closure objectives are met.
Construction Phase	The construction phase covers the initial site preparation and actual construction of the infrastructure.
Decommissioning Phase	The decommissioning phase covers infrastructure removal and site preparation for final rehabilitation.
DFO	DFO refers to the rate at which dust particles settle out of the atmosphere and deposit onto a surface over a specified period, typically measured using standard dust-fall monitoring buckets (e.g., ASTM D1739 or SANS 1137 methods).
Operational Phase	The operational phase covers the production phase of the mine.
Otjikoto Gold Mine	Collectively refers to the existing approved EIAs that make up the Project.
PM_{10}	PM_{10} refers to inhalable particulate matter with an aerodynamic diameter of 10 micrometres (µm) or smaller. These particles are small enough to be inhaled into the nose, throat, and upper respiratory tract.
$PM_{2.5}$	$PM_{2.5}$ refers to fine particulate matter with an aerodynamic diameter of 2.5 micrometres (µm) or smaller. These particles are about 30 times smaller than the width of a human hair and can remain airborne for long periods.
Project Area	The project area refers to the core zone where the majority of mining infrastructure will be established, within the Mining License area.
The proposed Project	Refers to the amended Otjikoto Gold Mine Environmental Clearance Certificate to cater for the Proposed Project.
TSP	TSP refers to the total concentration of airborne particulate matter suspended in the atmosphere, typically measured as all particles with an aerodynamic diameter of less than ~100 micrometres (µm).

1.0 Introduction and Background

1.1 Introduction

B2Gold Namibia (Pty) Ltd (B2Gold) is a Namibian registered Company and a subsidiary of B2Gold Corporation, based in Vancouver, Canada. It is jointly owned by B2Gold Corporation (90%) and EVI Namibia (10%). Otjikoto Gold Mine (OGM) is an operating gold mine owned and operated by B2Gold. B2Gold is an internationally recognised Canadian based gold exploration, development and mining company listed on the Toronto, Namibian and New York Stock Exchanges. It was founded in 2007 and has five operating gold mines and numerous exploration and development proposed Projects in various countries.

B2Gold was granted a Mining License (ML 169) in December 2012 by the Ministry of Mine and Energy (MME) after the Environmental Clearance Certificate (ECC) was issued in August 2012 by the Ministry of Environment, Forestry and Tourism (MEFT) for the OGM.

The geographical area of interest, as originally approved, would not change. The proposed Project is located within ML 169 on Farm Otjikoto, approximately 70 km north of Otjiwarongo in the Otjozondjupa Region of Namibia (Latitude: 20.020068°S and Longitude: 17.093529°E).

Mining operations have taken place at the OGM since December 2014 at the following two pits via different mining methods:

- The Otjikoto pit is mined through the open pit mining method; and
- The Wolfshag pit is mined through both open-pit and underground mining methods.

Excavated ore and waste from the opencast pits and the underground Wolfshag pit are loaded and hauled to a single Run of Mine (ROM) pad before being processed. Excavated waste rock material is stockpiled on the waste rock dump (WRD). All low-grade material (with a grade range greater or equal to 0.25 g/t) is stockpiled on the low-grade dump (LGD) for post-mining reclamation and processing. ROM ore is fed to a primary crusher and pebble crusher for blending, crushing, milling, leaching and gold extraction. The Processing Plant has a capacity for 3.4 mtpa ROM ore feed. The final processed ore yields gold bars, which are shipped for export. Tailings generated in the leaching section of the Processing Plant are stored in the lined Tailings Storage Facility (TSF). Process water from the tailings dam is stored in the return water dam for re-use.

Figure 1-1 provides the locality map for the proposed Project

1.2 Proposed Project Overview

The Antelope deposit was identified in 2022 through deep drill testing and 3D modelling of airborne electromagnetic data, and it has since become a central focus of B2Gold's exploration and development efforts at OGM.

The development strategy envisions Antelope as a small-scale, low-cost underground mine that would supplement OGM's processing plant feed material once open-pit operations cease. The Antelope deposit is expected to contribute to gold production between 2028 and 2032 (5-year Life of Mine), bridging the gap as the mine transitions to processing lower-grade stockpiles.

As part of mining the Antelope deposit, B2Gold has identified the need for additional surface infrastructure within ML 169 (hereafter referred to as the **proposed Project**). Please refer to Table 1-1 for a description of the proposed infrastructure and Section 2.0 for a detailed description of the proposed Project.

Table 1-1: Description of the Proposed Additional Infrastructure

Infrastructure	Description	Area (m^2)
Portal (different location)	The portal is the entrance to the underground mine. It allows for safe and efficient access to the underground workings.	0.169 ha
Ventilation shaft (different location)	Provides fresh air to underground workers and equipment, removes exhaust gases and heat, and ensures a safe working environment.	0.008 ha
Compressor	Supplies compressed air for pneumatic tools, drilling equipment, and ventilation control underground.	0.059 ha
Batch plant	Produces concrete or shotcrete used for underground support, such as lining tunnels or stabilising rock walls.	0.199 ha
Run of Mine pad	An area where mined ore is temporarily stored before being crushed or processed. It allows for blending and quality control of ore before it enters the processing plant.	4.973 ha
Waste Rock Dump	A designated area for disposing of non-economic rock material removed during mining before reclaimed for backfilling stopes underground.	4.566 ha
Laydown area	For storing equipment, materials, and supplies used in mining operations. It supports logistics and maintenance activities.	2.073 ha
Workshop/fuel bay	Facilities for maintaining and refuelling mining equipment. These are essential for minimising downtime and ensuring operational efficiency.	1.741 ha
Change room/lamp room	Provides miners with a place to change into work gear and collect safety equipment like cap lamps and PPE before entering underground.	0.663 ha
Dewatering boreholes	Groundwater wells are used to extract water from the underground workings for operational use (such as process water).	0.005 ha
Clarifier	Water from the underground mine working is pumped from an underground sump to the clarifier for treatment. The clarifier is a water treatment unit that removes suspended solids from water, making it suitable for reuse or safe discharge.	0.757 ha
Freshwater supply system	Water will be abstracted from existing boreholes and stored in new water tank to provide clean water for drinking, sanitation, and other non-industrial uses	0.138 ha
Substation	Converts and distributes electrical power to various parts of the mine. It's critical for powering equipment, lighting, and ventilation systems.	0.023 ha
Powerline	Transmits electricity from the national grid or on-site solar power generation and power plant to the substation and other facilities.	4,195 m (linear)
Light vehicle road	Used by smaller vehicles for personnel transport, inspections, and light logistics.	1 720 m (linear)
Heavy vehicle road	Designed for haul trucks and other large machinery to transport ore, and materials.	4 792 m (linear)

Infrastructure	Description	Area (m^2)
Game farm fence	A protective barrier to separate mining operations from surrounding wildlife areas or conservation zones. It helps prevent animal intrusion and supports biodiversity management.	5 020 m (linear)

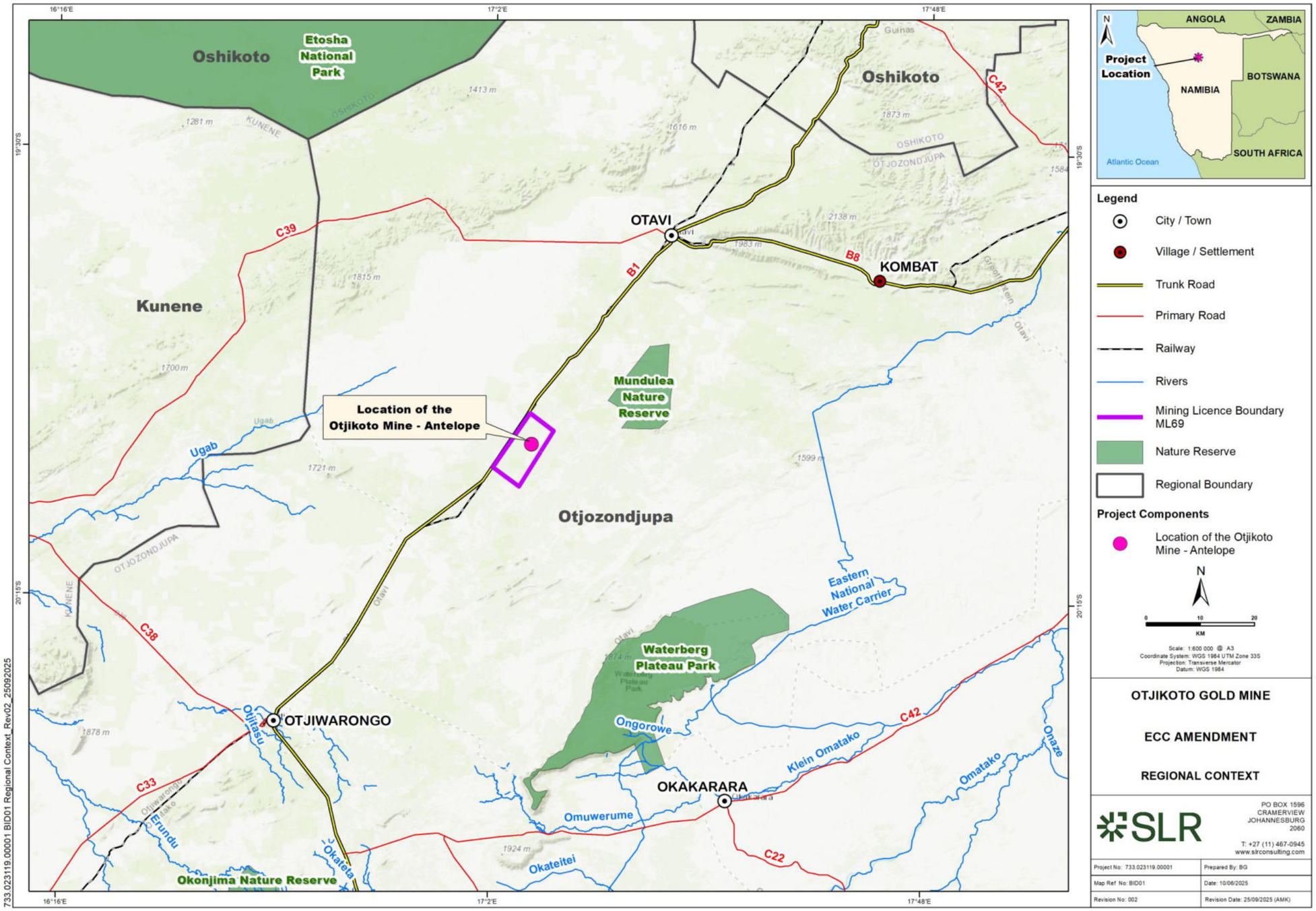

Figure 1-1: Regional Context of the Proposed Project

1.3 Summary of EIA Findings

A summary of the positive and negative environmental impacts is provided in Table 1-2 below.

Table 1-2: Summary of Positive and Negative Environmental Impacts

	Issue	Relevant Project Phase			Significance Rating Impact Assessment	
		Construction	Operation	Decommissioning and Closure	Unmitigated Scenario	Mitigated Scenario
BIOPHYSICAL	Loss of Soil and Land Capability Through Contamination	X	X	X	Medium	Low
	Loss of Soil and Land Capability Through Physical Disturbance	X	X	X	High	Low
	Lowering of Groundwater Levels Affecting Third Party Supply	X	X	X	Medium	Low
	Contamination of Groundwater Resources from Mine Residue Deposits Affecting Third Party Supply		X	X	Medium	Low
	Contamination of Groundwater Resources from Hazardous Waste and Chemicals Affecting Third Party Supply	X	X	X	Medium	Low
	Habitat Loss and Fragmentation	X	X	X	High	Medium
	Disruption to the Local Faunal Communities and Faunal SCC	X	X	X	Medium	Very Low
	Continued Habitat Degradation			X	Medium	Low
	Increase in Ambient Noise Levels Affecting Sensitive Receptors	X		X	Low	Low
			X		Medium	Low
	Surface Blasting Impacts During Construction Affecting Sensitive Receptors and Third Party Infrastructure	X			Medium	Low
	Underground Blasting Impacts During Operation Affecting Sensitive Receptors and Third Party Infrastructure		X		Low	Very Low

	Issue	Relevant Project Phase			Significance Rating Impact Assessment	
		Construction	Operation	Decommissioning and Closure	Unmitigated Scenario	Mitigated Scenario
	Increase in Ambient Air Pollutant Concentrations for Proximate Sensitive Receptors	X			Medium	Low
			X		Medium	Medium
CULTURAL HERITAGE	Direct Loss or Damage to Burial Cairn	X	X	X	High	Very Low
SOCIO-ECONOMIC	Generation of Negative Visual Views Affecting Sense of Place	X	X	X	Medium	Low
	Increase in Traffic Volumes Affecting the Safety of Road Users	X	X	X	High	Low
	Economic Benefit to National and Local Economies	X	X		Very High	Very High
	Job Creation and Skills Development	X	X	X	Very High	Very High
	Loss and Sterilisation of Mineral Resources		X	X	Very High	Low
	In-migration Impacts on Local Communities and Service Provision	X	X	X	High	Medium
	Hazardous Excavations and Infrastructure which can be Harmful to Third Parties and Animals	X	X	X	Medium	Low
	Mine Decommissioning and Closure Resulting in Loss of Jobs and Economic Benefits			X	High	Medium

1.4 Purpose of the EMP

The purpose of an Environmental Management Plan (EMP) is to outline how the environmental and social impacts identified during the Environmental Impact Assessment (EIA) process will be managed, mitigated, and monitored throughout the lifecycle of a proposed Project. The EMP serves as a practical tool that guides proposed Project developers, operators, and stakeholders in ensuring that a proposed Project's adverse impacts are minimised, and positive outcomes are enhanced. The purpose of the EMP is provided in Figure 1-2.

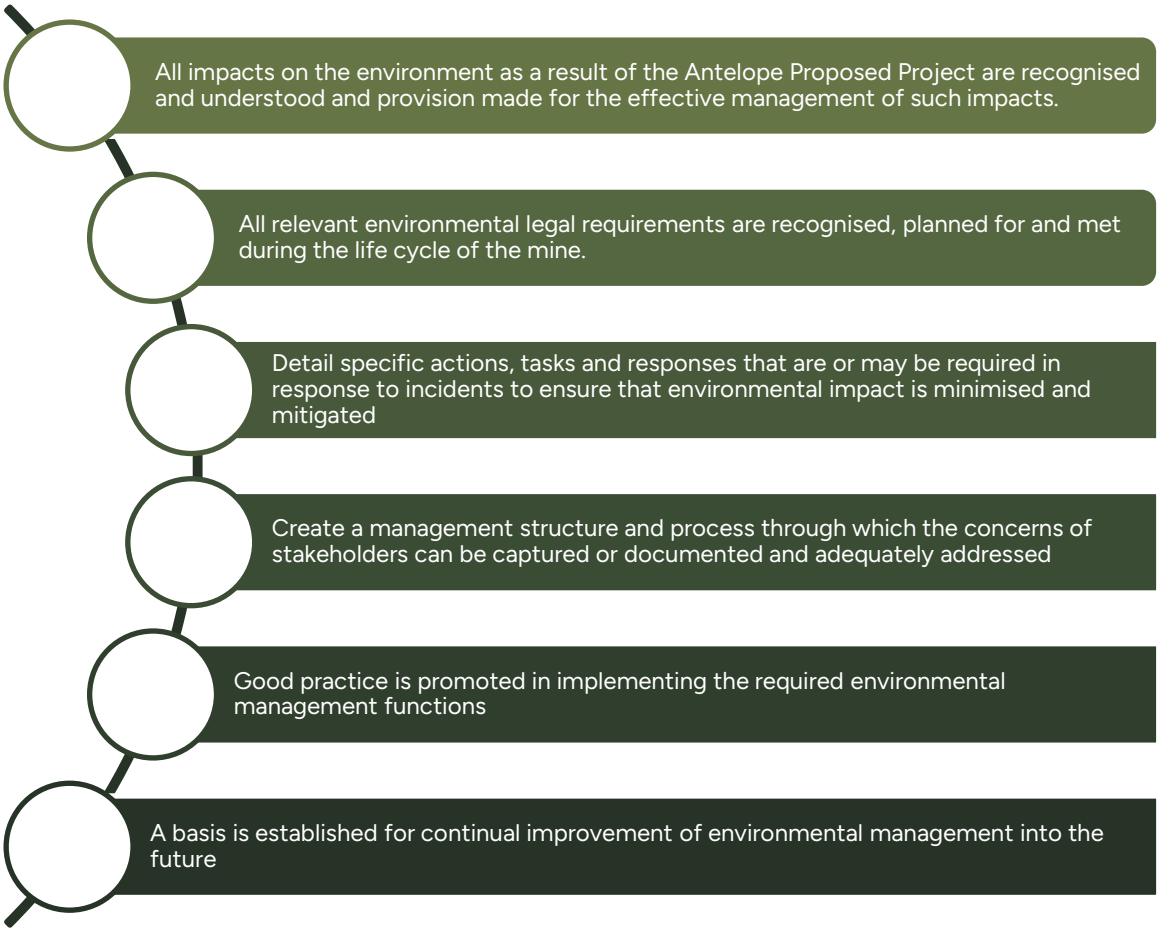

Figure 1-2: Purpose of the EMP

This EMP is submitted together with the EIA for the Otjikoto Gold Mine Environmental Clearance Certificate Amendment. B2Gold currently implement the approved consolidated EMP (Annexure 1), dated September 2021, for the OGM operations and this EMP is specific to the Antelope Deposit.

1.5 Legislative Requirements for the EMP

The EMP has been compiled in compliance with the requirements of the Environmental Impact Assessment Regulations, Government Notice No. 30 of 2012, Government Gazette No. 4878, 6 February 2012, promulgated under the Environmental Management Act, 2007 (Act No. 7 of 2007), Namibia. The legislative requirements and reference to where these are addressed are provided in Table 1-3.

Table 1-3: Content of the EMP

EIA Regulation requirement	EMP Reference
Details of the persons who prepared the EMP and the expertise of those persons to prepare an environmental management plan.	Section 1.6
A description of the aspects of the activity that are covered by the EMP.	Section 2.0
Information on any proposed management or mitigation measures to address the environmental impacts that have been identified in a report contemplated by these regulations, including environmental impacts or objectives in respect of – • Planning and design • Construction activities • Operation or undertaking of the activity • Closure, where relevant	Section 4.0
An identification of the persons to be responsible for the implementation of the mitigation measures.	Section 4.0
Proposed mechanisms for monitoring compliance with the EMP and reporting on it.	Section 0 and 5.0

1.6 Details of the EAP who prepared this EMP

SLR, the independent firm of consultants who compiled the EIA Report for the proposed Project, has also compiled this EMP. A table of the proposed Project team is provided in Table 1-4.

Table 1-4: Environmental Project Team

Team	Name	Designation	Tasks and roles	Company
Environmental Proposed Project Team	Natasha Smyth	Proposed Project Quality Assurance and Reviewer	Report review and approval (Quality Control and Assurance)	SLR Consulting
	Lester Harker	Technical Proposed Project Manager	Legislative oversight and B2Gold liaison	
	Njabulo Mzilikazi	Proposed Project Manager	Management of the process, team members, and other stakeholders. Report and process review.	
	Kristy van der Hoven	Technical Assistant	EIA Report compilation	
Specialist Investigations	Nansunga Kambinda	Groundwater Specialist	Groundwater Assessment	SLR Consulting
	Hesma Smith			
	Barend van der Merwe	Noise Specialist	Noise Assessment	dBA Acoustics
	Loren Dyer	Air Quality Specialist	Air Quality Assessment	SLR Consulting
	Lisa Hester	Biodiversity Specialist	Biodiversity Impact Assessment	SLR Consulting

Team	Name	Designation	Tasks and roles	Company
	Dr Alma Nankela	Archaeologist	Cultural Heritage Assessment	RCHeritage Services

2.0 Proposed Project Overview

2.1 Existing Operations at Otjikoto Gold Mine

B2Gold currently implement the approved consolidated EMP, dated September 2021, for the OGM operations. Information in this section of the report is derived from the approved EMP (B2Gold, 2021).

Mining operations have taken place at the OGM since December 2014 at the following two pits via different mining methods:

- The Otjikoto pit is mined through the open pit mining method; and
- The Wolfshag pit was mined through both open pit (mining completed in 2021) and currently through underground mining methods.

A brief overview of the existing operations is discussed in the sections below and the key existing facilities are shown in Figure 2-1.

2.1.1 Ore Excavation

The Otjikoto pit is mined through conventional open pit mining methods using drill, blast, load and haul techniques. The Wolfshag pit was also mined through the open pit mining method (completed in 2021), while underground mining is currently conducted. Underground mining at the Wolfshag pit is used to extract ore at depth via a portal located in the Otjikoto Pit. Longhole stoping is carried out using conventional ring drilling, employing a modified transverse stoping method with a primary and secondary mining sequence.

Excavated ore and waste from the Otjikoto opencast pit and the underground Wolfshag pit are loaded by large hydraulic excavators and hauled using rigid dump trucks. The ore is loaded and hauled to a single ROM pad. Excavated waste rock material is stockpiled on the WRD. All low-grade material (with a grade range greater or equal to 0.25 g/t) is stockpiled on the LGD for post-mining reclamation and processing. Topsoil from stripping activities has been stockpiled separately for rehabilitation purposes.

2.1.2 Mineral Processing Activities

Following ore extraction, the mined ore material is stockpiled at the ROM pad before being processed. ROM ore is fed to a primary crusher and pebble crusher for blending, crushing, milling, leaching and gold extraction. The crushed rock is delivered to the Processing Plant by means of an 800m conveyor belt, that deposits material onto a storage stockpile. The Processing Plant has capacity for 3.4 mtpa ROM ore feed. The final processed ore yields gold bars, which are shipped for export.

The metallurgical processing route (Figure 2-2), consists of the following main processes:

- Single Stage Crusher and Pebble Crusher;
- Two stage milling (SAG Mill and Ball Mill), classification and gravity circuit;
- Intensive Cyanidation of the Gravity Concentrate (Knelson Concentrator);
- Cyanide Leaching of the mill cyclone overflow (Leach Tanks);
- Carbon adsorption (Carbon in Pulp Tanks); and
- Elution, electro winning, regeneration and smelting (Furnace).

Tailings generated in the leaching section of the Processing Plant is stored in the lined TSF. Process water from the tailings dam is stored in the return water dam for re-use.

Figure 2-1: Existing Infrastructure Layout

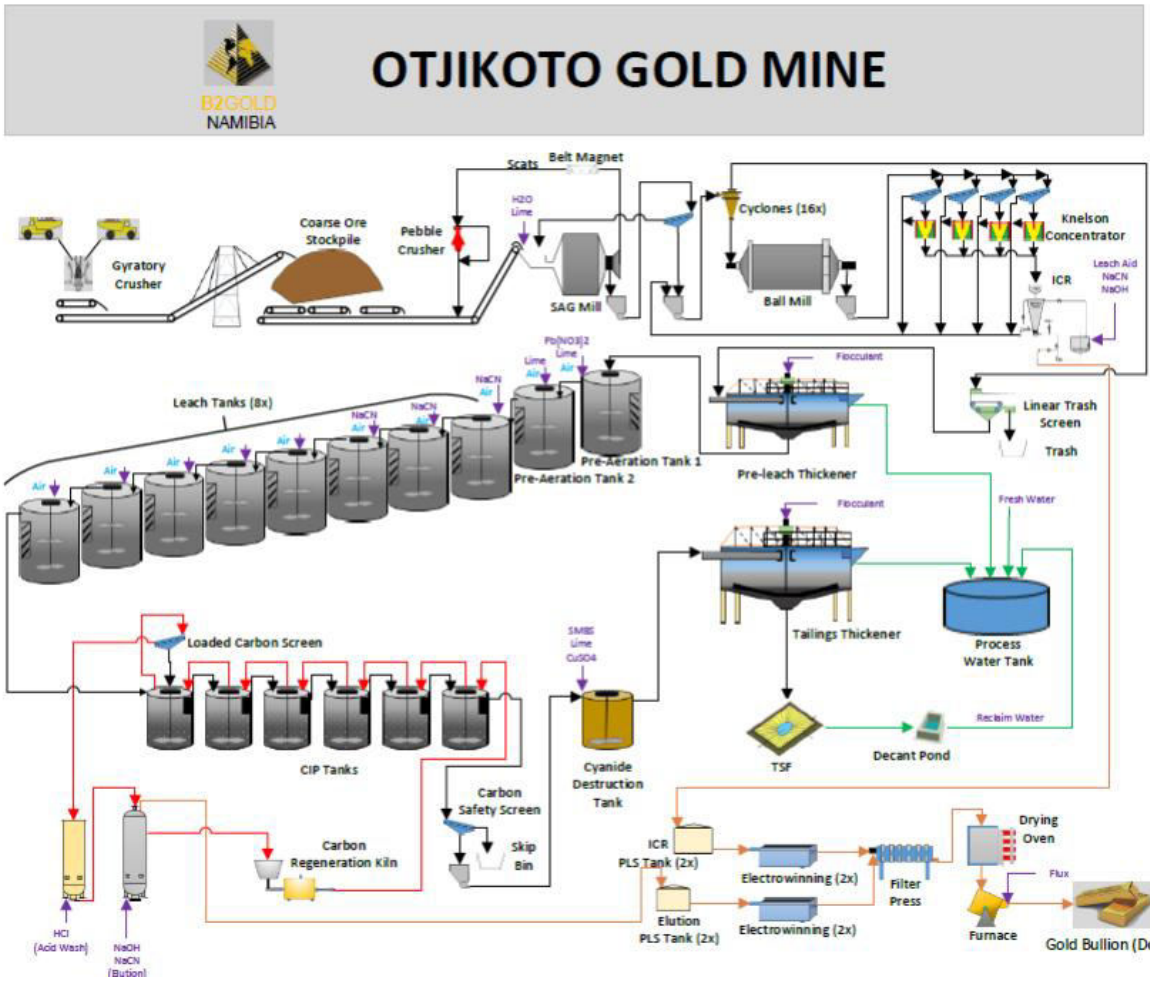

Figure 2-2: Schematic Diagram of the Metallurgical Process Flow

2.1.3 Key Support Infrastructure

Current key support infrastructure includes internal haul roads, workshops, warehouses, groundwater supply boreholes, stormwater management infrastructure, power supply infrastructure (generators, solar farm and NamPower), airstrip, construction camp and administrative infrastructure.

2.2 Exploration Activities

To date, exploration has been undertaken on the existing ML, which has resulted in the discovery of a new potential viable resource within the licence, known as the Antelope deposit.

The Antelope deposit was discovered in 2022, following a targeted deep drilling campaign. This campaign was informed by advanced 3D modelling of airborne electromagnetic data, which helped identify promising subsurface structures. Following its discovery, B2Gold rapidly advanced exploration efforts at the Antelope Deposit. By the end of 2024, the company had invested approximately $8 million in exploration activities across the Otjikoto area. This included over 45,000 meters of combined diamond and reverse circulation drilling. These efforts delineated three main mineralized zones within the Antelope Deposit: the

Springbok, Oryx, and a potential third zone named Impala, which remains under evaluation through ongoing drilling.

The Inferred Mineral Resource estimate that forms the basis of the Preliminary Economic Assessment (PEA) includes 1.75 million tonnes grading 6.91 g/t gold, totalling approximately 390,000 ounces of gold, with the majority hosted in the Springbok Zone.

The Antelope Deposit is located about 4 km southwest of the existing Otjikoto open pit and lies within the current ML area. This proximity allows B2Gold to integrate the new deposit into its existing operations efficiently. B2Gold plans to develop Antelope as an underground mine, drawing on its experience from the nearby Wolfshag underground operation. This approach not only optimizes infrastructure use but also streamlines permitting and environmental management.

The PEA outlines a 5-year life of mine for the Antelope underground operation, with an average processed grade of 5.75 g/t gold and total gold production of approximately 327,000 ounces. The average annual gold production is expected to be 65,000 ounces, with a gold recovery rate of 95%. When combined with LGD processing, Otjikoto's total annual production is proposed Projected to average 110,000 ounces from 2029 to 2032.

2.3 New Proposed Operations at Otjikoto Gold Mine

The underground mining activities for the new Antelope deposit, as described above, are already approved as part of the existing ECC for the OGM. However, additional surface infrastructure within the ML is required to enable extraction of this newly discovered resource. Accordingly, the scope of the ECC Amendment is limited to the development of surface ventilation infrastructure. The proposed Project includes the following (refer to Figure 2-3):

- Portal to access underground mining area;
- Ventilation shaft for air circulation while working underground;
- Dewatering boreholes to remove water from underground and for use as process water;
- Water reticulation, including a new water tank joined by an existing pipeline to a new clarifier to treat water from underground;
- Power reticulation, including a powerline that will run from an existing substation at the processing plant to a proposed substation;
- Light and heavy vehicle roads for site access and to transport ore from the new ROM pad to the existing processing plant;
- Mineral waste generated from mining is stockpiled as waste rock at the new WRD; and
- Other infrastructure including a batch plant, workshop/fuel bay, change room/lamp room, laydown area, compressor and game farm fence.

Figure 2-3: Proposed Layout Plan

2.4 Key Activities and Facilities

The activities[1] and facilities[2] during each proposed Project phase (construction, operational, decommissioning, closure) associated with the proposed Project are provided in the table below. For the purposes of this report, in broad terms:

- The construction phase covers the initial site preparation and actual construction of the infrastructure.
- The operational phase covers the production phase.
- The decommissioning phase covers infrastructure removal and the preparation of the site for final rehabilitation.
- The closure phase refers to the period when maintenance and aftercare of rehabilitated areas and facilities is required to ensure closure objectives are met.

[1] An activity is defined as a distinct process undertaken by an organisation for which a responsibility can be assigned. It is the physical activity involved.

[2] A facility is the physical structure or equipment that has the potential to impact on the biophysical, cultural and socio-economic environment.

Table 2-1: List of Key Actions / Activities / Processes

Main Activity/Facility	Sub-activities and facilities	C	O	D	C
Site Preparation: Vegetation Clearance	Bush clearing to be in line with the existing biodiversity management plan procedures.	ü			
Site Preparation: Topsoil Stripping and Stockpiling	Stripping and stockpiling of soil resources to be in line with the existing soil management plan procedures.	ü			
Site Preparation: Earthworks	Construction of laydown area.	ü			
	Continued use of the existing vehicle maintenance facility.	ü			
	Cleaning, grubbing, bulldozing and cut-and-fill to create terraces.	ü			
	Digging trenches and foundations.	ü			
	Establishing stormwater controls (channels, berms) for new infrastructure as per the existing stormwater management plan procedures.	ü			
	Establishment of the portal boxcut excavation.	ü			
	Stockpiling of waste rock during the establishment of the boxcut.	ü			
Construction of Structural Foundations	Use of laydown area.	ü			
	Foundation excavations and compaction.	ü			
	Erection, use of scaffolding and cranes.	ü			
	Mixing of concrete and concrete work, such as concrete plinths.	ü			
	Steelwork (including installing reinforcement steel, grinding and welding).	ü			
	Continued use of the existing vehicle maintenance facility.	ü			
	Storage and handling of fuel, lubricants, sand, rock, cement, and chemical additives in cement.	ü			
Construction of Buildings and Facilities	Use of laydown area.	ü			
	General building activities and erection of structures (batch plant, workshop/fuel bay, change room/lamp room, compressor).	ü			

Main Activity/Facility	Sub-activities and facilities	C	O	D	C
	Develop the portal through a ramp/decline from surface to provide access to the orebody and for haulage of the ore to surface.	ü			
	Construct a ventilation shaft system (including drifts and raises, fans, monitoring equipment and warning systems).	ü			
	Establishment of game farm fence to separate mining operations from surrounding wildlife areas.	ü			
	Drill dewatering boreholes to remove water from underground workings to allow for a safe working environment and for use as process water.	ü			
	Construct a new water tank and clarifier to join the existing pipeline to store and treat water from underground workings to be used as process water.	ü			
	Storage and management of waste (general, hazardous and sewage).	ü			
Road and Transport Infrastructure	Traffic management to be in line with the existing traffic management plan procedures.	ü	ü		
	The existing B1 road will be used to access the main gate to the OGM. Several existing tracks/gravel roads will be used during construction.	ü	ü		
	Construct and use new light and heavy vehicle roads for site access and to transport ore from the new ROM pad to the existing processing plant.	ü	ü		
Power Supply Infrastructure	Power use to be in line with the existing resource management plan procedures.	ü	ü		
	A genset will be used for early construction works, while the powerline is being constructed.	ü			
	Construct and use a new substation and powerline that will run to the existing substation at the processing plant.	ü	ü		
Water Supply Infrastructure	Water use to be in line with the existing resource management plan procedures.	ü	ü		
	Use of dewatering boreholes to remove water from underground workings.	ü	ü		
	During operation, underground water will be pumped from underground sumps via an existing pipeline to the new clarifier for treatment to be used as process water.	ü	ü		

Main Activity/Facility	Sub-activities and facilities	C	O	D	C
	A freshwater supply system will be installed for freshwater use during construction, which consists of a plastic 10 000 L tank, to provide clean water for drinking, sanitation, and other non-industrial uses. Water will be supplied from existing boreholes.	ü	ü		
Mineralised ore and waste management	Waste management to be in line with the existing waste management plan procedures.		ü		
	Waste rock generated will be disposed of at the new WRD.		ü		
	Tailings generated from underground operations will be disposed of into the existing TSF.		ü		
Non-mineralised (general and hazardous) waste management	Waste management to be in line with existing waste management plan procedures.	ü	ü		
	Collection and separation of general and hazardous waste.		ü	ü	
	Recycling, reuse, and storage of hazardous waste and contaminated soil.		ü	ü	
	Continued use of the on-site incinerator to reduce the volume of hazardous waste generated on site. Disposable hazardous waste will continue to be disposed of at a registered hazardous waste disposal facility in Walvis Bay.		ü	ü	
	Continued use of the incinerator for the disposal of medical waste.		ü	ü	
	Continued use of the on-site landfill facility for non-recyclable non-hazardous material (general waste).		ü	ü	
	Sewage will continue to be collected and transported to the Sewage Treatment Plant for treatment.		ü	ü	
Stormwater management	Stormwater management to be in line with the existing surface water management plan procedures.	ü	ü		
	Separation of clean and dirty water.	ü	ü		
	Operation and maintenance of stormwater management infrastructure.		ü		
Underground mining operations	Removal of waste rock from underground using drilling and blasting to the surface at the WRD via the portal decline.		ü		
	Removal of ore from underground using drilling and blasting to the surface for stockpiling at the ROM pad via the portal decline.		ü		
	Backfill with cemented rock fill (CRF).		ü		
	Ventilation via vent shaft and ventilation raises.		ü		
Mineral Processing	Transfer of ore to the ROM pad from underground workings.		ü		

Main Activity/Facility	Sub-activities and facilities	C	O	D	C
	RoM ore will be fed to the existing primary crusher and pebble crusher for blending, crushing, milling, leaching and gold extraction.		ü		
	The crushed rock will be delivered to the Processing Plant by means of an 800 m conveyor belt, that deposits material onto a storage stockpile.		ü		
Site management	Continued site management (monitoring, inspections, maintenance of facilities, security, access control).	ü	ü	ü	
	Continued environmental awareness training and emergency response.	ü	ü	ü	
Demolition	To be in line with the decommissioning and closure management plan procedures.				
	Dismantling and demolition of all infrastructure and removal of equipment.			ü	
	Slope stabilisation, erosion control and landscaping.			ü	
	Revegetation of final landforms remaining in perpetuity (waste rock and TSF).			ü	
	Re-vegetation of disturbed areas and where infrastructure is removed.			ü	
	Restoration of natural drainage patterns as far as practically possible.			ü	
Rehabilitation, maintenance and aftercare	Removal of alien invasive species from disturbed and rehabilitated sites.				ü
	Maintenance and repair of post closure landforms, facilities, and rehabilitated areas.				ü

3.0 Environmental Management and Framework

3.1 Environmental Management Philosophy

The environmental management philosophy consists of five broad components and is illustrated in Figure 3-1 below.

Figure 3-1: Environmental Management Philosophy

3.1.1 Environmental Policy

The Environmental and Biodiversity Policy ("the Policy") addresses B2Gold's key environmental risks and reflects their dedication to identifying and minimizing the impact on, and conserving the quality of, the natural environments in areas where they operate. The following sections are taken from the Policy (Annexure 2).

3.1.1.1 Transparency and Governance

B2Gold strives to maintain open and transparent dialogue with stakeholders on environmental aspects of our activities. To meet this commitment, the Company will:

- Maintain processes for receiving and responding to stakeholder concerns with respect to our environmental impacts and activities;
- Work with relevant local representatives in the communities in which we operate to educate communities on the environmental obligations associated with our activities;

- Monitor, assess, and audit our operations to evaluate the effectiveness of our environmental management systems, and communicate findings to the Health, Safety, Environment, Social and Security Committee of the Board of Directors; and
- Continuously increase transparency in our public disclosure on environmental matters, particularly regarding environmental risk management.

3.1.1.2 Environmental Stewardship

B2Gold is committed to complying with all applicable environmental statutory obligations, internal Environmental and Biodiversity Performance Standards, and relevant industry guidelines. We aim to continually improve our environmental performance over time and to promote sustainable development in the areas in which we operate. To achieve these commitments, the Company will:

- Establish and maintain effective environmental management systems, aligned with ISO 14001:2015 and other internationally accepted standards (including the International Cyanide Management Code), to identify, monitor, and eliminate or mitigate environmental impacts;
- Apply a proactive risk-management approach to safeguard and protect the environment;
- Ensure that B2Gold Personnel carry out their responsibilities in accordance with this Policy, and require employees to undertake relevant training;
- Prepare for, and maintain capability to, effectively respond to emergencies with environmental impacts, including hazardous substances or environmental releases; and
- Adopt appropriately funded reclamation and closure strategies for B2Gold operations, from exploration through closure.

3.1.1.3 Water

B2Gold acknowledges access to water as a human right and a requirement for priority biodiversity values. The Company recognizes the sensitivity around water management and water scarcity. We commit to:

- Conserve and protect local water resources;
- Monitor our usage of water resources in our areas of operation; and
- Continually improve water management systems and their efficiency.

3.1.1.4 Tailings and Waste Management

- We commit to responsible storage, handling, and disposal of mineral, non-mineral, and hazardous waste.
- We will maximize waste recovery and recycling processes throughout the mine life cycle, where feasible.
- We will continually research and implement tailings and waste management best practices to achieve the safe and secure management of mine tailings facilities.

3.1.1.5 Climate Risk Management

B2Gold acknowledges that human activities contribute to climate change and recognizes that society, including business, has a responsibility to address our climate impacts. B2Gold

supports the goal of “net zero” greenhouse gas emissions and the goals outlined in the Paris Climate Agreement. As a Company, we are committed to:

- Setting and achieving long-term science-based targets to manage our global energy consumption;
- Implementing renewable energy and low-carbon technologies and solutions to meet our climate goals and objectives; and
- Providing our stakeholders with the necessary information to make informed decisions regarding our climate risks and opportunities, and our management and performance relating to these risks.

3.1.1.6 Biodiversity and Land Use

B2Gold is committed to the conservation of biodiversity and an integrated approach to land use planning. B2Gold aims to manage biodiversity risks and impacts in accordance with the mitigation hierarchy to ensure that there is no net loss of critical habitat. To meet these commitments, we will:

- Comply with legal requirements regarding protected areas and species;
- Not explore or operate in declared World Heritage Sites;
- Identify priority biodiversity values and undertake biodiversity risk and impact assessments;
- Avoid, minimize, and restore potentially impacted priority biodiversity values, and where necessary, implement compensatory conservation measures; and
- Respect local communities and Indigenous Peoples’ rights and values for biodiversity resources and involve them in developing and agreeing on appropriate management strategies for potential impacts.

B2Gold is proud of its commitment to the environment and will continually strive to improve environmental performance and reduce their environmental impact. B2Gold will review this Policy on a regular basis and will make revisions, as necessary.

3.1.2 Planning

The planning phase of an EMP is a critical component of ensuring that a proposed Project is executed in a manner that responsibly addresses potential adverse environmental, cultural, and social impacts. This phase is not just about compliance with regulatory requirements but also about aligning the proposed Project with international best practices. The planning process involves a systematic approach to setting clear objectives, developing mitigation measures, and establishing performance indicators. These elements work together to guide the implementation and monitoring of the proposed Project, ensuring that environmental and social risks are effectively managed throughout the proposed Project’s lifecycle. The outputs of the planning phase of this EMP are included in Section **Error! Reference source not f ound.**.

3.1.2.1 Setting Objectives

The first step of the planning phase lies in the development of objectives for each of the biophysical, cultural, and social impacts identified during the EIA Process. This process, known as objective-based planning, is essential for translating the broad environmental and social goals of the proposed Project into specific, actionable outcomes. Objectives are designed to be outcome-focused, meaning they are intended to achieve specific, measurable results that directly address the impacts identified in the EIA. *For example, if the EIA highlights potential impacts on local water quality, an objective might be to ensure that*

water quality remains within safe limits for human consumption and ecosystem health throughout the proposed Project's operation. Each objective serves as a clear statement of what the Proposed Project aims to achieve in terms of environmental and social performance.

3.1.2.2 Mitigation Measures

Mitigation Measures are the practical steps taken to address the impacts identified in the EIA, structured around the mitigation hierarchy. This hierarchy provides a sequential approach to managing environmental and social impacts, prioritising the most effective actions to minimise harm. The mitigation hierarchy includes the following:

- **Avoidance:** The first step in the hierarchy is to avoid adverse impacts altogether wherever possible. This might involve altering the proposed Project design, changing the location of certain activities, or adopting alternative technologies that have a lower environmental footprint.
- **Minimisation**: If avoidance is not feasible, mitigation measures to reduce and/or manage impacts on the biophysical, cultural, and socio-economic environments need to be identified and implemented throughout a proposed Project's life cycle.
- **Restoration/Rehabilitation:** Most rehabilitation requirements are linked to the rehabilitation of unavoidable impacts. Restoration/rehabilitation refers to measures provided to return impacted areas to a near-natural state during the proposed Project life cycle (concurrent rehabilitation) or at closure.
- **Offset/Compensation:** If impacts cannot be avoided, minimised, or fully restored, compensatory measures are implemented as a last resort to offset the residual impacts. This could involve creating new habitats elsewhere, providing alternative livelihoods to affected communities, or investing in conservation proposed Projects that provide broader environmental benefits.

By following the mitigation hierarchy, the EMP ensures that environmental and social impacts are managed in a structured, prioritised way, with an emphasis on avoiding and minimising harm before considering restoration or compensation. This approach demonstrates a commitment to sustainable development and responsible proposed Project management. The mitigation measures that have been identified for the proposed Project are included in Section **Error! Reference source not found.**.

3.1.2.3 Management Plans

One key output of mitigation measures in environmental and social management is the development of comprehensive site-specific and phase-specific management plans. These plans integrate various mitigation measures into a structured framework, providing a roadmap for their implementation. Where a management plan needs to be developed, this has been indicated in Section 4.0 and will be developed by B2Gold.

3.1.3 Implementation and Operation

Implementation and operation serve to define how the mitigation measures will be implemented (Refer to Section 5.2). Roles, responsibilities, and training play an important role in ensuring implementation.

3.1.3.1 Roles and Responsibilities

The first and most important mechanism for implementing environmental management requirements is clearly articulating the roles and responsibilities associated with the various environmental management requirements. It is important to note that roles and

responsibilities include dedicated environmental management roles and establishing roles and responsibilities for all company personnel.

A key element of any large-scale proposed Project is ensuring that employees on-site understand and properly implement the environmental management requirements as part of their contracted activities.

3.1.3.2 Training

Together with defining the roles and responsibilities, it is necessary to develop an overarching training programme that will serve to equip proposed Project personnel to fulfil their roles and responsibilities whilst both sustaining and then advancing the overall levels of capability. Training may, and should, extend across awareness building, dedicated task-specific training, ‘out of the box’ training that serves to find new and innovative ways of improving performance and training that ensures that personnel who are required to fulfil an environmental management function understand the requirement, believe in the importance of the requirement, and have the necessary skills and capacity to fulfil that function.

3.1.4 Checking and Corrective Action

3.1.4.1 Monitoring

Checking and corrective actions are critical components that ensure the environmental policy's objectives are met. Checking involves regular inspections, audits, and assessments to verify that all environmental management activities are implemented according to the EMP and relevant legislation. If any discrepancies or non-compliance issues are identified, corrective actions are initiated to rectify these issues. Corrective actions are not only about fixing problems but also about preventing them in the future. Monitoring is intrinsically linked to the checking and corrective action processes. It involves the systematic observation and measurement of environmental parameters to track the impact of the organisation's activities on the environment.

3.1.4.2 Reporting

The findings of all of the above need to be structured into instructive reporting that provides information to all required parties on environmental management performance, together with clearly defined corrective action where this is seen to be required. All of the above must be conducted systematically and continuously, and preferably independently of the activity or facility in question. Records of the information must be maintained and protected, but the information itself must be readily and easily accessible on an ongoing basis. Within the reporting structure, it is necessary to create a review function that continuously assesses the reporting and prescribes the necessary corrective action. Reporting must also include the provision of information on environmental performance to external stakeholders and surrounding communities.

3.1.5 Management Review

The final component of the EMP is a formal management review (refer to Section 6.2) that takes place at defined intervals. The purpose of the management review is for senior management to review the environmental management performance and to propose measures for continual improvement. An essential part of the management review process is ensuring that senior personnel appreciate their responsibilities and obligations in ensuring that the environmental management performance is commensurate with the nature of the business and that the spirit of continual improvement is both supported and promoted

4.0 Management Actions and Objectives

Table 4-1 details the commitments that B2Gold must implement as part of the proposed Project. The information in this section has been sourced from the Air Quality, Noise, Biodiversity, Groundwater, and Heritage studies commissioned by SLR for the proposed Project and the EIA report. New management actions (i.e. do not appear on the existing EMP) are written in blue text. These must be undertaken in line with B2Gold's Environmental and Biodiversity Standards (please see Section 3.0 and Annexure 2: Environmental and Biodiversity Policy

Annexure 3). The description of impacts corresponds to those assessed in the EIA. Responsibility lies with those who are indicated, even if they are delegating to mine personnel.

Table 4-1: Environmental Management Commitment Register

Impact topic	Impact	Objective	Management Actions	Phases for implementation	Responsibility
Soils and Capability	• Loss of Soil and Land Capability Through Contamination • Loss of Soil and Land Capability Through Physical Disturbance	Prevent or minimise loss of soil resources and maintain soil resources to support post closure rehabilitation.	Clearly demarcate soil stockpiles to identify the soil type and the intended area of rehabilitation.	Construction and Operation	Environmental Manager
			Store mineral waste material separate from soil stockpiles.	Construction and Operation	Mining Manager and Environmental Manager
			Avoid mixing topsoil and subsoil.	Construction and Operation	Environmental Manager
			Ensure wastewater run-off is controlled and intercepted to prevent loss of soil and contamination.	Construction and Operation	Environmental Manager
			Restrict the mixing of concrete and the cleaning of mixing equipment to lined or impermeable surfaces.	Construction and Operation	Environmental Manager
			Ensure hydrocarbon products and chemicals are safely stored and handled to prevent contamination of soil.	Construction, Operation and Decommissioning	Supply Chain Manager and Environmental Manager
			Ensure that all spills are cleaned up immediately and reported via the Incident Management procedure.	Construction, Operation and Decommissioning	Environmental Manager
			Limit the disturbance of soil to areas where stripping activities are identified.	Construction and Operation	Environmental Manager
			Investigate the possibility of establishing stormwater diversion berms to prevent run-off erosion around stockpiles.	Construction and Operation	Environmental Manager
			Limit equipment movement on top of the soil stockpiles, to minimise compaction.	Construction and Operation	Environmental Manager
			Handle soils in dry weather conditions to cause as little compaction as possible.	Construction, Operation and Decommissioning	Environmental Manager
			Strip and stockpile together with any vegetation cover present the utilisable soil (top 300 mm of soil or until hard rock is encountered where soil depths are <300 mm).	Construction and Operation	Environmental Manager
			Rehabilitate all exposed soils, where practicable, by replanting indigenous vegetation.	Decommissioning	Environmental Manager
			Use “before’ and “after” photographic records to monitor and minimise the mixing of different soil types and excessive removal of vegetation and topsoil.	Construction and Operation	Environmental Manager
Groundwater	• Lowering of Groundwater Levels Affecting Third Party Supply • Contamination of Groundwater Resources from Mine Residue Deposits Affecting Third Party Supply • Contamination of Groundwater Resources from Hazardous Waste and Chemicals Affecting Third Party Supply	• Maintain groundwater availability and quality for third-party users by preventing significant drawdown, minimising contamination risks, and ensuring compliance with regulatory and lender standards.	Conduct thorough hydrogeological investigations to map aquifers, faults, and groundwater flow patterns before construction to allow for optimal placement so that the shaft and mineworks do not intersect fold axes, faults and sheer zones, if practical. These studies should include field geophysics, drilling and aquifer testing and analysis of field data.	Pre-construction	Technical Services Manager, Engineering Manager and Mining Manager
			Engineering controls must be implemented during construction for effective water management. This could include grouting and sealing to reduce water inflow and prevent preferential flow paths, or the installation of impermeable linings in shafts and tunnels to prevent water ingress and minimize hydraulic connectivity.	Construction	Engineering Manager
			Implement controlled dewatering management systems by means of strategically placed boreholes or sumps to manage inflows but also ensuring that drawdown is localized and does not affect surrounding aquifers excessively.	Construction and Operation	Engineering Manager, Mining Manager and Environmental Manager
			Develop protocols/ action plans for responding to unexpected changes in groundwater behaviour, such as sudden inflows or contamination.	Construction and Operation	Mining Manager and Environmental Manager
			The infrastructure should be moved west, and placing structures like the Antelope WRD, ROM pad, or any other hazardous facilities directly on Karibib Marble should be avoided.	Pre-construction and Construction	Technical Services Manager, Engineering Manager and Mining Manager

Impact topic	Impact	Objective	Management Actions	Phases for implementation	Responsibility
			Establish baseline groundwater data at the proposed Project footprint to monitor changes over time.	Pre-construction	Environmental Manager
			Undertake additional geochemical testing of core and tailings test material of the host rocks at the Antelope Deposit to confirm acid rock generation potential and metal leach results.	Preconstruction or Construction	Mining Manager and Environmental Manager
			Maintain and continue to monitor the integrity of liners and seepage collection systems around mine residue deposits i.e. TSF and WRD.	Construction, Operation and Decommissioning	Engineering Manager and Processing Manager
			Recycle process water and reuse where possible	Construction, Operation and Decommissioning	Mining Manager and Processing Manager
			Separate hazardous and non-hazardous waste.	Construction, Operation and Decommissioning	Environmental Manager
			Develop and implement spill prevention measures and emergency response plans to deal with accidental spills of fuel and hazardous substances and waste.	Construction, Operation and Decommissioning	Environmental Manager
			Conduct regular independent environmental audits.	Construction, Operation and Decommissioning	Environmental Manager
			Plan for rehabilitation and land reclamation post closure e.g. re-contour land, replace topsoil, and re-vegetate with native species.	Decommissioning and Closure	Environmental Manager
			Implement long-term monitoring after closure to measure the effectiveness and progress of rehabilitation efforts.	Closure	Environmental Manager
			Ensure correct chemical use and explosive charging practices are in place and followed for underground mining operations.	Construction and Operation	Mining Manager
			Bulk fuel will not be stored underground, and majority of fleet refuelling will occur on surface; and refuelling of drills and equipment working at the face will be done in a controlled manner following standard underground refuelling procedures.	Construction, Operation and Decommissioning	Engineering Manager and Environmental Manager
Biodiversity	• Habitat Loss and Fragmentation • Disruption to the Local Faunal Communities and Faunal SCC • Continued Habitat Degradation	Avoid, minimise, and rehabilitate habitat disturbance to maintain ecological connectivity, reduce impacts on local faunal communities, and prevent ongoing habitat degradation.	Demarcate and limit disturbance to authorised development areas	Construction and Operation	Environmental Manager
			Avoid disturbance of indigenous vegetation outside direct footprint	Construction and Operation	Environmental Manager and Engineering Manager
			Restrict laydown areas and temporary infrastructure to low/medium sensitivity zones	Construction	Supply Chain Manager
			Rehabilitate disturbed areas with indigenous species post-construction. Monitoring of the rehabilitated areas is essential to ascertain efficacy of rehabilitation efforts.	Decommissioning and Closure	Environmental Manager
			Prevent dust pollution from degrading established vegetation	Construction, Operation and Decommissioning	Environmental Manager
			All vehicles should adhere to a low-speed limit on site. Heavy vehicles should be restricted to 30 km/h and light vehicles to 50 km/h. Signs must be erected to inform on this.	Construction, Operation and Decommissioning	Environmental Manager and Supply Chain Manager
			All staff should undergo Environmental Awareness Training. Discussions are required on sensitive environmental receptors Figure 8-1within the proposed Project area to inform contractors and site staff of the presence of species, their identification, conservation status and importance, biology, habitat requirements and management requirements within the context of the ECC and the EMP.	Construction and Operation	Environmental Manager
			Continue access control and implement anti-poaching measures.	Construction, Operation and Decommissioning	Safety Manager, Security Manager and Environmental Manager
			Prevent bird collisions with new powerline with the use of prescribed deterrents/diverters e.g. spiral markers, flappers, or LED-based devices.	Construction and Operation	Environmental Manager
			The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas thereby causing further encroachment of invasive species.	Construction, Operation and Decommissioning	Environmental Manager

Impact topic	Impact	Objective	Management Actions	Phases for implementation	Responsibility
			An Alien Invasive Plant control programme must be implemented to control the encroachment of invasive plant species.	Construction, Operation and Decommissioning	Environmental Manager
			Avoid topsoil stockpiling near watercourses (Pans) and sensitive habitats.	Construction, Operation and Decommissioning	Mining Manager
			Waste management must be a priority and a site-specific Waste Management Plan must be followed. All waste collected must be sorted and disposed of at the landfill on site or incinerated at the onsite incinerator.	Construction, Operation and Decommissioning	Environmental Manager
			Portable toilets must be provided in the ratio specified in the Health and Safety Act. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.	Construction, Operation and Decommissioning	Safety Manager
			All waste must be collected and stored effectively. Temporary storage of domestic waste shall be in covered waste skips. Recycling is encouraged.	Construction, Operation and Decommissioning	Environmental Manager
Noise	Increase in Ambient Noise Levels Affecting Sensitive Receptors	Prevent or minimise proposed Project-related noise impacts to maintain compliance with applicable noise standards and protect the health, wellbeing, and amenity of sensitive receptors.	Install silencers for fans.	Construction and Operation	Engineering Manager and Environmental Manager
			Install suitable mufflers on engine exhausts and compressor components.	Construction and Operation	Engineering Manager and Environmental Manager
			Install acoustic enclosures for equipment causing radiating noise.	Construction and Operation	Engineering Manager and Environmental Manager
			Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding.	Construction and Operation	General Manager and Environmental Manager
			Take advantage during the design stage of natural topography as a noise buffer.	Pre-construction and Construction	General Manager and Engineering Manager
			Develop a mechanism to record and respond to complaints.	Construction, Operation and Decommissioning	Environmental Manager and Corporate Social Responsibility (CSR) Manager
			Construction activities to be done during daytime only.	Construction	General Manager and Environmental Manager
			Update the OGM noise management plan to include the proposed Project and implement international best practice. Periodically update the noise management plan to refine or adapt mitigation, management and monitoring strategies over time.	Construction, Operation and Decommissioning	Environmental Manager
			Acoustic mitigatory measures to be implemented at noise sources more than 85.0dBA.	Construction and Operation	Environmental Manager
			Demolition activities and maintenance activities to be done during daytime periods only.	Decommissioning	General Manager and Environmental Manager
Blasting and Vibration	• Surface Blasting Impacts During Construction Affecting Sensitive Receptors and Infrastructure • Underground Blasting Impacts During Operation Affecting Sensitive Receptors and Infrastructure	Limit blast vibration and fly rock, and prevent or minimise damage to sensitive receptors	Develop a blast design, implementation and monitoring programme that include safety and vibration requirements.	Pre-Construction	Mining Manager and Safety Manager
			Ensure that fly rock is contained within a maximum of 500 metres of the blast site.	Construction	Mining Manager
			Clear third parties to a safe distance determined by applicable legislation and safe working procedures, prior to each blast – sound an audible warning.	Construction and Operation	Mining Manager
			Ensure ground vibration at the closest third-party structures is within acceptable best practice standards.	Construction and Operation	Mining Manager
			Ensure that air blast at the closest third-party structures is within acceptable best practice standards.	Construction	Mining Manager
			Document and investigate all registered complaints and address areas of concern	Construction and Operation	Communications Manager

Impact topic	Impact	Objective	Management Actions	Phases for implementation	Responsibility
			Ensure blasting is done in a controlled manner and design to reduce vibration impact.	Construction and Operation	Mining Manager
			Ensure appropriate measures are put in place to rectify vibration complaints, should they occur.	Construction and Operation	Mining Manager
			Ensure procedures for receiving complaints from nearby land users or residents are in place and mitigation measures are implemented.	Construction and Operation	Public Relations Manager
			Ensure occupational noise and vibration is managed through the health and safety management plan and staff exposure is monitored.	Construction and Operation	Safety Manager
Air Quality	Increase in Ambient Air Pollutant Concentrations for Proximate Sensitive Receptors	Minimise proposed Project-related contributions to ambient air pollutant concentrations to protect sensitive receptors and ensure compliance with applicable air quality standards and guidelines.	Maintain appropriate operational controls (e.g. adhere to repair and maintenance requirements for all equipment, including vehicles).	Construction, Operation and Decommissioning	Environmental Manager
			Conduct workforce training at all levels (workers, foremen, managers, contractors) on air emissions awareness. This can be included in site induction courses and should focus on promoting understanding as to why operational controls are in place and should be adhered to.	Construction, Operation and Decommissioning	Environmental Manager and Safety Manager
			Continue to implement protocols and emergency response procedures to manage emission incidents such as fires, spills or other upset conditions resulting in uncontrolled/abnormal releases.	Pre-construction, Construction, Operation and Decommissioning	Safety Manager and Environmental Manager
			Update the OGM air quality management plan to include the proposed Project and ensure ongoing compliance with international best practice. Periodically update the Air Quality Management Plan (AQMP) to refine or adapt mitigation, management and monitoring strategies over time.	Construction, Operation and Decommissioning	Environmental Manager
			Maintain the complaints register. Complaints and any actions arising from a complaint must be recorded and investigated by site management. The outcomes thereof must be recorded for inspection by the authorities.	Construction, Operation and Decommissioning	Environmental Manager
			Maintain meticulous record keeping of site activities, including throughputs, blasting activities, fuel usage, vehicle fleets, etc, to allow for a more accurate accounting of site activities and emission inventory updates should future assessment be required.	Construction, Operation and Decommissioning	Environmental Manager
			Maintain roads, machinery, and their surrounding areas to remove deposited dust and minimise the load available for entrainment during high wind speed events.	Construction, Operation and Decommissioning	Environmental Manager
			Limit land clearing and vegetation removal to the minimum necessary. New areas should be cleared and opened up only when absolutely necessary.	Construction, Operation and Decommissioning	Environmental Manager
			Utilise windbreaks, contouring and material covers or enclosures for exposed soils and stockpiles of erodible material. Install porous windbreaks / fencing around the facility or at a minimum alongside areas of high erosion potential.	Construction and Operation	Procurement Manager, Engineering Manager and Environmental Manager
			Initiate or increase the frequency (as applicable) of water sprays and consider the addition of surfactants / chemical suppressants (e.g. lignosulfonates, calcium chloride, or polymer-based sealants) for areas / activities of concern (i.e. material handling, etc.), along unpaved roads and exposed surfaces (using water trucks with spray bars).	Construction, Operation and Decommissioning	Environmental Manager
			Initiate progressive rehabilitation (e.g. revegetation with appropriate species, in line with the surrounding landscape, or coarse material covers) to stabilise disturbed areas and reduce entrainment. Surfaces should be revegetated or otherwise rendered non-dust forming when inactive.	Construction and Operation	Environmental Manager
			Cover open-bodied trucks when the truck is carrying materials that can be released into the air.	Construction and Operation	Environmental Manager
			Adhere to the minimum practical drop heights when offloading materials.	Construction, Operation and Decommissioning	Engineering Manager and Environmental Manager
			Reduce speed limits, truck weights and the number of vehicles using unpaved roads/surfaces as far as practicable. . Speed limits should also be controlled on unpaved access roads for light duty vehicles.	Construction, Operation and Decommissioning	Environmental Manager

Impact topic	Impact	Objective	Management Actions	Phases for implementation	Responsibility
			Restrict idling times for vehicles and heavy machinery through efficient work planning to reduce fuel consumption and emissions.	Construction, Operation and Decommissioning	Environmental Manager
Heritage	Direct Loss or Damage to Burial Cairn	Identify, protect, and manage cultural heritage resources — including burial cairns — to avoid damage or loss, and implement procedures to address any chance finds.	The burial cairn (GPS co-ordinates: 20° 0' 53.83" S / 17° 5' 37.58" E) must be avoided and treated as a “no-go” zone.”	All	Mining Manager and Environmental Manager
			The burial cairn should be enclosed in a designated fence by erecting a durable 1.2 m metal barrier mesh wire with steel posts affixed to a concrete foundation. The fence should have a lockable gate to prohibit unauthorised access and deter wild animals.	All	Environmental Manager
			At both the 10 m and 20 m buffer zones as well as the access point, appropriate signage, such as directional and no authorised access signage, should be erected.	All	Environmental Manager
			Train all personnel and contractors involved in site clearing and construction to recognize the protected status of the archaeological site. Report any new heritage finds immediately to the National Heritage Council or a qualified archaeologist. Training should also emphasise the importance of avoiding disturbance or damage to the site's surroundings. When site clearing and construction are underway, B2Gold should ensure that all personnel and contractors working within the immediate area of this site are aware of the protected nature of the archaeological site as well as the legal obligation to report any new finds to the National Heritage Council and/or an archaeologist as soon as possible. Therefore, B2Gold ought to take steps to avoid directly encroaching on or unintentionally damaging the site’s immediate surroundings.	Construction and Operation	General Manager, Mining Manager and Environmental Manager
			Any servitude tracks should deviate from the burial cairn, while tracks to be used during site clearing and construction should not be mechanically cleared within 30 m of the sensitive site so as to avoid future soil erosion.	Construction, Operation and Decommissioning	Mining Manager and Environmental Manager
			B2Gold is to submit the Heritage Impact Assessment report to the competent authority, the National Heritage Council of Namibia, in an effort to secure a Heritage Consent for the proposed Project to be cleared.	Pre-construction	Environmental Manager
Visual	Generation of Negative Visual Views Affecting Sense of Place	Minimise the generation of negative visual views which will affect sense of place.	Restrict vegetation clearing to the minimum area required and undertake progressive rehabilitation of cleared areas at the earliest opportunity.	Construction, Operation and Decommissioning	Environmental Manager
			Maintain a clean and orderly construction site through the regular removal of rubble and waste materials.	Construction	Environmental Manager
			Ensure the consistent implementation of effective dust suppression measures to mitigate dust generation during construction activities.	Construction, Operation and Decommissioning	Environmental Manager
			Implement concurrent rehabilitation and revegetation during operations to reduce visual impact and dust.	Operation	Environmental Manager
			Ensure surface infrastructure remains within the approved final footprint sizes and heights.	Construction, Operation and Decommissioning	Environmental Manager and Engineering Manager
			Use downward-directed, low-intensity lighting to avoid light spill.	Construction, Operation and Decommissioning	Environmental Manager
			Select lighting fixtures with minimal wattage and mount them at low heights or use bollard/foot-level lights.	Construction, Operation and Decommissioning	Environmental Manager
			Incorporate motion detectors on security lighting, where feasible.	Construction, Operation and Decommissioning	Environmental Manager
			Paint buildings in natural tones to blend with the surrounding environment.	Construction	Environmental Manager
			Use non-reflective materials where possible to reduce glare.	Construction, Operation and Decommissioning	Environmental Manager
			Remove all infrastructure not required after decommissioning.	Decommissioning and Closure	Environmental Manager and Engineering Manager

Impact topic	Impact	Objective	Management Actions	Phases for implementation	Responsibility
			Rehabilitate all disturbed areas using indigenous grass species.	Construction, Operation and Decommissioning	Environmental Manager, Mining Manager and Processing Manager
			Ensure shaping and contouring of the remaining TSF and WRDs are congruent with the surrounding landform.	Construction, Operation and Decommissioning	Environmental Manager, Mining Manager and Processing Manager
			Ensure the remaining TSF and WRDs remain constantly vegetated.	Decommissioning and Closure	Environmental Manager, Mining Manager and Processing Manager
			All drivers will receive safety training, including modules on vulnerable groups, and vehicles will be regularly maintained and monitored.	Construction, Operation and Decommissioning	Safety Manager and Security Manager
			A grievance mechanism will be in place for communities to report unsafe driving or incidents, enabling adaptive management of traffic risks.	Construction, Operation and Decommissioning	CSR Manager, Environmental Manager, Safety Manager and Security Manager
Socio-economic	Economic Benefit to National and Local Economies	Enhance economic benefit to national and local economies	Source goods and services locally (e.g. contractors, accommodation, equipment, perishable goods) during construction wherever practicable.	Construction and Operation	Procurement Manager and Supply Chain Manager
			Promote small and medium enterprises in B2Gold's procurement policies and procedures.	Construction and Operation	Procurement Manager and Supply Chain Manager
			Use B2Gold's Corporate Social Investment strategy to give support to local economic development in Otavi and Otjiwarongo - encourage, stimulate and support Small to Medium Enterprise development.	Construction and Operation	CSR Manager, Procurement Manager and Supply Chain Manager
	Job Creation and Skills Development	Enhance and prioritise job creation and skills development	Adopt a human resources policy that prioritises the selection of women for recruitment, training and development.	Construction, Operation and Decommissioning	Human Resources Manager
			Ensure skills development strategies and programmes are in place to maximise the use of local labour force.	Construction, Operation and Decommissioning	Human Resources Manager
			Support employees and community members to continue learning and developing skills, to offer labour flexibility and productivity.	Construction, Operation and Decommissioning	Human Resources Manager
			Promote continuous learning programmes to diversify and upgrade skills.	Construction, Operation and Decommissioning	Human Resources Manager
			Provide recognised, documented and accredited skills upgrading / training.	Construction, Operation and Decommissioning	Human Resources Manager
			Maximise the recruitment of permanent workforce.	Construction, Operation and Decommissioning	Human Resources Manager
	Loss and Sterilisation of Mineral Resources	Minimise the loss and sterilisation of economically valuable mineral resources to ensure optimal resource recovery and long-term economic benefits.	Regularly monitor and test tailings for remaining valuable minerals, adjusting processing methods as needed to minimise resource loss.	Operation	General Manager
			Engage with mining engineers and metallurgists to optimise current processing methods, focusing on reducing the discard rate of valuable ore.	Operation	General Manager
	In-migration Impacts on Local Communities and Service Provision	Manage proposed Project-induced in-migration to minimise adverse impacts on local communities,	Give preferential recruitment to Otjozondjupa residents.	Construction, Operation and Decommissioning	Public Relations Manager and Human Resources Manager

Impact topic	Impact	Objective	Management Actions	Phases for implementation	Responsibility
		public services, and infrastructure, while supporting positive socio-economic benefits where feasible.	Assist Otavi and Otjiwarongo Town Council with the provision of essential infrastructure and services (i.e. water, electricity and sanitation) to marginalised residents (informal settlements).	Construction, Operation and Decommissioning	Public Relations Manager and Human Resources Manager
			Develop community wellness programmes in consultation with the neighbouring towns and farms. (Include Human Immunodeficiency Virus / Acquired immunodeficiency Syndrome / Tuberculosis related issues).	Construction, Operation and Decommissioning	Public Relations Manager and Human Resources Manager
	Hazardous Excavations and Infrastructure which can be Harmful to Third Parties and Animals	Prevent physical harm to third parties and animals from potentially hazardous excavations and infrastructure.	The working area of the ML will be fenced;	Construction and Operation	Security Manager
			Warning signs will be erected and maintained on the site boundary;	Construction and Operation	Security Manager
			Security control points will be in place, to prevent uncontrolled vehicle access to existing and future mining, stockpile and waste facility areas during the construction, operation and decommissioning phases;	Construction, Operation and Decommissioning	Security Manager
			The WRD will be designed, constructed and operated in a manner that flood protection is provided and that the risk of failure is limited to acceptable levels;	Construction and Operation	Safety Manager and Environmental Manager
			The WRD and stockpiles will be rehabilitated in a manner that they present landforms that will be stable, protected from flood damage, and slopes will be re-vegetated; and	Operation and Decommissioning	Safety Manager and Environmental Manager
			Any mining shafts or declines that remain open will be made safe to ensure that there is no risk to the safety of people and animals.	Operation and Decommissioning	Safety Manager and Mining Manager
	Mine Decommissioning and Closure Resulting in Loss of Jobs and Economic Benefits	Manage the closure of the mine fairly so as to facilitate personnel and businesses to obtain an opportunity elsewhere.	Minimise socio-economic impacts (including the loss of employment) through careful planning and preparation for closure. Loss of employment is managed as per Human Resources Closure Plan, which includes Change Management Training; negotiations with the Union; Heads of Departments briefing supervisors; Official communication shared with the workforce providing high-level information on closure process.	Decommissioning and Closure	Public Relations Manager and Human Resources Manager
			Develop a targeted communication strategy, which ensures that the needs of stakeholder groups and interested parties are adequately addressed and reflected in the Mine Closure Plan, and review and update periodically.	Decommissioning and Closure	Public Relations Manager and Human Resources Manager
			Where retrenchments are unavoidable, they should be managed humanely according to legislative requirements.	Decommissioning and Closure	Human Resources Manager
			Upon closure, the contracting company for the mining operations should attempt to redeploy employees to its other operations or consider worker retraining and skills transfer programs.	Decommissioning and Closure	Human Resources Manager

The following general environmental management measures are applicable across multiple aspects and phases of the proposed Project. These measures have been consolidated based on their recurrence and relevance throughout the EMP.

- Monitoring, records and audits: Maintain records, implement monitoring (baseline and ongoing) and conduct periodic environmental audits.
- Hazardous materials and spill prevention: Store/handle hazardous materials safely; provide spill prevention and emergency response.
- Progressive rehabilitation and revegetation: Implement progressive rehabilitation and revegetation of disturbed areas; contour and stabilise landforms.
- Demarcation and no-go / limit disturbance: Demarcate no-go areas and limit vegetation/soil disturbance to authorised footprints.
- Training and induction: Provide environmental and safety induction/awareness training to all personnel and contractors.
- Dust suppression and housekeeping: Apply dust suppression (water sprays, windbreaks, covers) and maintain clean work areas and roads.
- Water management (clean/dirty separation, drainage): Separate clean and dirty water; provide diversions/drainage/erosion control; maintain liners/seepage systems.
- Access control, fencing and signage: Fence sensitive/operational areas, control access and install warning/signage as required.
- Waste management and sanitation: Implement waste management plan; segregate waste, provide covered storage and adequate sanitation; no burning.
- Traffic and speed management: Enforce site speed limits, signage and driver training to protect workers, fauna and communities.
- Complaints and grievance: Maintain a complaints/grievance mechanism with timely response and tracking.

5.0 Implementation of the EMP

5.1 Permits and Agreements

Table 5-1 provides a list of all the applicable permits/authorisations required by B2Gold for the proposed Project.

Table 5-1: List of Permits/Approvals required by B2Gold

Aspect	Permits/Certificates/Authorizations	Regulator	Current Status
Mining License	Mining License	MME	In place
	Environmental clearance for the Otjikoto Gold Mine	MEFT	In place
Water	Drilling of Abstraction Boreholes	Ministry of Agriculture, Water and Forestry (MAWF) - Department of Water Affairs (DWA)	Pending ECC approval

5.2 Roles and Responsibilities

The implementation of this EMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the various proposed Project phases. The EMP is a binding document for B2Gold to the Government of Namibia. Table 5-2 shows the roles and responsibilities for the implementation of the EMP.

Table 5-2: Key Roles and Responsibilities for Implementing the EMP

Roles	Responsibilities
General Manager	Overall responsible for implementation and compliance to the EMP.
Environmental Manager	Provides support to various departments to implement the EMP commitments.
Financial Manager	Makes financial resources available to implement the EMP commitments - management, remediation, rehabilitation and closure costs.
Technical Services Manager	Provides geological and survey support.
Engineering Manager	Provides engineering, planning and maintenance support for infrastructure, machinery and equipment requirements.
Mining Manager	Responsible for effective operation of open-cast and underground pits, associated mineralised dumps and waste material.
Processing Manager	Responsible for effective operation of the Processing Plant and Tailings Storage Facility.
Procurement Manager	Responsible for implementing processes that minimise business waste, while sourcing products and services for B2Gold– negotiating and managing contracts and building key relationships with both suppliers and internal management team.
Supply Chain Manager	Responsible for the management of the flow of goods and services, including the movement and storage.

Roles	Responsibilities
CSR Manager	Creates links / relations between B2Gold and the community on common commitments towards sustainable social responsibility.
Safety Manager	Provides support to various departments to implement the Safety and Health commitments.
Public Relations Manager	Responsible for all internal and external communications for B2Gold, navigating public relations, ensuring a consistent messaging (e.g., preparing detailed media reports, press releases, facilitating workshops).
Human Resources Manager	Responsible for effective efficient management of people in B2Gold to maximise employee performance.
Security Manager	Responsible for security operations at B2Gold (e.g., access product control).

5.3 Method Statements

The Contractors shall compile Environmental Method Statements, which will set out the vehicles, machinery, materials, labour, and methods that the contractor proposes using to carry out all environmentally sensitive aspects of the work. The contractor must sign each Method Statement along with the Environmental Manager and the Engineering Manager to formalise the approved Method Statement.

All Method Statements including those, which, may be required as ad hoc or emergency maintenance method statements, must be submitted to the Engineering Manager and/or Environmental Manager for approval prior to the commencement of the activity. Any changes to the method of works must be reflected by amendments to the original approved Method Statement and must be approved by the Engineering Manager and/or Environmental Manager on the understanding that such changes are environmentally acceptable and in line with the requirements of this EMP.

The method statements for the following activities must be submitted for approval before construction activities commence:

- Construction camp location and layout;
- Site clearing;
- Lay down areas;
- Hazardous substances;
- Solid waste management;
- Wastewater management;
- Erosion and sediment control;
- Cement and concrete batching;
- Fire control;
- Dust control programme;
- Temporary site closure;
- Emergency procedures;
- Rehabilitation of modified environment(s);
- Sources of materials (including Material Safety Data Sheets (MSDSs));

- Top-soil management;
- Stormwater Management;
- Environmental awareness course(s);
- Sourcing, excavating, transporting, and dumping of fill and spoil material; and
- Emergencies, non-compliance, and communication.

The Contractor shall keep all the Method Statements and subsequent revisions on file, copies of which must be distributed to all relevant personnel for implementation.

5.4 Inspections and Auditing

5.4.1 Site Inspection

Regular inspections will be the function of the Environmental Manager who will spend the bulk of their time on-site conducting inspections to assess compliance with the EMP. At the same time some potential impacts are difficult to monitor quantitatively, such as soil erosion and waste management, and require physical inspection on an ongoing basis. The inspections will provide valuable qualitative information on effects such as these so that action can be taken to mitigate against further potential effects.

Daily inspections will be undertaken during construction, and weekly inspections during mining operations.

5.4.2 Internal Audits

The Environmental Manager will carry out internal management audits to ensure compliance with the commitments outlined in the EMP. During the construction phase, these audits will be conducted monthly, while in the operational phase, they will take place on a quarterly basis. All audit findings will be thoroughly documented to support record-keeping and facilitate continuous improvement.

5.4.3 External Audits

B2Gold must continue undertaking the biannual external environmental auditing and reporting. The external audits shall be undertaken by a suitably qualified independent environmental auditor to evaluate the mine’s compliance with the provisions of the EMP and assess the adequacy of the EMP in relation to on-site activities. The audit reports must be made accessible to the Competent Authority and any stakeholders.

5.5 Status of this Document

The development and implementation of environmental specifications is an on-going process that is iterative in nature. Any significant revisions to the EMP document must be approved by the MEFT before the EMP is revised.

5.6 Document and Record Keeping

This EMP must be readily accessible to all employees, contractors and subcontractors. It is the responsibility of the General Manager and Environmental Manager to ensure that the relevant documents are fully understood and that the requirements of those documents are incorporated into the day-to-day mining activities.

The Environmental Manager will keep written and photographic records of the site surroundings before, during and after any construction activities. The photos will be clearly

annotated to include a description of the exact date and location when and where they were taken.

All records related to the implementation of the EMP, including the ECC, must be maintained in a safe repository and must be easily accessible if required.

5.7 Responding to Complaints

A complaints register will be established and maintained by the Public Relations Manager, which will be used to record and track all complaints which are received regarding activities during all proposed Project phases. Complaints will be addressed as they are received and generally in the following manner:

- Acknowledgement of receipt of the complaint by the Environmental Manager timeously.
- Presentation of 1st response to the complainant timeously
- Implementation of identified corrective action as required as soon as possible but in accordance with the scale and intensity of the remedial action with confirmation to the complainant that the corrective action has been implemented.
- Close out with the complainant.

The nature of the complaint, the source, the turn-around time and the remedial action implemented will all be recorded in the complaints register. Complaints will be reviewed as a performance indicator by the Environmental Officer. All complaints received will be dealt with in accordance with the EMP and recommendations or instructions will be issued to the appropriate B2Gold team as soon as practical. The B2Gold team is to implement the remedial action.

5.8 Responding to Non-Compliance

When a non-compliance is identified, either through visual inspection or through audit reports, it is essential to assess the underlying cause and determine the appropriate corrective action.

Corrective and preventive actions can be communicated through verbal or written instructions. Verbal instructions are often used for minor issues identified during routine site inspections and help raise awareness among employees and subcontractors. These minor issues often arise from a lack of knowledge rather than intentional misconduct. Written instructions, on the other hand, are typically issued after an audit. They detail the sources of the problems and suggest solutions. The effectiveness of these solutions will be evaluated in a follow-up audit, and further written instructions will be provided if necessary.

5.9 Work Stoppage

When, in the opinion of the Environmental Manager, an activity will result in environmental damage, the Environmental Manager will issue instructions to halt the activity (if needed) and will assess the severity of the non-compliance and determine the appropriate course of action.

5.10 Corrective Action

Corrective action can take various forms, but it ultimately involves making changes to some aspect of the overall management approach. Identifying the root cause is crucial, and steps must be taken to address it. Any corrective action decided upon should be documented and formalised, and its implementation closely monitored. This process allows for the creation of

a corrective action record that can be referenced for future instances. B2Gold must continue with their current corrective action procedure.

6.0 Checking and Correction: Environmental and Social Monitoring Plan

6.1 Checking and Corrective Actions

B2Gold have a robust monitoring network. This section describes the monitoring programme recommended, if any, by specialists in addition to the existing.

6.1.1 Air Quality

B2Gold is currently undertaking routine ambient air quality monitoring, including a network of dust deposition gauges for measuring dust fallout and the measurement of fine particulate fractions using a combination of filter-based sampling and real-time continuous monitoring units. No new recommendations are made to the existing monitoring programme, as summarised in Table 6-1 and the monitoring network, which is depicted in Figure 6-1.

Table 6-1: Air Quality Monitoring Parameters

Pollutant	Averaging period	Threshold	Standard	Frequency
NO_x	1-hour Mean (µg/m³)	200 (a)	World Health Organization Air Quality Guidelines (WHO AQG); European Commission (EC); South African National Ambient Air Quality Standards (SA NAAQS)	Quarterly
	Annual Mean (µg/m³)	40	WHO AQG & EC & SA NAAQS	
SO_2	1-hour Mean (µg/m³)	350 (a)	EC Limit & SA NAAQS (no WHO guideline)	Quarterly
	24-hour Mean (µg/m³)	50(b)	WHO Interim Target (IT) 2 (seen as a per 40% of the SA and EC limits)	
	Annual Mean (µg/m³)	50 (b)	SA NAAQS (no WHO guideline)	
Particulate matter (PM_{10})	24-hour Mean	75 µg/m³	WHO IT3 & SA NAAQS	Monthly
	Annual Mean	40 µg/m³	SA NAAQS	
Particulate matter ($PM_{2.5}$)	24-hour Mean (µg/m³)	37.5 (b)	WHO IT3 & SA NAAQS	Monthly
	Annual Mean (µg/m³)	15	WHO IT3	
Dustfall	30-day average (mg/m²/day)	600 (c)	SA NDCR & Botswana residential limit	Monthly
	30-day average (mg/m²/day)	1200 (c)	SA NDCR & Botswana industrial limit	

Notes: (a) Not to be exceeded more than 88 hours per year (SA)

(b) Not to be exceeded more than 4 times per year (SA)

(c) Not to be exceeded more than 3 times per year or 2 consecutive months

In addition, the following recommendations apply to the air quality monitoring at OGM:

- B2Gold must continue with dust fallout monitoring to assess fugitive dust impacts,. If non-compliances are recorded, develop a detailed fugitive dust management plan as part of the OGM AQMP to establish and implement emission reduction strategies.
- B2Gold must continue to monitor fine particulates, focusing on continuous, real-time monitoring techniques (e.g. Atmos or other).

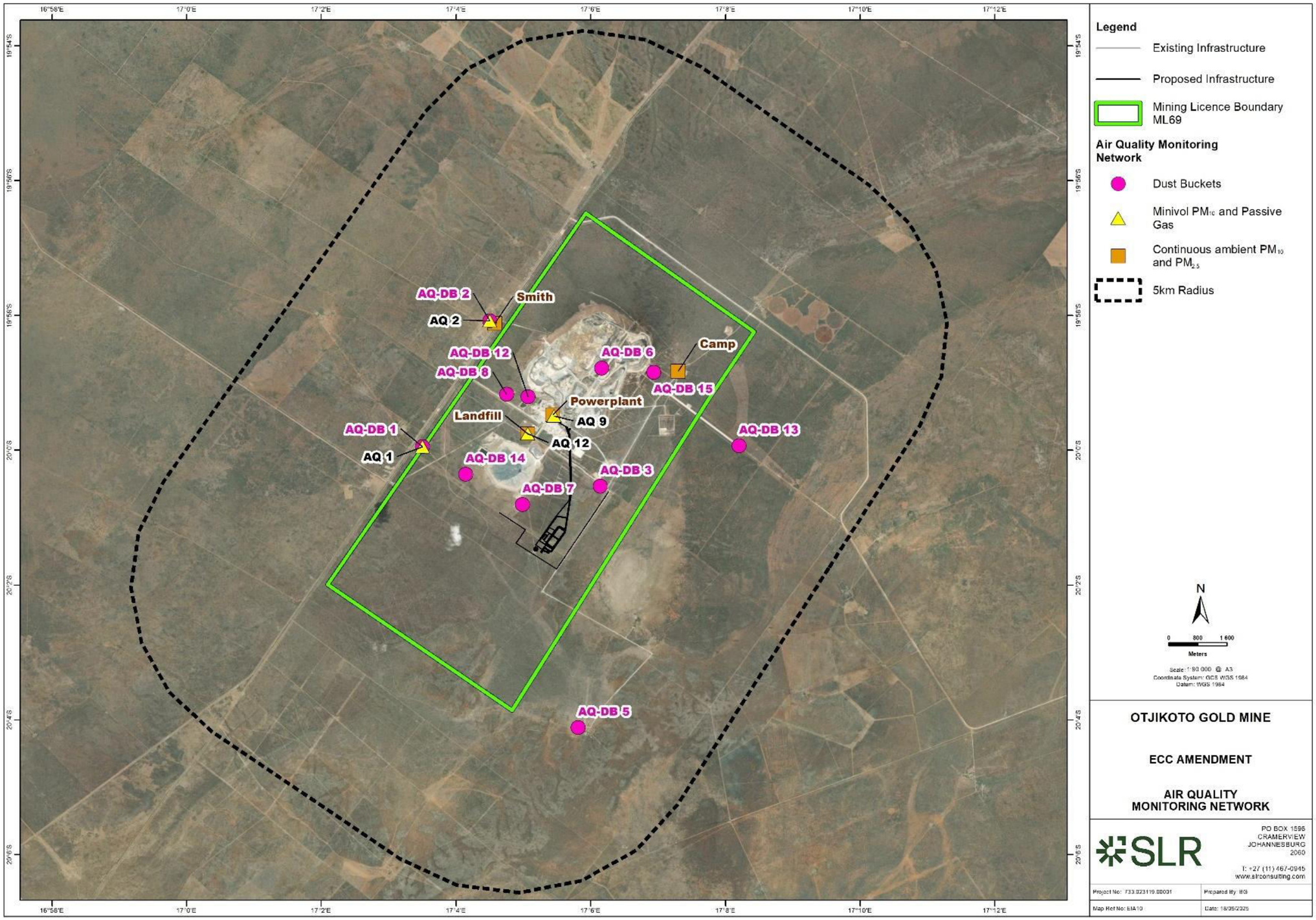

Figure 6-1: Air Quality Monitoring Network

6.1.2 Noise

The noise specialist recommends that International Finance Corporation Performance Standards (IFC), Environmental Health and Safety (EHS) Guidelines be implemented as good practice, as no noise standards exist for new developments in Namibia. The noise survey is recommended to be conducted for at least 1 hour per site during the day (07h00 to 22h00) and night (22h00 to 07h00). The following data must be provided:

- Time of the day.
- Wind direction.
- Wind speed.
- Temperature.
- Remarks on what is audible during the day and the night per site.

The prevailing ambient noise levels must not be exceeded by more than 3.0 dB (A) at the boundary of the proposed Project area.

Recommended noise monitoring points are provided in Table 6-2 and mapped (Figure 6-2).

Table 6-2: Proposed Noise Monitoring Points

Measuring points	Latitude	Longitude
A	19° 58.829'S	17° 7.364'E
B	19° 58.099'S	17° 4.550'E
C	19° 59.884'S	17° 3.364'E
D	20° 0.539'S	17° 2.612'E
E	19° 59.380'S	17° 5.361'E
F	19° 59.483'S	17° 5.511'E
G	19° 59.722'S	17° 5.506'E
H	19° 59.831'S	17° 5.518'E
I	20° 0.709'S	17° 5.175'E
J	20° 1.691'S	17° 5.480'E
K	20° 1.942'S	17° 5.851'E
L	20° 2.034'S	17° 6.018'E
M	20° 3.228'S	17° 8.202'E
N	20° 1.345'S	17° 10.259'E
O	20° 4.773'S	17° 11.609'E

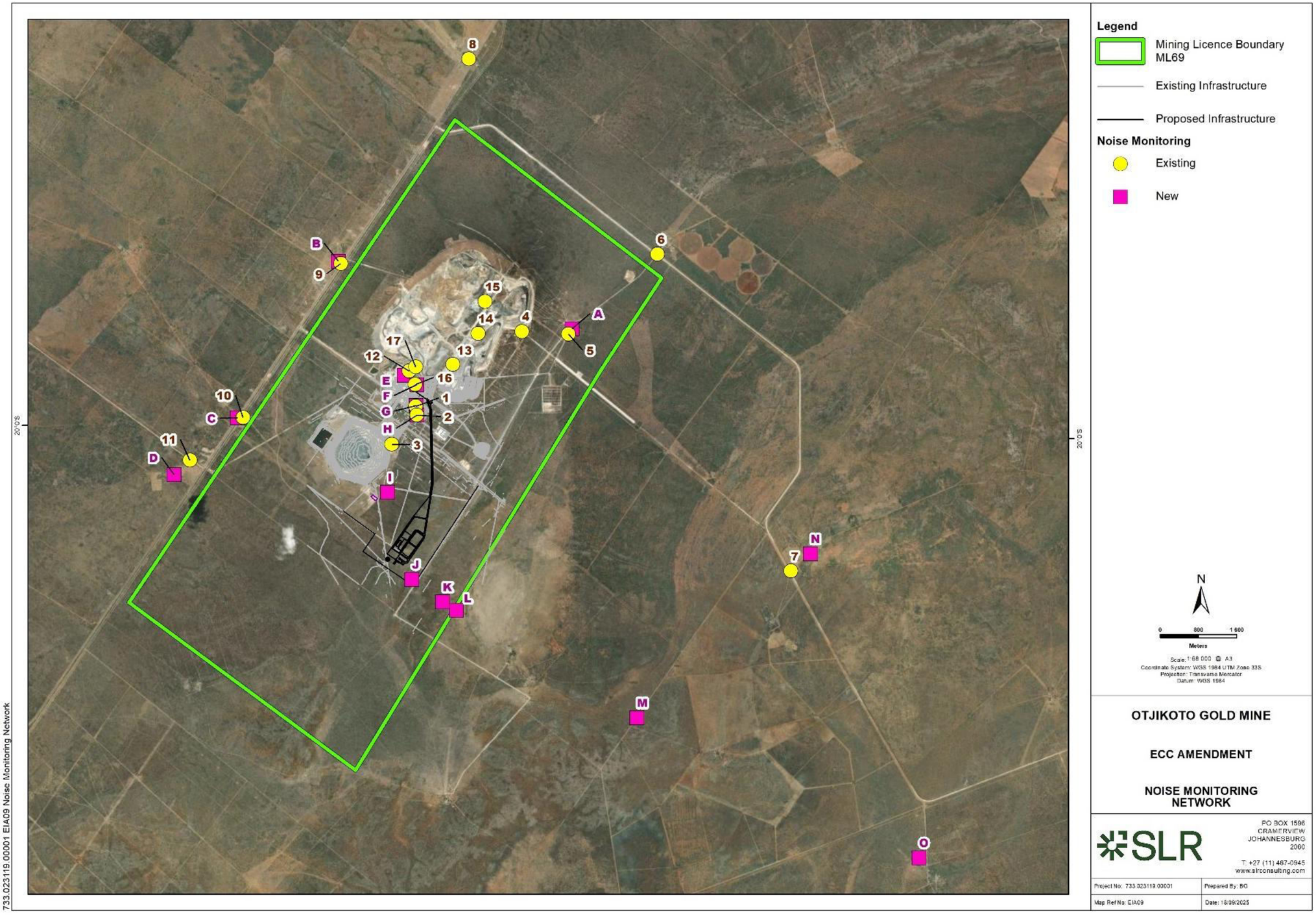

Figure 6-2: Existing and Proposed Noise Monitoring Points

6.1.3 Biodiversity

The proposed Project area, as defined in the infrastructure layout, shall be incorporated into the ongoing monitoring programme at OGM.

Monthly visual inspections shall be undertaken, with records maintained and supported by photographic evidence, covering the following aspects:

- **Alien vegetation**: The target shall be zero percent occurrence of new invasive species.
- **Rehabilitation vegetation cover**: The objective shall be to achieve 100 percent coverage of exposed areas.
- **Wildlife mortality**: The target shall be zero incidents of mortality.

6.1.4 Groundwater

Monthly groundwater level monitoring is undertaken both on-site and at the nearest farms to the OGM (refer to Figure 6-3), and this programme must be continued.

In addition, B2Gold conducts quarterly groundwater monitoring within and around the proposed Project area, which is also required to continue. Groundwater quality is assessed against the Namibian Drinking Water Quality Guidelines, with applicable thresholds presented in Table 6-3.

Table 6-3: Ground Water Quality Parameters against Namibian Drinking Water Quality Guidelines

Parameter	Ideal Drinking Water Quality	Acceptable Drinking Water Quality
pH	6 - 8.5	6 - 9
EC (mS/m)	80	300
Turbidity (NTU)	0.5	2
TDS (mg/l)	1000	2000
Total Hardness (mg/l)	400	1000
Cl^- (mg/l)	100	300
F^- (mg/l)	0.7	1.5
SO_4^{2-} (mg/l)	100	300
NO_3^- (mg/l)	6	11
NO_2^- (mg/l)	0.1	0.15
NH_3 (mg/l)	0.3	0.5
PO_4^{3-} (mg/l)	25	100
Na (mg/l)	100	300
K (mg/l)	25	100
Mg (mg/l)	30	70
Ca (mg/l)	80	150

The following recommendations are made to strengthen the groundwater monitoring and management programme:

- Monitoring shall continue as per the existing groundwater monitoring network to track groundwater quality trends.
- The monitoring network shall be extended further to the south of the proposed Project.
- New monitoring boreholes shall be drilled in the proposed Project area, specifically in areas where surface infrastructure such as the WRD, ROM pad, workshop, fuel bay, and batch plant are planned.
- Long-term groundwater monitoring shall be implemented after closure to evaluate the effectiveness and progress of rehabilitation efforts.

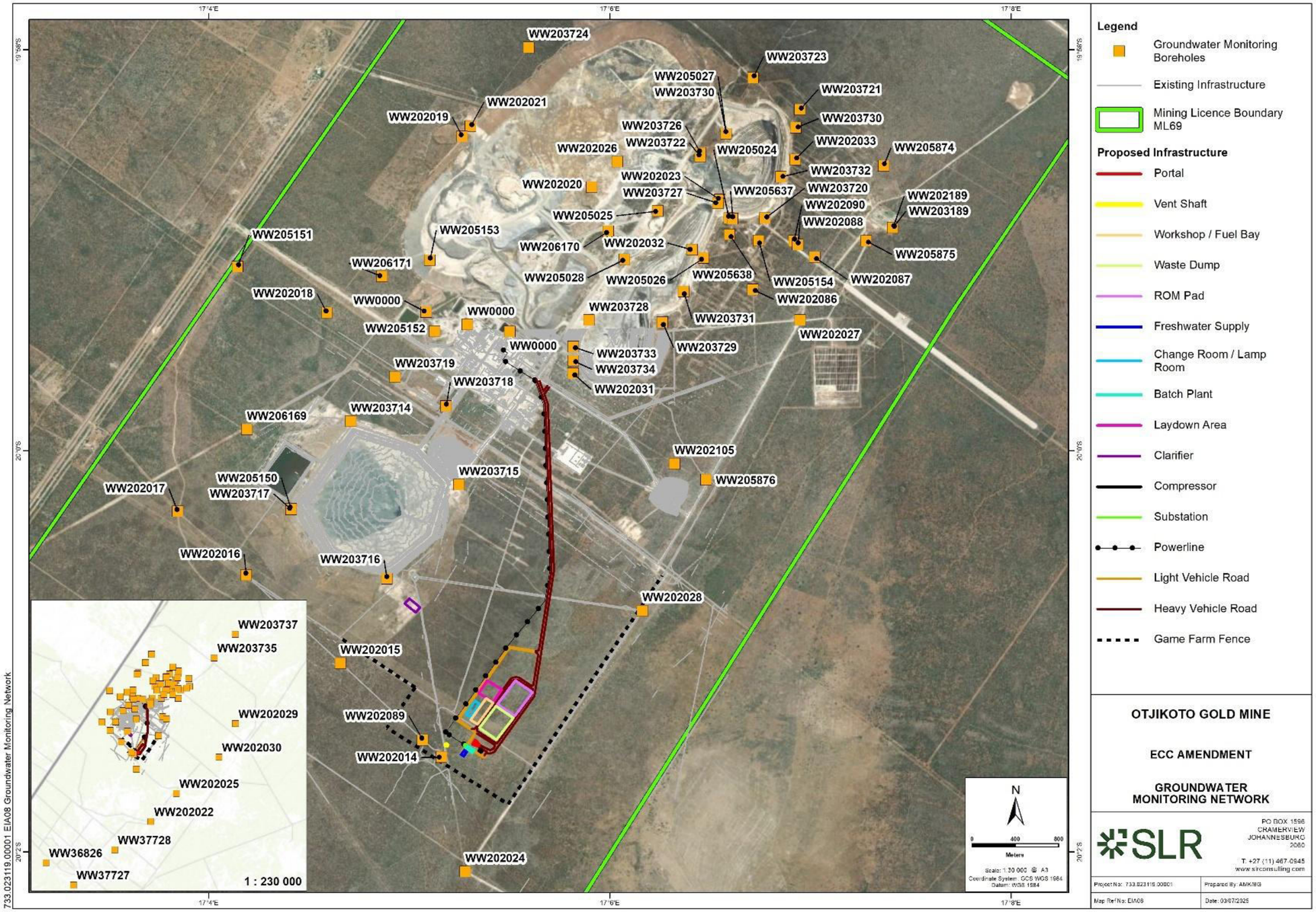

Figure 6-3: Existing Groundwater Monitoring Network

6.1.5 Heritage

Visual monitoring of the identified heritage sites must be undertaken to ensure that buffers are maintained, and demarcations are visible. This must be done at least weekly during the construction and decommissioning phases which present the most ground disturbing activities and monthly during the operation phase.

6.2 Management Review

To effectively manage the review and ensure the success of the EMP, the mine needs a well-structured Environmental Management System (EMS) that provides the foundation for consistently managing environmental and social responsibilities, integrating them into the overall operations of the mine.

OGM has established an EMS aligned with ISO 14001, which is integrated with its Occupational Health and Safety processes. This system encompasses a set of policies, procedures, and practices designed to identify, evaluate, and manage environmental risks, while supporting sustainability objectives. The EMS enables the mine to:

- Operate in compliance with relevant environmental legislation and regulations,
- Minimise environmental risks,
- Improve resource efficiency,
- Foster a culture of environmental stewardship, and
- Support the implementation of the EMP and B2Gold's Environmental and Biodiversity Performance Standards (see Section 3.1.1).

Overall, the EMS serves as a framework for achieving environmentally responsible and sustainable operations. B2Gold utilises a hierarchical system for its overall HSE Management System structure, where each component shall meet the requirements of those in the higher levels (see **Error! Reference source not found.**) in order to achieve a robust a nd sustainable management system.

7.0 Emergency Preparedness and Response Plan

Emergency procedures apply to incidents that are unexpected that, may be sudden and which lead to serious danger to employees/subcontractors, the public and/or potentially serious pollution of, or detriment to the environment (immediate and delayed). It is expected that B2Gold will develop an Emergency Preparedness and Response Plan for the proposed Project. This plan will need to be reviewed and updated, where necessary, to ensure alignment with the sections below. The Plan will be the responsibility of the Security Manager and Safety Manager to compile and implement. Below is a recommendation of the contents of the plan.

The general procedure that should be followed in the event of all emergencies is as follows.

- **Notification:** Applicable incident controller defined in emergency plans must be notified of an incident upon discovery.
- **Access Control:** Area to be cordoned off to prevent unauthorised access and tampering of evidence.
- **Emergency Actions:** Undertake actions defined in the emergency plan to limit/contain the impact of the emergency.
- **Incident Reporting:** Report the incident immediately to the relevant responsible B2Gold Team members.
- **Notification:** Immediately notify the relevant Namibian authorities the National Police, local government officials, and any other relevant agencies, as well as any persons whose health may be affected, about:
    - The nature of the incident.
    - Any risks posed to public health, safety, and property.
    - The toxicity of the substances or by-products released by the incident.
    - Any steps taken to avoid or minimise the effects of the incident on public health and the environment.
- **Incident Response**: As soon as possible after the incident, B2Gold must:
    - Take all reasonable measures to contain and minimise the effects of the incident, including its impact on the environment and any risks posed to the health, safety, and property of persons.
    - Undertake clean-up procedures.
    - Remedy the effects of the incident.
    - Assess the immediate and long-term effects of the incident on the environment and public health.
- **Reporting:** Within 14 days, B2Gold must document incidents and should it be required provide a report to the relevant Namibian authorities, and local government officials. The report should include:
    - The nature of the incident.
    - The substances involved and an estimation of the quantity released.
    - The possible acute effects of the substances on people and the environment (including data needed to assess these effects).
    - Initial measures taken to minimise the impacts.

- Causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure.
- Measures taken to prevent a recurrence of the incident.

8.0 Environmental Awareness Plan and Training

B2Gold must develop an Environmental Awareness Plan. The plan must describe how employees will be informed of environmental risks which may result from their work, the manner in which the risk must be dealt with to avoid pollution or degradation of the environment and the training required for general environmental awareness.

The content binds all employees and subcontractors who conduct work on behalf of B2Gold, and a contractual condition to this effect will be included in all such contracts entered into by the mine. If contractors are used, the responsibility for ensuring compliance with the EMP will remain with B2Gold.

The purpose of the environmental awareness plan is to ensure that all personnel and management understand the site's general environmental requirements. In addition, greater environmental awareness must be communicated to personnel involved in specific activities that can significantly impact the environment and ensure that they are competent to carry out their tasks based on appropriate education, training, and/or experience. The environmental awareness plan must enable B2Gold to achieve the objectives of the environmental policy.

8.1 Steps to Achieve the Environmental Policy Objectives

B2Gold ’s environmental management framework (see Section 3.0) will be realised by setting specific and measurable objectives. It is proposed that objectives are set throughout the life of mine, but initial objectives are as follows:

- Management of environmental responsibilities:
    - B2Gold will establish an environmental management team which will be led by the environmental manager, who will carry out the management of all environmental aspects of the site, for example:
        - Compliance with environmental legislation and EMP commitments.
        - Implementing and maintaining an environmental management system with the assistance of the appointed Environmental Manager.
        - Developing environmental emergency response procedures and coordinating personnel during incidents.
        - Manage routine environmental monitoring and data interpretation.
        - Environmental troubleshooting and implementation of remediation strategies.
- Communication of environmental issues and information:
    - The Environmental Manager will carry out meetings, consultations and progress reviews and will:
        - Set the discussion of environmental issues and feedback on environmental proposed Projects as an agenda item at all company board meetings.
        - Provide progress reports to the MEFT and MME on the achievement of policy objectives and the level of compliance with the EMP.
        - Ensure environmental issues are raised at all relevant mine wide meetings at all levels.
        - Ensure that the Public Relations Manager coordinates discussions on environmental issues at all general liaison meetings with local communities and other interested and affected parties.
- Environmental awareness training:

- B2Gold will provide environmental awareness training to individuals at a level of detail specific to the requirements of their job, but will generally comprise:
  - Basic awareness training that will be provided for all prior to granting access to the site (e.g., a short video presentation that requires registration once completed). Employees and subcontractors who have not attended the training will not be allowed on-site.
  - General environmental awareness training that will be given to all employees and contractors as part of the Safety, Health and Environment induction programme.
  - Specific environmental awareness training that will be provided to personnel whose work activities can have a significant impact on the environment (e.g. workshops, waste handling and disposal, sanitation, etc.).

- Review and update the environmental plans already under implementation.
- All mine proposed Projects will be designed to minimise impact on the environment and to accomplish closure/rehabilitation objectives.
- B2Gold will maintain records of all environmental training, monitoring, incidents, corrective actions and reports.

8.2 General Contents of the Environmental Awareness Plan

To achieve the objectives of environmental awareness, the general contents of the training plans are as follows:

- Module 1 – Basic training plan applicable to all personnel entering the site:
  - Short presentation to indicate the site layout and activities at specific business units together with their environmental aspects and potential impacts.
  - Individuals to sign off with site security on completion in order to gain access to the site.
- Module 2 – General training plan applicable to all personnel at the site:
  - General understanding of the environmental setting of the mine (e.g. local communities and industries and proximity to natural resources such as rivers);
  - Understanding the environmental impact of individuals' activities on site (e.g. excessive production of waste, poor housekeeping, energy consumption, water use, noise, etc.);
  - Indicate potential site-specific environmental aspects and their impacts;
  - B2Gold environmental management strategy;
  - Identifying poor environmental management and stopping work which presents significant risks;
  - Reporting incidents;
  - Examples of poor environmental management and environmental incidents; and
  - Procedures for emergency response and cleaning up minor leaks and spills.
- Module 3 – Specific training plan:
  - Environmental setting of the workplace (e.g. proximity of watercourses, vulnerability of groundwater, heritage resources and proximity of local communities or residences, etc.);

- Specific environmental aspects such as:
  - Spillage of hydrocarbons at workshops.
  - Poor waste management, such as mixing hazardous and general wastes, inappropriate storage and stockpiling substantial amounts of waste.
  - Poor housekeeping practices.
  - Poor working practices (e.g. not conducting oil changes in designated bunded areas).
  - Excessive noise generation and unnecessary use of hooters.
  - Protection of heritage resources (including palaeontological resources).
- Impact of environmental aspects, for example:
  - Hydrocarbon contamination resulting in loss of resources (soil, water) to downstream users.
  - Dust impacts on local communities (nuisance and health implications).
- B2Gold duty of care (specifically with respect to waste management).
- Purpose and function of B2Gold ’s environmental management system.

The actual contents of the training modules will be developed based on a training needs analysis.

Key personnel will be required to undergo formal, external environmental management training (e.g. how to operate the environmental management system, waste management and legal compliance).

In addition to the above, B2Gold will:

- Conduct refresher training/presentations on environmental issues at regular intervals for mine employees (permanent and subcontractors).
- Promote environmental awareness using relevant environmental topic posters displayed at strategic locations on the mine.

8.3 Training Objectives of the Environmental Awareness Plan

The environmental awareness plan ensures that training needs are identified and that appropriate training is provided. The environmental awareness plan must communicate the following:

- The importance of conformance with the environmental policy, procedures and other requirements of good environmental management.
- The significant environmental impacts and risks of individuals' work activities and explain the environmental benefits of improved performance.
- Environmental sensitivities present on the proposed Project area (see Figure 8-1)
- Individuals' roles and responsibilities in achieving the aims and objectives of the environmental policy.
- The potential consequences of not complying with environmental procedures.

8.4 Environmental Sensitivities

Several environmental sensitivities are found in the proposed Project area. These are mapped in Figure 8-1. The sensitivities by aspect are elaborated on as follows:

- Air quality: sensitive receptors that would be impacted by deteriorating air quality;
- Noise: sensitive receptors that would be impacted by elevated noise levels;
- Heritage: resources identified that should not be physically disturbed; and
- Hydrogeological: the Karibib Marble which has the potential to be negatively affected by groundwater contamination.

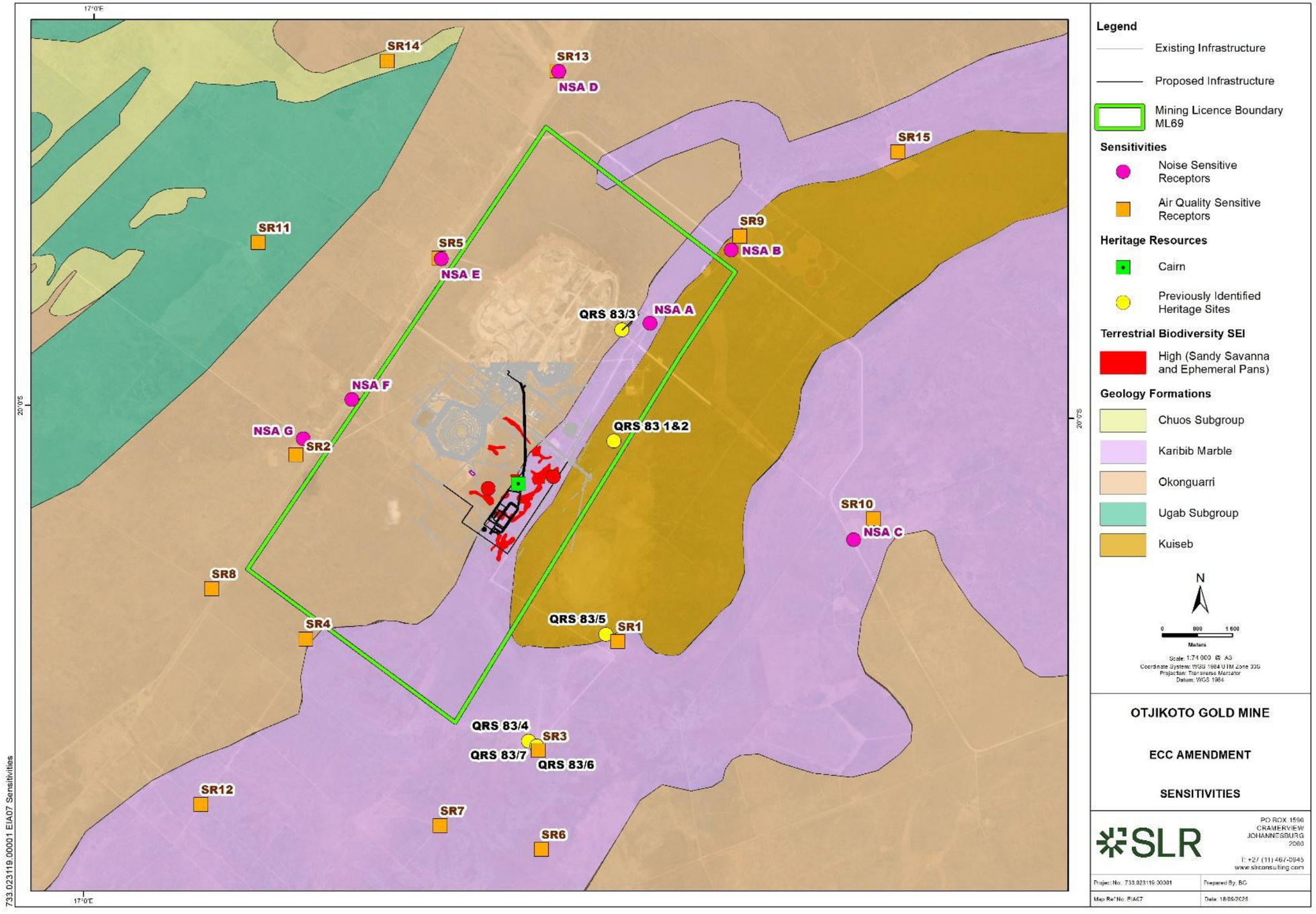

Figure 8-1: Combined Environmental Sensitivities

9.0 Management of Change

The EMP is considered a living document. It should be updated to align with the current operations of the OGM. As such, records of the ECC, EMP and audit reports must always be referred to in order to ensure compliance as well as identify any changes.

Changes in the proposed Project may occur due to unanticipated situations. Adaptive changes may also occur during the course of final design, commissioning or even operations. B2Gold will implement a formal procedure to manage changes (e.g., layout, technology, resources, etc.). The objective of the procedure must be to ensure that the impact of changes on the health and safety of personnel, the environment, adjacent communities, plants and equipment are identified and assessed prior to the changes being implemented. The management of change procedure must ensure that:

- proposed changes have a sound technical, safety, environmental, social and commercial justification;
- changes are reviewed by competent personnel and the impact of changes is reflected in documentation, including operating procedures and drawings;
- changes are communicated to personnel who are provided with the necessary skills, via training, to effectively implement changes; and
- the appropriate developer lead accepts the responsibility for the change.

Changes to be managed could include a risk to people, the environment, communities or the business, and might be related to a process, equipment, materials, people or the environment or proposed Project context. The change management process includes the following steps:

1. Identify and describe the change using a Management of Change Form;
2. Assess the E&S risks associated with the change;
3. Identify control measures (for risks that cannot be eliminated);
4. Appoint someone to review the risk assessment;
5. Develop actions to manage the change with clear responsibilities and timeline;
6. Implement actions; and
7. Review the change to ensure it has been effective.

All environmental and social legal requirements related to the change shall also be identified and implemented as required. Mitigation measures and monitoring requirements associated with significant environmental and social risks as related to the change shall be captured in this EMP. Substantive changes to the mitigation measures described in this EMP will need to be communicated to the MEFT and may require an application for amendment to the ECC to be lodged with MEFT.

Annexure 1: B2Gold Otjikoto Gold Mine Consolidated EMP (September 2021)

OTJIKOTO GOLD MINE

(MINING LICENCE 169)

CONSOLIDATED

ENVIRONMENTAL MANAGEMENT PLAN

SEPTEMBER 2021

CONTENTS

ACRONYMS

CSI	–	Corporate Social Investment
CSR	–	Corporate Social Responsibility
ECC	–	Environmental Clearance Certificate
EIA	–	Environmental Impact Assessment
EMP	–	Environmental Management Plan
HFO	–	Heavy Fuel Oil
HME	–	Heavy Machinery Equipment
LoM	–	Life of Mine
Mm^3	–	Million cubic metres
Mt	–	Million tonnes
MSDS	–	Material Safety Data Sheets
$\mu g/m^3$	–	Micrograms per cubic metre
$mg/m^2/day$	–	Milligram per square metre per day
MoHSS	–	Ministry of Health and Social Services
MME	–	Ministry of Mines and Energy
ML	–	Mining Licence
NO_x	–	Nitrogen Oxides
NO_2	–	Nitrogen oxide
OGM	–	Otjikoto Gold Mine
PM	–	Particulate Matter
PPE	–	Personal Protective Equipment
RoM	–	Run of Mine
SO_x	–	Sulphur Oxides
SO_2	–	Sulphur dioxide
STP	–	Sewage Treatment Plant
TSF	–	Tailings Storage Facility
WRD	–	Waste Rock Dump

1. INTRODUCTION AND BACKGROUND

B2Gold Namibia (Pty) Ltd is a Namibian registered Company and a subsidiary of B2Gold Corp. — based in Vancouver, Canada. It is jointly owned by B2Gold Corp. (90%) and EVI Namibia (10%). Otjikoto Gold Mine (OGM) is operated by B2Gold Namibia (Pty) Ltd and located in the north-central part of Namibia, approximately 70 km north-east of Otjiwarongo and 50 km south-west of Otavi - within the Otjozondjupa region (Figure 1).

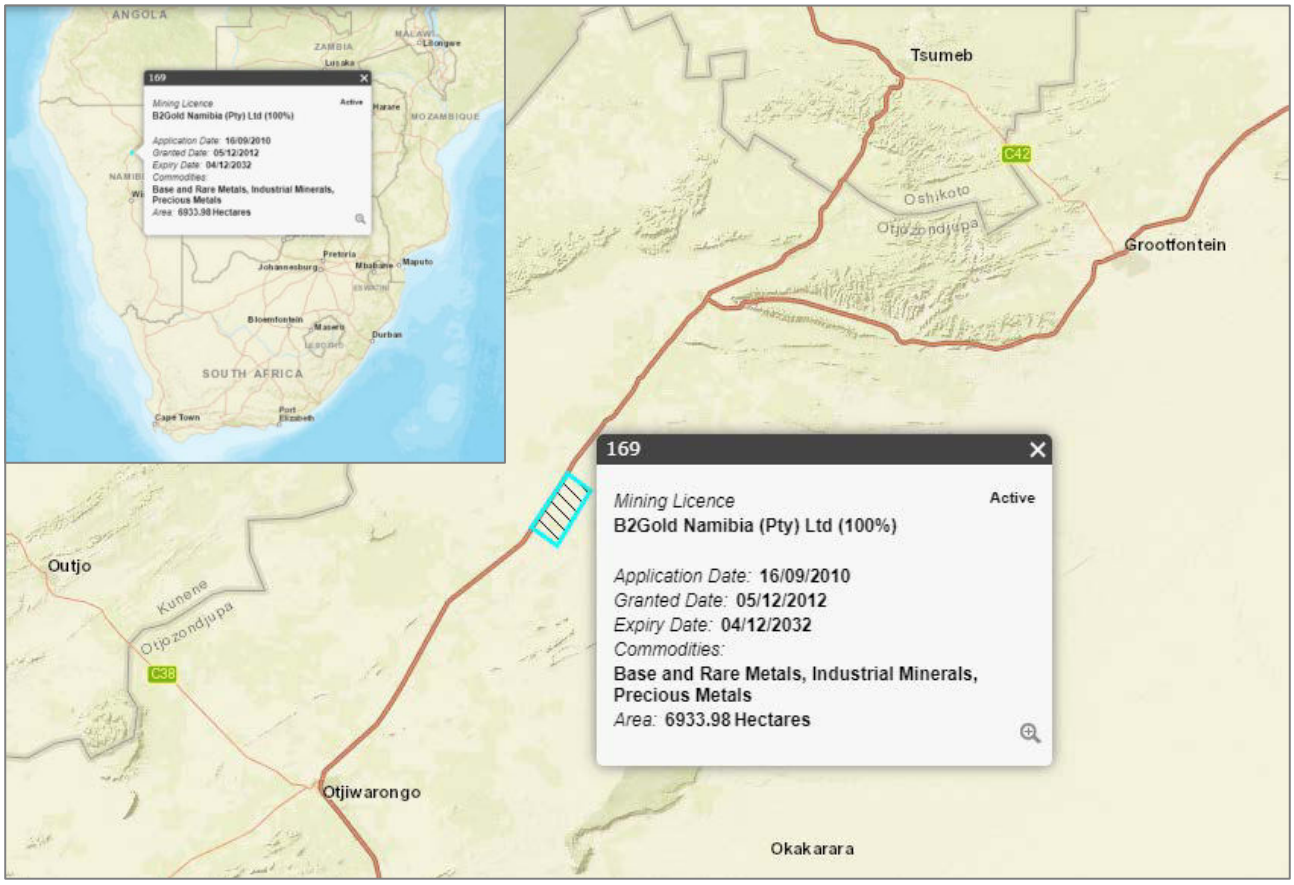

Figure 1: Location of B2Gold Namibia Otjikoto Gold Mine (ML 169)

B2Gold Namibia (Pty) Ltd was granted a Mining Licence (ML 169) in December 2012 after the Environmental Clearance Certificate was issued in August 2012 for the Otjikoto Gold Mine. Mining operations commenced in 2015, whereafter additional upgrades and improvements were introduced.

This document serves as a consolidated Environmental Management Plan (EMP) of the management actions in the initial approved EMP for the Otjikoto Gold Mine Project (SLR, 2012), incorporating management actions listed in EMPs approved since 2012 for the following additional project components:

- 2013: Proposed changes to the Otjikoto Gold Mine Project - Landfill Site and Power Plant;
- 2014: Proposed changes to the Otjikoto Gold Mine Project - Wolfshag Zone;
- 2017: Upgrade of the Existing Power Generation Facility at the Otjikoto Gold Mine by a 10.8 MW Photovoltaic (PV) Solar Plant;
- 2017: Amendment to the Hazardous Waste Management Plan at B2Gold Otjikoto Gold Mine;
- 2019: Otjikoto Gold Mine - Rehabilitation and Closure Plan; and
- 2020: Otjikoto Mine Wolfshag Pit Underground Mining Amendment – B2Gold Namibia.

This EMP includes all existing activities and associated impacts related to the operational and decommissioning phase of the B2Gold Namibia Otjikoto Gold Mine – Mining Licence 169. It is based on a review of findings and recommendations of the EMPs associated with the projects listed above.

This EMP will be reviewed and amended periodically - as and when required - with the change or addition of activities as per Section 50 (g) of the Minerals (Mining and Prospecting) Act, 33 of 1992, which states that the holder of a mining licence shall undertake the periodic review of the EMP(s) should circumstances change. The Environmental Impact Assessment process will be applied to any significant changes to the existing activities, products and services as per the Environmental Management Act, No. 7 of 2007 and the EIA Regulations of 2012.

The following key approvals have been granted by the relevant authorities for the B2Gold Namibia Otjikoto Gold Mine since the inception of the mine:

- August 2012: Environmental Clearance Certificate (ECC) - Otjikoto Gold Mine Project
- December 2012: Mining Licence, ML 169
- October 2013: Amendment to the 2012 ECC – Landfill Facility and Heavy Fuel Oil (HFO) Power Plant
- January 2015: Amendment to the 2012 ECC – Changes to the Otjikoto Mine Operations and the updated 2014 Environmental Management Plan (EMP)
- May 2017: Amendment to the 2012 ECC – Upgrade of the Heavy Fuel Oil (HFO) Power Plant to a Photovoltaic (PV) Solar Power Plant
- May 2017: Amendment to the 2014 EMP, Amendments to the Hazardous Waste Management Plan
- August 2018: Environmental Clearance Certificate for Otjikoto Gold Mine
- August 2019: Otjikoto Gold Mine - Rehabilitation and Closure Plan
- July 2020: Environmental Clearance Certificate for Underground Mining Activities at the Otjikoto Gold Mine

2. OVERVIEW OF OPERATIONS / ACTIVITIES

2.1 OPERATIONAL PHASE

2.1.1 Existing Operations

Opencast mining takes place from two open pit operations, Otjikoto Pit and Wolfshag Pit respectively, while underground mining (Wolfshag Pit) is used to extract ore at depth *via* a portal located in the Otjikoto Pit.

Ore is extracted from mining areas, using truck and shovel operations. Overburden is placed on the waste rock dump (WRD), low-grade ore is stockpiled, and the processed mineral waste is transferred to a lined tailings storage facility (TSF). A return water dam returns water from the TSF to the Plant. Ore is taken to the Plant for processing, where it is crushed, milled, leached and the concentrate smelted into gold bars as the final product.

The operations use water from groundwater abstraction boreholes. Power is generated from Heavy Fuel Oil (HFO) generators and a Photovoltaic (PV) Solar Power Plant. Detailed descriptions of the current operations can be found in the original and amended EMPs for the mine.

2.1.2 Mining Activities

2.1.2.1 Stripping

Areas of land is cleared for the establishment of mining infrastructure, pits, waste rock dump(s), stockpiles and haul roads. Stripping or land clearing takes place as mining activities progress into undisturbed areas. Land clearing assessments (flora and fauna) are conducted of the area prior to initiating stripping activities. This includes permitted clearing, accounting for volumes of topsoil stripped, harvested and stockpiled for progressive and future rehabilitation. Records are kept of tonnes of material stripped (topsoil harvested and stockpiled).

2.1.2.2 Ore excavation

Truck and shovel operations is used to excavate overburden /waste rock and ore from the opencast (Otjikoto and Wolfshag Pits) and underground (Wolfshag Pit) mining areas. Excavated overburden / waste rock material is stockpiled on the waste rock dump and low-grade ore is stockpiled close to the pits. Medium and high grade ore is taken to the Plant for processing.

With the increase in depth and groundwater seepage, dewatering of the Otjikoto Pit is conducted *via* a pit sumps and dewatering boreholes. The Wolfshag Pit is dewatered *via* a deep borehole towards its south. Excess water is used for processing in the Plant.

Longhole stoping and a modified transverse stoping mining method is used for underground mining (Wolfshag Pit). Existing abstraction boreholes and two dedicated dewatering borehole(s) to the north-east of the mining area is used for mine dewatering.

2.1.2.3 Drilling and blasting

All mining material requires rock fragmentation, undertaken by drilling and blasting activities. Drill rigs are used for drilling drill holes required in blasting.

A contractor supplies and transport all required blasting material. The material used for blasting activities is stored on site, managed and used by Otjikoto Gold Mine to carry out blasting activities.

2.1.2.4 Loading and Hauling

Excavated ore and waste is loaded by large hydraulic excavators and hauled using rigid dump trucks. The ore is loaded and hauled to a single Run of Mine (RoM) pad. Barren and mineralised (grade lower than 0.25 g/t) waste material is deposited on the waste rock dump. All low-grade material, with a grade range greater or equals to 0.25 g/t is stockpiled separately for post-mining reclamation and processing.

2.1.2.5 Stockpiling

Topsoil from stripping activities is stockpiled for rehabilitation purposes. Mineral waste generated from mining is stockpiled as waste rock at the waste rock dump (WRD), and ore stockpiles consist of low-grade material and the run of mine (RoM) ore stockpile. It is expected that the WRD's total footprint approved for the life of mine (LoM), will cover an area of 330 ha and a height of 40 m.

2.1.3 Mineral Processing Activities

Mined ore material is stockpiled at the RoM pad where it is blended and fed for crushing, milling, leaching and gold extraction.

The Processing Plant has capacity for 3.4 mtpa run of mine (RoM) ore feed. RoM ore is fed to the Primary Crusher and a Pebble Crusher. The crushed rock is delivered to the Processing Plant by means of an 800m conveyor belt, that deposits material onto a storage stockpile.

The metallurgical processing route (Figure 2), consists of the following main processes:

- Single Stage Crusher and Pebble Crusher;
- Two stage milling (SAG Mill and Ball Mill), classification and gravity circuit;
- Intensive Cyanidation of the Gravity Concentrate (Knelson Concentrator);
- Cyanide Leaching of the mill cyclone overflow (Leach Tanks);
- Carbon adsorption (Carbon in Pulp (CIP) Tanks); and
- Elution, electro winning, regeneration and smelting (Furnace).

The main resources used in the production of gold are reagents, water and energy.

Primary reagents required in the Processing Plant include: cyanide, caustic soda, hydrochloric acid, flocculent, lime, sodium metabisulphite, copper sulphate, activated carbon, borax, sodium nitrate and silica.

Water is sourced from groundwater *via* boreholes, dewatering of mining areas and return water from the Tailings Storage Facility (TSF). Raw water is pumped from production and pit dewatering boreholes to a receiving tank at the water treatment facility (WTF) and the process water tank. Raw water treatment includes coagulation, settling and filtration. Treated raw water is used in: Crushing and Milling for dust suppression; Potable Water Treatment Plant; Gland Service Water Distribution Tank; and Process Water.

Tailings generated in the leaching section of the Processing Plant is stored in the lined TSF. The TSF is designed and constructed according to international best practice and the International Cyanide Management Code.

Energy is provided *via* an on-site Heavy Fuel Oil (HFO) Power Plant and a 10.8 MW Photovoltaic (PV) Solar Power Plant. The primary fuel used in the power generation plant is heavy fuel oil (HFO) and the secondary fuel is diesel. Two above ground HFO storage facilities (tanks) with a combined volume of 2000 m^3 and one above ground diesel storage tank (300 m^3) is installed on site. Adequate bunding capacity and fire protection are incorporated in the design of the facility and sufficient off-loading facilities are provided for on site.

In addition to the HFO and diesel required for the HFO Power Plant, the mine uses **hydrocarbon products** for light vehicles, heavy mobile equipment and the emergency power generation facility. Diesel is the main consumable and is stored in bulk tanks (i.e. 500 000 litres) located in a bunded area at the mining workshop area.

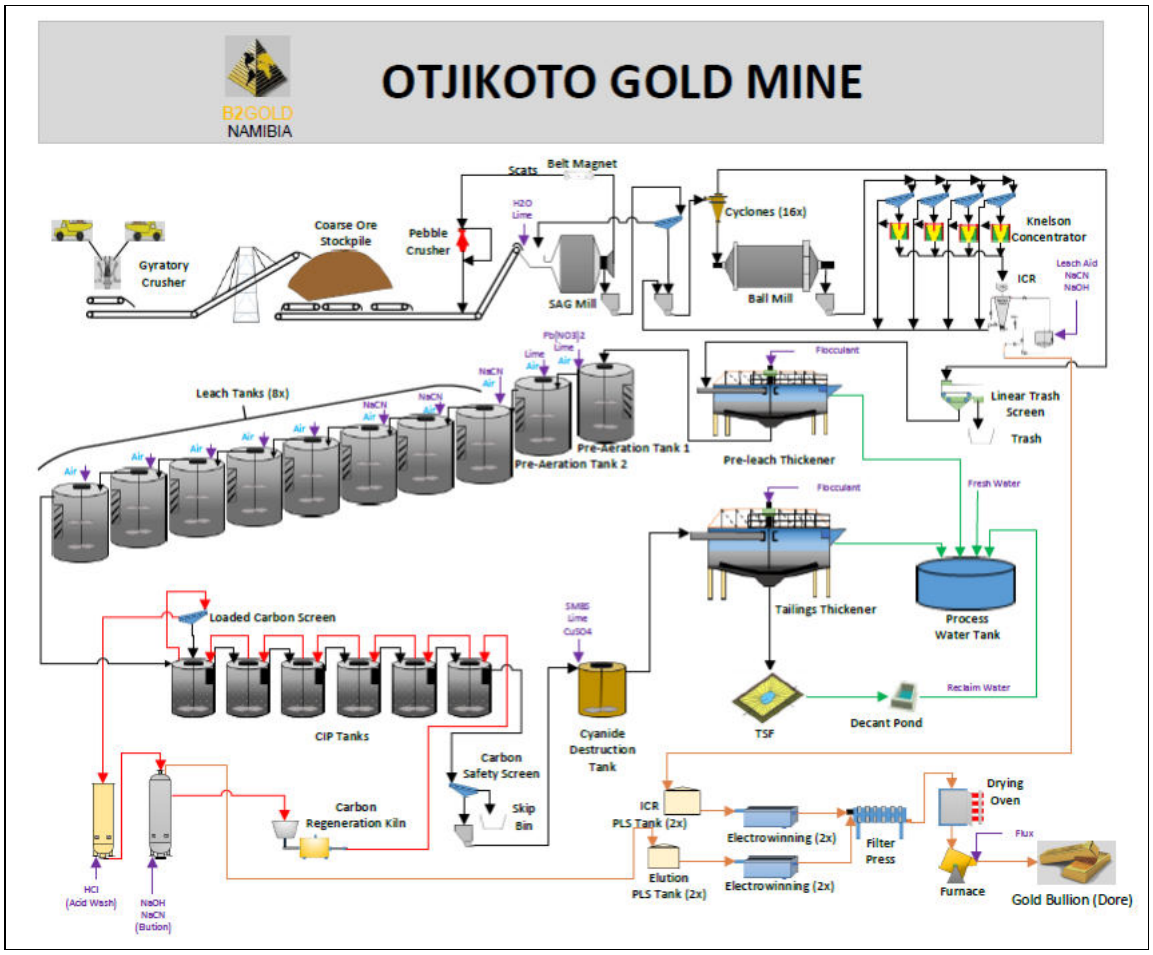

Figure 2: Schematic diagram of the metallurgical process flow

2.1.4 Engineering Activities

Engineering activities include: support services for heavy machinery and equipment; maintenance of the Processing Plant, site facilities and infrastructure; supply of power, water and fuel; sewage treatment and waste management.

2.1.4.1 Site Facilities for Operations

The operational phase consists of the following on-site facilities:

- Two open pits (Otjikoto and Wolfshag);
- Underground pit (Wolfshag);
- RoM stockpiles;
- RoM pad;
- Processing Plant;
- HFO Power Plant with associated fuel (HFO and diesel) storage facilities;
- Mine dewatering sumps;
- Access roads and haul roads;
- Mineralised waste disposal facilities (Waste Rock Dump, Low grade dump, and a tailings facility) and associated Offices and ablution facilities;
- Explosives magazine;
- Topsoil stockpiles;
- Conveyors (in the Plant, between the Plant and RoM complex);
- Contractors workshops;
- Power plant wash bay for washing equipment and vehicles;
- Tyre Bay for tyre services and installation;
- Refuelling areas;
- Hazardous substances storages areas;
- On-site (non-hazardous) landfill facility;
- Salvage yard and temporary non-mineralised waste handling facilities;
- Stores (Plant and mine complexes);
- On-site water supply infrastructure;
- Compressed air supply station;
- Stormwater management facilities;
- Water treatment facility;
- Clean and dirty water holding facilities;
- On-site power supply infrastructure;
- Change houses;
- Sewage treatment plants (STP);
- Weighbridge;
- Loading and off-loading areas;
- Parking areas;
- Security infrastructure;
- Laboratory;
- Communication infrastructure;
- Lighting infrastructure;
- Pit stop fuelling station for heavy machinery and equipment;
- Heavy Machinery Equipment (HME) repair and service workshop;
- General Mine Services (GMS) engineering workshop;
- Processing Plant engineering workshop;
- HME Warehouse for storing new equipment and machinery parts for the HME workshop;
- Lube Oil Facility - Oil lubrication storage tanks;
- Overhead power lines to support dewatering activities;
- Water pipelines to support dewatering and water transfer network;
- On-site Canteen catering for employees, contractors and visitors;
- HME Ablution Block for HME workshop employees;
- Boilermaker workshop for boiler making activities – constructing and repairing metal products and steel structures;
- HME and LDV Wash bays for cleaning heavy machinery / equipment and Light vehicles;
- Incinerator at the Landfill Facility for incineration of selected hazardous waste;
- Sandblasting yard for sandblasting activities;
- Administration building for office space;
- Management Camp for accommodation units;
- Mining haul roads constructed to cater for weather conditions (wider and lifted/higher);
- Mining Office Building including Technical Services;
- HSE Office Building including environmental laboratory and offices;
- Drill equipment service area; and
- Clinic Building including offices, consulting room for Doctor(s) and emergency equipment stores.

2.1.5 Non-mineralised Waste Management Activities

All **non-mineralised waste** is separated at source into hazardous and non-hazardous waste, stored in bins and skips to prevent discharge or contamination to the environment; and recycled or re-used where possible. To further minimise potential risks, secondary containment (designed and constructed to contain all liquid hazardous waste) is used to store hazardous waste. Off-site transportation of hazardous waste is conducted by an appropriate service provider capable of handling hazardous waste. Disposable hazardous waste is disposed of at a registered hazardous waste disposal facility in Walvis Bay.

Records of non-mineralised waste is maintained for both on-site and off-site disposal. These include types and quantities of hazardous wastes, audit and inspection records and waste disposal certificates. All the waste from both surface and underground operations can currently be handled by waste management systems in place at the operations.

Hazardous waste include: hydrocarbon waste (waste oil and fuel, grease, and contaminated soil), fluorescent tubes and bulbs, paint and solvents, batteries, electronic waste, and chemical waste.

- Waste oil and fuel are drained and stored in bunded tanks within a bunded area until removed from site for refining and re-use.
- Hydrocarbon contaminated soil is treated at an on-site **bioremediation facility**.
- Paint thinners, strippers and other solvents generated in small volumes site wide are evaporated and residue transferred into a labelled container for off-site disposal at a registered hazardous waste facility.
- Fluorescent tubes and bulbs are stored in a fluorescent tube drum for periodic removal and final disposal at a registered hazardous waste facility.
- Heavy mobile equipment batteries are stockpiled and periodically removed by a licenced dealer for recycling. Lithium batteries from small equipment and instruments are disposed of in a drum, sealed and removed for final disposal at a registered hazardous waste facility.
- Electronic waste (e-waste) is stockpiled and sent to an appropriate e-service waste provider for recovery and final disposal.

An **incinerator** is used as a hazardous waste treatment process to burn waste material in a furnace. The waste material is converted by high temperature (up to 1000℃) into ash, flue gas and heat. Following the combustion process, the ash residue is considered safe for disposal at the landfill facility. Incineration is used to reduce the volume of hazardous waste and is considered a safe, hygienic and cost-effective option of disposing of contaminated hazardous waste. Incineration of hazardous waste also detoxifies waste from harmful pathogens, bacteria and toxins. Combustion of waste also prevents wildlife from scavenging on waste.

The following materials are used or destroyed in the incinerator:

- Limited volumes of waste oil are re-used in a burn bunker and incinerator for the destruction of other hazardous wastes. Hydrocarbon contaminated materials not required for re-use or recycling are destroyed in the incinerator as per the operating procedures (rags, cardboards, pellets and other combustible materials).
- Empty reagent bags and packaging are destroyed in the incinerator as per the operating procedures.
- Fat, oil and grease (FOG) from the camp / canteen kitchens are destroyed at the incinerator.
- Any carcass of a dead animal found in the TSF, return water and events pond is destroyed in the incinerator, as there is potential for heavy metal contamination.

Explosive and blasting wastes are destroyed in the on-site burn bunker as per the explosives waste destruction procedure and as required by legislation.

Medical waste generated by the clinic is periodically incinerated in the onsite incinerator as authorised by the Ministry of Health and Social Services.

An on-site **landfill facility** is established and caters for non-recyclable non-hazardous material - primarily product packaging, wood products, organic materials, glass, plastics, metals and food scraps.

The landfill facility is constructed / operated in phases, i.e. one or two sections / cells (containment pits) of the facility will be open at any given time for depositing and covering waste. The next section / cell is opened when the previous one has almost reached its full capacity. The construction and operation of the landfill facility continues throughout the life of mine (LoM), as required.

Prior to the excavation of each containment pit cell, land clearing takes place, *i.e.* topsoil is stripped and bushes / shrubs removed. Topsoil is stripped to a depth of 300 mm and stockpiled close to the specific excavated section. Using an excavator, material from the containment pit is excavated to a depth of approximately 3 m. The typical size of each of the cells is approximately 15m x 30m. The active area is fenced along its perimeter to control and restrict access by personnel and wildlife, and to assist in further containment of any potential wind-blown refuse.

Two onsite biological wastewater treatment plants are used with suitable capacity for effluent generated from operations. Sewage is collected and transported *via* gravity reticulation buried sewer pipes to the **Sewage Treatment Plant** / **Facility (STP)** for treatment. The plant (STP) has the capacity to treat sewerage generated on site per day. The water discharged from the Sewage Treatment Plant / Facility (STP) is suitable for use in dust suppression, fire water and process water.

Underground operations generate wastewater effluent within chemical toilets, which is disposed offsite at municipal wastewater treatment plant(s).

2.1.6 Mineralised Waste Management Activities

There are three main stockpile dumps comprising of one large **waste rock** dump and two low-grade material, respectively. The low-grade dumps will be reclaimed and processed at a later stage during the LoM. All non-mineralised waste material generated is disposed of on the waste rock disposal site. During the active waste tipping phase, the waste rock dump is constructed at the material's natural angle of repose of approximately 35 degrees, which is contoured to approximately 17 degrees overall to allow for slope stability and re-vegetation. Waste rock from underground operations is hauled to the WRD and tipped in accordance with the WRD design and tipping plan, which is designed to accommodate volumes from both underground and surface operations.

Tailings from underground operations are disposed of into the TSF as slurry forming part of the overall production waste from the open pit mining. The TSF's capacity caters for both underground and surface operations.

2.1.7 Socio-economic Influence

B2Gold Namibia Otjikoto Gold Mine creates employment and skills development at the local and regional level, increasing job creation and economic growth. The Company also contributes towards empowerment opportunities in a range of skills and activities, while income from employees provides for immediate and extended family members. The Company also focus on giving preference to local, regional and national procurement.

Key focus is placed on economic impacts, in-migration and resulting community needs and changes in land-use and neighbouring communities. Commitments include preference of local procurement, prioritised training and recruitment policies, emphasis on skills development and upgrading, support and promotion of continuous learning programmes, training on personal financial management, promotion of home ownership, support of the local economies of Otavi and Otjiwarongo and supporting social initiatives.

3. APPLICABLE ENVIRONMENTAL LEGAL REQUIREMENTS

B2Gold Namibia Otjikoto Gold Mine is committed to complying with applicable legal requirements and other compliance obligations. Detailed descriptions of legislation applicable to Otjikoto Gold Mine are provided for in the following documents:

- Otjikoto Gold Mine Environmental Impact Assessment for the Proposed Otjikoto Gold Mine Project (SLR, 2012);
- Scoping Report (Including Impact Assessment) for the Proposed Changes to the Otjikoto Gold Mine Project - Landfill Site and Power Plant (SLR, 2013);
- Scoping Report (Including Impact Assessment) for the Proposed Changes to the Otjikoto Gold Mine Project – Wolfshag Zone (SLR, 2014);
- Environmental Scoping Report for the amendment to the Hazardous Waste Management Plan at B2Gold Otjikoto Gold Mine (A. Speiser Environmental Consultants cc, 2017);
- Otjikoto Gold Mine – Upgrade of existing Power Plant by10.8 MW (ECC, 2017); and
- Otjikoto Mine Wolfshag pit Underground Mining Amendment – B2Gold Namibia (ECC, 2019).

The tables that follow present a list of Applicable Environmental Legislation and Compliance Obligations, and Environmental Licences, Permits, Certificates and Approvals required by B2Gold Otjikoto Gold Mine.

3.1 ENVIRONMENTAL LICENCES, PERMITS, CERTIFICATES AND APPROVALS

LEGAL REQUIREMENT	APPLICABLE LEGISLATION
Environmental Clearance Certificate for the Otjikoto Gold Mine, ML 169	Environmental Management Act, No. 7 of 2007 and EIA Regulations of 2012
Mining licence	The Minerals (Prospecting & Mining) Act, No 33 of 1992, Section 93(1)
Electricity Generation Licence	Electricity Act, No. 4 of 2007, Section 17(1)
Permission to erect accessory works	The Minerals (Prospecting & Mining) Act, No 33 of 1992, Section 90(1)(e) and (2)(a)
Permit for possession of explosives	Explosives Act 1956, No. 26 of 1956, Section 6(1)
Permit for blasting	Explosives Act 1956, No. 26 of 1956, Section 9(1)
Exemption Permit for Wastewater Effluent Disposal	Water Act, 1956, No 54 of 1956, Section 21 and 22; Water Resources Management Act, No.11 of 2013, Section 13
Licence to abstract and use water and permit for drilling of boreholes	Water Act, 1956, No 54 of 1956, Section 2 and 30
Permit for Used Mineral Oil	Petroleum Products and Energy Act, No. 13 of 1990, Section 2(1); Petroleum Products Regulations, No 112 of 1991, Section 3(3)
Consumer Installation Certificate(s)	Petroleum Products Regulations of 2000, Regulation 18(5)
Reporting of major petroleum product spills	Petroleum Products Regulations of 2000, Regulation 49(1)
Grave relocation permit	National Heritage Act, No. 27 of 2004, Section 48 – 52 and 55
Licence to sell Group I hazardous substance; Registration to use, operate or apply Group III hazardous substance; Registration to install or keep installed any Group III hazardous substance	Hazardous Substances Ordinance, No.14 of 1974, Section 5 (1)(a)(b)(c)
Registration Certificate for a Scheduled Process	Atmospheric Pollution Prevention Ordinance, No. 11 of 1976, Section 5(1)

Licence to pick or transport any protected plant	Nature Conservation Ordinance, No. 4 of 1975, Section 73
Licence to sell, donate or export or remove a protected plant	Nature Conservation Ordinance, No. 4 of 1975, Section 74
Licence for Possession and use of Radiation Sources, Registration of Radiation Sources	Radiation Protection and Waste disposal Regulations; Atomic Energy and Radiation Protection Act, 2005 (No. 5 of 2005) Section 18 and section 21(1)(g)

3.2 Applicable Legislation and Other Compliance Obligations

Relevant Authority: Ministry of Justice	
Acts	
1990	Constitution of the Republic of Namibia, 1990
Relevant Authority: Ministry of Environment, Forestry and Tourism	
Acts	
2017	Protected Areas and Wildlife Management Bill, 2017
2007	Environmental Management Act, No 7 of 2007
2001 & 2005	Forest Act 12 of 2001 (as amended by Forest Amendment Act 13 of 2005)
1999	Draft Pollution Control and Waste Management Bill, 1999
Ordinances	
1975	Nature Conservation Ordinance, No. 4 of 1975
Regulations	
2012	Environmental Impact Assessment Regulations: Environmental Management Act, 2007
Policies	
2011	National Policy on Climate Change for Namibia, 2011
1995	Environmental Assessment Policy for Sustainable Development and Environmental Conservation, 1995
1994	Policy for the Conservation of Biotic Diversity and Habitat Protection, 1994
International Conventions	
1998	Kyoto Protocol on the Framework Convention on Climate Change, 1998
1992	The Rio de Janeiro Convention on Biological Diversity, 1992
1992	The United Nations Framework Convention on Climate Change, 1992
1989	The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989
1989	The Rotterdam convention on the Prior Informed Consent Procedure for Certain Hazardous chemicals and Pesticides in International Trade, 1989
1987	Montreal Protocol on Substances that Deplete the Ozone Layer, 1987
1985	Vienna Convention for the Protection of the Ozone Layer, 1985
Relevant Authority: Ministry of Agriculture, Water and Land Reform	
Acts	
2013	Water Resources Management Act, No 11 of 2013
1956	Water Act, No 54 of 1956
Regulations	
2016	Water Resources Management Act 11 of 2013 Regulations, 2016 (Draft)
Policies	
2000	National Water Policy White Paper
Relevant Authority: Ministry of Education, Arts and Culture	
Acts	

2004	National Heritage Act, 27 of 2004
REGULATIONS	
2005	National Heritage Regulations of 2005
RELEVANT AUTHORITY: MINISTRY OF MINES AND ENERGY	
ACTS	
2007	Electricity Act 4 of 2007
1990, 1994 & 2000	Petroleum Products and Energy Act, 1990 (Act 13 of 1990) — as amended by Petroleum Products and Energy Amendment Act 29 of 1994 and Petroleum Products and Energy Amendment Act 3 of 2000
1992	The Minerals (Prospecting & Mining) Act, No 33 of 1992
1956	Explosives Act 26 of 1956
ORDINANCES	
1968	Mines, Works and Minerals Ordinance 20 of 1968: Regulations (GN143, GG2927 of 1 October 1968)
REGULATIONS	
1991 & 2000	Petroleum Products Regulations of 1991 and 2000
POLICIES	
2002	Minerals Policy of Namibia, 2002
RELEVANT AUTHORITY: MINISTRY OF HEALTH AND SOCIAL SERVICES	
ACTS	
2015	Public and Environmental Health Act 1 of 2015
2005	Atomic Energy and Radiation Protection Act 5 of 2005
ORDINANCES	
1976	Atmospheric Pollution Prevention Ordinance 11 of 1976
1974	Hazardous Substances Ordinance 14 of 1974
REGULATIONS	
2011	Radiation Protection and Waste Disposal Regulations GN 221, GG4835, 11 November 2011
POLICIES	
2010	National Waste Management Policy, 2010
2002	National Environmental Health Policy, 2002
RELEVANT AUTHORITY: MINISTRY OF LABOUR, INDUSTRIAL RELATIONS AND EMPLOYMENT CREATION	
ACTS	
2007	Labour Act 11 of 2007
1997	Regulations relating to the Health & Safety of Employees at Work (promulgated in terms of Section 101 of the Labour Act No 6 of 1992 (GN156, GG 1617 of 1 August 1997)
RELEVANT AUTHORITY: MINISTRY OF WORKS, TRANSPORT AND COMMUNICATION	
ACTS	
1999	Road Traffic and Transport Act 22 of 1999
1994	Namibian Ports Authority Act 2 of 1994

REGULATIONS	
2001	Port Regulations promulgated in terms of this section in GN 117 published in GG2549 of 5 June 2001
B2GOLD STANDARDS	
2021	B2Gold Social Performance Management System Standards
2018	B2Gold Health, Safety and Environment Management System Standards
2018	B2Gold Environmental and Biodiversity Performance Standards
	Standard 1: Hazardous Materials and Dangerous Goods Management
	Standard 2: Cyanide Management
	Standard 3: Tailings Management
	Standard 4: Waste Rock Management
	Standard 5: Non-Process Waste Management
	Standard 6: Water Management
	Standard 7: Air Quality Management
	Standard 8: Closure and Reclamation Planning
	Standard 9: Topsoil and Reclamation Management
	Standard 10: Noise and Vibration Management
	Standard 11: Biodiversity Management
OTHER BEST PRACTICE STANDARDS	
2012	International Finance Corporation (IFC) Standards, 2012
	International Cyanide Management Code

4. ROLES AND RESPONSIBILITIES

The Environmental Clearance Certificate and Environmental Management Plan is a binding document between the Company and the Government of Namibia. The Company is responsible for compliance to the EMP and for providing the necessary resources to implement the management commitments. The successful implementation of the EMP is dependent on clearly defined roles and responsibilities for each of the management actions in the EMP. The table that follows indicates applicable key roles and responsibilities.

ROLES	RESPONSIBILITIES
General Manager	Overall responsible for implementation and compliance to the EMP.
Environmental Manager	Provides support to various departments to implement the EMP commitments.
Financial Manager	Makes financial resources available to implement the EMP commitments - management, remediation, rehabilitation and closure costs.
Technical Services Manager	Provides geological and survey support.
Engineering Manager	Provides engineering, planning and maintenance support for infrastructure, machinery and equipment requirements.
Mining Manager	Responsible for effective operation of open-cast and underground pits, associated mineralised dumps and waste material.
Processing Manager	Responsible for effective operation of the Processing Plant and Tailings Storage Facility.
Procurement Manager	Responsible for implementing processes that minimise business waste, while sourcing products and services for the Company – negotiating and managing contracts and building key relationships with both suppliers and internal management team.
Supply Chain Manager	Responsible for the management of the flow of goods and services, including the movement and storage.
CSR Manager	Creates links / relations between the Company and the community on common commitments towards sustainable social responsibility.
Safety Manager	Provides support to various departments to implement the Safety and Health commitments.
Public Relations Manager	Responsible for all internal and external communications for the Company, navigating public relations, ensuring for a consistent and engaging message (e.g. preparing detailed media reports, press releases, facilitating workshops and marketing materials).
Human Resources Manager	Responsible for effective and efficient management of people in the Company to maximise employee performance.
Security Manager	Responsible for the security of the operations of the Company (e.g. access and product control).

5. STAKEHOLDER ENGAGEMENTS

Detailed stakeholder engagements were conducted during the original Otjikoto Gold Mine Project EIA process and the additional projects that followed, as mentioned in the aforementioned 'Introduction and Background' section of this document.

Communication and stakeholder engagements with government stakeholders, Otjiwarongo and Otavi Town Councils, neighbouring farmers, communities, Non-Governmental Organisations, business partners, investors and interested parties are key to identify and manage opportunities, concerns and improvements of mutual interest.

6. AUDITING AND REPORTING

Compliance, system and functional environmental audits are essential to the operations. Internal and external audits are conducted on scheduled intervals by suitably qualified and experienced environmental auditors. Auditing is important to ensure environmental continual improvement and performance.

Regular reports to stakeholders are compiled as per legal requirements and other compliance obligations.

7. ENVIRONMENTAL MANAGEMENT PLAN

The management plans, listed in the tables below, are a consolidation of all the relevant management objectives, standards, activities, aspects, associated impacts, management actions and responsibilities applicable to Mining Licence 169 of B2Gold Namibia's Otjikoto Gold Mine - during the operational and decommissioning phases. These management plans contain previously approved commitments and updated management commitments where relevant.

The management plans include the following:

7.1 Air Quality Management Plan

7.2 Surface Water Management Plan

7.3 Groundwater Management Plan

7.4 Biodiversity Management Plan

7.5 Resource Management Plan

7.6 Soil Management Plan

7.7 Waste Management Plan

7.8 Archaeology Management Plan

7.9 Noise and Vibrations Management Plan

7.10 Visual Management Plan

7.11 Safety and Security Management Plan

7.12 Traffic Management Plan

7.13 Socio-economic Management Plan

7.14 Stakeholder Consultation / Communication Management Plan

7.15 Decommissioning and Closure Management Plan

7.1 Air Quality Management Plan

Management Objectives

- To prevent unacceptable ambient air quality related pollution impacts.
- To prevent deterioration of air quality and to minimise the potential for emitted dust and airborne pollutants.
- To identify, control and reduce GHG emissions through energy efficiency strategies

Management Standards

- Public and Environmental Health Act (No.1 of 2015)
- Explosives Act (No. 26 of 1956)
- The Minerals (Prospecting and Mining) Act (No. 33 of 1992)
- Atmospheric Pollution Prevention Ordinance (No. 11 of 1976)
- Labour Act (No. 11 of 2007)
- Regulations relating to the Health and Safety of Employees at Work (promulgated in terms of Section 101 of the Labour Act No 6 of 1992 (GN156, GG 1617 of 1 August 1997)
- Petroleum Products and Energy (No. 13 of 1990)
- B2Gold Health, Safety and Environment Management System Standards
- Air Quality Performance Management Plan
- NO_x / SO_x Emission Monitoring
- Ambient Air Monitoring
- Monitoring and Measurement Plan
- Air Quality Management Plan

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Storage of Tailings
- Establishing infrastructure
- Removal of infrastructure
- Energy/Power Generation
- Road construction and maintenance
- Operation of machinery, equipment and Plant
- Incineration

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Generation of Dust (Fall-out dust, PM_{10}, $PM_{2.5}$)	▪ Reduced visibility. ▪ Nuisance and Health impacts. ▪ Impact on flora (cover of foliage in dust which reduces growth, health of plant, etc.)	Develop a dust control and management program with monitoring procedures.	X		Environmental Manager	During operation
		Ensure that material transfer points that generate visible dust, are controlled with effective mitigation measures.	X		Mining Manager, Processing Manager, Engineering Manager and Safety Manager	During design and operation
		Use water sprays with or without suppressants on unpaved roads, unmitigated materials handling points (i.e crusher), WRD and at the RoM pad as needed to ensure compliance with air quality standards.	X		Mining Manager, Processing Manager and Safety Manager	During operation
		Enforce speed limits on all site roads.	X		Safety Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Ensure efficient and adequate monitoring and measurement of dust fall-out onsite and offsite (receptors) does not exceed applicable best practice standards.	X		Environmental Manager	Monthly during operations and post closure
		Ensure efficient and adequate monitoring and measurement of PM_{10} dust onsite and offsite (receptors) does not exceed applicable best practice standards.	X		Environmental Manager	Weekly, during operations and post closure
		Ensure that the landfill facility only operates one or two cells at any given time (one operational cell as the next one is being excavated / prepared).	X		Environmental Manager	During daily supervision and inspections
		Minimise hauling distances as far as practically possible (especially in the pit).	X		Mining Manager	During operation
		Ensure wind erosion is managed from exposed storage stockpiles (WRD) and surfaces (e.g TSF) where visible dust generation is controlled with effective mitigation measures.	X	X	Environmental Manager	During operation and rehabilitation
		Ensure that progressive rehabilitation is planned and implemented as soon as practical after earthworks to enhance vegetation cover of the exposed surfaces and slopes.	X	X	Environmental Manager	During operation and rehabilitation
		Conduct monthly visual inspections to ensure sufficient vegetation cover on exposed stockpiles and extend vegetation cover to exposed areas.	X	X	Environmental Manager	Monthly
		Conduct audits and inspections on the air quality monitoring procedure and practices.	X	X	Environmental Manager	As per the Audits and Inspections Schedule
Managing the landfill facility	▪ Reduced visibility.	Avoid burning of waste, unless the predicted volumes of waste to be landfilled is exceeded (i.e. small controlled aerated burning around mid-day in a dedicated area).	X		Environmental Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
	▪ Prevention of potential nuisance and health impact. ▪	Compact waste by passing heavy equipment over the deposited waste, as a preferred alternative to burning.	X		Environmental Manager	During operation
		Avoid burning plastics, rubber or tyres.	X		Environmental Manager	During operation
		Place the permanent earthen fill cover over a cell (containment pit) within the landfill facility once it has reached capacity.		X	Environmental Manager	During rehabilitation and closure
		Ensure that the capped area is vegetated to reduce the potential for wind-blown dust.		X	Environmental Manager	During rehabilitation and closure
Gaseous emissions	▪ GHG emission impacts ▪ Nuisance and Health impacts.	Develop site specific inventory of emissions	X		Environmental Manager	During operation and inspections
		Ensure that a maintenance and repair plan is in place for the mine fleet and equipment for regular service to lower emissions.	X		Engineering Manager	With the acquisition of fleet and equipment
	▪	Ensure an inspection and maintenance plan is implemented for the entire mine fleet to ensure proper combustion of fuel.	X		Engineering Manager	With the acquisition of fleet
	▪ Understanding and managing potential impact on air quality.	Conduct passive diffuse monitoring to confirm SO_2 and NO_x concentrations.	X		Environmental Manager	During operation
Fall-out dust and PM_{10} monitoring	▪ Understanding and managing potential impact on air quality.	Ensure that dust fall-out monitoring is conducted as per the dust management plan / procedure.	X	X	Environmental Manager	Throughout the LoM
Generation of Fall-out dust, PM_{10} and $PM_{2.5}$ from decommissioning	▪ Understanding and managing potential impact on air quality.	Include decommissioning in the dust and PM_{10} management plan.		X	Environmental Manager	During decommissioning
		Use topsoil recovered from stockpiles for rehabilitation and revegetation of surroundings.		X	Environmental Manager	During rehabilitation
		Place topsoil cover onto TSF and vegetate with indigenous grass species.		X	Environmental Manager	During rehabilitation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Contour berm at pit and vegetate with indigenous grass species.		X	Environmental Manager	During rehabilitation
		Replant any previously removed indigenous plant species in disturbed areas.		X	Environmental Manager	During rehabilitation
		Use indigenous plant species in the final landscaping of the rehabilitated mine site.		X	Environmental Manager	During rehabilitation
		Ensure a dense vegetation cover on WRD and TSF as defined by the final closure and decommissioning plan.		X	Environmental Manager	During rehabilitation
		Ensure that mitigation measures are applied should the infrastructure removal at the Processing Plant site, including the Primary Crusher and Conveyors, produce significant dust.		X	Environmental Manager and Engineering Manager	During decommissioning
		Ensure that demolition of infrastructure that necessitates blasting is only done during day-time hours.		X	Environmental Manager and Engineering Manager	During day-time
Dust and fumes from underground operations	▪ Potential nuisance and health impact.	Ensure vehicles adhere to speed limits to avoid producing excessive dust.	X		Engineering Manager and Safety Manager	During operation
		Ensure vehicles and machinery are regularly serviced as per the maintenance and repair plan, according to the manufacturers' specifications and kept in good working condition to minimise exhaust emissions.	X		Engineering Manager	With the acquisition of fleet and equipment
		Minimise the use of diesel-powered machines underground.	X		Engineering Manager	During operation
		Ensure that blasting takes place at fixed times and according to set designs using approved explosives.	X		Mining Manager	During operation
		Implement dust suppression on all dirt roads with high traffic loads.	X		Mining Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Measure particulate matter and fall-out dust from set monitoring stations.	X		Environmental Manager	During operation
		Ensure that underground ventilation is measured frequently, and personal exposure is sampled at regular intervals.	X		Safety Manager	During operation
Air quality from odour and particulate matter from underground operations	▪ Potential impact on air quality (deterioration in air quality from odour and particulate matter (i.e. total suspended particulate matter (TSP), PM_{10} and $PM_{2.5}$ (particulate matter of 2.5 micrometres or less in diameter) and dust deposition) generated from the underground operations.	Ensure mechanical equipment is maintained and serviced to ensure particulate matter is reduced.	X		Engineering Manager	During operation
		Ensure ventilation systems are providing fresh air to working headings and the underground workings are exhausted after each blast.	X		Engineering Manager	During operation
		Implement a pre-shift access checklist - air quality monitoring and personal exposure monitoring.	X		Mining Manager	Daily
Ventilation discharged from the underground workings *via* the portal	▪ Contribution to offensive odours.	Implement gas monitoring procedures as part of the daily operations of the underground mine.	X		Mining Manager	During operation
		Ensure adequate ventilation to prevent the build-up of odours and gas within the underground mine.	X		Mining Manager	During operation
		Implement an air quality monitoring and personal exposure monitoring programme.	X		Mining Manager, Environmental Manager and Safety Manager	During operation
Air quality and Greenhouse Gas (GHG) emissions from underground mining activities	▪ Impacts to air quality – community, neighbouring farmers and workers	Ensure mechanical equipment is maintained and serviced to ensure particulate matter is reduced.	X		Engineering Manager	During operation
		Ensure efficient handling of mineral waste material to reduce haul distances thereby reducing potential GHG emissions.	X		Mining Manager	During operation
		Report GHG emissions to key stakeholders.	X		Environmental Manager	During operation

7.2 Surface Water Management Plan

Management Objectives

- To minimise the discharge of contaminated surface water to the surrounding environment to reduce impacts to sensitive receptors.
- To minimise mixing of clean and dirty water systems.
- To prevent pollution of surface water run-off.
- To prevent pollution of surface water due to industrial effluent.
- To prevent pollution of surface water due to domestic effluent.
- To prevent pollution of surface water due to spillages.
- To reduce and prevent pollution of water resources.
- To minimise the run-off of sediment-laden or polluted water into the surrounding environment.

Management Standards

- Water Act (No. 54 of 1956)
- Water Resources Management Act (No. 11 of 2013)
- Petroleum Products and Energy Act (No. 13 of 1990)
- Hazardous Substances Ordinance (No. 14 of 1974)
- B2Gold Environmental and Biodiversity Performance Standards
- Monitoring and Measurement Plan
- Water Management Plan

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Storage of Tailings
- Establishing infrastructure
- Removal of infrastructure
- Road construction and maintenance
- Operation and maintenance of machinery, equipment and Plant

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Natural flow of stormwater (clean and dirty) flowing from surrounding areas into and around the operations	▪ Alteration of natural drainage systems due to mining infrastructure. ▪ Pollution / Contamination of water and surrounding environment.	Design all stormwater interventions to allow stormwater to bypass major infrastructure (e.g. open pits, tailings storage facility, landfill facility, waste rock dumps, and low-grade stockpiles).	X	X	Engineering Manager	Throughout the LoM
		Ensure that facilities are designed, constructed and operated to provide for flood protection.	X	X	Engineering Manager	Throughout the LoM
		Implement the International Finance Corporation (IFC) guideline principles (IFC Environmental, Health and Safety Guidelines for Mining (2007)).	X	X	Environmental Manager and General Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Flow of dirty stormwater (rainwater that falls onto and flows across the site)	▪ Alteration of natural drainage systems due to mining infrastructure. ▪ Pollution / Contamination of water and surrounding environment.	Construct engineered structures to direct contaminated water from the processing areas, landfill facility, roads and office areas to the return water dam circuit for storage and re-use.	X		Engineering Manager	Throughout the LoM
Surface water around landfill facility	▪ Alteration of natural drainage systems due to mining infrastructure. ▪ Pollution / Contamination of water and surrounding environment.	Use material excavated from the current active cell of the landfill area to construct embankments / berms to divert clean surface water away from the cell on the upstream side, and to the downstream side of the cell.	X		Engineering Manager and Environmental Manager	During operation
		Place the permanent compacted earthen fill cover over a cell (containment pit) within the landfill facility, once it has reached capacity.		X	Engineering Manager and Environmental Manager	During rehabilitation
		Place the permanent compacted earthen such that the final surface is graded to drain water off the landfill facility and to minimise any “ponding or collecting”.		X	Engineering Manager and Environmental Manager	During rehabilitation
Clean and dirty water separation	▪ Alteration of natural drainage systems due to mining infrastructure. ▪ Pollution / Contamination of water and surrounding environment.	Design, construct and operate surface water management facilities to keep dirty water separate from clean water run-off through a system of berms, channels, trenches, flood protection measures, erosion protection or dams.	X		Engineering Manager	Throughout the LoM
		Implement suitable measures for the WRD extension to ensure that no run-off from the WRD is allowed to enter the main channel in the downstream part of Catchment 1b (Refer to Groundwater and Surface Water Specialist Report), using stormwater channels and settlement ponds.	X		Engineering Manager	Throughout the LoM
		Re-use contained water or surplus water that cannot be used in the Plant or release it into the	X		Engineering Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		environment as per permit requirements from the relevant authority.				
		Determine the need for long-term controls around the waste rock dump (WRD) and extension as part of closure planning.		X	Engineering Manager	Throughout the LoM
General surface water pollution / spills	▪ Alteration of natural drainage systems due to mining infrastructure. ▪ Pollution / Contamination of water and surrounding environment.	Ensure that all hazardous chemicals (new and used), dirty water, mineralised waste, concrete batching activities and non-mineralised waste are handled in a manner to prevent contamination of surface water run-off or where this is not possible, demonstrate (through monitoring) that the potential contamination is within acceptable limits (for the environment and human health).	X	X	Environmental Manager, Mining Manager, Processing Manager and Engineering Manager	Throughout the LoM
		Prevent pollution *via* infrastructure design and education and training of employees and contractors.	X	X	Engineering Manager and Environmental Manager	Throughout the LoM
		Ensure that *in situ* bioremediation takes place at the point of pollution, or removal of soils for washing and/or bioremediation at a designated area.	X	X	Environmental Manager and Departmental Managers	Throughout the LoM
		Ensure that on-site contractors have all the necessary hazardous protection equipment for people and the environment in the advent of a spill.	X	X	Supply Chain Manager	Throughout the LoM
		Verify the fuel transport company's spill containment (emergency clean up) plan and spill clean-up agreement is in place.	X	X	Supply Chain Manager	Throughout the duration of the contract
		Ensure that fuel transporting companies adhere to the Petroleum Products and Energy Act (13 of 1990) and Regulations.	X	X	Supply Chain Manager	Throughout the duration of the contract

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Establish and maintain concrete bunded areas around all diesel generators, where required.	X	X	Engineering Manager	Throughout the LoM
		Maintain and implement a spill management procedure, including the clean-up of hydrocarbon spills.	X	X	Environmental Manager and Departmental Managers	Throughout the LoM
		Clean up or remediate *ad hoc* spills immediately in line with the spill management procedure.	X	X	Departmental Managers	Throughout the LoM
		Place spill kits in all areas where hazardous substances are dispensed and stored, and train staff to use it.	X	X	Departmental Managers	Throughout the LoM
		Develop specifications for post-rehabilitation audit criteria to determine whether the remediation has been effective.	X	X	Environmental Manager	Throughout the LoM
Mine infrastructure	▪ Pollution / Contamination of water and surrounding environment.	Ensure that where mine infrastructure becomes damaged or cause surface water contamination, it is timeously repaired and maintained.	X	X	Engineering Manager	Throughout the LoM
Emergency preparedness and response	▪ Pollution / Contamination of water and surrounding environment.	Handle major spillage incidents that contaminate flood waters in accordance with the emergency preparedness and response procedure and report incidents to relevant authorities.	X	X	Environmental Manager and General Manager	Throughout the LoM
Training and awareness	▪ Awareness creation on the significance of pollution / contamination of water and surrounding environment, and applicable preventative and corrective measures.	Induct all employees and contractors in the spill management procedure.	X	X	Environmental Manager	With onboarding and refresher inductions
		Train selected employees and contractors in the remediation of soil or water contaminated by hydrocarbon spills.	X	X	Environmental Manager	With onboarding and refresher inductions
Safe disposal and rehabilitation of hydrocarbon	▪ Pollution / Contamination of water and surrounding environment.	Develop and implement a hydrocarbon remediation procedure, which includes the treatment of contaminated soil and water.	X	X	Environmental Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
contaminated soil and water						
Monitoring of hydrocarbon spills	▪ Pollution / Contamination of water and surrounding environment.	Include hydrocarbon spills in the daily inspections' checklist.	X	X	Environmental Manager and Departmental Managers	Throughout the LoM
		Report spillages as per the incident management procedure and applicable legal requirements.	X	X	Environmental Manager and Departmental Managers	Throughout the LoM
Managing of the landfill facility	▪ Pollution / Contamination of water and surrounding environment.	Ensure effective supervision of materials taken to the landfill to prevent the illegal / unauthorised dumping of hazardous material at the facility.	X	X	Environmental Manager	Throughout the LoM
Legal compliance	▪ Pollution / Contamination of water and surrounding environment.	Apply to the relevant authority for exemption of certain conditions of the water discharge permit to allow the continued re-use of treated sewage effluent in the process water circuit.	X		Environmental Manager	During operation
Spillage or discharge of industrial effluent	▪ Pollution / Contamination of water and surrounding environment.	Prevent spillages of industrial effluent and ensure any spillages are properly contained.	X		Processing Manager	During operation
		Ensure that checking for industrial effluent spills is included in the daily inspection checklist.	X		Environmental Manager and Processing Manager	During operation
		Report spillages as per the incident management procedure and clean up spills within 24 hours of the incident occurring.	X		Processing Manager and Environmental Manager	During operation within 24 hours
		Investigate discharges of industrial effluent into the environment - stop the spillage as soon as possible and take corrective action to eliminate or control the root cause.	X		Processing Manager and Environmental Manager	During operation
		Maintain pipes, drains, pumps, valves, etc. to minimise the likelihood of leaks.	X	X	Engineering Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Pollution prevention from industrial effluent	▪ Pollution / Contamination of water and surrounding environment.	Recycle all process water from the process dam back into the plant as per the design specifications.	X		Processing Manager	During operation
		Ensure that the various effluent streams (tailings decant, treated effluent dirty stormwater, process effluent) are managed to prevent overflow of the return water dam.	X	X	Processing Manager	Throughout the LoM
		Ensure that a freeboard is maintained to accommodate run-off during a 1:50 year storm event.	X	X	Processing Manager	Throughout the LoM
		Monitor the effectiveness of the mitigation measures (e.g. liner) for damage to ensure that seepage does not occur.	X	X	Processing Manager	Throughout the LoM
		Ensure that storage / containment facilities have sufficient capacity to cater for the various sources of water including rainfall.	X	X	Processing Manager	Throughout the LoM
Discharge of industrial effluent to the return water dam and TSF	▪ Pollution / Contamination of water and surrounding environment.	Ensure that all the industrial effluent is discharged into the return water dam and the TSF (slurry).	X	X	Processing Manager	Throughout the LoM
		Install oil-water separators at all wash bays to separate hydrocarbons from the water and route the water to the return water dam.	X	X	Engineering Manager	Throughout the LoM
		Skim separators regularly and dispose of hydrocarbons as per the waste management procedure.	X	X	Engineering Manager	Throughout the LoM
Storage and disposal of liquid waste (hydrocarbons)	▪ Pollution / Contamination of water and surrounding environment.	Collect and safely store (in sealed drums on impermeable surfaces within bunded areas) all liquid hydrocarbon waste.	X		Engineering Manager	During operation
		Design bunded areas to contain 110% of the volume of one or the largest drum (in a multi-	X		Engineering Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		drum setup) and equip the bund with traps and oil-water separators to contain spilled hydrocarbons.				
		Provide used hydrocarbon liquid waste to third parties for recycling and keep related records.	X		Engineering Manager and Environmental Manager	During operation
Discharge of raw sewerage and grey water into appropriate sewage treatment facilities	▪ Pollution / Contamination of water and surrounding environment.	Conduct regular monitoring to ensure that effluent is not being discharged into the environment.	X	X	Environmental Manager	Throughout the LoM
		Operate biological sewage treatment plant to treat sewage and grey water generated on site.	X		Engineering Manager	During operation
Spillage of domestic and treated effluent	▪ Pollution / Contamination of water and surrounding environment.	Report spillages as per the incident management procedure and clean up spills within 24 hours of the occurrence of the incident.	X	X	Engineering Manager	Within 24 hours
		Investigate discharges of domestic effluent into the environment - stop the spillage as soon as possible and take corrective action to eliminate or control root cause.	X	X	Engineering Manager	Throughout the LoM
		Decontaminate soil or water pollution using appropriate methodology and rehabilitate the area.	X	X	Engineering Manager	Throughout the LoM
Awareness and Training	▪ Pollution / Contamination of water and surrounding environment.	Train operators to understand the legal requirements and how to achieve compliance.	X	X	Environmental Manager	With onboarding and refresher inductions
		Induct employees and contractors in the use of the spill management procedure.	X	X	Environmental Manager	With onboarding and refresher inductions
Treatment of sewerage	▪ Pollution / Contamination of water and surrounding environment.	Regularly service and maintain sewage treatment plant (STP) to keep it in proper working condition.	X	X	Engineering Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Discharge treated water to the environment or to the tailings storage facility.	X	X	Engineering Manager and Processing Manager	Throughout the LoM
		Remove sewerage sludge from the STP for disposal at the nearest waste drying beds.	X	X	Engineering Manager	Throughout the LoM
		Operate the STP according to the operations manual to ensure optimum performance.	X		Engineering Manager	During operation
Compliance to legal requirements	▪ Pollution / Contamination of water and surrounding environment.	Apply to the relevant authority for the relevant permissions for the STP and a possible Wastewater Discharge permit.	X	X	Environmental Manager	Throughout the LoM
		Conduct regular inspections and audits relating to the STP activities and ensure compliance to conditions of applicable permits.	X	X	Environmental Manager	Throughout the LoM
Hydrocarbon spills	▪ Pollution / Contamination of water and surrounding environment.	Ensure that the Company is in possession of the relevant licences for surface and underground storage tanks (as per legal requirements).	X	X	Supply Chain Manager	Throughout the LoM
		Ensure that hydrocarbon (used and new fuel and oil) tanks and drums are stored inside bunded areas on impermeable floors with traps and separators to contain spillages.	X	X	Engineering Manager	Throughout the LoM
		Ensure these areas are designed to contain 110% of the volume of one or the largest tank (in a multi-tank setup) and that pumps and pipes are properly maintained.	X	X	Engineering Manager	Throughout the LoM
		Equip all wash bays with oil traps and separators and store all collected oil in waste oil tanks.	X	X	Engineering Manager	Throughout the LoM
		Ensure that all fuel and oil storage facilities (farms) and transport tankers have spill kits.	X	X	Supply Chain Manager and Engineering Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Ensure that the fuel transport company has a system in place to deal with hydrocarbon spills and subsequent clean-up thereof.	X	X	Supply Chain Manager	Throughout the LoM
		Contain the spill and commence with remediation within 24 hours and report as per the incident management procedure.	X	X	Environmental Manager and Departmental Managers	Throughout the LoM
		Separate hydrocarbons from contaminated water and treat water before recycling and re-use.	X	X	Engineering Manager	Throughout the LoM
Domestic and Industrial effluent spillage	▪ Pollution / Contamination of water and surrounding environment.	Prevent effluent spills by ensuring that treatment and storage facilities are adequate and pipes in good condition.	X	X	Engineering Manager	Throughout the LoM
		Ensure that capacities of the various facilities and pipes are not exceeded.	X	X	Engineering Manager	Throughout the LoM
		Ensure that all vehicles and equipment are serviced in workshops and wash bays with contained impermeable, floors, dirty water collection facilities and oil traps.	X	X	Engineering Manager	During operation
		Contain spills and clean up within 24 hours and report as per the incident management procedure.	X	X	Engineering Manager	Throughout the LoM
		Pick up, in sealed containers, slurry that spilled the ground and transport to the TSF or emergency stockpile for disposal.	X	X	Processing Manager	Throughout the LoM
		Contain sewerage and industrial effluent spills and treat the pollution by means of *in situ* bioremediation.	X	X	Processing Manager and Engineering Manager	Throughout the LoM
		Excavate pollution and treat as per the waste management procedure, if *in situ* treatment is not possible or acceptable.	X	X	Processing Manager and Engineering Manager	Throughout the LoM

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Compliance to legal requirements – all spills	▪ Pollution / Contamination of water and surrounding environment.	Comply with all legal requirements regarding spills and containment structures.	X	X	All Departmental Managers	Throughout the LoM
		Report hydrocarbon spills of 200 litres or more to the MME in terms of Section 49 of the Petroleum Products Regulations 2000.	X	X	Environmental Manager and Departmental Managers	Throughout the LoM
Monitoring of all spills	▪ Pollution / Contamination of water and surrounding environment.	Ensure that the monitoring of all tanks, pipelines and bunds are included in the daily inspection programme to develop an early detection system for leaks.	X	X	Engineering Manager	During operation
		Update, maintain and implement a maintenance plan for tanks, tankers, pipelines and bunds.	X	X	Engineering Manager	During operation
		Identify post rehabilitation audit criteria for verifying effective remediation.	X	X	Environmental Manager	Throughout the LoM
		Conduct periodic audits of facilities to ensure compliance with legal and Company standards.	X	X	Environmental Manager	Throughout the LoM
Awareness and training – all spills	▪ Pollution / Contamination of water and surrounding environment.	Induct all employees and contractors on the Environmental Policy, spill management and incident management procedures.	X	X	Environmental Manager	With onboarding and refresher inductions
		Train selected employees and contractors in the containment, and handling of spills and in the decontamination and rehabilitation of affected environments.	X	X	Environmental Manager	With onboarding and refresher inductions
Large-scale hydrocarbon or reagent spills or remote spills - emergency situations	▪ Pollution / Contamination of water and surrounding environment.	Maintain and implement the emergency preparedness and response procedure to address large-scale hydrocarbon or reagent spills on and off site.	X	X	Safety Manager	Throughout the LoM
		Identify and contract a service provider / specialist to assist with the handling and clean-up of emergency spills off site.	X	X	Supply Chain Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Periodically test the emergency preparedness and response.	X	X	Safety Manager	Throughout the LoM
Reagent spills	▪ Pollution / Contamination of water and surrounding environment.	Ensure that the reagent supply and / or transportation company is in possession of the relevant licences (legal requirements) and complies with transport and storage tank requirements.	X		Supply Chain Manager	During operation
		Ensure that reagent tanks are housed inside concrete bunds and that dispensing takes place on an impermeable surface.	X		Supply Chain Manager and Engineering Manager	During operation
		Ensure that bunds are designed to contain 110% of the volume of one or the largest (in a multi-tank setup) tank and that pumps and pipes are maintained in good working order.	X		Engineering Manager	During operation
		Ensure that the reagent supply and/or transportation company has a system in place to deal with the variety of spills that may occur and the subsequent clean-up there-of.	X		Supply Chain Manager	During operation
		Contain spills using appropriate spill kits and clean up within 24 hours as per the MSDS specification and report as per the incident management procedure.	X	X	Processing Manager	Throughout the LoM
		Pick up all solid reagents and place in the relevant reagent tank for use in the Plant.	X	X	Processing Manager	Throughout the LoM
		Dispose polluted reagent in a safe disposal site.	X	X	Processing Manager	Throughout the LoM
		Commence with remediation within 24 hours and report as per the incident management procedure.	X	X	Processing Manager	Within 24 hours

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Contain contaminated water and treat it or direct it into the process dam for use in the Processing Plant.	X	X	Processing Manager	During operation
Process solution spills (Unplanned events – release of large volumes of process solutions)	▪ Pollution / Contamination of water and surrounding environment.	Ensure that bunds are designed to capture any release of solution – designed to contain 110 % of the largest tank inside the bunded area.	X		Processing Manager and Engineering Manager	During operation
		Keep bunds clean and empty of any spillage.	X		Processing Manager	During operation
		Ensure that pumps and pipelines are in place to pump solution from the bunds back into the Processing Plant.	X		Processing Manager	During operation
		Maintain and implement an emergency preparedness and response procedure for the containment and clean-up of process solution if bunds are breached and for the treatment of contaminated areas.	X		Processing Manager	During operation
		Identify and utilise a service provider to assist with the clean-up of very large reagent spills (emergency situations).	X	X	Processing Manager	Throughout the LoM
Sediment loading of surface water from decline development activities	▪ Pollution / Contamination of water and surrounding environment.	Install structures to divert non-contact surface water away from and around the mining operations.	X	X	Mining Manager and Engineering Manager	Throughout the LoM
		Ensure wastewater produced during the construction of the decline development is directed into the open pit.	X		Mining Manager and Engineering Manager	During operation
		Ensure water is diverted to the Processing Plant for re-use, or if not feasible, ensure an adequately sized sedimentation pond is constructed for handling the wastewater during the decline development phase, or find a suitable re-use strategy for the water, if the volume of	X		Mining Manager, Processing Manager and Engineering Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		water is too large and cannot be handled concurrently with open pit mining operations.				
Sediment loading of surface water from uncontrolled surface discharge of underground mine wastewater	▪ Pollution / Contamination of water and surrounding environment.	Ensure wastewater produced from underground mining activities is sent to the Processing Plant for re-use.	X		Mining Manager, Processing Manager and Engineering Manager	During operation
		Ensure an adequately sized sedimentation pond is constructed for handling the wastewater from the underground mining operations, if the volume of water is too large and cannot be handled by the Processing Plant for re-use.	X		Mining Manager, Processing Manager and Engineering Manager	During operation
		Investigate the re-use of water back into the underground mine.	X		Mining Manager, Processing Manager and Engineering Manager	During operation
Discharges of chemicals to surface water	▪ Pollution / Contamination of water and surrounding environment.	Ensure correct chemical use and clean-up procedures are in place and followed.	X		Mining Manager	During operation
		Ensure chemical spills in the underground mine are cleaned.	X		Mining Manager	During operation
		Prevent spills from entering the dewatering system where water is transferred to surface.	X		Mining Manager	During operation
Potential failure of containment dams that hold underground mine dewatering water	▪ Pollution / Contamination of water and surrounding environment.	Ensure water storage facilities are constructed and have capacity to hold the volume of water to be pumped from the underground operations.	X		Mining Manager	During operation
Pollution control measures	▪ Pollution / Contamination of water and surrounding environment.	Keep visual monitoring and photographic records of any surface and / or groundwater intersected.	X		Environmental Manager	During operation
		Visually monitor during rainfall events for run-off of polluted water.	X		Environmental Manager	During rainfall events

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Service vehicles and machinery regularly to minimise oil and fuel leaks.	X		Engineering Manager	During operation
		Ensure good housekeeping is maintained and chemicals, and fuel are stored securely to prevent any accidental spills.	X		Engineering Manager	During operation
		Construct and maintain lined pollution control dams and silt traps.	X		Engineering Manager	During operation
Sewage management	▪ Potential pollution to the environment.	Portable chemical toilet facilities will be hired for on-site use and the supplier / contactor will manage any sewerage generated.	X		Engineering Manager	During operation
Monitoring of surface water	▪ Prevention of potential pollution to the environment.	Develop and implement a surface water monitoring programme.	X	X	Environmental Manager	Throughout the LoM
		Keep an up-to-date mine water balance.	X	X	Processing Manager, Mining Manager, Engineering Manager and Environmental Manager	Throughout the LoM

7.3 Groundwater Management Plan

Management Objectives

- To minimise the impact of water supply and prevent the loss of groundwater to other users in the area.
- To prevent unacceptable groundwater pollution related impacts.
- To minimise potential impacts on groundwater.

Management Standards

- Water Act (No. 54 of 1956)
- Water Resources Management Act (No. 11 of 2013)
- Petroleum Products and Energy Act (No. 13 of 1990)
- Hazardous Substances Ordinance (No. 14 of 1974)
- B2Gold Environmental and Biodiversity Performance Standards
- Monitoring and Measurement Plan
- Water Management Plan

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Storage of Tailings
- Establishing infrastructure
- Removal of infrastructure
- Road construction and maintenance
- Operation and maintenance of machinery, equipment and Plant

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Water supply	▪ Potential loss of water	Construct adequate pipeline in flood lines to withstand flood conditions.	X		Engineering Manager	During operation
		Ensure that the pipeline is visible and / or marked to prevent damage to pipeline.	X		Engineering Manager	During operation
		Ensure that the pipeline and related infrastructure are designed to minimise evaporation and transmission losses.	X		Engineering Manager	During operation
		Install pressure gauges at the pipeline for the early detection of pressure loss that may indicate leakages.	X		Engineering Manager	During operation
		Conduct monthly visual checks for damp areas around borehole equipment and pipeline.	X		Engineering Manager	Monthly

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Consult communities before construction of the pipeline and for significant maintenance.	X		Engineering Manager	During operation
		Ensure boreholes and related equipment are fenced-in and the pumphouse locked for protection against theft and vandalism.	X		Engineering Manager	During operation
Mine dewatering	▪ Depletion of water resource - abstraction and dewatering of mine pits.	Consult communities in advance about the potential lowering of water levels in their boreholes.	X		Communications Manager	During operation
		Ensure that only permitted abstraction rates are applied and that water abstraction limits are not exceeded from production boreholes.	X		Engineering Manager and Environmental Manager	During operation
		Implement water saving measures in mining, operational and tailings deposition processes to reduce the use of groundwater resources for make-up water.	X		Mining Manager, Processing Manager, Engineering Manager and Environmental Manager	During operation
		Provide community with an alternative water supply source if community supply boreholes are dewatered / depleted.	X		CSR Manager	During operation
		Monitor groundwater levels in all pumping wells throughout the life of the mine.	X		Environmental Manager	Throughout the LoM
		Monitor groundwater levels at all monitoring boreholes.	X		Environmental Manager	Throughout the LoM
		Ensure that the increased groundwater volumes abstracted from the mine pits are used in the process, while reducing the abstraction from production boreholes in the Karibib marble with the same volume.	X		Mining Manager and Engineering Manager	During operation
		Apply for permission to the relevant authority to release surplus groundwater abstracted from the	X		Environmental Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		mine pit or dewatering wells into the environment.				
		Reduce or completely abandon abstraction from the Karibib Formation aquifer when dewatering volumes meet the demand of the mining operations to reduce the impact on groundwater resources and the radius of influence (ROI).	X		Engineering Manager and General Manager	During operation
Compliance to Legal requirements	▪ Prevention of illegal abstraction and dewatering and compliance to permit conditions.	Ensure that permits for abstraction and pit dewatering are renewed as required.	X		Environmental Manager	As per permit conditions
		Conduct regular audits to ensure that permit conditions are adhered to.	X		Environmental Manager	As per audit schedule
Groundwater contamination from the TSF	▪ Potential contamination of groundwater – quality.	Ensure that follow-up geochemical studies are conducted in more detail to further constrain sulphide content in the TSF and to better quantify potential leachate and acid formation possibilities.	X	X	Technical Services Manager	During operation
		Consider lining the TSF with a hydrologic ally isolating layer, should potential arsenic and sulphate leaching from the sulphide dump occur – following recommendations from the geochemical studies.	X		Processing Manager	During operation
		Ensure that the detail design consider that secondary containment be built into the TSF base beneath the hydrologic ally isolating layer.	X		Processing Manager	During design
		Implement measures identified during the detail design phase of the mineralised waste facilities and low-grade stockpiles aimed at minimising impacts on the environment and monitoring potential impacts on groundwater pollution.	X		Mining Manager and Processing Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Power Plant drain water	▪ Potential contamination of groundwater – quality.	Ensure that the approximately 0.5 m^3/h of "drain water" (water phase which is separated from the oily sludge) that is produced from the Power Plant, which must contain no more than 2.5 ppm residual oil, if released into the environment is re-used in the Processing Plant and that a permit is obtained from the relevant authority should discharge into the environment be required.	X		Engineering Manager, Processing Manager and Environmental Manager	During operation
		Sample and monitor the drain water on a regular basis and dilute if necessary.	X		Engineering Manager	As per Monitoring and Sampling schedule
Storage of fuel (diesel and HFO)	▪ Potential contamination of groundwater – quality.	Ensure that hydrocarbons are stored in bunded areas above ground, designed to contain 110% of the volume of one or the largest tank (in a multi-tank setup) and equipped with traps and separators to contain spilled fuel.	X		Engineering Manager	During operation
Groundwater contamination from the operations	▪ Potential contamination of groundwater – quality.	Use properly designed fuel containment facilities.	X		Engineering Manager	During operation
		Control the use of all materials, fuels and chemicals which could potentially leach into groundwater.	X		Departmental Managers	During operation
		Store materials, fuel and chemicals in a bunded and secured area to prevent pollution from spillages and leakages.	X		Departmental Managers	During operation
		Maintain vehicles and machinery properly to ensure that oil spillages are kept at a minimum.	X		Engineering Manager	During operation
		Provide spill / drip trays for refuelling of vehicles.	X		Engineering Manager	During operation
		Provide proper sanitary facilities for all employees and contractors and ensure that chemical toilets are not within proximity of any drainage system and are frequently maintained - including the removal - without spillages.	X		Engineering Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Ensure that no uncontrolled discharges - resulting in pollution of the receiving environment and aquifer - is permitted.	X		Environmental Manager and Departmental Managers	During operation
		Ensure that chemical storage areas are sufficiently contained, and the use of chemicals are controlled.	X		Departmental Managers	During operation
		Direct water seeping into the open pit during mining, into a sump and pump it to the surface.	X		Mining Manager	During operation
		Ensure that water pumped from the open pit mine during mining is pumped into a dirty water system and not allowed to enter any clean water system, natural drainage line, or the aquifer.	X		Mining Manager	During operation
		Ensure that potable water is made available to affected users, due to dewatering activities by the mine.	X		CSR Manager	During operation
		Ensure that seepage capturing boreholes, both shallow and deep, is drilled west of the TSF and WRD.	X		Environmental Manager and Engineering Manager	During operation
		Implement a groundwater monitoring programme upstream and downstream from the TSF, specifically sulphate, manganese, nickel, cobalt, arsenic and cyanide – including nitrate in the monitoring protocol on mine waste streams.	X		Environmental Manager	During operation
		All water retention structures, including tailings disposal facilities, return water dams, stormwater dams, retention ponds etc. should be constructed to have adequate freeboard to be able to contain water of 1:50 year rain events.	X		Engineering Manager	During operation
		The groundwater flow model should be updated regularly.	X		Environmental Manager	Every two years

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Emergency preparedness and response	▪ Prevention of potential contamination of groundwater resources.	Handle major spillage incidents in accordance with the emergency preparedness and response procedure.	X		Safety Manager	During operation
		Inform the relevant authorities and surrounding farmers (potential of contamination of farm boreholes) of major spillages.	X		Environmental Manager and Communications Manager	When major spillage occurs
Waste sludge from the Power Plant	▪ Potential pollution of groundwater resources	Separate and store the oil phase from the sludge in a tank prior to transporting it off site to a hazardous waste disposal facility.	X		Engineering Manager	During operation
Managing of the landfill facility	▪ Potential pollution of groundwater resources	Ensure effective supervision of materials taken to the landfill to ensure no hazardous material is dumped in the facility.	X		Environmental Manager	Daily
Contamination of groundwater from underground mine operations including hydrocarbons and explosives	▪ Potential pollution of groundwater resources	Ensure correct chemical use and explosive charging practices are in place and followed for underground mining operations.	X		Mining Manager	During operation
		Ensure bulk fuel is stored aboveground, and that most fleet refuelling occurs on surface.	X		Mining Manager	During operation
		Ensure that refuelling of drills and equipment working at the face is done in a controlled manner following standard underground refuelling procedures.	X		Mining Manager and Engineering Manager	During operation
Modification of hydrologic flow patterns from underground mining operations	▪ Potential altering of hydrologic flow during operations exists due to dewatering for the safe access to mining areas.	Conduct studies into the geochemical characteristics of tailings material to better quantify potential leachate and acid possibilities, as a follow-up on the 2012 geochemical studies.	X		Technical Services Manager	During operation
Infiltration of potential spills or discharges of	▪ Potential pollution of groundwater resources	Ensure correct chemical use and clean up procedures are in place and followed for underground mining operations.	X		Mining Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
chemicals into groundwater		Ensure bulk fuel is stored aboveground, and that most fleet refuelling occurs on surface.	X		Mining Manager	During operation
		Ensure all operators are trained on spill response for underground events.	X		Safety Manager	With onboarding and refresher inductions
Potential infiltration of groundwater from the Karibib Marble aquifer into the underground mining operation	▪ Potential pollution of groundwater resources	Ensure adherence to the mine plan.	X		Mining Manager	During operation
		Ensure known structures, and water bearing features are mapped and surveyed into the mine plans.	X		Technical Services Manager	During operation
		Ensure monitoring systems are in place to detect potential inflows.	X		Mining Manager	During operation
		Ensure the dewatering plan is implemented, monitored and reported on.	X		Mining Manager and Engineering Manager	During operation
Contamination of the Karibib Marble aquifer by the rebounding water table of potentially polluted water in the underground workings of the Karibib Marble aquifer after closure	▪ Potential pollution of groundwater resources	Ensure that the pit design allows for the groundwater level to be intersected and a pit lake to form, which will act as a sink of potentially contaminated water from various sources, including the rebounding water table in the underground workings.	X	X	Mining Manager	During operation
		Conduct ongoing modelling to confirm and refine transport models which indicate that evaporation should keep the free water in the pit from decanting and that it is an acceptable closure option.	X	X	Environmental Manager and Technical Services Manager	Throughout the LoM
		Investigate the option to use the free water in the pit for irrigation after closure.		X	Environmental Manager	During closure planning
Potential run-off of seepage from the solid waste landfill facility	▪ Potential pollution of groundwater resources	Ensure the landfill is managed in accordance with site procedures and covered and rehabilitated as required.	X	X	Environmental Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
because of additional solid waste being disposed of in the on-site landfill		Reduce the volume of material entering the landfill by continuing to implement the reduce, re-use and recycle principle used on site.	X		Departmental Managers	During operation
Potential for inrush into the underground mine workings during development and operations	▪ Potential pollution of groundwater resources	Ensure the dewatering plan is implemented, monitored and reported on.	X		Mining Manager	During operation
		Ensure all operations are undertaken in accordance with the mine plan.	X		Mining Manager	During operation
		Ensure all water bearing features are mapped and included in survey plans.	X		Technical Services Manager	During operation
		Ensure emergency preparedness and response procedures are in place to cater for the event of an inrush.	X		Safety Manager	During operation
		Ensure adequate pumping capacity with back-up pumps as critical spares are kept on site.	X		Engineering Manager	During operation
Regional groundwater levels	▪ Potential depletion or reduction in neighbouring groundwater levels.	Manage dewatering and abstraction of water from the aquifer to ensure limited impacts on neighbouring water users.	X		Engineering Manager and Environmental Manager	During operation
		Supply water to any adversely affected neighbouring water user.	X		CSR Manager	During operation
Monitoring of groundwater	▪ Preventing potential impact on groundwater.	Develop and implement a groundwater monitoring programme.	X	X	Environmental Manager	Throughout the LoM
		Keep an up-to-date mine water balance.	X	X	Processing Manager, Mining Manager, Engineering Manager and Environmental Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Monitoring of waste	▪ Preventing potential impact on groundwater.	Minimise waste at source as much as possible to reduce volumes of waste required to be treated or disposed.	X	X	Environmental Manager and Departmental Managers	During operation
		Ensure that records are kept of the types and volume of waste.	X	X	Environmental Manager	Throughout the LoM
Pollution control measures	▪ Prevent potential depletion or contamination of groundwater.	Visually monitor and keep photographic records of any surface and/or groundwater intersected.	X		Mining Manager and Environmental Manager	During operation
		Visually monitor during rainfall events for run-off of polluted water.	X		Mining Manager and Environmental Manager	During rainfall events
		Ensure that chemically laden water is not disposed of into surface water resources or into the bush.	X		Mining Manager and Environmental Manager	During operation
		Ensure vehicles and machinery are regularly serviced to minimise oil and fuel leaks.	X		Engineering Manager	During operation
		Ensure chemicals, oil and fuel are stored securely to prevent any accidental spills.	X		Departmental Managers	During operation

7.4 Biodiversity Management Plan

Management Objectives

- To prevent or limit the unacceptable loss of biodiversity and related functionality through physical disturbance.
- To prevent the unacceptable loss of biodiversity and related functionality through a reduction in the key ecological drivers of groundwater and temporary surface water flow.
- To prevent disturbance to biodiversity.
- To limit potential impacts on biodiversity through the minimisation of the footprint and the conservation of residual habitat within the mine area.

Management Standards

- Forest Act (No. 12 of 2001)
- Nature Conservation Ordinance (No.14 of 1975)
- Water Act (No. 54 of 1956)
- Water Resources Management Act (No. 11 of 2013)
- B2Gold Environmental and Biodiversity Performance Standards
- Monitoring and Measurement Plan
- Water Management Plan
- Biodiversity Management Plan

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Storage of Tailings
- Establishing infrastructure
- Removal of infrastructure
- Road construction and maintenance
- Operation and maintenance of machinery, equipment and Plant

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Physical destruction of biodiversity	▪ Impact on biodiversity areas and of related species - significant because of their status, and/or the role that they play in the ecosystem.	Clearly demarcate boundaries of the waste rock dump and TSF.	X		Mining Manager	During operation
		Delineate at least a 100 m wide boundary zone (free of developments and mine-related activities) around pans, specifically, the large ephemeral pan located east of the mine site.	X		Technical Services Manager and Environmental Manager	During operation
		Avoid cutting or relocating protected trees and develop plans to care for them during the life of mine until their surroundings have been restored.	X		Environmental Manager and Departmental Managers	During operation
		Obtain relevant permits where disturbance of protected trees is unavoidable.	X		Environmental Manager	During operation
		Evacuate animals of conservation significance from the mining area before disturbance.	X		Environmental Manager and Departmental Managers	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Remove and stockpile topsoil, along with its soil fauna and seed banks, and devise plans for its management during stockpiling and redeployment for restoration.	X		Environmental Manager, Mining Manager and Engineering Manager	During operation
		Remove organic material, including litter and dead wood, and stockpile separately for future use in restoration, investigating appropriate stockpiling methods to promote the viability of the communities they contain.	X		Environmental Manager, Mining Manager, Processing Manager and Engineering Manager	During operation
		Restrict construction crews and mining personnel to stay inside the demarcated boundaries of the construction and mining site areas.	X		Security Manager	During operation
		Earthen-bund the perimeter of the mining pit to reduce the chances of animals being killed or injured by blasting, or incurring damage by mining equipment.	X		Mining Manager	During operation
		Construct roads as narrow as operationally feasible and maintain all roads in good condition so that diversions of roads will not be necessary.	X		Mining Manager and Engineering Manager	During operation
		Locate / site aggregate borrow pits for road construction on the proposed mining site to reduce overburden stockpiling and unnecessary environmental disturbance.	X		Mining Manager and Engineering Manager	During operation
		Develop road use policy, including speed limits, and enforce it.	X		Safety Manager	During operation
		Initiate restoration of all roads and other sites that were only impacted during construction and will not be required for mining operation.	X		Engineering Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Increase environmental awareness of employees and contractors, including the ability of key staff to handle animals during evacuation.	X		Environmental Manager	During operation
		Enforce adherence to the environmental rules and invoke penalty clause(s).	X		Environmental Manager and Departmental Managers	During operation
		Erect a fence along the perimeter of the working area of the landfill facility to control ingress by wildlife.	X		Environmental Manager and Engineering Manager	Prior to start of activity
		Collect and dispose of food waste at the landfill facility and cover daily to avoid scavenging animals.	X		Environmental Manager	Daily
Decrease in the water table level	▪ Potential depletion of water resource.	Minimise water abstraction (except dewatering of the pit) by reducing the mine's water requirements where feasible.	X		Processing Manager and Engineering Manager	During operation
		Consider using extracted excess water from the open-cast pits to recharge aquifers, e.g. the Omarassa aquifer providing water to Otjiwarongo, or as bulk water.	X		Environmental Manager, Mining Manager, Processing Manager and Engineering Manager	During operation
	▪ Potential loss or decline in trees.	Investigate measures to improve tree condition declines (if it occurs) without abstracting more water and investigate possibilities for offsetting potential significant tree mortalities.	X		Environmental Manager	During operation
Monitoring of groundwater levels	▪ Potential depletion of or reduction in groundwater.	Monitor groundwater levels in boreholes – as per Groundwater Monitoring Programme.	X		Environmental Manager	Throughout the LoM
		Record the health of a sample of large trees throughout the life of mine in a reasonable radius (i.e. a radius that reflects the outcome of hydrogeological modelling studies) around the mine pit.	X		Environmental Manager	Annually

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Draft a detailed action plan to define and refine further mitigation options, should there be a significant decline in health or increase in mortalities of large trees that can be linked to groundwater changes.	X		Environmental Manager	Annually
		Consider biodiversity offsets, should there be no mitigation options.	X		Environmental Manager	Annually
Disturbance of biodiversity	▪ Encounters with and potential impacts on wildlife.	Erect and maintain a fence around the working area of the Mining Licence.	X	X	General Manager and Security Manager	Throughout the LoM
		Develop a policy that limits independent movements by staff into the veld outside the fenced-in mining site.	X	X	Security Manager	During operation
		Introduce and enforce a “zero tolerance” rule to prevent poaching and illegal of natural resources (e.g. firewood), or the possession of any such natural materials.	X	X	Security Manager and General Manager	During operation
		Ensure that there is adequate food for workers on site.	X	X	General Manager	During operation
		Allow only mining personnel, service providers and construction staff, and registered visitors on site.	X	X	Security Manager	During operation
		Train all employees and contractors to appreciate the natural non-consumptive values of biodiversity, and the applicable legal requirements relating to protected species.	X	X	Environmental Manager	During operation and with onboarding and refresher inductions
		Raise awareness on the distinction between venomous and non-venomous snakes / invertebrates and ensure that sufficient personnel are trained to handle snakes / invertebrates.	X	X	Environmental Manager	During operation and with onboarding and refresher inductions

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Install 'mosquito' screens on doors and windows, where practicable, for flying insects, e.g. kitchen / canteen area.	X	X	Engineering Manager	During operation
		Assess the possible compensation to farmers for livestock losses, based on valid claims.	X	X	General Manager and Financial Manager	During operation
		Train all drivers of vehicles in the necessary procedures for the safe operation of all vehicles and to maintain regulated speed limits.	X	X	Safety Manager	During operation
		Carry out regular training to instil appropriate vehicle control and a high degree of professional road conduct.	X	X	Safety Manager	During operation
		Enforce speed limits, including speed-reducing methods and speed-monitoring devices.	X	X	Safety Manager	During operation
		Avoid or limit driving to and from the mining sites at night, wherever possible.	X	X	Security Manager and General Manager	During operation
	▪ Disturbance to invertebrates.	Use yellow outdoor lights (sodium vapour floodlights with orange covers, or yellow bulbs / tubes for incandescent and fluorescent lights) wherever possible, as this is less glaring to invertebrates while meeting requirements for operations.	X	X	Engineering Manager	During operation
		Reduce the attraction to invertebrates to indoor lights by installing self-closing doors and non-opening windows in night-time operations buildings.	X	X	Engineering Manager	During operation
		Keep automated, UV-attractant pest management indoors (e.g. in maintenance sheds, administrative blocks, or production plants) or cover with wire mesh to ensure that	X	X	Supply Chain Manager and Departmental Managers	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		only right size target organisms are exterminated.				
	▪ Potential harm / injury to wildlife.	Ensure that animals have no access to contaminated water sources.	X	X	Processing Manager, Mining Manager and Engineering Manager	Throughout the LoM
		Fence in the TSF and other areas that are regularly artificially watered and use other proven means to deter birds; and limit artificial watering.	X	X	Processing Manager and Engineering Manager	During operation
		Strictly contain and timeously clean or neutralise all chemicals, emissions, and leaching products and tailings, applying best practice.	X	X	Processing Manager, Mining Manager and Engineering Manager	During operation
		Develop a site waste management policy and actively enforce it.	X	X	Environmental Manager	During operation
		Develop a policy for the management of hazardous materials and actively enforce it.	X	X	Environmental Manager and Supply Chain Manager	During operation
		Provide temporary waste deposition facilities on site (rubbish bins, skips), secured from scavengers, storms, or other disturbance.	X	X	Environmental Manager and All Departmental Managers	During operation
		Provide adequate toilet facilities for all workers at work sites.	X	X	All Departmental Managers	During operation
		Apply appropriate hydrocarbon handling and storage principles.	X	X	All Departmental Managers	During operation
		Contain all contaminated water and purify it to potable quality before re-use, or release into the environment.	X	X	Processing Manager and Engineering Manager	Throughout the LoM
		Avoid or limit destruction of trees - for the continued use by wildlife.	X	X	Environmental Manager, Processing Manager, Mining	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
					Manager and Engineering Manager	
		Locate linear infrastructure in a way that minimises new fragmentation, e.g. using infrastructure corridors.	X	X	Engineering Manager	During operation
		Rehabilitate areas around linear infrastructure after installation to minimise habitat fragmentation and to allow populations to be connected.	X	X	Engineering Manager	During operation
		Implement strict controls of movement of material on and off site to minimise the spread of invasive species;	X	X	Supply Chain Manager	During operation
		Monitor the occurrence and spread of invasive species for effective control measures.			Environmental Manager	During operation
		Conduct an expert study on the effects of the mine and its related activities on the cheetah population (effects on the movements and local population of cheetahs) - specifically focusing on those cheetahs whose home ranges are within an area of about 25 km of the mine.	X	X	Environmental Manager	During operation
Emergency preparedness and response	▪ Potential major spillages and some occurrences of injury to animals.	Respond to any incidents related to major spillage and/or injury to animals as per the emergency preparedness and response procedure.	X	X	All Departmental Managers	During operation
Dewatering of mining pit(s)	▪ Reduction in the water table could affect deep rooted tree survival during droughts.	Monitor groundwater levels and physiological stress levels in trees to see if a correlation exists.	X	X	Environmental Manager	During operation
		Identify and map trees and vegetation of importance that may be at risk from dewatering activities – i.e use of the modelled cone of depression maps.	X	X	Environmental Manager and Technical Services Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Determine feasibility for the rescue of identified trees.	X	X	Environmental Manager	During operation
Closure planning	▪ Prevention of potential long-term pollution.	Take into consideration the requirements for potential long-term pollution prevention and monitoring, with the designs of any permanent and potential polluting structures.		X	Environmental Manager and General Manager	Throughout the LoM
	▪ Prevention of potential contamination and emergency situations due to uncontrolled surface water flow.	Take into consideration the requirements related to surface water flow in the designs of any permanent structures, as part of closure planning.		X	Environmental Manager and General Manager	Throughout the LoM

7.5 Resource Management Plan

Management Objectives

- To monitor the energy (electricity and diesel) consumption and to find ways to minimise consumption.
- To monitor the water consumption and to find ways to optimise water usage.
- To monitor the use of manufactured materials and to ensure efficient usage.
- To monitor the fuel consumption and to find ways to optimise fuel usage.

Management Standards

- Petroleum Products and Energy Act (No. 13 of 1990)
- Water Act (No. 54 of 1956)
- Water Resources Management Act (No. 11 of 2013)
- Atmospheric Pollution Prevention Ordinance (No. 11 of 1976)
- Hazardous Substances Ordinance (No. 14 of 1974)
- Electricity Act (No. 4 of 2007)
- B2Gold Environmental and Biodiversity Performance Standards
- Monitoring and Measurement Plan
- NO_x / SO_x Emission Monitoring
- Water Management Plan

Activity(ies)

- Consumption of Energy (electricity and diesel)
- Consumption of fuel
- Consumption of water
- Use of manufactured materials

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Understanding B2Gold's electricity consumption and demand / High consumption of electricity	▪ Improved energy efficiency. ▪ Potential depletion of resources	Maintain the electricity consumption monitoring system.	X	X	Engineering Manager	During operation
		Monitor and record total consumption and compare with NamPower readings.	X	X	Engineering Manager	During operation
		Maintain the energy management plan that optimises electricity consumption whilst meeting efficiencies, where practicably possible.	X	X	Engineering Manager	During operation
Monitoring of the energy management plan	▪ Compliance with standards / commitments.	Review energy consumption in relation to the energy management plan.	X	X	Engineering Manager	During operation
Awareness and training	▪ Awareness creation on efficient energy use.	Continue to implement an awareness programme pertaining to energy usage.	X	X	Engineering Manager and Environmental Manager	During operation and with onboarding and refresher inductions

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Maintenance of electrical equipment	▪ Improved energy efficiency.	Maintain the maintenance plan for all electrical equipment used on site.	X	X	Engineering Manager	During operation
Alternate energy supply	▪ Reduction in consumption of non-renewable resources.	Investigate the possibility of solar energy supply for certain facilities.	X	X	Engineering Manager	During operation
Inefficient electricity use	▪ Potential increase in carbon footprint.	Rely on the use of the PV solar plant for the maximum electricity supply.	X		Engineering Manager	During operation
		Use energy efficient electrical equipment and lighting underground.	X		Engineering Manager	During operation
		Monitor energy usage.	X		Engineering Manager	During operation
Fuel consumption	▪ Energy resource depletion, remote impacts (i.e. mining and processing the particular fossil fuel).	Maintain and implement the preventative maintenance plan for all equipment and mine vehicles using diesel, petrol and gas on site to avoid wastage and leakages.	X	X	Engineering Manager	During operation
		Monitor fuel consumption in all departments.	X	X	Engineering Manager and Environmental Manager	During operation
		Monitor use of diesel heaters.	X	X	Engineering Manager	During operation
Alternative energy sources	▪ Energy resource depletion, remote impacts (i.e. mining and processing the particular fossil fuel).	Explore the use of alternative energy sources (e.g. solar power) to replace or supplement HFO use.	X	X	Engineering Manager	During operation
Water usage and control	▪ Reduction in potential wastage of water and improved water consumption.	Install and calibrate water flow meters on pipes at selected locations (including tailings lines and dewatering boreholes).	X	X	Engineering Manager	During operation
	▪ Compliance with permit conditions.	Monitor monthly abstraction volumes to ensure that the permitted annual volumes are not exceeded.	X	X	Engineering Manager and Environmental Manager	Monthly

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
	▪ Potential contamination of fresh / clean water resources and environment.	Ensure that stormwater falling inside the processing area is captured and directed *via* drains and pipes to the return water dam and re-used.	X	X	Engineering Manager and Processing Manager	During operation
		Ensure that the design of the relevant clean and dirty water systems is sufficient to cater for the water volumes associated with the infrequent flood events and that unacceptable discharges of polluted water is prevented.	X		Engineering Manager and Processing Manager	During operation
		Optimise the recycling of process water in the Processing Plant to reduce the demand for fresh water.	X		Processing Manager	During operation
		Recycle tailings decant water back to the return water dam in enclosed pipes for re-use in the Processing Plant.	X		Processing Manager	During operation
		Ensure groundwater encountered in the pits is dewatered and re-used (e.g. in the Processing Plant).	X		Mining Manager and Processing Manager	During operation
Maintenance of equipment	▪ Potential wastage / loss of water.	Develop, maintain and implement a comprehensive maintenance programme for tanks, tankers, pumps and pipes.	X	X	Engineering Manager	During operation
Monitoring of water leaks / spills	▪ Potential wastage / loss of water.	Include checking for water spills in the daily inspections.	X	X	Engineering Manager and Environmental Manager	Daily
		Ensure all spillages are reported as per the incident management procedure.	X	X	All Departmental Managers	During operation
Training and awareness	▪ Awareness creation on efficient water use.	Maintain and implement water awareness programme for B2Gold employees and contractors.	X	X	Engineering Manager and Environmental Manager	During operation with onboarding and refresher inductions

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Reporting to Society	▪ Improved transparency and accountability in responsible resource consumption.	Report to stakeholders on water management.	X	X	Environmental Manager and Public Relations Manager	As per legal requirements and other compliance obligations
Inefficient use of water resources	▪ Depletion / mis-use of water resources.	Use water effectively and efficiently by following the reduce-recycle-re-use approach.	X		Engineering Manager and Processing Manager	During operation
		Record volumes of abstraction and supply.	X		Engineering Manager and Processing Manager	During operation
		Keep an up-to-date water balance for the Operations.	X		Engineering Manager and Processing Manager	During operation
Transport of hazardous materials	▪ Accidental release of hazardous materials may lead to contamination.	Conduct routine inspections of the supply companies transporting hazardous materials to and from site.	X	X	Supply Chain Manager	As per the audit and inspections schedule
		Ensure companies compliance to legal and B2Gold requirements and that the contractor has all the necessary hazardous protection equipment for people and environment in the advent of a spill.	X	X	Supply Chain Manager	During operation throughout the duration of the contract
Consumption of reagents and chemicals	▪ Natural resource depletion. ▪ Loss of land (habitat). ▪ Change in land-use. ▪ Potential, loss of future economic opportunities.	Monitor reagent consumption monthly.	X	X	Processing Manager	Monthly
		Monitor, review and implement best practice for the use of cleaning products by contractors.	X	X	Supply Chain Manager and Environmental Manager	As per the audit and inspections schedule and duration of the contract.
		Identify consumables that can be replaced by more environmentally friendly products and conduct market research on such products.	X	X	Supply Chain Manager and Environmental Manager	During operation
		Monitor and update the process flow balance regularly to ensure optimum use of reagents.	X		Processing Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Consumption of consumables (e.g. PPE, paper)	▪ Natural resource depletion. ▪ Loss of land (habitat). ▪ Change in land-use. ▪ Potential, loss of future economic opportunities.	Calculate the volumes of consumables used and determine ways of reducing consumption.	X	X	Supply Chain Manager	During operation
		Investigate the use of alternative (environmentally friendly) consumables to replace current products (where applicable).	X	X	Supply Chain Manager and Environmental Manager	During operation

7.6 Soil Management Plan

Management Objectives

- To ensure that all topsoil stripping, stockpiling and replacement operations are undertaken in a manner that limits impacts on the soil functionality and to ensure it can be used for rehabilitation as and when required.
- To ensure that soil is appropriately managed and the impacts of clearing, digging and compaction of sediment and soil are minimised.
- To ensure that soil is not contaminated.
- To minimise the mixing of different soil types and excessive removal of vegetation and topsoil.

Management Standards

- Water Amendment Act (No. 54 of 1956)
- Water Resources Management Act (No. 11 of 2013)
- Forest Act (No. 12 of 2001)
- Nature Conservation Ordinance (No. 4 of 1975)
- B2Gold Environmental and Biodiversity Performance Standards
- Topsoil Management Plan
- Topsoil Management Procedure
- Land Clearing Permit Application Procedure
- Non-Process Waste Management Plan
- Rehabilitation Management Plan
- Rehabilitation Monitoring Procedure
- Monitoring and Measurement Plan

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Storage of Tailings
- Establishing infrastructure
- Removal of infrastructure
- Road construction and maintenance
- Operation and maintenance of machinery, equipment and Plant

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Delineation of stockpiling areas and stockpile management	▪ Potential alteration of soil chemistry and/or composition. ▪ Potential contamination of soil.	Limit the disturbance of soil to areas where stripping activities are identified.	X		Mining Manager and Environmental Manager	During operation
		Clearly demarcate soil stockpiles to identify the soil type and the intended area of rehabilitation.	X		Environmental Manager	During operation
		Investigate the possibility of establishing stormwater diversion berms to prevent run-off erosion around stockpiles.	X		Mining Manager and Environmental Manager	During operation
		Design safe slopes on stockpiles to ensure maximum security of topsoil and to minimise erosion. –	X		Mining Manager and Environmental Manager	During operation
		Establish erosion control in the form of vegetation for storage periods greater than 3	X		Mining Manager and Environmental Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		years - stockpile sides to be stabilised at a slope of 1 in 6 or less, where practicable.				
		Store waste material separate from soil stockpiles.	X		Mining Manager and Environmental Manager	During operation
		Limit equipment movement on top of the soil stockpiles, to minimise compaction.	X		Mining Manager and Environmental Manager	During operation
		Keep a photographic record of soil removal and subsequent replacement.	X	X	Mining Manager and Environmental Manager	During operation
		Avoid mixing topsoil and subsoil.	X	X	Mining Manager and Environmental Manager	During operation
		Ensure wastewater run-off is controlled and intercepted to prevent loss of soil and contamination.	X	X	Mining Manager and Environmental Manager	During operation
		Obtain a permit from the relevant authority prior to clearing or removing vegetation.	X	X	Environmental Manager	Throughout the LoM
		Establish an on-site land clearing permit system that manages the vegetation and soil removal process – keep a photographic record of “before” and “after” clearing.	X		Environmental Manager	During operation
		Consult the Environmental Department immediately for guidance should any groundwater be intersected during trenching operations.	X		Engineering Manager and Mining Manager	During operation
		Restrict the mixing of concrete and the cleaning of mixing equipment to pre-determined areas.	X		Engineering Manager	During operation
		Ensure hydrocarbon products and chemicals are safely stored and handled to prevent contamination of soil.	X		Engineering Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Rehabilitate all exposed soils, where practicable, by replanting indigenous vegetation.	X	X	Environmental Manager	During operation and rehabilitation
Stripping and handling of soils	▪ Potential loss of land (habitat) ▪ Potential impact on biodiversity.	Handle soils in dry weather conditions to cause as little compaction as possible.	X		Mining Manager and Environmental Manager	During operation
		Strip and stockpile together with any vegetation cover present the utilizable soil (top 300mm of soil or until hard rock is encountered where soil depths are <300mm).	X		Mining Manager and Environmental Manager	During operation
Soil erosion	▪ Potential loss in organic and fertile matter present in the soil.	Clear vegetation only when necessary for the immediate site.	X		Mining Manager and Environmental Manager	During operation
		Visually monitor and keep a photographic record of any surface disturbance and clearing.	X		Mining Manager and Environmental Manager	During operation
		Rip up soils that were compacted during bulk storage and by machinery.	X	X	Mining Manager and Environmental Manager	During operation
		Rehabilitate exposed soils after construction is completed and keep a photographic record.	X	X	Mining Manager and Environmental Manager	During operation
Monitoring of soil degradation and erosion	▪ Preventing soil degradation and erosion.	Use “before’ and “after” photographic records to monitor and minimise the mixing of different soil types and excessive removal of vegetation and topsoil.	X		Environmental Manager and Technical Services Manager	During operation
		Store subsoil stockpiles close to the work-in-progress to avoid mixing of soil types and unnecessary topsoil loss and erosion.	X		Engineering Manager and Mining Manager	During operation
		Ensure that all spills are reported *via* the Incident Management procedure.	X		All Departmental Managers	During operation
		Keep photographic records of rehabilitated areas.	X	X	Environmental Manager	During operation and rehabilitation

7.7 Waste Management Plan

Management Objectives

- To ensure proper storage, recycling, re-use, removal, transportation and disposal of non-hazardous solid waste.
- To ensure proper storage, removal, transportation and disposal of hazardous solid waste.
- To ensure proper storage, removal, transportation and disposal of medical waste.
- To ensure the proper storage, transport, treatment and disposal of waste and, where possible, following the waste hierarchy, which encourages waste avoidance and waste reduction followed by re-use, recycling and reclamation, before waste treatment and waste disposal.
- To ensure the storage and use of fuels or other chemicals are managed to minimise the risk of a release.
- To implement measures to promptly address impacts in the event of a fuel and/or chemical release.
- To protect the health and safety of any residents and staff in the vicinity.
- To protect water sources, soil and vegetation.
- To prevent pollution and protect the environment.
- To minimise impacts of waste to the environment i.e. minimal waste disposal, optimal recovery, recycling and treatment.
- To ensure compliance to the wastewater permit.

Management Standards

- Hazardous Substances Ordinance (No.14 of 1974)
- Atmospheric Pollution Prevention Ordinance (No. 11 of 1976)
- Solid Non-hazardous waste specification and collection procedure
- Solid hazardous waste specification and collection procedure
- Incinerator Operating Procedure
- Landfill Operations Procedure
- Non-process Waste Management Plan
- B2Gold Environmental and Biodiversity Performance Standards

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Storage of Tailings
- Road construction and maintenance
- Establishing infrastructure
- Removal of infrastructure
- Operation and maintenance of machinery, equipment and Plant
- Storage and handling of material

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Effective waste management	▪ Potential impact of waste on the environment.	Develop a waste management procedure that includes the recycling, re-use, storage, handling, transportation and disposal of waste at the on-site landfill facility.	X	X	Environmental Manager	During operation
		Ensure that employees and contractors are aware of the procedure.	X	X	Environmental Manager	With onboarding and refresher inductions

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Collection of waste	▪ Prevention of potential impact of waste on the environment.	Establish sufficient designated waste collection points on site with adequate capacity.	X	X	Environmental Manager	During operation
Waste storage / separation – domestic waste	▪ Prevention of potential impact of waste on the environment.	Collect general domestic and recyclable waste from all offices, tearooms, ablutions, security office, laboratory, workshops and stores and place into wheely or lugger bins and skips.	X	X	Environmental Manager	During operation
		Ensure that all recyclable waste is not disposed of in the landfill site.	X	X	Environmental Manager	During operation
		Investigate and assist with the development of small and medium size waste recycling companies in the surrounding towns (i.e. Otavi and Otjiwarongo).	X	X	CSR Manager	During operation and post-closure
		Separate the discarded domestic general and recyclable waste before placed into the correct wheely or lugger bins and skips.	X	X	All Departmental Managers	During operation
		Provide the recyclable materials to qualified companies that either directly or indirectly recycle the materials themselves or through third party companies.	X	X	Environmental Manager	During operation
		Ensure that waste storage areas and/or containers meet the specific waste types for that area (e.g. impervious floor, bunded areas with drainage / containment systems, lids to prevent light material from blowing away or sealed containers for hazardous material).	X	X	Environmental Manager	During operation
Waste classification (domestic and industrial)	▪ Prevention of potential impact of waste on the environment.	Keep an up-to-date waste inventory.	X	X	Environmental Manager	During operation
Disposal of waste and general operating		Construct / operate the on-site landfill facility in phases (i.e. only one or two sections / cells	X	X	Environmental Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
requirements of the landfill facility	▪ Minimising potential impact of waste disposal on the environment.	(containment pits) of the facility to be open at any given time.				
		Ensure that each cell at the landfill facility is no bigger than approximately 15m x 30m and 3m deep.	X	X	Environmental Manager	During operation
		Fence the working area along the perimeter of the landfill facility to control access by unauthorised personnel and wildlife and to assist in further containment of any potential wind-blown refuse.	X	X	Environmental Manager	During operation
		Compact the floor of the containment pits at the landfill facility with calcrete and cover filled pits with excavated material to prevent inflow of rainwater.	X	X	Environmental Manager	During operation
		Dispose of (non-recyclable) waste (i.e. non-hazardous, food scraps) at the on-site landfill facility.	X	X	Environmental Manager	During operation
Burning of waste	▪ Minimising potential impact of waste on the environment.	Avoid burning of waste, except when the predicted volumes of waste to be landfilled are exceeded.	X	X	Environmental Manager	During operation
		Compact waste by using a purpose-built landfill compactor over the deposited waste, to reduce the voids in waste and the overall volume.	X	X	Environmental Manager	During operation
Storage, removal, transportation and disposal of hazardous solid waste	▪ Potential impact of waste on the environment.	Develop a waste management procedure that includes the storage, handling and transportation of hazardous solid waste.	X	X	Environmental Manager	During operation
		Ensure that employees and contractors are aware of the procedure.	X	X	Environmental Manager	With onboarding and refresher inductions

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Collection of hazardous waste	▪ Prevention of potential impact of waste on the environment.	Establish sufficient designated waste collection points on site with adequate capacity for hazardous waste.	X	X	Environmental Manager	During operation
Hazardous waste storage	▪ Improved waste separation at source.	Store hazardous waste in designated suitable containers.	X	X	Environmental Manager	During operation
		Store empty print cartridges in a designated box at the office assistant's desk until removal from site.	X	X	Environmental Manager	During operation
		Store fluorescent tubes in a special labelled steel drum at the engineering workshop.	X	X	Environmental Manager	During operation
		Collect and accumulate other hazardous waste i.e. car batteries, miscellaneous batteries, oil filters, etc. at the engineering workshop until the amounts are sufficient to be removed from site.	X	X	Environmental Manager	During operation
		Safely burn explosives packaging at the magazine site according to permit conditions and procedures.	X	X	Environmental Manager	During operation
		Place oil and greasy cloths / rags into a steel drum and transport off site to the hazardous waste site, when full.	X	X	Environmental Manager	During operation
		Keep empty reagent bags (for a short period of time) at the reagents store until removed by the reagent contractor for refills.	X	X	Supply Chain Manager	During operation
		Ensure that waste storage areas and/or containers meet the needs for that specific type of waste (e.g. impervious floor, bunded areas with drainage / containment systems, lids to prevent light material from blowing away or sealed containers for hazardous material).	X	X	Environmental Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Waste classification	▪ Improved waste management.	Keep an up-to-date inventory of waste and include estimated quantities.	X	X	Environmental Manager	During operation
Waste transport	▪ Improved waste management.	Appoint an approved waste management contractor to transport waste.	X	X	Environmental Manager	During operation
Waste Disposal	▪ Improved waste management.	Dispose of waste at appropriate registered / permitted waste disposal facilities.	X	X	Environmental Manager	During operation
Disposal records	▪ Improved waste management.	Keep records of safe disposal of waste.	X	X	Environmental Manager	During operation
Storage, removal, transportation and disposal of medical waste	▪ Improved waste management.	Develop a waste management procedure that includes the storage, handling and transportation of medical waste.	X	X	Environmental Manager	During operation
		Ensure that employees and contractors are aware of the procedure.	X	X	Environmental Manager	With onboarding and refresher inductions
		Incinerate medical waste off-site at an approved medical facility.	X	X	Environmental Manager	During operation
Handling, storage, recycling, treatment and disposal of liquid waste	▪ Potential pollution to the environment.	Ensure registered companies correctly store and dispose of or recycle hydrocarbon and chemical contaminated solids.	X	X	Environmental Manager	During operation
		Ensure waste oil is collected by a reputable oil recycling company.	X		Environmental Manager	During operation
		Keep records of safe disposal certificates - to be readily available on request.	X	X	Environmental Manager	During operation
		Ensure all contaminated water is captured in pollution control structures on-site and re-used in the mineral Processing Plant and mining processes.	X		Engineering Manager, Mining Manager and Processing Manager	During operation
		Ensure proper construction and maintenance of lined pollution control dams and silt traps.	X	X	Engineering Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Dispose of sewage at the sewage treatment plant.	X		Engineering Manager	During operation
		Ensure effective operation and maintenance of the sewage treatment works.	X	X	Engineering Manager	During operation
Littering and environmental contamination from waste	▪ Potential pollution to the environment.	Keep the site tidy and free of litter and provide an adequate number of waste bins and skips for collecting and containing domestic and general waste.	X		Environmental Manager and Departmental Managers	During operation
Handling, storage and disposal of mine residue	▪ Potential pollution to the environment.	Dispose of waste rock at the Waste Rock Dump (WRD).	X		Mining Manager	During operation
		Minimise waste rock volumes through effective mining designs and planning.	X		Mining Manager	During operation
		Encapsulate PAF Material as per the on-site procedures and plans.	X		Mining Manager	During operation
		Dispose of tailings at the Tailing Storage Facility (TSF) and ensure strata control is managed for minimum tailings generation.	X		Processing Manager	During operation
Handling, storage and disposal of solid waste	▪ Potential pollution to the environment.	Dispose of domestic waste to a registered landfill facility to prevent the attraction of unwanted scavengers.	X		Environmental Manager	During operation
		Ensure correct storage and disposal of hydrocarbon and chemical contaminated solids.	X		Environmental Manager and Departmental Managers	During operation
Monitoring of waste	▪ Responsible management of waste – preventing potential pollution to the environment.	Keep a record of waste volumes generated to ensure overall waste reduction targets are met.	X		Environmental Manager	During operation
		Keep certificates of safe disposal of waste to a registered waste disposal site.	X		Environmental Manager	During operation
		Store hazardous chemicals in bunded areas.	X		Departmental Managers	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Handling and storage of Hazardous Chemicals	▪ Potential pollution to the environment.	Handle hazardous chemicals (such as fuels) over impervious surfaces.	X		Departmental Managers	During operation
		Contain and clean-up hazardous chemicals spills to ensure protection of the environment.	X		Departmental Managers	During operation
		Provide employees and contractors with the necessary PPE required for the safe handling and use of petrochemicals, oils and acids.	X		Departmental Managers	During operation
Machinery and Equipment Maintenance	▪ Potential pollution to the environment.	Conduct major servicing of equipment in appropriately equipped workshops.	X		Engineering Manager	During operation
		Take all reasonable precautions to avoid oil and fuel spills (e.g. spill trays, impervious sheets) for small repairs and required maintenance activities.	X		Engineering Manager	During operation
		Service vehicles and machinery regularly to minimise oil and fuel leaks.	X		Engineering Manager	During operation
		Provide the relevant PPE to employees and contractors to manage and maintain the machinery and equipment.	X		Engineering Manager	During operation
Spill Prevention	▪ Potential pollution to the environment.	Ensure spill kits (i.e. absorbent materials, chemical resistant shovels, heavy-duty chemical resistant plastic bags, PPE) are available throughout the site.	X		Supply Chain Manager	During operation
		Use drip trays and movable spillage capture equipment where appropriate.	X		Engineering Manager	During operation
		Ensure all machines are subjected to preventative maintenance of hydraulic hoses, oil pumps and fittings to reduce the risk of spillage during operation.	X		Engineering Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Undertake major servicing of equipment in appropriately designed and equipped workshops.	X		Engineering Manager	During operation
		Provide employees and contractors with applicable training on spill management, spill response and refuelling.	X		Environmental Manager and Engineering Manager	During operation
		Store fuels, lubricants and chemicals in appropriately sized, impermeable bunds or trays with a capacity not less than 110% of the total volume of products stored.	X		Engineering Manager	During operation
		Ensure proper maintenance of all fuel and chemical storage and handling equipment (including transfer hoses, etc.).	X		Engineering Manager	During operation
		Ensure storage and handling of fuel and chemicals comply with relevant legal requirements.	X		Engineering Manager	During operation
		Prevent refuelling within 50 metres of groundwater boreholes, surface water or streams.	X		Engineering Manager	During operation
		Keep MSDS easily accessible for each chemical used on site.	X		All Departmental Managers	During operation
Spill Response	▪ Potential pollution to the environment.	Develop a Spill Response Plan and ensure employees and contractors receive relevant training and awareness.	X		Environmental Manager and Engineering Manager	During operation
Reporting of Spills	▪ Potential pollution to the environment.	Report all major petroleum product spills to the Ministry of Mines and Energy (MME) on Form PP/11 titled “Reporting of major petroleum product spill”.	X		Environmental Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Effective management of waste	▪ Prevention of potential pollution to the environment.	Identify all hazardous waste into waste streams from source and storage in durable containers appropriate to the type of waste.	X	X	Environmental Manager	During operation
		Use secondary containment (designed and constructed to contain all liquid hazardous waste) to store hazardous waste to minimise potential risks.	X	X	Environmental Manager	During operation
		Take measures to ensure waste is contained and appropriately handled until it is collected for storage at an engineered facility, i.e. for other activities generating hazardous waste outside engineered facilities.	X	X	Environmental Manager	During operation
		Collect and transfer on-site hazardous waste appropriate to the hazardous nature of the waste and suitable containers, vessels and equipment.	X	X	Environmental Manager	During operation
		Ensure that off-site transportation of hazardous waste be conducted by an appropriate service provider capable of handling hazardous waste.	X	X	Environmental Manager	During operation
		Ensure that disposable hazardous waste be disposed of at a managed / registered facility capable of handling such waste.	X	X	Environmental Manager	During operation
		Monitor waste activities on-site and off-site and keep relevant records.	X	X	Environmental Manager	During operation
		Appoint an appropriate service provider capable of handling hazardous waste to transport hazardous waste off-site at a managed facility capable of handling such waste.	X	X	Environmental Manager	During operation
Availability of hazardous waste	▪ Prevention of potential pollution to the environment.	Ensure appropriate and adequate waste facilities and storage containers are available site wide for	X	X	Environmental Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
facilities and infrastructure		temporary storage, and for the treatment of selected hazardous waste.				
Incineration of hazardous waste	▪ Potential impact on the environment and health.	Install an incinerator to burn hazardous waste (e.g. empty reagent and cyanide bags).	X	X	Environmental Manager and Departmental Managers	During operation
		Incinerate hazardous waste to reduce volume and weight; to detoxify waste from harmful pathogens, bacteria and toxins; and prevent wildlife from scavenging on waste.	X	X	Environmental Manager	During operation
		Dispose of the incinerator ash at the Landfill Facility.	X	X	Environmental Manager	During operation
		Introduce stack measurements that include the concentration for all the compounds as per the applicable and relevant best practice standards.	X	X	Environmental Manager	Annually
Training and Awareness	▪ Creating awareness and responsibility for preventing pollution and protection of the environment.	Provide training to the staff operating the incinerator to ensure optimum combustion conditions.	X	X	Environmental Manager	During operation
		Provide training to all employees and contractors in pollution prevention and control; waste management and spill management.	X	X	Environmental Manager	During operation
Management and mitigation of hazardous recyclable and disposable waste	▪ Responsible management of waste.	Develop handling and treatment procedures for specific hazardous wastes and treatment processes.	X	X	Environmental Manager	During operation
Hazardous waste facilities and infrastructure	▪ Potential pollution to the environment.	Provide for appropriate and adequate waste facilities and storage vessels site wide for temporary storage, and for the treatment of selected hazardous waste.	X	X	Environmental Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Audits, monitoring and record keeping	▪ Effective waste management.	Identify the nature, composition and quantities of hazardous waste – i.e. waste stream identification.	X	X	Environmental Manager	During operation
		Develop a waste management plan to ensure proper, planning, handling and record management.	X	X	Environmental Manager	During operation
		Ensure all hazardous waste is separated at source, volumes and mass measured and records kept identifying improvement opportunities.	X	X	Environmental Manager and Departmental Managers	During operation
		Conduct environmental compliance audits of all off-site service providers and facilities.	X	X	Environmental Manager	As per audit schedule
		Keep records of hazardous waste streams for both on-site and off-site disposal – i.e. types and quantities of hazardous wastes, audit and inspection records and waste disposal certificates.	X	X	Environmental Manager	During operation

7.8 Archaeology Management Plan

Management Objectives

- To prevent the unacceptable loss of archaeological sites and related historical information.
- To ensure that areas around archaeological finds remain undisturbed.
- To ensure that correct actions are taken to preserve or document archaeological chance finds.

Management Standards

- National Heritage Act (No. 27 of 2004)
- National Heritage Regulations of 2005
- Archaeological Chance Find Procedure
- Environmental Awareness Presentation
- Environmental Awareness Assessment
- Environmental Induction
- B2Gold Environmental and Biodiversity Performance Standards

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Storage of Tailings
- Establishing infrastructure
- Removal of infrastructure
- Road construction and maintenance
- Operation of machinery, equipment and Plant

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Disturbance of archaeological sites	▪ Potential loss of archaeological sites and related losses to the broader archaeological landscape. ▪ Potential damage to archaeological sites.	Demarcate and protect all identified archaeological sites and clear the area within of encroaching bush.	X	X	Environmental Manager and General Manager Operations	Prior to start of identified activities
		Re-route the cutline running past archaeological site QRS 83/1 & 2 and provide for a 20m buffer around the site.	X	X	Environmental Manager and General Manager Operations	Prior to start of identified activities
		Clearly indicate all identified archaeological site localities on GIS and relevant field maps.	X	X	Environmental Manager and Technical Services Manager	Prior to start of identified activities
		Ensure that all employees and contractors whose activities may encroach on archaeological sites are aware of the sites and have the relevant maps available.	X	X	Environmental Manager and General Manager Operations	Prior to start of identified activities
		Consider test excavations to confirm the identification of the cairns as burial sites.	X	X	Environmental Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Obtain relevant permissions / permits from the National Heritage Council for the unavoidable disturbance or relocation of archaeological sites – e.g. Sites QRS 83/1, QRS 83/2, QRS 83/3.	X	X	Environmental Manager	Prior to start of identified activities
Chance find of an archaeological object / site	▪ Contribution to knowledge / information and protection of heritage.	Report the discovery of any archaeological object to the National Heritage Council as per Company standards.	X	X	Environmental Manager	Immediately with discovery
		Develop and keep an up-to-date Chance Find Procedure as per the requirements in the National Heritage Act (Act 27 of 2004).	X	X	Environmental Manager	Within first year of operations and review as and when required
		Keep relevant documents and records related to the archaeological chance find.	X	X	Environmental Manager	Throughout the LoM
Management of archaeological No-Go Areas	▪ Protection of archaeological sites.	Ensure that Archaeological No-Go Areas are identified and evaluated by a qualified archaeologist.	X	X	Environmental Manager	Prior to starting new activities
		Develop an archaeological site management plan as per the National Heritage Act, Section 58 (1)(b).	X	X	Environmental Manager	During operation
		Integrate the conservation and management of Archaeological No-Go Areas in the Company's procedures.	X	X	Environmental Manager	During operation
Provision of training and awareness	▪ Awareness creation on the importance of archaeological sites / finds.	Provide all employees and contractors with the relevant training and awareness on the legal requirements, Company procedures and code of conduct related to archaeological sites.	X	X	Environmental Manager	During onboarding and refresher inductions

7.9 Noise and Vibrations Management Plan

Management Objectives

- To limit excessive noise pollution.
- To limit excessive blast vibration and fly rock.
- To ensure potential odours, noise and vibration sources are mitigated.

Management Standards

- Labour Act (No. 11 of 2007)
- Regulations relating to the Health & Safety of Employees at Work (promulgated in terms of Section 101 of the Labour Act No 6 of 1992 (GN156, GG 1617 of 1 August 1997)
- Explosives Act (No. 26 of 1956)
- Noise and Vibrations Management Plan

Activity(ies)

- Drilling and blasting
- Ore excavation
- Loading and hauling
- Road construction and maintenance
- Establishing infrastructure
- Removal of infrastructure
- Operation of machinery, equipment and Plant

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Generation of noise	▪ Impact of noise on the environment / sensitive receptors	Document and investigate all registered complaints and make efforts to address the area of concern where possible.	X	X	Public Relations Manager and Environmental Manager	Throughout the LoM
		Ensure communication channels are established to give prior notice to the sensitive receptor, should activities that generate noise and vibrations are within their vicinity – include proposed working times; duration and purpose of the activity; and Company contact details.	X	X	Public Relations Manager	Throughout the LoM
		Ensure that plant and equipment is well-maintained and fitted with the correct and appropriate noise abatement measures.	X	X	Engineering Manager	Throughout the LoM
		Develop a noise barrier between nearest receptor areas and the open pit development,– i.e. earth berm of a height of at least 5 metres.	X	X	Mining Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Monitoring of noise on environment / receptors	▪ Improved understanding of the potential impact of noise on the environment / receptors.	Develop and implement a noise monitoring programme.	X	X	Safety Manager, Environmental Manager	Prior to start of operation / noise generating activity.
		Conduct noise monitoring at potential receptor locations and at areas where concerns are raised regarding noise originating from the operations.	X	X	Safety Manager, Environmental Manager	Quarterly
		Provide feedback regarding noise monitoring to key stakeholders and other Interested and Affected Parties in the area.	X	X	Public Relations Manager	Annually
		Use a sound propagation model to illustrate the extent of the noise impact from the operation.	X	X	Safety Manager and Public Relations Manager	Annually
Blasting disturbance	▪ Potential impact on safety of third parties. ▪ Potential impact on property – buildings and other infrastructure ▪ Potential impact on biodiversity	Develop a blast design, implementation and monitoring programme that include safety and vibration requirements.	X	X	Mining Manager and Safety Manager	During operation
		Ensure that fly rock is contained within a maximum of 500 metres of the blast site.	X	X	Mining Manager	During operation
		Clear third parties to a safe distance determined by applicable legislation and safe working procedures, prior to each blast – sound an audible warning.	X	X	Mining Manager	During operation
		Ensure ground vibration at the closest third-party structures is within acceptable best practice standards.	X	X	Mining Manager	During operation
		Ensure that air blast at the closest third-party structures is within acceptable best practice standards.	X	X	Mining Manager	During operation
		Document and investigate all registered complaints and address areas of concern.	X	X	Communications Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Generation of nuisance odours, noise and vibration	▪ Impact on sensitive receptors within proximity to the site - surrounding farmers, plants and animals. ▪ Potentially impact on the quality of life of neighbouring residents and tourism activities.	Avoid noise generating activities at night.	X	X	General Manager	During operation
		Ensure blasting is done in a controlled manner and design to reduce vibration impact.	X	X	Mining Manager	During operation
		Ensure appropriate measures are put in place to rectify odours, noise and vibration complaints, should they occur.	X	X	Safety Manager and Engineering Manager	During operation
		Ensure procedures for receiving complaints from nearby land users or residents are in place and mitigation measures are implemented.	X	X	Public Relations Manager	During operation
		Ensure occupational noise and vibration is managed through the health and safety management plan and staff exposure is monitored.	X	X	Safety Manager	During operation

7.10 Visual Management Plan

Management Objectives

- Minimise the visual impacts of mining operations on the community and public through progressive rehabilitation.

Management Standards

- The Minerals (Prospecting and Mining) Act (No. 33 of 1992)
- Forest Act (No. 12 of 2001)
- Nature Conservation Ordinance (No.14 of 1975)
- B2Gold Environmental and Biodiversity Performance Standards

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Storage of Tailings
- Establishing infrastructure
- Removal of infrastructure
- Road construction and maintenance
- Operation and maintenance of machinery, equipment and Plant

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Erecting infrastructure	▪ Visual impact (aesthetic quality of environment) - negative public perception.	Limit OGM signage on the B1 road.	X		General Manager and Safety Manager	During operation
		Rip and rehabilitate areas of the old road not utilised for the mine.	X		Engineering Manager	During operation
		Raise a 2.5 metre berm with local endemic plants to ensure that views down the old road are screened.	X		Engineering Manager	During operation
		Ensure that the trees between the railway line and the road are not removed – in consultation with relevant stakeholder(s).	X	X	Environmental Manager and General Manager	During operation
		Avoid using face brick and shield glass surfaces to avoid glare and reflections.	X		Engineering Manager	During operation
		Blend all painted surfaces into the natural surroundings.	X		Engineering Manager	During operation
Lighting of operations	▪ Alteration in nocturnal activities of fauna and flora.	Keep lighting to a minimum within the requirements of safety and efficiency.	X		Safety Manager and Engineering Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Avoid overly tall light poles and use low wattage and directional lighting.	X		Engineering Manager	During operation
		Shield security and perimeter lighting to ensure no light falls outside the area that requires light.	X		Security Manager and Engineering Manager	During operation
Disturbance of land	▪ Change to the visual landscape.	Develop a process to control unauthorised disturbance of land, vegetation clearing and fauna habitat destruction	X	X	Environmental Manager	Throughout the LoM
		Manage and protect all vegetation within the mine site that does not require removal.	X	X	Environmental Manager and General Manager	Throughout the LoM
		Remove and stockpile topsoil in areas to be excavated, for use in rehabilitation of the Tailings Storage Facility (TSF) and the WRD, Plant and infrastructure areas.	X	X	Environmental Manager and Mining Manager	Throughout the LoM
		Rehabilitate all the faces of the WRD to grass / scrub bushes and some trees - Reduce the angle of the WRD slope if not suitable for rehabilitation.	X	X	Environmental Manager; Mining Manager; Processing Manager and Engineering Manager	During operation
		Progressively rehabilitate the TSF dam walls, as it is raised.	X	X	Environmental Manager and Processing Manager	Throughout the LoM
		Establish a mechanism to ensure that the rehabilitation of the mine is properly funded to ensure that sufficient funds are available to implement the rehabilitation and mitigations required for closure.		X	General Manager and Environmental Manager	During operation
Removal of Infrastructure	▪ Preparation of disturbed areas for future land use.	Remove all components of the infrastructure used during operations.		X	Environmental Manager and Departmental Managers	During decommissioning
		Decontaminate ground where Processing Plants were located and cover with earth used for the		X	Environmental Manager and Departmental Managers	During decommissioning and rehabilitation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		berm and landscape into a natural form in alignment with the natural hydrological patterns.				

7.11 Safety and Security Management Plan

Management Objectives

- To prevent physical harm to third parties and animals from potentially hazardous excavations and infrastructure.

Management Standards

- Public and Environmental Health Act (No. 1 of 2015)
- Explosives Act (No. 26 of 1956)
- The Minerals (Prospecting and Mining) Act (No. 33 of 1992)
- Atmospheric Pollution Prevention Ordinance No. 11 of 1976)
- Labour Act (No. 11 of 2007)
- Regulations relating to the Health and Safety of Employees at Work (promulgated in terms of Section 101 of the Labour Act No 6 of 1992 (GN156, GG 1617 of 1 August 1997)
- Petroleum Products and Energy Act (No. 13 of 1990)
- B2Gold Health, Safety and Environment Management System Standards
- Safety Management Plan
- NO_x / SO_x Emission Monitoring
- Ambient Air Monitoring
- Monitoring and Measurement Plan
- Air Quality Management Plan

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Storage of Tailings
- Establishing infrastructure
- Removal of infrastructure
- Road construction and maintenance
- Operation and maintenance of machinery, equipment and Plant

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Access of unauthorised people to the Mining Licence.	▪ Potential risk of injury to third parties with unauthorised access.	Erect and maintain warning signs at the site boundary.	X	X	Security Manager	During operation
		Fence off the working area of the Mining Licence.	X	X	Security Manager	During operation
		Put security control points in place, to prevent uncontrolled vehicle access to existing and future mining, stockpile and waste facility areas during operation and decommissioning.	X	X	Security Manager	During operation and decommissioning
		Ensure that any person entering the Mining Licence Area (pit and plant) will only be allowed after formal induction.	X	X	Security Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Emergency preparedness and response	▪ Potential risk of injury to third parties with unauthorised access.	Develop and implement an emergency response plan for third parties potentially falling into or off hazardous excavations and causing injury.	X	X	Security Manager and Safety Manager	During operation
Safety Risks	▪ Potential impact on health and safety of people and animals.	Ensure that permanent aboveground waste facilities and stockpiles are rehabilitated in a manner that present landforms that are stable, protected from flood damage, and slopes are re-vegetated.	X	X	Safety Manager and Environmental Manager	During rehabilitation
		Ensure that any mining voids that remain open are made safe to ensure that there is no risk to the safety of people and animals.	X	X	Safety Manager and Mining Manager	During rehabilitation and closure
		Ensure that the permanent aboveground waste facilities are operated in a manner where stability is a priority, flood protection is provided, and the risk of failure is limited to acceptable levels.	X		Environmental Manager and Engineering Manager	During operation
Underground ground control and ground support failures	▪ Potential impact on safety of people working underground.	Ensure that the Company's Safety Management Plan include SOP and golden rules that no person is allowed to go beyond supported ground (ground that has been controlled to an approved standard and made safe).	X	X	Safety Manager	During operation
		Appoint a Ground Control Coordinator.	X		Mining Manager	During operation
		Develop a Ground Control Plan.	X		Mining Manager	During operation
		Ensure the application of a rigorous mine design process.	X		Mining Manager	During operation
		Develop a ground conditions model, prior to mining.	X		Mining Manager	During operation
		Ensure that the evaluation of long-term ground control requirements is incorporated into the sites' technical plans and planning process.	X		Mining Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Ensure that there is a multi-tiered response plan for ground support.	X		Safety Manager	During operation
		Ensure that all underground operators are trained in underground hazard identification.	X		Safety Manager	During operation
		Ensure that the site has ground control monitoring systems in place to proactively measure potential ground movement.	X		Mining Manager	During operation
		Ensure that the ground control requirements are incorporated into shift plans and work plans.	X		Mining Manager	During operation
		Ensure that the site develops a quality assurance program for all areas of ground control / support.	X		Mining Manager and General Manager	During operation
Underground fire incident	▪ Potential injury to people working underground.	Develop a Fire Control Plan through the process of risk assessment.	X		Safety Manager	During operation
		Develop a Maintenance System to prevent the deterioration of equipment condition and performance.	X		Engineering Manager	During operation
		Ensure no petrol is used underground.	X		Engineering Manager	During operation
		Design and control flammable substances use and storage.	X		Mining Manager and Engineering Manager	During operation
		Ensure that the control of hot work through a hot work permit system is in place specifically for underground operations.	X		Safety Manager	During operation
		Ensure the underground operators receive training to be able to identify and provide first response to fire emergencies.	X		Safety Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Ensure that the site has an operational and maintenance procedure for fire control.	X		Safety Manager	During operation
		Ensure that the design requirements for underground mobile equipment factors in fire suppression.	X		Engineering Manager	During operation
		Ensure that the site has specific design requirements for fixed mechanical, electrical and compressor installations.	X		Engineering Manager	During operation
		Design the ventilation system to ensure the least exposure to smoke from underground fires during evacuations.	X		Engineering Manager	During operation
		Ensure that associated infrastructure required for underground operations such as workshops, lunchrooms, toilets and refuge chambers are planned and designed for purpose.	X		Engineering Manager	During operation
Collision of underground mining equipment causing injury to people	▪ Potential injury to people working underground.	Ensure that procedures are in place to minimise the instances where pedestrians and operating mobile equipment are in the same area at the same time.	X		Mining Manager and Safety Manager	During operation
		Ensure that operational Risk Assessments are part of the planning process.	X		Mining Manager and Safety Manager	During operation
		Develop equipment specifications which include minimum safety requirements and the identification of critical control systems for underground equipment.	X		Mining Manager, Engineering Manager and Safety Manager	During operation
		Develop a maintenance system that identifies the maintenance requirements for critical safety systems.	X		Engineering Manager and Safety Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Ensure that design requirements of all underground roads are such to ensure good road conditions underground are maintained.	X		Mining Manager and Safety Manager	During operation
		Ensure suitable control of traffic through the development of SOPs.	X		Mining Manager and Safety Manager	During operation
		Ensure the site makes provision for the use of remote-controlled equipment to ensure high standards of safety.	X		Engineering Manager	During operation
		Ensure all operators understand and are trained for emergency response.	X		Safety Manager	During operation
Inrush or subsidence event within the underground mine causing injury and harm to people and project feasibility	▪ Potential injury to people working underground.	Ensure that due consideration of inrush and subsidence potential is implemented at the planning phase at each stage.	X		Mining Manager	During operation
		Ensure that the use of a risk assessment process is in place to identify specific hazards.	X		Mining Manager and Safety Manager	During operation
		Implement systematic collection and analysis of data.	X		Mining Manager	During operation
		Evaluate climatic conditions.	X		Mining Manager and Environmental Manager	During operation
		Identify risks of operating near water.	X		Mining Manager	During operation
		Ensure that consideration of pathways for inrushes is evaluated at each phase.	X		Mining Manager	During operation
		Develop, apply and monitor lead indicators.	X		Mining Manager and Safety Manager	During operation
		Develop and apply a response plan for lead indicators.	X		Mining Manager and Safety Manager	During operation

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
		Ensure the site has implemented contingency planning.	X		Mining Manager and Safety Manager	During operation
		Ensure that a Water Control Plan is developed and in place prior to the development of working areas.	X		Mining Manager and Engineering Manager	During operation
		Apply appropriate procedures for surface and underground drilling.	X		Mining Manager	During operation
		Apply a rigorous mine design process.	X		Mining Manager	During operation
		Implement effective ore and waste fill design.	X		Mining Manager	During operation
		Implement effective tailings and surface water storage.	X		Processing Manager and Engineering Manager	During operation
		Implement effective backfill design and procedures.	X		Mining Manager	During operation
		Implement effective underground and surface pumping and drainage systems.	X		Mining Manager and Engineering Manager	During operation
		Ensure that there is a method for open and clear communication of experiences and outcomes of inrush and subsidence events.	X		Mining Manager	During operation

7.12 Traffic Management Plan

Management Objectives

- To reduce the potential for safety and vehicle related impacts on road users.

Management Standards

- Road Traffic and Transport Act (No. 22 of 1999)
- Safety Induction
- Safety Topics and Talks
- Incident Management Procedure
- Corporate Social Responsibility Plan
- Stakeholder Engagement and Communications Management Plan
- B2Gold Occupational Health and Safety Performance Standards

Activity(ies)

- Road use - infrastructure
- Road construction and maintenance

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Impact on future road use	▪ Increase in traffic on the B1 road. ▪ High speed of traffic using the road and the potential for road traffic accidents. ▪ Loose gravel can lead to damaged windscreens. ▪ Presence of animals and the risk of collision.	Implement a driver trainer programme for all B2Gold employees and contractors including: complying with speed limits, holding valid licences, ensuring vehicles are roadworthy, zero tolerance for drinking and driving and using lights appropriately for night driving.	X	X	Safety Manager	As part of on-boarding programme
		Include requirement in contracts / agreements for all contractors to comply with Namibian Roads Authority regulations.	X	X	Safety Manager and Procurement Manager	During procurement process
Use of B1 route and T-junction	▪ Potential increase in traffic volume on the B1 road.	Install appropriate signage at the intersection: i.e. Stop sign at the T-junction; Warning signs on the approach to the T-junction and indicating the presence of heavy vehicles; Mine name board.	X	X	Safety Manager	Prior to start of identified activities
		Assess the safety situation at this intersection / B1 T-junction, considering a northbound passing lane, should traffic increase.	X	X	Safety Manager and General Manager	Annually

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Crossing the railway (Railway Crossings)	▪ Potential collision with the train.	Raise awareness among employees and contractors about the safety aspects related to the use of the railway crossing.	X	X	Safety Manager	During safety talks
	▪ Reduced visibility / line of sight due to vegetation growth along the road.	Obtain permission from the relevant authority to clear vegetation along the rail in the vicinity of D2808, focusing on specific bushes and plants that interfere with clear sight along the rail.	X	X	Safety Manager and Environmental Manager	Prior to start of identified activities
Use of D2808 route and T-junctions	▪ Potential vehicle collisions.	Install proper signage at the intersection on the D2808 and the T-junction at the construction camp: i.e. Stop signs at the T-junctions; warning signs on the approaches to the T-junction and indicating the presence of Heavy vehicles; Mine name board; 80km/h speed limit signs on the D2808.	X	X	Safety Manager	Prior to start of identified activities
	▪ Reduced visibility / line of sight due to vegetation growth along the road.	Clear vegetation from the road reserve south of the D2808 to the west of the intersection to increase sight distance - approximately 50 metres from the intersection.	X	X	Safety Manager and Engineering Manager	Prior to start of identified activities
Emergency Preparedness and Response	▪ Potential damage and injuries due to road accidents.	Respond to any mine related road accident as per the emergency preparedness and response procedure.	X	X	Safety Manager and General Manager	Immediately when emergency occurs

7.13 Socio-economic Management Plan

Management Objectives

- To enhance the positive impacts associated with job creation and investment.
- To limit the impacts associated with inward migration.
- To reduce negative impacts on land use and neighbouring communities.
- To support initiatives of sustainable economic growth in the Otjozondjupa region.

Management Standards

- Water Act (No. 54 of 1956)
- Water Resources Management Act (No. 11 of 2013)
- Electricity Act (No. 4 of 2007)
- Labour Act (No.11 of 2007)
- Public and Environmental Health Act (No. 1 of 2015)
- Road Traffic and Transport Act (No. 22 of 1999)
- B2Gold Environmental and Biodiversity Performance Standards
- Monitoring and Measurement Plan
- Water Management Plan
- Corporate Social Responsibility Plan
- Stakeholder Engagement and Communications Management Plan

Activity(ies)

- Provision of employment and housing
- Water supply
- Power supply
- Provision of sanitation facilities

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Employment opportunities and development benefits.	▪ Increase in employment, investment and procurement of goods and services.	Give preference to local procurement for goods and services.	X	X	Procurement Manager	During operation
		Promote small and medium enterprises in the Company's procurement policies and procedures.	X	X	Procurement Manager	During operation
		Adopt a human resources policy that prioritises the selection of women for recruitment, training and development.	X	X	Human Resources Manager	During operation
		Ensure skills development strategies and programmes are in place to maximise the use of local labour force.	X	X	Human Resources Manager	During operation
		Support employees and community members to continue learning and developing skills, to offer labour flexibility and productivity.	X	X	Human Resources Manager and CSR Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Promote continuous learning programmes to diversify and upgrade skills.	X		Human Resources Manager	During operation
		Provide recognise, documented and accredited skills upgrading / training.	X		Human Resources Manager	During operation
		Maximise the recruitment of permanent workforce.	X		Human Resources Manager	During operation
		Provide training on personal financial management.	X		Human Resources Manager	During operation
		Enable and promote home ownership throughout the workforce.	X		Human Resources Manager	During operation
		Assist Otavi and Otjiwarongo town councils to diversify their economic activities.	X		CSR Manager	During operation and post-closure
Perceived job opportunities causing inward migration	▪ Increase in the establishment of informal settlements.	Promote accommodation integration in existing residential areas, wherever possible.	X	X	CSR Manager	During operation
		Use the Company's Corporate Social Investment (CSI) strategy to give support to local economic development in Otavi and Otjiwarongo - encourage, stimulate and support SME development.	X	X	CSR Manager	During operation and post-closure
		Build up local skills by working with local training establishments, providing bursaries for key skills.	X	X	Human Resources Manager	During operation
		Actively recruit women for training and employment into the mining sector.	X	X	Human Resources Manager	During operation
		Give preferential recruitment to Otjozondjupa residents.	X	X	Human Resources Manager	During operation
		Include recruitment of Grade 10 school-leavers who pass an IQ, English and Maths test.	X	X	Human Resources Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Partner with the National Housing Action group (NHAG) and the Shack Dwellers Federation (SHDF) to enable residents in Otavi's and Otjiwarongo informal settlement to engage with the Town Council.	X	X	CSR Manager	During operation and post-closure
		Assist Otavi and Otjiwarongo Town Council with the provision of essential infrastructure and services (i.e. water, electricity and sanitation) to marginalised residents (informal settlements).	X	X	CSR Manager	During operation and post-closure
		Support the town councils to have enlightened town plans which enable affordable land tenure and business development.	X	X	CSR Manager	During operation and post-closure
		Negotiate with the Ministry of Health and Social Services to provide primary health care services to neighbouring farmworkers around farm Otjikoto, from its mine clinic.	X	X	CSR Manager	During operation
		Support Otavi and Otjiwarongo schools through the CSI programme and focus on the schools' priority requests and assess how best to provide support.	X	X	CSR Manager	During operation and post-closure
		Form a representative stakeholder committee, genuinely representative of those most affected by the B2Gold's operations – e.g. landowners, farmworkers, town councils and residents committees – to assist with the monitoring of social impacts and the effectiveness of the mitigation measures put in place.	X	X	CSR Manager	During operation
		Fence in the working area of the Mining Licence and employ strict security.	X	X	Security Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Regularly communicate to the public the process for recruiting to prevent potential job seekers gathering at the gate of B2Gold operations.	X	X	Human Resources Manager and Public Relations Manager	During operation
		Take measures to prevent Platveld from becoming an informal / squatter settlement.	X	X	CSR Manager and Public Relations Manager	During operation
		Develop and enforce a zero-tolerance procedure to alcohol in the workplace and on site.	X	X	Safety Manager and General Manager	During operation
		Establish a comprehensive HIV / AIDS / TB workplace policy and wellness programme.	X	X	Safety Manager	During operation
		Include HIV requirements for all contractors (HIV policies and programmes).	X	X	Procurement Manager, Supply Chain Manager and Safety Manager	During operation
		Develop community wellness programmes in consultation with the neighbouring towns and farms. (Include HIV / AIDS / TB related issues).	X	X	CSR Manager	During operation and post-closure
		Support partnerships that encourage a sense of community and that combat social ills, e.g. multi-purpose community and skills development centres; networking points for new migrants; sports tournaments, social clubs, youth clubs, activities that promote women's empowerment that can lead to gender equality and community policing.	X	X	CSR Manager	During operation and post-closure
Change of land-use and neighbouring communities	▪ Potential negative impact on neighbouring communities.	Manage the non-mining areas as productively as possible, including restoring bush encroached areas for productive farming.	X	X	CSR Manager	During operation
		Fence mining area to minimise security risks – employees and contractors, and neighbouring farms.	X	X	Security Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Establish a platform for on-going dialogue with neighbouring farmers, as a special interest group and provide a named point of contact.	X	X	Public Relations Manager	During operation and post-closure
		Give neighbouring farms opportunities to provide goods and services, as a form of compensation, e.g. to run a shop, provide farm produce and visitor accommodation.	X	X	CSR Manager and General Manager	During operation
		Enforce strict access rules of personal movement except along well established roads and walkways.	X	X	Security Manager	During operation
		Liaise with farm owner(s) and obtain the necessary authorization before entering these private properties, prior to any person conducting work for/on behalf of B2Gold on neighbouring farms.	X	X	Public Relations Manager and General Manager	During operation and post-closure
Creation of jobs during operational mining	▪ Increase in employment opportunities.	Ensure that local residents get first opportunity for positions employment, were applicable.	X		Human Resources Manager	During operation
		Consider redeploying redundant staff from decommissioned or closed operations.	X	X	Human Resources Manager	During decommissioning or closure of operations
Influx of contractor (workers and families) stimulating the local economy through increase spends	▪ Potential increase in local economic growth.	Engage with the local and regional government to ensure development plans cater for influx.	X		Human Resources Manager and Public Relations Manager	During operation
		Ensure local spend of CSI funding address development needs to cater for influx where applicable.	X		CSR Manager	During operation
Changes to community cohesion	▪ Potential improvement in local socio-economic conditions.	Ensure local spend of CSI funding address development needs to cater for influx where applicable.	X		CSR Manager	During operation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Employees, contractors and community health and wellness	▪ Socio-economic impact of Covid 19 Pandemic in the workplace and community.	Develop and implement a Covid 19 Pandemic policy and procedure in consultation with the MoHSS.	X		Safety Manager, Public Relations Manager and CSR Manager	During operation
		Ensure all employees and contractors are aware of the details of the policy and procedure.	X		Safety Manager, Public Relations Manager	During operation
		Provide support to employees and contractors who are affected by Covid 19 (i.e. physically and mentally).	X		Safety Manager and General Manager	During operation
		Assist the Otavi and Otjiwarongo Town Councils, and the relevant local government departments *via* the CSI programme with essentials during the management of the Covid 19 pandemic.	X		CSR Manager and Public Relations Manager	During operation

7.14 Stakeholder Consultation / Communication Management Plan

Management Objectives

- To ensure that ongoing feedback is provided on the relevant mining activities, together with feedback on the environmental management performance of the mine.
- To ensure that opportunity is provided for interested and affected parties to raise comments and concerns (complaints).
- To ensure communication / engagement strategies meet the needs of stakeholders.

Management Standards

- Environmental Management Act (No. 7 of 2007)
- EIA Regulations of 2012
- Labour Act (No.11 of 2007)
- Public and Environmental Health Act (No. 1 of 2015)
- Road Traffic and Transport Act (No. 22 of 1999)
- B2Gold Environmental and Biodiversity Performance Standards
- Corporate Social Responsibility Plan
- Stakeholder Engagement and Communications Management Plan

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Road construction and maintenance
- Road use - infrastructure
- Establishing infrastructure
- Removal of infrastructure
- Operation of machinery, equipment and Plant
- Provision of water, power, sanitation, employment and housing

Aspect	Impact	Management Actions	Operation	Decommissioning	Responsibility	Time Frame
Understanding and identifying key stakeholders	▪ Improved communications with stakeholders.	Maintain and update the stakeholder register with all relevant stakeholder groups, including stakeholders' needs and expectations.	X	X	Public Relations Manager	Throughout the LoM
		Ensure that marginalised and vulnerable groups are considered in the stakeholder communication process.	X	X	Public Relations Manager	Throughout the LoM
		Record partnerships and their roles, responsibilities, capacity and contribution to development.	X	X	Public Relations Manager	Throughout the LoM
Liaising with interested and affected parties at all phases during the life of mine	▪ Improved consultation with interested and affected parties.	Develop and implement a stakeholder communication and engagement strategy.	X	X	Public Relations Manager	Throughout the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Cooperative working relationship with stakeholders	▪ Enhanced engagement with affected communities through disclosure of information, consultation, and informed participation, aligned with the risks to and impacts on the affected communities.	Inform identified stakeholders about the Company's significant activities.	X	X	Public Relations Manager	Throughout the LoM
		Use appropriate communication channels to consult with and disseminate information to the public.	X	X	Public Relations Manager	Throughout the LoM
		Develop a communication procedure.	X	X	Public Relations Manager	Throughout the LoM
Managing perceptions and issues / complaints	▪ Enhanced engagement with affected communities through disclosure of information, consultation, and informed participation, aligned with the risks to and impacts on the affected communities.	Develop and implement a concerns / complaints (grievance) process for the public and publicise the channels through which complaints and comments can be submitted to the Company and responded to timeously.	X	X	Public Relations Manager	Throughout the LoM
		Keep a register or records of all significant communications – complaints / grievances, suggestions, responses and actions taken.	X	X	Public Relations Manager	Throughout the LoM
Safety of third parties	▪ Enhanced engagement with affected communities through disclosure of information, consultation, and informed participation, aligned with the risks to and impacts on the affected communities.	Provide information to educate third parties about the dangers associated with hazardous excavations and infrastructure, through appropriate communication and inductions.	X	X	Public Relations Manager	Throughout the LoM
Monitoring of stakeholder engagement	▪ Improved engagement with stakeholders.	Monitor changes in the communities of interest.	X	X	Public Relations Manager	Throughout the LoM
		Develop audit criteria for monitoring the performance of stakeholder engagement and communication strategies and relations between the Company and the identified stakeholders.	X	X	Public Relations Manager	Throughout the LoM

7.15 Decommissioning and Closure Management Plan

Management Objectives

- To enable all key stakeholders to have their interests considered during the mine closure process.
- To ensure the process of closure occurs in an orderly, cost-effective and timely manner.
- To ensure the cost of closure is adequately represented in the Company accounts and that the community is not left with a liability.
- To ensure there is clear accountability and adequate resources for implementation of the closure plan.
- To establish a set of indicators which demonstrate the successful completion of the closure process.
- To reach a point where the Company has met agreed completion criteria to the satisfaction of the responsible Government regulator.
- To prepare for changes in employment conditions at closure (negative social effects on people dependent on the mine).
- To understand closure risks and prepare to mitigate impacts on associated communities and dependent businesses.
- To protect public health and safety and the environment by using safe and responsible closure practices.
- To reduce or eliminate adverse environmental effects once the mine ceases operations.
- To establish conditions which are consistent with the predetermined end-use objectives.
- To reduce the need for long-term monitoring and maintenance by establishing effective physical, chemical and ecological stability of disturbed areas.
- To remove as much infrastructure as possible and rehabilitate what remains to resemble the pre-mining land state as closely as practicable.
- To prevent air and water pollution in accordance with the requirements of the relevant regulations and in line with good international practice.

Management Standards

- Environmental Management Act (No. 7 of 2007)
- EIA Regulations of 2012
- Labour Act (No.11 of 2007)
- The Minerals (Prospecting and Mining) Act (No. 33 of 1992)
- Water Amendment Act (No. 54 of 1956)
- Water Resources Management Act (No. 11 of 2013)
- B2Gold Environmental and Biodiversity Performance Standards
- Topsoil Management Plan
- Topsoil Management Procedure
- Rehabilitation Management Plan
- Rehabilitation Monitoring Procedure
- Monitoring and Measurement Plan
- Corporate Social Responsibility Plan
- Stakeholder Engagement and Communications Management Plan

Activity(ies)

- Stripping / Clearing of soil / vegetation
- Drilling and blasting
- Ore excavation
- Loading and hauling
- Stockpiling
- Road construction and maintenance
- Road use - infrastructure
- Establishing infrastructure
- Removal of infrastructure
- Operation of machinery, equipment and Plant
- Provision of water, power, sanitation, employment and housing

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Closure	▪ Opportunity to restore environment (soil, vegetation, landscape and land-use) and prevent potential contamination. ▪ Loss of employment.	Return disturbed areas - other than those comprising the open pits and mineralised waste facilities - to as close to the natural habitat (Thorn Bush Savannah) as practicable.		X	Environmental Manager and Engineering Manager	During remediation and rehabilitation
		Leave permanent visible features such as the mineralised waste facilities and related environmental bunds and safety bunds around the open pits in a form that blends with the surrounding environment.		X	Environmental Manager and Engineering Manager	During remediation and rehabilitation
		Prevent contamination beyond the mine site by wind, surface run-off or groundwater movement through appropriate erosion resistant covers, containment bunds and drainage to the open pit.		X	Engineering Manager	During remediation and rehabilitation
		Remove linear infrastructure comprising roads, pipelines, power lines, conveyors and related components and rehabilitate disturbed land to blend with the surrounding natural environment.		X	Engineering Manager	During decommissioning, remediation and rehabilitation
		Minimise socio-economic impacts (including the loss of employment) through careful planning and preparation for closure.		X	CSR Manager and Human Resources Manager	Three to five years prior to closure
Decommissioning	▪ Opportunity to restore environment (soil, vegetation, landscape and land-use) and prevent potential contamination.	Demolish and remove surface infrastructure, except for the mineralised waste facilities and open pits which will remain.		X	Engineering Manager	During decommissioning
		Level and restore areas where infrastructure has been removed - in terms of soils horizons, vegetation and drainage.		X	Engineering Manager and Environmental Manager	During remediation and rehabilitation
Open pit decommissioning	▪ Potential impact on safety of humans and animals.	Construct an exclusion bund around the northern, western and southern rims of the open pits and connect to the mineralised waste facilities which will form the eastern exclusion bund.		X	Mining Manager	During remediation and rehabilitation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Direct seepage water and all other contaminated water that can drain naturally to the open pits to the pits, where it will evaporate.		X	Mining Manager	During remediation and rehabilitation
		Place bunds around the access ramps to the open pits to prevent access down the ramps.		X	Mining Manager	During remediation and rehabilitation
		Slope the top berm to an angle of approximately 20 degrees.		X	Mining Manager	During remediation and rehabilitation
		Assess and stabilise pit slopes to ensure long-term stability performance.		X	Mining Manager	During remediation and rehabilitation
Mineralised waste facilities	▪ Potential contamination of soil. ▪ Opportunity to restore environment (soil, vegetation, landscape and land-use) and prevent potential contamination.	Take into consideration the prior land-use and the location with respect to current and potential future socio-economic development, for the intended end use.	X	X	Mining Manager and Environmental Manager	At the start and during the LoM
		Ensure that the design, construction and operational procedures are compatible with the achievement of final closure and rehabilitation - to acceptable environmental standards and at a reasonable cost.	X	X	Mining Manager and Environmental Manager	At the start and during the LoM
		Ensure that the non-segregated tailings materials have a low permeability to limit seepage from rainwater infiltration.	X		Processing Manager	At the start and during the LoM
		Ensure that the required final side slope and top surface geometries are achieved during the operational phase.	X	X	Processing Manager and Mining Manager	During the LoM
		Cover the side slopes with topsoil to establish vegetation.		X	Mining Manager	During remediation and rehabilitation
		Cover the top surfaces with a vegetated engineered layer (waste rock and topsoil).		X	Mining Manager and Environmental Manager	During remediation and rehabilitation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Include emergency spillways in the final closure design.		X	Processing Manager and Mining Manager	At the start and during the LoM
		Ensure that storm water storage dams remain in place.		X	Engineering Manager	During decommissioning
		Remove all surface structures (i.e. pumps, pipelines, power lines etc.).		X	Engineering Manager	During decommissioning
Process Plant	▪ Potential income from salvageable structures. ▪ Potential contamination of soil. ▪ Opportunity to restore environment (soil, vegetation and land disturbance).	Dismantle the processing plant, primary crusher and conveyors, and decontaminate and sell salvageable elements.		X	Engineering Manager	During decommissioning
		Dismantle and dispose of the remainder of the processing plant including steelwork, concrete, liners, brickwork etc. at a site approved by the relevant authorities.		X	Engineering Manager	During decommissioning
		Remove any contaminated soil below the processing plant and dispose of at a site approved by the relevant authorities.		X	Engineering Manager	During remediation and rehabilitation
		Ensure that conveyor belts and concrete footings and non-salvageable steel are disposed of in a similar fashion.		X	Engineering Manager	During decommissioning
		Backfill and level the residual excavations after removal of the processing plant and primary crusher with selected overburden material from the open pit mining operations and cover with a thickness necessary to provide a productive layer for reclamation.		X	Engineering Manager	During remediation and rehabilitation
		Ensure that the plant area is landscaped and levelled to ensure that it is contiguous with, and blends into, the surrounding environment.		X	Engineering Manager	During remediation and rehabilitation

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Direct the run-off from the primary crusher site to the open pit (this area falls within the open pit access exclusion bund) and restore the soil and vegetation function of the land.		X	Engineering Manager	During remediation and rehabilitation
Workshops, diesel and oil storage facilities, and explosive areas	▪ Potential income from salvageable structures. ▪ Potential contamination of soil. ▪ Opportunity to restore environment (soil, vegetation and land disturbance).	Dismantle all structures associated with these facilities and decontaminate and sell salvageable elements.		X	Engineering Manager	During decommissioning
		Ensure that the remainder of the infrastructure is broken up and disposed of at a site approved by the relevant authorities.		X	Engineering Manager	During decommissioning
		Excavate contaminated soils underlying the structures and dispose of it at a hazardous waste disposal facility or bioremediation facility in the Mining Licence and dispose of treated soil in the open pit.		X	Engineering Manager	During remediation and rehabilitation
		Backfill and level residual excavations using selected overburden material from open pit mining operations.		X	Mining Manager	During remediation and rehabilitation
		Re-establish a landscape that can over time regenerate sustainable endemic vegetation communities.		X	Mining Manager, Engineering Manager and Environmental Manager	During remediation and rehabilitation
		Restore the soil and vegetation function of the land, leaving behind an ecologically functioning (fauna and flora) environment.		X	Environmental Manager	During remediation and rehabilitation
		Direct run-off from these areas to the open pit.		X	Engineering Manager	During remediation and rehabilitation
		Ensure that all other hard surfaces are ripped, and rubble / waste disposed of in the open pit.		X	Engineering Manager	During decommissioning

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Remove pipelines and infrastructure and backfill and level residual excavation with selected overburden material and cover with between 300 mm and 500 mm of stockpiled topsoil.		X	Engineering Manager and Environmental Manager	During decommissioning
Closure activities	▪ Opportunity to restore environment and reduce liabilities.	Ensure that the extent of demolition and rehabilitation efforts during decommissioning are maximised.		X	Engineering Manager and Environmental Manager	During decommissioning, remediation and rehabilitation
Rehabilitation and Closure of underground mining operations	▪ Potential impact on water and the environment.	Reclaim all equipment and cables from the workings before the decline and ventilation shafts will be sealed, at closure.		X	Engineering Manager	During decommissioning
		Install a monitoring casing in the vent shaft seal to monitor the rebounding water table and water quality in the workings.	X	X	Engineering Manager and Environmental Manager	During the LoM
	▪ Potential to re-use accumulated water.	Investigate the potential to use the accumulated water in the underground workings (e.g. for crop irrigation).	X	X	CSR Manager	Prior to initiating reclamation and closure
Photovoltaic Solar Power Plant	▪ Potential to generate revenue for CSR projects.	Investigate opportunity to generate revenue from the sale of electricity to NamPower / Regional Electricity Distributors at the end of LoM.	X	X	Engineering Manager and CSR Manager	Prior to initiating decommissioning, reclamation and closure
		Consider using the revenue form electricity sales to sustain and expand the Company's ongoing CSR projects in the region and support the Otjikoto NatureReserve and education centre.	X	X	Engineering Manager and CSR Manager	Prior to initiating decommissioning, reclamation and closure
		Investigate the possibility of extending the life of the facility or upgrading the facility to more advantageous renewable technologies at the end of the LoM.	X	X	Engineering Manager and CSR Manager	Prior to initiating decommissioning, reclamation and closure

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
Decommissioning of the Photovoltaic Solar Power Plant	▪ Opportunity to restore environment (soil, vegetation, landscape and land-use) and prevent potential contamination.	Remove and recycle the module components after disconnecting the PV infrastructure from the electricity network.		X	Engineering Manager	During decommissioning
		Dismantle the structures and remove the concrete foundations.		X	Engineering Manager	During decommissioning
		Excavate and remove all underground cables.		X	Engineering Manager	During decommissioning
		Demolish and remove the buildings.		X	Engineering Manager	During decommissioning
		Rehabilitate disturbed areas to restore the land to its original landform.		X	Engineering Manager	During remediation and rehabilitation
Legal Compliance	▪ Opportunity to restore environment and reduce liabilities.	Ensure that all approvals, licences and permits relating to mine closure and reclamation are obtained and complied with.		X	General Manager	Prior to initiating reclamation and closure
Mine Closure Plan Development	▪ Opportunity to adequately represent the cost of closure in the Company's accounts. ▪ Potential liability to the community.	Incorporate mine closure into the technical and financial evaluation of a new operation, or a planned major modification / extension of the existing operations - to identify the technical aspects of closure and associated costs.	X	X	General Manager and Financial Manager	At the start and during the LoM
		Define and include preliminary or proposed post-closure mining land-uses during the design of new developments - complying with relevant regulatory requirements or agreements with external stakeholders.	X	X	General Manager	At the start and during the LoM
		Develop a Mine Closure Plan during the design phase of all new operations and maintain the plan.	X	X	General Manager	At the start and during the LoM

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Develop a Social and Labour Plan - including Human Resource Development, Local Economic Development, Responsible Management of Downscaling and Retrenchment – and associated Financial Provisioning.	X	X	General Manager, Financial Manager, Human Resources Manager, CSR Manager	At the start and during the LoM
		Define the relevant regulatory / licence requirements, closure and post-closure monitoring programmes and bond release / licence relinquishment requirements in the Mine Closure Plan.	X	X	General Manager	At the start and during the LoM
		Define reclamation and closure objectives and success / completion criteria based on the agreed post-mining land use in the Mine Closure Plan.	X	X	General Manager	At the start and during the LoM
		Distribute the Mine Closure Plan to relevant stakeholders to incorporate external views and requirements into operational plans to meet reclamation and closure objectives.	X	X	General Manager	During Mine Closure Plan reviews and associated reporting
Mine Closure Plan Review and Update	▪ Improved Closure Planning	Review the Mine Closure Plan upon completion of the construction phase and at least every five years thereafter.	X	X	General Manager	Every five years
		Review and update the Mine Closure Plan after significant changes to the operations.	X	X	General Manager	When significant changes take place
		Review the Mine Closure Plan annually when the operation is within five years of the end of the life of mine and during the post-closure period.	X	X	General Manager	Annually
Reclamation and Closure Cost Estimates	▪ Opportunity to reduce liability(ies)	Prepare closure cost estimates using agreed resource industry methodology - Cost estimates to be adequately supported with industry / contracted earthmoving accepted estimates, quotes or actual costs from similar activities.	X	X	General Manager and Financial Manager	During operational phase

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		Prepare closure cost estimates during the operational phase with an accuracy of ±30 %.	X	X	General Manager and Financial Manager	During operational phase
		Update the Mine Closure Plan to include detailed reclamation and closure designs and cost estimates to an accuracy of ±10 %.	X	X	General Manager and Financial Manager	Within the last two years of processing ore
		Review and update cost estimates for existing disturbance, reclamation and closure liability.	X	X	General Manager and Financial Manager	Annually
		Ensure that reclamation and closure cost estimates include costs associated with achieving post-closure land-use objectives / criteria and any post-closure maintenance and monitoring activities as defined in the Mine Closure Plan.	X	X	General Manager and Financial Manager	Annually
		Formally approve reclamation and closure cost estimates as part of the annual budget cycle.	X	X	General Manager	Annually
		Track actual costs of progressive reclamation and closure activities against budget.	X	X	General Manager and Financial Manager	Monthly
Final Closure Reports	▪ Potential reduction in residual liabilities.	Ensure that final closure reports detail the reclamation and closure works completed until the relinquishment of any bond release and licence.		X	General Manager	At closure
		Include reclamation and closure objectives and criteria, methods used for the successful reclamation and closure of various aspects of the site (i.e., waste rock disposal facilities, tailing storage facilities), as-built surveys for structures, asset liquidation, and actual costs versus estimated costs in the final closure reports.		X	General Manager	At closure
		Ensure that final closure reports detail ongoing post-closure management and monitoring activities (i.e., landform maintenance, water		X	General Manager	At closure

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		management and erosion control structures) and associated cost estimates.				
Reclamation and Closure Records	▪ Potential reduction in residual liabilities.	Retain comprehensive and accurate records for reclamation and closure activities for at least ten years after final licence relinquishment.		X	General Manager and Environmental Manager	For a period of ten years after licence is relinquished.
Stakeholder Involvement	▪ Opportunity to reduce potential liabilities to the community.	Involve all interested and affected parties (employees, local suppliers, communities (e.g. local business, land owners), government and interested non-governmental organisations) in the development of the Mine Closure Plan and during the periodic review(s) throughout the LoM.	X	X	General Manager and Public Relations Manager	Throughout the LoM
		Develop a targeted communication strategy, which ensures that the needs of stakeholder groups and interested parties are adequately addressed and reflected in the Mine Closure Plan, and review and update periodically.	X	X	General Manager and Public Relations Manager	At the start of the LoM
		Ensure that adequate human and financial resources are allocated from the start of the life of mine to plan for mine closure.	X	X	General Manager and Financial Manager	Throughout the LoM
End state vision	▪ Opportunity to reduce potential liabilities to the community.	Ensure that the mine site is returned to its original condition of conservation / wilderness state (or as close to this condition as possible).	X	X	General Manager	Throughout the LoM
Post-closure / aftercare and maintenance	▪ Potential liabilities to the community.	Develop post-closure / aftercare and maintenance managing and monitoring requirements and action plans (e.g. safety and security, stakeholder engagement / involvement, quality of water, air, soil; vegetation succession, erosion, slope stability, state of fencing and prohibition signs, effectiveness and functionality of water treatment and drainage systems,	X	X	General Manager, Environmental Manager and CSR Manager	During Mine Closure Plan reviews

ASPECT	IMPACT	MANAGEMENT ACTIONS	OPERATION	DECOMMISSIONING	RESPONSIBILITY	TIME FRAME
		surface run-off, pollution control facilities – TSF, evaporation ponds).				
		Ensure that adequate resources and funding are available for post-closure / aftercare and maintenance and that responsibilities and accountabilities are well-defined.	X	X	General Manager, Financial Manager and CSR Manager	Prior to closure
		Identify and ensure adequate documentation and records are retained of post-closure / aftercare and maintenance managing and monitoring activities and results.	X	X	CSR Manager and Environmental Manager	Post-closure

8. REFERENCES

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9. APPENDICES

9.1 CURRICULUM VITAE: ENVIRONMENTAL CONSULTANT

SHORTENED CURRICULUM VITAE – FIONA OLIVIER (ENVIRONMENTAL CONSULTANT)	
PERSONAL INFORMATION	P O Box 11663, Klein Windhoek, NAMIBIA +264 81 748 7488 fiona.olivier1@gmail.com Female Namibian citizen | Date of birth: 25 May 1974 English and Afrikaans proficient (speak, read, write)
QUALIFICATIONS	**The Australian National University** 1999 | Degree of Master of Environmental Management and Development 1998 | Graduate Diploma in Environmental Management and Development **University of Namibia** 1996 | Degree of Honours Bachelor of Arts (Geography) 1995 | Degree of Bachelor of Arts (Geography & Sociology)
PROFESSIONAL PROFILE	More than 15 years' experience in environmental management and development - systems development, implementation, maintenance, and improvement. **Key Areas:** Environmental Management System development, implementation, maintenance and improvement | Standards, policies and procedures development and integration into Company business processes and contracts | Legal and other requirements register development, implementation and compliance | Identification and prioritisation of environmental aspects (risks and opportunities) | Setting environmental management objectives, targets and programmes | Environmental training, awareness and competence development and implementation | Environmental performance monitoring and reporting | Facilitating, coordinating and conducting environmental audits and non-conformance management | Conducting environmental management reviews | Environmental Strategic Planning, Policy Development, Technical Advice and Coordination of Programmes and Projects | Research, Data Analyses, Report Compilation and Reviews | Environmental Risk Identification, Management and Mitigation | Environmental Monitoring, Measurement and Evaluation | Internal and External Environmental Communication / Engagement / Consultation with Stakeholders and Interested and Affected Parties | Participation and representation in key stakeholder forums (Industry Associations and Committees, International, Regional and National meetings, workshops and conferences) | Environmental Legal Compliance Management | Collaboration with experts, scientists and authorities on environmental best practice | Management and Coordination of Environmental Impact Assessment process | Budget management | Management of Contracts / Agreements | People Management – performance and development | Keeping abreast of environmental best practice | Environmental Balanced Score Card development and implementation.

APPLICABLE PROFESSIONAL EXPERIENCE

Fiona Olivier has more than fifteen (15) years of experience in environmental management within the mining industry. Of specific relevance, is her experience in the development, implementation of environmental management plans and/or environmental performance / compliance monitoring, auditing and reporting at the following organisations: Sperrgebiet Diamond Mining (Pty) Ltd; Dundee Precious Metals Tsumeb (Pty) Ltd; Swakop Uranium (Pty) Ltd; Langer Heinrich Uranium (Pty) Ltd; De Beers Marine Namibia (Pty) Ltd; and Namdeb Diamond Corporation (Pty) Ltd.

2020 – 2021	**Environmental Consultant | Sperrgebiet Diamond Mining (Pty) Ltd** **Key Role:** Providing Environmental Management Services to assist with the Company's environmental management requirements.
2020 – 2021	**Environmental Consultant | B2Gold Namibia (Pty) Ltd** **Key Role:** Compiling a customized Environmental Legal Compliance Register for Otjikoto Gold Mine.
2018 – 2019	**Freelance Environmental Consultant** **Key Role:** Providing *ad hoc* advice and guidance on environmental management requirements for small-scale projects.
2016 – 2017	**Environmental Consultant | Dundee Precious Metals Tsumeb (Pty) Ltd** **Key Role:** Providing Environmental Management Services to assist with the Company's environmental management requirements.
2014 – 2015 2013 2006 – 2009 2004 – 2006	**Environmentalist | Swakop Uranium (Pty) Ltd** **Environmental Manager | Langer Heinrich Uranium (Pty) Ltd – Paladin Energy Ltd** **Environmental Manager | De Beers Marine Namibia (Pty) Ltd** **Environmental Manager | Namdeb Diamond Corporation (Pty) Ltd** Company Environmental Management Representative for the Environmental Management System | **Key Role:** Developing, implementing, maintaining, and improving the EMS in line with legal and other requirements and strategic objectives | reporting EMS performance to top management and recommending improvements.
2010 – 2012	**Freelance Environmental Management Consultant** **Key Role:** Advising on developing and implementing Environmental Management Systems (EMS) and providing *ad hoc* advice and guidance on environmental management requirements for small-scale projects.
2000 – 2004	**Senior Environmental Officer | Namdeb Diamond Corporation (Pty) Ltd** Company Environmental Management Representative for the ISO 14001 EMS from 2002-2004 | **Key Role:** Implementation and maintenance of the Company's ISO 14001 Environmental Management System.
1999 – 2000	**Monitoring, Evaluation and Supporting Supervisor | Desert Research Foundation of Namibia (DRFN)** **Key Role:** Facilitating work of DRFN Community-Based Natural Resource Management (CBNRM) projects in the four 'O' Regions of Northern Namibia.

Annexure 2: Environmental and Biodiversity Policy

ENVIRONMENTAL AND BIODIVERSITY POLICY

Effective Date: November 9, 2023

PURPOSE

B2Gold Corp. (the "**Company**" or "**B2Gold**") is committed to operating as a responsible mining company and recognizes that environmental and biodiversity management is an important aspect of this commitment. This Environmental and Biodiversity Policy (the "**Policy**") addresses the Company's key environmental risks and reflects our dedication to identifying and minimizing the impact on, and conserving the quality of, the natural environments in areas where we operate.

SCOPE

This Policy applies to all personnel of the Company and all of its subsidiaries, affiliates, joint ventures and any other entity controlled by the Company (collectively, the "**B2Gold Group**"), including every director, officer, employee, consultant and contractor of the B2Gold Group (the "**B2Gold Personnel**"). To meet these commitments, B2Gold will provide sufficient resources to ensure environmental risks are adequately addressed during all phases (exploration, design, construction, operations and closure) of each project.

POLICY STATEMENTS

Transparency and Governance

B2Gold strives to maintain open and transparent dialogue with stakeholders on environmental aspects of our activities. To meet this commitment, the Company will:

- maintain processes for receiving and responding to stakeholder concerns with respect to our environmental impacts and activities;
- work with relevant local representatives in the communities in which we operate to educate communities on the environmental obligations associated with our activities;
- monitor, assess and audit our operations to evaluate the effectiveness of our environmental management systems, and communicate findings to the Health, Safety, Environment, Social and Security Committee of the Board of Directors; and,
- continuously increase transparency in our public disclosure on environmental matters, particularly regarding environmental risk management.

Environmental Stewardship

B2Gold is committed to complying with all applicable environmental statutory obligations, internal Environmental and Biodiversity Performance Standards, and relevant industry guidelines. We aim to continually improve our environmental performance over time and to promote sustainable development in the areas in which we operate. To achieve these commitments, the Company will:

- establish and maintain effective environmental management systems, aligned with ISO 14001:2015 and other internationally accepted standards (including the International Cyanide Management Code), to identify, monitor and eliminate or mitigate environmental impacts;
- apply a proactive risk-management approach to safeguard and protect the environment;
- ensure that B2Gold Personnel carry out their responsibilities in accordance with this Policy, and require employees to undertake relevant training;
- prepare for, and maintain capability to, effectively respond to emergencies with environmental impacts, including hazardous substances or environmental releases; and,
- adopt appropriately funded reclamation and closure strategies for B2Gold operations, from exploration through closure.

Water

B2Gold acknowledges access to water as a human right and a requirement for priority biodiversity values. The Company recognizes the sensitivity around water management and water scarcity. We commit to:

- conserve and protect local water resources;
- monitor our usage of water resources in our areas of operation; and,
- continually improve water management systems and their efficiency.

Tailings and Waste Management

- We commit to responsible storage, handling, and disposal of mineral, non-mineral, and hazardous waste.
- We will maximize waste recovery and recycling processes throughout the mine life cycle, where feasible.
- We will continually research and implement tailings and waste management best practices to achieve the safe and secure management of mine tailings facilities.

Climate Risk Management

B2Gold acknowledges that human activities contribute to climate change and recognizes that society, including business, has a responsibility to address our climate impacts. B2Gold supports the goal of 'net zero' greenhouse gas emissions and the goals outlined in the Paris Climate Agreement. As a Company, we are committed to:

- setting and achieving long-term science-based targets to manage our global energy consumption;
- implementing renewable energy and low carbon technologies and solution to meet our climate goals and objectives; and,
- providing our stakeholders with the necessary information to make informed decisions regarding our climate risks and opportunities, and our management and performance relating to these risks.

Biodiversity and Land Use

B2Gold is committed to the conservation of biodiversity and an integrated approach to land use planning. B2Gold aims to manage biodiversity risks and impacts in accordance with the mitigation hierarchy to ensure that there is no net loss of critical habitat. To meet these commitments, we will:

- comply with legal requirements regarding protected areas and species;

- not explore or operate in declared World Heritage Sites;
- identify priority biodiversity values and undertake biodiversity risk and impact assessments;
- avoid, minimize, and restore potentially impacted priority biodiversity values, and where necessary, implement compensatory conservation measures; and,
- respect local communities and Indigenous People's rights and values for biodiversity resources and involve them in developing and agreeing on appropriate management strategies for potential impacts.

REVIEW

B2Gold is proud of its commitment to the environment and will continually strive to improve our environmental performance and reduce our environmental impact. We will review this Policy on a regular basis and will make revisions, as necessary.

APPROVED

Clive Johnson
President and Chief Executive Officer, B2Gold Corp.

Annexure 3: Environmental and Biodiversity Standards

Environmental and Biodiversity Performance Standards



1st MARCH 2024

Final Version

Revision	Approved	Date	Description
Final	Ken Jones	17th August 2014	Original 2014 issue of the B2Gold Environmental and Biodiversity Performance Standards
Final	Ken Jones	24th May 2018	2018 revision, update and issue of the original 2014 B2Gold Environmental and Biodiversity Performance Standards
Final	Ken Jones	1st March 2024	2024 revision, update and issue of the 2024 B2Gold Environmental and Biodiversity Performance Standards

KEY ADDITIONS AND AMENDMENTS WITHIN THE MARCH 2024 B2GOLD ENVIRONMENTAL AND BIODIVERISTY PERFORMANCE STANDARDS UPDATE

Section Reference	New Section Reference	Description of the March 2024 Addition or Amendment
All B2Gold Environmental and Biodiversity Performance Standards	NA	The March 2024 B2Gold Environmental and Biodiversity Performance Standards were reviewed and updated to improve clarity and grammar for improved understanding by B2Gold site personnel.
Terms and Definitions	NA	As required, the inclusion of additional environmental terms and definitions.
Std 1 – Hazardous Materials and Dangerous Goods Management – Section 1.2.5 – Secondary Containment	Section 1.2.5	**Addition** - Clean roof-top water shall be diverted away from facilities used to drain and treat contaminated water on-site.
Std 1 – Hazardous Materials and Dangerous Goods Management – Section 1.2.5 – Secondary Containment	Section 1.2.5	**Addition** - Secondary containment shall be free of stored rainfall, spillage and/or other materials (including sediment) to maintain containment capacity.
Std 1 – Hazardous Materials and Dangerous Goods Management – Section 1.2.11 - Mercury	Section 1.2.11	**Addition** - Sites shall not use mercury to extract gold in their processing facilities nor accept gold produced by third parties using mercury (RGMP Principle 8.4). **Addition** - Where applicable, sites shall support government initiatives to reduce and eliminate the use of mercury by artisanal and small-scale miners (ASM). (RGMP Principle 3.3).
Std 1 – Hazardous Materials and Dangerous Goods Management – Section 1.2.13 -Training	Section 1.2.13	**Withdrawal** – Prescriptive training requirements previously in Section 1.2.13 Training have been withdrawn in favour of providing risk specific training applicable to Hazardous Materials and Dangerous Goods Management.
Std 1 – Hazardous Materials and Dangerous Goods Management – 1.2.14 - Audits and Inspections	Section 1.2.14	**Amendment** - The interval for scheduling and conducting third-party safety and environmental audits of supplier hazardous materials and dangerous goods transportation was increased from three to five years.
Std 2 – Cyanide Management – Section 2.2.3 - Cyanide Risk Management	Section 2.2.3	**Addition** – B2Gold sites shall identify and manage potential risks relating to the transportation, handling, storage and disposal of all hazardous materials. Sites shall ensure that their arrangements for the transport, storage, use and disposal of cyanide are in line with the standards of practice set out in the International Cyanide Management Code (RGMP Principle 8.3).
Std 2 – Cyanide Management – All Sections	All sections	**Additions and Amendments** - This Standard requires an increased level of conformance with the updated June 2021 version of the International Cyanide Management Code. Previous requirements were defined in the former May 2018 B2Gold Standard, which referenced the former January 2011 version of the Code.
Std 2 – Cyanide Management – Section 2.2.4 – Handling and Storage	Section 2.2.4	**Amendment –** The content within Section 2.2.10 Unloading, Storage and Mixing Facilities was incorporated into Section 2.2.4 Handling and Storage.
Std 2 – Cyanide Management – Section 2.2.7 - Cyanide Transport	Section 2.2.7	**Addition** – Cyanide transport requirement from Section 2.1 - Mining Standard of Practice.
Std 2 – Cyanide Management – Section 2.2.9 - Emergency Response (new section)	Section 2.2.9	**Addition** – New section on cyanide emergency response.
Std 2 – Cyanide Management – Section 2.2.10 - Training and Communication (new section)	Section 2.2.10	**Addition** – New section on cyanide training and communication.
Std 3 – Tailings Management – All relevant sections	Relevant sections	**Additions and Amendments** – Throughout this Standard, inclusion of key requirements, improved alignment and cross-referencing with the

Section Reference	New Section Reference	Description of the March 2024 Addition or Amendment
		B2Gold Tailings Management Procedure (March 2021), inclusive of key requirements specified by the Mining Association of Canada (MAC).
Std 3 – Tailings Management – Section 3.2.2 - Integrated Knowledge Base	Section 3.2.2	**Addition** – ICMM – Section 2 - Integrated Knowledge Base within the Global Industry Standard on Tailings Management (August 2020).
Std 3 – Tailings Management – Section 3.2.3 - Risk Assessment	Section 3.2.3	**Addition** – Mining Association of Canada - Section 4.1 – Risk Management within the Guide to the Management of Tailings Facilities Version 3.2 (March 2021).
Std 3 – Tailings Management – Section 3.2.3 - Risk Assessment and Hazard Classification	Section 3.2.3	**Addition** – Requirement for the completion of a dam break analysis and use of Trigger Action Response Plans (TARPs) for TSFs.
Std 3 – Tailings Management – Section 3.2.3 - Risk Assessment and Hazard Classification	Section 3.2.3	**Addition** – Inclusion of Hazard Classification requirements defined in Section 8.2.3 - Design Criteria of the 2021 B2Gold Tailings Management Procedure.
Std 3 – Tailings Management – Section 3.2.5 - Communications	Section 3.2.5	**Addition** – Mining Association of Canada - Section 4.11 – Communication within the Guide to the Management of Tailings Facilities Version 3.2 (March 2021).
Std 3 – Tailings Management – Section 3.2.6 - Management and Governance	Section 3.2.6	**Addition** – Mining Association of Canada - Principle 9 - Appoint and empower an Engineer of Record, within the Guide to the Management of Tailings Facilities Version 3.2 (March 2021).
Std 3 – Tailings Management – Section 3.2.7 - Design and Construction	Section 3.2.7	**Addition** – ICMM – Principle 4 - Develop plans and design criteria for the tailings facility, within the Global Industry Standard on Tailings Management (August 2020).
Std 3 – Tailings Management – Section 3.2.8 Resources	Section 3.2.8	**Addition** – Mining Association of Canada – Section 4.9 – Resources, within the Guide to the Management of Tailings Facilities Version 3.2 (March 2021).
Std 3 – Tailings Management – 3.2.9 Operation of TSFs	Section 3.2.9	**Amendment** - The minimum factor of safety of 1.4 was amended to 1.5 for static. A minimum factor of safety of 1.1 was included for post peak (post-liquefaction) conditions.
Std 3 – Tailings Management – 3.2.9 Operation of TSFs	Section 3.2.9	**Addition** – To prevent the uncontrolled release of tailings supernatant and to withstand the surface run-off from the Inflow Design Flood (IDF). The Annual Exceedance Probability (AEP) of the IDF is function of the dam classification as summarized in Table 8.2 of the 2021 B2Gold Tailings Management Procedure.
Std 3 – Tailings Management – Section 3.2.10 - Tailings Operations, Maintenance and Surveillance Manual	Section 3.2.10	**Additions and Amendments -** Inclusion of Tailings Operations, Maintenance and Surveillance Manual requirements defined in Section 9.2 – OMS Manual of the 2021 B2Gold Tailings Management Procedure.
Std 3 – Tailings Management – Section 3.2.17 - Emergency Prevention, Preparedness, Response and Recovery	Section 3.2.17	**Addition** – ICMM – Principles 13 and 14 - Prepare for emergency response and prepare for long term recovery, within the Global Industry Standard on Tailings Management (August 2020).
Std 3 – Tailings Management – Section 3.2.18 – Inspection and Audit and 3.2.19 - Dam Safety Review	Section 3.2.18 and 3.2.19	**Addition** – Addition of relevant sections relating to Section 3.2.18 – Inspection and Audit and 3.2.19 - Dam Safety Review of the 2021 B2Gold Tailings Management Procedure.
Std 4 – Waste Rock Management – Relevant sections	Relevant sections	**Addition** – Throughout this Standard, inclusion of key requirements of the B2Gold Waste Rock Dump Construction Guidelines for Stable and Non-Polluting Landforms (June 2021).
Std 5 – Non-process Waste Management	Relevant sections	**Amendments** – For most of this Standard, minor wording and grammatical changes only.
Std 5 – Non-process Waste Management - 5.2.4 - Incinerator Use	Section 5.2.4	**Addition** – New section on incinerator use.

Section Reference	New Section Reference	Description of the March 2024 Addition or Amendment
Std 5 – Non-process Waste Management - 5.2.6 - Overseas Shipment of Hazardous Waste	Section 5.2.7	**Addition** – New section relating to the overseas shipment of hazardous waste and the Basel Convention.
Std 6 – Water Management – 6.2.1 – Regulatory Requirements	Section 6.2.1	**Addition** – Inclusion of RGMP Principle 10.1 – Water Efficiency.
Std 6 – Water Management – 6.2.2 - Water Management Strategy	Section 6.2.2	**Addition** – Inclusion of specific B2Gold Global Water Strategy requirements.
Std 6 – Water Management – 6.2.3 - Water Management Plan and Water Balance	Section 6.2.3	**Addition** – Inclusion of specific B2Gold Global Water Strategy requirements.
Std 6 – Water Management – 6.2.7 - Stormwater and Erosion and Sediment Control Structures	Section 6.2.7	**Addition** – Inclusion of RGMP Principle 10.2 - Water access and quality.
Std 7 – Air Quality Management – 7.2.1	NA	Minor wording and grammatical changes only.
Std 8 – Mine Closure Planning - Relevant sections	Title	**Amendment –** Amendment of the title of the Standard from “Closure and Reclamation Planning” to “Mine Closure Planning”.
Std 8 – Mine Closure Planning - Relevant sections	Relevant sections	**Addition –** Throughout this Standard, inclusion of key requirements of the ISO 21795-1:2021 Standard - Mine closure and reclamation planning – Part 1. ***Note -*** *B2Gold sites shall be aware that the changes to Standard 8 were significant and too numerous to list within this table.*
Std 8 – Mine Closure Planning - Introduction	Introduction	**Addition** – Inclusion of RGMP Principle 9 – Biodiversity, land use and mine closure, Section 9.4 – Mine Closure.
Std 8 – Mine Closure Planning - Section 8.2.12 - Mine Closure Plan Review and Update	Section 8.2.12	**Addition** – Inclusion of relevant requirements of the ISO 21795-1:2021 Standard - Mine closure and reclamation planning - Part 1.
Std 8 – Mine Closure Planning - 8.2.15 - Long-term post-closure and reclamation	Section 8.2.15	**Addition** – Inclusion of relevant requirements of the ISO 21795-1:2021 Standard - Mine closure and reclamation planning - Part 1.
Std 9 – Progressive Reclamation	Title	**Amendment –** Amendment of the title of the Standard from “Topsoil and Reclamation Management” to “Progressive Reclamation”.
Std 9 – Progressive Reclamation	Relevant sections	**Addition** – Inclusion of relevant requirements of the ISO 21795-1:2021 Standard - Mine closure and reclamation planning - Part 1.
Std 9 - Progressive Reclamation - 9.2.2 Management of Topsoil and Subsoils	Section 9.2.2	**Amendment –** Requirements previously applicable to soil management (Sections 9.2.2 to 9.2.6) were collated into Section 9.2.2 Management of Topsoil and Subsoils
Std 9 - Progressive Reclamation - 9.2.4 Progressive Reclamation Plan	Section 9.2.4	**Addition –** Minimum requirements to be included within site Reclamation Plans are defined in Section 9.2.4 - Progressive Reclamation Plan.
Std 9 - Progressive Reclamation - 9.2.6 - Progressive Reclamation	Section 9.2.6	**Addition –** The requirement that reclamation shall be conducted as soon as practicable on land that is no longer needed for current or future operational requirements, in conformance with the site Reclamation Plan.
Std 9 - Progressive Reclamation - 9.2.6 - Progressive Reclamation	Section 9.2.6	**Addition –** The requirement for progressive reclamation to be budgeted, scheduled and conducted on an “annual” basis is defined in Section 9.2.6 - Progressive Reclamation.
Std 10 – Noise and Vibration Management – Relevant Sections	Relevant sections	Minor wording and grammatical changes only. **Addition** – Inclusion of RGMP Principle 8.5 - Noise and dust and related concepts.
Std 11 – Biodiversity Management - Introduction	Relevant sections	**Additions and Amendments** – Major additions and amendments relating to a) Priority Biodiversity Values (PBVs); b) required changes to

Section Reference	New Section Reference	Description of the March 2024 Addition or Amendment
		the content of Biodiversity Management Plans; c) required changes to Biodiversity mitigation measures (controls); d) ***Note -*** *B2Gold sites shall be aware that the changes to Standard 11 were significant and too numerous to list within this table.*
Std 11 – Biodiversity Management - Introduction	Relevant sections	Minor wording and grammatical changes only. **Addition** – Inclusion of RGMP Principle 9.1 – Biodiversity.
Std 11 – Biodiversity Management – Section 11.2.7 - Pest, Weed and Invasive Alien Species Management	Section 11.2.7	**Addition** – Inclusion of additional requirements applicable to translocation of wildlife.
11.2.8 Biodiversity Compensation of Critical Habitat	Section 11.2.8	**Addition** – Addition of a new Section 11.2.8 - Biodiversity Compensation of Critical Habitat.
Std 12 – Climate Change and Energy Management	New 2024 Standard	**New Standard** - New 2024 B2Gold Environmental and Biodiversity Performance Standard. Incorporates the key requirements applicable to: • 2019 RGMP – Principle 10.3 - Combating climate change and Principle 10.4 – Energy efficiency and reporting • Task Force on Climate-related Financial Disclosures (TCFD) (2017) • B2Gold Climate Strategy Report (February 2022).

CONTENTS

INTRODUCTION

PURPOSE

The purpose of these 2024 B2Gold Environmental and Biodiversity Performance Standards is to provide all B2Gold operating sites with a clear understanding of the Company's expectations in relation to the minimum standards to be met, to consistently and effectively manage the key risks associated with the environment and effects on biodiversity across the locations within which B2Gold operates.

These Environmental and Biodiversity Performance Standards provide the framework to assist B2Gold sites to:

- achieve a high level of operational control for the management of common environmental and biodiversity risks across the organization
- improve consistency in environmental and biodiversity management across all sites
- identify, assess, control and reduce environmental and biodiversity risks and impacts
- reduce the probability of significant environmental incidents occurring
- improve the environmental performance of all sites
- retain company and operational knowledge
- increase compliance to relevant environmental regulatory requirements and other obligations
- assist all sites to demonstrate duty of care and due diligence processes.

These Environmental and Biodiversity Performance Standards are supported by other B2Gold Corporate Health, Safety, and Environmental (HSE) Policies and Standards, which together form the basis for B2Gold's HSE Management System (HSE MS); the key elements of which are shown in Figure 1.

SCOPE

The requirements outlined within these Environmental and Biodiversity Performance Standards apply to the following B2Gold sites:

- Masbate (Philippines)
- Fekola (Mali)
- Otjikoto (Namibia)

The requirements outlined within this document apply to all of the following (i.e., these are included in the scope of these Environmental and Biodiversity Performance Standards):

- operating sites
- satellite mines
- near mine exploration that reports to an operating mine or satellite mine (i.e., exploration that reports to a B2Gold site that falls within the scope of these Standards).

The requirements outlined within this document do not apply to the following and these are excluded from the scope of these Environmental and Biodiversity Performance Standards':

- exploration that does not report to a B2Gold site that falls under the scope of these Standards (i.e., typically regional exploration)
- sites undergoing decommissioning and closure
- legacy sites
- construction sites
- sites under care and maintenance;
- Joint Venture sites (non-management roles)
- relinquished sites
- non-active sites
- B2Gold Vancouver Corporate office, except where explicitly stated.

APPLICATION

These 2024 B2Gold Environmental and Biodiversity Performance Standards shall be used and implemented by all B2Gold sites as defined within the scope of this document outlined on the previous page.

The key content, application and requirements of these Environmental and Biodiversity Performance Standards shall be communicated to any newly employed line manager (supervisor and above) through a formal induction so that all requirements are clearly understood and acknowledged.

By formally implementing the requirements specified in these Environmental and Biodiversity Performance Standards, B2Gold aims to improve the performance of its operating sites and quality of receiving environments (air, water, noise, soil), inclusive of reducing the potential for environmental incidents.

B2Gold shall ensure that environmental responsibility is at the core of how it works. This will include implementing and maintaining systems to monitor and manage impacts on the environment. At a site level, B2Gold shall avoid, minimize, mitigate or compensate for significant adverse impacts on the environment relating to its activities.

2024 REVISION AND UPDATE

Since the issue of the 2018 B2Gold Environmental and Biodiversity Performance Standards, B2Gold has become a signatory to the World Gold Council - Responsible Gold Mining Principles. Numerous additional external obligations now apply to the organisation, inclusive of relevant International Council on Mining and Metals (ICMM) and Mining Association of Canada requirements.

As a result, the 2024 revision and update to the B2Gold Environmental and Biodiversity Performance Standards included key content and requirements applicable to the following:

1. World Gold Council - Responsible Gold Mining Principles (2019)
2. B2Gold Environmental Strategic Plan (2023 to 2025)
3. B2Gold Water Risk Assessment and Water Risk Statement (2022)
4. B2Gold Water Accounting Framework (WAF)
5. ICMM Water Reporting Good Practice Guide (2021)
6. B2Gold Strategy for Managing Climate Risk (2022)
7. Mining Association of Canada (MAC) Guide to the Management of Tailings Facilities (2021)
8. Mining Association of Canada (MAC) – Additional Environment Protocols/Frameworks
9. ICMM Global Industry Standard on Tailings Management (2020)
10. B2Gold Waste Rock Management Guideline (2021)
11. B2Gold Tailings Management Procedure (2021)
12. International Cyanide Management Institute - International Cyanide Management Code (2021)
13. ISO21795:2021 Mine Closure and Reclamation Planning Standard (2021)
14. ISO14001:2015 Environmental Management Systems (as required)

HEALTH, SAFETY & ENVIRONMENTAL MANAGEMENT SYSTEM STRUCTURE

B2Gold utilizes a hierarchical system for its overall HSE MS structure, where each component shall meet the requirements of those in the higher levels in order to achieve a robust and sustainable management system.

As shown in Figure 1 below, these Environmental and Biodiversity Performance Standards are a fundamental component of B2Gold's HSE MS structure, which encompass B2Gold's Policies, Corporate HSE MS and HSE Performance Standards, relevant site procedures and supporting documentation.

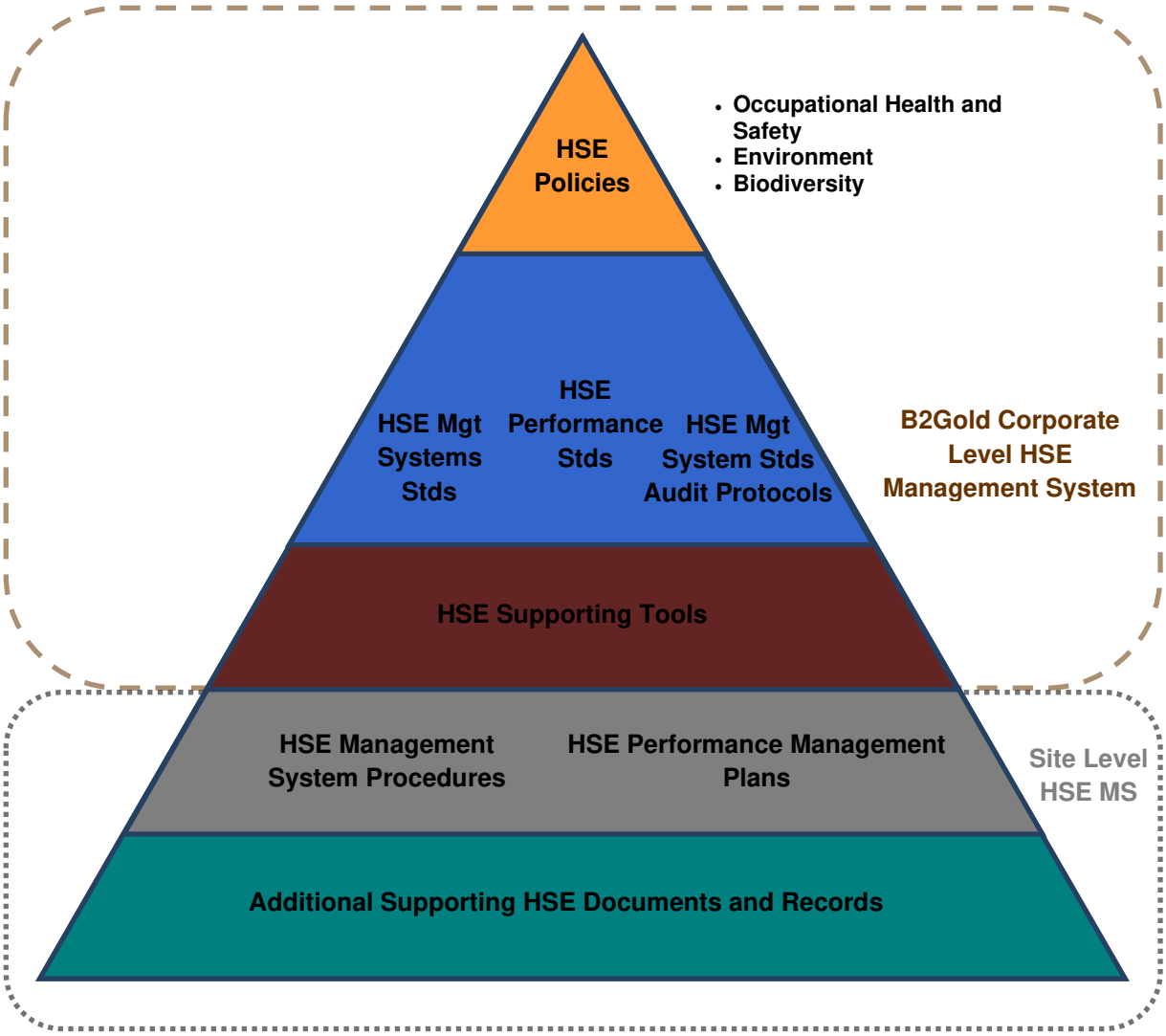


Figure 1: B2Gold's 2024 Corporate and Site HSE Management System Structure

The following describes the hierarchy and individual components of the B2Gold Corporate and B2Gold Site HSE MS (as defined in Figure 1):

B2Gold Corporate

1) B2Gold Corporate Policies (Occupational Health and Safety [OHS], Environment and Biodiversity, Social)

- The B2Gold Corporate Policies direct and restrict the plans, decisions, and actions of B2Gold as they relate to the achievement of its objectives for Health, Safety, Environmental and Social.

2) B2Gold Corporate HSE Management System Standards

- The B2Gold Corporate HSE MS Standards define to B2Gold sites "what" HSE systems and processes are required to be implemented and maintained.

3) B2Gold Corporate OHS Performance Standards

- The B2Gold Corporate OHS Performance Standards define the minimum operating and performance requirements for OHS for each B2Gold site. These OHS Performance Standards shall be used to reduce OHS risks across sites.

4) B2Gold Corporate Environmental and Biodiversity Performance Standards (these Standards)

- The B2Gold Corporate Environmental and Biodiversity Performance Standards define the minimum operating and performance requirements for environment and biodiversity for each B2Gold site. These Environmental and Biodiversity Performance Standards shall be used to reduce environmental risks and impacts across sites.

5) B2Gold Supporting HSE Tools

- A wide range of HSE templates, forms, checklists, guidelines, procedures, HSE management system software etc, exist to enable sites to implement the requirements defined within the B2Gold HSE MS and Performance Standards in a structured and consistent manner.

B2Gold Sites

6) Site HSE Management System Procedures

- Describes "how" the Management System functions at a B2Gold site.

7) Site HSE Performance Management Plans

- Describes "how" the individual OHS and Environmental and Biodiversity Performance Standards function and are implemented at a site level, inclusive of operational controls.

8) Site Additional Supporting HSE Documents and Records

- A wide range of HSE procedures, forms, etc. are utilized to enable sites to implement and/or record the processes and outputs of their HSE management system. Examples include site Emergency Response Plans, inspection checklists, site HSE monitoring schedules, permit to work forms, etc.

External

9) Audit Processes

- At two-yearly intervals, B2Gold commissions independent external auditors to audit each site against the Standards defined in 2), 3), 4) and 5) above. Audit reports are issued, non-conformances and agreed observations are required to be addressed and closed-out in a timely manner.
- In addition to the above, audits are commissioned to, and completed by, technical specialists against requirements specified in the above B2Gold HSE Performance Standards.

TERMS & DEFINITIONS

Relevant key terms and definitions that relate to B2Gold's 2024 Environmental and Biodiversity Performance Standards are provided below:

"Acid Rock Drainage"

Drainage of acidic water from facilities that contain acid generating material (e.g., open pits or waste rock disposal facilities). It is caused by the oxidation of sulfide minerals in rock following their exposure to oxygen. Water that percolates through or comes in contact with these minerals becomes acidic and may mobilize metals.

"As Low As Reasonably Practicable (ALARP)"

ALARP requires that all reasonable measures be taken with respect to "tolerable" or acceptable risks to reduce them even further until the cost and other impacts of additional risk reduction are grossly disproportionate to the benefit.

"Baseline Conditions"

The existing environmental conditions, i.e., the physical, chemical, or biological setting, of a proposed project area prior to disturbance by project-related development.

"Berm"

Containment structure that could be made out of earth, concrete, plastic, or other material. Also known as "bund".

"Closure"

The process followed when a site has reached the stage in its life cycle where the intended mining use has been permanently concluded. This generally includes decommissioning activities, reclamation and revegetation of disturbed areas for long-term physical and chemical stabilisation of the site. This typically includes incorporating stakeholder consultation regarding post-mining use.

"Closure Success Criteria"

An agreed standard or level of performance which demonstrates successful closure of a mine site. Specific milestones that indicate progress towards achievement of mine closure objectives, as agreed with stakeholders.

"Critical controls"

A control that is critical to preventing a potential undesirable event or mitigating the consequences of such an event. The absence or failure of a critical control would disproportionately increase the risk despite the existence of the other controls.

"Decommissioning"

The process that begins near or at the cessation of mineral processing and ends with the removal of all unwanted infrastructure and services.

"Energy efficiency"

Using less energy to achieve the same or a greater level of production output.

Energy performance

Using the minimum amount of energy necessary to meet business objectives.

"Environmental Impact"

Any change to the environment whether adverse or beneficial, wholly or partially resulting from a site's activities.

"Hazard"

Any substance, human activity, condition or other agent that may cause harm, loss of life, injury, health impacts, loss of integrity of natural or built structures, property damage, loss of livelihoods or services, social and economic disruption, or environmental damage.

"Hazardous Waste"

Any waste containing significant quantities of a substance that may present danger to human health and the environment when released into the environment or is improperly managed. Possesses at least one of five characteristics (ignitable, corrosive, reactive, toxic, radioactive), or is listed in-country as a hazardous waste.

"Leachate"

Water that has percolated through a solid material (e.g., tailings, ore, waste rock, landfill) and leached out some of the constituents of that solid material.

"Leak Detection Recovery System"

Fluid pumping system located between two liners (with at least one of the liners being a geosynthetic liner) that collects and pumps out detected fluid.

"Monitoring"

The gathering, analysis (especially for trends) and interpretation of information for the assessment of performance.

Examples of monitoring includes: air, soil and water quality, flora and fauna, reclamation, social aspects including complaints, operational dust, noise, vibration, property damage. Monitoring may be continuous, short-term or long term and may be undertaken manually or be automated.

"Non-Hazardous Waste"

Wastes that do not have any of the following characteristics: ignitability, corrosivity, reactivity, or toxicity, and are not listed in-country on hazardous waste lists.

"Point Source"

A stationary location or fixed facility from which contaminants are or may be discharged (e.g., a pipe, stack, ditch, well, or ore pit).

"Process Pond"

Ponds utilized to hold/contain process solution on a regular basis. These do not include contingency ponds (e.g., stormwater ponds).

"Quantitative Performance Objectives (QPOs)"

In relation to tailings management, QPOs provide critical controls consistent with design intent, criteria, and regulatory requirements. Sites shall establish tailing storage facilities (TSF) specific QPOs that provide a high level of assurance in preventing high consequence events.

"Reclamation"

The process of restoring the mine site to a natural or economically useable state as provided in a reclamation plan. Reclamation results in productive and sustainable landscapes to meet a range of conditions that might allow for biodiversity conservation, recreational or agriculture uses, or various forms of economic development.

"Trigger Action Response Plan (TARP)"

A TARP is a tool to manage risk controls, including critical controls. TARPs provide pre-defined trigger levels for performance criteria that are based on the risk controls and critical controls of the tailings facility. The trigger levels are developed based on the performance objectives and risk management plan for the tailings facility. TARPs describe actions to be taken if trigger levels are exceeded (performance is outside the normal range), to prevent a loss of control. A range of actions is pre-defined, based on the magnitude of the exceedance of the trigger level.

Environmental and Biodiversity Performance Standards



1st March 2024

Final Version

Standard
1

HAZARDOUS MATERIALS AND DANGEROUS GOODS MANAGEMENT

1.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard 1 - Hazardous Materials and Dangerous Goods Management is to define the requirements to ensure that employee and public risk associated with hazardous materials and dangerous goods is managed and reduced to the lowest practical level; to minimize the occurrences of spills, releases, leaks and uncontrolled overflows of hazardous materials or dangerous goods, and to ensure that potential or actual adverse environmental impacts of hazardous materials and dangerous goods are avoided or minimized.

This Standard applies to all B2Gold sites and addresses the requirements of hazardous materials and dangerous goods during their purchase, selection, introduction, transportation, transfer, distribution, storage, use, collection and disposal, as well as the training associated with hazardous materials and dangerous goods.

This Standard does not include requirements associated with the management of cyanide. These are defined in the B2Gold Environmental and Biodiversity Standard 2 – Cyanide Management.

1.2 CRITERIA AND REQUIREMENTS

1.2.1 Regulatory Compliance

Each site shall manage hazardous materials and dangerous goods in compliance with all relevant in-country regulatory requirements, licenses and any other applicable requirements.

1.2.2 Material Safety Data Sheets

Each site shall compile and maintain an up-to-date register of hazardous materials and dangerous goods on the site. The register shall include the types, quantities, location of these products and current Safety Data Sheets (SDS).

The classification of hazardous materials and dangerous goods shall be based on up-to-date SDS information and shall form the basis for site storage, usage and disposal practices, determination of suitable personal protective equipment (PPE), etc.

SDSs for hazardous materials and dangerous goods listed on the register shall be current (i.e., < 5 years), in the language of the host country as well as English, and readily available to personnel in each area where each product is stored and used.

1.2.3 Selection and Purchase

The selection and use of hazardous materials and dangerous goods used at each site shall be formally assessed and approved for purchase by both the site's OHS and Environmental Departments.

Prior to the purchase of new bulk hazardous materials or dangerous goods, a technical review and risk assessment shall be completed (using a dedicated form/template), including consideration of any relevant emergency response requirements.

1.2.4 Bulk Storage and Transfer

In locations where the bulk storage or handling of hazardous materials or dangerous goods is a "notifiable activity", the responsible manager shall notify the appropriate regulatory authority.

All bulk storage tanks and transfer systems/ distribution piping containing hazardous materials and dangerous goods shall be designed and constructed above ground (i.e., not buried).

If it is necessary to install underground piping (e.g., road crossings), there shall be either a passive system to detect leaks (e.g., leak detection system), the installation of a pipe within a pipe, and/or active mechanisms such as visual inspections, periodic integrity testing, etc. for the detection of potential leaks.

Incompatible classes of bulk hazardous materials and dangerous goods (e.g., acid and cyanide) shall be stored in separate containment areas with appropriate signage.

Hazardous materials and dangerous goods storage facilities (tanks, pipes, packaging, etc) shall have signage, color coding and labelling in accordance with the applicable SDS. Relevant systems to monitor inventories, detect leaks and recover product shall be available and utilized (e.g., visual inspections, active leak detection systems/alarms, periodic integrity testing, etc.).

1.2.5 Secondary Containment

All bulk hazardous materials and dangerous goods storage and transfer installations, including temporary facilities, shall have secondary containment that is capable of safely retaining the maximum credible release and that can contain a minimum of 110% of the volume of the largest tank in the containment area.

Secondary containment shall be free of stored rainfall, spillage and/or other materials (including sediment) to maintain containment capacity. Secondary containment for bulk storage tanks shall have a typical water permeability equivalent to untreated concrete.

Bulk hazardous materials and dangerous goods tanks shall be equipped with engineered overfill/overpressure protection devices.

Hazardous materials and dangerous goods use, transfer, distribution, and storage facilities shall have measures/systems to control rainfall and stormwater, including suitable drainage within and around containment areas.

The areas around fuel delivery pumps and vehicle refueling points shall provide containment against spills and releases utilizing suitable collection systems and sumps.

Any activity that requires the use of workshops or service areas shall have suitable collection facilities for waste hydrocarbons. Treatment facilities for hydrocarbon-contaminated water shall be utilized and maintained, and meet applicable in-country discharge standards.

Sites and contractors involved in the use, storage, transportation and delivery of hazardous materials and dangerous goods shall use regulatory compliant labelling and placarding on all new, used and waste product containers and tanks.

Clean roof-top water shall be diverted away from facilities used to store bulk hazardous materials and dangerous goods.

1.2.6 Hazardous Materials Transporters

Transporters of hazardous materials and dangerous goods to and from sites shall meet all relevant regulatory requirements. Sites shall specify and include contract conditions for suppliers and contractors involved in hazardous materials and dangerous goods transportation and use which require compliance to regulatory requirements, relevant Codes of Practice and this B2Gold Environmental and Biodiversity Performance Standard.

Specific contract conditions requiring the responsible management of hazardous materials and dangerous goods, including emergency response and spill clean-up, shall be incorporated into all applicable supply and transport contracts.

Sites and their suppliers shall only utilize hazardous materials and dangerous goods transporters and waste and/or recycling contractors that are licensed by the appropriate regulatory authorities. Sites shall periodically verify and document supplier and hazardous waste contractor licensing, disposal methods and locations.

Suppliers and contractors involved with the supply and transportation of bulk hazardous materials and dangerous goods to site shall complete a documented risk assessment in conjunction with a representative of B2Gold. This shall assess risks to public safety, incorporate a route evaluation and selection, be reviewed and approved by the site OHS and Environmental Managers prior to establishing transportation routes, awarding contracts and commencing freight activities.

Suppliers and contractors involved with the transportation and delivery of bulk hazardous materials and dangerous goods shall utilize suitable transportation vehicles and storage tanks which are maintained in an acceptable condition for proper handling and transportation.

Bulk hazardous material and dangerous goods transport equipment and vehicles shall be regularly inspected and maintained. Records shall be available.

Transport service providers shall demonstrate the competencies required to transport hazardous materials and dangerous goods based on regulatory and B2Gold requirements.

1.2.7 On-site Bulk Transfer

Bulk transfers of hazardous materials and dangerous goods shall be assessed and observed by B2Gold personnel or individuals trained in hazard analysis. B2Gold personnel shall participate in documented observations of bulk hazardous materials and dangerous goods transfers by suppliers to verify correct processes are followed.

1.2.8 Procedures

Procedures for hazardous materials and dangerous goods transportation, unloading, transfer, storage, handling, use and disposal shall be developed, document controlled, kept current, effectively implemented and relevant personnel trained. Periodic audits shall be scheduled and completed on higher risk procedures.

1.2.9 Emergency Preparedness and Response

Where applicable, information related to on-site hazardous materials and dangerous goods shall be provided to local emergency services and any relevant interested parties.

Where available and beneficial, mutual aid agreements shall be established between sites and local emergency service providers.

Relevant site personnel shall report any spills or releases during transport, unloading and storage to the regulatory authorities as required.

1.2.10 Environmental Protection

Suitable hydrocarbon/water treatment facilities shall be available, utilized and included on regular maintenance schedules to ensure they are routinely cleaned and maintained in accordance with design and manufacturer's requirements.

Hazardous materials and dangerous goods releases that occur on site, regardless of size or volume, shall be promptly cleaned up, properly disposed of, and reported utilizing the site action management database.

Fugitive dust from the transfer and storage of bulk dry chemicals (e.g., sodium hydroxide, lime, etc.) shall be controlled.

1.2.11 Mercury

Sites shall not use mercury to extract gold in their processing facilities, nor accept gold produced by third parties using mercury.

Where applicable, sites shall support government initiatives to reduce and eliminate the use of mercury by artisanal and small-scale miners (ASM).

1.2.12 Soil Remediation and Contaminated Sites

Sites shall maintain a formal register which documents the location, scale, characteristics, environmental risks and any regulatory requirements associated with contaminated sites.

Soils heavily contaminated with hydrocarbons shall be characterized, excavated and remediated. Alternatively, these contaminated soils may be disposed of within on-site engineered facilities that are supported by scientifically defensible studies that demonstrate that planned treatment and disposal practices comply with regulatory requirements and shall not have an adverse impact on human health and/or the environment.

Contaminated soils that cannot be excavated shall be remediated in-situ utilizing scientifically sound methods.

1.2.13 Training

Sites shall provide relevant employees and contractors with the appropriate training to manage exposure to workplace hazardous materials and dangerous goods, comply with regulatory requirements and apply proper use and maintenance of PPE.

Hazardous materials and dangerous goods training and communication processes shall be relevant and specific to site risks. Content shall align with the requirements defined within this Standard.

1.2.14 Audits and Inspections

Sites shall conduct or retain qualified third-party auditors to conduct safety and environmental audits of supplier hazardous materials and dangerous goods transportation every five years, or more frequently where significant risk exists.

Areas of bulk hazardous materials and dangerous goods storage, distribution, transfer and use, including on-site contractor facilities, shall be routinely inspected to verify that bulk storage, use, management and disposal practices conform to this Standard. Records of inspections shall be retained for a minimum of 12 months.

Treatment facilities used for hydrocarbon-contaminated water shall be routinely inspected and records of inspections retained.

1.2.15 Monitoring

If treated effluent is directly or indirectly discharged to the receiving environment, sites shall conduct routine testing of effluent from hydrocarbon-water treatment facilities. Sites that treat hydrocarbon contaminated water shall comply with in-country regulatory requirements and any internal risk-based discharge criteria.

Sites shall develop, implement, and document processes to routinely verify that the off-site disposal of solid and liquid hazardous waste and/or recycling of these products meets regulatory requirements and is protective of human health and the environment.

1.3 REFERENCE MATERIAL

World Gold Council - Responsible Gold Mining Principles - Principle 3.3 - Market access for ASM (September 2019)

World Gold Council - Responsible Gold Mining Principles - Principle 8.4 – Mercury (September 2019)

Standard
2

CYANIDE MANAGEMENT

2.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard 2 - Cyanide Management is to define the requirements to ensure that the on-site storage, handling and use of cyanide are protective of human health and the environment.

This Standard applies to the purchase, transportation, handling, mixing, storage and the operation of on-site cyanide mixing and storage facilities.

This Standard is largely derived from the relevant requirements of the June 2021 version of the International Cyanide Management (*ICMC*) Code (the Cyanide Code) and includes controls to manage cyanide at sites. This Standard should also be used in conjunction with the B2Gold Environmental and Biodiversity Performance Standard 3 - Tailings Management.

This Standard is applicable to all B2Gold sites that use cyanide. References to the Cyanide Code within this Standard are provided to assist sites to increasingly comply with requirements specified in the Cyanide Code.

2.2 CRITERIA AND REQUIREMENTS

2.2.1 Regulatory Compliance

Sites shall manage cyanide in compliance with all relevant in-country regulatory requirements, licenses and any other applicable requirements.

2.2.2 Cyanide Management Code

Even though B2Gold is not a signatory to the Code, as far as practicable, sites shall aim to conform with the applicable requirements and Standards of Practice listed under each principle and clause of the 2021 Cyanide Code.

2.2.3 Cyanide Risk Management

B2Gold sites shall identify and manage potential risks relating to the transportation, handling, storage and disposal of cyanide conform with the standards of practice defined in the Cyanide Code.

2.2.4 Handling and Storage

Sites shall design and construct unloading, storage and mixing facilities consistent with sound, accepted engineering practices; and quality control and quality assurance procedures, spill prevention and spill containment measures (*ICMC – Clause 3.1*).

Sites shall operate unloading, storage and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures (*ICMC - Clause 3.2*).

Utilizing a formal water management program, sites shall manage process solutions to avoid any unintentional releases of cyanide (*ICMC – Clause 4.3*).

2.2.5 Secondary Containment

Sites shall provide and maintain spill prevention or containment measures for process tanks and pipelines (*ICMC - Clause 4.7*).

Bulk cyanide containers, process solution tanks and pipelines shall include secondary containment that is graded to enable any potential releases to drain into a sump. Secondary containment shall have a typical water permeability equivalent to untreated concrete. The containment area shall have the capacity of at least 110% of the capacity of the largest mixing and/or storage tank.

On-site storage areas for solid cyanide shall prevent any contact of solid cyanide product with water or other chemicals. The area surrounding the bulk cyanide storage area shall be suitably sloped and drained to prevent any ingress, drainage and accumulation of stormwater within the storage area.

Piping/vessels containing liquid cyanide shall display the correct international color-coding and labelling, and have adequate secondary containment or deflection systems to avoid releases.

2.2.6 Cyanide Use

Sites shall operate their process plants to minimize cyanide use as much as practical, thereby limiting concentrations of cyanide in mill tailings and process solution ponds (*ICMC – Clause 4.2*).

2.2.7 Environmental Protection

Sites shall implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures (*ICMC – Clause 4.1*).

To achieve this, site storage and use of cyanide shall incorporate measures to:

- protect against unintentional releases, in accordance with the site water management (*ICMC – Clause 4.3*)
- protect birds, other wildlife and livestock from any adverse effects of cyanide process solutions (*ICMC – Clause 4.4*)
- protect fish and wildlife from direct and indirect discharges of cyanide process solutions to surface water (*ICMC – Clause 4.5*)
- prevent/manage seepage that contains cyanide to protect the beneficial use of groundwater resources (*ICMC – Clause 4.6*).

2.2.8 Cyanide Supplier Contracts

Cyanide shall only be purchased from certified manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment (*ICMC – Clause 1.1*).

Within contracts with cyanide suppliers, distributors and transporters, sites shall define clear lines of responsibility for safety, security, release prevention, training, emergency response, releases/spills clean up, compensation and liabilities of potential cyanide releases (*ICMC – Clause 2.1*).

2.2.9 Cyanide Transport

Sites shall make sure that supply contracts ensure that cyanide is safely managed through the entire transportation and delivery process, from the production facility to the mine. Certified transport shall be used with clear lines of responsibility for safety, security, release prevention, training and emergency response (*ICMC – Clause 2.1*).

Prior to commencing transportation activities, to protect communities and the environment, cyanide transport routes shall be risk assessed and selected in a manner that minimizes the potential for accidents and releases (*ICMC Transport Clause 1.1)*.

Sites shall ensure that contracted transportation personnel operate with minimum risk, inclusive of completing appropriate cyanide/hazardous materials training (*ICMC Transport Clause 1.2)*.

Sites shall verify and ensure that:

- transport vehicles and equipment are suitable for the transportation of cyanide *(ICMC Transport Clause 1.3)*
- a safety program for the transportation of cyanide is developed and implemented (*ICMC Transport Clause 1.4*)
- international standards for the transportation of cyanide by sea are followed *(ICMC Transport Clause 1.5)*

- they track cyanide shipments to prevent losses during transport *(ICMC Transport Clause 1.6)*
- cyanide transporters remain licensed by the appropriate regulatory authorities.

Sites shall verify that cyanide transporters have readily available (i.e. contract specific) emergency response strategies, plans and capabilities for potential cyanide releases, which are current and of an acceptable standard *(ICMC Transport Clause 1.3).* Cyanide suppliers and transporters shall periodically evaluate response procedures and capabilities and revise them as needed *(ICMC Transport Clause 3.5).*

Sites shall ensure that cyanide supply contracts include internal and external emergency notification and reporting (*ICMC Transport Clause 3.3)* and the responsibility for clean-up and remediation (*ICMC Transport Clause 3.4*).

During interim storage, suppliers shall utilize secure cyanide interim storage sites to prevent accidental releases and exposures. (*ICMC Transport Clause 2.1)*.

2.2.10 Emergency Responses

To protect communities and the environment, site emergency response strategies and capabilities shall:

- prepare detailed emergency response plans for potential cyanide releases, inclusive of considering local communities and external stakeholders
- designate appropriate personnel and commit necessary equipment and resources for emergency responses
- develop procedures for internal and external emergency notification and reporting
- periodically evaluate response procedures and capabilities and revise as needed.

2.2.11 – Training and Communication

Sites shall train employees and site emergency response personnel to understand the hazards and manage cyanide in a safe and environmentally protective manner (*ICMC – Clause 8.1*).

Sites shall train relevant employees with cyanide responsibilities, to operate on-site facilities according to site systems and procedures, and correctly respond to exposures and environmental releases of cyanide (*ICMC – Clauses 8.1, 8.2 and 8.3*).

As applicable and necessary, sites shall engage in public consultation and disclosure, and promote dialogue with stakeholders regarding cyanide management. Sites shall responsibly address identified concerns (*ICMC – Clause 9.1*).

Sites shall make appropriate operational and environmental information regarding cyanide available to local communities and relevant stakeholders (*ICMC – Clause 9.2*).

2.2.12 Inspection and Audit

Sites shall ensure that on-site process controls relating to cyanide storage and mixing facilities are periodically inspected to ensure their physical integrity and prevent accidental releases. Records of completed inspections shall be retained.

2.2.13 Monitoring

Sites shall implement and maintain monitoring programs to proactively monitor and detect any adverse effects to stock, wildlife, surface water and groundwater quality due to the storage and use of cyanide (*ICMC – Clause 4.9*).

Monitoring programs shall ensure that concentrations of Weak Acid Dissociable (WAD) cyanide within tailings dams does not exceed 50 ppm.

2.3 REFERENCE MATERIAL

International Cyanide Management Code for the Gold Mining Industry, International Cyanide Management Institute (www.cyanidecode.org) (June 2021)

World Gold Council - Responsible Gold Mining Principles – Principle 8.3 - Cyanide and hazardous materials (September 2019)

Standard
3

TAILINGS MANAGEMENT

3.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard - Tailings Management is to define the requirements for the diligent design of tailings storage facilities (TSF), characterization of tailings, protection of groundwater and surface water, and the prevention of embankment failure and uncontrolled releases to the environment.

B2Gold shall design, construct, manage and decommission TSFs and large-scale water infrastructure utilizing accepted industry practices.

Detailed requirements and criteria applicable to this Standard are defined in B2Gold Tailings Management Procedure (March 2021).

3.2 CRITERIA AND REQUIREMENTS

3.2.1 Regulatory Compliance

Sites shall operate and manage tailings storage facilities in compliance with all relevant in-country regulatory requirements, licenses, and any other applicable requirements.

Riverine or shallow submarine tailings shall not be utilized for the development of any new mine sites.

3.2.2 Integrated Knowledge Base

Sites shall develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the TSF lifecycle, including closure. Records and documents required to be retained are defined in Section 6 of the 2021 B2Gold Tailings Management Procedure.

All elements of the knowledge base, inclusive of social, environmental, economic and technical, shall be utilized to inform decisions throughout the TSF lifecycle, including closure.

3.2.3 Risk Assessment and Hazard Classification

Potential TSF risks, including the physical and chemical; as well as operational, organizational, financial and management risks, shall be identified and assessed.

Risk assessments shall be completed as frequently as required to meet the tailings management objectives established for any given tailings facility. These shall be completed in accordance with Section 9.1 of the 2021 B2Gold Tailings Management Procedure.

In addition to risk assessments, each B2Gold tailings dam shall be assessed and provided with a hazard classification in accordance with CDA design criteria by the Engineer of Record.

TSFs shall be designed, constructed, operated and closed in a manner that effectively manages risks to achieve the objective of minimizing harm. As the risk profile of the TSF changes over time, sites shall review and update relevant control measures.

Critical controls relating to the TSF shall be identified and implemented to prevent or mitigate a high-consequence event for all plausible failure modes. Performance indicators and actions for these controls shall be defined, inclusive of actions if performance is outside of the specified range (i.e. via the use of Trigger Action Response Plans [TARPs]).

Quantitative Performance Objectives (QPOs), performance standards and indicators shall be developed for the entire life cycle of the tailings facility, as defined in Sections 7 and 8 of the 2021 B2Gold Tailings Management Procedure. The Tailings Management Protocol (MAC, 2019) shall be used to evaluate tailings management performance on an annual basis.

A dam break analysis, inclusive of defining project affected persons (PAP), shall be completed and remain current. It shall include defining the inundation area in the event of embankment failure, the maximum extent of flooding, flood depths, and time to maximum depth.

3.2.4 Baseline Conditions

Area baseline conditions shall be determined prior to locating and designing a new tailings TSF. Baseline assessments shall utilize high quality technical studies that address relevant geographic and temporal variations. These shall include, at a minimum, groundwater and surface water hydrology; meteorological, flora, fauna, cultural heritage, geology, seismicity and soils.

Prior to TSF construction or expansion, any historical or recent exploratory drill holes located within a planned TSF footprint shall be correctly abandoned and plugged and records retained.

3.2.5 Communications

B2Gold sites shall respect the rights of local communities and meaningfully engage them at all phases of the TSF lifecycle, including closure.

B2Gold sites shall publicly disclose and provide access to information about their TSFs to support public accountability.

3.2.6 Management and Governance

To support the safety and integrity of their TSFs, B2Gold sites shall demonstrate effective use of existing site management systems to diligently manage their TSFs. This is inclusive of change management processes, action management systems, procedures, inspections and audits, records management etc.

B2Gold sites shall appoint and empower an Engineer of Record.

From a quality and risk management perspective, B2Gold sites shall implement formal review processes for all phases of the TSF lifecycle, including closure.

In relation to TSF management, B2Gold sites shall maintain an organizational culture that promotes learning, communication and early problem recognition.

3.2.7 Design and Construction

B2Gold sites shall develop plans and design criteria for their TSFs to minimize risk for all phases of its lifecycle. This shall include robust designs that integrates the knowledge base and minimizes the risk of failure.

Design and operation of TSFs shall mitigate long-term risks and reducing liability, inclusive of preventing a high-consequence event from occurring, or to mitigate the consequences of such an event.

Planning and designing for final reclamation and closure shall be initiated at the project conception and planning phase of the life cycle of each TSF.

Sites shall implement a quality assurance plan and quality control plan to ensure that TSF construction or expansion is in accordance with design specifications.

3.2.8 Resources

Responsibilities for tailings management are defined in Section 4 of the 2021 B2Gold Tailings Management Procedure.

Adequate staff resources shall be assigned to site TSFs to ensure that these facilities are being managed, utilized and maintained to a high standard.

Sites shall establish and make available annual budgets to facilitate effective tailings management, considering both the short-term and long-term requirements of these facilities.

3.2.9 Operation of TSFs

TSFs shall be designed, constructed and operated:

- to manage risk at all phases of the TSF lifecycle
- with solution recovery systems for newly designed and constructed TSFs (e.g., under-drains, pump-back wells, etc.) to prevent any adverse impacts to groundwater and surface water resources
- to be geotechnically stable
  - a minimum factor of safety of 1.5 for static, 1.0 for pseudo-static conditions, and 1.1 for post peak (post-liquefaction) conditions is required
  - relevant engineering standards shall be applied for construction in high seismic areas where the pseudo static factor conditions may require more complex and accurate analysis (i.e., advanced numerical modelling)
- utilizing existing change management processes as and when required
- to be protective of avian and terrestrial wildlife
- in a manner that ensures that the loss of fugitive dust from dried tailings is minimized
- to prevent the uncontrolled release of tailings supernatant and to withstand the surface run-off from the Inflow Design Flood (IDF) for newly designed and constructed TSFs. The Annual Exceedance Probability (AEP) of the IDF is a function of the dam classification as summarized in Table 8.2 of the 2021 B2Gold Tailings Management Procedure.

3.2.10 Tailings Operations, Maintenance and Surveillance Manual

A Tailings Operations, Maintenance and Surveillance (OMS) Manual shall be utilized by each site to meet performance objectives and to manage short and long-term risks. The OMS manual shall include tailings related TARPs and content defined in Section 9.2 of the 2021 B2Gold Tailings Management Procedure.

The manual shall be periodically reviewed and updated annually to ensure that it remains up-to-date and reflect the required operating practices of the facility on a day-to-day basis. Conformance with operational requirements defined in the manual shall be demonstrated by each site.

3.2.11 Tailings Dam Construction and Embankment Lifts

QA/QC monitoring and records retention is required for the construction of all TSFs.

Final 'as-built' documentation for initial construction and all embankment lifts, with associated QA/QC reports approved by an appropriate third party (as selected and approved by B2Gold), shall be diligently retained at the site over the life of the project until lease relinquishment is achieved.

3.2.12 Leak Detection and Surface and Groundwater Contamination

TSFs shall be designed, constructed and operated to prevent contamination of groundwater and surface water. The design process shall assess a range of clay and synthetic liner options that predict seepage rates, seepage water quality and any resulting impact on the beneficial use of groundwater and surface water.

Seepage recovery systems shall be incorporated into the design/construction/operation of the TSF.

TSF engineering designs and construction shall include the installation and use of piezometers to measure the solution head build up in the TSF embankment and the tailings. Underdrainage collection ponds shall have a suitable impervious liner and a Leak Collection and Recovery System (LCRS).

3.2.13 Tailings Characterization

Tailings shall be physically and geochemically characterized throughout the life of the TSF, using reliable acid-base accounting methodologies. Data shall be utilized during the TSF design, operation, closure and reclamation.

3.2.14 Secondary Containment

All process plant storage tanks and transfer systems that contain tailings shall have suitable secondary containment. Secondary containment for tanks shall have a typical water permeability at least equivalent to untreated concrete. Secondary containment shall be sized to contain and convey process solution or slurry from storage tanks, thickener and/or any pipeline leak or failure.

Runoff generated outside a TSF shall be diverted away from the facility as much as practical. Temporary stormwater structures shall be designed based on the level of risk associated with failure. Permanent

stormwater structures shall, at a minimum, be designed, operated and closed to convey and withstand a 100-year, 24-hour storm event.

3.2.15 Process Water and Supernatant Management

Sites shall utilize and maintain a Process Water Management Plan that addresses the management of process water during operations in accordance with B2Gold Environmental and Biodiversity Performance Standard 6 – Water Management.

During operations, TSF supernatant pond size shall be minimized and be located away from the TSF walls to prevent seepage. Where a liner system exists, the footprint of the supernatant pond shall remain within the boundary of the liner to prevent a direct hydraulic pathway to groundwater.

TSFs shall be operated to maintain minimum freeboard requirements as specified by design, any regulatory requirements and/or the site-wide water balance. Piezometric head in the embankment shall be maintained within design specifications.

Disposal of any waste other than tailings in the TSF requires the waste to be non-hazardous, compatible for disposal and compliant with any regulatory requirements. It shall not compromise closure and reclamation success.

3.2.16 Training and Competence

Relevant B2Gold employees with responsibilities relating to the TSF shall be competent based on qualifications, education and/or experience. This is inclusive of any relevant contractors, consultants and suppliers.

B2Gold sites shall ensure that appropriate training has been received by employees involved with the TSF and records of training retained.

3.2.17 Emergency Prevention, Preparedness, Response and Recovery

B2Gold sites shall prevent and prepare for any emergency event relating to their TSF, inclusive of formally assessing and preparing for long-term recovery in the unlikely event of catastrophic failure. Relevant content required to be included in emergency plans shall be in accordance with Section 9.6 of the 2021 B2Gold Tailings Management Procedure.

Emergency preparedness and response shall be augmented with crisis management and communications planning.

3.2.18 Inspection and Audit

As defined in Section 10 of the 2021 B2Gold Tailings Management Procedure, a program of inspections and audits of the TSF shall be implemented and maintained to verify the performance of the TSF, and to identify any deficiencies and opportunities for improvement. Internal inspections and audits shall be completed by competent personnel and records retained.

Daily TSF inspections shall be conducted by a competent individual, to demonstrate that the TSF is being operated in accordance with OMS Manual requirements.

TSFs shall be inspected annually (i.e. as a Dam Safety Inspection) by a qualified engineer/Engineer of Record (selected and approved by B2Gold). These inspections shall verify geotechnical stability, operational practices and confirm that the design intent and site-specific performance objectives are being met.

3.2.19 Dam Safety Review

A Dam Safety Review (DSR) shall be conducted by a competent, independent geotechnical engineer who is not the Engineer of Record. The DSR and associated report shall be completed in accordance with requirements specified in Section 10.3 - Dam Safety Review of the 2021 B2Gold Tailings Management Procedure.

Recommendations from annual inspections and DSR reports shall be formally actioned utilizing a site action management process and records retained.

3.2.20 Monitoring

Sites shall design, implement and operate monitoring systems to manage risk at all phases of the TSF lifecycle.

Sites shall design, implement and operate a comprehensive and integrated engineering monitoring system that is appropriate for verifying design assumptions and for monitoring potential failure modes. This shall include the structural monitoring of TSFs to detect any movement or change.

Tailings embankment piezometers shall be measured on a routine basis and data graphed, reviewed and compared to design specifications, and any adverse data reported to site management.

Groundwater monitoring wells shall be installed up-gradient of a TSF to establish control/background conditions, and down-gradient to monitor for any uncontained seepage.

During operations, sites shall develop and implement a detailed monitoring plan for TSFs (including monitoring groundwater wells, under-drains, LCRS and discharges to the environment). Monitoring shall continue until release from liability is granted by the appropriate regulatory agency.

Sites shall record, retain and evaluate monitoring data at appropriate frequencies, but annually as a minimum. Based on the data obtained, monitoring programs shall be updated to confirm that they remain effective in managing risk.

When applicable, reclamation completion criteria shall be monitored to validate closure and reclamation techniques and to support lease relinquishment.

3.3 REFERENCE MATERIAL

ICMM Global Industry Standard on Tailings Management (August 2020)

B2Gold Tailings Management Procedure (19th March 2021)

The Mining Association of Canada - A Guide to the Management of Tailings Facilities (Ver. 3.2) March 2021

World Gold Council - Responsible Gold Mining Principles – Principle 8.2 – Tailings and waste management (September 2019)

Canadian Dam Association (CDA), Application of Dam Safety Guidelines to Mining Dams (2019)

Mining Association of Canada (MAC), A Guide to the Management of Tailings Facilities (2019)

Mining Association of Canada (MAC), Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities. Second Edition (February 2019)

Mining Association of Canada (MAC), Towards Sustainable Mining, Tailings Management Protocol, (February 2019)

Standard
4

WASTE ROCK MANAGEMENT

4.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard – Waste Rock Management is to define the requirements for the management of waste rock (i.e., mineral waste); to prevent any adverse environmental impact, any costly re-handling of mineral wastes, to promote beneficial post-mining land uses, and to reduce post-mining reclamation and closure liabilities.

This Standard incorporates waste rock disposal facilities and other infrastructure utilizing waste rock for construction (e.g., haul roads, dams etc.), as well as ore stockpiles (e.g., relating to their potential to generate acid drainage), site quarries and borrow material from excavations.

This Standard addresses relevant geotechnical, geochemical, hydrogeological, landform design, reclamation, social/community and regulatory requirements associated with waste rock disposal facilities.

Detailed requirements and criteria applicable to this Standard are defined in B2Gold Waste Rock Dump Construction Guidelines for Stable and Non-Polluting Landforms (June 2021).

4.2 CRITERIA AND REQUIREMENTS

4.2.1 Regulatory Compliance

Waste rock disposal facilities shall be designed, constructed, reclaimed and closed in compliance with all relevant in-country regulatory requirements, license/permit conditions and any other applicable requirements. This is inclusive of regulatory requirements applicable to feasibility, planning, design, construction, operation, closure and post-closure.

4.2.2 Determination of Acid Rock Drainage Potential

Waste rock shall be physically and geochemically characterized prior to the design of each waste rock dump, during operations and, where applicable, during reclamation and closure phases.

Geochemical testing programs required at a) the conceptual/scoping, feasibility and detailed design; b) during operations; and c) during closure, are defined in the relevant sections of the 2021 B2Gold Waste Rock Dump Construction Guidelines.

Where acid rock drainage (ARD) risks exist, sites shall characterize and estimate the long-term geochemical and physical behavior of waste rock dumps. ARD potential shall be determined using reliable and proven acid-base accounting methodologies, inclusive of the potential leaching of harmful contaminants at near-neutral to alkaline pH.

4.2.3 Baseline Conditions

Area baseline conditions shall be determined prior to the location and design of a new or significant extension to a waste rock dump. Baseline conditions shall be determined through technical studies that address geographic and temporal variations. For new or significant extensions to existing waste rock facilities, these studies shall include at a minimum: groundwater and surface water hydrology, meteorological, flora, fauna, cultural heritage, geology, seismicity and soils.

4.2.4 Waste Rock Management Plan and Control

Sites with known net-acid generating ore and waste rock shall develop, implement, communicate, adhere to and maintain a Waste Rock Dump Management Plan that defines all site-specific strategies, operational controls and management practices that are utilized to manage this risk. The plan shall align with the site Water Management Plan, the site Mine Closure Plan and the site Annual Reclamation Plan (as defined in these Standards) to ensure that potential and actual adverse impacts are known and minimized.

As and when applicable, sites shall formally consider relevant waste rock and impacted drainage risks during the use of site management of change processes. Sites shall also consider and document waste rock and impacted drainage risks during the technical and financial evaluation of relevant capital projects.

4.2.5 Waste Rock Dump Design

Waste rock disposal facilities shall be designed, constructed and operated to:

- incorporate control measures to minimize the generation of ARD
- prevent the release of contaminants to the receiving environment; including surface runoff, toe seepage and infiltration to groundwater
- be geotechnically stable
    - Waste rock and ore stockpile geotechnical stability and design shall achieve a minimum factor of safety during operations of 1.3 static and 1.0 seismic loading or other risk-based design using site specific data.
    - These facilities shall be closed to maintain a minimum factor of safety of 1.5 static.
- ensure that waste rock design and ongoing disposal practices allow for periodic review (at least biennially) by a qualified engineer
- control surface water ingress and run-off during construction, operation, reclamation and closure/post-closure, to ensure slope stability and minimize the generation of low-quality seepage, erosion and sedimentation.

During the design phase, a balance of potentially acid generating and non-acid generating material shall be developed to evaluate and design controls to isolate any potential acid generating material in the short- and long-term, through effective mine planning and formal scheduling of the placement of waste rock. The balance shall also assess and incorporate the adequacy of available material (e.g., topsoil and capping material) for long-term reclamation/closure.

Designs for waste rock disposal facilities with the potential to generate low quality runoff shall include the installation and use of retention basins that are sufficiently sized to contain the runoff from waste rock disposal facilities resulting from a 100-year, 24-hour storm event, or greater, depending upon the risk posed by any potential contaminant release from the facility.

Permanent surface water diversion structures around the perimeter of waste rock disposal facilities shall be sized at a minimum to convey flow from a 100-year, 24-hour storm event. For sites located up-gradient of sensitive regions (e.g., habitations, high-value ecosystems, etc.), additional capacity or protection shall be considered based on the risk associated with failure of these structures.

4.2.6 Use of Waste Rock for Construction

Potentially acid generating material shall not be used for construction purposes outside of mitigation measures (e.g., controlled water management system) for which potential adverse impacts can be reduced to acceptable levels, during both operations and at closure.

4.2.7 Waste Rock and Ore Tracking System

During mine planning, a scheduling system shall be utilized to ensure mining blocks are differentiated by ARD rock type.

Sites shall develop and implement a waste rock and ore tracking system; inclusive of an inventory comprising quantities, locations and representative characteristics of potentially acid generating material.

Where ARD risks exist, sites shall demonstrate that waste rock has been properly characterized and disposed of within designated locations of nominated waste rock disposal facilities. Records of waste rock material types disposed at designated waste rock disposal facilities shall be retained for Life-of-Mine (LOM) to support lease relinquishment.

4.2.8 Non-mineral Waste Disposal in Waste Rock Disposal Facilities

Disposal of any non-mineral solid or hazardous waste in the waste rock dump requires a scientifically defensible study to demonstrate that the waste is compatible (i.e., does not adversely affect human health or the environment), complies with regulations and permit conditions, and shall not compromise reclamation and closure success.

4.2.9 Progressive Reclamation and Closure

Refer to Section 5 in the B2Gold Waste Rock Dump Construction Guidelines for Stable and Non-Polluting Landforms (June 2021).

Stabilization and/or progressive reclamation activities shall be scheduled and completed as soon as practical after designated areas of the waste dump become available.

Waste rock dump design, construction and operation shall incorporate both trial and progressive reclamation.

Waste rock disposal facilities shall be constructed, reclaimed and closed to ensure geotechnical stability and geochemical stability, to minimize erosion and to leave landforms that are aesthetically acceptable to external stakeholders and can be used by wildlife.

During the reclamation and closure of waste rock disposal facilities, sites shall consider the physical and geochemical characteristics of the waste rock during the design of the cover system (i.e., to control infiltration through and seepage from the waste rock dump).

Cover design for waste rock disposal facilities containing acid forming materials, or materials that elevate contaminants, shall utilize suitable predictive models to evaluate suitable reclamation and closure design options (e.g., infiltration, store-and-release, vegetative cover, etc.).

Waste rock disposal facilities shall be closed in accordance with defined reclamation objectives and agreed closure criteria.

4.2.10 Inspection and Monitoring

ARD predictions based on static test results shall be confirmed as part of an ongoing monitoring program using kinetic tests.

Waste rock disposal facilities shall be monitored to verify they are being constructed in accordance with geotechnical design criteria. Waste rock disposal facilities shall be inspected quarterly (at a minimum) to detect any abnormal conditions such as subsidence, and to verify the integrity of existing controls. Records of these inspections shall be retained.

Waste rock disposal facilities shall be inspected following periods of heavy rainfall. Inspection processes shall document any observed surface ponding, slumping on slopes, discoloration, or seepage from the toe, inclusive of the determination of pH and EC. All drainage diversion and sediment control structures shall also be periodically inspected to verify they remain fully operational.

Where adverse surface ARD and/or elevated contaminants are actually or likely to be detected, groundwater monitoring bores shall be installed up-gradient to establish background conditions, and down-gradient to monitor for seepage from the waste rock dump or any other source of ARD. These monitoring bores shall be periodically monitored in accordance with a formal schedule.

Progressive reclamation of waste rock dumps shall be monitored to validate agreed reclamation and closure completion criteria, in accordance with requirements defined in the B2Gold Standard 9 – Topsoil and Reclamation Management.

4.3 REFERENCE MATERIAL

B2Gold Waste Rock Dump Construction Guidelines for Stable and Non-Polluting Landforms (June 2021)

World Gold Council - Responsible Gold Mining Principles – Principle 8 – Environmental Stewardship (September 2019)

World Gold Council - Responsible Gold Mining Principles – Principle 9 – Biodiversity, land use and mine closure (September 2019)

Standard
5

NON-PROCESS WASTE MANAGEMENT

5.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard – Non-Process Waste Management is to define requirements for the management of hazardous wastes, non-hazardous wastes and wastewater generated at sites, to ensure that human health and the environment are protected.

This Standard incorporates the generation, segregation, collection, storage, transportation, disposal and/or recycling of hazardous wastes and non-hazardous wastes.

A solid or liquid waste is considered hazardous if it is ignitable, corrosive, reactive, toxic, radioactive and/or is listed in-country as a hazardous (or regulated) waste.

5.2 CRITERIA AND REQUIREMENTS

5.2.1 Regulatory Compliance

All generated hazardous and non-hazardous waste shall be segregated, collected, stored, transported, disposed and/or recycled in compliance with all relevant in-country regulatory requirements, license conditions and any other applicable requirements.

Regulatory permits shall be secured for all burning of waste within on-site incinerators.

5.2.2 Waste Management Plan

Sites shall develop, implement, communicate, adhere to and maintain a formal Waste Management Plan that defines all on-site and relevant off-site strategies, operational controls and management practices relating to the management of site waste.

The Waste Management Plan shall be periodically reviewed to reflect required site operating practices. It shall define the key waste management objectives, risks and the operational controls implemented by the site to protect both human health and the environment.

Potential waste streams and their sources shall also be identified, during operations and incorporated into the Waste Management Plan and the design of on-site waste disposal facilities.

Sites shall maintain formal processes to identify, classify and manage new and evaluate existing waste streams whenever new or significant changes to site processes, facilities or operational practices occur.

5.2.3 On-site Storage and Disposal of Hazardous Waste

If suitable off-site disposal facilities for hazardous wastes are not available or are not protective of human health and the environment, on-site disposal options shall be considered where these are legally authorized.

On-site engineered hazardous waste disposal facilities shall be supported by scientifically defensible studies that can demonstrate compliance with all relevant in-country laws and permits. Sites shall prove that no measurable adverse impacts on human health and the receiving environment will occur during or after the cessation of operations.

Secondary containment shall be designed and constructed from materials compatible with the wastes to be stored and shall be capable of containing all liquid hazardous wastes stored in a facility.

Sites shall implement and maintain processes to prevent the incorrect disposal of hazardous wastes; inclusive of sewage sludge, grey water, sewage screenings and sludge; medical waste, waste hydrocarbon products, hydrocarbon or chemical contaminated soil and dead fauna.

5.2.4 Incinerator Use

Sites that are required to burn wastes on-site shall utilize a dedicated incinerator that can operate at temperatures suitable for the waste types being burnt and as recommended by the manufacturer.

When incinerator use is permitted, site personnel shall monitor actual burning practices and emissions. On-site incinerators shall not emit visible black smoke for extended periods (>30 minutes). Remedial actions shall be taken when this occurs.

Medical waste shall not be disposed of or buried within any on-site landfill. It shall either be disposed of off-site within approved facilities or burned on-site within an incinerator at the nominated temperature.

Records of the type and quantity of wastes burnt within on-site incinerators shall be recorded and retained.

5.2.5 Landfill Management

The burning of waste within on-site landfills (i.e. to reduce bulk) is not authorised and shall not occur.

All on-site landfills shall be designed, constructed and operated to:

- ensure geotechnical stability of trenches, disposal pits and slopes
- prevent any adverse impacts to the environment/wildlife
- minimize the generation of leachate, to prevent adverse impacts to ground and surface water quality.

The potential for contaminated leachate generation and any adverse impacts shall be evaluated and appropriately managed. Discharges from landfills shall meet any applicable standards.

On-site landfills shall be suitably fenced or bermed. They shall display suitable signage at the entrance defining contact information, wastes authorized to be received, and wastes banned.

Hazardous wastes shall not be disposed within an on-site landfill unless approved in writing from regulatory agencies and the repository has been designed and constructed to be protective of human health and the environment for such waste. It shall only be authorized if no other viable alternative, such as off-site treatment/disposal, recycling or reprocessing exists.

Wastes disposed of within on-site landfills shall be routinely covered to prevent wind-blown litter, odors, and to limit access by native fauna and pest species.

Dust and/or significant odors from on-site landfills shall be controlled to eliminate complaints.

5.2.6 On-site Segregation and Storage of Wastes

Sites shall establish suitable processes for the segregation of non-hazardous and hazardous wastes across the site. These waste streams shall not be blended.

Suitable bulk bins/receptacles shall be made available and utilized across the site for the collection of hazardous wastes.

A suitable temporary storage area shall be utilized until hazardous waste is removed off-site. Where applicable, these temporary storage areas shall include suitable fencing, signage, roofing, lighting, a means of communication in case of emergency, lightning protection and secondary containment for all liquid products.

Awareness training shall be provided to all operational personnel to facilitate correct waste segregation and temporary storage practices.

5.2.7 Overseas Shipment of Hazardous Waste

Sites shall verify and ensure that the removal and shipment of hazardous waste from the site does not contravene requirements defined in the Basel Convention, which regulates the transboundary movements of hazardous wastes between countries.

All hazardous waste from the site that is removed by third-party waste contractors shall be managed and disposed of in a legally compliant and environmentally sound manner.

5.2.8 Inspections of Off-site Treatment and Disposal Facilities

Prior to their selection and use, off-site treatment and disposal facilities shall be inspected to verify that the facilities are engineered and responsibly operated by the service provider(s) to be protective of human health and the environment. Periodic follow-up inspections of these treatment and disposal facilities shall be scheduled and completed on at least two-yearly intervals.

5.2.9 Records Management

Sites shall retain records for the storage, transportation and disposal (off-site and on-site) of all waste streams. Records shall include the locations of on-site disposal of non-hazardous waste, removal of hazardous waste, inclusive of the types and quantities of hazardous wastes, relevant audit and inspection records and any hazardous waste tracking certificates.

5.2.10 Monitoring, Inspections and Audits

Periodic on-site waste segregation, temporary waste storage facilities and landfill inspections shall be scheduled and completed, to verify that on-site wastes are being correctly segregated, stored and disposed of, and in compliance with relevant regulatory requirements.

Sites shall schedule and conduct at least annual environmental audits of hazardous waste segregation, on-site storage, off-site shipment and disposal practices. Corrective actions shall be tracked utilising a formal action management system.

5.3 REFERENCE MATERIAL

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1992)

Standard 6

WATER MANAGEMENT

6.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard - Water Management is to define the requirements for effectively managing water at sites; including process water, stormwater, off-site discharges, wastewater, effluent and mine dewatering activities, to ensure no loss of beneficial use, and that human health and the environment are protected.

Additional water management requirements related to mining infrastructure are included in B2Gold Environmental and Biodiversity Performance Standard 3 – Tailings Management and Standard 5 – Non-process Waste Management.

This Standard does not address the management of wastewater from sites that are connected to public sewage networks and/or when sewage treatment facilities are not managed or operated by B2Gold.

6.2 CRITERIA AND REQUIREMENTS

6.2.1 Regulatory Compliance

Sites shall manage water discharges, water extraction, stormwater, wastewater, effluent and mine dewatering; in compliance with all relevant in-country regulatory requirements, licenses and any other applicable requirements.

If in-country regulatory discharge criteria do not exist or are incomplete; appropriate site-specific, risk-based discharge criteria shall be determined from baseline conditions, potential pathways of contaminants applicable to environmental receptors, known adverse impacts, and input from relevant specialists. These criteria shall be periodically reviewed and updated as required.

In addition to addressing compliance requirements, sites shall improve their efficiency in the use of water, recognizing that the impacts of water constraints may increasingly become a threat to the local region. Sites that operate in water-stressed areas shall take proportionate and practicable steps to improve the efficiency of water use and seek to reduce the sites' water footprint and increase recycling.

6.2.2 Water Management Strategy and Action Plans

Water management strategies and practices adopted by sites shall formally incorporate B2Gold's five Water Strategy Pillars (based on the ICMM Framework's 'strategic imperatives'), including; a) Watershed Approach; b) Impact Mitigation; c) Operational Performance; d) External Engagement; and e) Internal Collaboration.

Site risk registers shall identify and incorporate current and future water-related risks to help document, plan, and track water management strategies and improve water management performance.

Sites shall also develop and implement site-specific Water Action Plans to understand and mitigate key water risks to meet the objectives of B2Gold's Global Water Strategy.

6.2.3 Water Management Plan and Water Balance

Sites shall develop, implement, communicate, adhere to and maintain a site-specific water management plan that defines all applicable strategies, operational controls and management practices relating to on-site water management.

Applicable water quality objectives and internal performance criteria shall be established for water discharges, utilizing relevant in-country standards.

The site water distribution network (inclusive of process and non-process water) shall be documented and periodically reviewed.

To effectively manage water resources and to standardize water use reporting and water management across sites, a site-specific water balance shall be developed, maintained, operated and updated in conjunction with the site Water Management Plan and relevant LOM plans. Site-wide water balances shall incorporate the Water Accounting Frameworks (WAF) that are aligned with the ICMM water reporting guidance and disclosure standard.

Sites shall consider and document any relevant water related risks and impacts during the site management of change process. These shall also be considered during the technical and financial evaluation of relevant capital projects.

6.2.4 Baseline Conditions

Baseline surface water, groundwater hydrology (including identification of site water users and uses), groundwater quality and geochemical characterization of waste rock shall be conducted for any new site or project expansion to establish pre-operational baseline conditions.

Appropriate risk assessment and risk control planning shall be incorporated into any new project design or expansion, to ensure that actual and potential water related risks and impacts are identified, communicated and controlled.

Potential risks and adverse impacts to surface water and groundwater shall be quantified during new project designs and project extensions, inclusive of cumulative demands. Identified actual and potential impacts shall be mitigated.

6.2.5 Water Extraction

Sites shall comply with all regulatory requirements and conditions, inclusive of extraction volumes, specified in site water licenses. Water extraction regimes shall not result in significant adverse environmental or local community impacts.

Sites shall improve and optimize their water extraction and distribution networks to maximize efficiencies, inclusive of maintenance and operational schedules.

6.2.6 Tailings and Process Facilities

Tailings and on-site processing facilities shall be designed, constructed, managed and operated in a manner that precludes releases to the receiving environment. Where engineering design constraints and climatic conditions require process water discharges from any tailings and/or process facilities to occur, discharge water quality shall meet applicable criteria defined within regulatory and B2Gold Standards.

Storage facilities used to impound process or contaminated water shall be suitably lined depending on the characteristics of the water to be contained. If impounded water contains contaminants that could impact groundwater (i.e., cyanide, acid water, metals, etc.) these facilities shall have a suitable LRCS.

6.2.7 Stormwater and Erosion and Sediment Control Structures

Erosion and sediment control facilities shall be designed and installed prior to major ground disturbance. These shall be utilized and maintained during construction, operations and the post-closure monitoring phase to manage stormwater, minimize erosion, and treat surface water from disturbed areas and areas undergoing reclamation.

Temporary stormwater structures shall be designed based on the level of risk associated with failure. Permanent stormwater structures shall, at a minimum, be designed, operated and closed to convey and withstand the 100-year, 24-hour storm event. For any impoundments or conveyance structures up-gradient of sensitive regions (e.g., high-value habitat/ecosystems, etc.), additional capacity or protection shall be considered based on the risk associated with failure.

Sites shall manage their operations to ensure that they do not adversely affect the overall quality of catchment water resources available to other users.

6.2.8 Wastewater

Domestic wastewater shall be treated using sewage treatment plants (STPs) or septic systems that shall produce effluent quality that meets in-country regulatory requirements and B2Gold Standards.

STPs shall be designed and constructed with sufficient capacity for current and foreseeable future volumes requiring treatment (i.e., during shutdowns).

Only domestic wastewater shall be connected to on-site sewage systems (i.e., no trade, workshop, process or industrial wastewater).

Solid screenings and sludge from STPs shall be managed in accordance with any in-country regulatory requirements and in a manner that is protective of human health.

On-site septic systems shall be designed, constructed, operated and maintained in accordance with an applicable industry code or engineering standard. Adequate absorption capacity by the receiving environment shall be demonstrated for any planned or existing discharges prior to locating and installing relevant septic facilities.

6.2.9 Monitoring

To enable an accurate water balance to be maintained, calibrated instrumentation and suitable measures shall be utilized for metering and/or determining site water extraction, use and discharge.

The quantity and quality of sewage treatment plant (STP) effluent shall be monitored in accordance with relevant license or permit conditions. The data shall be used to maintain and optimize STP performance.

Where required, groundwater shall be monitored down gradient of septic infiltration trenches, landfill sites, process dams, waste rock disposal facilities, tailings dams or other potential sources of contamination. This monitoring shall be conducted in accordance with relevant regulatory requirements, license or permit conditions and any other applicable requirements.

Sites shall develop and implement suitable monitoring and inspection/audit programs to verify that site water management systems and processes remain fully functional and are achieving the targeted performance.

Sites shall develop and implement suitable marine, groundwater and surface water quality and quantity monitoring programs that evaluate local water resources, point source and non-point source discharges and any receiving waters potentially impacted by off-site discharges.

Water monitoring shall be conducted by trained and competent personnel.

External laboratories used for water quality analyses shall be accredited by a third-party to perform the required analysis.

6.2.10 Data Analysis, Management and Retention

Sites shall determine water quality and usage/consumption trends at relevant monitoring locations. The site action management system shall be utilized to address any potential or actual identified variances or detected adverse impacts.

Monitoring data shall be periodically reviewed (at least annually) inclusive of trend analysis, and any concerns communicated to site management.

The site water/environmental monitoring database shall be maintained and retained until final lease relinquishment.

6.3 REFERENCE MATERIAL

B2Gold Global Water Strategy (January 2023)

B2Gold Water Risk Statement (February 2022)

ICMM Water Reporting – Good Practice Guide (2nd Ed.) (August 2021)

World Gold Council - Responsible Gold Mining Principles – Principle 10 – Water, energy and climate change (September 2019)

Standard 7

AIR QUALITY MANAGEMENT

7.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard - Air Quality Management is to define the requirements to manage point and non-point source (i.e., fugitive) air emissions and ambient air quality, to be protective of both human health and the environment.

This Standard does not include requirements associated with greenhouse gas or carbon emissions. These are discussed in B2Gold's Environmental and Biodiversity Performance Standard 12 – Climate Change and Energy Management.

Operational requirements relating to air quality applicable to human health are defined in the relevant B2Gold OHS Performance Standard(s).

7.2 CRITERIA AND REQUIREMENTS

7.2.1 Regulatory Compliance

Sites shall obtain all relevant approvals, licenses and permits relating to air emissions. Sites shall maintain compliance with all relevant in-country regulatory requirements, license conditions and any other applicable requirements.

During the operational phase, sites shall formally identify all major forms of point source and non-point source air and dust emissions.

Sites shall prevent exceedances of license limits and criteria under normal and reasonable worst-case operating conditions and adverse meteorological conditions.

As necessary, sites that emit point source air emissions shall utilize appropriate air pollution control equipment to comply with in-country regulatory requirements, defined regulatory standards and/or site license limits.

7.2.2 Air Quality Management Plan

Sites shall develop, implement, communicate, adhere to and maintain a suitable Air Quality Management Plan that defines all relevant strategies, operational controls and management practices relating to air and dust emissions.

Referencing relevant in-country standards and license/permit limits, air quality objectives and internal performance criteria shall be established for air emission sources and ambient air quality.

Sites shall consider and document relevant air quality risks and impacts during site change management processes. Sites shall assess any air quality risks and impacts during the technical and financial evaluation of relevant capital projects.

7.2.3 Baseline Conditions

To establish pre-operational conditions, relevant meteorological data and baseline ambient air quality conditions shall be characterized, monitored and recorded for any new site or major project expansion.

Appropriate risk assessment and risk control planning shall be incorporated into any new project design or major project expansion, to ensure that ambient air related risks and impacts are known and controlled during construction and operations.

Environmental impact assessments shall incorporate all relevant requirements associated with air emissions and ambient air quality.

7.2.4 Air Emission and Impact Determination

Point source and fugitive air and dust emissions shall be identified, characterized and controlled in accordance with the potential risk to personnel, the local community and/or the environment.

Periodic ambient and, where relevant, point source, air quality monitoring shall be used to determine if any potential hazardous air contaminants are being emitted from the site.

Air quality dispersion modelling shall be utilized where a potential significant risk of affecting human health or the environment exists. Where hazardous air contaminants are potentially emitted from a site and require control; suitable risk-based, cost-effective control technologies shall be utilized and maintained.

7.2.5 Monitoring

Where air emissions pose an actual or potential significant risk to human health (i.e., employees and/or the community) or the environment, sites shall quantify the contaminant emissions (i.e., concentrations and/or total loadings) using calibrated monitoring equipment, mass balancing and/or other approved methods.

Depending on the site location and risk profiles, sites shall utilize suitable monitoring and inspection programs to verify that point source air emission and ambient dust controls remain functional and effective, and air emissions do not have an adverse effect on human health or the environment, inclusive of any visual impacts.

Monitoring of particulate matter, sulfur oxide (SO_x), nitrogen oxide (NO_x) and heavy metals shall be conducted where relevant point source air emissions exist (e.g., on-site power station, laboratory and/or gold room stack emissions) and/or if a valid community complaint is received.

7.2.6 Calibration and Maintenance Schedule

Sites shall develop, implement and maintain calibration and maintenance schedules for both air emissions control and monitoring equipment. Records shall be retained.

7.2.7 Data Analysis and Management

Air emission and ambient air monitoring data shall be periodically reviewed, inclusive of trend analysis, and the results communicated to site management.

7.3 REFERENCE MATERIAL

World Gold Council - Responsible Gold Mining Principles – Principle 8.5 – Noise and dust (September 2019)

Standard 8

MINE CLOSURE PLANNING

8.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard - Mine Closure Planning is to define the requirements for closure and reclamation planning and the management of long-term legal and financial liabilities associated with mine closure.

Sites shall plan for the social and environmental aspects of mine closure in consultation with authorities, their workforce, affected communities and other relevant stakeholders. B2Gold shall make financial and technical provision to ensure planned closure and post-closure commitments are realized; including the reclamation of land, beneficial future land use, preservation of water sources and prevention of acid rock drainage.

This Standard does not include requirements associated with the social aspects of mine closure.

8.2 CRITERIA AND REQUIREMENTS

8.2.1 Regulatory Compliance

All approvals, licenses and permits relating to mine closure and reclamation shall be secured. Sites shall achieve and maintain compliance with all relevant regulatory requirements, license/permit conditions and any other applicable requirements.

8.2.2 Risk Assessment

Sites shall incorporate mine closure risks and opportunities into annual updates of the site risk register, as defined in the B2Gold Corporate Procedure for the Management of Occupational Health, Safety, Environment and Social Risk.

8.2.3 Mine Closure Plan Development

A preliminary Mine Closure Plan shall be developed during the design phase of all new sites and be updated and maintained throughout operations. Mine Closure Plans should be sufficiently detailed as the operation or components of the operation (Waste Rock Dumps/Tailings Storage Facilities/Pits etc.) near completion.

As a minimum, site Mine Closure Plans shall define the following:

- relevant regulatory/permit requirements, including any bond release/lease relinquishment requirements.
- risk assessments of mine closure aspects
- reclamation and closure objectives, and measurable completion criteria based on the agreed post-mining land use and other closure commitments
- mine closure and reclamation planning and design; which shall be resilient, respond to changes and risks in a dynamic environment and reduce the risk of catastrophic and/or chronic failure
- specification of technical requirements to demonstrate effective mine closure and reclamation planning
- the decommissioning and disposal of processing facilities, infrastructure and equipment
- a mine closure and reclamation schedule
- cost estimates for mine closure and reclamation
- post-closure land-use that complies with any relevant regulatory requirements or agreements with external stakeholders
- strategies for community engagement and to mitigate the socio-economic impacts of mine closure

- an assessment of alternative closure scenarios
- relevant contingency plans for unplanned suspension, cessation or closure of the site.
- a post-closure operations, maintenance, monitoring, and reporting plan. The post-closure phase shall provide for adaptive management, and for ongoing environmental protection until completion criteria and post mining land-use requirements are met.

Site Mine Closure Plans shall incorporate the entire mine site; including open pits, mineral and non-mineral waste, surface and groundwater, infrastructure, contaminated media and socio-economic factors.

Mine closure and reclamation options that address the mine closure treatments, and which maximize opportunities, shall be identified and evaluated by sites, to select the preferred mine closure and reclamation option that on an overall basis best meets defined objectives.

As necessary during the life of the site, the site's Mine Closure Plan shall be distributed to relevant stakeholders to enable external views and requirements to be incorporated into relevant operational plans, to enable reclamation and closure objectives to be met.

8.2.4 Mine Closure Plan Review and Update

Mine Closure Plans shall be reviewed upon completion of the construction phase of a project. During operations, these plans shall be reviewed at three-yearly intervals. The Mine Closure Plan shall be reviewed annually when the project is within three years of the end of its life, and during the post-closure period. In addition, the Mine Closure Plan shall be reviewed and updated after any significant expansion/reduction or other major changes to the project (e.g., plant expansion, new tailings storage facility, pit closure etc.).

As and when required, sites shall allow for adjusting designs and construction methods that do not meet mine closure and reclamation objectives. Under these circumstances, new knowledge and techniques shall be determined and applied, including those that may arise from stakeholder consultation.

As and when required, sites shall schedule a) peer reviews of their Mine Closure Plans; and b) design reviews during various stages of operations/closure, and inspections of the integrity of final post-closure facilities and post mining landforms.

8.2.5 Reclamation and Closure Cost Estimates

When conducting closure cost calculations for the determination of closure cost estimates, sites shall follow relevant in-country regulations and agreed resource industry methodology.

Cost estimates shall be adequately supported by industry/contractor accepted estimates, quotes or actual costs from similar activities.

Reclamation and closure cost estimates shall include costs associated with achieving post-closure land use objectives/criteria and post-closure maintenance and monitoring activities, as defined in the Mine Closure Plan.

Reclamation and closure cost estimates shall be formally approved by the site General Manager (or equivalent position). Actual costs of progressive reclamation and closure activities shall be tracked against budget.

Sites shall provide the B2Gold corporate office with an annual Asset Retirement Obligation (ARO) to meet internal financial obligations.

Financial provisions shall be determined and made available as required in accordance with in-country regulatory requirements, for each stage of the life of the mine, including any required bond or provisions for unplanned closure and post-closure. Closure provisioning shall be defined and maintained within a site-specific financial plan.

8.2.6 Reclamation and Closure Records

Suitable database and records retention processes shall be utilized and maintained, to effectively retain closure data and associated records until lease relinquishment is achieved. These records shall be retained for at least ten years after final lease relinquishment.

8.3 REFERENCE MATERIAL

ISO 21795-1:2021 - Mine closure and reclamation planning - Part 1

World Gold Council - Responsible Gold Mining Principles – Section 9.4 – Mine closure (September 2019)

Standard 9

PROGRESSIVE RECLAMATION

9.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard - Progressive Reclamation is to define the requirements for progressive and final reclamation stages of individual projects including the removal, stockpiling, use and management of topsoil during project design, construction, operations and mine closure.

This Standard is related to but does not include other specific requirements associated with mine closure planning. These requirements are specified in Standard 8 – Mine Closure Planning.

9.2 CRITERIA AND REQUIREMENTS

9.2.1 Regulatory Compliance

Landform design, vegetation clearance and ground disturbance, topsoil removal, and revegetation strategies shall be conducted in compliance with all relevant in-country regulatory requirements, license/permit conditions and any other applicable requirements.

Sites shall confine vegetation clearance and ground disturbance to be within authorized and legally designated areas.

9.2.2 Management of Topsoil and Subsoils

Projects shall be designed to minimize the disturbance required across the footprint of the site including the location and placement of infrastructure.

Material planning processes shall identify topsoil quantity and quality required to meet progressive reclamation objectives, and define recovery methods and storage areas, including designated stockpile locations.

A materials balance for topsoil and subsoils shall be developed during project design and maintained throughout operations and the post-closure period. Stockpiles shall be surveyed to ensure progressive reclamation needs are met.

Topsoil and subsoils shall only be disturbed and/or utilized with formal approval from the Site Environmental Manager.

As much as possible, scheduling of topsoil stripping shall align with progressive reclamation schedules, and topsoil and subsoil shall be directly placed instead of stockpiling, where practicable.

All topsoil and subsoil stockpiles shall be constructed with consideration of surface water flows. Stockpiles shall not form a barrier to surface water movement and shall be protected from erosion.

Any material for future reclamation that is to be stockpiled shall be stored to ensure its long-term viability. This may include reducing stockpile heights, ripping to minimize compaction, erosion protection and revegetation of stockpiles.

All topsoil and subsoil stockpiles shall display clear signage in the field. The location and surveyed volume shall be recorded in a suitable database.

Processes shall be available to ensure that topsoil stripping, recovery and stockpiling activities during windy conditions are suspended when excessive dust from handling topsoil is generated.

9.2.3 Vegetation and Weed Management

Prior to the commencement of vegetation disturbance and earthworks, weed control and/or its removal shall be assessed and conducted where necessary.

If appropriate, mature vegetation shall be removed in a manner that facilitates its use during progressive or final reclamation activities.

9.2.4 Progressive Reclamation Plan

Sites shall develop, implement, and maintain a Reclamation Plan that defines all relevant strategies, schedules, locations, operational controls and practices relating to progressive reclamation of the site.

As a minimum, site Reclamation Plans shall define the following:

- Regulatory/Permit requirements
- Design criteria for structures requiring soil placement
- Soil recovery, placement and storage methods
- Soil quality assessments, particularly if sodic or acid sulphate soils are present
- Material balances aligned with LOM plans
- Surface stabilization methods
- Species suitability and selection assessment to meet reclamation objectives
- Alignment with surface water management and drainage plans to prevent erosion
- Defined reclamation success criteria
- Reclamation monitoring programs through operations and post closure

Site Reclamation Plans shall be revised and updated on an annual frequency. These shall align with the budget cycle to ensure that funds remain available for annual progressive reclamation of the site.

Knowledge obtained during progressive reclamation shall be used for updates of the Mine Closure Plan, annual Reclamation Plans and Closure Cost Estimates.

9.2.5 Reclamation Trials

Reclamation trials shall be conducted as early as practical to facilitate understanding and knowledge of required progressive and final reclamation techniques. The Mine Closure Plan, annual Reclamation Plan and site-specific closure criteria shall be refined based on reclamation trials.

Reclamation trials shall be applied to the reclamation of tailings dams, waste rock disposal facilities and other disturbed areas to achieve landform stability and facilitate progressive and final closure revegetation processes.

9.2.6 Progressive Reclamation

Sites shall progressively reclaim open pits, subsidence zones and waste rock dumps as soon as practicable on land that is no longer needed for current or future operational requirements, in conformance with the site Reclamation Plan.

Reclamation of major disturbed areas shall:

- meet established reclamation and closure success criteria
- be compatible with the agreed land uses and values in the local region
- be integrated into the existing landscape
- be chemically, physically and geotechnically safe and stable
- be physically and biologically resilient and sustainable

Progressive reclamation shall be budgeted, scheduled and conducted on an annual basis, and to the extent that disturbed land has been made available for reclamation. Waste rock dumps shall be constructed to create final slopes as soon as practical.

9.2.7 Monitoring

The condition of all soil stockpiles shall be periodically inspected and monitored for weed growth and erosion.

Reclaimed areas shall be monitored (e.g., for physical stability, weed colonization) to ensure that these areas meet established success criteria, and to identify any opportunities to improve reclamation practices. Any identified deficiencies shall be corrected.

9.3 REFERENCE MATERIAL

ISO 21795-1:2021 - Mine closure and reclamation planning - Part 1

World Gold Council - Responsible Gold Mining Principles – Principle 9 – Biodiversity, land use and mine closure (September 2019)

Standard
10

NOISE AND VIBRATION MANAGEMENT

STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard - Noise Vibration and Management is to define the minimum requirements for managing any adverse impacts of noise and vibration on site personnel and any relevant external stakeholders.

10.2 CRITERIA AND REQUIREMENTS

10.2.1 Regulatory Compliance

The management of noise and vibration at all sites shall be conducted in compliance with all relevant in-country regulatory requirements, licenses and any other applicable requirements.

10.2.2 Determination of Noise and/or Vibration Sources

Sites shall monitor and determine if noise and/or vibration from site activities is having an adverse impact within or around the site, inclusive of any nuisance impacts to external stakeholders.

Sources of ambient noise/vibration at sites may include, but not be limited to:

- heavy mobile equipment
- power generation
- fixed processing plant and equipment
- transportation
- blasting
- construction activities.

Environmental and nuisance impacts of noise and vibration that require review and consideration at sites include:

- nuisance impacts on adjacent landowners, villages or local residents
- impacts on wildlife
- background levels of noise/vibration (i.e., other sources in the area).

10.2.3 Noise and Vibration Management Plan

Sites that are:

- located close to local residents, villages, landowners or other external stakeholders; or
- have regulatory requirements and/or license conditions specifying noise/vibration conditions or relevant limits,

shall develop, implement, communicate, adhere to and maintain a noise and vibration management plan for managing ambient noise and vibration. This Plan shall identify all major sources of noise/vibration generated at the site and define the applicable strategies, operational controls and management practices to reduce potential and existing noise and vibration impacts to acceptable levels.

10.2.4 Management of Noise and Vibration Sources

Sites shall adopt and implement policies and practices to avoid or mitigate impacts on local communities and the environment arising from noise, blasting and vibration.

Where applicable, known adverse noise and vibration impacts from sites shall be effectively managed through the systematic identification of sources and impacts, and completion of risk assessments.

Where adverse noise and vibration impacts have been identified and confirmed through monitoring within or around the site, these impacts shall be managed using one or more of the following control strategies:

- selection of low noise plant and equipment
- acoustic enclosures around relevant noise emitting, process plant equipment
- for new projects, optimizing mine layout to shield noise from external receptors
- altering the blast drilling pattern and delay layout
- blasting at times that suit local conditions and any community requests
- adopting effective community liaison programs.

10.2.5 Monitoring

Depending on location and risk profiles, sites shall develop and implement suitable monitoring and inspection/audit programs to verify that any noise and/or vibration abatement programs and emission controls are fully functional, operating properly and achieving the targeted performance, and that noise and vibration are not having any ongoing adverse or nuisance impact.

Noise and vibration monitoring shall be conducted by trained and competent personnel.

10.2.6 Calibration and Maintenance Schedule

Sites shall develop, implement and maintain planned calibration and maintenance schedules for all noise and vibration monitoring equipment in use. Records of equipment calibration and maintenance shall be retained.

10.2.7 Data Analysis and Management

Noise and vibration monitoring data shall be periodically reviewed inclusive of trend analysis, and the results communicated to site management.

10.3 REFERENCE MATERIAL

World Gold Council - Responsible Gold Mining Principles – Principle 8, Section 8.5 – Noise and dust (September 2019)

Standard 11

BIODIVERSITY MANAGEMENT

11.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard - Biodiversity Management is to define the requirements for managing biodiversity risk to minimize and compensate any adverse acute or cumulative impacts on vegetation, wildlife and Priority Biodiversity Values (PBVs). PBVs are ecosystems, natural habitats, critical habitats, species (including protected species), protected areas or ecosystem services with a high level of vulnerability and irreplaceability that could be affected during exploration, construction, operation or closure.

11.2 CRITERIA AND REQUIREMENTS

11.2.1 Regulatory Compliance

Biodiversity, inclusive of the identification and protection of all protected flora and fauna within and around site, shall be managed in compliance with all relevant in-country regulatory requirements, license conditions and any other applicable requirements.

Based on applicable regulatory standards and license/permit limits, sites shall demonstrate protection of surrounding aquatic (including groundwater dependent ecosystems), terrestrial and marine environments.

11.2.2 Identification of Priority Biodiversity Values

Sites shall determine the presence / likely absence of PBVs that may be impacted by exploration and mine activities through measures such as:

- desktop PBV screening (e.g. using IBAT data, literature and other relevant datasets)
- Critical Habitat Assessment (against Criterions 1 to 5)
- biodiversity surveys, monitoring, context mapping and/or through study and assessment of local knowledge
- habitat mapping based on satellite imagery and ground-truthing
- biodiversity impact assessments

If required, research programs shall be initiated and utilized to improve the understanding of the PBVs.

11.2.3 Biodiversity Management Plan

If biodiversity management and protection was identified as a potential or actual environmental risk during original environmental impact or baseline studies, or has since been identified as a risk during operations, the site shall develop, communicate, adhere to and maintain a Biodiversity Management Plan.

The Biodiversity Management Plan shall describe key management strategies and controls to address identified biodiversity risks, and to safeguard and monitor PBVs. This includes details of any biodiversity assessments, compensatory strategies and implementation plans.

Sites shall incorporate both scientific and traditional knowledge when designing adaptation strategies for environmental assessment and ecosystem management.

11.2.4 Biodiversity Mitigation

Mitigation measures (controls) shall be defined to address adverse impacts to PBVs and other wildlife and natural habitats in accordance with the mitigation hierarchy. Where applicable, specialist knowledge shall be

utilized in the management and protection of PBVs. Local communities and Indigenous People's rights and values for biodiversity resources shall be respected and local communities should be involved in developing and agreeing on appropriate management strategies for potential impacts. Biodiversity mitigation shall include, but not be limited to:

- vegetation clearance controls
- fauna protection
- pest, weed and invasive alien species management.

11.2.5 Vegetation Clearance Controls

To prevent unnecessary ground disturbance and to protect areas of known high biodiversity value, control measures for minimizing access, disturbance to land and clearing of vegetation / natural habitats shall be developed, implemented and monitored.

For mining and related activities, the clearance of all vegetation on the lease area requires formal authorization by personnel from the site Environmental Department. All sites shall maintain and utilize a Vegetation Clearing Permit process and retain records of all completed permits.

After the request for vegetation clearance, qualified environmental staff shall conduct field surveys to identify the presence of any PBVs and to identify mitigation measures (or controls) to safeguard PBVs / wildlife and minimize risks and impacts during the proposed works. The approved Vegetation Clearing Permit with the agreed mitigation measures shall be issued prior to any ground disturbance.

Protected vegetation shall be clearly marked in the field (e.g., using flagging tape) or relocated. Personnel and contractors involved in vegetation clearance shall be instructed and made aware of the requirement to protect vegetation that has been marked.

11.2.6 Fauna Protection

Where vehicles and mobile machinery can impact wildlife, control measures shall be implemented and monitored to reduce injury or mortality risks. Control measures may include fencing of impacted areas, reduced speed limits, and training to promote awareness of relevant employees and contractors.

Water storage facilities, diversion structures and containment facilities shall be designed to limit and restrict fauna access, and to provide egress for any fauna which has entered those facilities or structures.

Water crossings or diversion structures shall be designed and operated to minimize adverse impacts on aquatic ecosystems.

Wildlife crossings on access and haul roads shall be identified and maintained, based on field survey data.

Controls to reduce access and/or exposure of fauna to hazardous materials shall include controlling fauna access to containment facilities and/or minimizing any open storage of hazardous materials.

Where accommodation (e.g., camp or community) is located in the vicinity of the site, suitable controls shall be implemented and communicated to:

- prohibit the unauthorised collection or harvesting of plant species
- prohibit the unauthorised collection of timber
- prohibit unauthorized hunting and trapping wildlife, and the sale of wildlife parts
- minimize and/or restrict access to designated and/or protected areas.

11.2.7 Pest, Weed and Invasive Alien Species Management

Where pest management is required (e.g., feral dogs, cats, rats, etc.), suitable control measures shall be utilized, including trapping, eradication, relocation and baiting that safeguard PBVs. Relevant employees and contractors shall receive training about these programs.

Wildlife identified on site that can pose a safety or other risk (e.g., poisonous snakes or other wildlife) shall be translocated by trained employees and contractors to suitable receptor areas, where feasible.

Where weed and / or invasive alien species management is required, suitable control measures shall be utilized. Potential measures could include the use of wash down facilities, controlled access to designated areas, ongoing monitoring and training of relevant personnel.

11.2.8 Biodiversity Compensation of Critical Habitat

In instances where the application of the biodiversity mitigation hierarchy does not fully eliminate residual impacts on Critical Habitat, sites shall develop compensatory measures including:

- offset plans that clearly outline actions to compensate for residual impacts on Critical Habitat, where possible
- supporting conservation actions that contribute to the overall protection and enhancement of Critical Habitat.

11.2.9 Monitoring

If applicable, biodiversity monitoring programs shall be developed, implemented and periodically reviewed. Programs shall include the monitoring of any potential or actual adverse biodiversity impacts (e.g., on PBVs) and to assess the effectiveness of site control measures and the requirement for adaptive management.

Stock and wildlife mortalities from any site-related activities shall be monitored and reported in accordance with site incident reporting processes and any applicable stakeholder and regulatory reporting processes.

Specialist knowledge shall be sourced and utilized when defining the scale of monitoring programs and the indicators to be monitored.

Monitoring data shall be periodically reviewed, inclusive of trend analysis, and the results communicated to site management. External communication of this information shall be conducted as required.

11.3 REFERENCE MATERIAL

World Gold Council - Responsible Gold Mining Principles – Section 9.1 – Biodiversity (September 2019)

Standard 12

CLIMATE CHANGE AND ENERGY MANAGEMENT

12.1 STANDARD

The purpose of this B2Gold Environmental and Biodiversity Standard - Climate Change and Energy Management is to define the requirements for managing climate risk and reducing greenhouse gas (GHG) emissions, including the requirements of B2Gold's climate risk management strategy and its climate change and energy-related targets.

Relevant aspects of climate and energy management are defined; inclusive of energy auditing, identification of climate risks, Climate and Energy Management Plan, determination of Scope 1, 2 and 3 GHG Emissions; energy awareness, reporting and monitoring.

12.2 CRITERIA AND REQUIREMENTS

12.2.1 Regulatory Compliance

Based on applicable in-country regulatory standards, sites shall demonstrate implementation of GHG and energy efficiency measures to comply with relevant local, state, and federal regulatory requirements relating to energy efficiency and greenhouse emissions.

12.2.2 International Accords and Agreements

Sites shall support the objectives of relevant global climate accords through avoidance, reduction or mitigation of GHG emissions. Programs shall be developed and implemented to ensure that B2Gold sites and nearby communities, as much as practical, are resilient to the effects of climate change.

12.2.3 Energy Audits

Sites shall commission and conduct a baseline energy audit to determine operational and equipment performance. The audit shall be used to benchmark energy use (including an analysis of site energy use and benchmarking against leading industry practices) and to identify and evaluate energy saving opportunities based on key criteria; such as implementation costs, energy and GHG reductions and relevant payback periods.

Site energy audit(s) shall enable sites to improve their understanding of energy use and costs, and to prioritize energy savings opportunities. Estimates for cost savings shall be determined, based on energy price projections in future years.

Reports from energy audits shall define the estimated costs and benefits of potential energy efficiency projects that are outlined.

12.2.4. Identification of Climate Risks

Climate risks and opportunities at sites shall be identified through standard risk management processes and integrated into the enterprise risk management system.

Relevant climate risks from each site shall be presented to the B2Gold HSESS Committee.

12.2.5 Climate and Energy Management Plans

Sites shall develop, implement and maintain a formal Climate and Energy Management Plan that defines the following minimum requirements:

- identifying climate risks for integration into decision-making, from design and planning through to closure

- identifying adaptation/mitigation measures to reduce vulnerability to climate change risks
- ensuring that GHG emissions are adequately estimated and monitored over time
- establishing an energy consumption baseline, setting clear and measurable goals to drive energy management improvement, and tracking progress towards such goals
- determining the site strategies, processes, and technologies needed to achieve energy reduction goals
- identifying control measures used by the site to minimize energy use and improve energy efficiency.

To improve energy performance and efficiency, sites shall reference and utilize the concepts defined in ISO50001:2018 – Energy Management Systems – requirements and guidance for use.

Site Climate and Energy Management Plans shall be periodically reviewed to assess implementation, identify lessons and potential consideration and inclusion of best practices.

When changes to the business context occur, such as new developments, procurement, mine expansions or business improvement projects, opportunities shall be used to improve energy performance.

12.2.6 Determination of Scope 1, 2 and 3 GHG Emissions

Sites shall complete GHG emissions inventories for Scope 1 (direct) emissions from owned or controlled sources.

Relevant B2Gold sites shall complete GHG emissions inventories for Scope 2 (indirect) emissions from the generation of purchased electricity.

Sites shall complete inventories for Scope 3 GHG emissions; inclusive of relevant upstream categories, shall be determined.

12.2.7 Climate Champions

Sites shall appoint and maintain an appropriate number of Climate Champions. These nominated representatives shall support the site in meeting B2Gold's Climate Risk Management Strategy by assisting in the identification of climate-related risks, opportunities, and priorities across B2Gold, and by ensuring that relevant tasks to reduce GHG emissions are actioned and achieved.

12.2.8 Performance Measures and Action Plans

Site energy performance goals and targets shall be reviewed and updated annually.

Improvements in energy efficiency and GHG emissions from sites shall include, but not be limited to:

- energy supply and procurement
- buildings
- blasting
- on-site materials movement
- minerals processing
- air, water and ancillary equipment.

Incorporated into each site's HSE MS Improvement Plans, sites shall ensure that actions identified by the corporate Climate Risk Management Committee are scheduled, resourced and implemented. Site General Managers shall have overall site accountability for their implementation and completion.

12.2.9 Reporting

Sites shall provide relevant data and information to the B2Gold Corporate office, to allow B2Gold to report annually on climate risk and energy management in their Responsible Mining Report and Climate Strategy Report (i.e. to allow B2Gold to maintain alignment with the recommendations of the TCFD).

12.2.10 Climate and Energy Awareness

Sites shall demonstrate ongoing processes to embed climate risk and energy management into the culture of their operation.

Site personnel and contractors shall maintain a high level of climate risk and energy awareness and the role they play in achieving energy goals. Best practices and lessons learned shall be shared with relevant personnel.

Sites shall identify and create incentives to motivate staff and contractors to improve GHG emissions and energy performance.

12.2.11 Energy Monitoring

Monitoring programs shall be implemented to collect, interpret and report on energy data in order to measure and verify energy performance and to locate opportunities for reducing energy use and cost.

Energy monitoring systems shall provide both real time and historic electricity usage information.

Sites shall demonstrate a continuous review of energy performance, inclusive of those applicable to relevant processes and related equipment.

12.3 REFERENCE MATERIAL

Task Force on Climate-related Financial Disclosures (TCFD) (2017)

B2Gold Climate Strategy Report (February 2022)

World Gold Council - Responsible Gold Mining Principles – Principle 10.3 - Combating climate change and Principle 10.4 – Energy efficiency and reporting (September 2019)

Mining Association of Canada - Energy and GHG Emissions Management Reference Guide (March 2015)

APPENDIX A
CHECKLIST – KEY REQUIREMENTS AND OUTPUTS OF THE 2024 B2GOLD ENVIRONMENTAL AND BIODIVERSITY STANDARDS

This appendix has been provided within these Standards to enable B2Gold sites to readily identify and understand the key "requirements" and "outputs" defined within the 2024 B2Gold Environmental and Biodiversity Standards.

This appendix is available for use by B2Gold sites a) as the basis for internal auditing against these Standards; b) as preparation prior to the two-yearly external audits completed against these Standards; and c) for general understanding and improved conformance with the requirements defined within these Standards.

Standard 1 - HAZARDOUS MATERIALS AND DANGEROUS GOODS MANAGEMENT

Section 1.2.2 – Up-to-date register of hazardous materials and dangerous goods ☐

Section 1.2.2 – Current Safety Data Sheets (SDSs) ☐

Section 1.2.3 – Technical review and risk assessment for new bulk hazardous materials or dangerous goods ☐

Section 1.2.4 – Above ground piping or leak detection mechanisms for underground piping ☐

Section 1.2.4 – Signage, color coding and labelling of storage facilities (tanks, pipes, packaging) ☐

Section 1.2.5 – Secondary containment of bulk hazardous materials and dangerous goods storage and transfer installations ☐

Section 1.2.5 – Secondary containment shall be free of stored rainfall, spillage and/or other materials ☐

Section 1.2.5 – Areas around fuel delivery pumps and vehicle refueling points shall provide containment ☐

Section 1.2.5 – Workshops or service areas shall have suitable collection facilities for waste hydrocarbons ☐

Section 1.2.5 – Treatment facilities for hydrocarbon contaminated water shall be utilized and maintained ☐

Section 1.2.5 – Use of regulatory compliant labelling and placarding on all new, used and waste product containers and tanks ☐

Section 1.2.6 – Contract conditions for suppliers/contractors involved in hazardous materials/dangerous goods transportation ☐

Section 1.2.6 – Suppliers and transport contractors shall complete a documented route risk assessment ☐

Section 1.2.6 – Transportation vehicles and storage tanks shall be maintained in an acceptable condition ☐

Section 1.2.6 – Transport equipment and vehicles shall be regularly inspected and maintained ☐

Section 1.2.6 – Transport service providers shall demonstrate the competencies to transport hazardous materials ☐

Section 1.2.7 – Assessment and observation of bulk transfers of hazardous materials and dangerous goods ☐

Section 1.2.8 – Procedures for hazardous materials and dangerous goods transportation; unloading, transfer, storage, handling, use and disposal ☐

Section 1.2.9 – Information shall be provided to local emergency services and any relevant interested parties ☐

Section 1.2.9 – Mutual aid agreements shall be established between sites and local emergency service providers ☐

Section 1.2.9 – Reporting of any spills or releases during transport, unloading and storage to the regulatory authorities ☐

Section 1.2.10 – Hydrocarbon/water treatment facilities shall be available, utilized and included on regular maintenance schedules ☐

Section 1.2.11 – Sites shall not use mercury to extract gold in their processing facilities ☐

Section 1.2.12 – Sites shall maintain a formal register of contaminated sites ☐

Section 1.2.13 – Appropriate training provided to manage exposure to workplace hazardous materials and dangerous goods ☐

Section 1.2.14 – Safety/environmental audits of supplier hazardous materials and dangerous goods transportation every five years ☐

Section 1.2.14 – Inspection of bulk hazardous materials and dangerous goods storage, distribution, transfer and use ☐

Section 1.2.15 – Routine testing of effluent from hydrocarbon-water treatment facilities ☐

Section 1.2.15 – Verification of the off-site disposal of solid and liquid hazardous waste and/or recycling of these products ☐

Standard 2 - CYANIDE MANAGEMENT

Section 2.2.3 – Identify and manage potential risks relating to the transportation, handling, storage and disposal of cyanide ☐

Section 2.2.4 – Cyanide unloading, storage and mixing facilities are consistent with sound, accepted engineering practices ☐

Section 2.2.4 – Maintain quality control and quality assurance procedures, spill prevention and spill containment measures ☐

Section 2.24 – Conduct inspections, preventive maintenance and have contingency plans for unloading, storage and mixing facilities ☐

Section 2.2.4 – Process solutions shall be managed to avoid any unintentional releases of cyanide ☐

Section 2.2.5 – Bulk cyanide containers, process solution tanks and pipelines shall include secondary containment ☐

Section 2.2.5 – Storage areas for solid cyanide shall prevent any contact of solid cyanide product with water or other chemicals ☐

Section 2.2.5 – Piping/vessels containing liquid cyanide shall display the correct international color-coding and labelling ☐

Section 2.2.6 – Process plants shall minimize cyanide use as much as practical ☐

Section 2.2.7 – Cyanide management and operating systems shall be maintained to protect human health and the environment ☐

Section 2.2.8 – Cyanide shall only be purchased from certified manufacturers employing appropriate practices and procedures ☐

Section 2.2.8 – Clear lines of responsibility are defined within contracts with cyanide suppliers, distributors and transporters ☐

Section 2.2.9 – Supply contracts shall ensure that cyanide is safely managed through the entire transportation/delivery process ☐

Section 2.2.9 – Cyanide transport routes shall be risk assessed prior to commencing transportation activities ☐

Section 2.2.9 – Contracted transportation personnel shall operate with minimum risk and completing cyanide/haz mat training ☐

Section 2.2.9 – Road and sea transport of cyanide by suppliers shall conform with the transport requirements of the Code ☐

Section 2.2.9 – Cyanide transporters shall readily available emergency response strategies, plans and capabilities ☐

Section 2.2.9 – Cyanide supply contracts shall include internal and external emergency notification and reporting ☐

Section 2.2.9 – Suppliers shall utilize secure cyanide interim storage sites to prevent accidental releases and exposures ☐

Section 2.2.10 – Site emergency response strategies and capabilities shall include detailed emergency response plans, trained personnel, necessary equipment, procedures for emergency notification and evaluation of response procedures capabilities ☐

Section 2.2.11 – Employees and site emergency response personnel shall understand the hazards and how to manage cyanide ☐

Section 2.2.11 – Relevant employees with cyanide responsibilities shall be trained and competent to operate on-site facilities ☐

Section 2.2.11 – Sites shall consult with the public and promote dialogue with stakeholders regarding cyanide management ☐

Section 2.2.11 – Sites shall make operational and environmental information regarding cyanide externally available ☐

Section 2.2.12 – On-site process controls for cyanide storage and mixing facilities shall be inspected and records retained ☐

Section 2.2.13 – Monitoring programs shall identify any adverse effects to stock, wildlife, surface water and groundwater quality due to the storage and use of cyanide ☐

Section 2.2.13 – Monitoring programs shall ensure that concentrations of Weak Acid Dissociable (WAD) cyanide within tailings dams does not exceed 50 ppm ☐

Standard 3 - TAILINGS MANAGEMENT

***Note** - Also refer to the B2Gold Tailings Management Procedure – Appendix A - TMP Compliance Checklist (2021)*

Section 3.2.1 – Riverine or shallow submarine tailings shall not be utilized for the development of any new mine sites ☐

Section 3.2.2 – Sites shall develop and maintain an interdisciplinary knowledge base to support safe tailings management throughout the TSF lifecycle, including closure. This information shall be used for decision making. Records shall be retained ☐

Section 3.2.3 – Identify and manage potential risks relating to on-site TSFs ☐

Section 3.2.3 – Each TSF shall have a hazard classification in accordance with CDA design criteria by the Engineer of Record ☐

Section 3.2.3 – TSFs shall be designed, constructed, operated and closed in a manner that effectively manages risks ☐

Section 3.2.3 – Critical controls performance indicators and actions for each TSF shall be identified and implemented ☐

Section 3.2.3 – Quantitative performance objectives (QPOs), performance standards and indicators shall be developed ☐

Section 3.2.3 – Tailings Management Protocol (MAC, 2019) shall be used to evaluate TSF performance on an annual basis ☐

Section 3.2.3 – A dam break analysis for each TSF shall be completed and remain current ☐

Section 3.2.4 – Area baseline conditions shall be determined prior to locating and designing a new tailings TSF ☐

Section 3.2.4 – Prior to TSF construction or expansion, exploratory drill holes within TSF footprint shall be correctly abandoned ☐

Section 3.2.5 – Sites shall engage local communities and publicly disclose and provide access to information about their TSFs ☐

Section 3.2.6 – Sites shall effectively use of existing site management systems to diligently manage their TSFs ☐

Section 3.2.6 – Sites shall appoint and empower an Engineer of Record and maintain an organizational culture for TSF management ☐

Section 3.2.6 – Formal review processes for all phases of the TSF lifecycle, including closure shall be implemented ☐

Section 3.2.7 – TSF plans and design criteria shall be developed and utilized to minimize risk for all phases of its lifecycle ☐

Section 3.2.7 – Sites shall implement a quality assurance plan and quality control plan ☐

Section 3.2.8 – Responsibilities shall be defined and adequate staff resources shall be assigned to site TSFs ☐

Section 3.2.8 – Sites shall establish and make available annual budgets for their TSFs ☐

Section 3.2.9 – TSFs shall be designed, constructed and operated as per requirements defined in Section 3.2.9 ☐

Section 3.2.10 – A Tailings Operations, Maintenance and Surveillance Manual shall be utilized and include relevant TARPs ☐

Section 3.2.10 – The manual shall remain up-to-date, reflect current operating practices. Conformance shall be demonstrated ☐

Section 3.2.11 – QA/QC monitoring and records retention is required for the construction of all TSFs. Final 'as-built' documentation for initial construction and all embankment lifts, with associated approved QA/QC reports shall be retained ☐

Section 3.2.12 – TSFs shall be designed, constructed and operated to prevent contamination of groundwater and surface water ☐

Section 3.2.12 – Underdrainage collection ponds shall have a suitable impervious liner and a Leak Collection and Recovery System. Piezometers shall be installed and utilized ☐

Section 3.2.13 – Tailings shall be characterized throughout the life of the TSF, using reliable acid-base accounting methodologies ☐

Section 3.2.14 – All process plant storage tanks and transfer systems that contain tailings shall have suitable secondary containment ☐

Section 3.2.14 – Runoff generated outside a TSF shall be diverted away from the facility as much as practical ☐

Section 3.2.15 – Sites shall utilize and maintain a Process Water Management Plan ☐

Section 3.2.15 – During operations, TSF supernatant pond size shall be minimized and be located away from the TSF walls. Minimum freeboard requirements and piezometric head in the embankment shall be maintained ☐

Section 3.2.16 – Relevant site employees and contractors with TSF responsibilities shall be trained and competent ☐

Section 3.2.17 – Sites shall prevent and prepare for any TSF emergency event, inclusive of maintaining emergency information ☐

Section 3.2.18 – Inclusive of daily TSF inspections, a program of TSF inspections/audits shall be implemented and maintained ☐

Section 3.2.18 – TSFs shall be inspected annually by a qualified engineer/Engineer of Record ☐

Section 3.2.19 – A Dam Safety Review shall be conducted by a geotechnical engineer who is not the Engineer of Record ☐

Section 3.2.20 – Sites shall design, implement and operate monitoring systems to manage risk at all phases of the TSF lifecycle ☐

Standard 4 - WASTE ROCK MANAGEMENT

Section 4.2.1 – Regulatory requirements applicable to feasibility, planning, design, construction, operation, closure and post-closure of waste rock dumps (WRDs) shall be known and complied with ☐

Section 4.2.2 – Waste rock shall be physically and geochemically characterized during all relevant phases of the facility. Where acid rock drainage risks exist, sites shall characterize and estimate the long-term geochemical and physical behavior of WRDs ☐

Section 4.2.3 – Area baseline conditions shall be determined prior to the location and design of a new or significant extension to a waste rock dump ☐

Section 4.2.4 – Sites with known net-acid generating ore and waste rock shall develop, implement, communicate, adhere to and maintain a Waste Rock Dump Management Plan ☐

Section 4.2.5 – Waste rock dumps shall be designed, constructed and operated as per requirements defined in Section 4.2.5 ☐

Section 4.2.5 – During design, a balance of potentially acid generating and non-acid generating material shall be developed to evaluate and design controls ☐

Section 4.2.5 – Waste rock dumps with the potential to generate low quality runoff shall include retention basins ☐

Section 4.2.5 – Permanent surface water diversion structures around waste rock dumps shall be sized to convey flow ☐

Section 4.2.6 – Potentially acid generating material shall not be used for construction purposes ☐

Section 4.2.7 – During planning, a scheduling system shall be utilized to ensure mining blocks are differentiated by ARD rock type☐

Section 4.2.7 – A waste rock and ore tracking system shall be developed and implemented ☐

Section 4.2.7 – Where ARD risks exist, sites shall demonstrate that waste rock has been properly characterized and disposed ☐

Section 4.2.8 – Only compatible non-mineral solid or hazardous waste shall be disposed in waste rock dumps ☐

Section 4.2.9 – Stabilization and/or progressive reclamation activities on WRDs shall be scheduled and completed ☐

Section 4.2.9 – Waste rock dump design, construction and operation shall incorporate both trial and progressive reclamation ☐

Section 4.2.9 – Waste rock dumps shall be constructed, reclaimed and closed to ensure geotechnical and geochemical stability ☐

Section 4.2.9 – During the reclamation and closure, the physical and geochemical characteristics of the waste rock shall be considered during the design of the cover system ☐

Section 4.2.9 – Where acid forming materials are present, predictive models shall be used to evaluate suitable reclamation and closure design options for cover design ☐

Section 4.2.9 – Waste rock dumps shall be closed using defined reclamation objectives and agreed closure criteria ☐

Section 4.2.10 – ARD predictions based on static test results shall be confirmed during monitoring program using kinetic tests ☐

Section 4.2.10 – Waste rock dumps shall be monitored to verify construction occurs in accordance with geotechnical design criteria☐

Section 4.2.10 – Waste rock dumps shall be inspected quarterly (at a minimum) to detect any abnormal conditions ☐

Section 4.2.10 – Waste rock dumps, drainage diversion and sediment control structures, shall be inspected periodically and following periods of heavy rainfall ☐

Section 4.2.10 – Where adverse surface ARD and/or elevated contaminants are actually or likely to be detected, groundwater monitoring bores shall be installed and monitored ☐

Section 4.2.10 – Progressive reclamation of waste rock dumps shall be monitored to validate agreed reclamation and closure completion criteria ☐

Standard 5 - NON-PROCESS WASTE MANAGEMENT

Section 5.2.1 – Regulatory permits shall be secured for all burning of waste within on-site incinerators ☐

Section 5.2.1 – A formal Waste Management Plan shall be implemented defining all on-site and relevant off-site strategies, operational controls and management practices. The plan shall be periodically reviewed when changes are planned or occur ☐

Section 5.2.3 – Where off-site disposal facilities for hazardous wastes are not available or protective of human health/the environment, on-site facilities shall be used where legally authorized and it can be demonstrated measurable adverse impacts will not occur ☐

Section 5.2.3 – Secondary containment shall be utilized where liquid hazardous wastes are stored in an on-site facility ☐

Section 5.2.3 – Sites shall implement and maintain processes to prevent the incorrect disposal of hazardous wastes ☐

Section 5.2.4 – To burn wastes on-site, a dedicated incinerator shall be used that can operate at suitable temperatures. Buring practices and emissions shall be monitored ☐

Section 5.2.4 – Medical waste shall not be disposed of or buried within any on-site landfill ☐

Section 5.2.5 – The burning of waste within on-site landfills is not authorised ☐

Section 5.2.5 – Contaminated leachate generation and any adverse impacts shall be evaluated and managed ☐

Section 5.2.5 – Landfills shall be suitably fenced or bermed and display suitable signage at the entrance ☐

Section 5.2.5 – Wastes disposed of within on-site landfills shall be routinely covered ☐

Section 5.2.5 – Dust and/or significant odors from on-site landfills shall be controlled to eliminate complaints ☐

Section 5.2.6 – Sites shall establish suitable processes and bulk bins/receptacles for the segregation of non-hazardous and hazardous wastes ☐

Section 5.2.6 – A suitable temporary storage area shall be utilized until hazardous waste is removed off-site. ☐

Section 5.2.6 – Awareness training shall be provided to all operational personnel to facilitate correct waste segregation and temporary storage practices ☐

Section 5.2.7 – The removal and shipment of hazardous waste shall not contravene the Basel Convention requirements ☐

Section 5.2.7 – The management and disposal of hazardous waste from the site that is removed by third-party waste contractors shall a legally compliant and conducted in an environmentally sound manner ☐

Section 5.2.8 – Off-site treatment and disposal facilities shall be inspected to ensure they are engineered and responsibly operated. Inspections shall occur at two yearly intervals ☐

Section 5.2.9 – Records for the storage, transportation and disposal (off-site and on-site) of all waste streams shall be retained ☐

Section 5.2.10 – Periodic on-site waste segregation, temporary waste storage facilities and landfill inspections shall be scheduled and completed ☐

Section 5.2.10 – Sites shall schedule and conduct at least annual environmental audits of hazardous waste segregation, on-site storage, off-site shipment and disposal practices ☐

Standard 6 - WATER MANAGEMENT

Section 6.2.1 – If in-country regulatory discharge criteria do not exist or are incomplete; appropriate site-specific, risk-based discharge criteria shall be determined ☐

Section 6.2.1 – Improved efficiency in the use of water on site shall be demonstrated ☐

Section 6.2.2 – Site risk registers shall identify and incorporate current and future water-related risks ☐

Section 6.2.2 – Development and implementation of site-specific Water Action Plans shall be used to understand and mitigate key water risks to meet the objectives of B2Gold's Global Water Strategy ☐

Section 6.2.3 – Development, implementation, communication, adherence to and maintenance of a site-specific water management plan shall be demonstrated ☐

Section 6.2.3 – For water discharges, sites shall establish applicable water quality objectives and internal performance criteria ☐

Section 6.2.3 – Documentation and periodic review of the site water distribution network shall occur ☐

Section 6.2.3 – Sites shall develop, maintain and operate a site-specific water balance in conjunction with the site Water Management Plan and relevant LOM plans. It shall incorporate the Water Accounting Frameworks (WAF) and be aligned with the ICMM water reporting guidance and disclosure standard ☐

Section 6.2.4 – Water related risks and impacts shall be considered during the site management of change process ☐

Section 6.2.4 – Sites shall establish pre-operational baseline conditions for surface water, groundwater hydrology, groundwater quality and geochemical characterization of waste rock ☐

Section 6.2.4 – New project design or expansion shall incorporate risk assessment and risk control planning relating to water, with potential risks and adverse impacts quantified. Impacts shall be mitigated ☐

Section 6.2.5 – Extraction volumes and other regulatory conditions shall be specified in site water licenses shall be complied with ☐

Section 6.2.5 – Water extraction and distribution networks shall be optimized to maximize efficiencies ☐

Section 6.2.6 – Tailings and on-site processing facilities shall be designed, constructed, managed and operated to preclude releases to the receiving environment ☐

Section 6.2.6 – Any process water discharges from TSFs and/or process facilities shall meet applicable criteria ☐

Section 6.2.6 – Depending on the characteristics of the water to be contained, storage facilities used to impound process or contaminated water shalland have a suitable LRCS ☐

Section 6.2.7 – Erosion and sediment control facilities shall be designed and installed prior to major ground disturbance ☐

Section 6.2.7 – Temporary stormwater structures shall be designed based on the level of risk associated with failure. Permanent stormwater structures shall, at a minimum, convey and withstand a 100-year, 24-hour storm event. ☐

Section 6.2.8 – Domestic wastewater shall be treated using sewage treatment plants (STPs) or septic systems that shall produce effluent quality that meets in-country regulatory requirements. Only domestic wastewater shall be connected to STPs ☐

Section 6.2.8 – Solid screenings and sludge from STPs shall be managed in accordance with in-country regulatory ☐

Section 6.2.8 – Septic systems shall meet applicable industry code or engineering standard, with adequate absorption of discharges☐

Section 6.2.9 – Calibrated instrumentation and suitable measures shall be utilized for metering and/or determining site water extraction, use and discharge ☐

Section 6.2.9 – The quantity and quality of sewage treatment plant (STP) effluent shall be monitored in accordance with relevant license or permit conditions ☐

Section 6.2.9 – Where required, groundwater shall be monitored down gradient of septic infiltration trenches, landfill sites, process dams, waste rock disposal facilities, tailings dams or other potential sources of contamination ☐

Section 6.2.9 – Suitable monitoring and inspection/audit programs shall be used to verify that site water management systems and processes ☐

Section 6.2.9 – Suitable marine, groundwater and surface water quality and quantity monitoring programs shall be utilized to evaluate local water resources, point source and non-point source discharges and receiving waters potentially impacted by off-site discharges☐

Section 6.2.9 – Water monitoring shall be conducted by trained and competent personnel and external laboratories shall be accredited by a third-party ☐

Section 6.2.9 – Sites shall determine water quality and usage/consumption trends at relevant monitoring locations. ☐

Section 6.2.9 – Monitoring data shall be periodically reviewed and retained until final lease relinquishment ☐

Standard 7 - AIR QUALITY MANAGEMENT

Section 7.2.1 – All relevant approvals, licenses and permits relating to air emissions shall be obtained and exceedances of license limits and criteria shall be prevented ☐

Section 7.2.1 – During the operational phase, sites shall formally identify all major forms of point source and non-point source air and dust emissions ☐

Section 7.2.1 – Appropriate air pollution control equipment shall be utilized to comply with all relevant regulatory and license requirements ☐

Section 7.2.2 – Sites shall develop, implement, communicate, adhere to and maintain a suitable Air Quality Management Plan ☐

Section 7.2.2 – Internal performance criteria shall be established for air emission sources and ambient air quality ☐

Section 7.2.2 – Relevant air quality risks and impacts shall be considered/documented during site change management processes☐

Section 7.2.2 – Air quality risks and impacts shall be assessed during technical and financial evaluation of relevant capital projects ☐

Section 7.2.3 – For any new site or major project expansion, relevant meteorological data and baseline ambient air quality conditions shall be characterized, monitored and recorded ☐

Section 7.2.3 – Utilizing risk assessment and risk control planning for any new project design or major expansion, ambient air related risks and impacts shall be known and controlled ☐

Section 7.2.3 – Environmental impact assessments shall incorporate all relevant requirements associated with air emissions and ambient air quality ☐

Section 7.2.4 – Point source and fugitive air and dust emissions shall be identified, characterized and controlled in accordance with the potential risk ☐

Section 7.2.4 – Periodic ambient and point source air quality monitoring shall be used to determine if any potential hazardous air contaminants are being emitted from the site ☐

Section 7.2.4 – Air quality dispersion modelling shall be utilized where a potential significant risk of affecting human health or the environment exists ☐

Section 7.2.5 – Where air emissions pose an actual or potential significant risk to human health or the environment, sites shall quantify the contaminant emissions using calibrated monitoring equipment, mass balancing and/or other approved methods. ☐

Section 7.2.5 – Monitoring and inspection programs shall be used to verify that point source air emission and ambient dust controls remain functional and effective ☐

Section 7.2.5 – Monitoring of particulate matter, sulfur oxide (SOx), nitrogen oxide (NOx) and heavy metals shall be conducted where relevant point source air emissions exist and/or if a valid community complaint is received. ☐

Section 7.2.6 – Sites shall develop, implement and maintain calibration and maintenance schedules for both air emissions control and monitoring equipment and records shall be retained. ☐

Section 7.2.7 – Air emission and ambient air monitoring data shall be periodically reviewed, inclusive of trend analysis, and the results communicated to site management ☐

Standard 8 - MINE CLOSURE PLANNING

Section 8.2.1 – All approvals, licenses and permits relating to mine closure and reclamation shall be known and secured ☐

Section 8.2.2 – Mine closure risks and opportunities shall be incorporated into annual updates of the site risk register ☐

Section 8.2.3 – A preliminary Mine Closure Plan shall be developed during the design phase of all new sites and be updated and maintained throughout operations ☐

Section 8.2.3 – Site Mine Closure Plans shall incorporate the content as per requirements defined in Section 8.2.3 ☐

Section 8.2.3 – Mine closure and reclamation options shall be identified and evaluated by sites, to select the preferred mine closure and reclamation option that on an overall basis best meets defined objectives ☐

Section 8.2.3 – During the life of the mine, the site's Mine Closure Plan shall be distributed to relevant stakeholders to enable external views and requirements to be incorporated into relevant operational plans ☐

Section 8.2.4 – Mine Closure Plans shall be reviewed as per the intervals defined in Section 8.2.4 ☐

Section 8.2.4 – Sites shall allow for adjusting designs and construction methods that do not meet mine closure and reclamation objectives ☐

Section 8.2.5 – Sites shall follow relevant in-country regulations and agreed resource industry methodology when determining closure cost estimates ☐

Section 8.2.5 – Cost estimates shall be adequately supported by industry/contractor accepted estimates, quotes or actual costs from similar activities ☐

Section 8.2.5 – Reclamation and closure cost estimates shall include costs associated with achieving post-closure land use objectives/criteria and post-closure maintenance and monitoring activities ☐

Section 8.2.5 – Reclamation and closure cost estimates shall be formally approved by the site General Manager (or equivalent position). Actual costs of progressive reclamation and closure activities shall be tracked against budget ☐

Section 8.2.5 – Sites shall provide the B2Gold corporate office with an annual Asset Retirement Obligation (ARO) to meet internal financial obligations ☐

Section 8.2.5 – Financial provisions shall be determined and made available in accordance with in-country regulatory requirements, for each stage of the life of the mine, including required bond or provisions for unplanned closure and post-closure ☐

Section 8.2.5 – Closure provisioning shall be defined and maintained within a site-specific financial plan ☐

Section 8.2.6 – Suitable database and records retention processes shall be utilized to retain closure data. These records shall be retained for at least ten years after final lease relinquishment ☐

Standard 9 – PROGRESSIVE RECLAMATION

Section 9.2.1 – Sites shall confine vegetation clearance and ground disturbance to be within authorized and legally designated areas☐

Section 9.2.2 – Projects shall be designed to minimize the disturbance required across the footprint of the site including infrastructure☐

Section 9.2.2 – Material planning processes shall identify topsoil quantity and quality to meet progressive reclamation objectives, including designated stockpile locations ☐

Section 9.2.2 – A materials balance for topsoil and subsoils shall be developed during project design and maintained. Stockpiles shall be surveyed to ensure progressive reclamation needs are met ☐

Section 9.2.2 – Topsoil and subsoils shall only be disturbed/utilized with formal approval from the Site Environmental Manager ☐

Section 9.2.2 – Scheduling of topsoil stripping shall align with progressive reclamation schedules, and topsoil and subsoil shall be directly placed instead of stockpiling, where practicable ☐

Section 9.2.2 - All topsoil and subsoil stockpiles shall be constructed with consideration of surface water flows ☐

Section 9.2.2 – Any material for future reclamation that is to be stockpiled shall be stored to ensure its long-term viability ☐

Section 9.2.2 – All topsoil and subsoil stockpiles shall display clear signage in the field. The location and surveyed volume shall be recorded in a suitable database ☐

Section 9.2.3 – Prior to vegetation disturbance and earthworks, weed control shall be assessed and conducted ☐

Section 9.2.3 – Mature vegetation shall be removed to enable its use during progressive or final reclamation activities ☐

Section 9.2.4 – Sites shall develop, implement, and maintain a Reclamation Plan that defines all relevant strategies, schedules, locations, operational controls and practices relating to progressive reclamation as defined and listed in Section 9.2.4 ☐

Section 9.2.4 – Site Reclamation Plans shall be revised and updated on an annual frequency and align with the annual budget cycle☐

Section 9.2.4 – Knowledge obtained during progressive reclamation shall be used for updates of the Mine Closure Plan, annual Reclamation Plans and Closure Cost Estimates ☐

Section 9.2.5 – Reclamation trials shall be conducted as early as practical. The Mine Closure Plan, annual Reclamation Plan and site-specific closure criteria shall be refined based on reclamation trials ☐

Section 9.2.6 – In conformance with the site Reclamation Plan, sites shall progressively reclaim open pits, subsidence zones and waste rock dumps as soon as practicable, in accordance with the criteria listed in Section 9.2.6 ☐

Section 9.2.6 – Progressive reclamation shall be budgeted, scheduled and conducted on an annual basis ☐

Section 9.2.7 – Soil stockpiles shall be periodically inspected and monitored for weed growth and erosion ☐

Section 9.2.7 – Reclaimed areas shall be monitored to ensure they meet established success criteria, and to identify any opportunities to improve reclamation practices ☐

Standard 10 - NOISE AND VIBRATION MANAGEMENT

Section 10.2.2 – Sites shall monitor and determine if noise and/or vibration from site activities is having an adverse impact within or around the site, inclusive of any nuisance impacts to external stakeholders ☐

Section 10.2.3 – Dependent on the location of the site and relevant regulatory requirements, a Noise and Vibration Management Plan shall be developed, implemented, communicated, adhered to and maintained and include the content specified in Section 10.2.3 ☐

Section 10.2.4 – Sites shall adopt and implement policies and practices to avoid or mitigate impacts on local communities and the environment arising from noise, blasting and vibration ☐

Section 10.2.4 – Known adverse noise and vibration impacts from sites shall be effectively managed through the systematic identification of sources and impacts, and completion of risk assessments ☐

Section 10.2.5 – Where adverse noise and vibration impacts exist, they shall be managed using the control strategies defined in Section 10.2.5 ☐

Section 10.2.5 – Sites shall implement suitable monitoring and inspection/audit programs to verify that any noise and/or vibration abatement programs and emission controls are fully functional, operating properly and achieving the targeted performance ☐

Section 10.2.5 – Noise and vibration monitoring shall be conducted by trained and competent personnel ☐

Section 10.2.6 – Sites shall develop, implement and maintain planned calibration and maintenance schedules for all noise and vibration monitoring equipment in use and records shall be retained ☐

Section 10.2.7 – Noise and vibration monitoring data shall be periodically reviewed and trended and the results communicated to site management ☐

Standard 11 - BIODIVERSITY MANAGEMENT

Section 11.2.2 – Through measures defined in Section 11.2.2, sites shall determine the presence / likely absence of Priority Biodiversity Values (PBVs) that may be impacted by exploration and mine activities ☐

Section 11.2.2 – If required, research programs shall be initiated and utilized to improve the understanding of the PBVs ☐

Section 11.2.3 – If biodiversity management and protection was identified as a potential or actual environmental risk, the site shall develop, communicate, adhere to and maintain a Biodiversity Management Plan. It shall describe key management strategies and controls to address identified biodiversity risks, and to safeguard and monitor PBVs ☐

Section 11.2.3 – Scientific and traditional knowledge shall be incorporated when designing adaptation strategies for environmental assessment and ecosystem management ☐

Section 11.2.4 – Mitigation measures (controls) shall be defined to address adverse impacts to PBVs and other wildlife and natural habitats in accordance with the mitigation hierarchy ☐

Section 11.2.5 – To protect areas of known high biodiversity value, control measures for minimizing access, disturbance to land and clearing of vegetation / natural habitats shall be developed, implemented and monitored ☐

Section 11.2.5 – The clearance of all vegetation on the lease area requires formal authorization from the site Environmental Department. A Vegetation Clearing Permit process shall be utilized and records of all completed permits retained ☐

Section 11.2.5 – After the request for vegetation clearance, qualified environmental staff shall conduct field surveys to identify the presence of any PBVs and to identify mitigation measures (or controls) ☐

Section 11.2.5 - Approved Vegetation Clearing Permits with the agreed mitigation measures shall be issued prior to commencing ground disturbance ☐

Section 11.2.5 – Protected vegetation shall be clearly marked in the field or relocated. Personnel and contractors involved in vegetation clearance shall be provided relevant instructions, including vegetation marking ☐

Section 11.2.6 – Where vehicles and mobile machinery can impact wildlife, control measures shall be implemented and monitored to reduce injury or mortality risks ☐

Section 11.2.6 – Water storage facilities, diversion structures and containment facilities shall be designed to limit and restrict fauna access, and to provide egress for any fauna ☐

Section 11.2.6 – Water crossings or diversion structures shall be designed and operated to minimize adverse impacts on aquatic ecosystems ☐

Section 11.2.6 – Wildlife crossings on access and haul roads shall be identified and maintained, based on field survey data ☐

Section 11.2.6 – Controls shall be implemented to reduce access and/or exposure of fauna to hazardous materials, camps and communities ☐

Section 11.2.7 – Suitable pest control measures, inclusive of employee training, shall be utilized to safeguard PBVs ☐

Section 11.2.7 – Wildlife identified on site that can pose a safety or other risk shall be translocated by trained personnel to suitable receptor areas, where feasible ☐

Section 11.2.7 – Where weed and / or invasive alien species management is required, suitable control measures shall be utilized ☐

Section 11.2.8 – Where the application of the biodiversity mitigation hierarchy does not fully eliminate residual impacts on Critical Habitat, sites shall develop compensatory measures ☐

Section 11.2.9 – If applicable, biodiversity monitoring programs shall be developed, implemented and periodically reviewed, inclusive of the monitoring of any adverse biodiversity impacts (e.g., on PBVs) and to assess the effectiveness of site control measures and the requirement for adaptive management. ☐

Section 11.2.9 – Stock and wildlife mortalities from any site-related activities shall be monitored and reported in accordance with site incident reporting processes and any applicable stakeholder and regulatory reporting processes ☐

Section 11.2.9 – Specialist knowledge shall be sourced and utilized when defining the scale of monitoring programs and the indicators to be monitored ☐

Section 11.2.9 – Monitoring data shall be periodically reviewed and the results communicated to site management and externally as required ☐

Standard 12 - CLIMATE CHANGE AND ENERGY MANAGEMENT

Section 12.2.1 – Sites shall demonstrate implementation of GHG and energy efficiency measures to comply with relevant local, state, and federal regulatory requirements ☐

Section 12.2.2 – Sites shall support the objectives of relevant global climate accords through avoidance, reduction or mitigation of GHG emissions ☐

Section 12.2.3 – Sites shall commission and conduct a baseline energy audit to determine operational and equipment performance. The audit shall be used to benchmark energy use and to identify and evaluate energy saving opportunities based on key criteria ☐

Section 12.2.3 – Site energy audit(s) shall enable sites to improve their understanding of energy use and costs, to prioritize energy savings opportunities and determine estimates for cost savings ☐

Section 12.2.3 – Energy audits shall define the estimated costs and benefits of potential energy efficiency projects that are outlined☐

Section 12.2.4 – Climate risks and opportunities at sites shall be identified through standard risk management processes and integrated into the enterprise risk management system ☐

Section 12.2.4 – Relevant climate risks from each site shall be presented to the B2Gold HSESS Committee ☐

Section 12.2.5 – Sites shall develop, implement and maintain and periodically review a formal Climate and Energy Management Plan that defines the minimum requirements in Section 12.2.5 ☐

Section 12.2.5 – To improve energy performance and efficiency, sites shall reference and utilize the concepts defined in ISO50001:2018 – Energy Management Systems ☐

Section 12.2.5 – Opportunities shall be used to improve energy performance when changes to the business context occur ☐

Section 12.2.6 – Sites shall complete GHG emissions inventories for Scope 1, Scope 2 and Scope 3 emissions ☐

Section 12.2.7 – Sites shall appoint and maintain an appropriate number of Climate Champions to assist in the identification of climate-related risks, opportunities, and priorities across B2Gold, and by ensuring that relevant tasks to reduce GHG emissions are actioned and achieved ☐

Section 12.2.8 – Site energy performance goals and targets shall be reviewed and updated annually. Improvements in energy efficiency and GHG emissions shall include those from sources defined in Section 12.2.8 ☐

Section 12.2.8 – Incorporated into each site's HSE MS Improvement Plans, sites shall ensure that actions identified by the corporate Climate Risk Management Committee are scheduled, resourced and implemented ☐

Section 12.2.9 – Sites shall provide relevant data and information to the B2Gold Corporate office ☐

Section 12.2.10 – Sites shall demonstrate ongoing processes to embed climate risk and energy management into the culture of their operation ☐

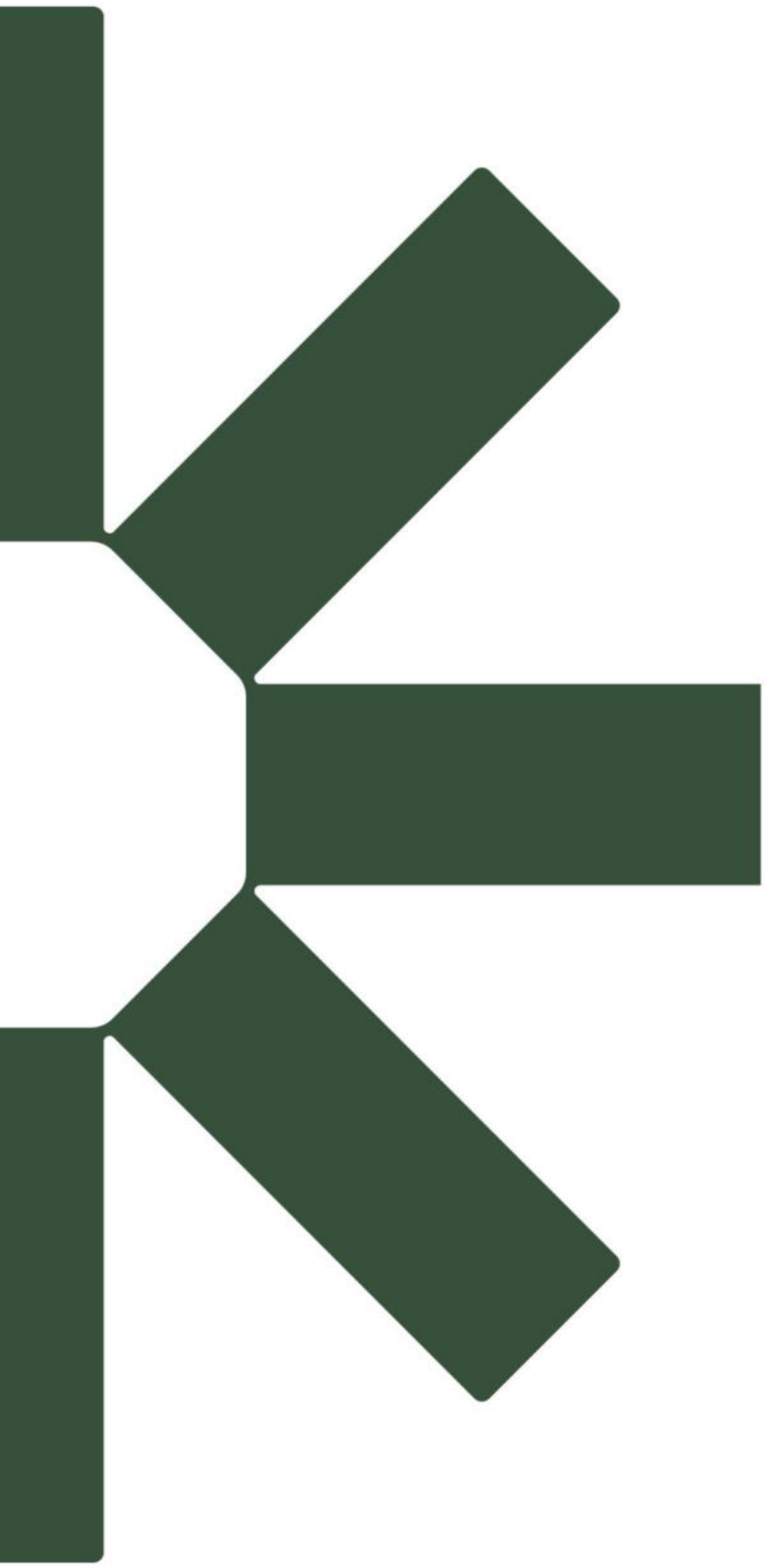
Section 12.2.10 – Site personnel and contractors shall maintain a high level of climate risk and energy awareness and the role they play in achieving energy goals. ☐

Section 12.2.10 – Sites shall identify and create incentives to motivate staff and contractors to improve GHG emissions and energy performance ☐

Section 12.2.11 – Monitoring programs shall be implemented to collect, interpret and report on energy data to verify energy performance and to locate opportunities for reducing energy use and cost ☐

Section 12.2.11 – Energy monitoring systems shall provide both real time and historic electricity usage information ☐

Section 12.2.11 – Sites shall demonstrate a continuous review of energy performance, inclusive of those applicable to relevant processes and related equipment ☐



Making Sustainability Happen