Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

Prepared by:

SLR Environmental Consulting (Namibia) (Proprietary) Limited

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Basis of Report

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Executive Summary

Project Background

B2Gold Namibia (Pty) Ltd (B2Gold) is a Namibian registered Company and a subsidiary of B2Gold Corporation, based in Vancouver, Canada. Otjikoto Gold Mine (OGM) is an operating gold mine owned and operated by B2Gold. The OGM is located in the north-central part of Namibia, approximately 70 km northeast of Otjiwarongo and 50 km south-west of Otavi, within the Otjozondjupa region (refer to the regional locality map below).

B2Gold was granted a Mining License (ML 169) in December 2012 by the Ministry of Mines 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. Mining operations commenced in late 2014. The latest ECC amendment/renewal was granted in March 2023 (currently valid until March 2026). B2Gold currently implement the approved consolidated Environmental Management Plan (EMP), dated September 2021, for the OGM operations.

Since the granting of the ECCs for the OGM, exploration has been undertaken on the existing ML, resulting in the discovery of a potential viable resource, the Antelope deposit, at an alternate location within the OGM ML Boundary. As such, B2Gold intends to develop additional surface infrastructure to mine the newly discovered resource using underground mining methods to extract ore at depth. The underground mining activities for the new Antelope deposit 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 is hereafter referred to as the **Proposed Project**.

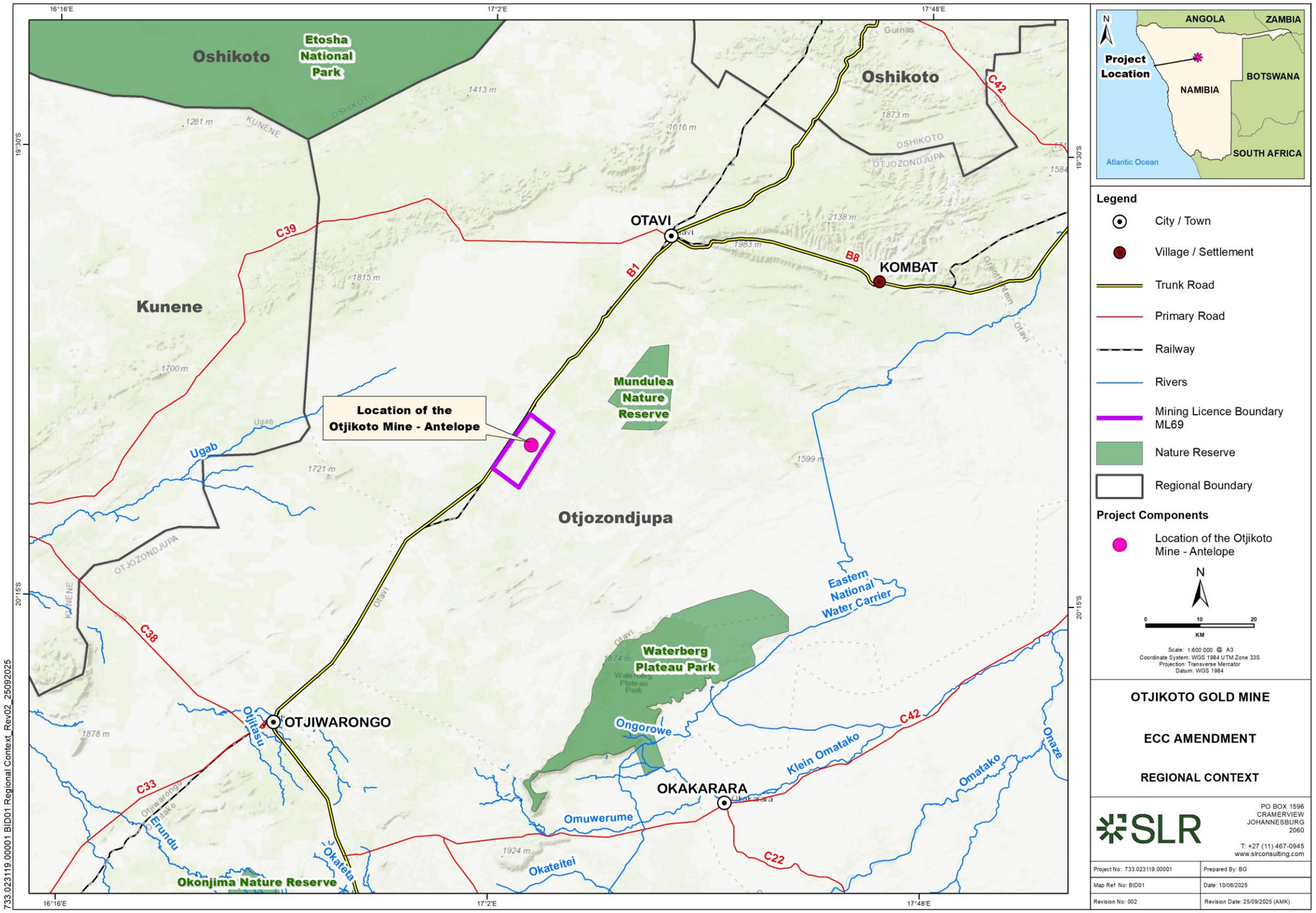
The Proposed Project requires approval of an amended Environmental Impact Assessment (EIA) and EMP by the MEFT (the Competent Authority), through an ECC amendment process. The ECC amendment process will be undertaken in terms of the Environmental Management Act (EMA), Act No. 07 of 2007, gazetted on 27 December 2007 (Government Gazette No. 3966), and Section 19 of the EIA Regulations, which were promulgated on 06 February 2012. The ECC amendment process requires an application phase and an EIA and EMP phase to amend the ECC in accordance with the 2012 EIA Regulations.

Project Overview

Existing 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.

An overview of the existing operations at OGM is provided in detail in the report.



Regional Locality Map for OGM

The proposed Project includes the following surface infrastructure (refer to layout plan below):

- 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 Run of Mine (ROM) pad to the existing processing plant;
- Mineral waste generated from mining is stockpiled as waste rock at the new Waste Rock Dump (WRD); and
- Other infrastructure including a batch plant, workshop/fuel bay, change room/lamp room, laydown area, compressor and game farm fence.

Project Motivation

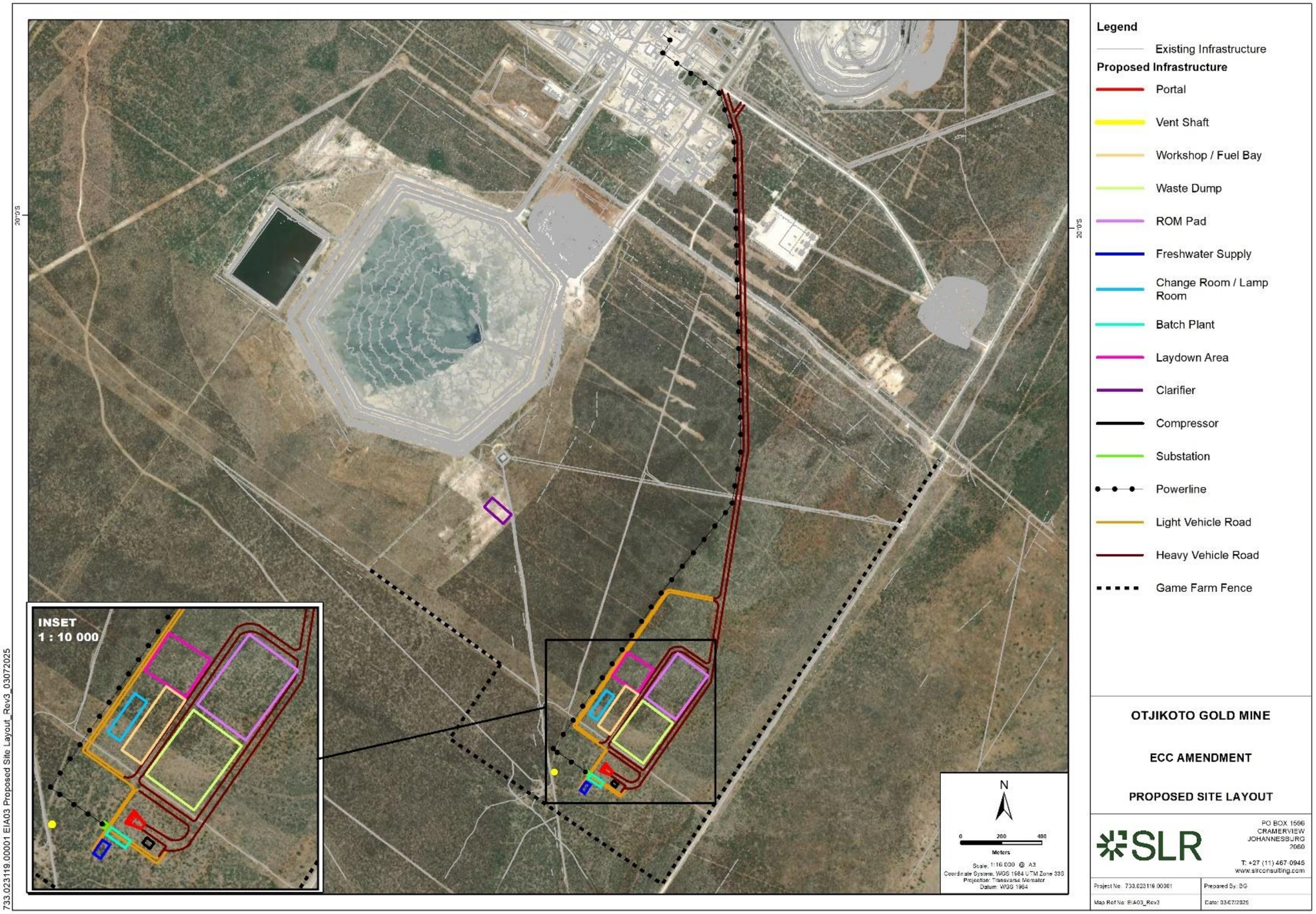
Namibia's Constitution and Vision 2030 emphasise sustainable resource use, environmental protection, and economic diversification. Mining plays a critical role in achieving these goals, contributing significantly to GDP, employment, government revenue, and social development. Between 1981 and 2018, mining contributed an average of 11.1% to GDP, increasing to 14.4% in 2023, and has been a consistent driver of economic growth, job creation, and community investment.

The Antelope deposit hosts an estimated 1.75 Mt grading 6.91 g/t gold, with 390,000 ounces of contained gold. The Project is economically robust, with a forecast LOM after-tax free cash flow of $185 million, an NPV (5%) of $131 million, an IRR of 35%, and a pre-production capital cost of $129 million, with payback in 1.3 years. Strategically, it ensures OGM's continued viability and sustained gold production between 2028 and 2032.

At the national and regional level, B2Gold has already contributed N$19.5 billion to the Namibian economy since 2015, supported a 95% Namibian workforce, achieved 76% local procurement in 2022, and invested over N$123 million in community initiatives. The Project will further enhance fiscal revenues, employment, and skills development, particularly in underground mining.

Locally, the Project safeguards jobs in north-central Namibia where alternatives are limited, strengthens local procurement and SME development, and promotes community upliftment. B2Gold's initiatives include the Otjikoto Nature Reserve and Education Centre, environmental education reaching nearly 5,000 learners, partnerships with UNAM and NUST, and the Environmental Summer School. Broader sustainability efforts include agricultural production at Farm Erhardtshof, supporting food security and long-term post-closure land use.

Overall, the Proposed Project aligns with Namibia's constitutional commitments, Vision 2030, and national development goals. It secures OGM's future, generates significant economic returns, sustains employment, and delivers lasting socio-economic and environmental benefits to Namibia and its people.



Layout Plan for the Proposed Surface Infrastructure

EIA and Public Consultation Process

The EIA process for the Project is regulated under Namibia's Environmental Management Act (EMA), 2007, and its associated regulations. The process ensures that potential environmental and social impacts are identified and mitigated to achieve sustainable project development.

The key phases of the EIA process include:

- Project Initiation Phase: A desktop review was conducted to identify key environmental risks and necessary specialist studies. The Project was registered with the MME and the MEFT. MEFT issued a screening notice requesting an EMP.
- Impact Assessment Phase: A comprehensive evaluation of potential environmental and social impacts, including biophysical and socio-economic factors, was conducted. The assessment incorporated specialist studies and an impact rating methodology to determine significance, reversibility, and mitigation measures.

The findings of the EIA, along with the EMP, will inform the decision-making process for the ECC amendment application. The Project's impacts and mitigation measures are designed to ensure environmentally responsible and sustainable mining operations.

The Public Consultation Process (PCP) is being undertaken per the requirements of Regulation/Part 21 of the EMA as follows:

- Project Initiation Phase: During this phase, Interested and Affected Parties (IAPs) were notified of the Project and invited to provide comments. Stakeholder communications are recorded in Appendix K.
- EIA Phase: The Draft EIA Report will be available for public comment for a two-week period from 17 October 2025 to 31 October 2025. Registered IAPs will receive notifications via email, along with a revised Background Information Document (BID). Once the review and comment period has lapsed, stakeholder feedback will be compiled into an updated Comments and Responses Report (CRR) for inclusion in the Final EIA Report.

  The Final EIA Report will then be submitted to MEFT and MME for review and decision-making.
- Authority Decision Phase: The MEFT will issue a decision on the ECC Amendment Application based on the Final EIA Report and EMP. SLR will notify all registered IAPs of the decision and the appeals process. Further consultation with MEFT and MME may take place as needed until a final decision is reached.

Description of the Current Environment

Biophysical Environment

The baseline biophysical environment of the Project area encompasses key environmental components and is summarised below.

Summary of the Profile of the Biophysical Baseline Environment

Aspect	Description
Topography	The topography of the Project area is characterized by relatively flat terrain with gentle undulations. The Project area is characterised as flat, with elevations across the mining lease area ranging between ~1,480 – 1,530 mamsl. It is important to note that the existing topography has already been altered by the existing mining operations.

Aspect	Description
Climate	Data provided in the report shows temperature averaging at ~21.5°C. Humidity averages at 33%. Most rainfall occurs in summer (~66%), followed by autumn (~20%), with spring (~14%) and winter (<1%) being the driest periods.
Soils and Land Capability	Soils of the Project area are generally dominated by variably coarse texture. The soils are shallow (10 to 20 cm deep), poorly developed and characterised by a mixture of organic and transported sediments of the Kalahari Group aeolian soils and sands. The soils are widely characteristic of calcrete or sediment/soil profiles sometimes with fragmented bedrock or regolith carbonate. Alternatively, dominant soils at OGM can be described as alluvial plain soils of the mollic leptosol type (i.e. shallow, stony, dark, fine-grained soils over a petro-calcic horizon).
Surface Water	There are no well-defined surface water drainage features on or near the site and no major surface water flow or defined channel flow is expected other than local events after heavy rainfall. The Project area is located in the most eastern parts of the Ugab catchment, an ephemeral river catchment draining westwards into the Atlantic Sea. The surface water flow direction at the mine site is in a north-westerly direction, following the gradient towards the Platveld basin. Surface water flow in this region occurs as overland flow accumulating in pans and depressions from where it infiltrates or evaporates.
Geohydrology	The Project is located within the Okonguarri and Karibib Marbles formation. The Karibib Marble Formation serves as the primary aquifer in the area. This geological unit, where exposed on the eastern limb of the anticline in the hills, is karstified and has moderate to high groundwater potential. Water supply to OGM is from boreholes in the Karibib Marble and active dewatering also takes place. Groundwater quality monitoring data shows that some parameters are consistently exceeding the ideal and standard threshold limits of public health concern in all boreholes, such as salinity (EC), Turbidity, Total Hardness, Magnesium (Mg) and Calcium (Ca).
Terrestrial Biodiversity	The site intersects a mosaic of vegetation types typical of Namibia's Acacia Savanna biome, including Karstveld, Thornbush Shrubland, and Northern Kalahari Woodland. Ephemeral pans and sandy savanna patches were assessed as ecologically sensitive features supporting specialist fauna and higher Site Ecological Importance (SEI). The updated assessment recorded several previously identified Species of Conservation Concern (SCC), reaffirmed the presence of six nationally listed raptor species, and highlighted the ecological functionality of the project area as a movement corridor and seasonal foraging area.

Aspect	Description
Noise	The prevailing ambient noise levels throughout the Project area are created by traffic, birds, industrial type activities and domestic activities. The existing mining activities at OGM entail blasting activities which result in existing blasting noise and ground vibration to the receiving environment at the site. Blasting activities occur at least twice a week during the daytime. Monitoring noise from on-site sources ensures the operations meet applicable requirements and leading practices. Monitoring results show that air blast levels and ground vibrations are below the prescribed limits. Ambient noise from the existing operations is also generated on site. Some operational areas which exceed the noise thresholds include the plant mills and the primary crusher during the night period. The predominant sources of noise that the surrounding farms experience are attributed to the B1 road traffic and animal activities, more so than the mining operations.
Air Quality	The Project area is remote and sparsely populated, classified as rural. It is bordered by the Otjikoto Nature Reserve, with isolated homesteads and livestock paddocks dispersed in all directions. Key emission sectors in Namibia relevant to the Project area include mining, biomass burning, agriculture and road traffic. OGM undertake routine ambient air quality monitoring of the air emissions from existing mining activities.

Cultural Heritage

The Project area has a cultural and heritage landscape, encompassing archaeological, historical, and palaeontological resources that are summarised below.

Summary of the Profile of the Cultural Heritage Baseline Environment

Aspect	Description
Archaeological and Cultural Heritage Resources	A previous archaeological survey and assessment was conducted as part of the initial EIA Process in 2012, which identified several sites of archaeological and/or historical significance that are pertinent to the National Heritage Act (27 of 2004) and the Burial Places Ordinance (27 of 1966). None of these sites are directly impacted by the OGM. These sites are mostly burial cairns and historic gravesites identified as QRS 83/1 & 2, QRS 83/3, QRS 83/4, QRS 83/5, QRS 83/6, QRS 83/7, QRS 83/357 and QRS 83/358 that spread across the east and southeast of the OGM and the surrounding game reserve. As part of the current Heritage Impact Assessment, field surveys were undertaken on 2-5th June 2025, 15 June 2025 and 23 June 2025. A possible burial cairn is the only potentially significant heritage feature that was identified to be relevant under the National Heritage Act (27 of 2004).

Socio-Economic

The socio-economic baseline of the Project provides an overview of the region's demographic, economic, infrastructure, and social conditions and is summarised below.

Summary of the Profile of the Socio-economic Baseline Character

Aspect	Description
Visual	While the OGM has resulted in obvious visible landscape alterations/disturbance created by the mining operations, B2Gold has aimed to maintain and preserve the non-mining areas in their natural, pre-developed state, in addition to establishing the 11,000 Ha Otjikoto Education Centre and Nature Reserve adjacent to the mine as part of B2Gold's Corporate Social Investment. The most current visible aspects at OGM are the WRD and the TSF.
Traffic	Main access to the OGM is obtained off the national B1 road. Mine related traffic travels from both Otavi and Otjiwarongo directions daily using the B1 road. Traffic on the B1 is a combination of B2Gold OGM, other mining and businesses, private and tourism related traffic. Internal haul roads are established as part of the existing OGM operations.
Socio-economic Structure / Profile	The OGM is situated in the large, central Otjozondjupa Region. The region is the fifth largest region in Namibia. The total population of the region in 2019 was projected at 160,000 people, and has increased to 220 811 people in 2023. Otjiwarongo, the regional capital, is about 70 km away and Otavi about 50 km away from the OGM. In 2019, the population of Otjiwarongo was estimated to be more than 35,000 people, increasing to 49 022 people in 2023. Otavi is smaller, recording only 6,500 people in 2019 and increasing to 10 756 people in 2023. Urban migration is continuous as reflected in the growth of both neighbouring towns, as people move to seek better opportunities. The socio-economic baseline of the Project area has changed drastically from the pre-development of OGM. The presence of the OGM has brought employment and skills development at the local and regional level, resulting in increased job creation and economic growth. This has also contributed to by other mining projects such as Okuruso and Okanjande and the Whale Rock cement factory of Cheetah Cement near Otjiwarongo and Ohorongo Cement near Otavi. Other factors that have influenced the socio-economy of the region, and in particular Otjiwarongo and Otavi, is the continuous growth of the tourism industry as well as the growing importance of the charcoal industry. Combined, all these factors had a cumulative role in the changing socio-economic landscape of the region (and the two towns). As of the end of June 2024, the total workforce of B2Gold Namibia was 918 employees, of which 861 are based at the OGM, 57 are based off-site (Windhoek office and Exploration Department). Of the 918 employees, 145 are Fixed Term Employees and / or Graduates. The remaining 773 are employed permanently. Most of the workers at Otjikoto reside in Otjiwarongo, and to a lesser extent in Otavi. The Otjozondjupa region has reportedly experienced a decrease in unemployment over the 2018–2023 period, standing at 31.2% in 2023. In terms of access to services within the Otjozondjupa region, there have been some improvements since 2011, but also some declines. Education attainment has increased in percentage since 2011. The proportion of the population that has access to electricity for lighting has risen from 56% to 57.9% since 2011. Rural Household access to formal (flush) toilet facilities has increased from 28.4% to 36.5% in 2023. There has been a slight decline in access to safe drinking water by the population (93.8% in 2023 compared to 94.6% in 2011).

Aspect	Description
Land Uses	The OGM operations and mining activities have commenced since 2014. The proposed surface infrastructure is located within the OGM ML and therefore there will be no change or impact on land use. The surrounding land uses reflect the region's dominant agricultural, conservation, and mineral development.

Impact Assessment

The anticipated impacts associated with the Project were assessed according to SLR's standardised impact assessment methodology which is presented in Section 2.2.2.3 of the main report. The impact assessment methodology enables the assessment of biophysical, cultural, and socio-economic impacts including cumulative impacts and impact significance through the consideration of intensity, extent, duration, and the probability of the impact occurring.

The assessment indicates that the Project's impacts post-mitigation ranges from highly positive and Very Low to Medium negative. A summary of the EIA is provided below.

A comparative analysis of the impacts assessed in the 2012 and 2019 EIA indicates that the revised Proposed Project will not result in increased adverse impacts. The changes in layout and LOM have led to an expanded operation with an extended LOM, contributing to impacts with a higher positive significance rating. While certain potential impacts identified during the Impact Assessment Phase were classified as highly significant, appropriate mitigation measures, as outlined in the EMP, can effectively minimize these adverse effects. Implementation of the EMP will be subject to ongoing monitoring and auditing to evaluate the efficacy of the prescribed mitigation measures.

All negative environmental and social impacts identified will be managed and mitigated to acceptable levels, whilst the positive impact will be enhanced to realise the potential positive impacts through the implementation of the commitments stipulated in the EMP. B2Gold will be responsible for ensuring that all environmental and social obligations pertinent to the proposed Project are met. The implementation of the EMP and meeting of the environmental objectives and targets of OGM has been prepared and attached in Appendix J. The EMP contains specific management measures recommended by the specialists that should be implemented.

Environmental Statement and Conclusion

It is anticipated that it will be possible to successfully mitigate all of the environmental impacts to acceptable levels and the implementation will be monitored and audited to determine the effectiveness of the measures implemented.

No fatal flaws/aspects have been identified that could render this the Project unfeasible and impractical. Therefore, it is SLR's opinion that, based on the findings of the EIA process, there is no reason why the proposed development may not continue subject to the implementation of recommended mitigation measures. The Project should be allowed to proceed, considering the positive social and economic benefits associated with the Project.

Opportunity to Comment on the EIA Report

SLR has compiled this report, which is an EIA Report of the Project. This report is currently available for review and comment. The EIA Report outlines the steps undertaken to date, including public participation; provides detail on the Project activities and provides a description of the affected environment.

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Appendices

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Appendix B **Project Team CVs**
Appendix C **ECC Amendment Application**
Appendix D **MEFT Environmental Screening Notice**
Appendix E **Air Quality Impact Assessment**
Appendix F **Desktop Hydrogeological Appraisal**
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Appendix H **Noise Impact Assessment**
Appendix I **Heritage Impact Assessment**
Appendix J **Environmental Management Plan**
Appendix K **Public Consultation Record**

Acronyms and Abbreviations

Abbreviation/Acronym	Definition
ABA	Acid Base Accounting
AQIA	Air Quality Impact Assessment
BID	Background Information Document
COD	Cone Of Drawdown
CRF	Cemented Rock Fill
CRR	Comments and Responses Report
CVs	Curricula Vitae
dB	decibels
dBA	decibels A
DEA	Department of Environmental Affairs
DFO	Dust fallout
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act, 2007 (No. 7 of 2007)
EMP	Environmental Management Plan
ESIA	Environmental Scoping and Impact Assessment
ESS	Environmental Summer School
GDP	Gross Domestic Product
GHG	Greenhouse Gas
HFO	Heavy Fuel Oil
IAPs	Interested and Affected Parties
IBAs	Important Bird Areas
IFC	International Finance Corporation
IUCN	Union for Conservation of Nature
KBAs	Key Biodiversity Areas
LGD	Low-grade Dump
LOM	Life of Mine
LSOP	Little Shop of Physics
mamsl	Metres Above Mean Sea Level
mbgl	Metres Below Ground Level
MEFT	Ministry of Environment, Forestry and Tourism
ML	Mining License
Mm^3	Million Cubic Metres

Abbreviation/Acronym	Definition
MME	Ministry of Mine and Energy
NHC	National Heritage Council
NPC	National Planning Commission
NUST	Namibia University of Science and Technology
OGM	Otjikoto Gold Mine
PCP	Public Consultation Process
PEA	Preliminary Economic Assessment
PM	Particulate Matter
PM_{10}	Particulate Matter ≤ 10 µm
$PM_{2.5}$	Particulate Matter ≤ 2.5 µm
PV	Photovoltaic
ROM	Run of Mine
SCC	Species of Conservation Concern
SEI	Site Ecological Importance
STP	Sewage Treatment Plant
TSF	Tailings Storage Facility
TSP	Total Suspended Particulates
VECs	Valued Environmental Components
VOCs	Volatile Organic Compounds
WHO AQG	World Health Organisation Air Quality Guidelines
WRD	Waste Rock Dump
WRF	Weather Research and Forecasting

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).
Leq-dBA	Equivalent Continuous Sound Level, A-Weighted: Leq-dBA is a measure of the average sound level over a specified period, expressed in A-weighted decibels (dBA). It represents the constant sound level that, over the same time period, would deliver the same total sound energy as the varying noise being measured.
Lmax - dBA	Maximum Sound Level, A-Weighted: Lmax-dBA is the highest instantaneous sound pressure level recorded during a specified measurement period, expressed in A-weighted decibels (dBA). It captures the single loudest moment of noise exposure, rather than an average over time.
Lmin - dBA	Minimum Sound Level, A-Weighted: Lmin-dBA is the lowest instantaneous sound pressure level recorded during a specified measurement period, expressed in A-weighted decibels (dBA). It indicates the quietest moment captured within the measurement timeframe.
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

1.1 Project Background

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 projects in various countries.

B2Gold was granted a Mining License (ML 169) in December 2012 by the Ministry of Mines 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. Mining operations commenced in late 2014. The following main ECC amendments and renewals have been undertaken since:

- October 2013: ECC Amendment due to changes to the project (Landfill Facility and Heavy Fuel Oil (HFO) Power Plant);
- January 2015: ECC Amendment due to changes to the OGM operations;
- May 2017: ECC Amendment due to the upgrade of the HFO Power Plant to a Photovoltaic (PV) Solar Power Plant as well as amendments to the Hazardous Waste Management Plan;
- August 2018: Renewal of the ECC;
- July 2020: ECC Amendment to include underground mining activities, and Renewal of the ECC; and
- March 2023: Renewal of the ECC (currently valid until March 2026).

B2Gold currently implements the approved consolidated Environmental Management Plan (EMP), dated September 2021, for the OGM operations. A copy of the latest valid ECC is included in Appendix A.

Mining operations have taken place at the OGM since December 2014 via the following 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.

Excavated ore and waste from the Otjikoto opencast pit and the underground Wolfshag pit is loaded and hauled to a single ROM pad, before being processed. 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 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 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 is stored in the lined Tailings Storage Facility (TSF). Process water from the tailings dam is stored in the return water dam for re-use.

1.2 Project Overview

Since the granting of the ECCs for the OGM, exploration has been undertaken on the existing ML, which has resulted in the discovery of a potential viable resource, the Antelope deposit, at an alternate location within the OGM ML boundary. As such, B2Gold intends to develop additional surface infrastructure to mine the newly discovered resource using underground mining methods to extract ore at depth.

The underground mining activities for the new Antelope deposit 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 (hereafter referred to as the **proposed Project**). A detailed description of the Project is provided in Section 3.

The Proposed Project requires approval of an amended Environmental Impact Assessment (EIA) and EMP by the MEFT (the Competent Authority), through an ECC amendment process. The ECC amendment process will be undertaken in terms of the Environmental Management Act (EMA), Act No. 07 of 2007 gazetted on 27 December 2007 (Government Gazette No. 3966), and Section 19 of the EIA Regulations, which were promulgated on 06 February 2012. The ECC amendment process required includes an application phase and an EIA and EMP phase to amend the ECC in terms of the 2012EIA Regulations.

This report constitutes the EIA Report undertaken for the ECC amendment. B2Gold has appointed SLR to facilitate this process.

1.3 Proposed Project Location

The OGM is 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 (refer to Figure 1-1 for a regional locality map).

The Mundulea Private Nature Reserve is located approximately 10 km northeast of the OGM. The Etosha National Park, a major wildlife sanctuary, is over 120 km to the northwest and the Waterberg Plateau Park is over 30 km to the southeast. Adjacent to the OGM are commercial farms and lodges, as well as the Otjikoto Nature Reserve established by B2Gold. The transport network is well-developed in the area, with roads and railway lines that support both passenger and freight movement. The OGM is situated on the east of the B1 national road and railway line, with access to the OGM off the B1 national road.

The Proposed Project area is located within the OGM ML and thus is situated in a brownfield site where gold mining operations currently take place. The properties on which the OGM is located are owned by B2Gold. The ML area is approximately 6 934 Ha in size. The central geographical position of the Project area is at latitude 20.020068°S and longitude 17.093529°E.

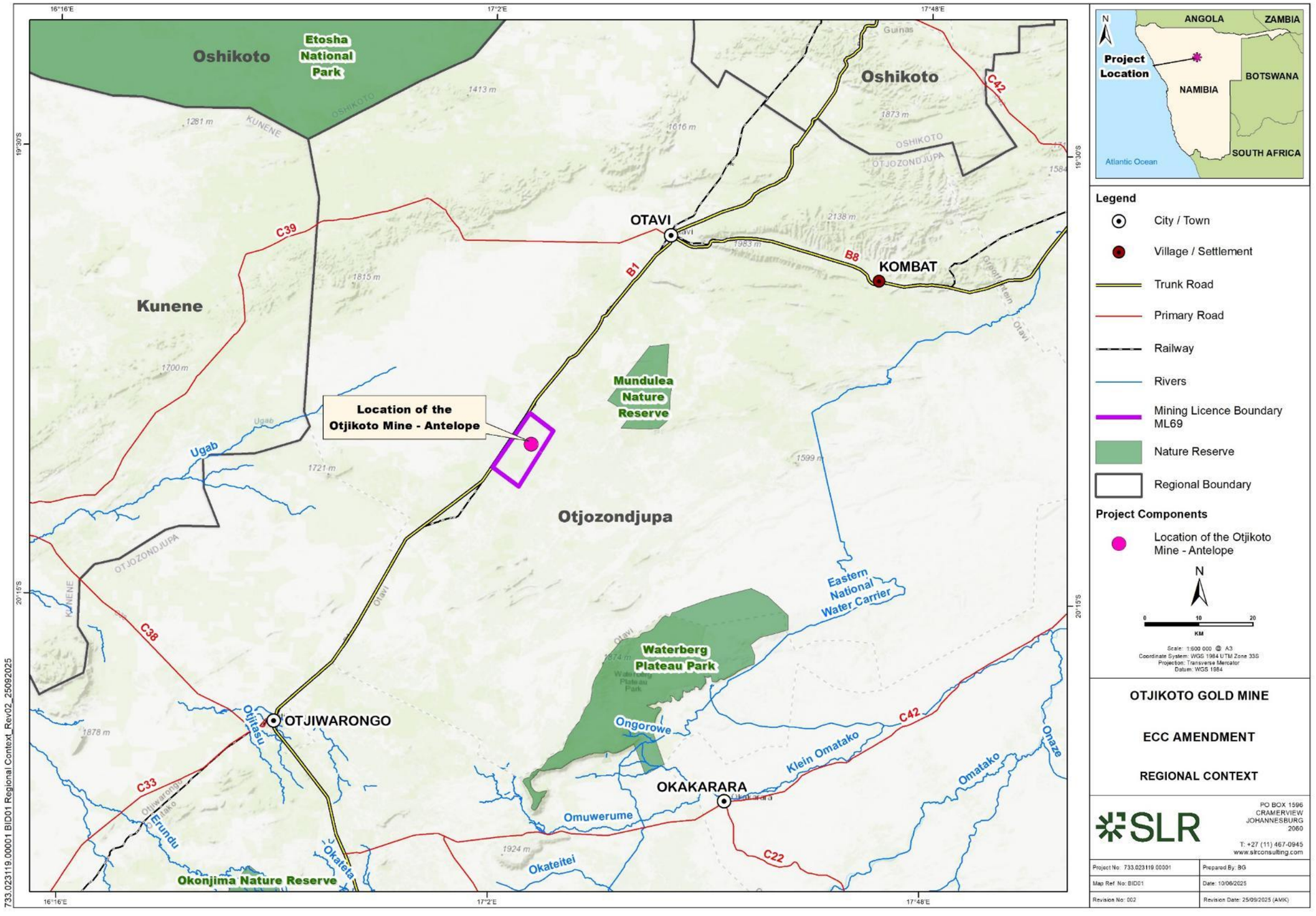


Figure 1-1: Regional Locality Map

1.4 Public Consultation Process Going Forward

This EIA Report is being made available for a 14-day comment period from **17 October 2025 to 31 October 2025**.

Interested and Affected Parties (IAPs) have the opportunity to comment on the Proposed Project and findings of the EIA process. The full report can be downloaded from the SLR website and hard copies are available at the following locations:

- Otjiwarongo public library
- Otavi public library

Comments should be sent to SLR at the address, telephone/fax numbers or e-mail address shown below. For comments to be included in the Final EIA Report, comments should reach SLR by **no later than 31 October 2025.**

SLR Environmental Consulting (Namibia) (Pty) Ltd

E-mail: otjikoto@slrconsulting.com

Tel: +264 61 231 287

Post: PO Box 86386, Windhoek

2.0 Environmental Impact Assessment Process

2.1 Environmental Impact Assessment Team

SLR, part of the SLR Group, is an independent firm of consultants that has been appointed by B2Gold to undertake the EIA processes in support of the ECC amendment application. SLR is an international environmental consulting and advisory company that provides services and expertise to a varied and diverse client base across the globe. SLR provides a full range of technical and environmental services throughout the Project life cycle from initial site assessment and design, site identification and acquisition through detailed design, engineering, environmental impact assessment, planning, permitting, and compliance, to final restoration and after use, including long-term care and maintenance.

The details of the team, including the Environmental Assessment Practitioners (EAPs) and specialists undertaking the EIA process, are provided in Table 2-1. The Curricula Vitae (CVs) of the team are provided in Appendix B.

Table 2-1: Environmental Project Team

Team	Name	Designation	Tasks and roles	Company
B2Gold Project Team	Angie-Ritta Kanandjembo	Environmental Manager	Responsible for the interface between B2Gold and the environmental team, and for ensuring the implementation of the EIA outcomes.	B2Gold
	Miya Kabajani	Environmental Officer		
Environmental Project Team	Natasha Smyth	Project Quality Assurance and Reviewer	Report review and approval (Quality Control and Assurance)	SLR Consulting
	Njabulo Mzilikazi	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
	Dr Alma Nankela	Archaeologist	Cultural Heritage Assessment	Quaternary Research Services

Natasha Smyth is responsible for various environmental assessment Projects and has 15 years of experience within the minerals sector, both as a Project manager and director to various Projects. She has managed a wide range of EIA Projects for major and small-scale minerals developments for many of the major operators within the minerals industry. Since

2009 Natasha has been involved in over 80 Projects varying in complexity. Natasha is registered as an Environmental Assessment Practitioner with the Environmental Assessment Practitioners' Association of South Africa and is a member of the International Association for Impact Assessment South Africa.

Njabulo Mzilikazi has eight years of experience working as an environmental consultant. Njabulo leads multi-disciplinary EIA Projects from the screening and application phase to the impact assessment and submission to authorities for decision. Her experience spans across the mining and built environment industries in both public and private sectors. Njabulo has worked on gap assessments in which she identifies the client's need for compliance with Project-specific, local, and international environmental legislation, regulations and standards.

Kristy van der Hoven is a registered Professional Natural Scientist (SACNASP Reg Number 116238) in the field of Environmental Science and a registered Environmental Assessment Practitioner (EAPASA Reg Number 2020/2129) with an MSc Degree in Environmental Sciences. She has over 12 years of experience in management and compilation of both local and international Environmental and Social Impact Assessments. Kristy has key experience in the energy, residential, water, waste, mining and infrastructure sector. Kristy has undertaken projects throughout South Africa, as well as in Saudi Arabia, Sierra Leone, and Tanzania.

2.2 Environmental Impact Assessment Process

EIAs are regulated by the MEFT in terms of the EMA gazetted on 27 December 2007 (Government Gazette No. 3966) and the EIA Regulations, which were promulgated on 06 February 2012.

In order to ensure compliance with the objectives of EMA and the EIA Regulations, the EIA process seeks to identify the environmental consequences of the Project from the beginning and helps to ensure that the Project, over its life cycle, will be environmentally acceptable and sustainably integrated into the surrounding environment. It further seeks to provide the decision-making authorities with sufficient and accurate information in order to make a sound decision on the Project and set conditions that must be adhered to.

After SLR's submission of the application form (see Appendix C), the MEFT requested that a project-specific EMP be developed (see Appendix D for the screening notice from MEFT). In compliance with this, SLR has compiled this EIA Report to inform the EMP, which is appended as Appendix J.

After submitting the ECC Amendment Application and Final EIA and EMP to the MME, the MME is then required to make a recommendation on the acceptance or rejection of the report to MEFT, who will make the final decision on the ECC Amendment Application.

The Environmental Commissioner can issue an ECC upon receipt of an application for environmental clearance in the form of an EIA or for classified small projects through receipt of baseline information on the likely environmental impacts associated with a project. However, due to the scope of the Project, a full EIA will be undertaken.

The EIA process for the Project is undertaken as follows:

- Project Initiation (Screening) Phase;
- Impact Assessment Phase and EMP.

The following sections provide a summary of the EIA approach taken, as well as the key steps and corresponding activities.

2.2.1 Project Initiation Phase

The initiation phase has been completed and included the following tasks:

- Desktop review of the available information to become familiar with the Project, the geographical area, other projects in the area and any other information that may assist in the execution of the EIA process.
- Scoping of key environmental risks/potential impacts, and confirming the need for specialist studies.
- Identification of key stakeholders that need to be involved in the process, and developing and updating the stakeholder database.
- Confirmation of the list of activities, according to the EMA, that are associated with the Project, and which may not commence without an ECC.
- Registration of the Project and EIA process with the MME and MEFT. This was done through the submission of an electronic copy of the ECC Amendment Application form, together with a Background Information Document (BID), through the MEFT portal, as well as the submission of a hard copy of the ECC Amendment Application to MME and MEFT on 11 July 2025 (Appendix C).
- The MEFT reviewed the ECC Amendment application, BID and project layout plan and issued an environmental screening notice, requesting that an EMP be compiled and submitted to the MEFT for final decision-making. A copy of the environmental screening notice is attached in Appendix D.

2.2.2 Environmental Impact Assessment Phase

The objectives of the Impact Assessment phase are to:

- Provide an overview of the legal requirements relevant to the Project (Section 3).
- Provide a description of the Project (Section 4).
- Provide a description of the Project alternatives assessed (Section 5);
- Provide baseline environmental and social information on the Project area (Section 7).
- Outline the approach and impact assessment methodology used in the process, e.g. the impact rating methodology (Section 2.2.2.3).
- Identify and assess the environmental (biophysical and socio-economic) impacts, including cumulative impacts, of the construction, operation, and decommissioning impacts of the Project (Section 9).
- Identify and evaluate potential management and mitigation measures that will reduce the negative impacts of the Project and enhance the positive impacts, as well as training needs in the EMP (Appendix J).
- Undertake the required Public Consultation Process (Section 10).
- Provide the decision-making authorities with sufficient and accurate information in order to make a decision on the Project.

The specialist findings and other relevant information have been integrated into the impact assessment (Section 9).

Key environmental and social impacts that may result from the Project were identified based on the nature of the development (as described in Section 4) and the receiving environment (as described in Section 7). Impacts were then assessed, either by the SLR EIA team or, in the case of key impacts requiring more specific knowledge, by specialists in each particular field, using the impact assessment methodology as described below.

The impact assessment methodology enables the assessment of biophysical, cultural, and socio-economic impacts, including cumulative impacts and impact significance, through the consideration of intensity, extent, duration, and the probability of the impact occurring. Consideration is also given to the degree to which impacts may cause irreplaceable loss of resources, can be avoided, reversibility of the impacts and the degree to which the impacts can be mitigated.

2.2.2.1 Alternatives

In accordance with Section 15 (2) (f) of the 2012 EIA Regulations, feasible alternatives need to be considered and assessed. Details on the assessment of Project alternatives are provided in Section 5.

2.2.2.2 Specialist Studies

Five specialist studies were undertaken in order to assess the impacts associated with the proposed surface infrastructure. Specific ToRs were given for each of the specialist studies (Table 2-2).

The generic ToR for each specialist study were to:

- Describe the existing baseline characteristics of the study area and place this in a regional context.
- Identify and assess potential impacts resulting from the Project (including impacts associated with the construction and operation of the Project), using SLR's prescribed impact rating methodology.
- Identify and describe potential cumulative impacts resulting from the Project in relation to the surrounding area.
- Recommend mitigation measures to avoid or minimise impacts and/or optimise benefits associated with the Project.
- Recommend and draft a monitoring plan, if applicable.

Certain impacts that are anticipated to be of limited or lower significance, either by virtue of the scale of the impacts, their short duration (e.g., construction phase only), disturbed nature of the receiving environment and/or distance to communities, were assessed by the SLR Environmental Consultants and reported directly into the EIA Report and accompanying EMP.

Copies of the full specialist assessment reports are included in Appendix E to Appendix I.

Table 2-2: Specialist Terms of Reference

Specialist Assessment	Specialists Terms of Reference
Biophysical environment	
Biodiversity Impact Assessment	Desktop Lists of potentially occurring species will be generated using previous biodiversity studies in the project area, as well as available biodiversity bases, particularly the following: • Environmental Information Service (http://the-eis.com/) • iNaturalist (https://www.inaturalist.org/home) • Global Biodiversity Information Services (https://www.gbif.org/)

Specialist Assessment	Specialists Terms of Reference
	Focus will be placed on records of Species of Conservation Concern (SCC), i.e. Union for Conservation of Nature (IUCN) threatened species, restricted-range species, as well as Protected Species. Transects will be selected based on inspection of satellite imagery and ensuring that all habitats are covered. <u>Fieldwork</u> Transects will be walked through areas of potential surface infrastructure and surrounding areas, ensuring that all potentially impacted habitats are covered. All observations of avifauna, mammals and herpetofauna will be recorded, including the following data: • Date • Time • Weather • Habitat • Observation type (observed, heard, spoor, faeces, etc.) • No. of individuals Observations on vegetation will comprise data on dominant plant species in each habitat. Unidentified species will be photographed for identification once fieldwork is complete. Observations will be made on the suitability of habitat for potentially occurring plant SCC. <u>Reporting</u> A terrestrial biodiversity baseline and impact assessment will be prepared that include the following: • Biodiversity baseline description • Vegetation map • Ecological Importance Assessment • Ecological Importance map • Impact Assessment <u>Relevant Project Information</u> The following EIA reports for the Otjikoto Mine are available: • 2012 EIA for the open pit mine; and • 2019 EIA amendment for the underground mine.
Groundwater Assessment	• Review of existing EMPs, including the 2012 EIA and subsequent assessments to the extent of coverage in the original EIA, current and planned underground mining workings, numerical groundwater report, borehole information and other associated baseline reports; • Review of water-related legislation relating to underground mining operations; • Develop a gap analysis and recommend additional investigations to mitigate gaps identified; • Identify and assess risks associated with the planned underground mining and recommend mitigation measures; and • Apply for a groundwater abstraction and mine dewatering licence with the Ministry of Agriculture Water and Land Reform.
Air Quality Impact Assessment (AQIA)	• Desktop review (using available information), including: o A description of the study area and Project activities;

Specialist Assessment	Specialists Terms of Reference
	○ A summary of applicable air quality legislation and international guidance; and ○ A review of the receiving environment, including identification of possible sensitive receptors, proximate pollution sources, prevailing meteorological conditions and baseline ambient air quality measurements. • An emissions inventory for key emission sources using available activity information and internationally recognised emission factors for process relevant pollutants. • Air dispersion modelling using AERMOD View. • Impact significance assessment through the comparison of predicted concentrations with relevant national standards and international guidelines. • Identify practicable air quality management and mitigation measures to minimise negative impacts.
Noise Impact Assessment	• Baseline assessment; • Acoustic inventory; • Noise modelling; • Impact Assessment; and • Noise impact assessment report.
Cultural Heritage	
Archaeological and Heritage Impact Assessment	• Project documents review (reports, GIS & KML maps and all relevant project related information) including preparation of assessment and field survey forms. • Archaeological field survey to the proposed infrastructure (portal and vent shaft) as well as mining areas as well as monitoring of previously assessed sites and conduct interviews. • Post-Fieldwork Analyses: Data analysis (written / audio records and photography), interpretations, report writing & management recommendations.

2.2.2.3 Methodology Used to Determine Impact Significance

Evaluation of impact significance follows a stepwise process as set out below. Part A (Table 2-3) provides the definition for determining impact consequence (combining intensity, extent, and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Parts B (Table 2-4) and Part C (Table 2-5). The impact significance is interpreted in Part D (Table 2-6). This methodology is utilised to assess both the incremental and cumulative project related impacts.

Table 2-3: Criteria and Definitions for Determining Consequence and Significance

Part A: Definitions and Criteria	
Definition of SIGNIFICANCE	**Significance = consequence x probability**
Definition of CONSEQUENCE	**Consequence is a function of intensity, extent, and duration**

Part A: Definitions and Criteria		
Criteria for ranking of the INTENSITY of environmental impacts	**VL**	• Negligible change (severity), disturbance, or nuisance with very minor consequences or deterioration. • Targets, limits, and thresholds of concern never exceeded. • Species or habitats with negligible importance.
	L	• Minor (Slight) change (severity), disturbance, or nuisance with minor consequences or deterioration. • Targets, limits, and thresholds of concern rarely exceeded. • Habitats and ecosystems which are degraded and modified.
	M	• Moderate change (severity), disturbance, or discomfort with real but not substantial consequences. • Targets, limits, and thresholds of concern may occasionally be exceeded. • Habitats or ecosystems with important functional value in maintaining biotic integrity.
	H	• Prominent change (severity), disturbance, or degradation with real and substantial consequences. • May result in illness or injury. • Targets, limits, and thresholds of concern regularly exceeded. • Habitats or ecosystems which are important for meeting national/provincial conservation targets.
	VH	• Severe change (severity), disturbance, or degradation with severe consequences. • May result in severe illness, injury, or death. • Targets, limits, and thresholds of concern are continually exceeded. • Habitats or ecosystems of high importance for maintaining the persistence of species or habitats that meet critical habitat thresholds.
	VL+	• Negligible change or improvement. • Almost no benefits. • Change not measurable/will remain in the current range.
	L+	• Minor change or improvement. • Minor benefits. • Change not measurable/will remain in the current range.
	M+	• Moderate change or improvement. • Real but not substantial benefits.

Part A: Definitions and Criteria		
		• Will be within or marginally better than the current conditions.
	H+	• Prominent change or improvement. • Real and substantial benefits. • Will be better than current conditions.
	VH+	• Substantial, large-scale change or improvement. • Considerable and widespread benefit. • Will be much better than the current conditions.
Criteria for ranking the DURATION of impacts	**Very Short term**	Very short, always less than a year or may be intermittent (less than 1 year). Quickly reversible.
	Short term	Short term occurs for more than 1 but less than 5 years. Reversible over time.
	Medium term	Medium-term, 5 to 10 years.
	Long term	Long term, between 10 and 20 years. Likely to cease at the end of the operational life of the activity or because of natural processes or by human intervention.
	Permanent	Very long, permanent, +20 years. Irreversible. Beyond closure or where recovery is not possible either by natural processes or by human intervention.
Criteria for ranking the EXTENT of impacts	**Portion of site**	The impact is limited to the immediate footprint of the activity and within a confined area.
	Whole site	The impact is limited to the immediate footprint of the activity and within a confined area.
	Beyond site	Beyond the site boundary, affecting immediate neighbours.
	Local	The impact extends far beyond the site boundary.
	Regional/ National	The impact extends beyond district or regional boundaries, with national implications.

Table 2-4: Determining Consequence

Part B: Determining Consequence – Applies to Potential Positive or Adverse Impacts						
		EXTENT				
		Portion of site	**Whole site**	**Beyond the site, affecting neighbours**	**Local area extending far beyond site**	**Regional/ National**
INTENSITY = VL						
DURATION	**Very short term**	Very Low	Very Low	Very Low	Low	Low
	Short term	Very Low	Very Low	Low	Low	Medium
	Medium term	Very Low	Low	Low	Medium	Medium

Part B: Determining Consequence – Applies to Potential Positive or Adverse Impacts						
	Long term	Low	Low	Medium	Medium	Medium
	Very long term/permanent	Low	Medium	Medium	Medium	High
INTENSITY = L						
DURATION	**Very short term**	Very Low	Very Low	Low	Low	Medium
	Short term	Very Low	Low	Low	Medium	Medium
	Medium term	Low	Low	Medium	Medium	Medium
	Long term	Low	Medium	Medium	Medium	High
	Very long term/permanent	Medium	Medium	Medium	High	High
INTENSITY = M						
DURATION	**Very short term**	Very Low	Low	Low	Medium	Medium
	Short term	Low	Low	Medium	Medium	Medium
	Medium term	Low	Medium	Medium	Medium	High
	Long term	Medium	Medium	Medium	High	High
	Very long term/permanent	Medium	Medium	High	High	High
INTENSITY = H						
DURATION	**Very short term**	Low	Low	Medium	Medium	Medium
	Short term	Low	Medium	Medium	Medium	High
	Medium term	Medium	Medium	Medium	High	High
	Long term	Medium	Medium	High	High	High
	Very long term/permanent	Medium	High	High	High	Very High
INTENSITY = VH						
DURATION	**Very short term**	Low	Medium	Medium	Medium	High
	Short term	Medium	Medium	Medium	High	High
	Medium term	Medium	Medium	High	High	High
	Long term	Medium	High	High	High	Very High
	Very long term/permanent	High	High	High	Very High	Very High

Table 2-5: Determining Significance

Part C: Determining Significance - Applies to Positive or Adverse Impacts						
		CONSEQUENCE				
		Very Low	**Low**	**Medium**	**High**	**Very High**
PROBABILITY	**Unlikely**	Insignificant	Insignificant	Very Low	Low	Medium

Part C: Determining Significance - Applies to Positive or Adverse Impacts						
(of exposure to impacts)	**Conceivable**	Insignificant	Very Low	Low	Medium	High
	Possible/ frequent	Insignificant	Very Low	Low	Medium	High
	Probable/ likely	Very Low	Low	Medium	High	Very High
	Highly likely/ definite/ continuous	Very Low	Low	Medium	High	Very High

Criteria for ranking the PROBABILITY of impacts	**Unlikely**	Where the possibility of the impact to occur is very low or not expected to occur, i.e. ≤ 5% chance of occurring.
	Conceivable	Where the impact could occur but there is little evidence to suggest that it would happen. >5 to ≤35% chance of occurring.
	Possible/frequent	Where there is a reasonable probability that the impact would occur, i.e. >35 to ≤65% chance of occurring.
	Probable/likely	Where there is high probability that the impact would occur and is not continuous i.e. >65 but ≤95 % chance of occurring.
	Highly Likely/ Definite/ Continuous	Where an impact is certain to occur, >95 to 100% chance of occurring.

Table 2-6: Interpretation of Significance

Part D: Interpretation of Significance		
Significance		**Decision guideline**
Insignificant		Inconsequential, not requiring any consideration.
Very Low	**Very Low +**	These beneficial or adverse impacts will not influence the decision. In the case of adverse impacts, mitigation is not required.
Low	**Low +**	These beneficial or adverse impacts are unlikely to influence the decision. In the case of adverse impacts, limited mitigation is likely to be required.
Medium	**Medium +**	These beneficial or adverse impacts may be important but are not likely to be key decision-making factors. In the case of adverse impacts, mitigation will be required.
High	**High +**	These beneficial or adverse impacts are considered to be very important considerations and must influence the decision. In the case of adverse impacts, substantial mitigation will be required.
Very High	**Very High +**	Represents a key factor in decision-making. Adverse impact would be considered a potential fatal flaw unless mitigated to lower significance.

2.2.2.4 Cumulative Impacts

Cumulative impacts (assessed in Section 9.5) are those that result from incremental and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably defined projects. For practical reasons, the identification and

management of cumulative impacts are limited to those effects generally recognised as important based on scientific concerns and/or concerns of affected communities.

The overall goal is to identify impacts that, in the context of existing, planned, and reasonable predictable developments, may generate cumulative impacts that could jeopardize the overall long-term environmental, social, and economic sustainability of the Project and the region in which the Project is situated. The assessment has the following objectives:

The assessment outcomes are as follows:

- Identification of selected aspects of the social and natural environment that are likely to result in cumulative impacts.
- Identification of other existing and reasonably anticipated and/or planned projects in the vicinity of the Project.
- Identification of external environmental and social stressors that could contribute to cumulative impacts.
- Assessment of the future condition of the selected social and environmental components as the result of the Project's cumulative impacts combined with those of other developments and external stressors.
- Identification of cumulative impact avoidance and minimisation measures.

- Definition of monitoring and management of cumulative environmental and social risks.

2.2.2.5 Residual Impacts

Residual impacts (assessed in Section 9.6) refer to the remaining environmental or social impacts after all feasible mitigation measures have been applied. These impacts are those that cannot be entirely avoided, reduced, or offset despite the implementation of mitigation strategies. The residual impacts are identified, and project proponents must take comprehensive, transparent, and proactive steps to manage these impacts. This includes compensating affected parties, implementing offsets, engaging with stakeholders, and continuously monitoring and adapting management strategies to ensure long-term sustainability and minimal adverse effects on the environment and communities.

2.2.2.6 Structure of the EIA Report and EMP

Section 15 of the 2012 EIA Regulations stipulates the minimum requirements and issues that need to be addressed in the EIA Report and EMP.

A project specific EMP has been developed for the Project and includes mitigation and management measures aimed at ensuring that impacts associated with the Project are avoided and/or minimised. A copy of the Project EMP is attached as Appendix J.

Table 2-7 indicates requirements in the 2012 EIA Regulations and where they have been addressed in the EIA.

Table 2-7: Requirements of Regulation 15 (2) of the EIA Regulations

Section of the EIA Regulations, 2012	Description of EIA Regulations Requirements for EIA Reports	Completed	Section
Regulation 15 (2)	An assessment report must contain all information that is necessary for the Environmental Commissioner to consider and to make a decision on the application, and must include -		
Regulation 15 (a)	The curriculum vitae of the EAP who compiled the report.	Yes	Section 2.1 Appendix B
Regulation 15 (b)	A detailed description of the proposed activity.	Yes	Section 4
Regulation 15 (c)	A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity.	Yes	Section 7 Appendix E to Appendix I
Regulation 15 (d)	A description of the need and desirability of the proposed listed activity and identified potential alternatives to the proposed listed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity.	Yes	Section 6
Regulation 15 (e)	An indication of the methodology used in determining the significance of potential effects.	Yes	Section 2.2.2.3
Regulation 15 (f)	A description and comparative assessment	Yes	Section 5 and

Section of the EIA Regulations, 2012	Description of EIA Regulations Requirements for EIA Reports	Completed	Section
	of all alternatives identified during the assessment process.		Section 8.2
Regulation 15 (g)	A description of all environmental issues that were identified during the assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures.	Yes	Section 8 and Section 9 Appendix J
Regulation 15 (h)	An assessment of each identified potentially significant effect, including -		
Regulation 15 (h) (aa)	Cumulative effects.	Yes	Section 9.5
Regulation 15 (h) (bb)	The nature of the effects.	Yes	Section 9
Regulation 15 (h) (cc)	The extent and duration of the effects.		
Regulation 15 (h) (dd)	The probability of the effects occurring.		
Regulation 15 (h) (ee)	The degree to which the effects can be reversed.		
Regulation 15 (h) (ff)	The degree to which the effects may cause irreplaceable loss of resources.		
Regulation 15 (h) (gg)	The degree to which the effects can be mitigated.		
Regulation 15 (i)	A description of any assumptions, uncertainties and gaps in knowledge.	Yes	Section 11
Regulation 15 (j)	An opinion as to whether the proposed listed activity must or may not be authorised, and if the opinion is that it must be authorised, any conditions that must be made in respect of that authorisation.	Yes	Section 12
Regulation 15 (k)	A non-technical summary of the information.	Yes	Executive Summary

3.0 Legal Framework

3.1 Namibian Institutional and Administrative Structure

3.1.1 Ministry of Industries, Mines and Energy

The MME comprises six directorates, one of which is the Directorate of Mines. The Directorate of Mines is mandated to promote optimal mining and integrate the mining industry with other sectors of the economy for the country's socio-economic development. The Mines Directorate comprises the following divisions:

- Mineral Rights & Resources Development
- Mine Safety & Services
- Controlled Minerals & Minerals Development
- Small Scale Mining

In addition, the MIME also includes the Directorate of Energy, which consists of 2 divisions:

- Electricity Division
- Renewable Energy Division

The Directorate of Energy enforces the compliance of legal requirements of energy legislation (Electricity Act, 2007) and regulations and researches new and renewable sources of energy.

The mandate of the Energy Directorate is to ensure an adequate and affordable energy supply in a sustainable manner, taking advantage of Namibia's natural resources in support of the nation's socio-economic development.

The MIME is a Competent Authority for the Project and is required to make a recommendation to the MEFT on the application for an amendment of the ECC. The MEFT will make the final decision, taking into account the MIME recommendations.

3.1.2 Ministry of Environment, Forestry and Tourism

The mission of the MEFT is to promote biodiversity conservation in the Namibian environment through the sustainable utilisation of natural resources and tourism development for the maximum social and economic benefit of its citizens. MEFT develops, administers, and enforces environmental legislation and policy.

The MEFT's Department of Environmental Affairs (DEA) is mandated to give effect to Article 95L of the Constitution by promoting environmental sustainability. The Environmental Commissioner serves as head of the DEA. The DEA is responsible for, inter alia, the administration of the EIA process undertaken in terms of the Environmental Management Act, 2007, and the EIA Regulations 2012.

The DEA will be responsible for issuing a decision on the application for an amendment of the ECC, based on the recommendations from MME. If approved, the DEA will issue an amended ECC.

3.1.3 Namibia Power Corporation

The Namibia Power Corporation (Pty) Ltd ("NamPower") is Namibia's national power utility, whose core business is generation, transmission, and energy trading, and its mission is to provide for the energy needs of its customers. NamPower supplies bulk electricity to regional

electricity distributors, mines, farms, and local authorities throughout Namibia. Part of the Project power supply will be from NamPower.

B2Gold will need to consult with NamPower regarding new powerlines.

3.1.4 Namibia Water Corporation Ltd (NamWater)

The Namibia Water Corporation (Pty) Ltd ("NamWater") is Namibia's bulk water supply company, whose core business is the supply of bulk water to industries, municipalities and the Directorate of Rural Water Supply in the Ministry of Agriculture, Water and Forestry.

The Directorate of Rural Water Supply in the Ministry of Agriculture, Water and Forestry supplies water to rural communities.

The Project water supply will be from existing boreholes. Therefore, B2Gold do not need to consult with NamWater regarding water supply and reticulation.

3.1.5 Ministry of Agriculture, Water and Land Reform (MAWLR): Department of Water Affairs (DWA)

The MAWLR is mandated to promote, develop, manage and utilise Agricultural and Water resources.

DWA's mandate is to promote, manage and utilise water resources sustainably to ensure water supply security. The Project has the potential to impact surface and groundwater quality, as well as freshwater ecology. Surface water, groundwater and biodiversity specialist assessments focusing on the potential impacts of the Project on surface water, groundwater and freshwater ecology have been undertaken as part of the EIA.

The DWA will be provided with an opportunity to review and comment on the findings of the Groundwater and Biodiversity specialist assessments and EIA.

3.1.6 Ministry of Works and Transport (MWT): Directorate of Transportation

The MWT is responsible for infrastructure development and setting transport policy and regulation. MWT comprises the four departments, one of which is the Department of Transport.

The Directorate of Transportation Infrastructure falls under the Department of Transport. This Directorate is responsible for the development of modern transport infrastructure for roads, aerodromes, harbours, and waterways; ensuring optimal utilisation and management of transport infrastructure projects assigned to the Directorate.

B2Gold do not need to consult with MWT as only internal roads are proposed, which are located entirely within the ML.

3.2 Namibian Legislation and Policies

The Republic of Namibia has five tiers of law and a number of policies relevant to environmental assessment and protection, which include:

- The Constitution
- Statutory law
- Common law
- Customary law
- International law

As the main source of legislation, the Constitution of the Republic of Namibia (1990) makes provision for the creation and enforcement of applicable legislation. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and mitigate against adverse environmental impacts.

3.2.1 Environmental Management Act, 2007 (Act No. 07 of 2007)

The EMA was promulgated in December 2007 and came into effect on 06 February 2012. Part 1 of the EMA describes the various rights and obligations that pertain to citizens and the Government. The main objectives of the Act are to ensure that:

- Significant effects of activities on the environment are considered carefully and timeously;
- There are opportunities for timeous participation by IAPs throughout the assessment process; and
- Findings are taken into account before any decision is made in respect of activities affecting the environment.

Part 2 of the EMA sets out a number of principles of environmental management which give effect to the provisions of the Constitution for integrated environmental management. Decision-makers must take these principles into account when deciding whether or not to approve a Project. In terms of this legal framework, certain identified activities may not commence without an environmental clearance (or amendment thereto) that is issued by the office of the environmental commissioner in the MEFT.

The Project involves the amendment of the ECC issued for the listed activities. This ECC amendment application will be submitted to the MEFT for approval.

3.2.2 2012 EIA Regulations

The EIA Regulations promulgated in terms of the EMA identify certain activities which could have a substantially detrimental effect on the environment. These listed activities require environmental clearance from MEFT (DEA) prior to commencing.

The Project will not result in changes to the already approved EMA-listed activities triggered by the Project.

3.2.3 Other Relevant Legislation

Other legislation relevant to the Project includes:

- Namibian Constitution First Amendment Act (Act No. 34 of 1998);
- Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1995);
- Water Act, 1956 (No. 54 of 1956);
- Water Resources Management Act, 2013 (No. 11 of 2013);
- Nature Conservation Ordinance (No. 4 of 1975) – Nature Conservation Amendment Act (Act No. 5 of 1996);
- Soil Conservation Act, 1969 (No. 76 of 1969);
- Hazardous Substances Ordinance 14 of 1974; and
- Atmospheric Pollution Prevention Ordinance 11 of 1976.

Relevant policies currently in force include:

- The EIA Policy (1995).
- Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1994).
- The National Climate Change Policy of Namibia (September 2010).
- Minerals Policy of Namibia (2004).
- Policy for the Conservation of Biotic Diversity and Habitat Protection (1994).
- Policy for Prospecting and Mining in Protected Areas and National Monuments (1999).

A detailed analysis of the abovementioned legislation and its relevance to the Project is provided in Table 3-1.

Table 3-1: Legislation and Policies Applicable to the Project

Legislation	Description and Relevance	Responsible Authority
Namibian Constitution First Amendment Act (Act No. 34 of 1998)	Article 95 (l) of the Constitution of the Republic of Namibia states that *"the State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at … maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of natural resources on a sustainable basis for the benefit of all Namibians both present and future; in particular the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian Territory*." Article 100 states "*that the land, water and natural resources below and above the surface of the land … shall belong to the State if they are not otherwise lawfully owned*." Article 101 of the Namibian Constitution further states that the principles embodied within the constitution "*shall not of and by themselves be legally enforceable by any court but shall nevertheless guide the Government in making and applying laws. The courts are entitled to have regard to the said principles in interpreting any laws based on them*." The constitutional recognition of environmental concerns triggered widespread legislative reform relating to the management of natural resources in Namibia. The country's environmental protection effort is currently comprised of the EMA and its Regulations (2012). **Relevance to Project: Ecological sustainability will inform and guide this ECC amendment application process and the Project.**	Not Applicable
Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1995)	The purpose of the Policy is seen as informing decision makers and promoting accountability; ensuring that options and alternatives and environmental costs and benefits are considered; striving for a high degree of public participation and involvement of all sectors; incorporating internationally accepted norms and standards; taking into account secondary and cumulative environmental impacts; promoting the user pays principle; and promoting sustainable development. The Policy requires that all listed policies, programmes, and projects, whether initiated by the Government or the private sector, be subject to an EIA. Policies, programmes, and projects requiring an Environmental Assessment, amongst others, include structure plans (e.g. land-use plans and policies); rezoning applications; establishment of settlements; power generation facilities with an output of 1 megawatt or more; electrical substations and transmission lines having equipment with an operating voltage in excess of 30 000 volts rms phase-to-phase; afforestation projects; major roads; major pipelines; major canals, aqueducts, river diversions and water transfers; permanent flood control schemes; small scale (formal) water supply schemes; deforestation projects; effluent plants; multinational projects; waste disposal sites; alternate energy programmes; and commercial tourism and recreation. The EIA Policy of 1995 therefore promotes accountability and informed decision making through the	MEFT

Legislation	Description and Relevance	Responsible Authority
	requirement of EIAs for listed programmes and projects. As mentioned above, the EIA policy is currently enforced through the EMA and its Regulations (2012). **Relevance to Project: The Environmental Assessment Policy for Sustainable Development and Environmental Conservation is applicable to the Project as listed activities in terms of the EIA Regulations, GNR 30 of 2012 published in terms of the EMA Section 56 regulates this Project and have been used to guide the EIA to obtain an amended ECC prior to the commencement of the Project.**	
Environmental Management Act, 2007 (No. 7 of 2007)	The EMA promotes sustainable management of the environment and the use of natural resources. It establishes principles for decision making on environmental-related matters, establishes the Sustainable Development Advisory Council, provides for the appointment of an Environmental Commissioner along with environmental Officers, provides for the control and assessment of activities that might have a significant impact on the environment, and provides for incidental matters. **Relevance to Project: The EIA Regulations, GNR 30 of 2012, published in terms of the EMA Section 56, regulate this Project and have been used to guide the EIA (Scoping and Impact Assessment) to obtain an amended ECC prior to the commencement of the Project.**	MEFT
Water Act, 1956 (No. 54 of 1956) **Water Resources Management Act, 2013 (No. 11 of 2013)**	The Water Resources Management Act, 2013 (No. 11 of 2013) (WRMA) provides a framework for the management, protection, development, use, and conservation of water resources, for the regulation and monitoring of water services, and incidental matters. Currently, the Water Act, 1956 (No. 54 of 1956) is the applicable law. WRMA will become applicable law once the Government publishes a Government Notice in the Government Gazette, confirming the commencement of the new Act. A person may only abstract and use water from a water resource, which exceeds the threshold authorised in terms of a law relating to water resources above a certain threshold, if the person holds a licence issued by the Minister that authorises the abstraction and use of water from that water resource. **Water supply is from existing groundwater abstraction (direct abstraction from borehole and pit dewatering). OGM holds a groundwater abstraction permit 10971 (for both types of abstraction) and a permit 733 for wastewater discharge as per the requirements of the Water Resources Management Act (No. 11 of 2013). An amendment to the abstraction permit will be required once the new dewatering requirements are determined.** Part 13 of the WRMA deals with Water Pollution Control and the opening section stipulates that "*a person may not by any act or omission cause a water resource to be polluted, either directly or indirectly, unless authorised to do so by or under this Act or any other law, and in accordance with that authorisation*." **Relevance to Project: The protection of ground and surface water resources should be a priority for B2Gold. Possible deterioration of groundwater as a result of accidental spillages of hazardous**	Ministry of Agriculture, Water, and Rural Development

Legislation	Description and Relevance	Responsible Authority
	substances from construction vehicles and machinery, as well as from hazardous materials storage areas, is the main threat to water resources associated with the Project. A Groundwater specialist study has been undertaken to update the findings from the previous EIA process. The specialist has assessed the significance of the potential groundwater impacts and identified mitigation measures that B2Gold will be required to implement to reduce and/or avoid severe groundwater impacts.	
Namibia Water Corporation Act, 1997 (No. 12 of 1997)	The Namibia Water Corporation Act, 1997 (No. 12 of 1997) aims to establish the Namibia Water Corporation Limited; to regulate its powers, duties, and functions; to provide for a more efficient use and control of water resources; and to provide for incidental matters. **Relevance to Project: The protection of ground and surface water resources should be a priority for B2Gold. Possible deterioration of groundwater as a result of accidental spillages of hazardous substances from construction vehicles and machinery, as well as from hazardous materials storage areas, is the main threat to water resources associated with the Project. A Groundwater specialist study has been undertaken to update the findings from the previous EIA process. The specialist has assessed the significance of the potential groundwater impacts and identifies mitigation measures that B2Gold will be required to implement to reduce and/or avoid severe groundwater impacts.**	Ministry of Agriculture, Water, and Rural Development
Nature Conservation Ordinance (No. 4 of 1975) – Nature Conservation Amendment Act (Act No. 5 of 1996)	The Nature Conservation Amendment Act No. 5 of 1996 amends the Nature Conservation Ordinance, 1975, "*to provide for an economically based system of sustainable management and utilization of game in communal areas; to delete references to representative authorities; and to provide for matters incidental hereto*." Section 73. 1) provides: "*No person other than the lawful holder of a permit granted by the local authority shall at any time pick ("pick", as defined in Section 1 (xxxviii), includes to cut off, chop off, pick off, take, gather, uproot, damage or destroy) or transport any protected plant: Provided that – (a) the owner a nursery licensed under section 75 may without such permit pick and transport any protected plant cultivated on the premises of such nursery and cause such protected plant to be picked and transported; (b) the owner or lessee of land may on that land without such permit pick the flower of a protected plant for use as a decoration in his home; (c) the owner or lessee of land may without such permit pick a protected plant on that portion of such land – (i) which he needs for cultivated lands, the erection of a building, the construction of a road or airfield or any other development which necessitates the removal of vegetation; or (ii) on which such protected plant has been specially cultivated*" (Nature Conservation Ordinance 4 of 1975, Chapter VI Indigenous Plants, Picking and transport of protected plants). **Relevance to Project: Although the Project footprint includes areas of historical disturbance, key habitats such as ephemeral pans and Sandy Savanna patches remain structurally intact and ecologically functional, containing floral SCC. This Act and Ordinance will be applicable to the Project as clearance for the Project may include the need to remove protected and endangered species as well as invasive species. In accordance with this, a biodiversity impact assessment was conducted as part of specialist**	MEFT

Legislation	Description and Relevance	Responsible Authority
	studies.	
Forest Act, 2001 (No. 12 of 2001)	The Forest Act, 2001 (No. 12 of 2001 *provides for the establishment of a Forestry Council and the appointment of certain officials; to consolidate the laws relating to the management and use of forests and forest produce; to provide for the protection of the environment and the control and management of forest fires; to repeal the Preservation of Bees and Honey Proclamation, 1923 (Proclamation No.1 of 1923), Preservation of Trees and Forests Ordinance, 1952 (Ordinance No. 37 of 1952) and the Forest Act, 1968 (Act No. 72 of 1968); and to deal with incidental matters." Section 22. (1) provides: "Unless otherwise authorised by this Act, or by a licence issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove - (a) vegetation which is on a sand dune or drifting sand or a gully unless the cutting, destruction or removal is done for the purpose of stabilising the sand or gully; or (b) any living tree, bush or shrub growing within 100 metres of a river, stream or watercourse*." **Relevance to Project: Although the Project footprint includes areas of historical disturbance, key habitats such as ephemeral pans and Sandy Savanna patches remain structurally intact and ecologically functional, containing floral SCC. This Act and Ordinance will be applicable to the Project as clearance for the Project may include the need to remove protected and endangered species as well as invasive species. In accordance with this, a biodiversity impact assessment was conducted as part of specialist studies.**	MEFT
National Heritage Act, 2004 (No. 27 of 2004)	This National Heritage Act, 2004 (No. 27 of 2004) provides for, inter alia, the protection and conservation of places and objects of heritage significance. The National Heritage Council has been established to identify, conserve, manage, and protect places and objects of heritage significance. Permits are required for the removal, damage, alteration, or excavation of heritage sites or remains. Any person who discovers an archaeological site should notify the National Heritage Council. **Relevance to Project: These aspects could be relevant during the construction activities of the Project and are required to be assessed. Potential deterioration of cultural artefacts within the proposed footprint of the Project area. Construction activities may overturn currently unidentified historical artefacts. A heritage and archaeological impact assessment was conducted as part of the Impact Assessment phase of the Project. Any heritage resources (e.g., human remains, artefacts, etc.) discovered during the Construction Phase of the Project that will be impacted will require a permit from the National Heritage Council (NHC) for relocation.**	MEFT
Burial Place Ordinance 27 of 1966	Burial Place Ordinance 27 of 1966 prohibits the desecration or disturbance of graves and regulates how bodies may be unearthed or dug up. **Relevance to Project: A heritage and archaeological impact assessment has been conducted as part of**	MEFT

Legislation	Description and Relevance	Responsible Authority
	the Impact Assessment phase of the Project. Any heritage resources (e.g., human remains, artefacts, etc.) discovered during the Construction Phase of the Project that will be impacted will require a permit from the NHC for relocation.	
National Monuments Act, 1969 (No. 28 of 1969)	The National Monuments Act, 1969 (No. 28 of 1969) establishes a National Monuments Council and provides for the preservation of certain properties as National Monuments and the maintenance of certain burial grounds. **Relevance to Project: No property of National importance is located within the Project footprint area / ML.**	MEFT
Soil Conservation Act, 1969 (No. 76 of 1969)	The purpose of this Soil Conservation Act, 1969 (No. 76 of 1969) is "*to consolidate and amend the law relating to the combating and prevention of soil erosion, the conservation, improvement, and manner of use of the soil and vegetation and the protection of the water sources in the Republic and the territory of South-West Africa; and to provide for matters incidental thereto*." **Relevance to Project: Cognizance will be taken in identifying potential impacts of the Project on soil, vegetation, water supply sources, and resources by following the hierarchy of environmental impact mitigation i.e., avoid, then minimise, then restore impacted areas and finally offset any impacts that remain.**	Ministry of Agriculture, Water, and Rural Development
Hazardous Substances Ordinance 14 of 1974	The Hazardous Substances Ordinance 14 of 1974 provides for the control of toxic substances that may result in injury, ill health, or death of human beings. **Relevance to Project: The Project will include the storage and handling of various hazardous chemicals including fuel and explosives. The Impact Assessment will include an assessment of the potential biophysical and socio-economic impacts due to the include the storage and handling of various hazardous chemicals. Mitigation measures to avoid and/or minimise the significance of the identified potential impacts will be identified and included in the Project EMP.**	Ministry of Health and Social Services
Atmospheric Pollution Prevention Ordinance 11 of 1976	The Atmospheric Pollution Prevention Ordinance, 11 of 1976 (GG 3555) came into force on 18 August 1976. This Ordinance provides for the prevention of the pollution of the atmosphere and related incidental matters. **Relevance to Project: Potential deterioration of air quality due to the generation and dispersion of Particulate Matter (PM) and nuisance dust caused by various mining activities. In accordance with this, an air impact assessment was conducted as part of the specialist studies.**	Ministry of Health and Social Services
Labour Act (Act No. 11 of 2007)	The Labour Act, Act No 11 of 2007 (GG 3971) was enforced on 1 March 2009 and was amended by Act No 2 in 2012 (GG 4925). This Act consolidates and amends the labour law, establishes a comprehensive labour law, entrenches fundamental labour rights and protections, regulates basic employment terms and	Ministry of Labour, Industrial

Legislation	Description and Relevance	Responsible Authority
	conditions, ensures the safety, health, and welfare of employees, protects employees from unfair labour practices, regulates trade union and employer organisation registrations, regulates collective labour relations, provides for systematic prevention and resolution of labour disputes, establishes the Labour Advisory Council, the Labour Court, the Wages Commission, and the labour inspectorate, provides for the appointment of the Labour Commissioner and Deputy Labour Commissioner, and provides for incidental matters. **Relevance to Project: B2Gold should ensure that all contractors involved during the construction, operation, and maintenance phases of the Project comply with the provisions of these legal instruments.**	Relations and Employment Creation
Public and Environmental Health Act, 2015 (No. 1 of 2015)	The Public and Environmental Health Act, 2015 (No. 1 of 2015) was published in GG 5740 and brought into force on 17 September 2020. This Act provides a framework for a structured uniform public and environmental health system in Namibia. It also provides for incidental matters. The Public Health Covid-19 General Regulations, GNR 91 of 2021 (GG 7522) was published in terms of the Public and Environmental Health Act and was repealed numerous times in 2021 and 2022. **Relevance to Project: B2Gold should ensure that all contractors involved during the construction, operation, and maintenance phases of the Project comply with the provisions of these legal instruments.**	Ministry of Health and Social Services
Regulations relating to the health and safety of employees at work (GN 156 of 1997)	These Regulations establish health and safety regulations for the workplace. **Relevance to Project: B2Gold should ensure that all contractors involved during the construction, operation, and maintenance phases of the Project comply with the provisions of these legal instruments.**	Ministry of Health and Social Services
Urban and Regional Planning Act, 2018 (No. 5 of 2018)	The Urban and Regional Planning Act, 2018 (No. 5 of 2018) (GG 6631) came into force on 3 September 2020 and aims to consolidate laws relating to urban and regional planning, provide the legal framework for spatial planning, provide principles and standards of spatial planning, establish the regional and urban planning board, decentralise matters relating to spatial planning, prepare, approve, and review the national spatial development framework, regional structure plans, and urban structure plans, prepares, approves, reviews, and amendments zoning schemes, establish townships, alter boundaries of approved townships, disestablishment of approved townships, change names of approved townships, subdivide and consolidate land, alter, suspend, and delete conditions relating to land, and provide for incidental matters. Regulations relating to Urban and Regional Planning (GG 223) of 2020 (GG 7327) were published in terms of the Urban and Regional Planning Act Section 131. **Relevance to Project: The Project area has a demarcated ML area for mining activities.**	Ministry of Urban-Rural Development
Roads Ordinance 17 of 1972	The Roads Ordinance, 17 of 1972 (OG 3268) was brought into force on 1 January 1973 and was amended in 1973 (twice), 1974, 1975, 1979, 1980, 1984, 1986, and 1993. This Ordinance consolidates and amends laws relating to roads and incidental matters:	Ministry of Works and Transport

Legislation	Description and Relevance	Responsible Authority
	• Reserve boundaries (S3.1); • Control of traffic on the urban trunk and main roads (S27.1); • Rails, tracks, bridges, wires, cables, subways, or culverts across or under proclaimed roads (S36.1); • Infringements and obstructions on and interference with proclaimed roads. (S37.1); and • Distance from proclaimed roads at which fences are erected (S38). **Relevance to Project: Only internal roads are proposed, which are located entirely within the ML, and therefore no approval is required from the Ministry of Works and Transport.**	

4.0 Description of the Project

4.1 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 4-1.

4.1.1 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.

4.1.2 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 4-2), 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 4-1: Existing Infrastructure Layout

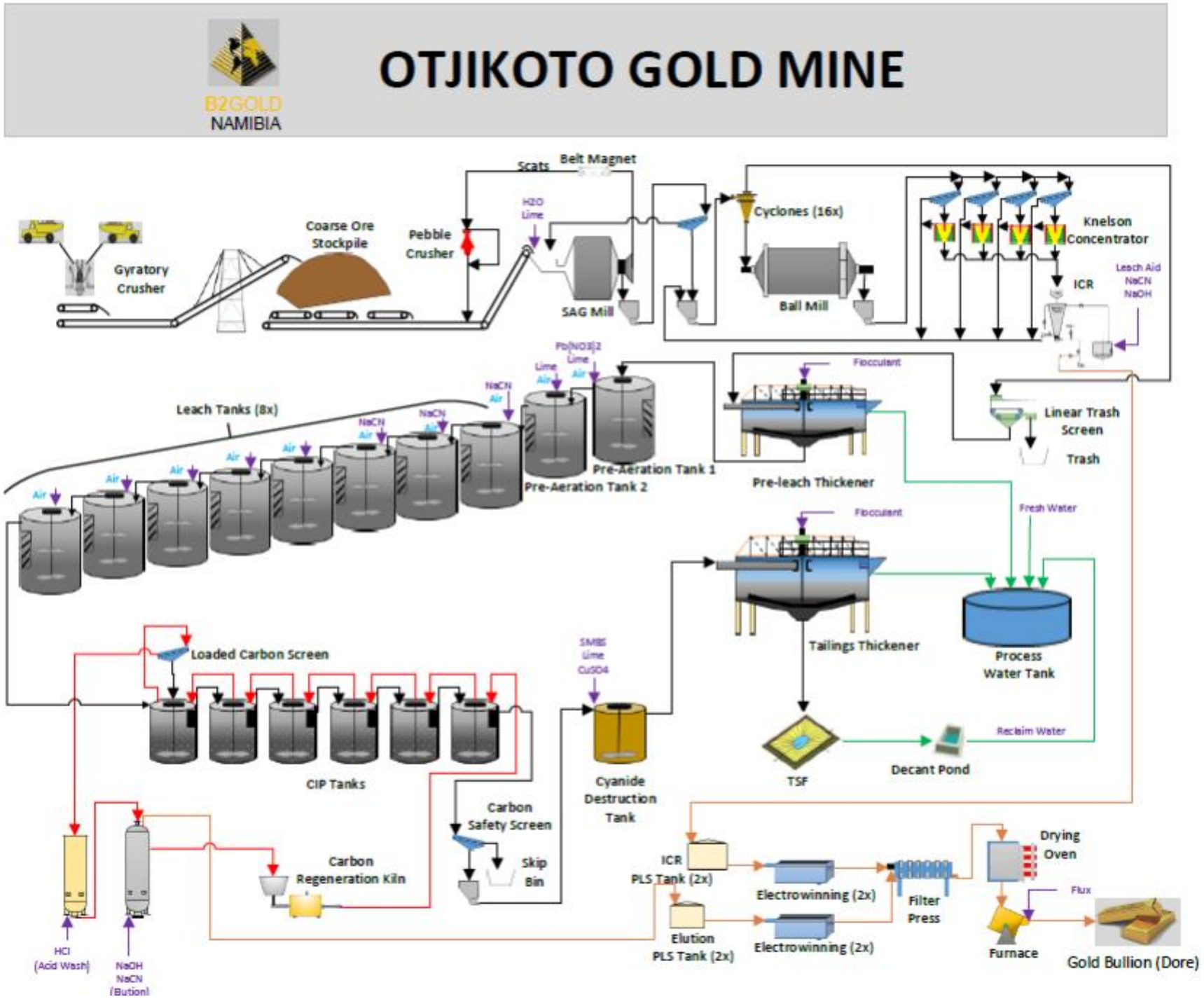


Figure 4-2: Schematic Diagram of the Metallurgical Process Flow

4.1.3 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.

4.2 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 mineralised 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. The company plans to develop Antelope as an underground mine, drawing on its experience from the nearby Wolfshag underground operation. This approach not only optimises infrastructure use but also streamlines permitting and environmental management.

The PEA outlines a 5-year life of mine (LOM) 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 projected to average 110,000 ounces from 2029 to 2032.

4.3 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 Project is hereby referred to as the **Proposed Project**, which includes the following (refer to Figure 4-3):

- Portal to access the 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 for construction as well as a new clarifier to treat water from underground during operation;

- 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 4-3: Proposed Layout Plan

4.4 Key Activities and Facilities

The activities[1] and facilities[2] during each 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 4-1: 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			
	Develop the portal through a ramp/decline from surface to provide access to the orebody and for haulage of the ore to surface.	ü			

Main Activity/Facility	Sub-activities and facilities	C	O	D	C
	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 for freshwater supply.	ü			
	Install underground sumps to join the existing pipeline to pump water from underground workings to a new clarifier 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		
	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		
	Waste management to be in line with the existing waste management plan procedures.		ü		

Main Activity/Facility	Sub-activities and facilities	C	O	D	C
Mineralised ore and waste management	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		
	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		

Main Activity/Facility	Sub-activities and facilities	C	O	D	C
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

4.5 Construction Phase

The purpose of the construction phase is primarily to establish the infrastructure and activities required for the operational phase. The construction phase will commence in Q1 2026 and last for approximately 3 years.

A summary of the key construction activities and other construction-related aspects is discussed below.

4.5.1 Construction Phase Activities and Facilities

The construction phase of the Proposed Project is anticipated to take approximately 3 years (2025 –2028) and will entail the following activities and facilities:

- Site preparation, which entails:
  - Clearing of vegetation;
  - Stripping and stockpiling of topsoil to prepare the foundations for the establishment of the mine infrastructure;
  - Undertaking bulk earthworks to prepare the terraces for surface infrastructure.
- Construction of Structural Foundations
- Construction of Buildings and Facilities
- Road and Transport Infrastructure
- Power Supply Infrastructure
- Water Supply Infrastructure
- Waste Management Infrastructure

4.5.2 Site Preparation

Site preparation involves several key activities to ensure efficient operations while minimising environmental impacts.

4.5.2.1 Vegetation Clearance

The process begins with vegetation clearing, where trees, shrubs, and grass are removed using bulldozers or excavators.

4.5.2.2 Topsoil Stripping and Stockpiling

Following vegetation removal, topsoil stripping is conducted using graders and scrapers to remove the uppermost fertile soil layer carefully. This topsoil is stockpiled in a designated area to preserve its quality for future land rehabilitation. Stockpiles are strategically placed away from active mining areas, shaped to minimise erosion, and often seeded with cover crops to prevent degradation.

4.5.2.3 Bulk Earthworks

Bulk earthworks refer to the excavation and compaction of soil and rock to prepare the site for surface infrastructure development. During the construction phase of a mine, these works are essential for shaping the terrain, establishing stable foundations, and enabling safe access to key facilities.

Cut and fill operations involve excavation of high points (cutting) and placement of material in low areas (filling) to create level platforms for infrastructure such as batch plants,

workshops, roads, and stockpiles. Platform preparation will entail construction of engineered pads and terraces to support buildings, equipment, and heavy vehicle traffic. Construction of light and heavy vehicle roads requires proper drainage and compaction to support the transport of materials and equipment. Drainage channels, culverts, and retention ponds need to be formed for stormwater management to manage surface water and reduce erosion risks.

These works are typically carried out using heavy equipment such as excavators, bulldozers, graders, articulated dump trucks, and rollers. Bulk earthworks are often one of the first major activities on site, laying the groundwork for all subsequent construction activities.

4.5.3 Construction of Structural Foundations

The development of a mine involves extensive civil works to establish the necessary infrastructure for operations. These works include construction activities, foundation preparations, and structural installations to support mining processes.

Foundation preparation is a key aspect of mine development. It involves excavation to the required depth, removal of unsuitable materials, and soil compaction to achieve the necessary load-bearing capacity. Proper compaction enhances stability and minimises the risk of ground settlement, ensuring the durability of mine structures.

Scaffolding and cranes are essential for constructing and installing high-rise structures, conveyors, and heavy machinery. Scaffolding provides safe access for workers, while cranes lift and position heavy materials before being removed after installation is completed.

Concrete work is integral to mine development. It includes mixing and applying concrete in various structural elements, such as concrete plinths that support heavy machinery and infrastructure. Proper mixing, curing, and finishing techniques contribute to the strength and longevity of these structures.

Steel fabrication and installation are also critical. Reinforcement steel is placed in concrete structures to enhance their load-bearing capacity. Grinding and welding operations are conducted to assemble steel frameworks, conveyor supports, and other structural components.

Effective implementation of these civil works establishes a robust infrastructure that supports efficient mining operations while ensuring safety and compliance with industry standards.

4.5.4 Construction of Buildings and Facilities

After the structural foundations are in place, the physical infrastructure is erected on site. This will involve general building activities and erection of structures (batch plant, workshop/fuel bay, change room/lamp room, compressor, ventilation shaft, portal).

Dewatering boreholes will be drilled on site to remove water from underground workings to allow for a safe working environment and for use as process water. Pre-production dewatering will use a cascading system of skid mounted tanks with twin slurry or progressive cavity pumps in the ramp during development.

The new water tank and clarifier will be constructed to join the existing pipeline to treat water from underground workings to be used as process water.

Mining operations require a fleet of heavy vehicles, making the construction of maintenance and wash bays essential. These facilities provide designated vehicle servicing, fuelling, and washing areas, ensuring equipment remains operational.

4.5.5 Road and Transport Infrastructure

The existing B1 road will be used to access the main gate to the OGM. Several existing tracks/gravel roads that were used during exploration will be used to move around the construction site while clearing for the main heavy and light vehicle access roads commences. Materials required for the construction phase will be brought to the construction site via the existing road network that surrounds the OGM.

4.5.6 Power Supply Infrastructure

Power requirements during the construction phase include a 1.35 MW temporary supply and power distribution network while the permanent distribution network is being constructed. Most of the 525 V equipment (mini substations, cables and ring main unit) are available onsite. A genset will be used for early construction works, while the powerline is being constructed.

4.5.7 Water Supply Infrastructure

Water will be supplied from the existing boreholes and pumped to a new temporary tank with a polyvinyl chloride (“PVC”) piping distribution network throughout the construction site. Borehole water will be supplied for ablution facilities. Bottled water will be supplied for drinking during the period when the fresh water supply infrastructure is still not commissioned and in operation.

4.5.8 Waste Management Infrastructure

OGM has a well-established waste management system as part of its existing underground and surface operations.

Construction waste will be 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. Off-site transportation of hazardous waste will be conducted by an appropriate service provider capable of handling hazardous waste. Disposable hazardous waste is transported and disposed of at a registered hazardous waste disposal facility in Walvis Bay.

The types of non-mineralised waste expected to be generated during the construction phase include:

- General waste (domestic waste and other non-hazardous waste) primarily product packaging, wood products, organic materials, glass, plastics, metals and food scraps.
- Industrial waste such as scrap metal and building rubble.
- Hazardous waste which includes hydrocarbon waste (waste oil and fuel, grease, and contaminated soil), fluorescent tubes and bulbs, paint and solvents, batteries, electronic waste, and chemical waste.

During the construction phase, portable chemical toilets would be provided onsite for staff. The portable toilets will be supplied by an appropriate contractor and will be serviced on a regular basis.

4.5.9 Stormwater Management Infrastructure

During the construction phase, the stormwater management infrastructure to support the overall operational mine will be established.

Temporary silt management measures, including silt berms and traps will be implemented during construction.

4.5.10 Construction Workforce and Housing

All construction workers are expected to be based in the nearby towns of Otjiwarongo and Otavi as no construction camp will be established on the site. Workers would therefore be transported from these locations to site and back each day. However, the construction workers will be provided with access to proper hygiene, medical and workplace facilities.

Approximately 225 jobs will be created during the construction phase of the Project. It is expected that B2Gold and its contractor(s) will encourage the employment of local people during construction, particularly for unskilled and semi-skilled labour.

4.6 Operation Phase

4.6.1 Operational Phase Activities and Facilities

The operational phase marks the commencement of full-scale mining, processing, and associated activities aimed at extracting and beneficiating mineral resources. This phase represents the longest and most impactful stage of the mine's lifecycle, involving continuous ore extraction, waste management, and resource utilisation.

The operational phase of the Proposed Project is anticipated to have a 5-year LOM (from 2028 to 2032) and will entail the following activities and facilities:

- New On-site Facilities;
- Underground Mining – already approved, not under current application;
- Mineral Processing – already approved, not under current application;
- Road and Transport System
- Power Supply and Use
- Water Supply and Use
- Waste Management
- Stormwater Management

4.6.2 New On-Site Facilities

The operational phase will consist of the following on-site facilities, which are shown in the site layout (refer to Figure 4-3) and described Table 4-2.

Table 4-2: Proposed Infrastructure Description

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

Infrastructure	Description	Area (m^2)
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)
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)

4.6.3 Underground Mining

The underground mining activities for the new Antelope deposit are already approved as part of the existing ECC for the Otjikoto Gold Mine.

The Antelope deposit will be extracted using underground mining methods. A combination of *drift and fill,* and *cut and fill* mining methods is proposed (Worley, 2025). Other alternatives that may be suitable include the use of room and pillar methods, with either post-and-pillar cut-and-fill used in thicker areas, or room and pillar with floor benching in the thicker areas.

The existing mining activities at OGM entail blasting activities which result in existing blasting noise and ground vibration to the receiving environment at the site. Blasting activities occur at least twice a week during the daytime.

4.6.4 Mineral Processing

The mineral processing activities for the new Antelope deposit are already approved as part of the existing ECC for the Otjikoto Gold Mine.

The underground mining operation for the Antelope deposit will move up to approximately 1,400 tonnes per day with development-based mining methods (assuming a 3.0 g/t cutoff grade and 4.0 m minimum mining thickness), which will be hauled to the existing processing plant (B2Gold, 2025). Underground gold production will be blended with existing Otjikoto LGD feed to increase previously projected gold production by an average of approximately 65,000 ounces per year over the estimated LOM (B2Gold, 2025).

The Otjikoto processing plant utilises a conventional flowsheet whereby gold is recovered by gravity concentration/intensive leaching and by an agitated cyanide leach/carbon-in-pulp process for treatment of gravity tailings (Worley, 2025).

4.6.5 Road and Transport System

The OGM is accessible through the B1 national road, and the mine has security access and exit protocol through the main entrance. The Proposed Project will entail light and heavy vehicle roads to access the resource area and transport ore from the ROM pad to the existing processing plant.

A new game fence of 5 022 m length is also proposed to surround the new infrastructure area.

4.6.6 Power Supply and Use

Preliminary power requirements for the Proposed Project are a 3.7-megawatt (MW) supply for production. Equipment from the Wolfshag 5 MW substation and distribution network could be reused for Antelope since a substation, transformers and 3 950 m long powerline are all proposed for the Project.

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. A fuel bay is proposed for the Proposed Project.

4.6.7 Water Supply and Use

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.

The mine itself is dependent on groundwater abstraction for mining operations and office/domestic use. Water supply to the mine and plant is provided from various boreholes abstracting groundwater from the Karibib Marbles to the east and southeast of the mine. The mine holds a groundwater abstraction license for mining operation and wastewater discharge as per the requirements of the Water Resources Management Act, No. 11 of 2013 and its guideline and standards. An amendment will be required once the dewatering requirements are determined. Groundwater abstraction from the mine concession and regional boreholes included in the groundwater abstraction license are monitored and recorded weekly from manual and electronic flow meters installed in all abstraction boreholes. The objective of monitoring the groundwater abstraction is to ensure compliance with the allocated water abstraction license, which currently allows for a total abstraction of 4 Million cubic metres (Mm^3) per year.

The total abstraction for 2023 was 2,687,986 m^3, which is still within the current water abstraction license limit of 4 Mm^3. The overall volume abstracted from the Karibib Marbles during 2023 was around 1.4 Mm^3/year, whereas a volume of approximately 1.2 Mm^3/yr

dewatering holes and pit sumps abstracted from the Okonguarri Formation. In 2023, a total volume of 1,180,394 m³ groundwater was pumped from the Otjikoto pit, averaging 98,366 m³ per month. However, this total includes 1,036,781 m³ of groundwater dewatered from the Wolfshag Decline.

Dewatering boreholes are proposed to remove water from underground workings to allow for a safe working environment and for use as process water. The underground mine dewatering system will be designed to handle an estimated 200 m^3/hr, including groundwater inflow and utility water inflow. This groundwater will be pumped to the new clarifier for treatment. Treated raw water is used as process water. The average process water consumption during mine production is estimated to be approximately 28 m^3/hr, including the 20% contingency. Peak process water consumption could be estimated by adding 50% to the average, resulting in a peak of 42 m³/hr.

4.6.8 Mineralised Waste Management

Mineral waste generated from mining will be stockpiled as waste rock at the WRD. No static or kinetic geochemical testing has been undertaken for the Antelope deposit to determine the acid rock generation potential of the deposit yet. Due to the similarity in mineral composition between the Otjikoto and Antelope rocks, the most recent geochemical testing conducted on waste rock samples from the Phase 5 Otjikoto Open Pit assessment done in June 2022, was used to extrapolate the potential leachate quality for the Antelope preliminary assessment. The Acid-Base Accounting (ABA) results confirmed the non-acid-generating (NAG) potential of the host rocks. The data are considered representative of likely leachate from the Antelope underground host rocks, but additional geochemical testing of core and tailings test material from the Antelope area will be required to confirm this.

The TSF is already approved as part of the existing ECC for the Otjikoto Gold Mine.

Tailings from underground operations are disposed of in 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.

4.6.9 Non-mineralised Waste Management

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 includes:

- 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 the 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 licensed 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 on-site **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 approved on-site landfill facility.

The following materials are used or destroyed in the incinerator:

- Limited volumes of waste oil are reused 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 LOM, as required. 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 a suitable capacity for the effluent generated from operations. Underground operations generate wastewater effluent within chemical toilets, which is collected and transported via gravity reticulation, buried sewer pipes, to the Sewage Treatment Plant (STP) for treatment. The STP has the capacity to treat sewerage generated on site per day. The water discharged from the STP is suitable for use in dust suppression, fire water and process water.

Ablution facilities at the underground laydown area will be connected to the main sewer system.

4.6.10 Stormwater Management

Surface water flow is in a northwest direction following the gradient towards the Platveld basin away from the divide to the Omatako basin. The local surface drainage system is, however, poorly developed due to the flat topography, and no permanent or seasonal drainage channels are present.

Site topography gradually slopes to the west, and a system of diversion channels, ponds, and culverts is in place to drain the operational areas. Excess water from the operational areas is stored in a smaller stormwater dam. A larger stormwater dam is prepared to contain the runoff during a 1:50-year 7-day rainfall event. Both dams have spillways and silt traps. Water in these impoundments is used in the mining and processing facilities.

The existing operations ensure that contaminated surface water from the mine is contained, reused and/or treated through the necessary design, construction and operational considerations. Run-off from the WRDs, TSF and landfill is prevented as far as reasonably practical. By containing dirty water and diverting clean water as far as possible, the surface water drainage scheme ensures that clean surface water flow is directed around structures such as the WRDs, TSF and landfill. Furthermore, the current EMP stipulates mitigation measures with regard to hydrocarbon, reagent, domestic and industrial effluent spills and managing of the landfill. Management components focus on altering of drainage patterns, pollution, industrial and domestic effluents and spills. Stormwater interventions are designed in such a way that surface water can bypass the major structures, such as the two open pits, TSF, WRDs and the LGDs, and direct contaminated water from the processing areas to the return water dam for storage and re-use.

4.6.11 Operations Workforce

The existing Wolfshag underground mining team is proposed to manage the development and operation of the Antelope underground mine.

4.7 Decommissioning and Closure Phase

The decommissioning and closure phase of the Proposed Project will be carried out in a structured and environmentally responsible manner, ensuring compliance with regulatory requirements and alignment with best practices for mine rehabilitation. The primary objective is to dismantle infrastructure, restore landforms, and rehabilitate the site to achieve long-term environmental stability while minimising residual impacts on the surrounding ecosystem. The details pertaining to the rehabilitation and closure of the mine is detailed in the rehabilitation and closure section of the Environmental Scoping and Impact Assessment ESIA.

4.7.1 Key Activities During Decommissioning and Closure

Key activities that will take place during the decommissioning and closure phase include:

- **Dismantling and Demolition:**
    - All mine infrastructure, including the process plant, offices, workshops, pipelines, and electrical installations, will be systematically dismantled and removed.
    - Mining equipment and salvageable materials will be either repurposed, sold, or responsibly disposed of.
- **Landform Stabilisation and Erosion Control:**

  - Final slopes will be reshaped and stabilised to prevent erosion and improve structural integrity.
  - Engineering controls such as drainage channels, sediment traps, and retaining structures will be installed where necessary.
- **Revegetation and Ecosystem Restoration:**
  - WRDs and the TSF will be capped and revegetated to promote long-term environmental stability.
  - Previously disturbed areas and sites where infrastructure is removed will be rehabilitated with native plant species to support ecosystem recovery.
  - Alien invasive species will be systematically removed, preventing them from disrupting the reestablished natural environment.
- **Restoration of Natural Drainage Patterns:**
  - Wherever feasible, original watercourses and drainage patterns will be restored to support natural hydrological functions.
  - Surface water and groundwater monitoring systems will be implemented to track water quality and flow conditions.
- **Post-Closure Landform Maintenance**:
  - Regular inspections and maintenance will be conducted to ensure the stability of rehabilitated WRDs, TSF, drainage systems, and landforms.
  - Any signs of erosion, settlement, or structural instability will be promptly addressed.

4.7.2 Duration of Decommissioning and Closure

The decommissioning and closure period is expected to span approximately two years. The workforce will significantly decrease as mining operations cease, transitioning to a smaller team focused on closure activities. Following decommissioning, the post-mine closure period will commence immediately, focusing on environmental monitoring, maintenance, and ongoing rehabilitation.

5.0 Alternatives

Section 15 (2) (f) of the EIA Regulations requires that feasible alternatives be considered and assessed during the EIA Phase of a Project.

Project related alternatives were assessed during the 2012 and 2019 EIAs for the Project including alternative mining methods, processing methods, power supply options and ventilation options. The details of these assessments are provided in the previous EIAs and have not been repeated in this report. Alternatives that were considered for the Proposed Project are discussed below in further detail.

5.1 Project Layout Alternatives

Layout plan 1 was developed for the proposed surface infrastructure. Various baseline specialist studies were then undertaken on site to identify any environmental sensitives that may be present on the site. The findings of the baseline studies are provided in Section 7 of the EIA Report. The overall main environmental sensitivities on site are summarised in Section 8. It is important to have an understanding of the baseline sensitivities on site first in order to understand the layout alternative options that were considered.

Refer to Figure 5-1 for the two layout plan alternatives considered in this EIA report. The layout plan, alternative comparative analysis and the rationale for determining the Best Practicable Environmental Option (i. e. the preferred alternative) are discussed below.

5.2 Comparative Analysis of Alternatives

Table 5-1 below outlines the key layout modifications made between Layout 1 and Layout 2 (preferred option), incorporating specialist recommendations and engineering requirements. This section should be read in conjunction with Section 8 to understand the site sensitivities. The main changes included the re-routing of the powerline and the light and heavy vehicle roads, as well as the relocation of the substation, portal, and vent shaft (Figure 5-1). The layout amendment was undertaken to avoid the potential burial cairn which holds cultural heritage significance.

Layout plan 2 is the preferred option as it avoids the burial cairn identified on site. It must be noted that this layout plan needs to be further amended to consider the recommendations of the Hydrogeological Appraisal which involves moving the surface infrastructure to the west of the site (on the Okonguarri Formation) to reduce the potential groundwater contamination impact of the Karibib Marble. There is no significant difference in terrestrial biodiversity impacts between the two layout plan alternatives.

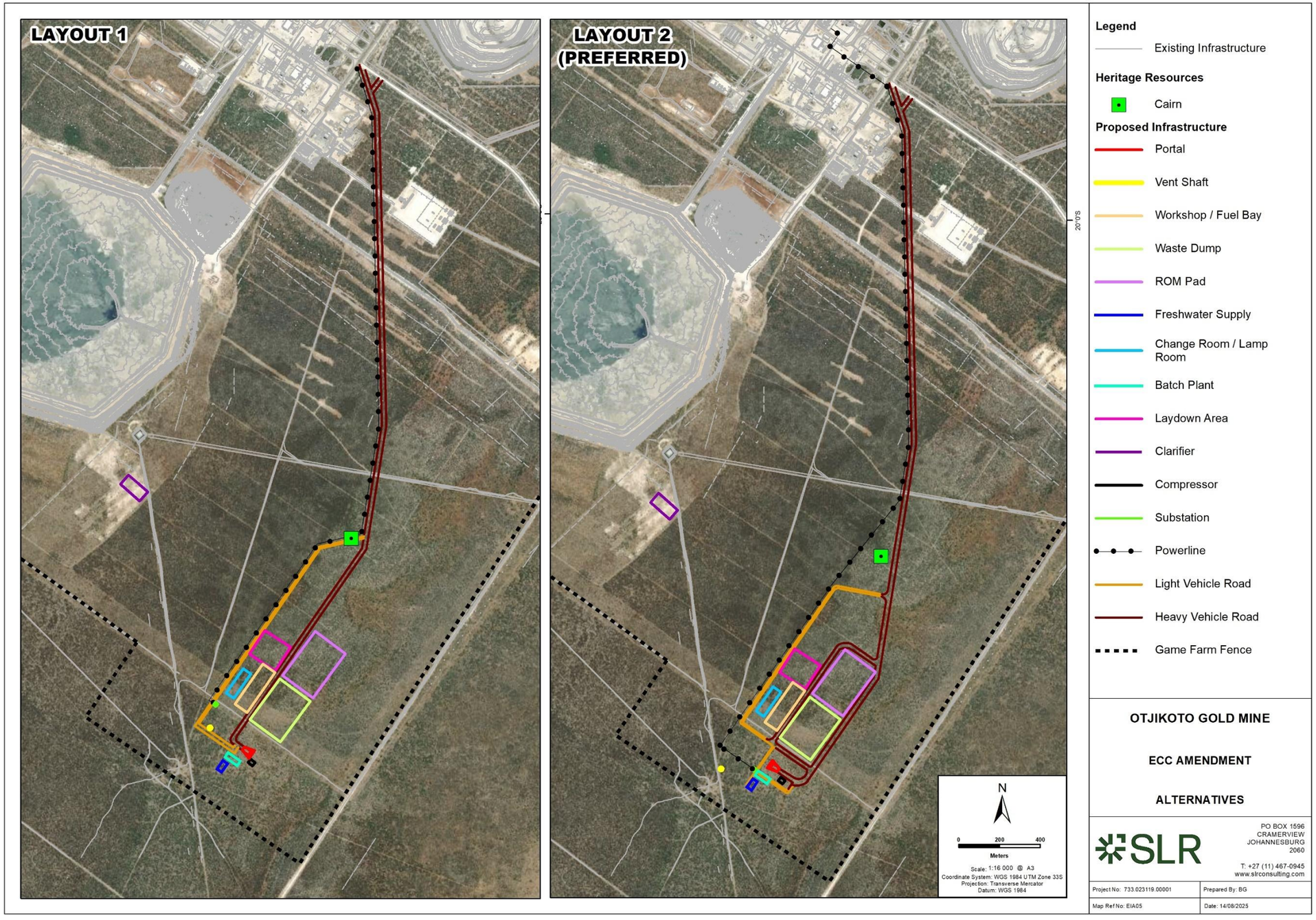


Figure 5-1: Layout Plan Alternatives

Table 5-1: Layout Alternatives Comparative Analysis

Aspect	Feature	Original Layout (Alternative Option)	Current Layout (Preferred Option)
Geohydrology	The Karibib Marble aquifer is a sensitive aquifer as it is the sole source of water supply to OGM.	The planned surface infrastructure is located on Karibib Marble.	The planned surface infrastructure in the amended layout plan is still located on Karibib Marble. <u>Specialist Recommendation:</u> The infrastructure should be moved west, where it would be built on the Okonguarri Formation, thus reducing the potential groundwater contamination of the Karibib Marble.
Terrestrial Biodiversity	The Sandy Savanna and ephemeral pans were assessed as ecologically sensitive areas (High), due to these habitats containing some of the identified SCC.	Part of the planned surface infrastructure is located within the Sandy Savanna habitat.	Part of the planned surface infrastructure in the amended layout plan is still located within the Sandy Savanna habitat, thus having a similar impact on the loss of this habitat.
Heritage	A potential burial cairn was identified on site and is of cultural heritage significance.	The planned powerline and the heavy and light vehicle roads traverse through the burial cairn.	The amended layout plan resulted in the re-routing of the powerline and the heavy and light vehicle roads to avoid the burial cairn, thus reducing the impact on heritage resources.

5.3 No-go Option

The assessment of this option requires a comparison between the option of proceeding with the proposed Proposed Project layout changes with that of proceeding with the authorised project (latest amendments in 2019).

As the current main OGM open pit nears the end of its productive life, the new Antelope deposit offers a way to extend operations without the need for a new greenfield site, except for the areas of supporting infrastructure on the surface. Proceeding with the proposed Project will thus allow for extended exploitation of the mineral resource over a period of 5 years (between 2028 and 2032).

The mining of the Antelope deposit will optimise the use of existing mining infrastructure while minimising additional ecological disturbance. This approach aims to reduce the environmental footprint by avoiding large-scale land clearing and habitat disruption. The project benefits from existing environmental management systems, including progressive rehabilitation, water management, and biodiversity protection. The integration of solar power and grid electricity into the mine's energy mix also supports Namibia's climate goals by reducing greenhouse gas emissions and reliance on fossil fuels.

Proceeding with the Project layout changes will also result in significant increased positive economic impacts such as increased employment opportunities, investment and procurement of goods and services. From a social aspect, the Project is essential to

sustaining employment and economic activity in the region. The OGM is an important employer in north-central Namibia, and the transition from open-pit to underground mining at Antelope will help preserve jobs and maintain livelihoods for hundreds of workers and their families. This continuity is particularly important in rural areas where alternative employment opportunities are limited. The proposed Project also presents opportunities for skills development, especially in underground mining techniques, which are less common in Namibia. Economically, the Antelope deposit is a strategic asset that ensures the continued viability of the OGM. With high-grade ore and relatively low projected operating costs, the deposit is expected to contribute significantly to gold production between 2028 and 2032. This will help maintain revenue streams for both B2Gold and the Namibian government through taxes, royalties, and dividends. The proposed Project also supports local procurement and service industries, reinforcing its role in regional economic development. By leveraging existing infrastructure, the Project reduces capital expenditure requirements and improves return on investment, making it a financially sound and desirable addition to the OGM's long-term plan.

The added potential socio-economic benefits are expected to override the potential additional negative environmental and social impacts of significance. Therefore, proceeding with the Project will allow for extended exploitation of the mineral resource at the mine and allow for the associated additional positive economic impacts, provided that the relevant management and mitigation measures are successfully implemented to avoid/reduce the negative impacts. Not proceeding with the Project means that the additional economic benefits will not materialise.

6.0 Project Motivation (Need and Desirability)

The underground mining activities for the new Antelope deposit are already approved as part of the existing ECC for the OGM. However, additional surface infrastructure within the ML is required to enable the extraction of this newly discovered resource.

6.1 Introduction

The Constitution of the Republic of Namibia for environmental protection. Article 95 of the Constitution of the Republic of Namibia states that “the State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at the following: (I) maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of natural resources on a sustainable basis for the benefit of all Namibians both present and future; in particular the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian Territory.”

Article 10 of the Constitution provides for the creation of the Office of Ombudsman to ensure that the constitutionally protected individual freedoms and other fundamental rights of all people are not denied by the government or others. One of the constitutional obligations of the ombudsman is to “investigate complaints concerning the over-utilization of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystem and failure to protect the beauty and character of Namibia.” The ombudsman in Namibia provides citizens with direct access to the courts and a means to stop activities that harm the environment.

Namibia’s Vision 2030 which was formulated in 2001/02, aims to guide the country’s development plans from National Development Plan (NDP) II through to NDP VII, while providing direction to government ministries, the private sector, non-governmental organisations, and local authorities Namibia’s Vision 2030 fully embraces the idea of sustainable development. For the natural resource sector, it states:

“The nation shall develop its natural capital for the benefit of its social, economic, and ecological well-being by adopting strategies that: promote the sustainable, equitable and efficient use of natural resources; maximise Namibia’s comparative advantages; and reduce all inappropriate resource use practices. However, natural resources alone cannot sustain Namibia’s long-term development, and the nation must diversify its economy and livelihood strategies.”

6.2 Benefits of Mining in Namibia

The mining industry is of great importance to the Namibian economy. According to the National Planning Commission (NPC) in the Office of the President of Namibia (NPC, 2021), the mining sector has been and remains the backbone of the economy, as reflected by its average annual economic growth, contribution to GDP, job creation, income generation, and a key source of government fiscal receipts and foreign exchange earnings, among others (NPC, 2021).

The sector has also led to the establishment of towns while remaining committed to the achievement of national goals of poverty reduction, employment creation and skills development, among others. A study on the impacts of the mining sector in Namibia found that (NPC, 2021):

- The mining sector’s average annual contribution to Namibia’s Gross Domestic Product (GDP) between 1981 and 2018 was 11.1%. The Chamber of Mines of Namibia 2023 Annual Review reported that the mining industry’s contribution to GDP increased to 14.4% in 2023.

- The mining sector has, on average, been a key growth driver as it registered strong growth, recording an average annual growth of 13.9% from 1981 to 2018.
- The mining sector continued being an employment creator, employing 1.7% of the total employed persons in 2018. It is expected that more employment and revenue can be created with intensified value addition and beneficiation in the sector.
- Mining companies have made significant corporate social investments to communities over the years, contributing approximately N$ 537.9 billion between 2013 and 2018 to improve the living condition of local communities.

The Proposed Project is deemed feasible and achieved a positive PEA, with a total measured and indicated inferred Mineral Resource estimate for the Antelope deposit of 1.75 million tonnes grading 6.91 g/t gold for a total of 390,000 ounces of gold, the majority of which is hosted in the Springbok Zone.

6.3 Socio-economic Benefits of the Project

The Proposed Project has the potential to benefit the country, society, and surrounding communities both directly and indirectly. Especially, as the Project is located in an area with low development and opportunities supporting Namibia's Vision 2030. Direct economic benefits will be derived from wages, taxes, and profits. Indirect economic benefits will be derived from the procurement of goods and services and the increased spending power of employees through the creation of new jobs at the mine. Economically, the Antelope deposit is a strategic asset that ensures the continued viability of the OGM. With high-grade ore and relatively low projected operating costs, the deposit is expected to contribute significantly to gold production between 2028 and 2032. This will help maintain revenue streams for both B2Gold and the Namibian government through taxes, royalties, and dividends.

6.3.1 National and Regional Level

The motivation for Namibia to support the Project is economic and strategic in nature. The information provided below was sourced from Mining Review Africa which describes how the OGM is a major contributor to Namibia's economy (Mining Review Africa, 2023).

Since commercial production was declared (from March 2015 to 31 December 2022), B2Gold have contributed N$19.5 billion to the Namibian economy. These contributions were made in the areas of local procurement, indirect taxes, salary and wages, corporate income tax, PAYE, royalties and export levies and CSI projects.

B2Gold's approach to local employment focuses on recruiting individuals from designated groups, as set out in the country's Affirmative Action Employment Act. Preference is given to previously disadvantaged Namibians and those from local communities. The company supports the redress of imbalance in the Namibian workplace caused by the historic legacy of discriminatory socio-economic practices. This is achieved through the implementation of employment equity principles and affirmative action measures. Its Affirmative Action Plan has resulted in a workforce that is 95% Namibian from previously disadvantaged groups. In addition, only 1.7% of the total workforce is non-Namibian and the positions of non-Namibian employees all have Namibian understudies.

The number of previously disadvantaged employees (including women) at middle and senior management levels is 62%. In the past year, 97.8% of recruitment and 92.5% of promotions were from previously disadvantaged groups. OGM has consistently focused on improving local procurement levels since the initial construction of the mine. More than 76% of procurement in 2022 came from in-country purchases, with about N$16 million spent directly on SMEs within the mine's area of influence. Since commercial production was achieved in 2015, B2Gold has spent more than N$12 billion on local procurement. Of its total supplier spend, about 80% relates to spending on Namibian suppliers of goods and services.

OGM also encourages its suppliers to support local social development programmes. For example, Treron Investments, which provides construction and maintenance services to the mine, employs 44 youths on fixed-term contracts, some of whom had the opportunity to receive additional training and employment at the mine. This is a group which is systematically excluded from the job market due to a lack of educational qualifications and experience.

In addition to making significant contributions to the Namibian economy and providing employment to almost 1 000 employees and contractors, B2Gold has invested substantially in CSI initiatives in the country, impacting the mine's neighbouring communities of Otavi and Otjiwarongo and Namibia as a whole. From 2015 until 2022, the company invested more than N$123.1 million in CSI projects. B2Gold's CSI programmes focus on four pillars: education; arts and culture; livelihoods; and environmental conservation.

There is a strong emphasis on investing in sustainable projects that lead to long-term impacts which, among others, contribute to economic upliftment and poverty reduction through skills training and livelihood development; promote educational opportunities, capacity building, innovation and technical excellence; and empower communities, groups and entrepreneurs to help themselves. An example of a successful initiative to provide quality education is the Eduvision programme, where B2Gold provided funding for several smartboards and the monthly cost of a high-speed satellite link. In addition, B2Gold has also made contributions to SMEs Compete, a consultancy firm that helps Namibian SMEs grow their business, create wealth and generate employment. In 2022, B2Gold committed to support the DoBox JumpStart incubation programme which provides support, training and coworking opportunities to young entrepreneurs.

The PEA for the Proposed Project highlighted the following economic benefits (B2Gold, 2025):

- LOM after-tax free cash flow of $185 million at $2,400 per ounce gold price;
- Assuming a discount rate of 5.0%, net present value ("NPV") after-tax of $131 million generating an after-tax internal rate of return ("IRR") of 35%, with a project payback on pre-production capital of 1.3 years; and
- Estimated pre-production capital cost of $129 million.

6.3.2 Local Level

The Proposed Project is essential to sustaining employment and economic activity in the region. The OGM is an important employer in north-central Namibia, and the transition from open-pit to underground mining at Antelope will help preserve jobs and maintain livelihoods for hundreds of workers and their families. This continuity is particularly important in rural areas where alternative employment opportunities are limited.

The proposed Project also presents opportunities for skills development, especially in underground mining techniques, which are less common in Namibia. The proposed Project also supports local procurement and service industries, reinforcing its role in regional economic development.

The information provided below was sourced from the Namibian Sun (Namibian Sun, 2022).

B2Gold transformed 11 000 Ha of adjacent commercial cattle farmland into the Otjikoto Nature Reserve in 2012. The Otjikoto Education Centre and Nature Reserve was established as part of B2Gold Namibia's Corporate Social Investment. The Otjikoto Nature Reserve is home to plains game such as Oryx, Eland, Kudu, Zebra, Giraffe, Springbok, Hartebeest, Wildebeest, Impala and Waterbuck as well as large carnivores such as Leopard, Spotted Hyena, Brown Hyena and Cheetah, making it ideal for wildlife veterinary training.

The Reserve's environmental education programme was established in 2014 to promote the fundamental understanding of mining activities and conservation and how these could coexist. The programme involves practical activities to preserve and sustain the natural environment. Activities offered through this programme include but are not limited to ecological studies, leadership training, guided nature walks, career development and mine tours. The Environmental Education programme is open to primary and secondary schools across Namibia. B2Gold avails the Otjikoto Nature Reserve for this programme at no cost to any of the attendees. To date, this programme has reached 4839learners and 590 teachers.

The Little Shop of Physics (LSOP) is one of B2Gold's Corporate Social Investment flagship projects. The programme was designed by the Colorado State University in the USA. LSOP aims to take complex physics concepts and theories and demonstrate them in creative and practical ways, using everyday material. An LSOP lab was established at the Otjikoto Nature Reserve where pupils and teachers can participate in the LSOP activities and visit the mine.

The University of Namibia's School of Veterinary Medicine, based at their Neudamm Campus, is the only school offering a compulsory Wildlife component to undergraduate classes. For the past five years, B2Gold has offered its facilities to the UNAM for practical training and, as such, veterinary students have gained valuable knowledge and experience.

Another tertiary institution that has partnered with B2GoldReserve and Education Centre is the Namibia University of Science and Technology (NUST) through its Biodiversity Research Centre. One of the goals of the Otjikoto Nature Reserve is to enhance biodiversity and conservation of Namibian wildlife around the mine. To achieve this, the reserve must manage and monitor its wildlife effectively and timeously.

In addition, B2Gold's Environmental Department has been hosting the B2Gold Environmental Summer School (ESS) at the Otjikoto Nature Reserve since 2019. The programme offers students an opportunity to learn from experts in the environmental management field. The programme is fully funded by B2Gold, and each year the mine's Environmental Department selects a topic and invites experts to present special lectures and seminars.

The information provided below was sourced from Mining and Energy (Mining and Energy, 2024). Maize is grown at the adjacent Farm Erhardtshof, a property originally acquired to support the development of the OGM. Over the past five years, B2Gold has converted the farm into a productive agricultural venture as part of its broader sustainability initiatives. B2Gold has begun harvesting its 2024/2025 maize crop at farm Erhardshof with a forecasted yield of nearly 2,000 tonnes of white maize from its irrigation scheme. The Project is designed not only to support local food production but also to form part of its long-term post-closure land use strategy. The initiative forms part of B2Gold's wider commitment to addressing food security in Namibia through sustainable, locally driven solutions.

6.4 Environmental Responsibility

It is expected that the Proposed Project will have negative environmental impacts, including, but not limited to, the impacts that have been included in Section 9 of this report.

The impacts were investigated in detail during the previous EIAs, and a consolidated EMP was compiled. Although the environmental performance requirements set out in the approved EMP are considered to be robust and comprehensive, it is expected that the Project will require a revision and update of the requirements. The extent to which the environmental performance requirements set out in the approved EMP will require updating will be confirmed during the Impact Assessment phase.

The approved EMP was developed based on an adaptive environmental management approach and therefore provided sufficient controls for the Project, as it was described in 2021. However, due to the increased project footprint and changes in the infrastructure, it is

expected that additional measures may be required. This will be confirmed during the EIA process, where the EMP will be brought in line with current international best practices.

The EMP will ensure that B2Gold keeps track of the impacts of the Project on the environment, mitigates impacts where possible and if necessary, take remedial action.

7.0 Description of the Current Environment

This chapter provides general information on relevant environmental (biological, cultural heritage and socio-economic) aspects associated with the Proposed Project.

This section was compiled utilising the following sources of information:

- Atlas of Namibia;
- Google Earth; and
- Specialist assessments undertaken as part of this EIA (Appendix E to Appendix I).

The description of the current environment encompasses the Project infrastructure footprint, i.e., disturbance areas within the Project area, as well as the surrounding natural environment.

7.1 Baseline Biophysical Environment

The baseline characterisation for the proposed new infrastructure at the OGM primarily focuses on the undisturbed area proposed for infrastructure development, as this area has not been subject to prior mining activities. While the existing mined and previously disturbed areas will be generally considered to provide a broader environmental context, the detailed baseline data collection is concentrated within the footprint of the new development area to ensure site-specific environmental characterisation for the impact assessment.

7.1.1 Topography

7.1.1.1 Data Collection

Desktop information provided in this Section was sourced from the approved 2012 EIA Report (SLR, 2012) and the Air Quality Impact Assessment undertaken by SLR (SLR(c), 2025), included in Appendix E.

7.1.1.2 Local Topography

The topography of the Project area is characterised by relatively flat terrain with gentle undulations. The OGM is at approximately 1,500 metres above mean sea level (mamsl). Regional topography within 50 km is shown in Figure 7-1. The ML is characterised as flat, with elevations across the mining lease area ranging between ~1,480 – 1,530 mamsl. It is important to note that the existing topography has already been altered by the existing mining operations.

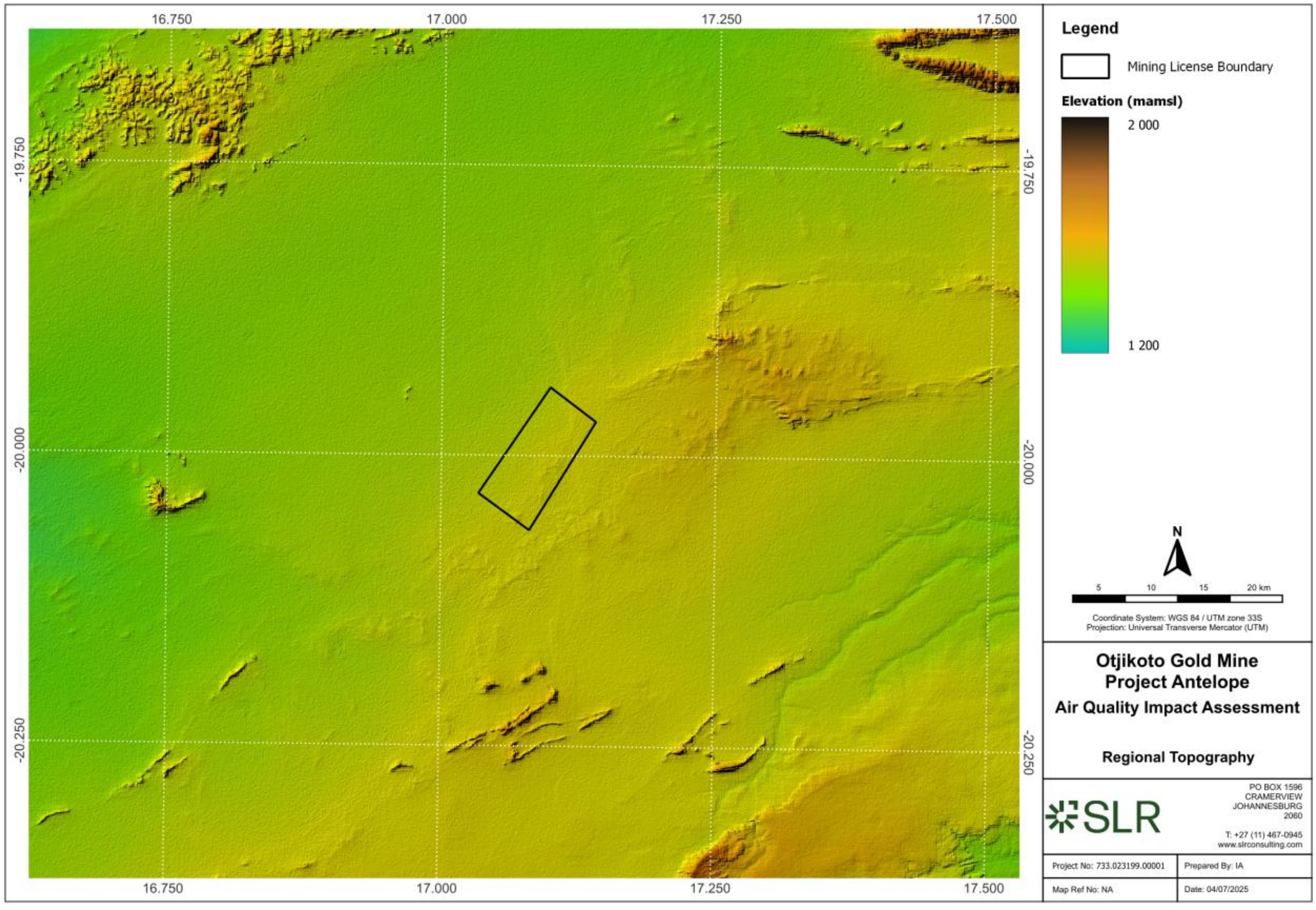


Figure 7-1: Regional Topography

7.1.2 Climate

7.1.2.1 Data Collection

Information provided in this Section was sourced from the Air Quality Impact Assessment undertaken by SLR (SLR(c), 2025), included in Appendix E.

This section presents an overview of local meteorological conditions for the OGM area. Two meteorological datasets were analysed:

1) OGM's onsite weather station (-20.008995°S; 17.102391°E). This dataset was analysed for the period January 2022 – December 2024 (i.e. three calendar years), providing sufficient data to understand seasonal variations; and
2) The Weather Research and Forecasting (WRF) prognostic meteorological dataset, a required input for dispersion modelling. This AERMET-ready WRF dataset is centred at the OGM (-19.99092°S and 17.09157°E) analysed for the period January 2022 - December 2024 for comparison with measured conditions onsite.

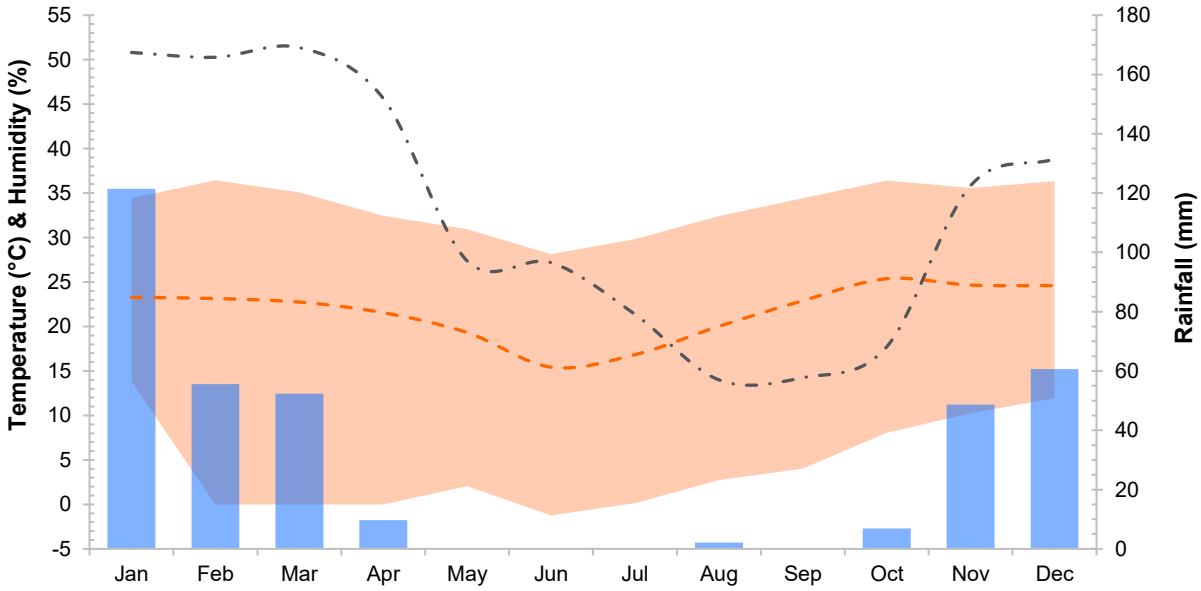
7.1.2.2 Temperature, Rainfall and Relative Humidity

The climate of Namibia's central interior, including the Otjozondjupa region, is shaped by subtropical atmospheric circulation and exhibits a distinct wet-dry seasonal pattern.

Average temperature, humidity and rainfall are presented in Figure 7-2.

Both the onsite and WRF datasets show temperature averaging at ~21.5°C. Peak (~36.5°C) and highest average (~24.6 °C) temperatures are measured during summer (December, January and February) and spring (September, October and November). Temperatures average lowest in winter (June, July and August) at ~16.5°C and with minimum temperatures of ~2.1°C. Humidity averages at 33%.

There is a discrepancy in rainfall data between the WRF prognostic dataset and the onsite weather station. The onsite station recorded an average annual rainfall of ~358 mm, whereas the WRF dataset modelled a higher value of 608 mm. In both datasets, most rainfall occurs in summer (~66%), followed by autumn (~20%), with spring (~14%) and winter (<1%) being the driest periods.



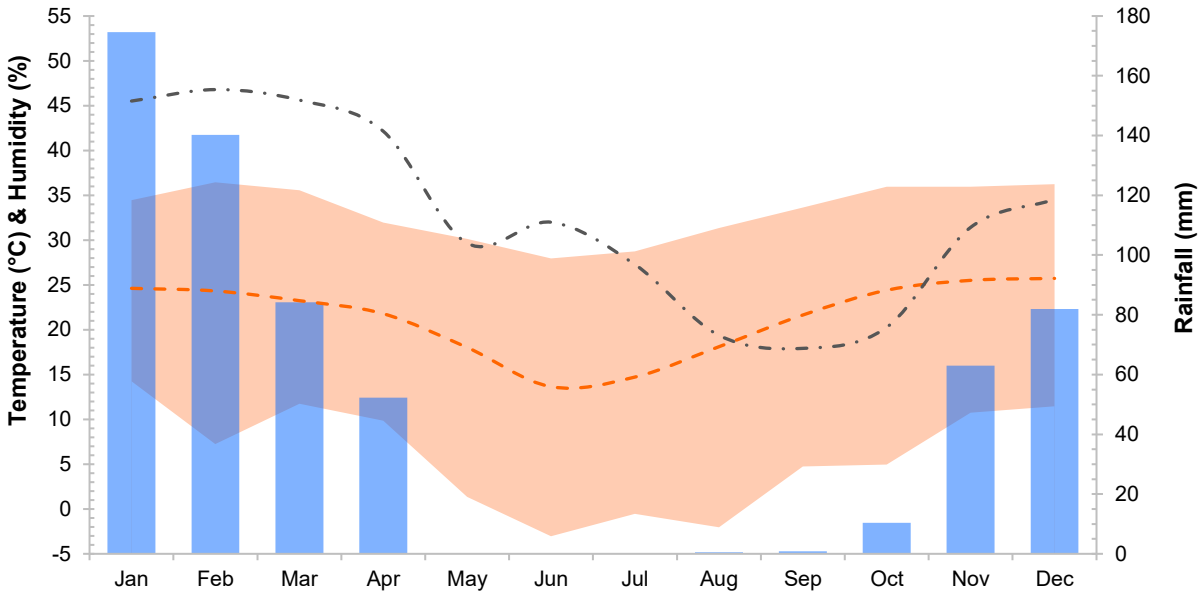


Figure 7-2: Monthly Average Temperature, Rainfall and Relative Humidity (2022-2024)

7.1.2.3 Atmospheric Stability

Atmospheric stability for new generation dispersion modelling is determined by two input parameters, namely the mixing depth (i.e. the height above ground within which air can mix) and the Monin-Obukhov (LMo) length (i.e. the height at which turbulence is generated by buoyancy rather than wind shear). Diurnal stability trends using the WRF prognostic meteorological data for the study area are shown in Figure 7-3. Lower mixing heights and positive LMo values are associated with stable conditions and reduced dispersive potential. Higher mixing heights and negative LMo values are associated with unstable conditions and improved dispersion potential.

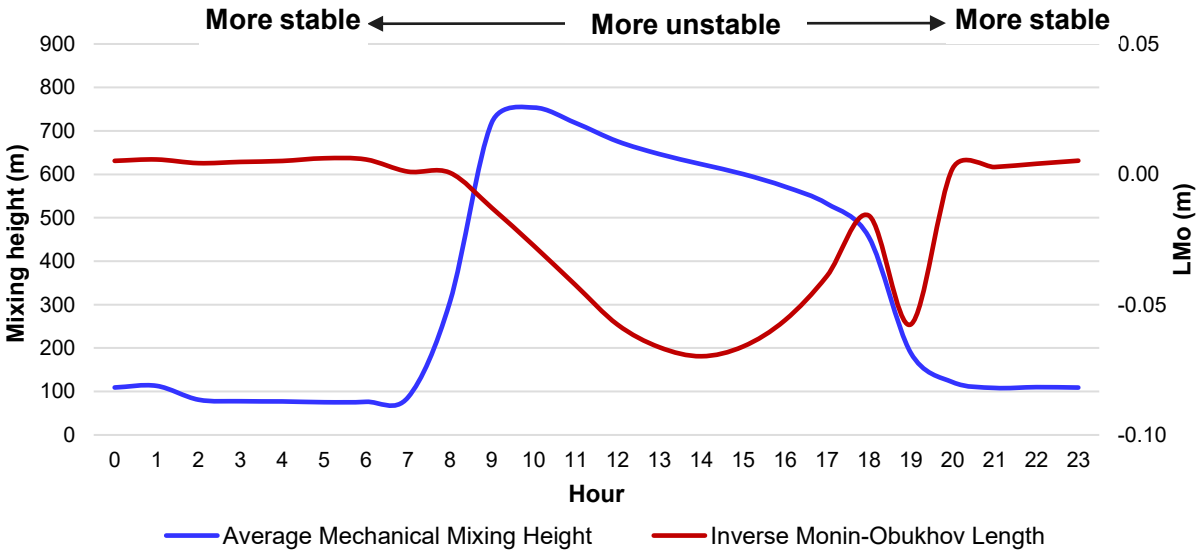


Figure 7-3: Diurnal Atmospheric Stability for the Study Area

7.1.2.4 Surface Wind Field

The wind field is presented as wind rose charts that display wind speed and directional frequency. Each directional branch on a wind rose represents wind flow originating from that direction. Each directional branch is divided into segments of colour, representative of different wind speeds. The wind roses presented in Figure 7-4 were created using Lakes Environmental WRPlot Freeware (Version 12.0.1) and the available meteorological datasets.

The onsite dataset was analysed further for diurnal and seasonal trends. Temporal scales (Figure 7-5) assessed include diurnally for early morning (00h00 – 06h00), morning (06h00 – 12h00), afternoon (12h00 – 18h00) and night (18h00 – 00h00), and seasonally for summer (December, January and February), autumn (March, April and May), winter (June, July and August) and spring (September, October and November). Wind speed classes and the descriptions applied in this study align with the Beaufort Wind Force Scale:

- Winds are predominantly from the east-southeast and east throughout the day, with components from the northwest developing in the afternoon (12h00–18h00) and west-southwest in the evening (18h00–00h00).
- On a seasonal basis, east-southeasterly winds prevail year-round, with southwesterly components during summer and spring.

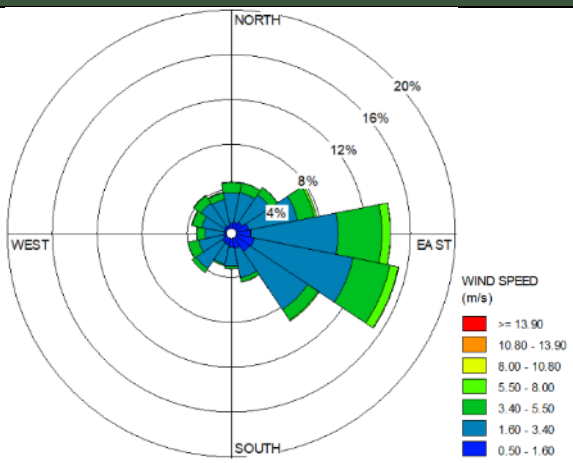
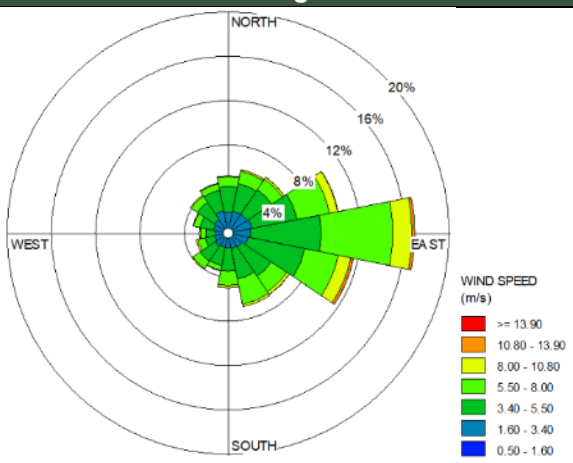
Onsite Station	WRF Prognostic
	
• Calm conditions occurred 1.62% of the time. • Wind speeds ranged from light (0.5 – 1.5 m/s) to fresh breeze (7.9 – 10.7 m/s) prevailing from the east-southeast and east. • Peak (9.2 m/s) and highest average (2.9 m/s) wind speeds occurred from the east.	• Calm conditions occurred 0.44% of the time. • Wind speeds ranged from light (0.5 – 1.5 m/s) to moderate gale (13.9 – 17.10 m/s) prevailing from the east. • Peak (14.2 m/s) wind speeds occurred from the east-southeast. • Highest average (5.6 m/s) wind speeds occurred from the east.

Figure 7-4: Wind Rose Charts for OGM (2022-2024)

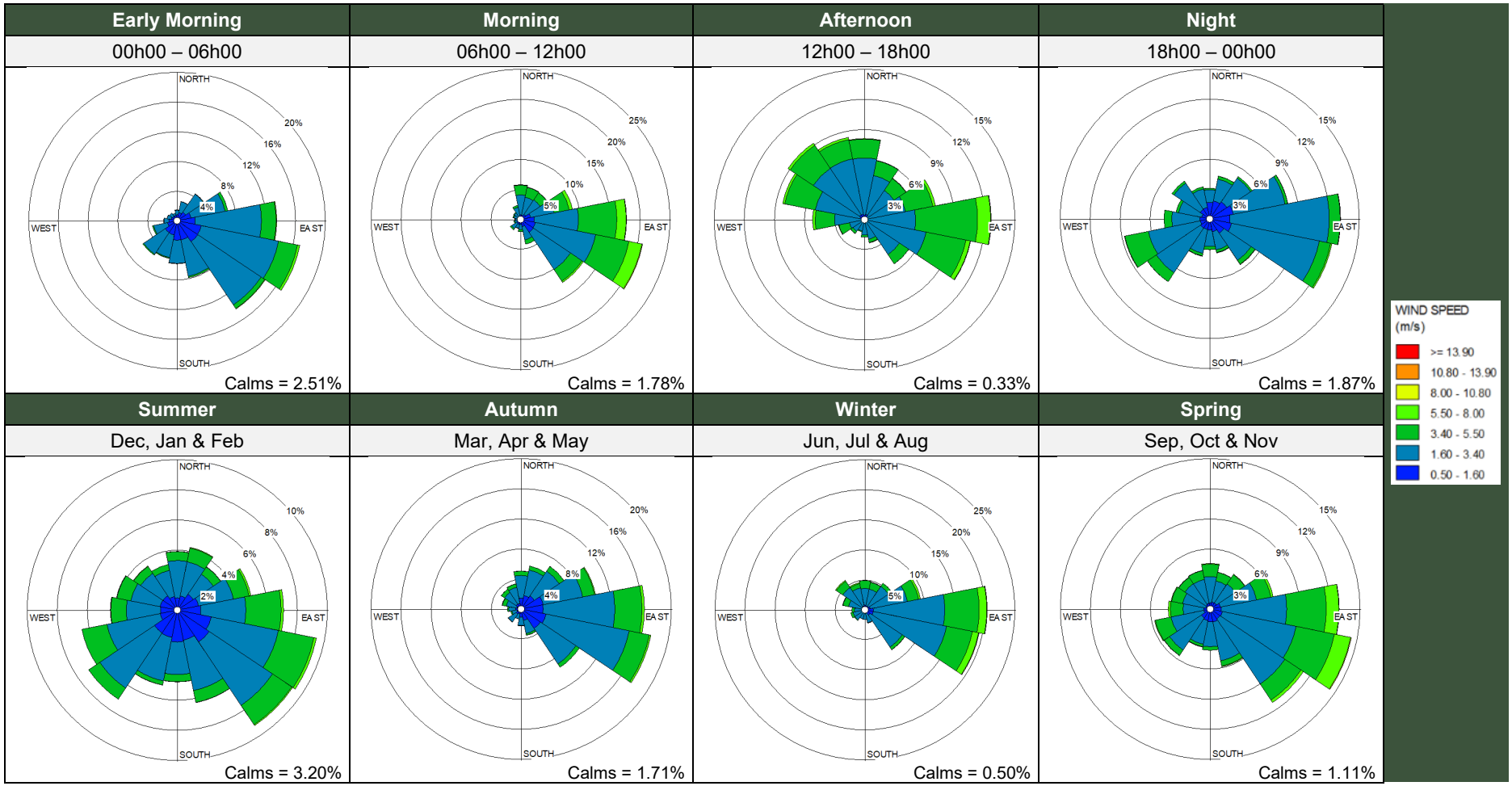


Figure 7-5: Temporal Wind Cnditions for OGM (2022-2024)

7.1.3 Soils and Land Capability

7.1.3.1 Data Collection

The desktop baseline characterisation of the undisturbed soils within the proposed development footprint is discussed below. Information provided in this Section was sourced from the “Surface Water Assessment for the Site Surface Water Management and Erosion Modelling of the WRD Landform at OGM in Namibia” (Digby Wells Environmental, 2024).

7.1.3.2 Regional Soil Classification

Soils of the Project area are generally dominated by a variably coarse texture. The soils are shallow (10 to 20 cm deep), poorly developed and characterised by a mixture of organic and transported sediments of the Kalahari Group aeolian soils and sands. The soils are widely characteristic of calcrete or sediment/soil profiles, sometimes with fragmented bedrock or regolith carbonate. Alternatively, dominant soils at OGM can be described as alluvial plain soils of the mollic leptosol type (i.e. shallow, stony, dark, fine-grained soils over a petro-calcic horizon). According to the 2021 National Soil Profile Database of Namibia, the Project falls within soils classified as the eutric chromic cambisol and eutric regosol (Figure 7-6).

Physical and Chemical Properties of Eutric Chromic Cambisols and Eutric Regosols Soils Types

The Eutric Chromic Cambisols soils are well-developed and moderately deep, typically forming on gently undulating to rolling terrain (National Soil Profile Database of Namibia , 2021) (FAO, 2015).

- Texture and Structure:
  - Medium-textured, generally loamy with good aggregation.
  - Well-structured subsoil with moderate blocky or granular structure, providing good water infiltration and aeration.
- Depth and Drainage:
  - Moderately deep (50–100 cm) with a distinct cambic (subsoil) horizon.
  - Well-drained with moderate to high permeability.
- Water-Holding Capacity:
  - Moderate to high, supporting good plant available water.
- Organic Matter:
  - Moderate levels of organic carbon in the topsoil.
- Chemical Properties:
  - **Base Status:** Classified as *eutric*, meaning it has a relatively high base saturation (>50%).
  - **pH:** Neutral to slightly alkaline (pH 6.5–7.5).
  - **Nutrient Content:** Generally fertile, with adequate levels of Ca^{2+}, Mg^{2+}, K^{+}, and Na^{+}; cation exchange capacity (CEC) moderate to high.
  - **Salinity/Sodicity:** Usually non-saline and non-sodic under natural conditions.

The Eutric Regosol are weakly developed soils that often form in areas with active erosion, deposition, or on young geological substrates (National Soil Profile Database of Namibia , 2021) (FAO, 2015).

- Texture and Structure:
  - Highly variable texture — often sandy to loamy-sandy.
  - Weak or absent structure (massive or single-grained), making them prone to erosion.
- Depth and Drainage:
  - Shallow to moderately deep with limited horizon development.
  - Rapid drainage due to coarse texture; low water retention.
- Water-Holding Capacity:
  - Generally low, limiting available moisture for vegetation.
- Organic Matter:
  - Low organic carbon content due to limited soil development.
- Chemical Properties:
  - **Base Status:** Also *eutric*, indicating a high base saturation despite limited profile development.
  - **pH:** Usually neutral to slightly alkaline (pH 6.0–7.5).
  - **Nutrient Content:** Can be moderately fertile but nutrients are easily leached because of low clay and organic matter content.
  - **Salinity/Sodicity:** Typically non-saline but may be susceptible to surface crusting under intensive use.

7.1.4 Surface Water

7.1.4.1 Data Collection

Desktop information provided in this Section was sourced from the approved 2012 EIA Report (SLR, 2012) and the Desktop Hydrogeological Appraisal undertaken by SLR (SLR(a), 2025), included in Appendix F.

7.1.4.2 Local Hydrology

There are no well-defined surface water drainage features on or near the site, and no major surface water flow or defined channel flow is expected other than local events after heavy rainfall. The Project area is located in the most eastern parts of the Ugab catchment, an ephemeral river catchment draining westwards into the Atlantic Ocean (Figure 7-7). The surface water flow direction at the mine site is in a north-westerly direction, following the gradient towards the Platveld basin. Surface water flow in this region occurs as overland flow accumulating in pans and depressions from where it infiltrates or evaporates (SLR, 2012).

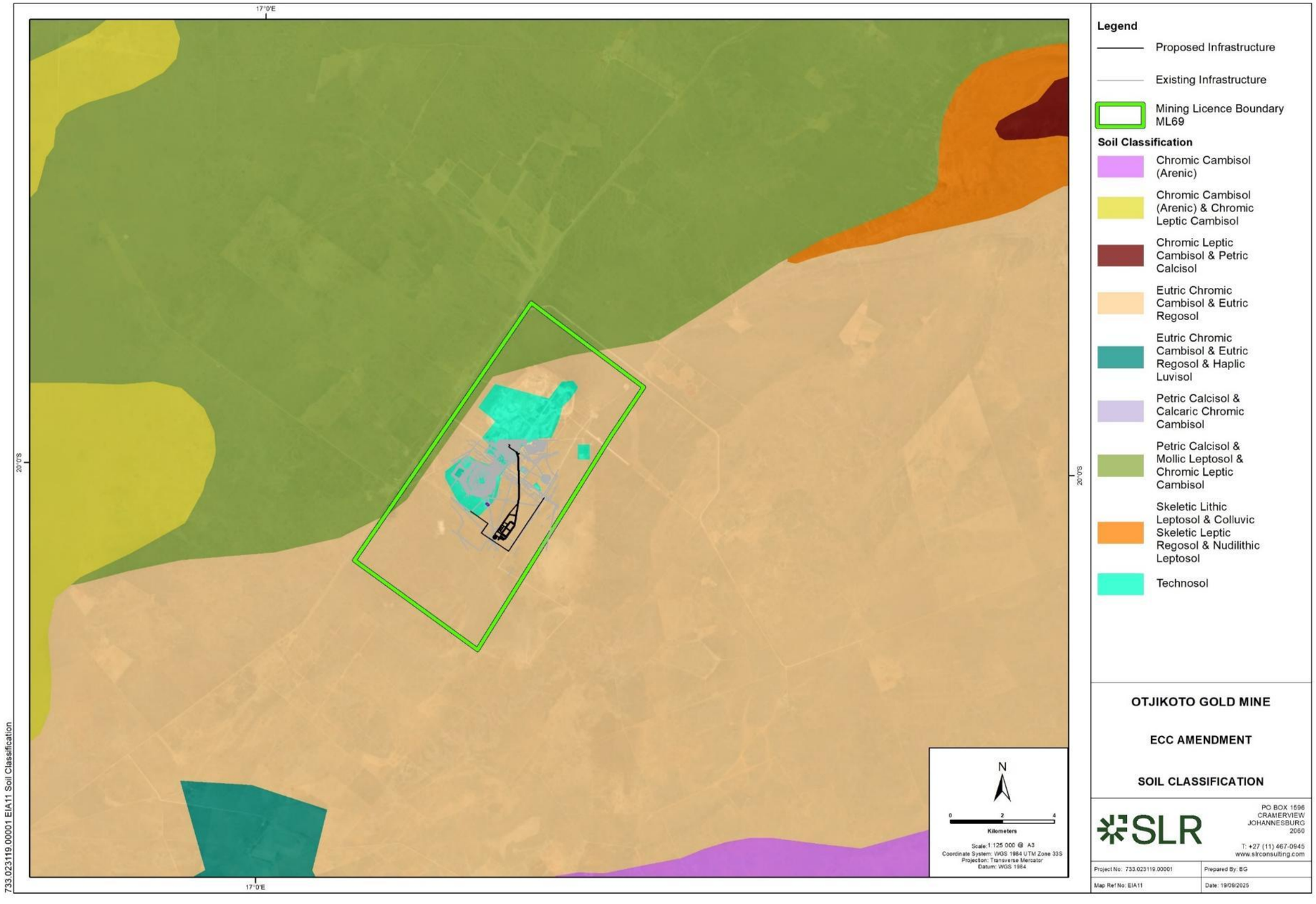


Figure 7-6: Regional Soils Classification

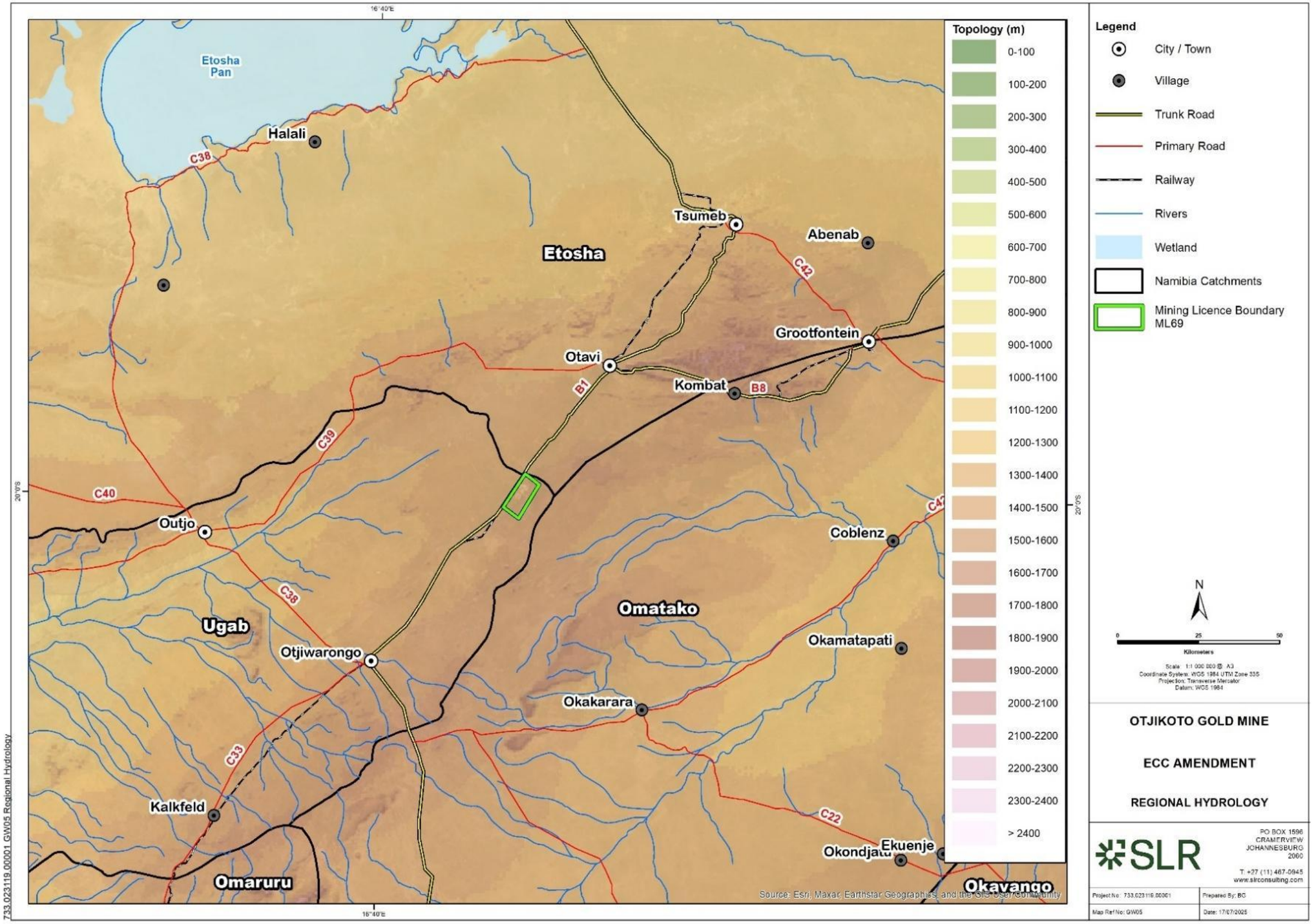


Figure 7-7: Topography and Surface Drainage

7.1.5 Geohydrology

7.1.5.1 Data Collection

Desktop information provided in this Section was sourced from the Desktop Hydrogeological Appraisal undertaken by SLR (SLR(a), 2025) included in Appendix F.

7.1.5.2 Regional and Local Geology

The geology of an area provides information on the presence of mineral resources, the geochemistry and related potential for contamination from mined material and the presence of geological structures (such as faults and dykes) that act as barriers or conduits (preferential flow paths) for groundwater flow. Geological processes also influence soil forms and the type and nature of groundwater aquifers.

The major regional geology is influenced by the Damara Orogeny (~850–460 Ma) developed as a result of successive phases of spreading, rifting, subduction and continental collision between the Kalahari, Congo and Río de la Plata Cratons.

The Damara Mobile Belt present in the region can be divided into a number of zones, separated by regional lineaments. The Project area is primarily within the area referred to as the Northern Zone. The basement rocks in the area are part of the Huab Metamorphic Complex, which includes a lower sequence of sedimentary origin and an upper sequence of volcanic materials. These rock layers were represented by dark mafic magma, as well as lighter, granitic magma, which formed large sills and plutons. Subsequent metamorphic processes transformed the mafic intrusions into amphibolite, and the granitic intrusions into gneisses. The basement rocks are overlain by the Nosib Group, which includes arkosic quartzite found to the west and north of Otjiwarongo. Additionally, the Tsaun Formations within the group contain layered arkosic quartzite and amphibolite that have undergone metamorphic processes, now incorporating minerals such as garnet and cordierite.

Overlying the Nosib Group with an angular unconformity are rocks of the Swakop Group, further subdivided from lowermost to uppermost as follows:

- Ugab Subgroup consisting of marine, shallow-water, mixed carbonate-clastic sequences,
- Usakos Subgroup consisting of the Chuos, Rasthof, and Okonguarri Formations (the gold-bearing formation), and
- Navachab Subgroup consisting of the Ghaub, Karibib, and Kuiseb Formations. These are the formations daylighting at surface level and gets intersected by some of the mining areas.

In terms of the local geology, the gold deposits are located within the Okonguarri Formation belonging to the Swakop Group and are composed primarily of metasediments as albites, hornfels and schists with thinner but distinguished marble bands (the Footwall Marble FW and the Otjikoto B - Okonguarri Formation (OTB) Marble) within the Middle Okonguarri, which have also been folded and sheared. Table 7-1 presents a description of the geological formations present in the study area.

Table 7-1: Description of Geological Formations Present in the Study Area

Formation	Description
Upper Okonguarri	It overlies the Nosib Group and is composed of various rock types, including biotite schists, albitites, marble units, and is structurally complex, with evidence of folding and metamorphism.

Formation	Description
Middle Okonguarri	This unit lies beneath the footwall marble and is composed mainly of biotite-rich and biotite-garnet schists.
Okonguarri	The formation consists of metamorphosed sedimentary rocks, primarily biotite-feldspar schists with minor quartz, dolomite, calcite, and garnet.
Ghaub	The Ghaub is a glacially derived diamictite, easily recognized by its mix of rock fragments and found around the Otjikoto deposit. In the west, it contains fine-grained pyrite in scattered patches and lenses.
Karibib	The Karibib features thick, ridge-forming marbles in the east and north, composed mainly of calcite interlayered with biotite schist.
Quaternary age calcium carbonate rocks	Surface layers of calcium carbonate and calcrete cover the area, ranging from 2 to 15 meters thick, with variations from hard, rock-like layers to softer, powdery forms depending on location and depth.
Kalahari Group Aeolian Soils and Sands	Wind-blown sands and soils from the Kalahari Group fill local depressions across the area.

Outcrop in the Project area is limited to Karibib Formation marbles, with most of the region covered by a thick layer of calcrete, transported Kalahari Group sands, and soil (Figure 7-8).

The Antelope Deposit is located within the upper Okonguarri formation, a sequence of deep-marine rocks including layered sandstones, shales, and marble beds, originally formed in paleo basins. These rocks have been metamorphosed and shaped by unique structural changes compared to the surrounding areas.

Gold mineralisation at the OGM is mainly found in quartz-pyrrhotite-carbonate veins, often near two key marble layers (OTB and FW), which historically marked the end of mineralisation. However, new discoveries below these layers have expanded exploration potential. At the Antelope Deposit, gold is concentrated in fold hinges and influenced by deformation around the marble layers. A strong magnetic signal, extending over 4 km south of the Otjikoto pit, links to a new ore zone. The mineralised zones dip gently north-northeast and remain open for further exploration.

The Antelope deposit includes up to three distinct mineralised structures, with the southernmost Springbok Zone defined by drilling over an 800 m strike length, dipping 150 m, and ranging from 7 to 10 m thick. Northeast of this, the Oryx Zone contains similar high-grade mineralisation, positioned above the Springbok Zone. Together, the deposit's mineralisation spans about 1,500 m in strike length. As significant mineralisation starts at approximately 450 m depth, the deposit is being considered for potential underground mining.

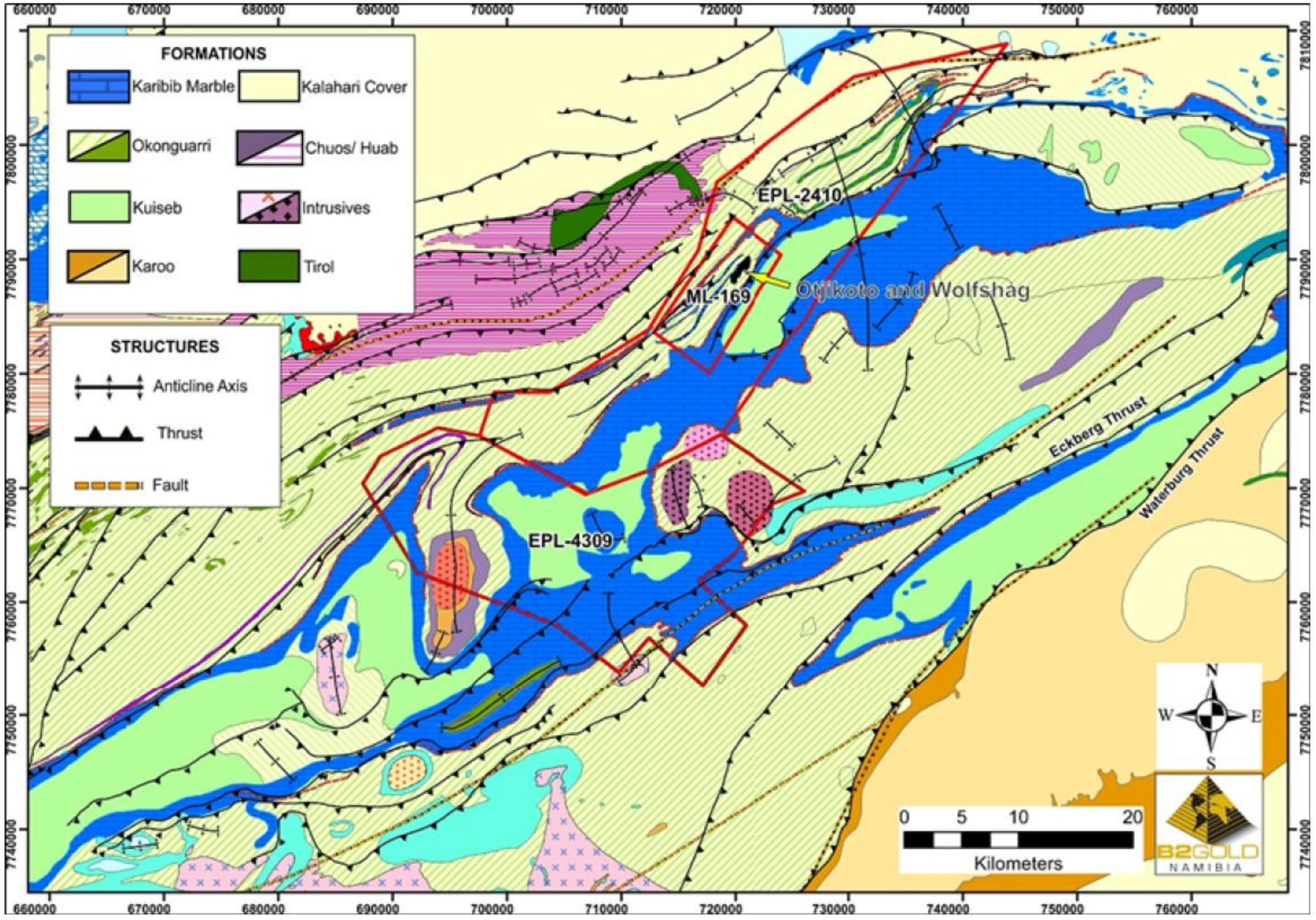


Figure 7-8: Geology Map

7.1.5.3 Aquifer Type

Groundwater is defined as water which is located beneath the surface of the ground in soil/rock pore spaces and fractures and can be a valuable resource. In arid areas, groundwater is frequently the sole source of water and thus essential to agriculture and other development. Groundwater quality and quantity are key indicators of the resource value and status and can have a significant effect on the suitability and availability for use. Mine-related activities have the potential to influence the quality and availability of groundwater through seepage of contaminants that may reach underlying aquifers.

Otjikoto Mine falls within the Kunene South Groundwater Basin, which generally has low to moderate groundwater potential, with the exception being the Karibib Marble formation. The Ghaub Formation is dominated by diamictite, which has a low permeability except where faults across this formation provide higher secondary permeability. This unit separates the Karibib Marbles from the Okonguarri Schists and acts as an aquitard. The Okonguarri metamorphosed sediments (albitites, schists, and hornfels) are generally considered to have low permeability, with slightly enhanced permeability along the bedding or foliation planes (i.e., along strike, with a generally NE-SW orientation). The thinner marble units (FW and OTB) are likely to have higher permeability, particularly at the contacts with the Schists and albitites and minor fold axes. No major karstification is likely, as the Karibib Marbles are much thicker where exposed. The Karibib Marble Formation serves as the primary aquifer in the area. This geological unit, where exposed on the eastern limb of the anticline in the hills, is karstified and has moderate to high groundwater potential due to the dissolution of carbonic minerals that have formed sinkholes and dissolution channels, allowing for rapid recharge and high storage capacity. Fault structures connecting the Karibib Marbles to the Okonguarri Formation are considered preferential flow paths, which have been shown to provide enhanced recharge to the Wolfshag underground workings as evident from hydrochemical analysis of seepage water.

7.1.5.4 Groundwater Level and Gradients

The pre-mining groundwater flow direction was from the Marble Aquifer in the south-east to the Schist and Platveld Aquifer in the north-west, following the topographic gradient, with a water level depth ranging between 17 m bgl in the Karibib formation to 48 m bgl in the Okonguarri formation. Before mining occurred in the Otjikoto area, the measured groundwater levels in the Karibib Formation were 10 to 20 metres below ground level (mbgl), which is approximately 1,500 mamsl. The water levels in the Okonguarri Formation were deeper, measuring 30 to 50 mbgl. This lower water level is due to the lower permeability of the metasediments compared to the marble unit. The Karibib Marble aquifer is also hydraulically separated from the Okonguarri Aquifer due to low permeable contact. The flow is therefore mainly within the Karibib Marble from NE to SW.

Since the mining of the Otjikoto open pit commenced in 2013, water supply to the mine has been from water supply boreholes in the Karibib Marbles to the east of the mine. In addition, once mining of the open pits progressed below the water table, passive dewatering commenced as sump pumping. Active dewatering holes targeting the OTB and FW Marbles in the vicinity of the Wolfshag deposit were initiated to decrease the pore pressures in the confined aquifer that was intercepted in the fold axis of the Okonguarri Marbles (so-called Supertube). Dewatering has also continued as pumping from Wolfshag Underground sumps.

7.1.5.5 Aquifer Recharge

A paper published by Ugulu and Wanke in 2020 summarised a number of recharge estimation studies that have been done over the years. The recharge estimation for the northern parts of Namibia on Kalahari and dolomitic aquifers using the saturated volume fluctuation approach revealed an annual recharge range between 0.33% and 4% of MAP.

Recharge percentages of 2 – 3 % of MAP were applied in the numerical model done for the PEA study, which falls within the range published by Ugulu in 2020.

7.1.5.6 Groundwater Quality

An existing Groundwater Management Plan is implemented at OGM for existing operations (B2Gold, 2024) which mainly focuses on managing groundwater abstraction (direct abstraction and pit and pit dewatering) for water supply. A comprehensive Groundwater Monitoring Programme is implemented and maintained at OGM to manage groundwater pollution by monitoring the quality and quantity of groundwater.

The groundwater quality monitoring points listed in Table 7-2 and are shown in Figure 7-9.

Table 7-2: Groundwater Quality Monitoring Points

Borehole Name	Xcoord (UTM)	Ycoord (UTM	Farm name
WW202014	718209	7784338	Gerhardshausen
WW202015	717340	7785213	Gerhardshausen
WW202016	716531	7786034	Gerhardshausen
WW202017	715943	7786628	Gerhardshausen
WW202018	717263	7788441	Otjikoto
WW202019	718460	7790049	Otjikoto
WW202020	719582	7789570	Otjikoto
WW202021	718534	7790142	Otjikoto
WW202022	719438	7779559	Felsenquelle
WW202023	720695	7789440	Otjikoto
WW202024	718403	7783282	Felsenquelle
WW202025	721241	7781549	Gerhardshausen
WW202026	719807	7789799	Otjikoto
WW202027	721380	7788322	Otjikoto
WW202028	719973	7785663	Gerhardshausen
WW202029	725453	7786531	Wolfshag
WW202030	724288	7784141	Otjikoto
WW202031	719398	7787856	Otjikoto
WW202032	720447	7788981	Otjikoto
WW202033	721354	7789799	Wolfshaag
WW202080	720972	7788608	Wolfshaag
WW202086	721512	7788900	Otjikoto
WW202087	721366	7789015	Wolfshaag
WW202088	718048	7784498	Wolfshaag
WW202089	721335	7789052	Gerhardshausen
WW202090	720270	7787013	Wolfshaag
WW202105	720972	7788608	Otjikoto

Borehole Name	Xcoord (UTM)	Ycoord (UTM	Farm name
WW37727	720678	7789405	Namwater
WW37728	719542	7788344	Namwater
WW36826	711975	7776625	Namwater
WW203714	717460	7787439	Gerhardshausen
WW203715	718393	7786844	Gerhardshausen
WW203716	717756	7785986	Gerhardshausen
WW203717	716930	7786633	Gerhardshausen
WW203718	718289	7787568	Gerhardshausen
WW203719	717850	7787842	Otjikoto
WW203720	721085	7789264	Wolfshaag
WW203721	721401	7790259	Wolfshaag
WW203722	720531	7789839	Wolfshaag
WW203723	720997	7790557	Wolfshaag
WW203724	719050	7790862	Wolfshaag
WW203725	719480	7791454	Wolfshaag
WW203734	719400	7787973	Wolfshaag
WW205025	720152	7789342	Otjikoto
USI001	718126	7788437	Otjikoto
Plant BH PP01	718484	7788317	Otjikoto
Plant BH PP03	718852	7788248	Otjikoto

Groundwater quality monitoring data for the period 2023 and 2024 were assessed against the Namibian Drinking Water Guidelines (Table 7-3) and indicated high total hardness in the regional groundwater quality driven by high Calcium (Ca) and Magnesium (Mg) concentrations. Parameters consistently exceeding the ideal and standard threshold limits of public health concern in all boreholes are salinity (EC), Turbidity, Total Hardness, Magnesium (Mg) and Calcium (Ca). Parameters showing exceedances to the Namibian guidelines to a lesser extent and only in some boreholes include Total dissolved solids (TDS), Chloride (Cl), Sulphate (SO_4), Nitrate (NO_3) and Sodium (Na).

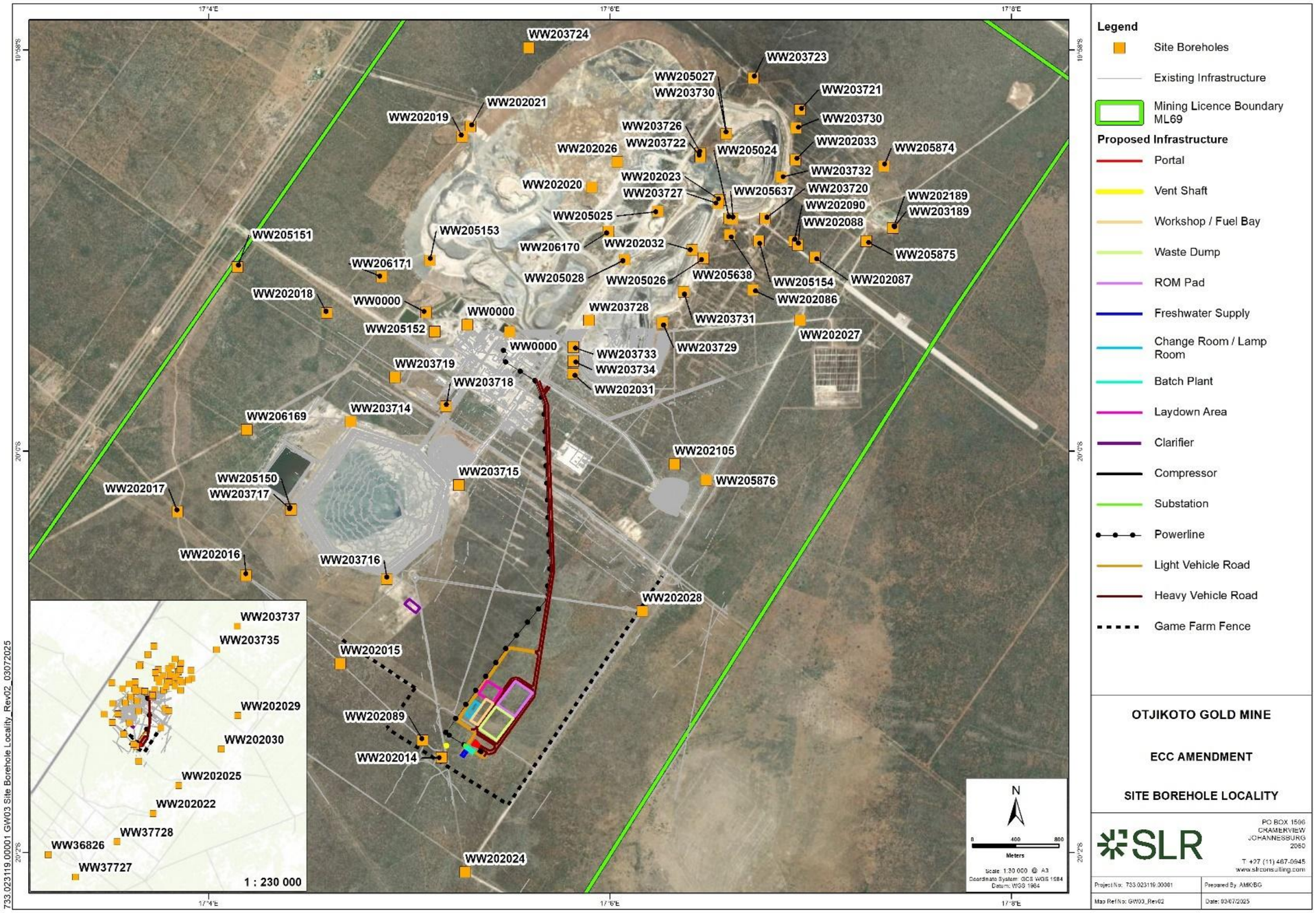


Figure 7-9: Location of Existing Groundwater Monitoring Points

Table 7-3: Groundwater Quality Data Benchmarked against Namibian Drinking Water Quality Guidelines

Date	Borehole ID	Location	pH	EC (mS/m)	Turb (NTU)	TDS (mg/l)	Total Hardness (mg/l)	Cl^- (mg/l)	F^- (mg/l)	SO_4^{2-} (mg/l)	NO_3^- (mg/l)	NO_2^- (mg/l)	NH_3 (mg/l)	PO_4^{3-} (mg/l)	Na (mg/l)	K (mg/l)	Mg (mg/l)	Ca (mg/l)
Namibia Ideal Drinking Water Quality			6 - 8,5	80	0,5	1000	400	100	0,7	100	6	0,1	0,3	25	100	25	30	80
Namibia Acceptable Drinking Water Quality			6 - 9	300	2	2000	1000	300	1,5	300	11	0,15	0,5	100	300	100	70	150
2024-11-24	WW203716	Gerhardshausen	6,9	95	3	571	352	10	0,1	46	<0.5	<0.01	0,15	0,4	87	7	32	88
2024-11-24	WW203716	Gerhardshausen	6,8	106	1	651	500	34	0,3	69	2	0,04	<0.02	0,3	53	6	45	126
2024-11-24	Plant BH PP03	Otjikoto	6,7	189	0	1123	773	238	0,4	187	5	0,03	<0.02	0,6	114	6	67	199
2024-11-24	USI001	Otjikoto	6,9	121	219	610	481	246	0,2	3	<0.5	<0.01	0,20	0,3	46	6	49	112
2024-11-24	WW202105	Otjikoto	6,8	86	0	493	488	9	0,3	8	4	0,01	<0.02	0,2	4	2	16	169
2024-11-24	WW203719	Otjikoto	6,8	87	2	501	423	16	0,3	17	1	0,02	<0.02	0,2	35	8	22	133
2024-11-24	WW206169	Otjikoto	6,8	98	0	573	527	24	0,3	29	6	<0.01	<0.02	0,3	13	2	20	178
2024-11-24	WW203723	Wolfshaag	6,7	90	0	518	449	16	0,3	13	2	<0.01	<0.02	0,4	29	4	23	142
2024-11-24	WW203724	Wolfshaag	6,7	89	0	513	499	12	0,4	13	4	0,03	<0.02	0,3	6	1	18	170
2024-11-24	WW203725	Wolfshaag	6,7	89	1	507	478	20	0,3	8	2	0,04	0,51	0,3	8	7	19	160
2024-11-24	WW203734	Wolfshaag	6,6	183	10	1104	942	256	0,3	213	<0.5	0,04	<0.02	0,4	44	7	70	262

Date	Borehole ID	Location	pH	EC (mS/m)	Turb (NTU)	TDS (mg/l)	Total Hardness (mg/l)	Cl^- (mg/l)	F^- (mg/l)	SO_4^{2-} (mg/l)	NO_3^- (mg/l)	NO_2^- (mg/l)	NH_3 (mg/l)	PO_4^{3-} (mg/l)	Na (mg/l)	K (mg/l)	Mg (mg/l)	Ca (mg/l)
2024-11-24	WW205150	Gerhardshausen	6,8	149	0	904	628	124	0,2	160	8	0,06	<0.5	0,4	90	10	61	151
2024-11-24	WW205152	Otjikoto	6,8	116	3	642	406	104	0,2	60	1	<0.01	0,48	0,4	70	8	21	128
2024-11-21	WW202017	Gerhardshausen	6,7	99	1	567	534	26	0,3	29	4	<0.01	<0.02	0,5	11	5	23	176
2024-11-21	Plant BH PP01	Otjikoto	6,7	163	29	954	777	251	0,2	121	<0.5	0,03	0,27	0,5	44	9	54	222
2024-11-21	WW202021	Otjikoto	6,7	95	9	573	513	30	0,4	68	7	0,01	<0.02	0,3	8	2	19	174
2024-11-21	WW202031	Otjikoto	6,9	128	3	732	598	139	0,2	101	1	<0.01	<0.02	0,5	46	8	67	129
2024-11-21	WW206170	Otjikoto	6,7	185	0	1083	718	261	0,2	168	1	0,01	<0.02	0,4	111	11	70	172
2024-11-21	WW206171	Otjikoto	6,8	98	1	580	535	24	0,4	28	6	0,01	<0.02	0,3	13	3	19	183
2024-11-21	WW202087	Wolfshaag	6,6	86	0	499	485	11	0,4	8	4	<0.01	0,03	0,2	4	1	17	166
2024-05-26	WW203715	Gerhardshausen	7,0	86	0	473	435	11	0,2	6	1	<0.01	0,03	0,5	22	5	22	138
2024-05-26	WW203716	Gerhardshausen	7,1	94	2	542	345	9	0,2	27	1	0,03	<0.02	0,4	84	7	31	87
2024-05-26	WW203717	Gerhardshausen	6,9	106	2	586	482	31	0,3	26	2	0,02	<0.02	0,4	51	6	43	122
2024-05-26	Plant BH PP01	Otjikoto	6,8	166	1	881	750	240	0,2	74	0	0,05	<0.02	0,3	44	10	53	213
2024-05-26	WW205150	Gerhardshausen	7,0	143	1	839	590	113	0,2	135	7	0,06	<0.02	0,4	84	9	56	144

Date	Borehole ID	Location	pH	EC (mS/m)	Turb (NTU)	TDS (mg/l)	Total Hardness (mg/l)	Cl^- (mg/l)	F^- (mg/l)	SO_4^{2-} (mg/l)	NO_3^- (mg/l)	NO_2^- (mg/l)	NH_3 (mg/l)	PO_4^{3-} (mg/l)	Na (mg/l)	K (mg/l)	Mg (mg/l)	Ca (mg/l)
2024-05-25	WW203714	Gerhardshausen	7,0	86	2	472	417	8	0,3	<1	0	0,01	0,52	0,4	31	7	23	129
2024-05-25	Plant BH PP03	Otjikoto	6,8	211	0	1297	930	265	0,3	277	10	0,04	<0.02	0,4	103	7	78	244
2024-05-25	WW202031	Otjikoto	6,8	192	4	1104	956	265	0,2	206	2	<0.01	<0.02	0,5	42	8	89	236
2024-05-25	WW203719	Otjikoto	7,0	86	5	485	409	13	0,3	13	1	<0.01	<0.02	0,3	30	9	21	129
2024-05-25	WW205152	Otjikoto	7,0	118	2	648	467	101	0,2	62	0	0,01	0,34	0,3	70	9	29	139
2024-05-24	USI001	Otjikoto	7,0	125	206	600	501	230	0,2	<1	0	<0.01	0,18	0,5	47	6	49	120
2024-05-24	WW202021	Otjikoto	6,9	99	24	570	491	37	0,3	107	8	<0.01	<0.02	0,2	10	2	20	164
2024-05-24	WW206170	Otjikoto	6,9	166	1	1070	762	267	0,2	145	2	0,02	<0.02	0,3	116	11	74	183
2024-05-24	WW206171	Otjikoto	7,0	98	0	554	511	22	0,3	27	6	<0.01	<0.02	0,4	14	3	18	175
2024-05-24	WW203724	Wolfshaag	6,9	90	1	505	495	16	0,3	11	4	0,01	<0.02	0,2	6	2	19	167
2024-05-24	WW203725	Wolfshaag	7,0	90	3	501	488	15	0,3	7	2	0,10	0,03	0,3	8	8	19	164
2024-05-24	WW203734	Wolfshaag	6,9	185	26	1094	956	233	0,2	222	0	0,02	<0.02	<0.5	<0.01	<0.05	43	7
2024-05-23	WW202017	Gerhardshausen	6,8	99	1	553	525	25	0,3	31	4	0,01	<0.02	0,2	11	5	22	174
2024-05-23	WW202105	Otjikoto	6,8	86	0	474	480	7	0,3	5	4	0,01	<0.02	0,3	4	2	16	166

Date	Borehole ID	Location	pH	EC (mS/m)	Turb (NTU)	TDS (mg/l)	Total Hardness (mg/l)	Cl^- (mg/l)	F^- (mg/l)	SO_4^{2-} (mg/l)	NO_3^- (mg/l)	NO_2^- (mg/l)	NH_3 (mg/l)	PO_4^{3-} (mg/l)	Na (mg/l)	K (mg/l)	Mg (mg/l)	Ca (mg/l)
2024-05-23	WW206169	Otjikoto	6,8	99	0	556	508	24	0,3	30	6	<0.01	<0.02	0,2	14	2	19	172
2024-05-23	WW202087	Wolfshaag	6,9	86	0	473	468	7	0,3	5	3	<0.01	<0.02	0,4	4	1	16	161
2024-05-23	WW203723	Wolfshaag	7,0	90	1	497	440	12	0,3	14	2	<0.01	<0.02	0,3	28	4	22	140
2023-11-23	WW203714	Gerhardshausen	6,9	85	5	489	414	7	0,2	5	2	0,01	0,09	0,7	33	7	23	128
2023-11-23	WW203715	Gerhardshausen	6,9	87	7	491	448	12	0,2	8	1	<0.01	<0.02	0,9	23	5	24	140
2023-11-23	WW203716	Gerhardshausen	7,2	95	4	548	347	9	0,1	27	0	0,01	0,07	1,1	88	8	31	88
2023-11-23	WW203718	Gerhardshausen	6,9	106	1	594	491	30	0,2	23	2	0,05	<0.02	0,7	52	6	44	124
2023-11-23	Plant BH PP01	Otjikoto	7,1	165	1	880	744	233	0,2	64	0	0,11	0,12	0,3	48	11	54	209
2023-11-23	WW202105	Otjikoto	7,0	86	1	444	480	8	0,4	7	3	0,02	<0.02	0,4	4	2	16	166
2023-11-23	WW203719	Otjikoto	6,9	85	10	483	414	11	0,2	10	1	<0.01	<0.02	1,8	28	9	21	131
2023-11-23	WW205150	Gerhardshausen	7,1	138	1	779	566	101	0,2	111	6	0,05	0,01	0,4	87	9	55	136
2023-11-23	WW205152	Otjikoto	7,1	118	1	658	459	101	0,2	63	0	0,02	0,10	0,5	76	9	29	136
2023-11-22	Plant BH PP03	Otjikoto	6,8	155	2	865	682	118	0,3	125	12	0,06	0,04	0,8	84	7	84	7
2023-11-22	WW202031	Otjikoto	6,7	203	3	1175	1040	311	0,2	212	2	0,01	<0.02	0,6	42	6	90	268

Date	Borehole ID	Location	pH	EC (mS/m)	Turb (NTU)	TDS (mg/l)	Total Hardness (mg/l)	Cl^- (mg/l)	F^- (mg/l)	SO_4^{2-} (mg/l)	NO_3^- (mg/l)	NO_2^- (mg/l)	NH_3 (mg/l)	PO_4^{3-} (mg/l)	Na (mg/l)	K (mg/l)	Mg (mg/l)	Ca (mg/l)
2023-11-22	WW203734	Wolfshaag	6,7	216	29	1281	1109	323	0,2	276	0	0,02	<0.02	<0.5	47	8	88	299
2023-11-21	WW202017	Gerhardshausen	6,8	100	3	557	532	26	0,3	39	5	0,10	1,00	0,5	12	6	23	175
2023-11-21	USI001	Otjikoto	6,9	128	225	632	506	242	0,2	9	0	<0.01	0,25	0,4	48	6	50	120
2023-11-21	WW202018	Otjikoto	6,8	101	1	557	549	29	0,3	37	8	<0.01	0,03	0,3	7	2	23	182
2023-11-21	WW202021	Otjikoto	6,9	88	1	490	496	11	0,3	8	4	<0.01	0,04	0,4	6	2	18	169
2023-11-21	WW206169	Otjikoto	6,8	102	0	573	546	28	0,3	40	7	<0.01	0,04	0,3	15	3	21	184
2023-11-21	WW206170	Otjikoto	6,7	202	1	1146	815	311	0,2	152	2	0,02	0,01	0,4	122	12	82	191
2023-11-21	WW202087	Wolfshaag	6,8	85	1	384	410	6	0,3	6	4	<0.01	0,03	0,2	4	2	17	136
2023-11-21	WW203723	Wolfshaag	6,8	90	4	505	452	12	0,3	17	2	<0.01	0,03	1,1	30	4	23	143
2023-11-21	WW203724	Wolfshaag	6,8	90	0	496	499	11	0,3	13	4	0,04	0,01	0,5	6	2	18	170
2023-11-21	WW203725	Wolfshaag	6,8	89	1	498	483	13	0,3	9	2	<0.01	0,09	0,4	8	8	19	162
2023-06-07	WW205152	Otjikoto	6,8	115	2	650	450	107	0,2	64	<0.5	<0.01	0,14	0,8	68	8	28	134
2023-06-06	WW203714	Gerhardshausen	6,8	83	1	470	403	7	0,3	7	<0.5	<0.01	0,16	<0.05	29	7	22	125
2023-06-06	WW203715	Gerhardshausen	6,7	85	3	479	437	12	0,2	8	1	<0.01	<0.02	0,7	21	5	23	137

Date	Borehole ID	Location	pH	EC (mS/m)	Turb (NTU)	TDS (mg/l)	Total Hardness (mg/l)	Cl^- (mg/l)	F^- (mg/l)	SO_4^{2-} (mg/l)	NO_3^- (mg/l)	NO_2^- (mg/l)	NH_3 (mg/l)	PO_4^{3-} (mg/l)	Na (mg/l)	K (mg/l)	Mg (mg/l)	Ca (mg/l)
2023-06-06	WW203716	Gerhardshausen	6,7	93	2	537	338	9	0,1	29	<0.5	<0.01	0,12	0,6	82	7	30	86
2023-06-06	Plant BH PP01	Otjikoto	6,7	159	1	917	710	290	0,2	65	<0.5	0,23	<0.02	0,4	45	10	50	202
2023-06-06	WW203719	Otjikoto	6,8	82	11	465	416	7	0,3	9	<0.5	<0.01	<0.02	0,7	21	8	21	132
2023-06-06	WW205150	Gerhardshausen	6,8	129	3	743	536	92	0,3	102	6	0,06	<0.02	0,8	79	9	50	132
2023-06-05	Plant BH PP03	Otjikoto	6,8	122	2	670	530	79	0,3	65	8	0,02	<0.02	0,5	<0.01	<0.05	58	6
2023-06-05	WW202021	Otjikoto	6,6	86	1	492	521	12	0,3	8	4	<0.01	<0.02	0,3	6	2	18	179
2023-06-05	WW202031	Otjikoto	6,5	186	0	1101	954	285	0,3	192	2	0,03	<0.02	0,5	42	6	82	247
2023-06-05	WW206170	Otjikoto	6,6	192	4	1142	816	310	0,3	151	2	0,02	<0.02	0,7	122	12	77	200
2023-06-05	WW202087	Wolfshaag	6,6	83	0	479	509	7	0,4	6	3	<0.01	<0.02	0,5	4	1	17	176
2023-06-04	USI001	Otjikoto	6,6	133	280	692	578	268	0,2	1	<0.5	<0.01	0,24	0,5	51	7	53	144
2023-06-04	WW202105	Otjikoto	6,6	82	3	475	508	7	0,4	8	4	<0.01	<0.02	0,4	4	2	16	177
2023-06-04	WW206169	Otjikoto	6,6	102	0	596	590	41	0,4	47	7	0,02	<0.02	0,5	16	3	22	200
2023-06-04	WW203723	Wolfshaag	6,7	89	2	525	483	13	0,3	28	3	<0.01	<0.02	0,4	32	4	24	154
2023-06-04	WW203724	Wolfshaag	6,7	89	2	525	483	13	0,3	28	3	<0.01	<0.02	0,4	32	4	24	154

Date	Borehole ID	Location	pH	EC (mS/m)	Turb (NTU)	TDS (mg/l)	Total Hardness (mg/l)	Cl^- (mg/l)	F^- (mg/l)	SO_4^{2-} (mg/l)	NO_3^- (mg/l)	NO_2^- (mg/l)	NH_3 (mg/l)	PO_4^{3-} (mg/l)	Na (mg/l)	K (mg/l)	Mg (mg/l)	Ca (mg/l)
2023-06-04	WW203725	Wolfshaag	6,6	86	8	499	508	17	0,3	8	3	0,01	0,04	0,4	7	8	19	172
2023-06-03	WW202017	Gerhardshausen	6,6	100	8	584	582	32	0,4	42	6	<0.01	<0.02	0,4	13	6	23	195
2023-06-03	WW202018	Otjikoto	6,6	99	1	568	588	34	0,4	40	8	<0.01	<0.02	0,5	7	2	24	196

7.1.5.7 Groundwater Use

Groundwater in the area surrounding the mine is used primarily for livestock watering, crop irrigation and domestic purposes.

7.1.6 Terrestrial Biodiversity

7.1.6.1 Data Collection

Information provided in this Section was sourced from the Terrestrial Biodiversity Specialist Report undertaken by SLR (SLR(b), 2025) included in Appendix G.

This section summarises the results of the following two biodiversity assessments undertaken for the Project to date:

- The comprehensive baseline flora and fauna survey that was included as part of the original ECC application process (A. Speiser Environmental Consultants cc, 2008). Between April 2007 and February 2008, a number of specialist studies were conducted: Vegetation, avifaunal, invertebrates, arachnids, and vertebrates (amphibians, reptiles and mammals).
- The recent rapid biodiversity assessment (Agri-Ecological Services, 2025), conducted to support the Proposed Project. The survey was undertaken from 24 to 25 April 2025.

The findings from the above were compared with each other and are presented below under relevant ecological components.

7.1.6.2 Biomes

The Project area is situated within the Savanna Biome, specifically the Acacia Savanna, which dominates large portions of central and northern Namibia. This biome is characterised by open to semi-open woodland vegetation, with scattered trees or shrubs interspersed within a grass-dominated understory. The Acacia Savanna supports a range of large herbivores and carnivores, many of which are migratory or wide-ranging, depending on seasonal rainfall.

Acacia Savanna is ecologically significant due to its transitional nature between arid desert systems to the west and more mesic woodland systems to the northeast. It supports diverse flora and fauna adapted to semi-arid conditions, with ecological processes driven by fire, grazing, and episodic rainfall events.

7.1.6.3 Regional Vegetation

The Project area falls within a mosaic of three major vegetation types:

- **Karstveld:** This vegetation type is largely associated with calcareous soils and dolomitic geology. It is characterised by dense, semi-deciduous woodland dominated by species such as *Combretum apiculata, Terminalia sericea*, and *Senegalia nigrescens*. This region is particularly known for its high plant endemism and rocky substrates, which support diverse microhabitats.
- **Thornbush Shrubland:** Common in central Namibia, this vegetation type consists of a mix of shrubs and low trees, notably species such as *Vachellia mellifera* (formerly *Acacia mellifera*), which can form impenetrable thickets. It results from decades of bush encroachment linked to fire suppression, overgrazing, and reduced large herbivore populations. Despite its encroached nature, the shrubland supports many browsing species and avifauna.

- **Northern Kalahari Woodland:** This more open, sandy area supports *Burkea africana, Pterocarpus angolensis*, and a grassy understorey, often associated with deep Kalahari sands. It has a relatively high biodiversity, especially in undisturbed areas, and represents a key ecological corridor between the Waterberg and Etosha systems.

7.1.6.4 Key Biodiversity Areas / Important Bird Areas

The Project area lies within proximity to two designated Important Bird Areas (IBAs) and Key Biodiversity Areas (KBAs):

- Etosha Pan KBA/IBA (approx. 40 km north-west): Etosha National Park is a globally important IBA, known for its seasonal saline pan that supports large populations of Greater and Lesser Flamingos (*Phoenicopterus roseus, Phoeniconaias minor*), and other waterbirds during high rainfall years. The park also provides critical habitat for vulnerable and endemic bird species such as the Blue Crane (*Anthropoides paradiseus)* and Rüppell's Korhaan (*Heterotetrax rueppellii*).
- Waterberg Plateau Park IBA/KBA (approx. 30 km south-east): This plateau supports a mix of woodland and savanna species and serves as a key breeding refuge for birds of prey, including the vulnerable Cape Vulture (*Gyps coprotheres*). The surrounding plains also provide habitat for Red-billed Oxpecker (*Buphagus erythrorhynchus*), Bradfield's Hornbill (*Lophoceros bradfieldi*), and a variety of raptors.

While the Project does not fall directly within the boundaries of either IBA/KBA, its location within 30–40 km implies potential ecological connectivity or overlapping foraging areas for some mobile or wide-ranging species, such as vultures and other raptors.

7.1.6.5 Protected Areas and Ramsar Sites

One nationally protected area lies within a 40 km radius of the Project area:

- Waterberg Plateau Park: Established primarily for the conservation of endangered and rare species, the park is managed intensively as a sanctuary for White Rhino, Roan and Sable Antelope, and predators such as Leopard and Brown Hyena. The park's elevated sandstone escarpment also creates unique microhabitats and refuges for endemic species.

Although the Project area lies outside this protected area, the proximity suggests the need to assess and mitigate potential indirect impacts, particularly for wide-ranging fauna, potential hydrological connectivity, and ecological corridors.

7.1.6.6 Flora

2007 Baseline Assessment

The 2007 survey was a detailed biannual assessment covering the original Otjikoto mining area. Two main vegetation communities were identified:

- Thornbush Thicket: The dominant vegetation type, characterised by various Acacia (now *Vachellia* and *Senegalia*) species. Prominent woody species included:
  - *Vachellia erioloba;*
  - *Philenoptera nelsii;*
  - *Peltophorum africanum;* and
  - *Boscia albitrunca.*

- Ephemeral Pan Margin Vegetation: Occurring in localised depressions, these areas supported robust grass species such as *Andropogon gayanus var. polycladus, Urochloa brachyura, Eragrostis superba*, and herbaceous species such as *Leonotis ocymifolia var. schinzii*.

Both vegetation communities showed signs of degradation from historic exploration activities and intensive grazing by livestock and game. Despite this, several protected and near-endemic plant species were recorded. In total, eight SCC were documented, including species protected under the Forest Act, 2001 (Act No. 12 of 2001). While these species were present in low numbers, they are broadly distributed in Namibia and not considered locally restricted.

2025 Rapid Assessment

The 2025 survey was prompted as a targeted rapid assessment[3], focusing on the proposed underground mine expansion within the existing ML. As the area had been previously assessed and already holds an ECC, this survey focused on confirming habitat types and identifying any additional conservation-sensitive features.

Five habitat types were identified, representative images are displayed in Photo 1 and mapped in Figure 7-10 below:

- **Dense Woodland**: Predominantly found in the central and western elevated zones. This community is characterised by a medium-height tree and shrub layer (3-5 m), often exhibiting signs of bush encroachment. The herbaceous layer is suppressed, likely due to competition for light and space. Despite this, the area offers high browse availability for herbivores.
- **Rocky Shrubland**: Occurs along a prominent north–south-oriented ridge with shallow, rocky soils and an easterly aspect. The vegetation is relatively open, comprising low-growing woody species (3-4 m). The herbaceous layer is sparse, likely constrained by the skeletal soil profile and exposure.
- **Shrubland Plains**: This vegetation occurs predominantly in the low-lying eastern and southern portions of the site, characterised by sandy loam soils with intermittent clayey patches and calcrete outcrops. The vegetation comprises open to moderately dense shrubland, historically subjected to bush control activities in some areas. Dominant and diagnostic species include *Senegalia mellifera, Catophractes alexandri, Tarchonanthus camphoratus*, and *Grewia flava*. The area supports high avifaunal diversity and is regularly utilised by plains game, indicating its ecological importance for both foraging and movement.
- **Sandy Savanna**: Present as scattered patches, primarily in the eastern half of the study area, sometimes embedded within woodland. The structure varies from open to moderately dense, with western patches more encroached. Eastern patches support a well-developed grass layer, and although large trees (>6 m) are infrequent, they provide valuable habitat. The savanna is heavily utilised by plains game and supports high avian diversity. While it covers the smallest area locally, it is well represented in the broader landscape.
- **Modified Habitats**: Several habitat areas located along the periphery of existing mining infrastructure, particularly adjacent to the TSF, historical exploration clearings, and firebreak zones along the fence line, have undergone substantial modification.

[3] Rapid Biodiversity Assessment': A singular field visit by one ecologist overseeing multiple disciplines in terrestrial ecology. The basis of this assessment was done taking into account the area size and all the previous collected information.

These areas were originally composed of natural woodland and shrubland community's characteristic of the surrounding landscape. However, due to ongoing land use activities such as vegetation clearance, soil disturbance, and edge effects from infrastructure development, these habitats have lost much of their original structure, and ecological function. As a result, they are now classified as modified habitats, with reduced biodiversity value and altered ecosystem processes compared to adjacent intact systems.

Ephemeral Pans were also delineated, these are small (<20 m diameter) seasonal depressions scattered across the landscape. Although not spatially mapped due to their limited size, they were recorded during fieldwork and are of ecological importance, providing temporary breeding and foraging habitat for a range of local species.

To ensure continuity and relevance, the habitat types identified during the 2025 assessment will be used as the basis for the sensitivity analysis, as they represent the most recent and contextually applicable ecological data available.

	
Dense Woodland	**Rocky Shrubland**
	
Sandy Savanna	**Shrubland Plains**

Photo 1: Representative Photos of the Vegetation Types Taken During the 2025 Survey

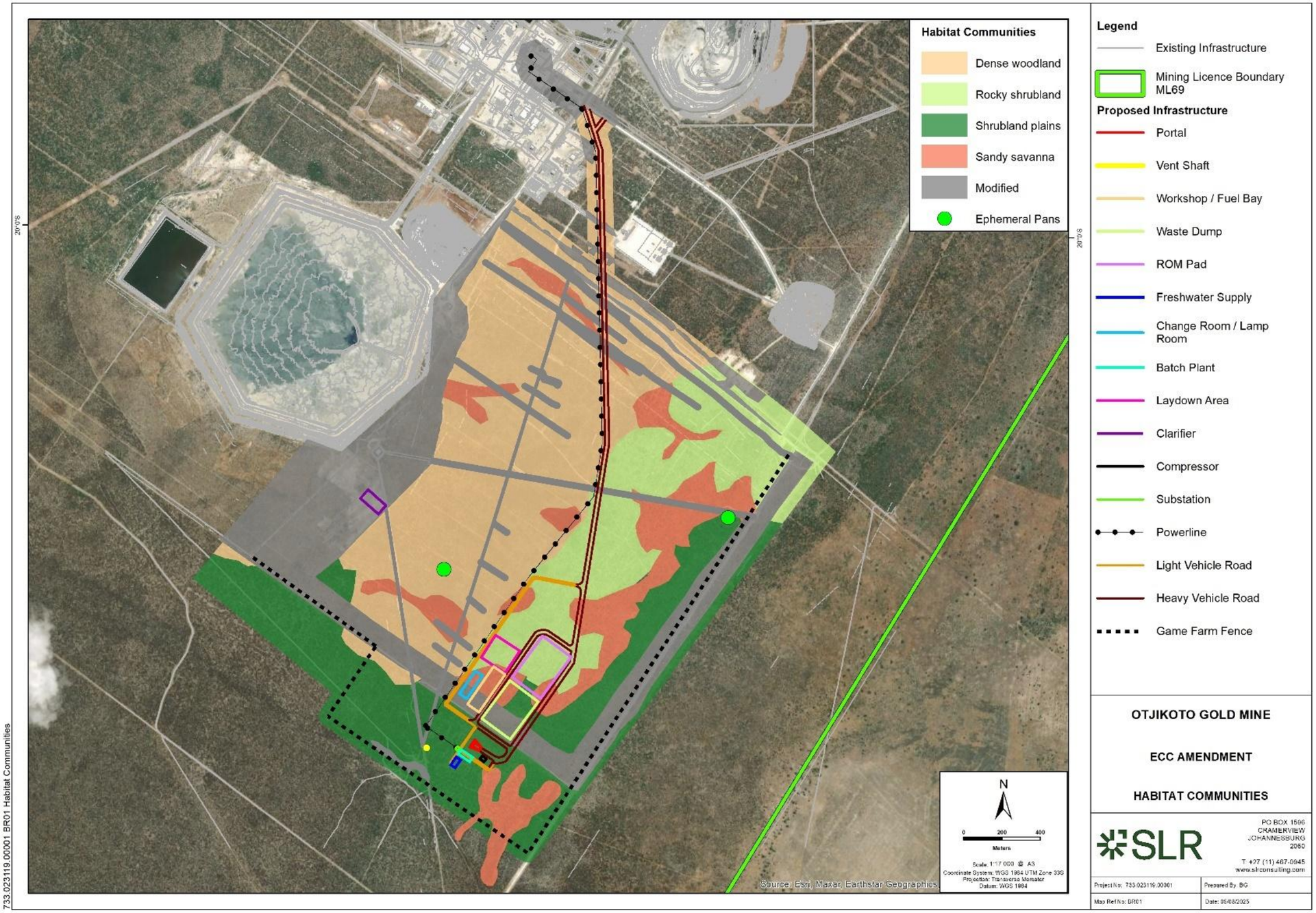


Figure 7-10: Delineated Habitat Communities

Flora Sensitivity

Compared to the 2007 survey, the 2025 survey recorded four of the original eight floral SCC (Table 7-4). The persistence of several protected tree species was confirmed, although no new SCC were identified. The Sandy Savanna patches and ephemeral pans were assessed as ecologically sensitive. The Rocky Shrubland was classified as moderately sensitive, primarily due to the presence of sparse protected trees and its importance for faunal use. The Dense Woodland and remaining plains were considered to have lower ecological sensitivity, but individual features such as large or protected trees should still be avoided or minimised where possible.

Table 7-4: Previously Recorded and Recently Confirmed Floral SCC (2007 vs 2025)

Species	Conservation Status	Recorded 2007	Recorded 2025
Vachellia erioloba	Protected*	✓	✓
Albizia anthelmintica	Protected*	✓	
Boscia albitrunca	Protected*	✓	✓
Combretum imberbe	Protected*	✓	✓
Hiernia angolensis	Near-endemic	✓	
Leucas pechuelii	Near-endemic	✓	
Peltophorum africanum	Protected*	✓	
Ziziphus mucronata	Protected*		✓

**Protected under Annexure 2 of the Forest Act, 2001 (Act No. 12 of 2001)*

7.1.6.7 Fauna - Mammals

2007 Baseline Assessment

The 2007 survey identified a total of approximately 78 mammal species that could potentially occur within the broader Otjikoto Mine region, with several of these being SCC.

2025 Rapid Assessment

As part of the 2025 survey, a total of nine mammal species were recorded (Table 7-5).

The Damara Dik-Dik (*Madoqua kirkii damarensis*) (see Figure 7-11), a near-endemic species adapted to dense woodland and rocky shrubland, was confirmed during the 2025 survey. It is listed as Protected Game under Namibia's Nature Conservation Ordinance (Schedule 4) and serves as an indicator of microhabitat integrity in the expansion area.

Other notable large mammals observed or expected in the area include Giraffe (*Giraffa camelopardalis),* listed globally as Vulnerable, and Plains Zebra (*Equus quagga*), Near Threatened. While not all are nationally threatened, species such as Blue Wildebeest, Springbok, Greater Kudu, and Aardvark are ecologically important and contribute to savanna ecosystem functioning.

Table 7-5: Mammal Species Recorded During the 2025 Assessment Period

Family	Species	Common Name	Namibian Red Data List	IUCN	Method of observation
Bovidae	*Sylvicapra grimmia*	Common Duiker	LC	LC	Direct observation
	Aepyceros melampus	Impala	LC	LC	Scat
	Tragelaphus strepsiceros	Greater Kudu	LC	LC	Scat
	Antidorcas marsupialis	Springbok	LC	LC	Tracks
	Connochaetes taurinus	Blue Wildebeest	LC	LC	Tracks
	Madoqua kirkii damarensis	Damara Dik Dik	LC	LC	Direct observation
Equidae	*Equus burchelli*	Plains Zebra	LC	NT	Scat and tracks
Giraffidae	*Giraffa camelopardalis*	Giraffe	LC	VU	Scat and tracks
Orycteropodidae	*Orycteropus afer*	Aardvark	LC	LC	Confirmed Burrow

Figure 7-11: Damara dik-dik (*Madoqua kirkii*) Seen in the Dense Woodland Habitat

Mammals Summary

Compared to the 2007 survey, the 2025 survey confirmed the presence of one SCC, the Damara Dik-Dik (*Madoqua kirkii damarensis*).

Although the species recorded are not expected to be adversely affected at a population level, their continued presence highlights the importance of maintaining habitat connectivity, minimising disturbance, and protecting key features such as ephemeral pans and woody thickets. Monitoring of faunal activity should form part of the broader biodiversity management plan.

7.1.6.8 Fauna - Avifauna

2007 Baseline Assessment

Avifaunal data sourced from regional biodiversity databases (e.g. biodiversity.org.na and SABAP2) indicate that approximately 141 bird species are expected to occur within the broader Project region, encompassing quarter-degree squares 1917Cc and 2017Aa. Of these 141 bird species, 66 species were recorded during the 2007 survey. Of the 66 recorded bird species, six were classified as SCC, notably raptors and large terrestrial species associated with open savanna and thornbush habitats (A. Speiser Environmental Consultants cc, 2008):

- Booted Eagle (Endangered);
- Whitebacked Vulture (Near Threatened);
- Lappetfaced Vulture (Vulnerable);
- Tawny Eagle (Endangered);
- Martial Eagle (Endangered); and
- Bateleur (Endangered).

The Project area is ecologically characterised by homogeneous bush thicket with scattered taller trees, and exhibits limited habitat diversity. No microhabitats or ecological features of particular ornithological significance were identified. Systematic searches of tall tree copses[4] revealed no nests or breeding signs of raptor species of conservation concern. Consequently, the risk of breeding disruption or nest site loss is considered low.

Roughly 20 migratory species are known from the area, comprising both Palearctic migrants from Eurasia and intra-African migrants. Given the lack of habitat specialisation and absence of significant wetlands or roosting sites, the potential impact of open pit mining on migratory birds is considered negligible.

2025 Rapid Assessment

The 2025 survey, which focused on a smaller spatial area within the existing ML, recorded a total of 23 bird species (Table 7-6). No SCCs were observed during the 2025 survey.

[4] Tree copse is a small, dense grouping of trees often with a mix of species and sizes ranging from small patches to large hectares.

Table 7-6: Bird Species Recorded During the 2025 Assessment Period

Common Name	Scientific Name	Namibia Red Data List	IUCN Red List
Acacia Pied Barbet	*Tricholaema leucomelas*	Not listed	Least Concern
Pririt Batis	*Batis pririt*	Protected Game	Least Concern
African Red-eyed Bulbul	*Pycnonotus nigricans*	Not listed	Least Concern
Golden-breasted Bunting	*Emberiza flaviventris*	Not listed	Least Concern
Cape Turtle Dove	*Streptopelia capicola*	Not listed	Least Concern
Marico Flycatcher	*Melaenornis mariquensis*	Protected Game	Least Concern
Grey Go-away-bird	*Crinifer concolor*	Not listed	Least Concern
Helmeted Guineafowl	*Numida meleagris*	Not listed	Least Concern
African Hawk-Eagle	*Aquila spilogaster*	Not listed	Least Concern
Lesser Honeyguide	*Indicator minor*	Not listed	Least Concern
African Grey Hornbill	*Lophoceros nasutus*	Not listed	Least Concern
Southern Yellow-billed Hornbill	*Tockus leucomelas*	Not listed	Least Concern
Red-crested Korhaan	*Lophotis ruficrista*	Not listed	Least Concern
Crowned Lapwing	*Vanellus coronatus*	Not listed	Least Concern
Common Scimitarbill	*Rhinopomastus cyanomelas*	Protected Game	Least Concern
Crimson-breasted Shrike	*Laniarius atrococcineus*	Not listed	Least Concern
Red-billed Spurfowl	*Pternistis adspersus*	Not listed	Least Concern
Cape Starling	*Lamprotornis nitens*	Not listed	Least Concern
Brown-crowned Tchagra	*Tchagra australis*	Not listed	Least Concern
Chestnut-vented Tit-babbler	*Curruca subcoerulea*	Not listed	Least Concern
Violet-eared Waxbill	*Granatina granatina*	Not listed	Least Concern

Common Name	Scientific Name	Namibia Red Data List	IUCN Red List
Shaft-tailed Whydah	*Vidua regia*	Not listed	Least Concern
Swallow-tailed Bee-eater	*Merops hirundineus*	Not listed	Least Concern

Avifauna Sensitivity

While several bird SCC are expected to occur, none were recorded in the recent 2025 survey, and no evidence of breeding sites was found. As such, the proposed development is not expected to pose a significant conservation risk to the region's avifauna.

In addition to the six identified SCC, the following additional Red Data bird species are potentially associated with the Project area, primarily consisting of large raptors and terrestrial foragers that depend on expansive savanna and woodland habitats. These species include:

- Rüppell's Parrot (*Poicephalus rueppellii*) – Near Threatened (Namibia and IUCN): This near-endemic parrot is confined largely to central and north-western Namibia and parts of southern Angola. It favours woodland habitats, especially areas dominated by Vachellia and Terminalia spp, where it nests in tree cavities and feeds on fruits, seeds, and flowers. The species is threatened by habitat degradation and collection for the pet trade. While not recorded during field surveys, suitable habitat exists within the Project area, and it may occur occasionally as a foraging or dispersing individual.
- Kori Bustard (*Ardeotis kori*) – Near Threatened (Namibia and IUCN): As Africa's heaviest flying bird, the Kori Bustard is a slow-moving, ground-dwelling species dependent on expansive open savannas and lightly wooded areas. It is vulnerable to habitat fragmentation, hunting, and collisions with infrastructure such as powerlines. Though not observed during fieldwork, it is likely to occur within the broader landscape and could use the site intermittently for foraging or movement.
- Cape Vulture (*Gyps coprotheres*) – Critically Endangered (IUCN): A cliff-nesting species endemic to southern Africa, potentially linked to the Waterberg Plateau colony. While not directly observed on-site, it may forage within the Project region.
- Secretarybird[5] (*Sagittarius serpentarius*) – Endangered (IUCN), Vulnerable (Namibia): The Secretarybird is a large, terrestrial raptor found in open savannas and grasslands, where it hunts snakes and small vertebrates on foot. It is listed as Vulnerable due to widespread population declines linked to habitat loss, persecution, and human disturbance. While it was not recorded during the 2008 or 2025 field assessments, a research-grade record from iNaturalist (2022) confirms its presence approximately 26 km west of the Project area.

7.1.6.9 Fauna - Herpetofauna

2007 Baseline Assessment

The herpetofauna assemblage of the Project area included an estimated 14 amphibian species and approximately 78 reptile species expected to occur. Due to the scarcity of permanent surface water in the region, the frog species present are well-adapted to

[5] iNaturalist record: https://www.inaturalist.org/observations/107099014

opportunistic breeding in temporary pans and seasonal rainwater pools. These breeding habitats occur broadly across the landscape, meaning habitat loss is expected to be limited to the mine's direct development footprint, which represents a minor proportion of available habitat both locally and nationally.

Only one amphibian SCC was noted for the area: the Spotted Rubber Frog (*Phrynomantis affinis*), a species known to occur across northern Namibia. While individuals may be present within the mine footprint, the local population is unlikely to be significant relative to the species' broader range. As such, any potential impact from the development is not expected to affect the species' national conservation status.

Four reptile species that are expected in the area are listed as Protected Game under Namibia's Nature Conservation Ordinance No. 4 of 1975:

- Leopard Tortoise (*Stigmochelys pardalis*).
- Kalahari Tent Tortoise (*Psammobates oculiferus*).
- Rock Monitor (*Varanus albigularis*).
- Southern African Python (*Python natalensis*).

These species are sensitive to disturbance and may be negatively affected by high levels of human activity or habitat fragmentation associated with mining. Nonetheless, the potential impact is not expected to alter their conservation status at a national level.

Several Namibian endemic reptiles are also expected in the region, including:

- Namibian Dwarf Gecko (*Lygodactylus bradfieldi*).
- Western Whip Snake (*Psammophis trigrammus*).
- Leopard Whip Snake (*Psammophis leopardinus*).
- Zebra Snake (*Naja nigricincta*).

While these species may be affected at a local scale, they are not expected to be significantly impacted by the Project, provided suitable habitat remains accessible across the broader landscape.

2025 Rapid Assessment

The 2025 survey recorded only one reptile species, a sand lizard species, in the Dense Woodland habitat. However, data from a previous 2008 study indicates a broader reptile community is likely to occur across the Project area, particularly in the surrounding savanna.

Herpetofauna Sensitivity

No confirmed reptiles or amphibians of SCC have been recorded in any of the surveys.

7.1.6.10 Fauna - Invertebrates

2007 Baseline Assessment

The Project area is not currently known to support any endangered invertebrate species, although the broader region may host some rare or endemic taxa. No invertebrate SCC have been definitively recorded within the development footprint. However, a natural pan located east of the proposed mining site (20.0156°S, 17.1125°E) is considered to be of medium ecological sensitivity, particularly due to the potential presence of specialist insect and arachnid communities that may have established over time. This pan may warrant precautionary measures to avoid water and soil contamination impacts.

The invertebrate communities associated with the savanna plains, where major disturbances such as open pit and plant infrastructure are planned, are expected to be resilient to localised development, with overall low ecological sensitivity.

Alien insect species are currently limited, but development is likely to facilitate the establishment of common, disturbance-tolerant invasive insects. No known alien species in the area currently require quarantine measures.

With respect to arachnids, including scorpions and solifugids, no species of special conservation concern have been recorded to date. While some species in the broader Thornbush Savannah are potentially endemic, none are currently known to be restricted to the vegetation type present within the Project area. The burrowing scorpion community near the pan area may be of interest due to soil variability and should be sampled prior to disturbance to improve the understanding of site-specific biodiversity and inform management planning (A. Speiser Environmental Consultants cc, 2008).

2025 Rapid Assessment

The 2025 survey did not include the assessment of invertebrates.

Invertebrate Summary

No confirmed invertebrates of SCC have been recorded in the 2007 survey.

7.1.7 Noise

7.1.7.1 Data Collection

Information provided in this Section was sourced from the Noise Impact Assessment undertaken by dBAcoustics (dBAcoustics, 2025) included in Appendix H.

7.1.7.2 Sensitive Noise Receptors

The existing noise receptors in relation to the proposed Project are shown as A to G in Figure 7-12. A 7 km area of influence was selected as the area is such a flat surface and the low frequency content of the sound will propagate at long distances.

7.1.7.3 Current Noise Monitoring

An existing Noise and Vibrations Management Plan is implemented at OGM for existing operations (B2Gold, 2024) which mainly focuses on limiting noise and vibration disturbance on humans, biodiversity and associated land uses. The prevailing ambient noise levels throughout the Project area are created by traffic, birds, industrial type activities and domestic activities.

OGM undertook an internal noise monitoring survey on site in May 2025, this data was analysed in the Noise Impact Assessment. The noise monitoring survey included 17 noise monitoring points (Figure 7-12).

Due to a lack of recommended environmental noise standards for new developments in Namibia, the International Finance Corporation (IFC) Environmental Health and Safety (EHS) Guidelines (IFC 2007) were used as the reference standard. The recommended noise level guidelines for residential areas and industrial areas are set out in Table 7-7.

Table 7-7: IFC Recommended Noise Levels for Residential Areas and Industrial Areas

Receptor	Either	Or
	Period	

	Daytime (06:00 – 22:00)	Night-time (22:00 – 06:00)	Where baseline exceeds IFC guideline
Residential, institutional, and educational	55	45	3 dB increase over baseline
Industrial and commercial	70	70	

The baseline noise survey results are provided in Table 7-8 below. The peak noise levels were from traffic, mining activity noises, and/or birds in the vicinity of the measuring point during the day. The resultant noise levels exclude insect noise, barking dogs and bird noises and there was no nighttime noise data. The results show that current baseline noise levels at monitoring points 8, 12 and 17 exceed the IFC guideline noise levels (Table 7-8).

Table 7-8: Baseline Noise Survey Results at the Monitoring Points

Measuring point	Leq-dBA[6]	Lmax - dBA[7]	Lmin - dBA[8]	Type of Receptor	Remarks
1	59.1	72.1	52.6	Industrial	HME Workshop activities
2	53.9	66.5	45.3	Industrial	Byrnecut workshop activities
3	41.8	54.5	29.0	Industrial	TSF and distant mining activities
4	60.2	64.1	55.2	Industrial	60m from upcast ventilation shaft
5	52.6	57.3	49.0	Residential	Distant mining activities
6	46.9	67.5	30.4	Residential	Distant birds and domestic activities
7	50.3	66.1	32.3	Residential	Distant bird activities
8	65.2	80.5	29.4	Residential	Distant traffic along B1
9	50.8	68.3	37.6	Residential	Distant mining activities
10	52.2	59.5	47.2	Residential	Distant mining activities and traffic
11	36.6	50.6	29.2	Residential	Birds
12	73.7	75.1	72.0	Industrial	Plant mill activities
13	53.0	58.5	49.5	Industrial	Otjikoto Pit activities
14	52.2	65.8	42.7	Industrial	Distant pit activities
15	44.0	51.4	39.8	Industrial	Distant mining activities mobile crusher not operational
16	58,5	103.7	51,9	Industrial	Distant power plant
17	72.8	89,5	70.0	Industrial	Processing plant activities

[6] Equivalent Continuous Sound Level, A-Weighted: Leq-dBA is a measure of the average sound level over a specified period, expressed in A-weighted decibels (dBA). It represents the constant sound level that, over the same time period, would deliver the same total sound energy as the varying noise being measured.

[7] Maximum Sound Level, A-Weighted: Lmax-dBA is the highest instantaneous sound pressure level recorded during a specified measurement period, expressed in A-weighted decibels (dBA). It captures the single loudest moment of noise exposure, rather than an average over time.

[8] Minimum Sound Level, A-Weighted: Lmin-dBA is the lowest instantaneous sound pressure level recorded during a specified measurement period, expressed in A-weighted decibels (dBA). It indicates the quietest moment captured within the measurement timeframe.

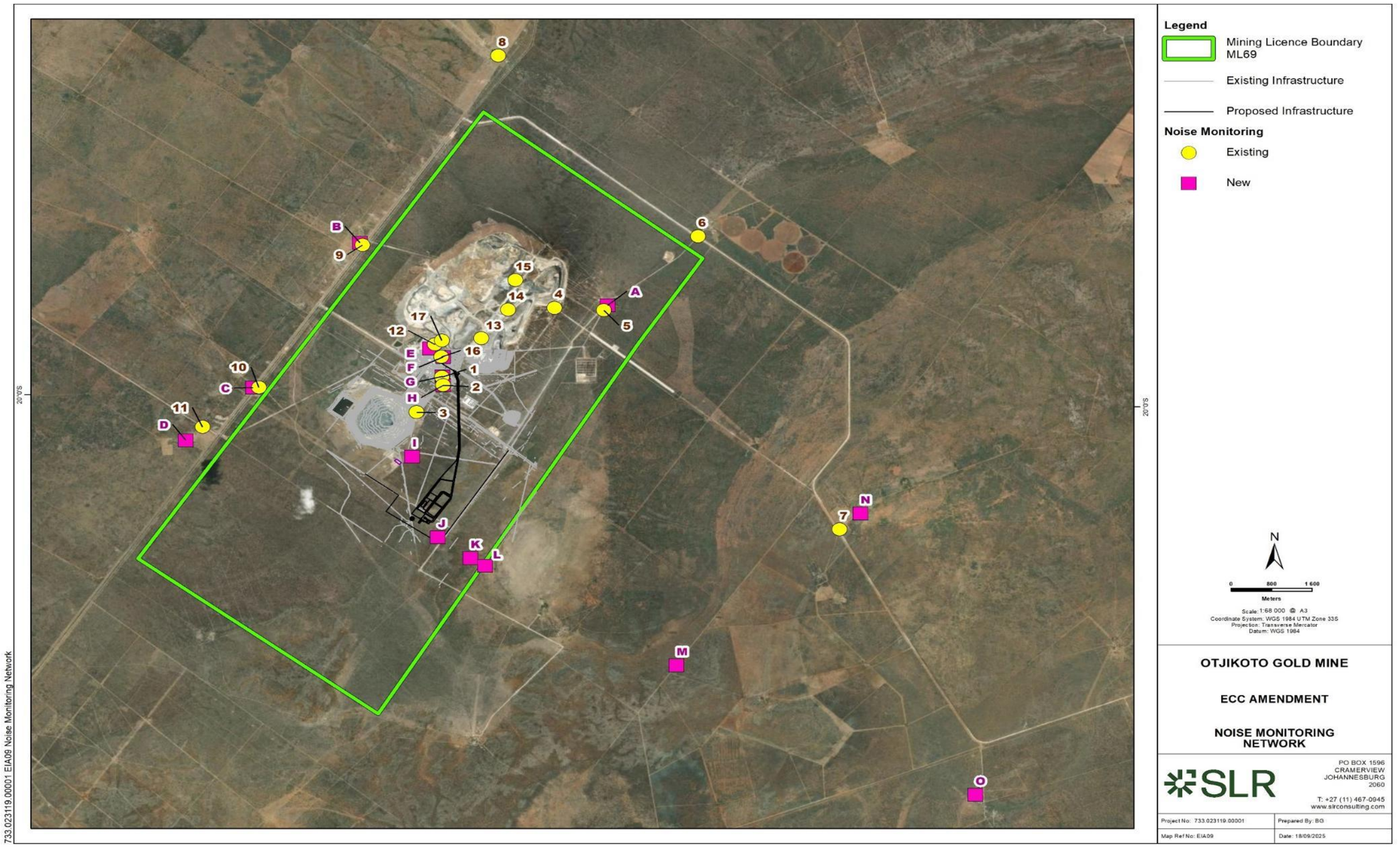


Figure 7-12: Noise Sensitive Receptors and Noise Monitoring Points

7.1.8 Air Quality

7.1.8.1 Data Collection

Information provided in this Section was sourced from the Air Quality Impact Assessment undertaken by SLR (SLR(c), 2025), included in Appendix E.

Existing information the receiving environment (including identification of possible sensitive receptors, proximate pollution sources, prevailing meteorological conditions and baseline ambient air quality measurements) was used in the Air Quality Impact Assessment, and is presented below. An emissions inventory was compiled for key emission sources using available activity information and internationally recognised emission factors for process relevant pollutants. Air dispersion modelling was undertaken using AERMOD View.

7.1.8.2 Regional Ambient Air Quality

Key emission sectors in Namibia relevant to the Project area include the following:

- **Mining:** The main emissions to air from mining operations consist of wind-borne dust (Total Suspended Particulates (TSP)[9], Particular matter (PM) PM_{10}[10] and $PM_{2.5}$[11]) from mineral extraction, material handling, vehicle movement on unpaved surfaces, stockpiling, and processing activities (e.g. crushing) as well as vehicle exhaust emissions (i.e. predominantly gases) from mining equipment.
- **Biomass Burning:** As a significant source of gaseous and particulate matter emissions to the atmosphere, biomass burning is a seasonal air quality concern, particularly in regions with established agriculture. In addition to natural fires, intentional fires are lit for the purposes of land management (cultivated land management, preventing bush encroachment, firebreaks, etc.). Although agriculture in the study area is limited to mainly livestock rearing, Google Earth satellite imagery data show burn scars and smoke plumes in the Otjozondjupa region during the dry season. Pollutants associated with biomass burning include greenhouse gases, ozone (O_3), PM, carbon monoxide (CO), and volatile organic compounds (VOCs).
- **Agriculture:** Due to the region's arid climate, agriculture is largely limited to pastoral animal husbandry. Herd movement on unpaved surfaces generates localised fugitive dust emissions, while seasonal overgrazing reduces vegetation cover, increasing dust potential from exposed soils. Commercial crop agriculture takes place <1 km northeast of the ML area. Cultivated and pastured land requires field preparation and management (i.e. tilling, harvesting, burning, etc.) while crop producers usually administer chemical treatments (i.e. pesticide, fertiliser, etc.). Wind erosion and crop burning result in significant PM and CO emissions while crop spraying is associated with gaseous emissions including NO_2 and VOCs.
- **Road Traffic:** Vehicle emissions are relevant in either urban areas (due to higher population densities and the associated traffic volumes) or in this case along key road networks used for transporting road freight cargo between logistics hubs and urban areas. Vehicle emissions are estimated to be responsible for up to 95% of CO

[9] 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).

[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.

[11] $PM_{2.5}$ 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.

and up to 70% of NO_x emissions in the urban environment. Other pollutants associated with vehicle emissions include SO_2, PM, C_6H_6 and lead (Pb). Dust entrainment along unpaved roads, usually in rural areas, is another air quality concern associated with traffic, particularly in dry conditions.

7.1.8.3 Sensitive Receptors

The Project area is remote and sparsely populated, classified as rural. It is bordered by the Otjikoto Nature Reserve, with isolated homesteads and livestock paddocks dispersed in all directions. The nearest town is Otavi, located approximately 40 km to the north-northeast, with a population of 10,756. The proximity of sensitive receptors (i.e. places where sensitive individuals may be impacted, such as residences, schools, medical facilities and places of worship) in relation to OGM's ML area is shown in Figure 7-13.

7.1.8.4 Ambient Air Quality Monitoring

An existing Air Quality Management Plan is implemented at OGM for existing operations (B2Gold, 2024) which mainly focuses on managing air quality issues at OGM such as ambient dust (nuisance dust) generated through daily activities (such as vehicle movement, material handling and transfer) and particulate matter (PM_{10}) or air borne respirable particles and fugitive gas emissions from combustible matter. Monitoring air emissions from on-site sources ensures the operations meet applicable requirements and leading practices. The sources of the dust deposition include windblown dust originating from various sources such as mine tailings, haul roads, and other fugitive dust sources.

OGM evaluates its climate risks and keeps inventories of Scope 1, 2 and 3 Greenhouse Gas (GHG) emissions. OGM has undertaken efforts to improve energy efficiency and reduce GHG emissions and made a commitment to reduce Scope 1 and 2 GHG emissions by 30% by 2030, measured against the 2021 baseline.

OGM undertake routine ambient air quality monitoring including a network of dust deposition gauges for measuring dust fallout and the measurement of fine particulate fractions. The following available monitoring data is presented below.

Dry Dust Fallout (DFO) Deposition

The OGM DFO network comprises 12 single bucket ASTM D1739 compliant deposition gauges (Figure 7-14). A summary of data collected between 2022 and 2024 showing compliance with the Initiative for Responsible Mining Assurance (IRMA), in the absence of national standards or WHO guidelines for dry dust deposition, is shown in Figure 7-15.

Annual average DFO rates measured at AQ-DB6 (Haul road), AQ-DB9 (Powerplant) and AQ-DB12 (Evaporation pond) exceeded the IRMA guideline (350 mg/m²/day) in all years for which there is data. All three of these sampling locations are situated in key operational areas where elevated levels of fugitive dust are typical. DFO rates for AQ-DB6 decreased significantly in 2024, suggesting changes to proximate activities or improved efficacy of mitigation efforts.

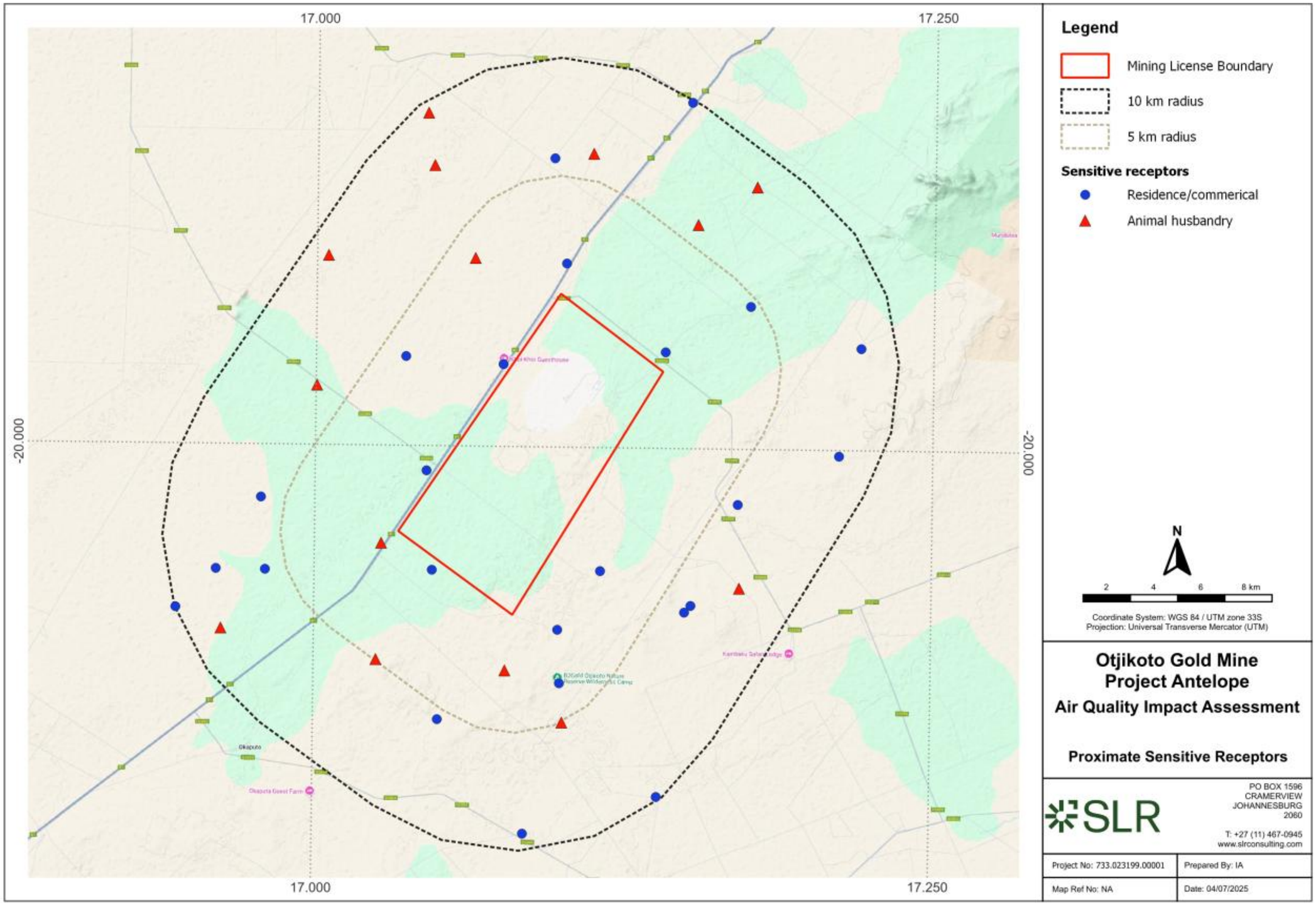


Figure 7-13: Proximity of Sensitive Receptors

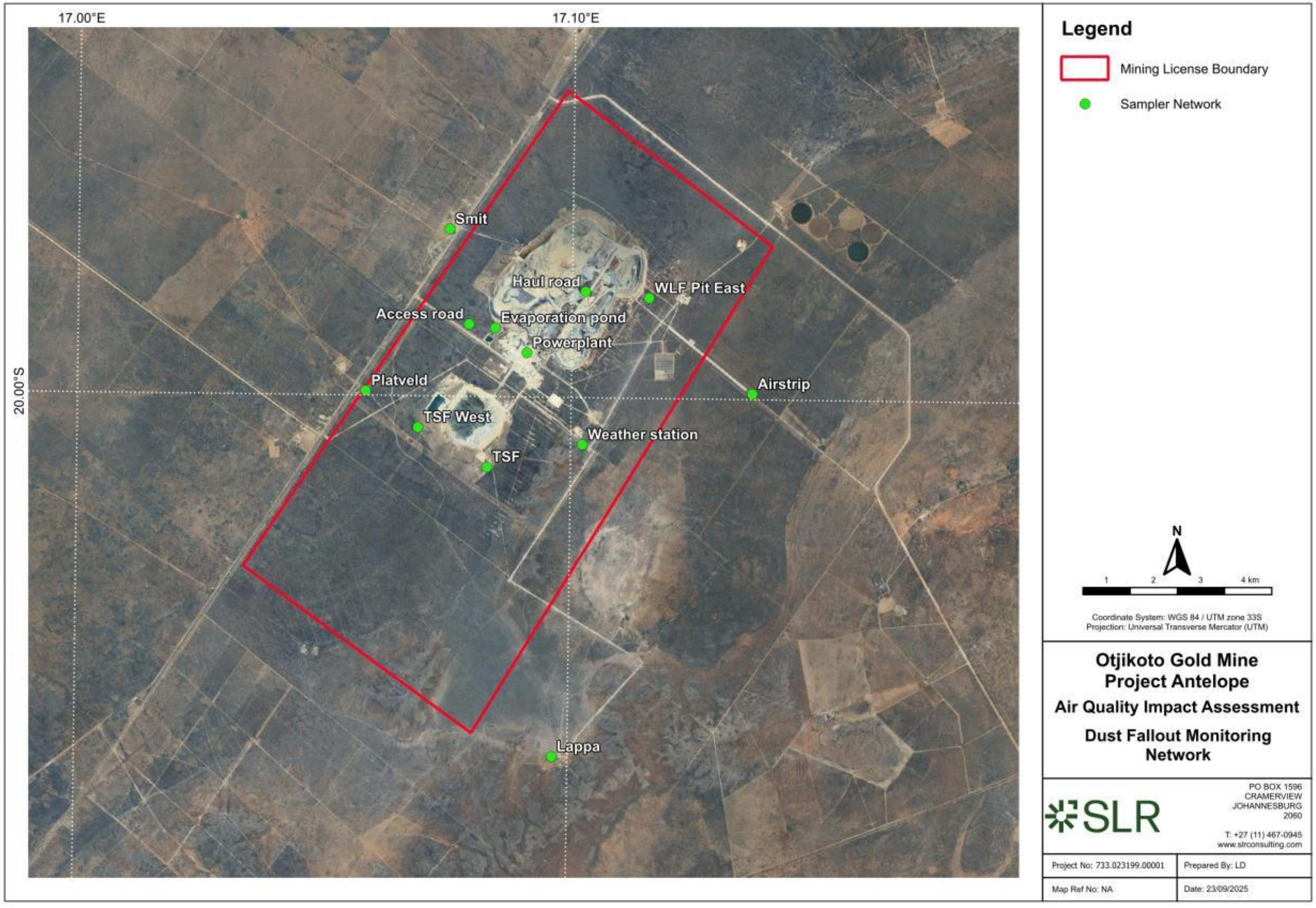


Figure 7-14: DFO Monitoring Network (2022 - 2024)

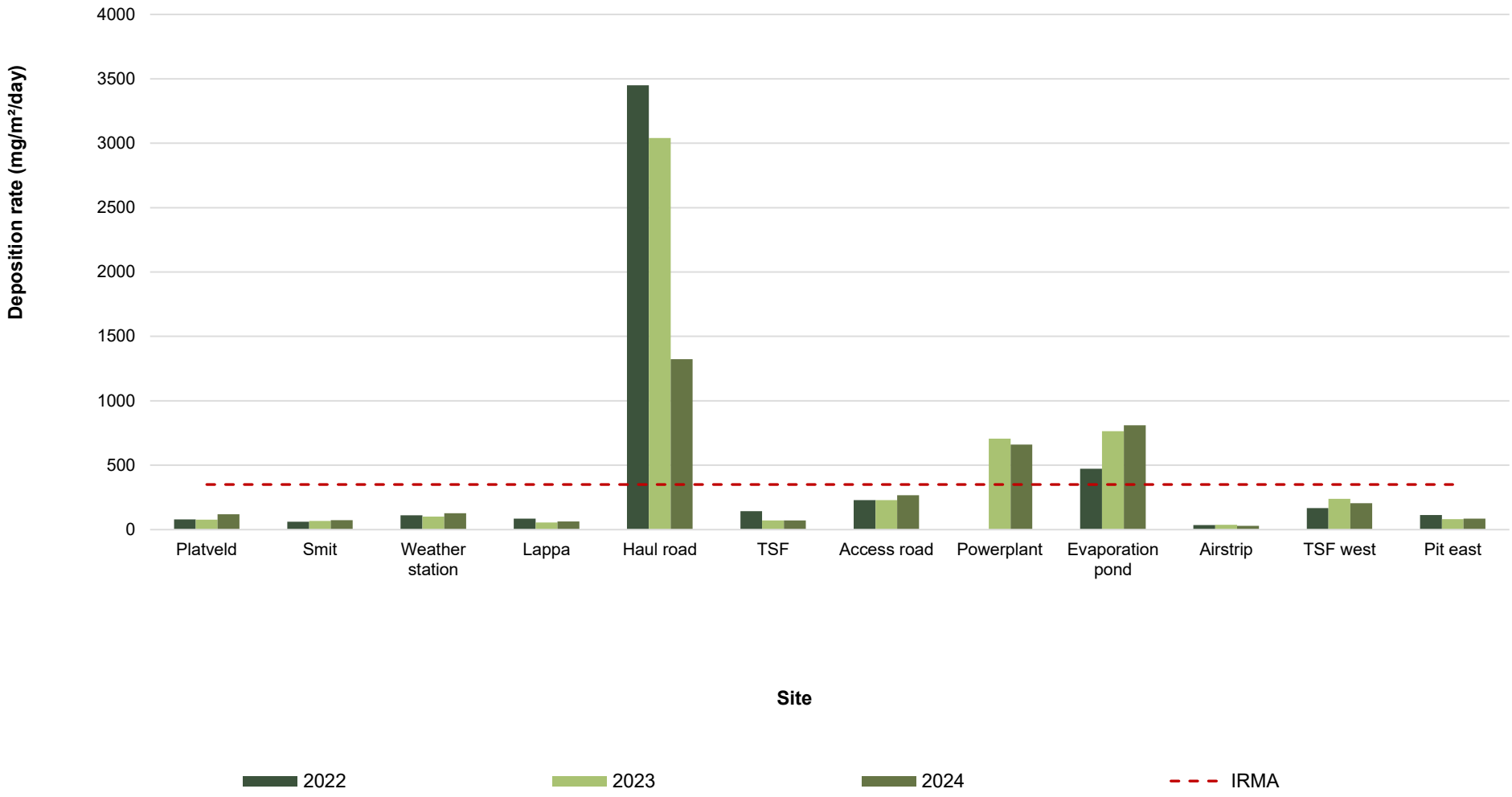


Figure 7-15: DFO Results Summary (2022 - 2024)

Filter-based PM_{10}

MiniVol measurements were provided for PM_{10} concentrations across six locations (Figure 7-16) for the period between 2022 and 2024. Table 7-9 provides a guideline exceedance count and the annual average PM_{10} concentration for each monitoring location.

Short-term (24-hour) average concentrations at four of the six sites comply with the World Health Organisation air quality guidelines (WHO AQG); however, none of the measurement locations met long-term (annual) WHO AQG limits. Key findings are as follows and should be considered in the context of data availability:

- Short-term (24-hour average) measurements exceed:
  - WHO IT1 (150 µg/m³) at AQ-PM9 (2022, 2023 & 2024); and
  - WHO IT2 (100 µg/m³) at AQ-PM12 (2022 & 2024).
- Measurements averaged over the long-term (annual average) exceed:
  - WHO IT1 (70 µg/m³) at AQ-PM9 (2022, 2023 & 2024) and AQ-PM12 (2022 & 2024);
  - WHO IT2 (50 µg/m³) at AQ-PM12 (2023).
  - WHO IT3 (30 µg/m³) at AQ-PM1 (2022, 2023 & 2024), AQ-PM2 (2022), AQ-PM5 (2022, 2023 & 2024) and AQ-PM13 (2022).
  - WHO IT4 (20 µg/m³) at AQ-PM2 (2023 & 2024) and AQ-PM13 (2023 & 2024)

Continuous PM_{10} and $PM_{2.5}$

Ambient PM_{10} and $PM_{2.5}$ concentrations are measured around OGM, measurements were provided in an hourly resolution for four locations (Figure 7-17) for the period 01 February 2024 to 19 April 2025. Data recovery and a guideline compliance summary are presented in Table 7-10.

Key findings are as follows and should be considered in the context of data availability:

PM_{10}:

- Short-term (24-hour average) measurements exceed the 24-hour WHO AQG (45 µg/m³, four exceedance days per annum) at the Power Plant and Landfill monitoring locations in 2024.
- Long-term (annual average) measurements at all monitoring locations comply with the annual WHO AQG (15 µg/m³).

$PM_{2.5}$:

- Short-term (24-hour average) measurements exceed:
  - WHO IT-3 (37.5 µg/m³, four exceedance days per annum) at the Power Plant and Landfill monitoring locations in 2024.
  - WHO IT-4 (25 µg/m³, four exceedance days per annum) at all monitoring locations in 2024.
- Long-term (annual average) measurements exceed:
  - WHO IT-4 (10 µg/m³) at the Landfill monitoring location in 2024.
  - WHO AQG (5 µg/m³) at the Power Plant, Smit and Camp in 2024. The Camp monitoring location also exceeded the WHO AQG in 2025.

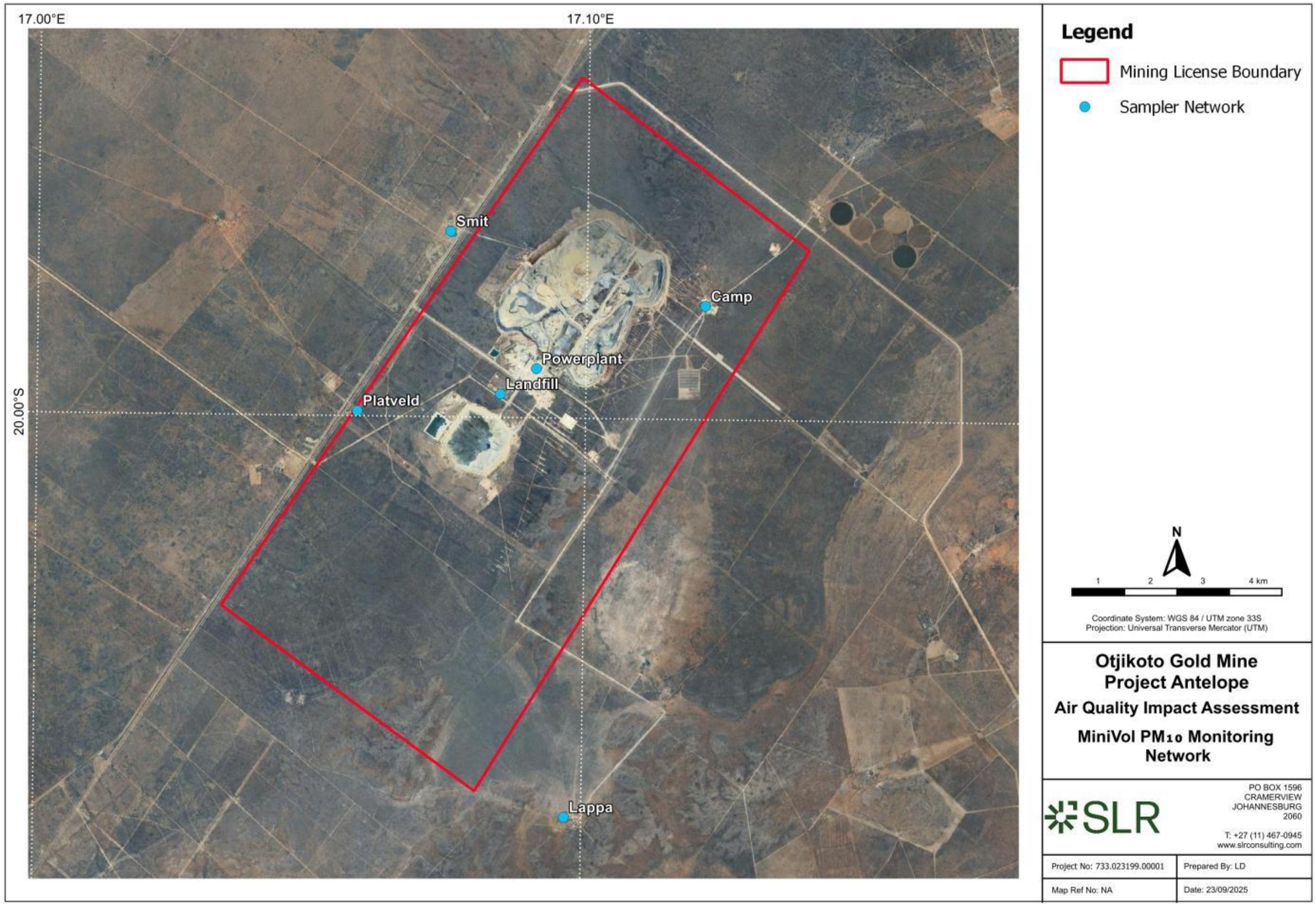


Figure 7-16: MiniVol ambient PM_{10} Monitoring Locations

Table 7-9: MiniVol 24-hour PM_{10} Guideline Exceedance Count and Annual Average Concentrations

Site ID	Site Name	Coordinates		Year	Data availability	24-hour average exceedance count (four permitted per annum)					Average concentration (µg/m³)
		Latitude (°S)	Longitude (°E)			WHO IT-1	WHO IT-2	WHO IT-3	WHO IT-4	WHO AQG	
AQ-PM1	Platveld	-19.999131	17.058384	2022	1.6%	0	1	1	2	2	46
				2023	1.9%	0	0	0	2	2	33
				2024	3.3%	0	0	2	4	4	38
AQ-PM2	Smit	-19.968064	17.075037	2022	2.5%	0	0	0	3	3	38
				2023	1.6%	0	0	0	0	0	24
				2024	2.5%	0	0	0	0	0	22
AQ-PM5	Lappa	-20.068684	17.096887	2022	1.4%	0	1	1	2	2	48
				2023	2.7%	0	1	1	2	3	35
				2024	2.7%	0	0	1	3	3	36
AQ-PM9	Powerplant	-19.991546	17.090965	2022	9.6%	**19**	**25**	**29**	**33**	**33**	203
				2023	9.6%	**9**	**16**	**21**	**26**	**27**	118
				2024	10.7%	**11**	**18**	**22**	**27**	**28**	124
AQ-PM12	Landfill	-19.995973	17.084447	2022	2.5%	2	**5**	**6**	**6**	**7**	113
				2023	3.3%	0	2	2	3	4	54
				2024	2.5%	4	**5**	**5**	**6**	**8**	113
AQ-PM13	Camp	-19.980462	17.121650	2022	2.2%	0	0	0	2	3	39
				2023	2.5%	0	0	0	1	1	25
				2024	2.5%	0	0	0	2	2	29

Notes:

Red	-	Exceeds WHO AQG permissible frequency of exceedance (i.e. 3-4 exceedance days per year)
Red	-	Exceeds WHO IT1
Orange	-	Exceeds WHO IT2
Yellow	-	Exceeds WHO IT3
Green	-	Exceeds WHO IT4
Blue	-	Exceeds WHO AQG

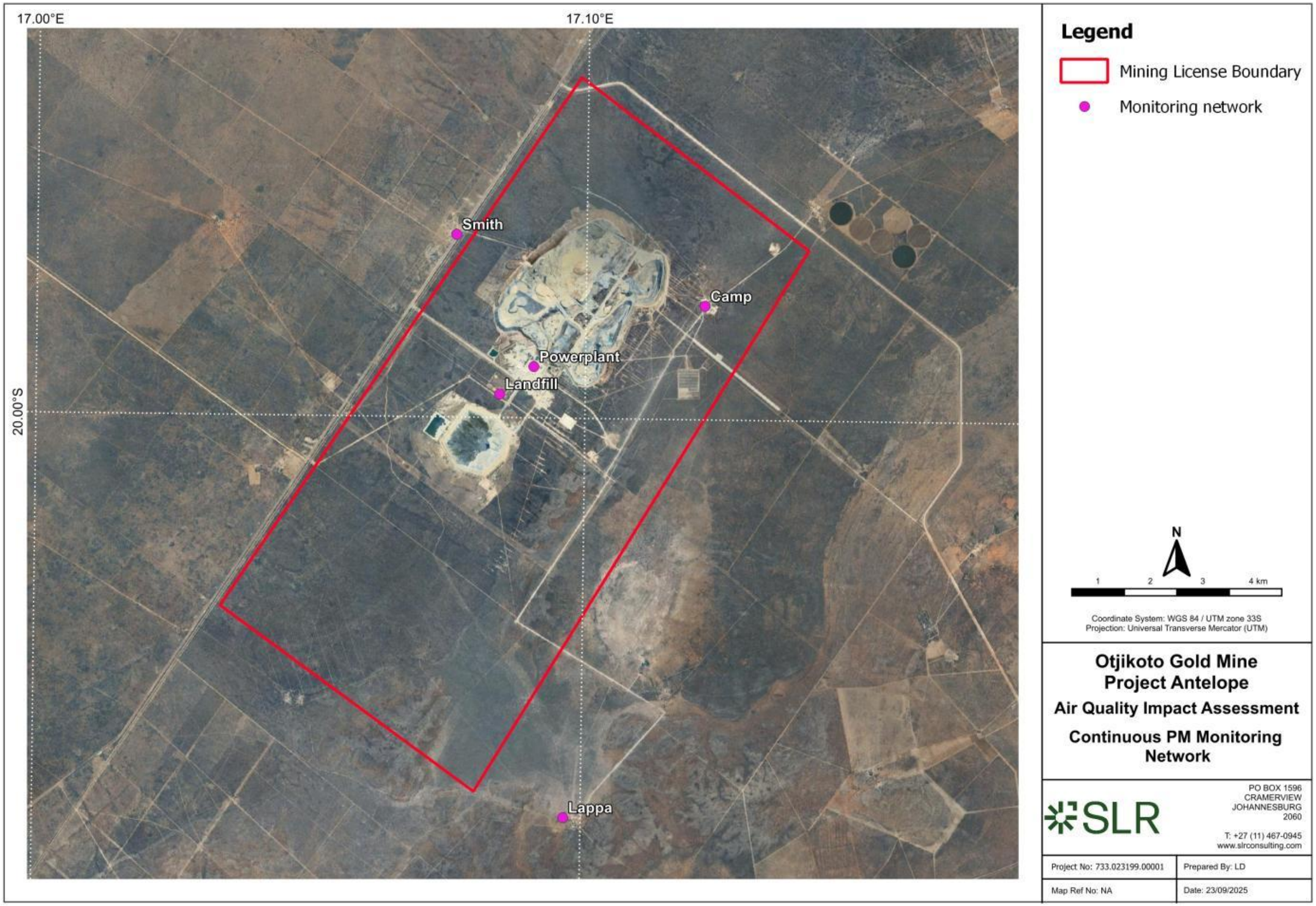


Figure 7-17: Continuous Ambient PM_{10} and $PM_{2.5}$ Monitoring Locations

Table 7-10: Continuous 24-hour PM_{10} and $PM_{2.5}$ Guideline Exceedance Count and Annual Average Concentrations

Monitoring location	Coordinates		Year	Data recovery		No. of 24-hour guideline exceedances										Annual average concentration (µg/m³)	
						$PM_{2.5}$					PM_{10}						
	Latitude (°S)	Longitude (°E)		$PM_{2.5}$	PM_{10}	IT-1	IT-2	IT-3	IT-4	AQG	IT-1	IT-2	IT-3	IT-4	AQG	$PM_{2.5}$	PM_{10}
Power Plant	-19.991194	17.090603	2024 [a]	71%	71%	0	1	**8**	**22**	**42**	0	0	0	4	**6**	8.5	9.6
			2025 [b]	83%	83%	0	0	0	0	1	0	0	0	0	0	4.7	4.8
Smit	-19.968607	17.076284	2024 [a]	57%	62%	1	2	4	**17**	**38**	1	1	1	4	4	8.1	9.8
			2025 [b]	5%	6%	0	0	0	0	0	0	0	0	0	0	0.7	1.0
Camp	-19.980462	17.121650	2024 [a]	58%	60%	0	2	3	**22**	**44**	0	0	0	3	4	8.7	9.8
			2025 [b]	3%	3%	0	0	0	0	0	0	0	0	0	0	7.7	8.1
Landfill	-19.995973	17.084447	2024 [a]	19%	20%	1	2	**7**	**22**	**40**	0	0	2	4	**5**	10.0	11.2
			2025 [b]	28%	30%	0	0	0	0	0	0	0	0	0	0	3.4	3.7

Notes:

(a)	-	01 February - 31 December 2024 (92% of the 2024 calendar year)
(b)	-	01 January - 19 April 2025 (30% of the 2025 calendar year)
Red	-	Exceeds WHO AQG permissible frequency of exceedance (i.e. 3-4 exceedance days per year)
Red	-	Exceeds WHO IT-1
Orange	-	Exceeds WHO IT-2
Yellow	-	Exceeds WHO IT-3
Green	-	Exceeds WHO IT-4
Blue	-	Exceeds WHO AQG

Passive Gas Monitoring

Ambient SO_2 and NO_2 measurements were collected on a quarterly basis at the corresponding MiniVol PM sampling locations (Figure 7-16) using passive diffusive samplers. Passive gas monitoring ceased in 2019. In the absence of more recent data, the most recent three years of measurements (i.e. 2017-2019) are presented below.

Results are shown in Figure 7-18 for SO_2 and Figure 7-19 for NO_2, benchmarked against the WHO and the United Nations Economic Commission for Europe (UNECE) guidelines. The annual guideline is used in this instance as a conservative reference threshold to gauge impact. However, results are based on ~14-day exposure periods and should not be interpreted as true annual averages for the respective sites. Key findings are as follows:

SO_2:

- Quarterly measurements and annual averages comply with the annual UNECE guideline (20 µg/m³) for vegetation and ecosystems. The WHO does not provide an SO_2 AQG for an annual average.

NO_2:

- Quarterly measurements exceeded the annual WHO AGQ (10 µg/m³) at the Platveld, Smit and Powerplant monitoring locations in July 2018. When averaged annually, all sites and years comply with the AQG.

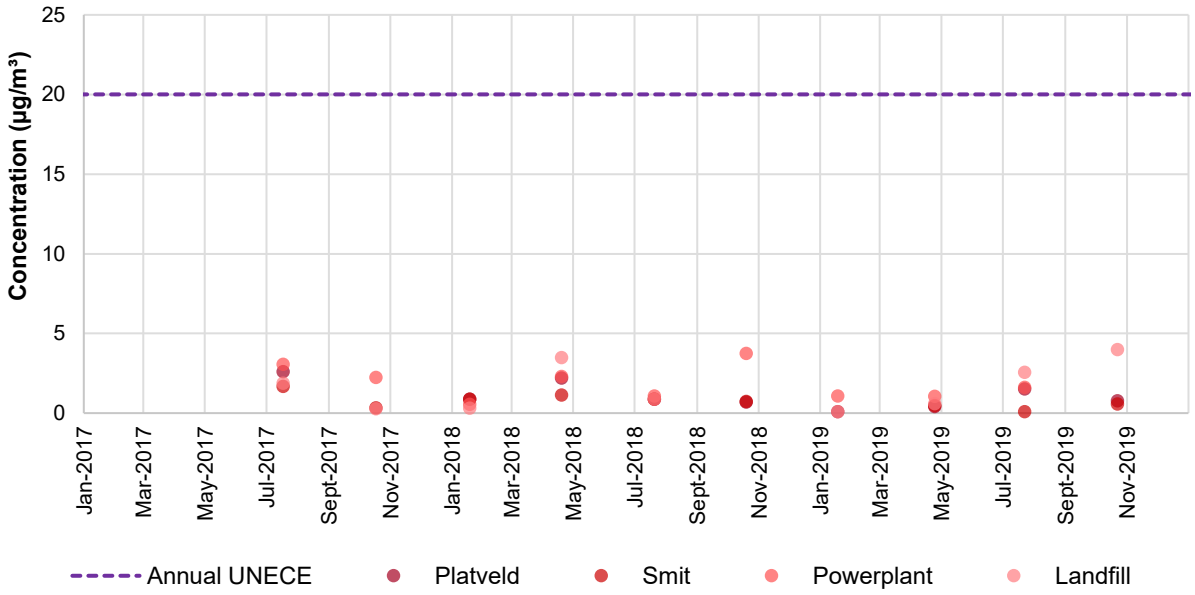


Figure 7-18: Measured Ambient SO_2 Concentrations

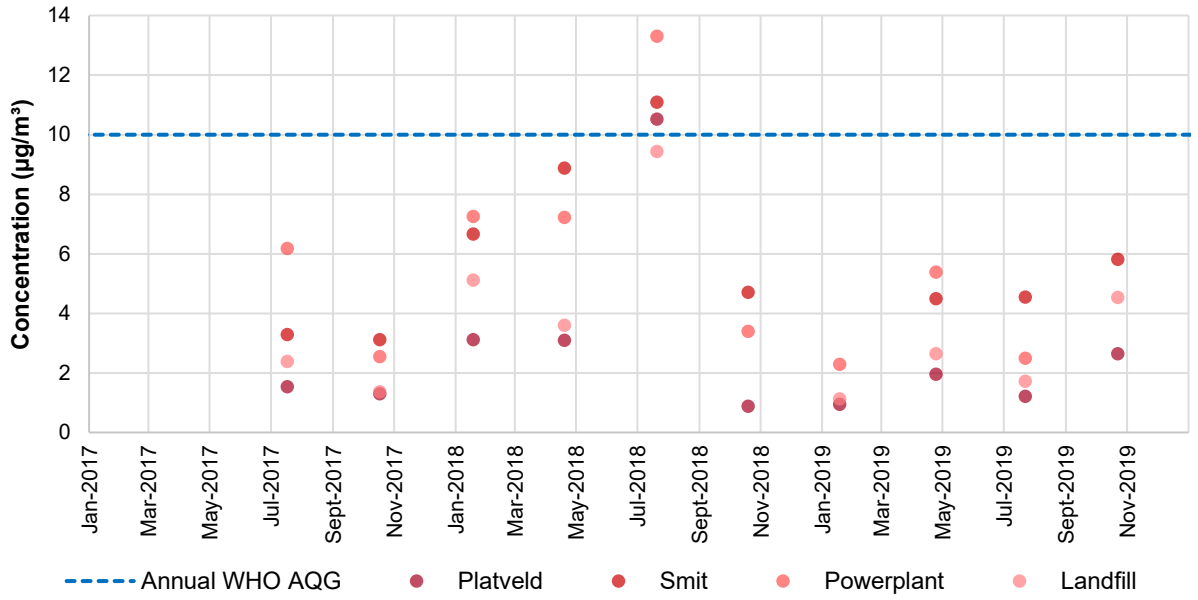


Figure 7-19: Measured Ambient NO_2 Concentrations

7.2 Baseline Cultural Heritage Environment

7.2.1.1 Data Collection

Information provided in this Section was sourced from the Heritage Impact Assessment (RCHeritage Services CC, 2025) included in Appendix I.

As part of the current Heritage Impact Assessment, field surveys were undertaken on 2-5 June 2025, 15 June 2025 and 23 June 2025.

7.2.1.2 Existing Cultural Heritage Resources

An existing Archaeology Management Plan is implemented at OGM for existing operations (B2Gold, 2024) which mainly focuses on protecting the heritage sites identified at the OGM and the surrounding area, including chance finds.

A previous archaeological survey and assessment was conducted as part of the initial EIA Process in 2012, which identified several sites of archaeological and/or historical significance that are pertinent to the National Heritage Act (27 of 2004) and the Burial Places Ordinance (27 of 1966). None of these sites are directly impacted by the OGM. These sites are mostly burial cairns and historic gravesites identified as QRS 83/1 & 2, QRS 83/3, QRS 83/4, QRS 83/5, QRS 83/6, QRS 83/7, QRS 83/357 and QRS 83/358 that spread across the east and southeast of the OGM and the surrounding game reserve (Figure 7-20).

A possible burial cairn is the only potentially significant heritage feature that was identified within the proposed Project area to be relevant under the National Heritage Act (27 of 2004) (Photo 2). The site is located at the following GPS coordinates: 20° 0' 53.83" S and 17° 5' 37.58" E (Figure 7-21).

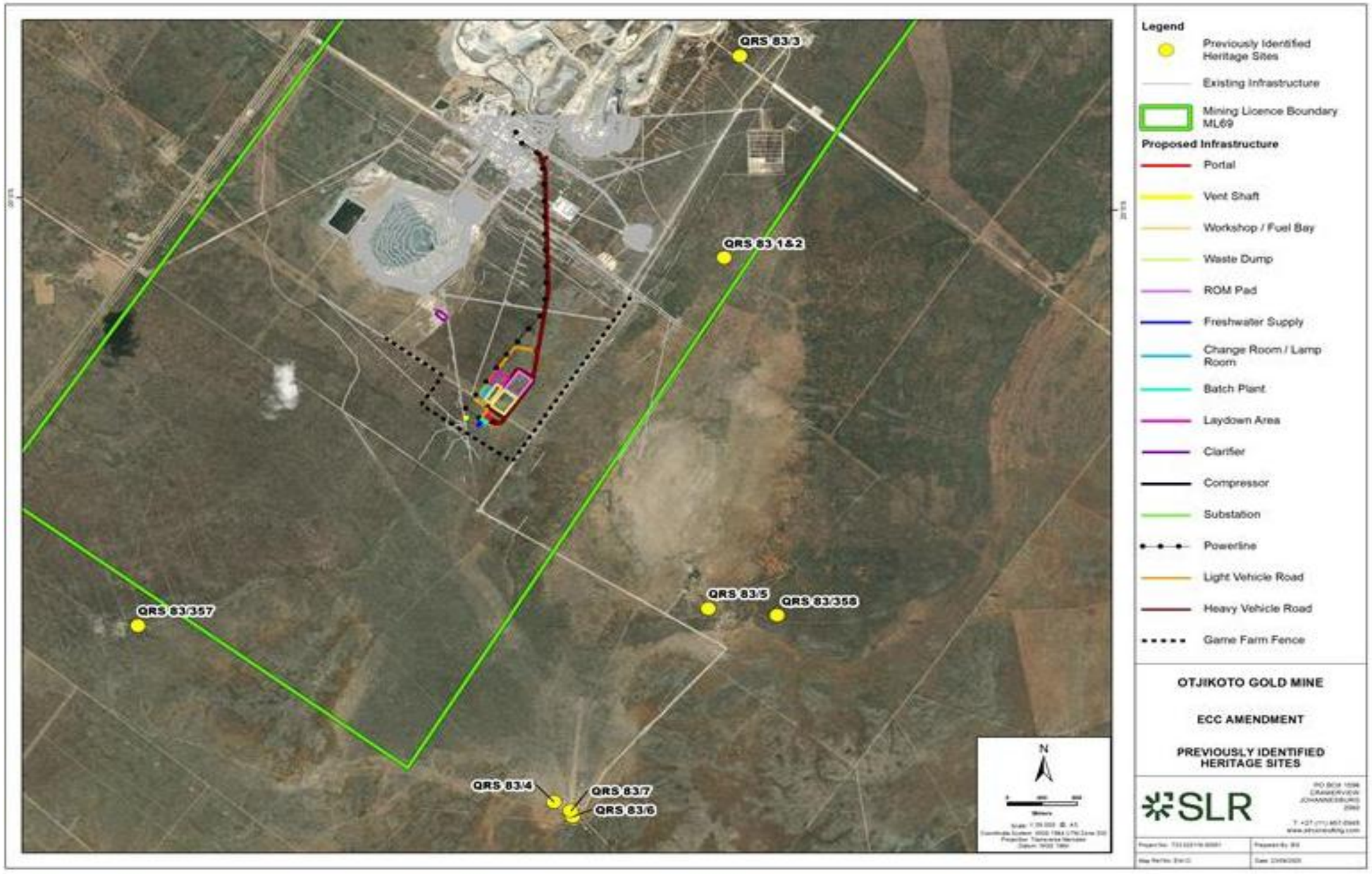


Figure 7-20: Previously Recorded Archaeological and Historic Sites at OGM and Surrounding Game Farm

Photo 2: Photograph of Potential Burial Cairn Recorded on Site

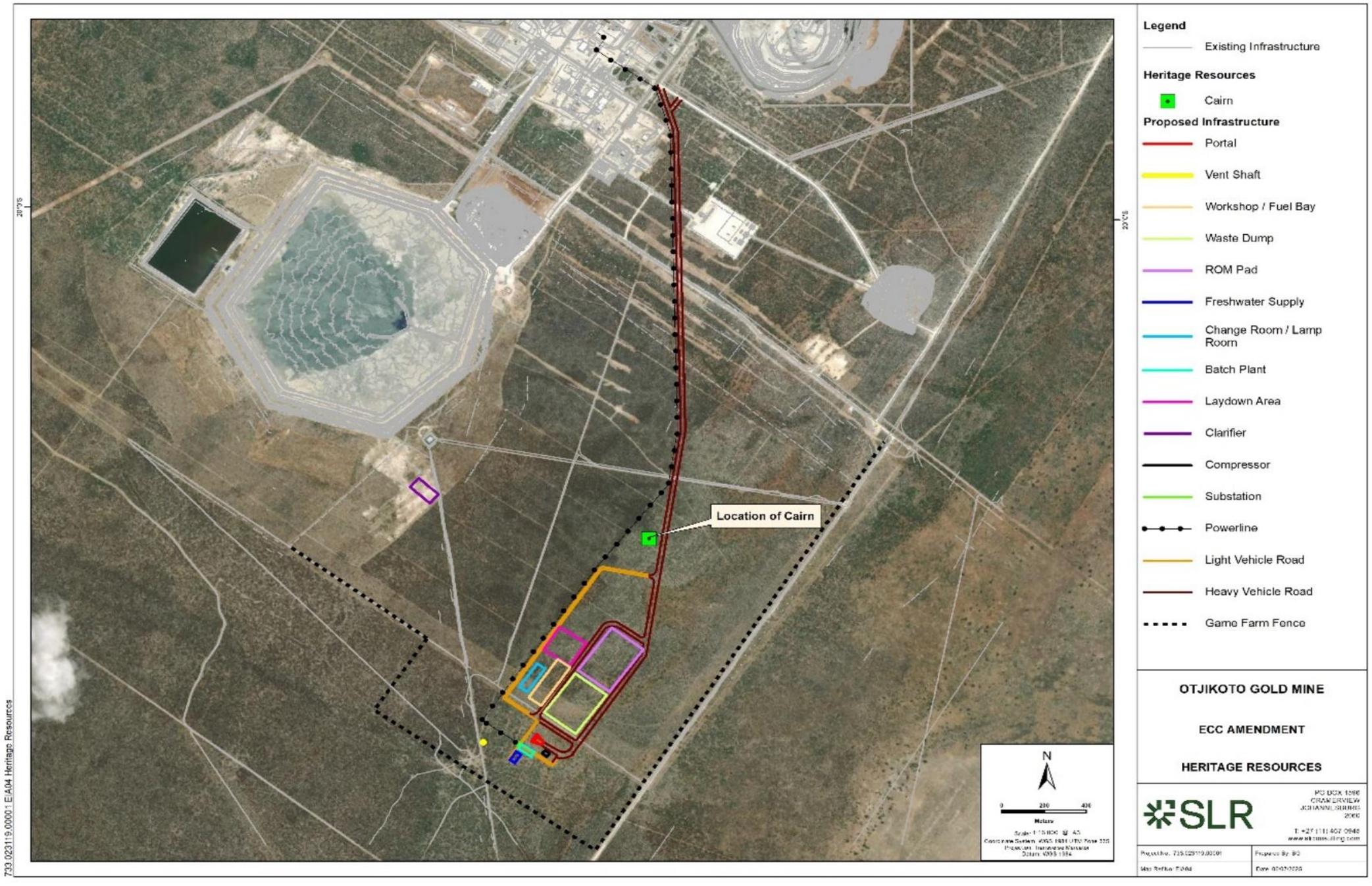


Figure 7-21: Location of Potential Burial Cairn Recorded on Site

7.3 Baseline Socio-Economic Environment

7.3.1 Visual

7.3.1.1 Data Collection

Desktop information provided in this Section was sourced from the approved 2012 EIA Report (SLR, 2012) and the OGM Environmental Performance Report (B2Gold, 2024).

7.3.1.2 Landscape Character

The landscape character within the OGM has been transformed due to B2Gold's current approved mining infrastructure and activities. The landscape character directly to the north and west of the proposed Project area has been extensively disturbed by existing mining operations associated with the OGM. Beyond the OGM to the north and west are isolated farmsteads and the B1 national road. The landscape character towards the south of the proposed Project area is characterised by open areas associated with semi-arid vegetation, however this is part of the ML area. While the OGM has resulted in obvious visible landscape alterations / disturbance created by the mining operations, B2Gold has aimed to maintain and preserve the non-mining areas in their natural, pre-developed state, in addition to establishing the 11 000 Ha Otjikoto Education Centre and Nature Reserve adjacent to the east of the mine as part of B2Gold's Corporate Social Investment.

7.3.1.3 Scenic Quality

The scenic quality of the OGM and surrounding area is linked to the type of landscapes that occur within an area. In this regard, scenic quality can range from high to low as follows:

- High – these include the natural features such as mountains and koppies and drainage systems;
- Moderate – these include agricultural activities, smallholdings, and recreational areas; and
- Low – these include towns, communities, roads, railway line, industries and existing mines.

The scenic quality within the OGM is considered to be low due the presence of existing mining activities. However, the overall scenic quality for the proposed Project area is considered to be moderate given the presence of undisturbed areas to the east and south that provide open views of the nature reserve.

7.3.1.4 Sensitivity of Visual Resource

It follows that the highest value visual resource described above is also the most sensitive to changes. In contrast, areas, which are not considered to have a high scenic value, are expected to be the least sensitive to change such as the mining and infrastructure areas.

7.3.1.5 Sense of Place

The sense of place results from the combined influence of landscape diversity and distinctive features. The primary informant of these qualities is the spatial form and character of the natural landscape taken together with the cultural transformations and traditions associated with the historic use and habitation of the area.

An existing Visual Management Plan is implemented at OGM for existing operations (B2Gold, 2024) which mainly focuses on minimising the visual impacts of the mining operations on the community and public through progressive rehabilitation.

The most current visible aspects at OGM are the WRD and the TSF. WRDs and TSFs are an integral part of mining operations and are designed to safely store and manage waste materials generated from the extraction and processing of minerals. The WRD and TSF at OGM are located in close proximity to the B1 national road, which increases visibility from the road. Due to the nature of these facilities, there may be instances where the landscape appears to have unnatural colours.

Rehabilitation of the WRD is ongoing as a management measure on the potential visual aesthetics created by the advancement of this landform. The western slopes of the WRD have been rehabilitated and allowed for natural revegetation to occur. Rehabilitation was done in accordance with the Rehabilitation Management Plan. Rehabilitation monitoring continues on the WRD. Mineralised waste facilities' design, construction and operational procedures are continuously reviewed and updated (if required) to ensure alignment with final rehabilitation and closure objectives. Permanent visible features that will remain at the end of the LOM are constructed / shaped and maintained throughout the LOM to meet final landform / closure requirements.

Existing mining operations and the infrastructure that supports the mine dominates the area to the north and west of the proposed Project area. However, seen in context with the site surrounded by large open spaces of vegetation and the nature reserve to the east, the harsh nature of the mining activities is "softened". When the viewer views the area from outside the OGM, the larger area has a stronger sense of place.

7.3.1.6 Visual Receptors

When viewed from the perspective of tourists and residences within the area, mining operations could be associated with a sense of disenchantment. People who benefit from the Project (employees, contractors, service providers etc.) may not experience this disenchantment but rather see the mine with a sense of excitement and anticipation.

It follows that the sensitive viewer locations are located outside the OGM ML area (with isolated homesteads and livestock paddocks dispersed in all directions) and third parties travelling along the B1 national road.

There have been no formal stakeholder complaints received during the reporting period regarding visual nuisance of any of these landforms.

7.3.2 Traffic

7.3.2.1 Data Collection

Desktop information provided in this Section was sourced from the approved 2012 EIA Report (SLR, 2012) and the OGM Environmental Performance Report (B2Gold, 2024).

7.3.2.2 Existing Road Network

An existing Traffic Management Plan is implemented at OGM for existing operations (B2Gold, 2024) which mainly focuses on managing safety and vehicle related impacts on road users.

Main access to the OGM is obtained off the national B1 road. Mine related traffic travels from both Otavi and Otjiwarongo directions daily using the B1 road. Traffic on the B1 is a combination of B2Gold OGM, other mining and businesses, private and tourism related traffic. Internal haul roads are established as part of the existing OGM operations.

No traffic surveys of the B1 are available to provide an informative baseline. In terms of traffic related accidents between the period of January 2024 to June 2024, the site

emergency response team (ERT) responded to five vehicle accidents and public emergency callouts on the National B1 road within 30 km of the OGM.

7.3.3 Socio-Economic Structure/Profile

7.3.3.1 Data Collection

Information provided in this Section was sourced from the approved 2012 EIA Report (SLR, 2012) and the approved 2019 EIA Report (ECC Environmental, 2019). The latest 2023 census information was used to provide an updated reflection of the socio-economic environment (Namibia Statistics Agency , 2023). An existing Socio-economic Management Plan and Stakeholder Consultation / Communication Management Plan is implemented at OGM for existing operations (B2Gold, 2024).

7.3.3.2 Regional Socio-economic Baseline

The OGM is situated in the large, central Otjozondjupa Region. The region is the fifth largest region in Namibia. The total population of the region in 2019 was projected at 160,000 people, and has increased to 220 811 people in 2023. Otjiwarongo, the regional capital, is about 70 km away and Otavi about 50 km away from the OGM. In 2019, the population of Otjiwarongo was estimated to be more than 35,000 people, increasing to 49 022 people in 2023. Otavi is smaller, recording only 6,500 people in 2019 and increasing to 10 756 people in 2023. Urban migration is continuous as reflected in the growth of both neighbouring towns, as people move to seek better opportunities.

7.3.3.3 Local Socio-economic Baseline

The socio-economic baseline of the Project area has changed drastically from the pre-development of OGM (SLR, 2012). The presence of the OGM has brought employment and skills development at the local and regional level, resulting in increased job creation and economic growth. This has also contributed to by other mining projects such as Okorusu and Okanjande and the Whale Rock cement factory of Cheetah Cement near Otjiwarongo and Ohorongo Cement near Otavi. Other factors that have influenced the socio-economy of the region, and in particular Otjiwarongo and Otavi, is the continuous growth of the tourism industry as well as the growing importance of the charcoal industry. Combined, all these factors had a cumulative role in the changing socio-economic landscape of the region (and the two towns).

As of the end of June 2024, the total workforce of B2Gold Namibia was 918 employees, of which 861 are based at the OGM, 57 are based off-site (Windhoek office and Exploration Department). Of the 918 employees, 145 are Fixed Term Employees and / or Graduates. The remaining 773 are employed permanently. Most of the workers at Otjikoto reside in Otjiwarongo, and to a lesser extent in Otavi. The Otjozondjupa region has reportedly experienced a decrease in unemployment over the 2018–2023 period, standing at 31.2% in 2023.

In terms of access to services within the Otjozondjupa region, there have been some improvements since 2011, but also some declines. Education attainment has increased in percentage since 2011. The proportion of the population that has access to electricity for lighting has risen from 56% to 57.9% since 2011. Rural Household access to formal (flush) toilet facilities has increased from 28.4% to 36.5% in 2023. There has been a slight decline in access to safe drinking water by the population (93.8% in 2023 compared to 94.6% in 2011).

7.3.4 Land Uses

7.3.4.1 Data Collection

Desktop information provided in this Section was sourced from the approved 2012 EIA Report (SLR, 2012) and the Heritage Impact Assessment (RCHeritage Services CC, 2025).

7.3.4.2 Current Land Use

B2Gold was granted a Mining License (ML 169) in December 2012 by the MME. The properties on which the OGM is located are owned by B2Gold.

The land use for the Project area has changed drastically since the initial baseline assessment in 2012. The OGM operations and mining activities have commenced since 2014, thus the proposed Project area is already heavily transformed (Photo 3). The proposed surface infrastructure is located within the OGM ML and therefore there will be no further change or impact on land use.

Photo 3: Aeral View of the OGM

7.3.4.3 Surrounding Land Uses

The surrounding land uses reflect the region's dominant agricultural, conservation, and mineral development (Figure 7-22). Examples of a few land uses surrounding the OGM include commercial livestock farming (cattle ranching and game farming), the Otjikoto Nature Reserve (Photo 4), and Farm Erhardtshof which produces maize. Other mining projects such as Okuruso and Okanjande occur within 40 to 80 km away from OGM. The closest rural settlements are Otavi (~50 km east) and Otjiwarongo (~70 km south).

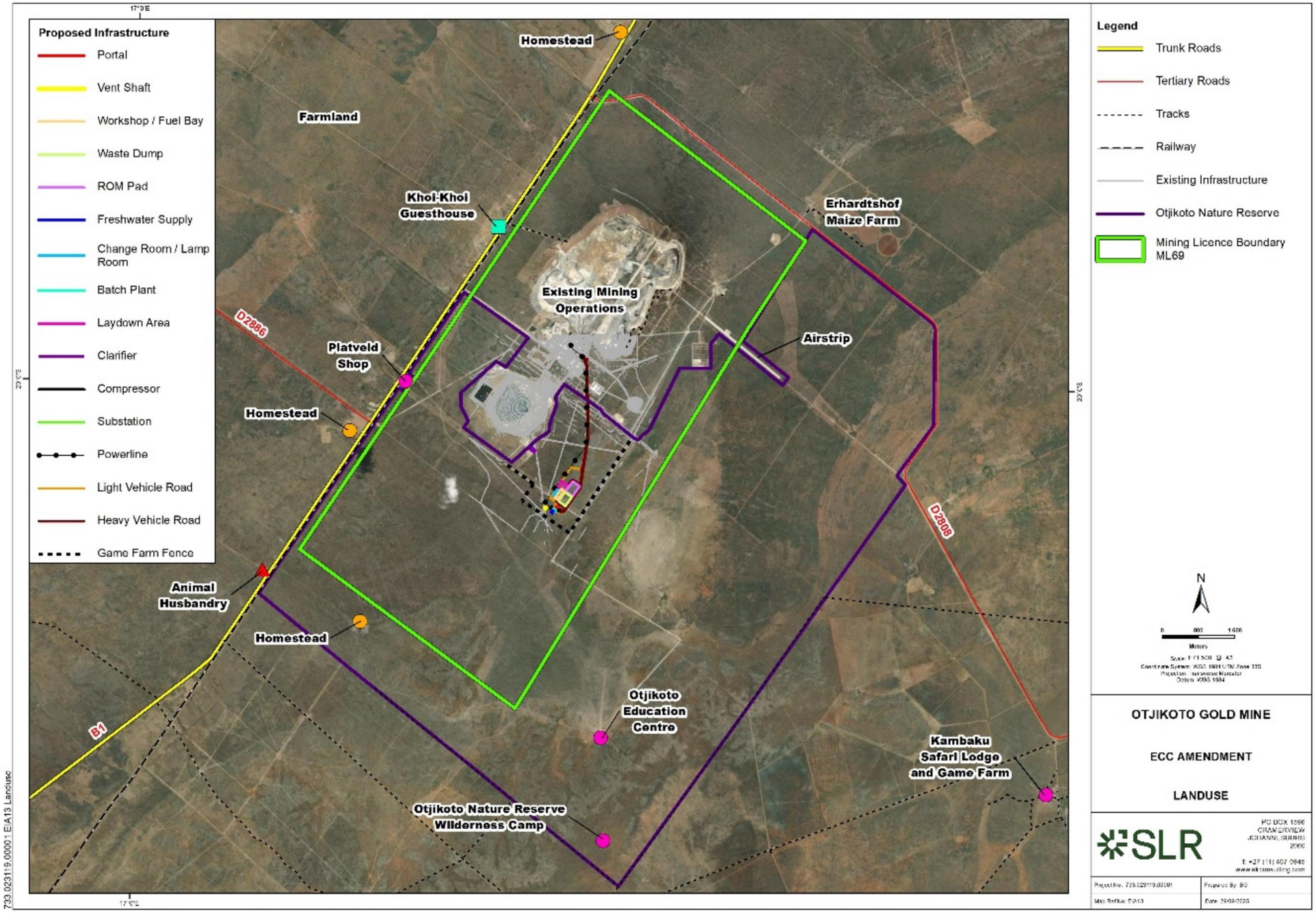


Figure 7-22: Directly Adjacent Land Uses

Photo 4: Otjikoto Environmental Education Centre and Nature Reserve

The non-mining areas within the OGM include plains covered by savannah grassland and dense thornbushes of *Acacia mellifera* and *Acacia reficiens* (Photo 5), as well as a variety of aloe plants, including *Aloe littoralis, Aloe dewinteri* and *Aloe viridiflora*. The adjacent Otjikoto Nature Reserve is home to plains game such as Oryx, Eland, Kudu, Zebra, Giraffe (Photo 5), Springbok, Hartebeest, Wildebeest, Impala and Waterbuck as well as large carnivores such as Leopard, Spotted Hyena, Brown Hyena and Cheetah. The wildlife roam freely within the game reserve (outside the OGM ML area).

Photo 5: Natural Vegetation Cover in the Non-Mining Areas (left) and an Example of the Animals Present within the Otjikoto Nature Reserve (right)

8.0 Summary of Environmental Sensitivities

8.1 Environmental Sensitivity Map

The placement of the proposed surface infrastructure was informed by the environmental sensitivity plan (Figure 8-1) which considered the location of identified sensitive physical, social and environmental features within the proposed Project area. This included consideration of the following:

- The extent of the proposed Project area;
- Existing physical structures;
- Findings from the Specialist Studies undertaken that are of environmental importance:
    - Hydrogeological appraisal – sensitive aquifer present on site (the Karibib Marble aquifer);
    - Terrestrial Biodiversity – sensitive ecological areas present on site with High sensitivity rating (the Sandy Savanna patches and ephemeral pans); and
    - Heritage and cultural resources – sensitive potential burial cairn present on site.

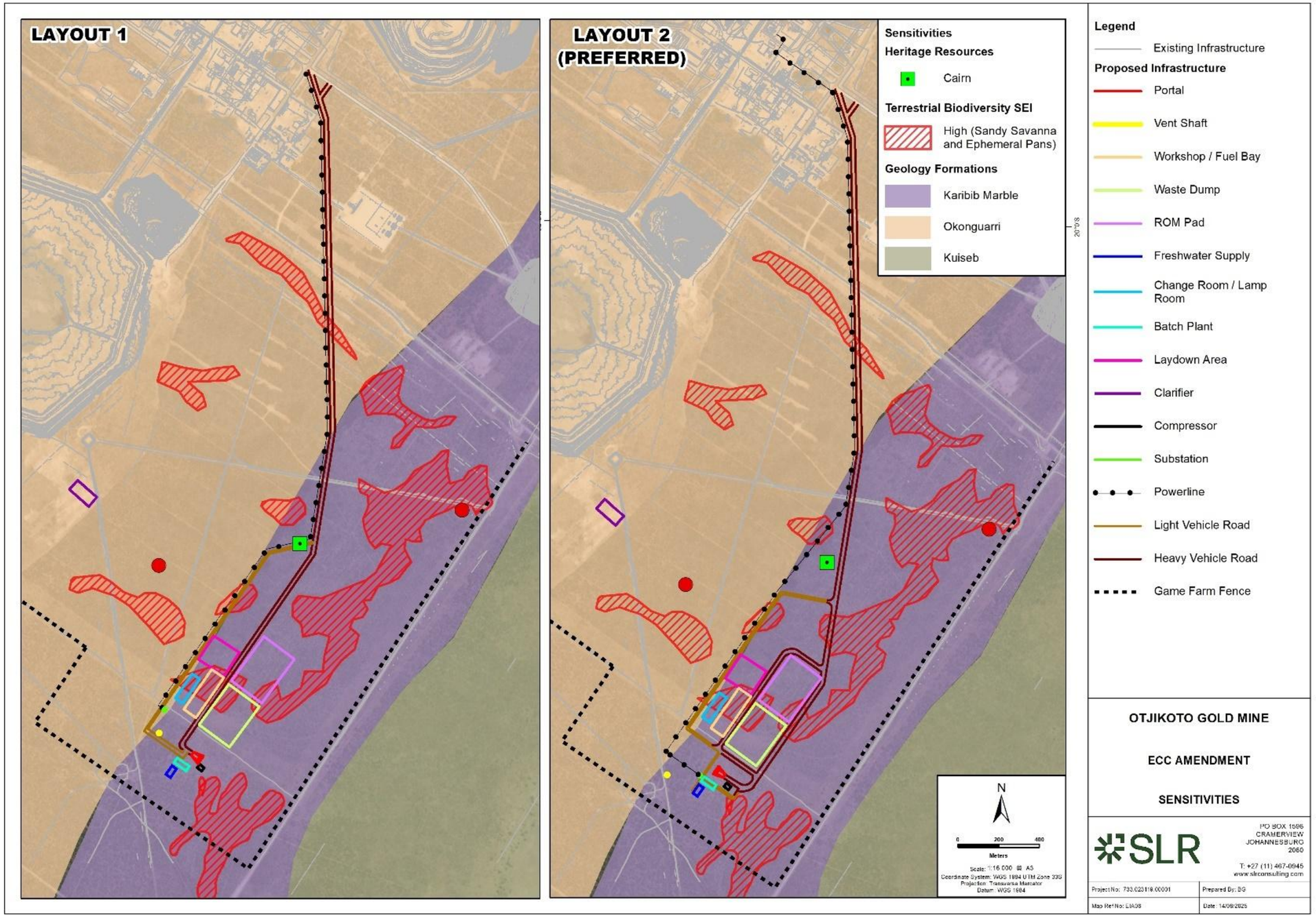


Figure 8-1: Environmental Sensitivity Map for Layout 1 and Layout 2

9.0 Biophysical, Social and Cultural Impacts and Risks

This section identifies and discusses the potential biophysical, cultural/heritage, and socio-economic impacts of the Proposed Project. The impact assessment discussion below takes into consideration all the Project phases (construction, operations, decommissioning, and closure) and, where required, has been informed by specialist assessments.

It is important to note that the impacts in this section were assessed for pre-mitigation (Layout Plan 1) and post-mitigation (Layout Plan 2 – preferred option).

The impact assessment included in this section is based on the impact assessment methodology provided in Section 2.2.2.

A summary of the results from the impact assessment is provided in Table 9-33.

9.1 Impacts Screened Out

The following impacts listed in **Error! Reference source not found.** were screened out (based on the current receiving environment baseline information provided in Section 7) and deemed to have no impact by the proposed Project.

Table 9-1: Impacts Screened Out

Aspect	Rationale
Climate	No significant contribution to climate change.
Surface Water	No surface water resources on or near the site.
Groundwater - acid mine drainage and metal contamination impact	Underground mining can contaminate groundwater by mobilizing heavy metals from ore or waste materials through exposure to oxygen. A major impact that could occur is acid mine drainage, where sulphide minerals (e.g., pyrite) react with air and water to form sulfuric acid, lowering groundwater pH and increasing heavy metal mobility, leading to widespread water contamination. The geochemical ABA results derived from rock samples taken at Wolfshag however, confirm the NAG nature of the geology in the area. The leach test results were compared with the Namibian DWA Acceptable Limits (2023) and only aluminium (Al) in the biotite schist and the hornfels material exceeded the Namibian guideline values. Based on the outcome of the extrapolated Geochemistry result the expected impact is insignificant.
Change in land use affecting third party use	The proposed Project area is located within the existing ML area and will not directly impact on surrounding land uses.

9.2 Biophysical Environmental Impacts

9.2.1 Soils and Land Capability

These impacts were assessed qualitatively by SLR.

9.2.1.1 Impact: Loss of Soil and Land Capability Through Contamination

Impact Description

Mining related activities have the potential to damage soil resources through contamination. The loss of soil resources has a direct impact on the potential loss of the natural capability of the land. In the construction and decommissioning phases, these potential pollution sources

are temporary in nature, usually existing for a few weeks to a few months. Although the sources are temporary in nature, the potential related pollution can have long term effects. The operational phase will present more long-term potential sources, and the closure phase will present final landforms that may have the potential to contaminate soils through long term seepage and/or run-off.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project phase	Activity/infrastructure
Construction	• Site preparation (clearance for all Project infrastructure), including bulk earthworks and construction of laydown area. • Construction of structural foundations. • Construction of buildings and facilities. • Establishment of roads, powerline and water supply infrastructure. • Waste management (non-mineralised). • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.
Operational	• Operation of the new on-site facilities. • Underground gold mining extraction. • Operation of the existing processing plant. • Operation and maintenance of transport systems. • Operation and use of power supply infrastructure. • Operation and maintenance of water supply and use of infrastructure. • Operation and use of mineralised and non-mineralised waste management facilities. • Removal of waste rock from underground using drilling and blasting to the new WRD. • Ore stockpiles (low-grade material and the ROM ore stockpile). • Tailings from underground operations are disposed of into the existing TSF. • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.
Decommissioning	• Clearance of land during the removal of infrastructure from the site. • Dismantling and demolition of all infrastructure and removal of equipment. • Slope stabilisation, erosion control and landscaping. • Revegetation of final landforms remaining in perpetuity (WRD and TSF). • Re-vegetation of disturbed areas and where infrastructure is removed.
Closure	• Rehabilitation, maintenance and aftercare of rehabilitated areas and final landforms.

Impact Discussion

The soil contamination impacts do not differ to the existing soil impacts from the OGM.

In the unmitigated scenario, pollution of soils from numerous incidents can result in a loss of soil functionality as an ecological driver because it can create a toxic environment for vegetation, vertebrates and invertebrates that rely on the soil. It could also negatively impact

on the chemistry of the soils such that current growth conditions are impaired. The intensity of the impact in an unmitigated scenario is considered to be high. In the mitigated scenario, the number of pollution events should be significantly less which reduces the potential intensity to medium. In the unmitigated scenario, most pollution impacts will remain until long after closure. In the mitigated scenario most of these potential impacts should either be avoided or be remedied within the life of the mine. Important related issues are the reaction time of the clean-up team and the selected remediation methods, which must be carefully considered in the dry environment associated with the Project as it has different underlying processes in the soil when compared to wetter environments. In both the unmitigated and mitigated scenarios, the potential loss of soil resources and associated land capability will be restricted to within the site boundary. Without any mitigation, the probability of impacting on soils and land capability through pollution events is high. With mitigation, the probability reduces because emphasis will be placed on preventing pollution events and on quick and effective remediation if pollution events do occur.

In the unmitigated scenario, the significance of the impact would be **MEDIUM**, which can be reduced to **LOW** in the mitigated scenario.

Table 9-2: Impact Summary - Loss of Soil and Land Capability Through Contamination

Loss of Soil and Land Capability Through Contamination		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	All	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Moderate change (Medium)
Duration	Permanent (> 20 years)	Long-term (10 to 20 years)
Extent	Part of site/property	Part of site/property
Consequence	Medium	Medium
Probability	Probable (High)	Possible / frequent (Medium)
Significance	**Medium -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage soils in accordance with the existing Soil Management Plan. The objective of the mitigation measures is to prevent soil contamination. Key mitigation measures to be implemented include: • Clearly demarcate soil stockpiles to identify the soil type and the intended area of rehabilitation. • Store mineral waste material separate from soil stockpiles. • Avoid mixing topsoil and subsoil. • Ensure wastewater run-off is controlled and intercepted to prevent loss of soil and contamination. • Restrict the mixing of concrete and the cleaning of mixing equipment to lined or impermeable surfaces. • Ensure hydrocarbon products and chemicals are safely stored and handled to prevent contamination of soil. • Ensure that all spills are cleaned up immediately and reported via the Incident Management procedure. • Limit the disturbance of soil to areas where stripping activities are identified.		

- Investigate the possibility of establishing stormwater diversion berms to prevent run-off erosion around stockpiles.
- Limit equipment movement on top of the soil stockpiles, to minimise compaction.
- Handle soils in dry weather conditions to cause as little compaction as possible.
- 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).
- Rehabilitate all exposed soils, where practicable, by replanting indigenous vegetation.
- Use “before’ and “after” photographic records to monitor and minimise the mixing of different soil types and excessive removal of vegetation and topsoil.

9.2.1.2 Impact: Loss of Soil and Land Capability Through Physical Disturbance

Impact Description

Soil has historically already been lost through the development of the existing OGM. Topsoil is a resource of high value as it is a non-renewable growth medium containing a gene bank of vegetation seeds and other organisms. Soil resources can be lost through physical disturbance such as removal, erosion and compaction, which can result in a loss of soil functionality as an ecological driver. There are a number of activities/infrastructure in all phases that have the potential to disturb soils through removal, compaction and/or erosion. In the construction and decommissioning phases, these activities are temporary in nature, usually existing for a few weeks to a few months. The operational phase will present more long term activities, and the closure phase will present final landforms that may be susceptible to erosion.

The impact sources linked to the mine’s activities and infrastructure likely to cause a loss of soil resources and land capability through physical disturbance include:

Project phase	Activity/infrastructure
Construction	• Site preparation (clearance for all Project infrastructure), including bulk earthworks and construction of laydown area. • Construction of structural foundations. • Construction of buildings and facilities. • Establishment of roads, powerline and water supply infrastructure. • Waste management (non-mineralised). • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.
Operational	• Operation of the new on-site facilities. • Underground gold mining extraction. • Operation of the existing processing plant. • Operation and maintenance of transport systems. • Operation and use of power supply infrastructure. • Operation and maintenance of water supply and use of infrastructure. • Operation and use of mineralised and non-mineralised waste management facilities. • Removal of waste rock from underground using drilling and blasting to the new WRD. • Ore stockpiles (low-grade material and the ROM ore stockpile).

Project phase	Activity/infrastructure
	• Tailings from underground operations are disposed of into the existing TSF. • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.
Decommissioning	• Clearance of land during the removal of infrastructure from the site. • Dismantling and demolition of all infrastructure and removal of equipment. • Slope stabilisation, erosion control and landscaping. • Revegetation of final landforms remaining in perpetuity (WRD and TSF). • Re-vegetation of disturbed areas and where infrastructure is removed.
Closure	• Rehabilitation, maintenance and aftercare of rehabilitated areas and final landforms.

Impact Discussion

The soil contamination impacts do not differ to the existing soil impacts from the OGM.

In the unmitigated scenario, physical soil disturbance can result in a loss of soil functionality as an ecological driver. In the case of erosion, the soils will be lost to the area of disturbance. In the case of compaction, the soil's functionality will first be compromised through a lack of rooting ability and aeration. Secondly, the compacted soils are likely to erode because, with less inherent functionality, there will be little chance for the establishment of vegetation and other matter that naturally protects the soils from erosion. Any soils that remain beneath the permanent landforms (such as the new WRD) will be a lost resource, and the associated land capability will be permanently altered. In the unmitigated scenario, the loss of soil and related functionality is long-term and will continue after the life of the mine. In the mitigated scenario, the soil is conserved and replaced in some areas, which reduces the duration of the impact if the soil functionality can be restored. In the unmitigated scenario, the potential loss of soil resources and associated land capability extends to the whole site and nearby surroundings, but is reduced to part of the site with mitigation. Without any mitigation, the probability of losing soil and related land capability is definite. With mitigation, the probability of pollution events will be reduced because the emphasis will be placed on preventing such events and on quick and effective remediation if they do occur.

In the absence of soil conservation and management measures and a pollution prevention plan, the significance of the potential impact is expected to be **HIGH**. This impact significance can be reduced to **LOW** with the implementation of mitigation measures focused on minimising impacts during construction and operations and remedying any negative impacts at closure. At the decommissioning phase, any landforms remaining in perpetuity, such as the WRD, will need to be appropriately rehabilitated and topsoil replaced in order to allow for effective rehabilitation.

Table 9-3: Impact Summary - Loss of Soil and Land Capability Through Physical Disturbance

Loss of Soil and Land Capability through Physical Disturbance	
Type of Impact	Direct
Nature of Impact	Negative
Phases	All

Criteria	Without Mitigation	With Mitigation
Intensity	Severe change (Very high)	Moderate change (Medium)
Duration	Long-term (10 to 20 years)	Long-term (10 to 20 years)
Extent	Whole site and nearby surroundings	Part of site/property
Consequence	High	Medium
Probability	Definite / Continuous (Very high)	Possible / frequent (Medium)
Significance	**High -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage soils in accordance with the existing Soil Management Plan. The objective of the mitigation measures is to prevent soil contamination. Key mitigation measures to be implemented include: • Clearly demarcate soil stockpiles to identify the soil type and the intended area of rehabilitation. • Store mineral waste material separate from soil stockpiles. • Avoid mixing topsoil and subsoil. • Ensure wastewater run-off is controlled and intercepted to prevent loss of soil and contamination. • Restrict the mixing of concrete and the cleaning of mixing equipment to lined or impermeable surfaces. • Ensure hydrocarbon products and chemicals are safely stored and handled to prevent contamination of soil. • Ensure that all spills are cleaned up immediately and reported via the Incident Management procedure. • Limit the disturbance of soil to areas where stripping activities are identified. • Investigate the possibility of establishing stormwater diversion berms to prevent run-off erosion around stockpiles. • Limit equipment movement on top of the soil stockpiles, to minimise compaction. • Handle soils in dry weather conditions to cause as little compaction as possible. • 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). • Rehabilitate all exposed soils, where practicable, by replanting indigenous vegetation. • Use “before’ and “after” photographic records to monitor and minimise the mixing of different soil types and excessive removal of vegetation and topsoil.		

9.2.2 Geohydrology

Information provided in this Section was sourced from the Desktop Hydrogeological Appraisal undertaken by SLR (SLR(a), 2025) included in Appendix F.

9.2.2.1 Impact: Lowering of Groundwater Levels Affecting Third Party Supply

Impact Description

Activities such as groundwater abstraction through boreholes for mine water supply as well as mine dewatering, which involves removing groundwater from underground workings to maintain safe working conditions and facilitate mining operations, can lower groundwater levels. Dewatering is essential during operations to prevent flooding, maintain stability, and keep the mine dry. Dewatering usually redirects natural groundwater flow to the mining void or dewatering wells. A reduction in groundwater levels has the potential to affect the water supply for third-party borehole users.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below:

Project phase	Activity/infrastructure
Construction	• Groundwater abstraction. • Dewatering of the underground workings.
Operational	• Groundwater abstraction. • Dewatering of the underground workings.
Decommissioning	• Groundwater abstraction. • Cessation of dewatering.
Closure	• Cessation of dewatering.

Impact Discussion

Groundwater has historically already been impacted by the development of the existing OGM. Construction of the vent shaft, underground portal and mine infrastructure could have a potential impact on groundwater flow direction as the shaft and access portal will cut through different aquifer units, fold axes, faults and sheer zones. The opening of the shaft will lead to pressure changes underground and create new pathways, causing a change in groundwater flow direction in areas surrounding the shaft and access portal. The underground mine voids/tunnels themselves can act like new pathways for water to move underground and potentially have an impact further south of the proposed Project. The extent of the impact is based on existing information that was extrapolated from Wolfshag which has similar aquifer properties, but a level of uncertainty remains.

Modelling was not undertaken as part of the Desktop Hydrogeological Appraisal undertaken by SLR (SLR(a), 2025). The MINEDW model developed by Itasca Africa in 2017, was updated by Knight Piésold, 2025 to include the Antelope area and used to predict the inflows into the planned Antelope Underground Mine. Two scenarios were simulated to run until 2050:

- **Scenario 1** is seen as a worst-case scenario. Dewatering at the Wolfshag and Antelope Underground mine voids is maintained for 17 years after mine closure (thus up to the year 2050) to simulate continued pumping.
- **Scenario 2** is seen as a likely scenario. Dewatering at the Wolfshag and Antelope Underground mine drains was deactivated sequentially to simulate flooding of the underground workings and groundwater rebound until 2050.

In Scenario 1, the situation of continued dewatering was simulated, thus pumping was kept active throughout mining and post-closure as the worst-case scenario to simulate the cone of drawdown (COD) and impacts on adjacent farming communities. As shown in Figure 9-1, the COD around the Ojikoto open pit and the Wolfshag underground will overlap the simulated drawdown at the Antelope underground mining by the end of current LoM (2033). Figure 9-2 shows the COD 17 years post-mining in 2050, indicating further expansion of the drawdown to the surrounding farms.

In Scenario 2, the situation of ceasing dewatering was simulated; thus, pumping is gradually deactivated after mining. The drawdown of the pore pressure at Antelope is less than those simulated in Scenario 1 post-mining due to the rebound from the Otjikoto/Wolfshag mine area. The simulation shows that the pit lake level for Scenario 2 in the Otjikoto mine will be higher, as groundwater will flow from the flooded underground mine workings and active dewatering ceases. Since the flow direction is towards the open pit as the groundwater is rebounding, the pit lake water level will not impact the Antelope area in the first 25 years of

mining. The COD from Antelope overlaps with the Otjikoto COD well after mining at Otjikoto Pit is set to cease.

In summary, numerical modelling and observations at the existing Wolfshag underground mine indicate that the changes in groundwater flow direction cause a COD within the ML area during the operational phase. The addition of the Antelope development may increase the extent of the COD thus impacting groundwater flow direction beyond the ML area, leading to lower water levels in boreholes that will fall within this cone of influence. Some of the boreholes that might be impacted include those used for irrigation at B2Gold (owned by Erhardshof) in worst-case scenarios (Figure 9-2). The level of uncertainty shown in the current numerical modelling results is not sufficient enough to determine with a high level of confidence which borehole users is likely to be impacted, especially when taking into consideration the location of two NamWater water supply boreholes for Otjiwarongo which is located on the Marble aquifer further south of the ML area. The modelling results do not clearly indicate the impact on boreholes (some monitored by NamWater) located south of the Project area within the Karibib Marbles, but there is a potential risk of water level decline and subsequent loss of yield. The confidence of the modelling results is low, and more site-specific drilling, aquifer testing and modelling is required to determine the extent of the impact more accurately.

Because it is expected that drawdown associated with groundwater abstraction and mine dewatering will affect some adjacent third party boreholes, the intensity of the impact is high in the unmitigated scenario. With mitigation in place, it is expected that no third-party borehole users would be affected and thus the intensity is low. In both the mitigated and unmitigated scenarios, the lowering of groundwater levels will be during the life of the mine, when active abstraction and mine dewatering takes place. Post closure, the underground voids will flood with groundwater rebound. Based on the modelled simulations, the COD will be local. The probability of a reduction in groundwater levels to third-party users is very high in the unmitigated scenario, as there are third-party groundwater users located in close proximity to the Project area, and is lowered to medium in the mitigated scenario. After mine closure, water tables will recover until a state of equilibrium is reached, and groundwater flow patterns are likely to return to pre-mining conditions.

In the unmitigated scenario, the significance of the impact would be **MEDIUM**, which can be reduced to **LOW** in the mitigated scenario.

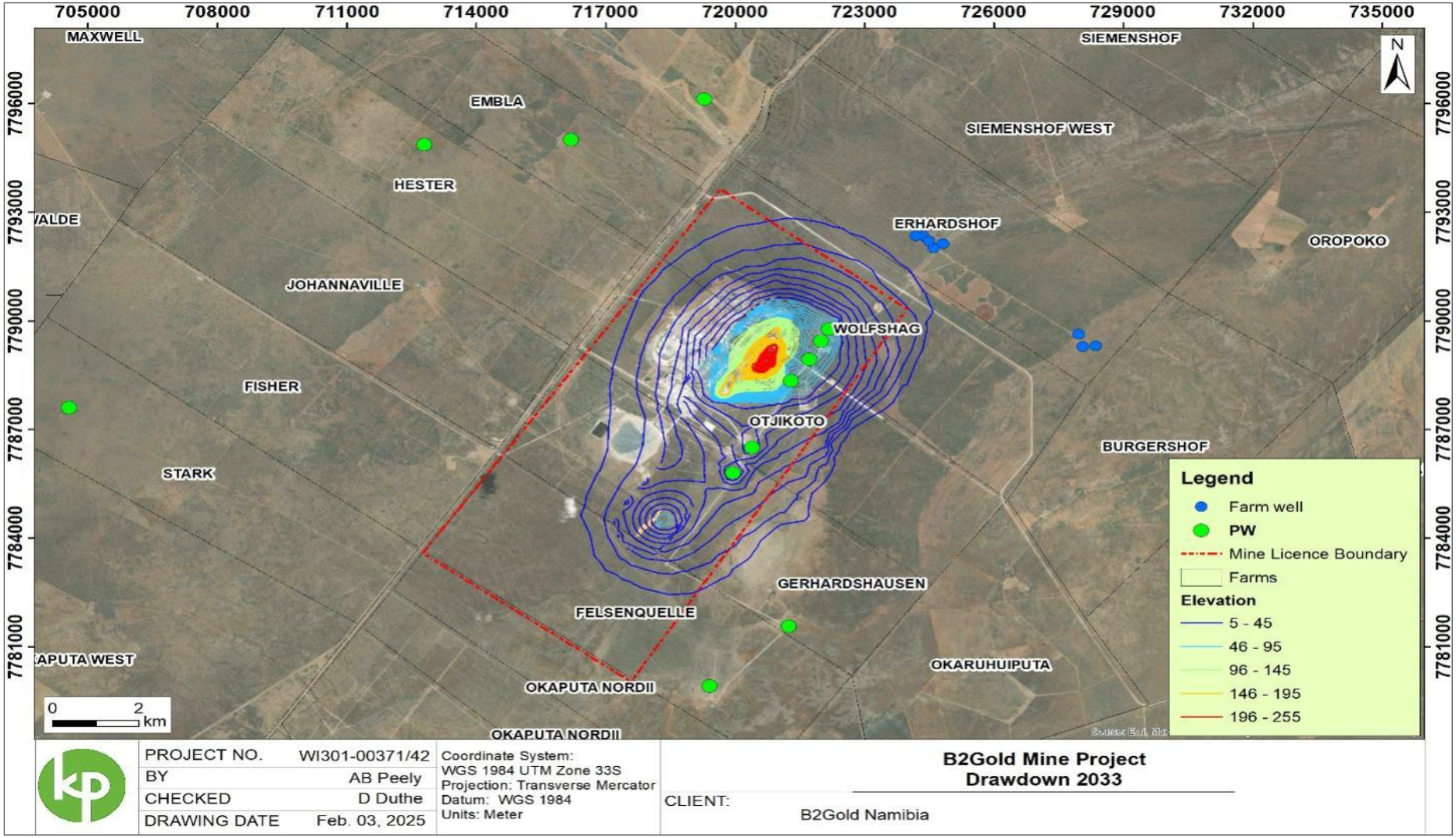


Figure 9-1: Simulated Drawdown Cone for Worst Case (Scenario 1) at LoM 2033

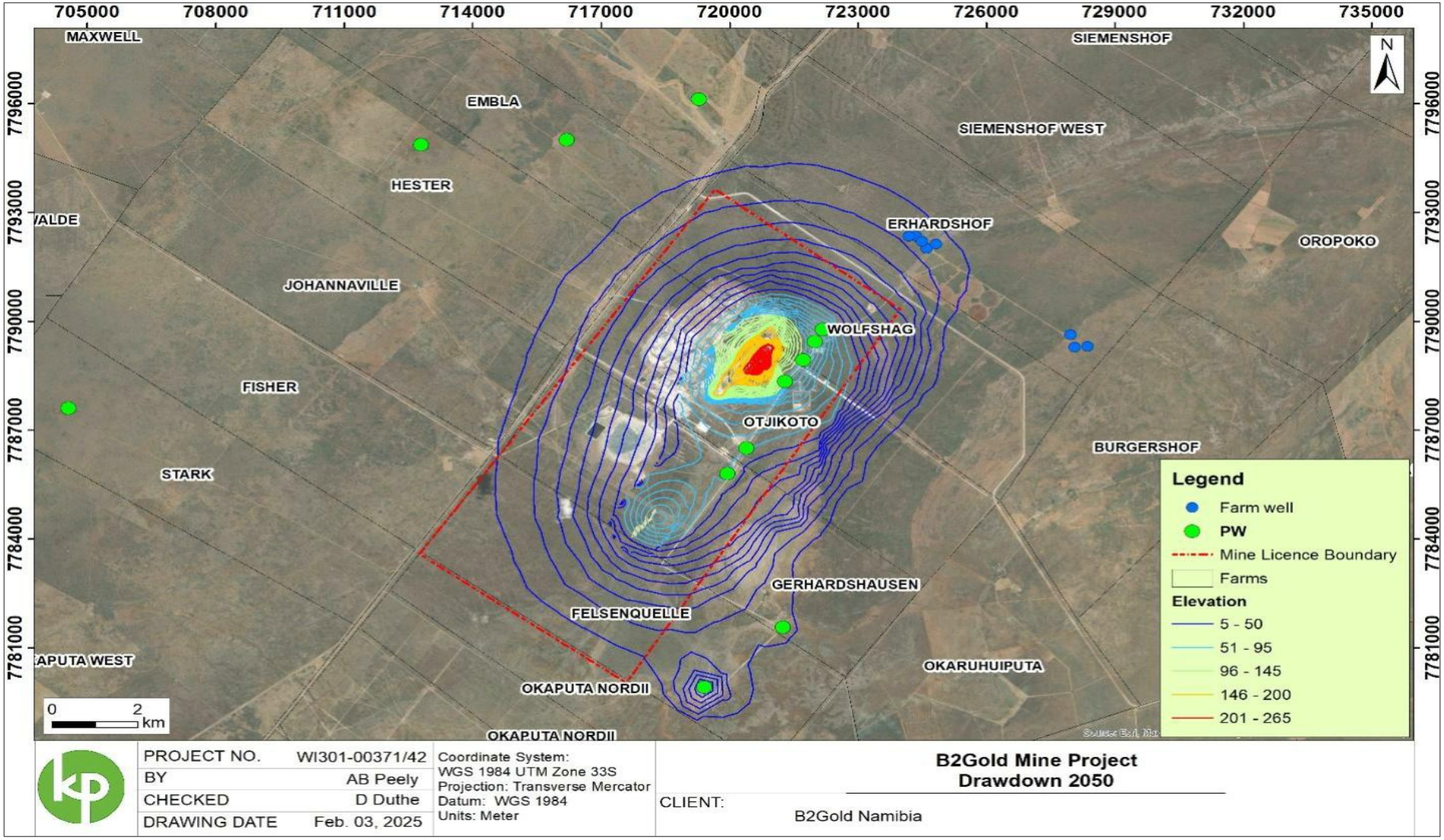


Figure 9-2: Simulated Drawdown Cone for Worst Case (Scenario 1) 17 years Post Closure

Table 9-4: Impact Summary - Lowering of Groundwater Levels Affecting Third Party Supply

Lowering of Groundwater Levels Affecting Third Party Supply		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	All	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Minor change (Low)
Duration	Long-term (10 to 20 years)	Medium-term (5 to 10 years)
Extent	Local	Local
Consequence	Medium	Medium
Probability	Definite / Continuous (Very high)	Possible / frequent (Medium)
Significance	**Medium -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		

B2Gold must continue to manage groundwater in accordance with the existing Groundwater Management Plan. The objective of the mitigation measures is to minimise the impact of water supply and prevent the loss of groundwater to other users in the area.

Key mitigation measures to be implemented include:

- 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.
- 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.
- 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.
- Develop protocols/ action plans for responding to unexpected changes in groundwater behaviour, such as sudden inflows or contamination.
- 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 avoid ed.
- Establish baseline groundwater data at the proposed Project footprint to monitor changes over time.
- 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.
- Maintain and continue to monitor the integrity of liners and seepage collection systems around mine residue deposits i.e. TSF and WRD.
- Recycle process water and reuse where possible
- Separate hazardous and non-hazardous waste.
- Develop and implement spill prevention measures and emergency response plans to deal with accidental spills of fuel and hazardous substances and waste.
- Conduct regular independent environmental audits.
- Plan for rehabilitation and land reclamation post closure e.g. re-contour land, replace topsoil, and re-vegetate with native species.

- Implement long-term monitoring after closure to measure the effectiveness and progress of rehabilitation efforts.
- Ensure correct chemical use and explosive charging practices are in place and followed for underground mining operations.
- 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.

9.2.2.2 Impact: Contamination of Groundwater Resources from Mine Residue Deposits Affecting Third Party Supply

Impact Description

There are a number of sources in all mine phases that have the potential to pollute groundwater and impact surrounding groundwater users. In the construction, decommissioning, and closure phases, some of these potential pollution sources are temporary and diffuse in nature. Improper management of mine residue deposits (i.e. the TSF and WRD) can lead to long-term contamination of groundwater. The operational phase will present more long-term potential sources, and the closure phase will present final landforms that may have the potential to pollute groundwater resources through long-term seepage and/or run-off.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below:

Project phase	Activity/infrastructure
Operational	• Operation and use of mineralised waste management facilities. • Removal of waste rock from underground using drilling and blasting to the new WRD. • Tailings from underground operations are disposed of into the existing TSF.
Decommissioning	• Revegetation of final landforms remaining in perpetuity (WRD and TSF).
Closure	• Rehabilitation, maintenance and aftercare of rehabilitated areas and final landforms.

Impact Discussion

The existing TSF will be extended, the footprint will therefore increase, however these impacts will be assessed as part of the separate TSF extension amendment application currently underway.

Plumes of sulfate (SO_4) and nitrate (NO_3) are commonly included in post-mining contaminant transport modelling because they are key indicators of groundwater quality changes associated with mining. The mass transport numerical modelling results for the TSF (prior to additional tailings material from the Antelope deposit) and WRD shows that SO_4 300mg/l isoline is not expected to migrate beyond 300 m from the TSF and WRD footprint (Figure 9-3). The NO_3 1mg/l isoline is not expected to migrate beyond 100m from the TSF and WRD footprint (Figure 9-4). Therefore, contaminant plumes are expected to remain within the ML area, assuming the liners stay intact.

In terms of impact intensity, in the unmitigated scenario, the severity is high, as contaminant levels exceed Namibian DWA guidelines Ideal and Acceptable Standard threshold limits. With the implementation of mitigation measures, including TSF liners, underdrain systems, controlled water treatment, and groundwater monitoring, the extent and intensity of contamination are significantly reduced. Under a fully mitigated scenario, contaminant

concentrations remain below regulatory limits, and seepage is effectively contained within the TSF footprint. In contrast, in the unmitigated scenario, contamination persists beyond the life of the mine, with seepage plumes continuing to migrate beyond the WRD and TSF boundaries. The duration of the impact in the unmitigated scenario is permanent, with contamination persisting beyond the LOM and requiring extensive remediation efforts. While the impact in the mitigated scenario is long-term, it is actively managed and controlled, ensuring progressive water quality improvement over time. Overall, the implementation of engineering containment systems, active groundwater monitoring, and post-closure treatment strategies is essential to minimising the risk and long-term environmental impact of TSF and WRD seepage on groundwater quality.

The probability of the impact occurring relies on a causal chain comprising three key elements:

- Does contamination reach groundwater resources?
- Are the contamination levels harmful?
- Will people or ecosystems be exposed to this contaminated groundwater?

The first element concerns whether contamination from the TSF and WRDs will reach groundwater resources. Numerical groundwater modelling indicates that in the unmitigated scenario, seepage from both the TSF and WRDs will directly infiltrate the groundwater system. The second element assesses whether the contamination levels are harmful. Unmitigated of sulfate and nitrate plumes are considered harmful to third-parties. The third element determines whether people or ecosystems will be exposed to contaminated groundwater. The available monitoring results show that the sulfate and nitrate plumes remain within the ML area, thus the impact will be localised in the mitigated scenario.

In the unmitigated scenario, the significance of the impact would be **MEDIUM**, which can be reduced to **LOW** in the mitigated scenario

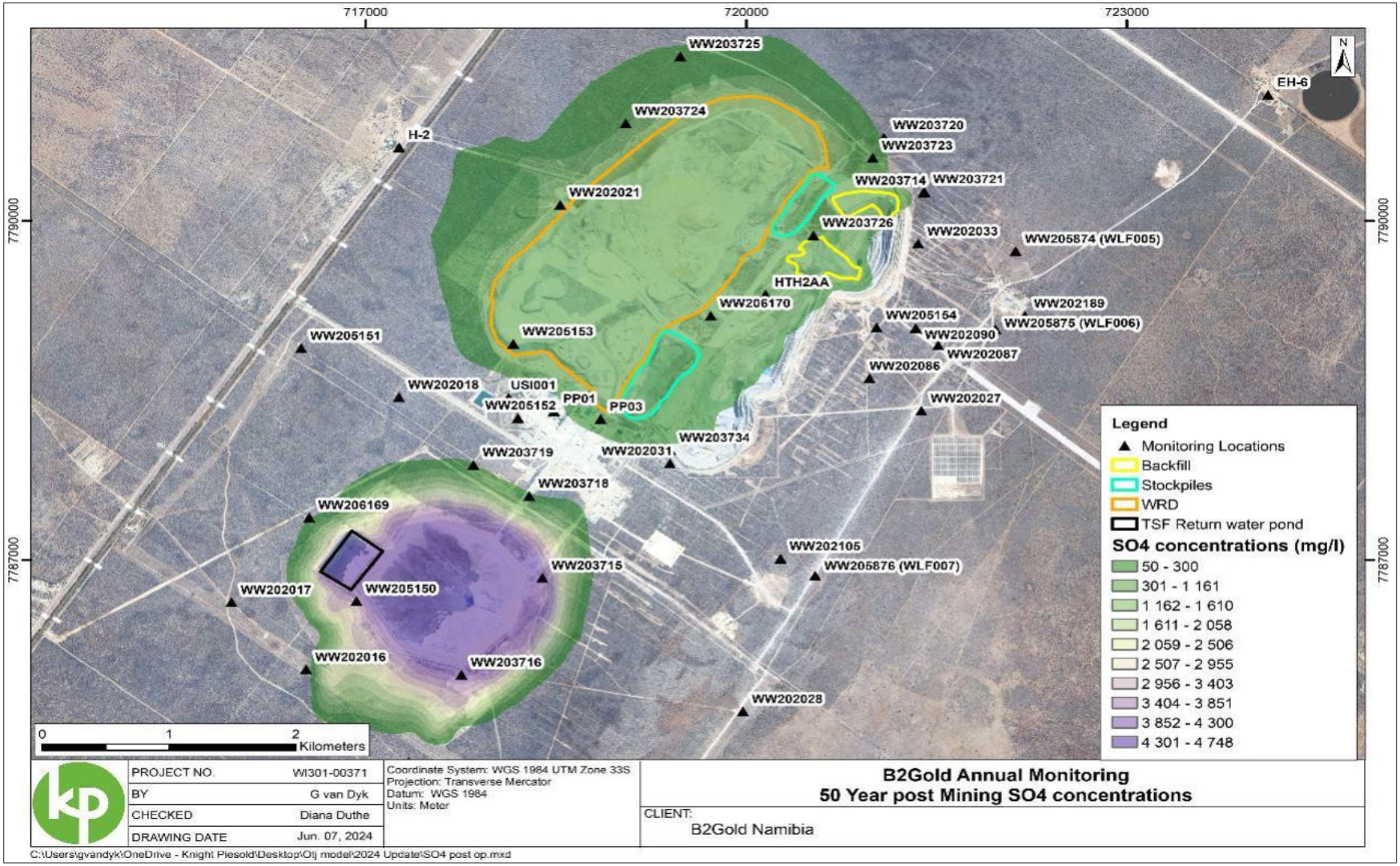


Figure 9-3: SO_4 Plume 50 years after Mine Closure

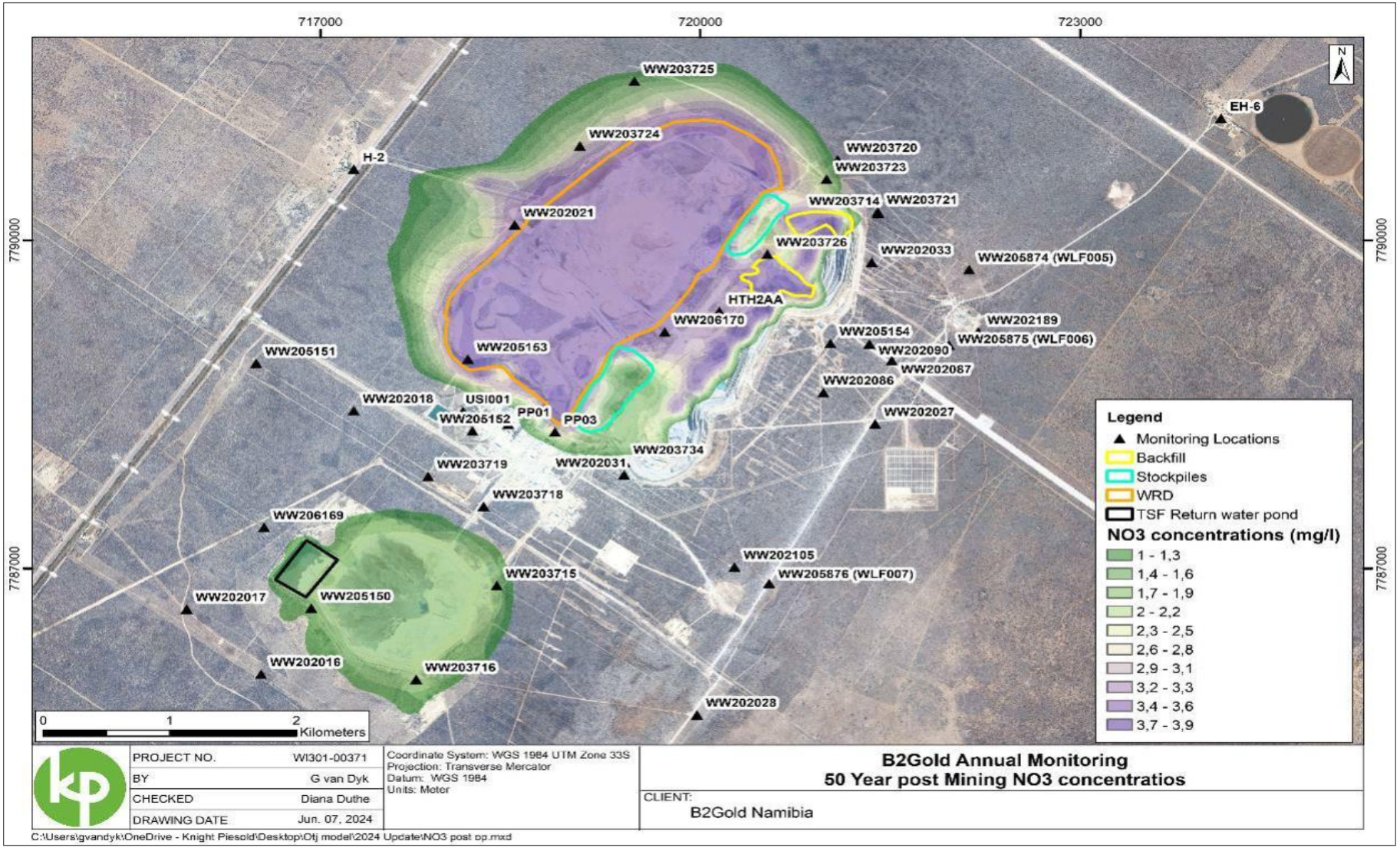


Figure 9-4: NO_3 Plume 50 years after Mine Closure

Table 9-5: Impact Summary - Contamination of Groundwater Resources from Mine Residue Deposits Affecting Third Party Supply

Contamination of Groundwater Resources from Mine Residue Deposits Affecting Third Party Supply		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Operation, Decommissioning and Closure	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Minor change (Low)
Duration	Permanent (> 20 years)	Long-term (10 to 20 years)
Extent	Within / near site	Within / near site
Consequence	Medium	Low
Probability	Definite / Continuous (Very high)	Definite / Continuous (Very high)
Significance	**Medium -**	**Low -**

Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)

B2Gold must continue to manage groundwater in accordance with the existing Groundwater Management Plan. The objective of the mitigation measures is to prevent groundwater contamination.

Key mitigation measures to be implemented include:

- 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.
- 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.
- 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.
- Develop protocols/ action plans for responding to unexpected changes in groundwater behaviour, such as sudden inflows or contamination.
- 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 avoid ed.
- Establish baseline groundwater data at the proposed Project footprint to monitor changes over time.
- 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.
- Maintain and continue to monitor the integrity of liners and seepage collection systems around mine residue deposits i.e. TSF and WRD.
- Recycle process water and reuse where possible
- Separate hazardous and non-hazardous waste.
- Develop and implement spill prevention measures and emergency response plans to deal with accidental spills of fuel and hazardous substances and waste.
- Conduct regular independent environmental audits.

- Plan for rehabilitation and land reclamation post closure e.g. re-contour land, replace topsoil, and re-vegetate with native species.
- Implement long-term monitoring after closure to measure the effectiveness and progress of rehabilitation efforts.
- Ensure correct chemical use and explosive charging practices are in place and followed for underground mining operations.
- 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.

9.2.2.3 Impact: Contamination of Groundwater Resources from Hazardous Waste and Chemicals Affecting Third Party Supply

Impact Description

Mining operations can introduce a variety of contaminants above ground and into the subsurface environment, posing significant risks to groundwater quality. These risks could arise from several sources from the planned infrastructure for the Proposed Project. This includes a small WRD, ROM pad, workshop, fuel bay, and the underground mining activities where hazardous chemicals such as solvents, degreasers, battery acid, and fuels are used and stored. If these substances leak or are improperly disposed of, they can seep into the soil and contaminate groundwater with heavy metals and other toxic compounds. Spills from storage tanks, refuelling stations, and maintenance activities are common sources of petroleum hydrocarbon pollution. These contaminants can migrate through the soil and reach groundwater.

During the construction and operation phases, potential pollution sources include hazardous industrial waste (e.g., used oil, lubricants, paints, solvents, grease), general industrial waste (e.g., scrap metal, building rubble), medical waste (e.g., swabs, bandages), and domestic waste (e.g., packaging, canteen waste, office waste). While these wastes may be in lesser quantities than in the operational phase, improper management poses a risk to groundwater.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below:

Project phase	Activity/infrastructure
Construction	• Storage and handling of new and used materials and chemicals (including hydrocarbons) • Equipment Servicing • Use of vehicles and equipment that may leak lubricants and fuel • Runoff from non-mineral waste areas
Operational	• Runoff from non-mineral waste areas • Run-off of stormwater that may have collected contaminants from the day-to-day on-site activities due to spills and leaks (Fuels and lubricants) and general and hazardous waste storage sites.
Decommissioning	• Runoff from non-mineral waste areas • Run-off of stormwater that may have collected contaminants from the day-to-day on-site activities due to spills and leaks (Fuels and lubricants) and general and hazardous waste storage sites. • Use of vehicles and equipment that may leak lubricants and fuel

Project phase	Activity/infrastructure
	• Storage and handling of new and used materials and chemicals (including hydrocarbons)

Impact Discussion

This area was not included in any mass transport model and will have to be considered in the updated model when additional data from drilling of monitoring and dewatering boreholes is available.

The primary risk to groundwater from non-mineralized waste arises if improper handling leads to leachate generation and contamination. However, the planned waste management measures, including sorting, recycling, and disposal through licensed facilities, mitigate this risk. These wastes will be temporarily handled and sorted on-site before removal for recycling, reuse, or disposal at permitted facilities by a registered Waste Management Company. During the decommissioning phase, non-mineralised waste will be limited to remnant materials, as all movable infrastructure will be deconstructed and removed off-site. The complete removal of infrastructure and waste further reduces the likelihood of contamination. Effective waste management practices throughout all Project phases are essential in preventing potential groundwater contamination.

In the unmitigated scenario, the significance of the impact would be **MEDIUM**, which can be reduced to **LOW** in the mitigated scenario.

Table 9-6: Impact Summary - Contamination of Groundwater Resources from Hazardous Waste and Chemicals Affecting Third Party Supply

Contamination of Groundwater Resources from Hazardous Waste and Chemicals Affecting Third Party Supply		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction, Operation and Decommissioning	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Minor change (Low)
Duration	Permanent (> 20 years)	Medium-term (5 to 10 years)
Extent	Local	Within / near site
Consequence	Medium	Medium
Probability	Definite / Continuous (Very high)	Possible / frequent (Medium)
Significance	**Medium -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage groundwater in accordance with the existing Groundwater Management Plan. The objective of the mitigation measures is to prevent groundwater contamination. Key mitigation measures to be implemented include: • 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. • 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.

- 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.
- Develop protocols/ action plans for responding to unexpected changes in groundwater behaviour, such as sudden inflows or contamination.
- 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 avoid ed.
- Establish baseline groundwater data at the proposed Project footprint to monitor changes over time.
- 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.
- Maintain and continue to monitor the integrity of liners and seepage collection systems around mine residue deposits i.e. TSF and WRD.
- Recycle process water and reuse where possible
- Separate hazardous and non-hazardous waste.
- Develop and implement spill prevention measures and emergency response plans to deal with accidental spills of fuel and hazardous substances and waste.
- Conduct regular independent environmental audits.
- Plan for rehabilitation and land reclamation post closure e.g. re-contour land, replace topsoil, and re-vegetate with native species.
- Implement long-term monitoring after closure to measure the effectiveness and progress of rehabilitation efforts.
- Ensure correct chemical use and explosive charging practices are in place and followed for underground mining operations.
- 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.

9.2.3 Terrestrial Biodiversity

Information provided in this Section was sourced from the Terrestrial Biodiversity Specialist Report undertaken by SLR (SLR(b), 2025) included in Appendix G.

9.2.3.1 Impact: Habitat Loss and Fragmentation

Impact Description

Mining activities and infrastructure have the potential to result in the loss of vegetation, habitat and related ecosystem functionality through physical disturbance and/or contamination of soil and/or water resources. Habitat loss involves the direct destruction or physical take-up of vegetation. Loss of habitat also leads to habitat fragmentation. In the construction and decommissioning phases, these activities are temporary in nature, usually existing from a few weeks to a few months. These activities will result in the direct removal of protected trees and natural vegetation, alteration of ephemeral pans and their catchments, and fragmentation of remaining natural habitats. The operational phase will present more long-term activities, and the closure phase will present final landforms (WRDs and TSF) and rehabilitated areas.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project Phase	Activity/Infrastructure
Construction	• Site preparation (clearance for all Project infrastructure), including bulk earthworks and construction of laydown area. • Construction of structural foundations. • Construction of buildings and facilities. • Establishment of roads, powerline and water supply infrastructure. • Waste management (non-mineralised). • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.
Operational	• Operation of the new on-site facilities. • Underground gold mining extraction. • Operation of the existing processing plant. • Operation and maintenance of transport systems. • Operation and use of power supply infrastructure. • Operation and maintenance of water supply and use of infrastructure. • Operation and use of mineralised and non-mineralised waste management facilities. • Removal of waste rock from underground using drilling and blasting to the new WRD. • Ore stockpiles (low-grade material and the ROM ore stockpile). • Tailings from underground operations are disposed of into the existing TSF. • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.

Impact Discussion

Vegetation and fauna have historically already been impacted by the development of the existing OGM. Construction and operational activities associated with the Project have the potential to cause the following impacts:

- Clearance of natural vegetation for infrastructure (e.g. roads, pads, laydown areas) will result in direct habitat loss, especially in intact shrubland and sandy savanna habitats.
- Development of access routes and fencing may cause habitat fragmentation, restricting the movement of wildlife and reducing ecological connectivity.
- Ephemeral pans, which are sensitive and hydrologically important habitats, may be indirectly affected if adjacent vegetation or catchment areas are disturbed.
- Fragmentation and disturbance may alter the species composition, potentially reducing local biodiversity and ecosystem function.
- These impacts are most significant where infrastructure overlaps or encroaches upon high-sensitivity habitats, such as pans, sandy savanna patches, and areas with protected trees.
- Reduction in extent of intact Sandy Savanna and Shrubland Plains.

The criteria ratings reflect the ecological characteristics of the Project area and the sensitivity of its vegetation types. 'High' intensity and consequence are justified due to the presence of

protected trees, ephemeral pans, and high-SEI habitats in the proposed development footprint. 'Local extent is selected because fragmentation and ecological corridor disruption extend beyond the footprint. The loss of biodiversity will mostly occur during the construction phase but will continue into the operational phase of the Project. As such, the duration of the impact is considered long term, beyond the LOM in the unmitigated scenario, and medium in the mitigated scenario. While mitigation reduces duration and extent, full recovery is unlikely without intervention, especially in arid environments.

In the unmitigated scenario, the significance of the impact would be **HIGH**, which can be reduced to **MEDIUM** in the mitigated scenario.

Table 9-7: Impact Summary - Habitat Loss and Fragmentation

Habitat Loss and Fragmentation		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction, Operation and Decommissioning	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Moderate change (Medium)
Duration	Long-term (10 to 20 years)	Medium-term (5 to 10 years)
Extent	Local area, far beyond site	Part of site/property
Consequence	High	Low
Probability	Probable (High)	Probable (High)
Significance	**High -**	**Medium -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to protect biodiversity in accordance with the existing Biodiversity Management Plan. The objective of the mitigation measures is to prevent or limit the unacceptable loss of biodiversity and related functionality through physical disturbance. Key mitigation measures to be implemented include: • Demarcate and limit disturbance to authorised development areas • Avoid disturbance of indigenous vegetation outside direct footprint • Restrict laydown areas and temporary infrastructure to low/medium sensitivity zones • Rehabilitate disturbed areas with indigenous species post-construction. Monitoring of the rehabilitated areas is essential to ascertain efficacy of rehabilitation efforts. • Prevent dust pollution from degrading established vegetation • 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. • All staff should undergo Environmental Awareness Training. Discussions are required on sensitive environmental receptors within 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. • Continue access control and implement anti-poaching measures. • Prevent bird collisions with new powerline with the use of prescribed deterrents/diverters (e.g. spiral markers, flappers, or LED-based devices). • The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas thereby causing further encroachment of invasive species.		

- An Alien Invasive Plant control programme must be implemented to control the encroachment of invasive plant species.
- Avoid topsoil stockpiling near watercourses (Pans) and sensitive habitats.
- 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.
- 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.
- All waste must be collected and stored effectively. Temporary storage of domestic waste shall be in covered waste skips. Recycling is encouraged.

9.2.3.2 Impact: Disruption to the Local Faunal Communities and Faunal SCC

Impact Description

Project activities have the potential to adversely affect faunal communities, including Species of Conservation Concern (SCCs), through habitat loss, disturbance, and increased human activity. Vegetation clearance, noise, dust, and lighting may displace animals, disrupt breeding behaviour, and reduce habitat quality, while increased traffic and human presence can elevate the risk of poaching, illegal harvesting, and road kills. These disturbances will exist during all mine phases until mining activities cease.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project phase	Activity/infrastructure
Construction	• Site preparation (clearance for all Project infrastructure), including bulk earthworks and construction of laydown area. • Construction of structural foundations. • Construction of buildings and facilities. • Establishment of roads, powerline and water supply infrastructure. • Waste management (non-mineralised). • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.
Operational	• Operation of the new on-site facilities. • Underground gold mining extraction. • Operation of the existing processing plant. • Operation and maintenance of transport systems. • Operation and use of power supply infrastructure. • Operation and maintenance of water supply and use of infrastructure. • Operation and use of mineralised and non-mineralised waste management facilities. • Removal of waste rock from underground using drilling and blasting to the new WRD. • Ore stockpiles (low-grade material and the ROM ore stockpile). • Tailings from underground operations are disposed of into the existing TSF. • Storage and handling of new and used materials and chemicals (including hydrocarbons).

Project phase	Activity/infrastructure
	• Management of dirty water.
Decommissioning	• Clearance of land during the removal of infrastructure from the site. • Dismantling and demolition of all infrastructure and removal of equipment. • Slope stabilisation, erosion control and landscaping. • Revegetation of final landforms remaining in perpetuity (WRD and TSF). • Re-vegetation of disturbed areas and where infrastructure is removed.
Closure	• Rehabilitation, maintenance and aftercare of rehabilitated areas and final landforms.

Impact Discussion

Activities during all phases associated with the Project have the potential to cause the following impacts:

- Breeding Disturbance to Raptors and Large Birds: The loss of tall trees and increased construction activity may reduce available nesting sites and cause disturbance to breeding pairs of large avifauna, including *Gyps africanus* (White-backed Vulture), *Torgos tracheliotos* (Lappet-faced Vulture), and *Aquila rapax* (Tawny Eagle), among others.
- Faunal Displacement and Barrier Effects: The physical presence of infrastructure, increased noise and dust may disrupt movement patterns of terrestrial and avifaunal species, leading to reduced access to key resources such as food, shelter, and breeding sites. This may affect plains game, birds, and small mammals, particularly in previously contiguous habitat areas.
- Increased risk of bird collisions: The proposed powerline may intersect flight paths of large birds, including raptors and other soaring species.
- Illegal Harvesting and Poaching Pressure: Increased access and human presence can elevate the risk of illegal activities such as bushmeat hunting, collection of firewood, and poaching of protected species. This may result in the loss of biodiversity, with significant impacts on protected trees, game species, and sensitive bird populations.

The 'medium' intensity and consequence ratings are based on the likelihood of disturbing nationally protected raptor species and common game, compounded by increased poaching risk. The extent is beyond the site due to wide-ranging faunal movements across and beyond the Project area. Implementation of the proposed mitigation actions will lower the probability and reduce significance of the impacts.

In the unmitigated scenario, the significance of the impact would be **MEDIUM**, which can be reduced to **VERY LOW** in the mitigated scenario.

Table 9-8: Impact Summary - Disruption to the Local Faunal Communities and Faunal SCC

Disruption to the local faunal communities and faunal SCC	
Type of Impact	Direct
Nature of Impact	Negative
Phases	Construction, Operation and Decommissioning

Criteria	Without Mitigation	With Mitigation
Intensity	Moderate change (Medium)	Negligible change (Very low)
Duration	Medium-term (5 to 10 years)	Medium-term (5 to 10 years)
Extent	Beyond site	Whole site and nearby surroundings
Consequence	Medium	Low
Probability	Probable (High)	Possible / frequent (Medium)
Significance	**Medium -**	**Very Low -**

Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)

B2Gold must continue to protect biodiversity in accordance with the existing Biodiversity Management Plan. The objective of the mitigation measures is to prevent or limit the unacceptable loss and disturbance of biodiversity and related functionality through physical disturbance.

Key mitigation measures to be implemented include:

- Demarcate and limit disturbance to authorised development areas
- Avoid disturbance of indigenous vegetation outside direct footprint
- Restrict laydown areas and temporary infrastructure to low/medium sensitivity zones
- Rehabilitate disturbed areas with indigenous species post-construction. Monitoring of the rehabilitated areas is essential to ascertain efficacy of rehabilitation efforts.
- Prevent dust pollution from degrading established vegetation
- 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.
- All staff should undergo Environmental Awareness Training. Discussions are required on sensitive environmental receptors within 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.
- Continue access control and implement anti-poaching measures.
- Prevent bird collisions with new powerline with the use of prescribed deterrents/diverters (e.g. spiral markers, flappers, or LED-based devices).
- The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas thereby causing further encroachment of invasive species.
- An Alien Invasive Plant control programme must be implemented to control the encroachment of invasive plant species.
- Avoid topsoil stockpiling near watercourses (Pans) and sensitive habitats.
- 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.
- 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.
- All waste must be collected and stored effectively. Temporary storage of domestic waste shall be in covered waste skips. Recycling is encouraged.

9.2.3.3 Impact: Continued Habitat Degradation

Impact Description

Mining-related projects have the potential to cause continued habitat degradation even after construction is complete. Residual disturbance from the mine footprint and associated infrastructure can lead to ongoing impacts such as edge effects, the spread of invasive alien

plants, erosion from altered runoff patterns, and bush encroachment. These processes progressively reduce habitat quality and ecological functionality, potentially altering species composition and limiting natural regeneration. If not actively managed through rehabilitation and monitoring, such degradation can exert long-term pressure on local biodiversity and ecosystem services.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project phase	Activity/infrastructure
Decommissioning	• Clearance of land during the removal of infrastructure from the site. • Dismantling and demolition of all infrastructure and removal of equipment. • Slope stabilisation, erosion control and landscaping. • Revegetation of final landforms remaining in perpetuity (WRD and TSF). • Re-vegetation of disturbed areas and where infrastructure is removed.
Closure	• Rehabilitation, maintenance and aftercare of rehabilitated areas and final landforms.

Impact Discussion

Activities during the decommissioning and closure phases associated with the Project have the potential to cause the following impacts:

- Removal of infrastructure will lead to the creation of solid waste areas and areas lacking vegetation where there was infrastructure during the operational phase. Previously disturbed areas are at risk of being encroached by pioneering species such as *Dichrostachys cinerea* and *Vachellia mellifera*.
- Edge effects from expanded infrastructure footprint will reduce the habitat integrity.
- Operational activities may lead to dust pollution which may impact vegetation regrowth.
- Increased risk of soil erosion and sedimentation. Dumping of discarded material will lead to areas prone to erosion run-off and wind due to the death of vegetation.
- Encroachment by AIPs into areas that have been disturbed will lower habitat quality and may cause complete habitat loss in areas with dense infestations.

This impact is rated as 'Moderate' in intensity and consequence due to expected degradation patterns typical of infrastructure developments in savanna landscapes, such as AIP spread, erosion, and bush encroachment. While localised, these processes persist over time without management.

In the unmitigated scenario, the significance of the impact would be **MEDIUM**, which can be reduced to **LOW** in the mitigated scenario.

Table 9-9: Impact Summary - Continued Habitat Degradation

Continued Habitat Degradation		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Decommissioning and Closure	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Moderate change (Medium)	Minor change (Low)

Duration	Permanent (> 20 years)	Permanent (> 20 years)
Extent	Whole site and nearby surroundings	Part of site/property
Consequence	Medium	Medium
Probability	Probable (High)	Conceivable (Low)
Significance	**Medium -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to protect biodiversity in accordance with the existing Biodiversity Management Plan. The objective of the mitigation measures is to limit potential impacts on biodiversity through the minimisation of the footprint and the conservation of residual habitat within the mine area. Key mitigation measures to be implemented include: • Demarcate and limit disturbance to authorised development areas • Avoid disturbance of indigenous vegetation outside direct footprint • Restrict laydown areas and temporary infrastructure to low/medium sensitivity zones • Rehabilitate disturbed areas with indigenous species post-construction. Monitoring of the rehabilitated areas is essential to ascertain efficacy of rehabilitation efforts. • Prevent dust pollution from degrading established vegetation • 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. • All staff should undergo Environmental Awareness Training. Discussions are required on sensitive environmental receptors within 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. • Continue access control and implement anti-poaching measures. • Prevent bird collisions with new powerline with the use of prescribed deterrents/diverters (e.g. spiral markers, flappers, or LED-based devices). • The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas thereby causing further encroachment of invasive species. • An Alien Invasive Plant control programme must be implemented to control the encroachment of invasive plant species. • Avoid topsoil stockpiling near watercourses (Pans) and sensitive habitats. • 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. • 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. • All waste must be collected and stored effectively. Temporary storage of domestic waste shall be in covered waste skips. Recycling is encouraged.		

9.2.4 Noise

Information provided in this Section was sourced from the Noise Impact Assessment undertaken by dBAcoustics (dBAcoustics, 2025) included in Appendix H.

9.2.4.1 Impact: Increase in Construction Phase Ambient Noise Levels Affecting Sensitive Receptors

Impact Description

Two types of noise are distinguished: noise disturbance and noise nuisance. The former is noise that can be registered as a discernible reading on a sound level meter and the latter, although it may not register as a discernible reading on a sound level meter, may cause nuisance because of its tonal character (e.g., distant humming noises). Mining related projects present the possibility of generating both noise disturbances and noise nuisance in the construction phase.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project Phase	Activity/Infrastructure
Construction	• Clearing and grubbing of the infrastructure footprint – Use of heavy machinery and hauling of topsoil to waste area. • Construction activities at Upcast ventilation, Portal, Haul Road, OHPL, Light vehicle road, Pipeline – Construction of the different sections of the project. • Civil construction activities – Construction of internal roads, storm water channels, infrastructure, and buildings. • Construction of the Integrated Waste rock storage area and ROM pad – Scraping of footprint and lining of area.

Impact Discussion

The potential noise intrusion levels from the proposed Project area at the residential areas (monitoring points 5 to 11 = NSA A to G) were calculated as follows:

Noise intrusion level = cumulative noise level – baseline noise level

The criteria for assessing the magnitude of the potential noise intrusion impact are illustrated in Table 9-10. The calculated noise intrusion levels during the construction phase are illustrated in **Error! Reference source not found.**. Results show that there are mostly no n oise intrusion level increases, only a slight increase of 0.1 dBA for construction activities associated with the clarifier and pipeline at Noise Sensitive Area (NSA) G. However, all impacts will not be audible as classified by the criteria in Table 9-10.

Table 9-10: The Criteria of the Magnitude of the Noise Intrusion Levels

Increase Δ-dBA	Assessment of impact magnitude	Color code
0 <Δ≤ 1	Not audible	
1 <Δ≤ 3	Very Low	
3 <Δ≤ 5	Low	
5 <Δ≤ 10	Medium	
10 <Δ≤ 15	High	
15 <Δ	Very High	

Cumulative noise level: The following formula was used to calculate the projected/cumulative noise levels at the different noise receptors during the construction phase of the Project:

$Lp = Lw - 20log\ R - \alpha$

where, Lp is the sound level at a distance from the source in dBA.

Lw is the sound level at the source in dBA.

R is the distance from the source.

α is the noise reduction factor of 3dB for air density, ground conditions will be allowed for.

The cumulative noise levels as calculated at the different noise receptors will be added in a logarithmic manner to determine the potential noise intrusion levels at specific areas.

Baseline noise level: Provided in Section 7.1.7.3 and Table 7-8.

Table 9-11: Noise Intrusion Levels for the Construction Phase in dBA

Residential Property	Baseline Noise Level		Cumulative Noise Level		Noise Intrusion Level	
	Day	Night	Day	Night	Day	Night
All Construction Activities (Except Clarifier and Pipleine)						
NSA A - Camp	52.6	49.0	52.6	49.0	0.0	0.0
NSA B - Erhardshof	46.9	30.5	46.9	30.5	0.0	0.0
NSA C - Burgershof	50.3	32.2	50.3	32.2	0.0	0.0
NSA D - Tirol	65.2	29.4	65.2	29.4	0.0	0.0
NSA E - Smit	50.8	37.6	50.8	37.6	0.0	0.0
NSA F - Platveld	52.2	47.7	52.2	47.7	0.0	0.0
NSA G - Fischer	36.6	29.4	36.6	29.4	0.0	0.0
Clarifier and Pipleine						
NSA A - Camp	52.6	49.0	52.6	49.0	0.0	0.0
NSA B - Erhardshof	46.9	30.5	46.9	30.5	0.0	0.0
NSA C - Burgershof	50.3	32.2	50.3	32.2	0.0	0.0
NSA D - Tirol	65.2	29.4	65.2	29.4	0.0	0.0
NSA E - Smit	50.8	37.6	50.8	37.6	0.0	0.0
NSA F - Platveld	52.2	47.7	52.2	47.7	0.0	0.0
NSA G - Fischer	36.6	29.4	36.7	29.5	0.1	0.1

Based on the noise intrusion level results, exceedances over the 3 dB increase of the baseline in terms of the IFC guidelines are not expected in both the unmitigated and mitigated scenarios, and as such will result in a minor change to existing ambient noise levels. Therefore the intensity of the impact is low in the unmitigated scenario and is expected to remain low with mitigation. Due to the nature of construction related activities, which are limited to three years, the duration of the impact in both the mitigated and unmitigated scenarios is short-term. Noise impacts are expected to be site specific in both the mitigated and unmitigated scenarios. In both the unmitigated and mitigated scenarios, the likelihood of construction activities creating a noise nuisance is high due to the proximity of the sensitive receptors in relation to the OGM, therefore having a high probability of affecting the sensitive receptors.

The significance of this potential impact is **LOW** in both the unmitigated and mitigated scenario.

Table 9-12: Impact Summary - Increase in Construction Phase Ambient Noise Levels Affecting Sensitive Receptors

Increase in Construction Phase Ambient Noise Levels Affecting Sensitive Receptors		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Minor change (Low)	Minor change (Low)
Duration	Short-term (1 to 5 years)	Short-term (1 to 5 years)
Extent	Whole site and nearby surroundings	Whole site and nearby surroundings
Consequence	Low	Low
Probability	Probable (High)	Probable (High)
Significance	**Low -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage noise impacts in accordance with the existing Noise and Vibrations Management Plan. The objective of the mitigation measures is to limit excessive noise levels. Key mitigation measures to be implemented include: • Install silencers for fans. • Install suitable mufflers on engine exhausts and compressor components. • Install acoustic enclosures for equipment causing radiating noise. • Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding. • Take advantage during the design stage of natural topography as a noise buffer. • Develop a mechanism to record and respond to complaints. • Construction activities to be done during daytime only. • 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. • Feed back to the Engineering Manager once the prevailing ambient noise level is exceeded by more than 3.0dBA. • Acoustic mitigatory measures to be implemented at noise sources more than 85.0dBA or when the ambient noise level is exceeded by more than 3.0dBA.		

9.2.4.2 Impact: Increase in Operational Phase Ambient Noise Levels Affecting Sensitive Receptors

Impact Description

Two types of noise are distinguished: noise disturbance and noise nuisance. The former is noise that can be registered as a discernible reading on a sound level meter and the latter, although it may not register as a discernible reading on a sound level meter, may cause nuisance because of its tonal character (e.g., distant humming noises). Mining related

projects present the possibility of generating both noise disturbances and noise nuisance in the operational phase.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project Phase	Activity/Infrastructure
Operational	• Hauling & Deposition: Continuous truck movement and rock tipping generate rolling noise and impulsive sound events. • Clarifier & Processing Plant: Steady mechanical hum from pumps and rotating equipment adds to background noise. • Hauling Vehicles: Intermittent engine, braking, and reversing alarm noise along haul routes. • Downcast Ventilation Shaft: Constant fan noise acting as a key point source. • Portal Area: Combined noise from vehicle movements, loading/unloading, and ventilation fans, with peaks during shift changes.

Impact Discussion

The significance assessment for operational phase noise impacts are based on LAeq levels from the day-time noise measurements. For conservatism, daytime and nighttime levels emitted by operational activities were assumed equal, reflecting 24-hour operations.

The calculated noise intrusion levels during the operational phase are illustrated in Table 9-13. Results show that there are mostly no noise intrusion level increases, only a slight increase of 0.6 dBA for at NSA G. However, all impacts will not be audible as classified by the criteria in Table 9-10.

Table 9-13: Noise Intrusion Levels for the Operational Phase in dBA

Residential Property	Baseline Noise Level		Cumulative Noise Level		Noise Intrusion Level	
	Day	Night	Day	Night	Day	Night
NSA A - Camp	52.6	52.6	52.6	52.6	0.0	0.0
NSA B - Erhardshof	46.9	46.9	46.9	46.9	0.0	0.0
NSA C - Burgershof	50.3	50.3	50.3	50.3	0.0	0.0
NSA D - Tirol	65.2	65.2	65.2	65.2	0.0	0.0
NSA E - Smit	50.8	50.8	50.8	50.8	0.0	0.0
NSA F - Platveld	52.2	52.2	52.2	52.2	0.0	0.0
NSA G - Fischer	36.6	36.6	37.2	37.2	0.6	0.6

Based on the noise intrusion level results, exceedances over the 3 dB increase of the baseline in terms of the IFC guidelines are not expected in both the unmitigated and mitigated scenarios, and as such will result in a minor change to existing ambient noise levels. The intensity of the impact is moderate in the unmitigated scenario occurring over a longer period (LOM). Due to the nature of operational activities, which are confined to the LOM, the duration of the impact in both the mitigated and unmitigated scenarios is long-term. Noise impacts are conceivable beyond the site boundary in both the mitigated and unmitigated scenarios. The probability of the impact occurring at NSA G is high in the mitigated scenario and is reduced to medium with mitigation in place.

The significance of this potential impact is **MEDIUM** in the unmitigated scenario and reduced to **LOW** in the mitigated scenario.

Table 9-14: Impact Summary - Increase in Operational Phase Ambient Noise Levels Affecting Sensitive Receptors – Daytime and Nighttime

Increase in Operational Phase Ambient Noise Levels Affecting Sensitive Receptors – Daytime and Nighttime		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Operational	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Moderate change (Medium)	Minor change (Low)
Duration	Long-term (10 to 20 years)	Long-term (10 to 20 years)
Extent	Beyond site	Beyond site
Consequence	Medium	Medium
Probability	Probable (High)	Possible / frequent (Medium)
Significance	**Medium -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage noise impacts in accordance with the existing Noise and Vibrations Management Plan. The objective of the mitigation measures is to limit excessive noise levels. Key mitigation measures to be implemented include: • Install silencers for fans. • Install suitable mufflers on engine exhausts and compressor components. • Install acoustic enclosures for equipment causing radiating noise. • Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding. • Take advantage during the design stage of natural topography as a noise buffer. • Develop a mechanism to record and respond to complaints. • 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. • Feed back to the Engineering Manager once the prevailing ambient noise level is exceeded by more than 3.0dBA. • Acoustic mitigatory measures to be implemented at noise sources more than 85.0dBA or when the ambient noise level is exceeded by more than 3.0dBA.		

9.2.4.3 Impact: Increase in Decommissioning Phase Ambient Noise Levels Affecting Sensitive Receptors

Impact Description

Two types of noise are distinguished: noise disturbance and noise nuisance. The former is noise that can be registered as a discernible reading on a sound level meter and the latter, although it may not register as a discernible reading on a sound level meter, may cause nuisance because of its tonal character (e.g., distant humming noises). Mining related projects present the possibility of generating both noise disturbances and noise nuisance in

the decommissioning phase. Once mining activities have been completed, noise related activities will cease and as such, no noise related impacts are expected during the closure phase.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project phase	Activity/infrastructure
Operational	• Removal of ore - underground. • Waste rock dump and ROM dump activities. • Clarifier. • Hauling vehicles. • Downcast Ventilation shaft. • Portal. • Existing Processing plant. • Existing Primary Crusher. • Existing Power plant.

Impact Discussion

The calculated noise intrusion levels during the construction phase are illustrated in Table 9-15. Results show that there are no noise intrusion level increases at any of the NSAs. All impacts will not be audible as classified by the criteria in Table 9-10.

Table 9-15: Noise Intrusion Levels for the Decommissioning Phase in dBA

Residential Property	Baseline Noise Level		Cumulative Noise Level		Noise Intrusion Level	
	Day	Night	Day	Night	Day	Night
NSA A - Camp	52.6	49.0	52.6	49.0	0.0	0.0
NSA B - Erhardshof	46.9	30.5	46.9	30.5	0.0	0.0
NSA C - Burgershof	50.3	32.2	50.3	32.2	0.0	0.0
NSA D - Tirol	65.2	29.4	65.2	29.4	0.0	0.0
NSA E - Smit	50.8	37.6	50.8	37.6	0.0	0.0
NSA F - Platveld	52.2	47.7	52.2	47.7	0.0	0.0
NSA G - Fischer	36.6	29.4	36.6	29.4	0.0	0.0

Based on the noise intrusion level results, exceedances over the 3 dB increase of the baseline in terms of the IFC guidelines are not expected in both the unmitigated and mitigated scenarios, and as such will result in a minor change to existing ambient noise levels. Therefore the intensity of the impact is low in the unmitigated scenario and is expected to remain low with mitigation. Due to the nature of decommissioning related activities, the duration of the impact in both the mitigated and unmitigated scenarios is short-term. Noise impacts are expected to be site specific in both the mitigated and unmitigated scenarios. In both the unmitigated and mitigated scenarios, the likelihood of decommissioning activities creating a noise nuisance is high due to the proximity of the sensitive receptors in relation to the OGM, therefore having a high probability of affecting the sensitive receptors.

The significance of this potential impact is **LOW** in both the unmitigated and mitigated scenario.

Table 9-16: Impact Summary - Increase in Decommissioning Phase Ambient Noise Levels Affecting Sensitive Receptors

Increase in Decommissioning Phase Ambient Noise Levels Affecting Sensitive Receptors		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Decommissioning	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Minor change (Low)	Minor change (Low)
Duration	Short-term (1 to 5 years)	Short-term (1 to 5 years)
Extent	Whole site and nearby surroundings	Whole site and nearby surroundings
Consequence	Low	Low
Probability	Probable (High)	Probable (High)
Significance	**Low -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage noise impacts in accordance with the existing Noise and Vibrations Management Plan. The objective of the mitigation measures is to limit excessive noise levels. Key mitigation measures to be implemented include: • Install silencers for fans. • Install suitable mufflers on engine exhausts and compressor components. • Install acoustic enclosures for equipment causing radiating noise. • Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding. • Take advantage during the design stage of natural topography as a noise buffer. • Develop a mechanism to record and respond to complaints. • 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. • Feed back to the Engineering Manager once the prevailing ambient noise level is exceeded by more than 3.0dBA. • Acoustic mitigatory measures to be implemented at noise sources more than 85.0dBA or when the ambient noise level is exceeded by more than 3.0dBA. • Demolition activities and maintenance activities to be done during daytime periods only.		

9.2.5 Blasting and Vibration

This impact was assessed qualitatively by SLR.

9.2.5.1 Impact: Surface Blasting Impacts During Construction Affecting Sensitive Receptors and Third Party Infrastructure

Impact Description

Surface blasting activities have the potential to impact on people, animals and infrastructure located in the vicinity of the operation. Blast hazards include ground vibration, airblast, fly rock, blast fumes and dust. Ground vibrations travel directly through the ground and have the potential to cause damage to surrounding structures. Airblasts result from the pressure released during the blast resulting in an air pressure pulse (wave), which travels away from the source and has the potential to damage surrounding structures. Fly rock is the release of pieces of rock over a distance and can be harmful to people and animals and damage structures and property. Ground vibrations and airblasts have the potential to cause nuisance to people and animals even if blasts occur within legal limits.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project phase	Activity/infrastructure
Construction	• Blasting activities for box cuts and WRD removal

Impact Discussion

Blast damage to third-party infrastructure may be caused by the following blast-related pathways:

- Fly rock (that can be thrown up to 1.5 km from the blast site),
- Ground vibration where the peak particle velocity is above 12mm/s at low frequencies (and 6 mm/s for informal structures), and
- Air blast above 130 decibels (dB).

In the unmitigated scenario, ground vibrations and airblasts can cause damage to third party structures and can be a nuisance for animals and people. Fly rock has the potential to travel some distances from the blast site and has potential to cause injury and/or death to people and animals and damage to plants and infrastructure. If any damage or injury occurs it is considered to be a high intensity in the unmitigated scenario which may be reduced to medium in the mitigated scenario because the potential for blast related incidents is expected to decrease with properly designed blasts. Injury or death is considered to be long term in nature. Therefore, the unmitigated and mitigated duration is permanent. In the unmitigated scenario, potential impacts will be felt outside of the mine boundary but for the most part, will still be localised. Injury and/or death to people will, however, be felt by families and communities beyond the site boundary.

In the unmitigated scenario, the probability of blasting hazards resulting in either damage and/or creating a nuisance is low due to the remote setting of the Project area and limited third-party infrastructure in the vicinity of the OGM. With mitigation, the probability is also low as access to the fly rock zone will be controlled, and proper blast design will be adhered to thereby minimising vibrations.

The significance of this potential impact is **MEDIUM** in the unmitigated and can be reduced to **LOW** in the mitigated scenario as the potential for blast-related incidents is expected to decrease with properly designed blasts.

Table 9-17: Impact Summary – Surface Blasting Impacts During Construction Affecting Sensitive Receptors and Third-Party Infrastructure

Blasting Impacts Affecting Sensitive Receptors and Third-Party Infrastructure		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Moderate change (Medium)
Duration	Permanent (> 20 years)	Permanent (> 20 years)
Extent	Beyond site	Whole site and nearby surroundings
Consequence	High	Medium
Probability	Conceivable (Low)	Conceivable (Low)
Significance	**Medium -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage blasting activities in accordance with the existing Noise and Vibrations Management Plan. The objective of the mitigation measures is to limit excessive blast vibration and fly rock. Key mitigation measures to be implemented include: • Develop a blast design, implementation and monitoring programme that include safety and vibration requirements. • Ensure that fly rock is contained within a maximum of 500 metres of the blast site. • Clear third parties to a safe distance determined by applicable legislation and safe working procedures, prior to each blast – sound an audible warning. • Ensure ground vibration at the closest third-party structures is within acceptable best practice standards. • Ensure that air blast at the closest third-party structures is within acceptable best practice standards. • Document and investigate all registered complaints and address areas of concern. • Ensure blasting is done in a controlled manner and design to reduce vibration impact. • Ensure appropriate measures are put in place to rectify vibration complaints, should they occur. • Ensure procedures for receiving complaints from nearby land users or residents are in place and mitigation measures are implemented. • Ensure occupational noise and vibration is managed through the health and safety management plan and staff exposure is monitored.		

9.2.5.2 Impact: Underground Blasting Impacts During Operation Affecting Sensitive Receptors and Third Party Infrastructure

Impact Description

Underground blasting activities have the potential to generate seismic vibrations that can:

- Affect structural stability, such as destabilising underground openings; and
- Propagate to the surface, impacting on people, animals and infrastructure located in the vicinity of the operation.

Poor ventilation can trap blast fumes generated underground which can affect worker health.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project phase	Activity/infrastructure
Operational	• Blasting activities to extract ore underground

Impact Discussion

Vibrations from underground mining are orders of magnitude smaller than open pit mining, furthermore the vibration pattern and methods for underground blasting are such that smaller blasts are required. As with open pit mining there is the potential for vibration to follow fault lines and sometimes vibrations can be felt some distance away from the operation. The impact is expected to be a negligible change to current operations.

In the unmitigated scenario, ground vibrations have a risk of rock falls or ground collapse within the underground pit, and toxic gases that may be generated have the potential to reduce air quality around the portal. Potential damage is considered to have a medium intensity in the unmitigated scenario which may be reduced to low in the mitigated scenario because the potential for blast related incidents is expected to decrease with properly designed blasts. Underground blasting is expected to occur during the LOM therefore the unmitigated and mitigated duration is long-term. In the unmitigated scenario, potential impacts will be felt at the site and nearby surroundings but can be limited to part of the site where blasting occurs with properly designed blasts.

In the unmitigated scenario, the probability of blasting hazards resulting in either damage and/or creating a nuisance is low due to the remote setting of the Project area and limited third-party infrastructure in the vicinity of the OGM. With mitigation, the probability is also low as proper blast design will be adhered to thereby minimising vibrations.

The significance of this potential impact is **LOW** in the unmitigated and can be reduced to **VERY LOW** in the mitigated scenario as the potential for blast-related incidents is expected to decrease with properly designed blasts.

Table 9-18: Impact Summary – Underground Blasting Impacts During Operation Affecting Sensitive Receptors and Third-Party Infrastructure

Blasting Impacts Affecting Sensitive Receptors and Third-Party Infrastructure		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Operational	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Moderate change (Medium)	Minor change (Low)
Duration	Long-term (10 to 20 years)	Long-term (10 to 20 years)
Extent	Whole site and nearby surroundings	Part of site/property
Consequence	Medium	Low
Probability	Conceivable (Low)	Conceivable (Low)
Significance	**Low -**	**Very Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage blasting activities in accordance with the existing Noise and Vibrations Management Plan. The objective of the mitigation measures is to limit excessive blast vibration.		

Key mitigation measures to be implemented include:

- Develop a blast design, implementation and monitoring programme that include safety and vibration requirements.
- Clear third parties to a safe distance determined by applicable legislation and safe working procedures, prior to each blast – sound an audible warning.
- Ensure ground vibration at the closest third-party structures is within acceptable best practice standards.
- Document and investigate all registered complaints and address areas of concern.
- Ensure blasting is done in a controlled manner and design to reduce vibration impact.
- Ensure appropriate measures are put in place to rectify vibration complaints, should they occur.
- Ensure procedures for receiving complaints from nearby land users or residents are in place and mitigation measures are implemented.
- Ensure occupational noise and vibration is managed through the health and safety management plan and staff exposure is monitored.

9.2.6 Air Quality

Information provided in this Section was sourced from the Air Quality Impact Assessment undertaken by SLR (SLR(c), 2025), included in Appendix E.

9.2.6.1 Impact: Increase in Ambient Air Pollutant Concentrations for Proximate Sensitive Receptors During the Construction Phase

Impact Description

Mining-related construction activities have the potential to significantly increase ambient concentrations of air pollutants within and around the Project Area. Activities such as land clearing, topsoil stripping, blasting, material handling, and increased movement of heavy vehicles on unpaved roads can generate substantial dust emissions (TSP, PM_{10}, $PM_{2.5}$), while construction equipment contributes to exhaust emissions including NO_x, SO_2, and CO. These emissions can temporarily degrade local air quality, leading to elevated particulate and gaseous pollutant concentrations. Proximate sensitive receptors — including nearby communities, schools, clinics, and other public gathering areas — may experience nuisance dust deposition, reduced visibility, and potential health effects, particularly for vulnerable groups such as children, the elderly, and individuals with respiratory conditions.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project phase	Activity/infrastructure
Construction	• Surface Preparation / Excavation: Earthworks, grading, and excavation disturb soil surfaces, generating loose material that becomes a source of dust emissions. • Dust Entrainment from Vehicles and Equipment: Movement of trucks and heavy machinery on unpaved roads lifts and suspends fine particles into the air, contributing to elevated TSP, PM_{10}, and $PM_{2.5}$ levels. • Material Handling and Stockpiling: Loading, unloading, tipping, and wind erosion from exposed stockpiles release fugitive dust, especially under dry and windy conditions. • Vehicle Exhaust Emissions: Diesel-powered equipment and haul trucks emit combustion gases (NO_x, SO_2, CO, and particulate matter) that can degrade local air quality.

Impact Discussion

Construction activities will increase ambient pollutant concentrations, with PM as the primary concern. Emission sources include surface preparation/excavation, dust entrainment from vehicles/equipment moving on unpaved surfaces, material handling and stockpiling, wind erosion and vehicle exhaust emissions. While combustion-related emissions from equipment and vehicles contribute to the overall pollutant load, these will be insignificant relative to PM from material handling and dust entrainment. Construction phase emissions will vary significantly based on activity levels and meteorological conditions at the time. Given the uncertainty in equipment, schedules, and activity intensities, a qualitative assessment following international best practices is the most appropriate approach for rating impacts from this short-term phase.

During the unmitigated scenario, the intensity of the impact is expected to be high, as recommended WHO AQG levels will be exceeded regularly. With mitigation, the intensity is expected to reduce to low, as air emissions are expected to remain within acceptable WHO AQG thresholds. Due to the nature of construction related activities, which are limited to three years, the duration of the impact in both the mitigated and unmitigated scenarios is short-term. Air emissions are expected to extend beyond the ML boundary in both the mitigated and unmitigated scenarios. In the absence of detailed modelling, a precautionary approach has been followed, whereby exceedances of ambient concentrations are expected to occur at sensitive receptors in both the mitigated and unmitigated scenarios.

The significance of this potential impact is **MEDIUM** in the unmitigated and can be reduced to **LOW** in the mitigated scenario with emphasis placed on reducing construction related emissions.

Table 9-19: Impact Summary - Increase in Ambient Air Pollutant Concentrations for Proximate Sensitive Receptors During the Construction Phase

Increase in Ambient Air Pollutant Concentrations for Proximate Sensitive Receptors During the Construction Phase		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Minor change (Low)
Duration	Very short-term	Very short-term
Extent	Beyond site	Beyond site
Consequence	Medium	Low
Probability	Highly likely	Highly likely
Significance	**Medium -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage and monitor air emissions in accordance with the existing Air Quality Management Plan. The objective of the mitigation measures is to prevent unacceptable ambient air quality related pollution impacts. Key mitigation measures to be implemented include: • Maintain appropriate operational controls (e.g. adhere to repair and maintenance requirements for all equipment, including vehicles).		

- 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.
- 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.
- 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.
- 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.
- 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.
- Maintain roads, machinery, and their surrounding areas to remove deposited dust and minimise the load available for entrainment during high wind speed events.
- Limit land clearing and vegetation removal to the minimum necessary. New areas should be cleared and opened up only when absolutely necessary.
- 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.
- 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).
- 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.
- Cover open-bodied trucks when the truck is carrying materials that can be released into the air.
- Adhere to the minimum practical drop heights when offloading materials.
- 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.
- Restrict idling times for vehicles and heavy machinery through efficient work planning to reduce fuel consumption and emissions.

9.2.6.2 Impact: Increase in Ambient Air Pollutant Concentrations for Proximate Sensitive Receptors During the Operational Phase

Impact Description

Mining operations have the potential to increase ambient concentrations of air pollutants in the vicinity of the Project Area throughout the life of mine. During the operational phase, continuous activities such as ore extraction, blasting, hauling, can generate significant dust emissions (TSP, PM_{10}, $PM_{2.5}$), while haul trucks, loaders, and stationary equipment release exhaust gases including NO_x, SO_2, and CO. These emissions may result in sustained elevations of particulate and gaseous pollutant levels, potentially affecting proximate sensitive receptors such as communities, schools and clinics. In addition to nuisance dust fallout, prolonged exposure could contribute to respiratory irritation and other health effects, particularly in vulnerable populations.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project phase	Activity/infrastructure
Operational	• UG Ventilation: Ventilation fans at the downcast and upcast shafts exhaust air from underground workings, which may contain dust and diesel particulate matter from underground equipment. • Dust Entrainment from Vehicles/Equipment: Movement of haul trucks and machinery on unpaved surfaces generates fugitive dust plumes, especially under dry, windy conditions. • Material Handling: Loading, unloading, and transfer of ore and waste rock release dust into the atmosphere, and stockpiles can contribute to windblown emissions. • Vehicle Exhaust Emissions: Haul trucks, loaders, and support vehicles emit combustion pollutants (NO_x, SO_2, CO, and PM), which contribute to ambient air quality impacts.

Impact Discussion

The Project activities will increase ambient pollutant concentrations, with PM as the primary concern. Emission sources include UG ventilation, unpaved roads, material handling, wind erosion and vehicle exhaust emissions. While combustion-related emissions from equipment and vehicles contribute to the overall pollutant load, these are insignificant relative to PM from UG ventilation and hauling activities.

An AERMOD dispersion modelling assessment was conducted to understand the dispersion of emissions from operational phase activities. The model results are presented in Table 9-21. In the absence of local standards, outputs are compared with international guidelines. Figure 9-6 to Figure 9-15 show the ambient concentrations for both the average 24 hour and annual periods for PM_{10}, $PM_{2.5}$, SO_2, NO_2 and CO. No sensitive receptors fall within any areas that exceed the WHO AQG. The average annual DFO rates are shown in Figure 9-5. The zone of exceedance is contained within the OGM ML area.

Based on the model results, exceedances of the WHO AQG standards are expected and as such will result in a minor change to existing ambient concentrations, particularly in the unmitigated scenario. Within mitigation, the intensity of the impact can be further reduced as the intensity and frequency of exceedances is expected to reduce. PM_{10} concentrations are predicted to exceed the WHO AQG beyond the mining lease boundary in both the mitigated and unmitigated scenarios.

While modelled results indicate that exceedances of guideline concentrations are not expected at sensitive receptors, a precautionary approach should still be adopted when assessing potential health risks. According to the WHO Air Quality Guidelines (2021), guideline values are set to significantly reduce public health risks but do not imply that no risk exists below these thresholds. Scientific evidence demonstrates that some individuals — particularly children, the elderly, and those with pre-existing respiratory or cardiovascular conditions — may still experience subclinical or clinical health effects at concentrations below guideline values. Moreover, the precise sensitivity of the identified receptors is not known, meaning there may be individuals within the nearby receptors who are more vulnerable to even low-level exposures. For these reasons, the probability of the impact is rated as "definite" as a precautionary measure in both the mitigated and unmitigated scenarios. It follows that the significance of this potential impact is **MEDIUM** in both the mitigated and unmitigated scenarios. It is however important to note, that adherence to proposed dust mitigation schedules, particularly regular wet suppression, is essential to maintain compliance at nearby receptors. Further emission reductions and offsite

compliance with WHO AQG could be achieved through additional mitigation, specifically the use of surfactants or increased watering frequency.

Table 9-20: Impact Summary - Increase in Ambient Air Pollutant Concentrations for Proximate Sensitive Receptors During the Operational Phase

Increase in ambient air pollutant concentrations for proximate sensitive receptors during the operational phase		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Operational	
Criteria	**Without Mitigation (current)**	**With Mitigation (additional)**
Intensity	Minor/slight change (Low)	Negligible change (Very low)
Duration	Long-term	Long-term
Extent	Beyond site	Beyond site
Consequence	Medium	Medium
Probability	Definite	Definite
Significance	**Medium -**	**Medium -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage and monitor air emissions in accordance with the existing Air Quality Management Plan. The objective of the mitigation measures is to prevent unacceptable ambient air quality related pollution impacts. Key mitigation measures to be implemented include: • Maintain appropriate operational controls (e.g. adhere to repair and maintenance requirements for all equipment, including vehicles). • 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. • 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. • 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. • 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. • 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. • Maintain roads, machinery, and their surrounding areas to remove deposited dust and minimise the load available for entrainment during high wind speed events. • Limit land clearing and vegetation removal to the minimum necessary. New areas should be cleared and opened up only when absolutely necessary. • 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.		

- 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).
- 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.
- Cover open-bodied trucks when the truck is carrying materials that can be released into the air.
- Adhere to the minimum practical drop heights when offloading materials.
- 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.
- Restrict idling times for vehicles and heavy machinery through efficient work planning to reduce fuel consumption and emissions.

Table 9-21: Model Simulated Ground-Level Pollutant Concentrations

Pollutant		DFO	PM_{10}		$PM_{2.5}$		SO_2		NO_2			CO		
Averaging period		Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	1-hour	24-hour	Annual	1-hour	8-hour	24-hour
Percentile		N/A	P99	N/A	P99	N/A	P99	N/A	P99	P99	N/A	P99	P99	P99
Unit		mg/m²/day	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Isopleth map		Figure 9-5 to Figure 9-15	**Figure 9-6**	**Figure 9-7**	**Figure 9-8**	**Figure 9-9**	**Figure 9-10**	**Figure 9-11**	**Figure 9-12**	**Figure 9-13**	**Figure 9-14**	Not mapped	Not mapped	**Figure 9-15**
Standard / Guideline	UNECE	-	-	-	-	-	-	20	-	-	30	-	-	-
	IRMA	350	-	-	-	-	-	-	-	-	-	-	-	-
	WHO -IT1	-	150	70	75	35	125	-	-	120	40	-	-	7000
	WHO -IT2	-	100	50	50	25	50	-	-	50	30	-	-	-
	WHO -IT3	-	75	30	37.5	15	-	-	-	-	20	-	-	-
	WHO -IT4	-	50	20	25	10	-	-	-	-	-	-	-	-
	WHO AQG	-	45	15	15	5	40	-	200	25	10	35000	10000	4000
Domain peak														
Peak		1 063	3 883	1 010	389	101	209	17	123	192	15	923	1 477	1 435
Latitude (°S)		-20.0086	-2.00E+01	-2.00E+01	-2.00E+01	-20.0086	-20.0249	-20.0249	-20.0249	-20.0249	-20.0249	-20.0249	-20.0249	-20.0249
Longitude (°E)		17.0953	17.0953	17.0953	17.0953	17.0953	17.0897	17.0897	17.0897	17.0897	17.0897	17.0897	17.0897	17.0897
Receptor ID		**Model simulated concentration for sensitive receptors**												
SR1		0.26	36.01	2.78	3.69	0.32	0.66	0.04	1.20	0.71	0.06	2.40	6.12	4.35
SR2		1.28	27.24	5.74	3.04	0.63	0.74	0.07	2.20	0.73	0.10	14.38	7.24	5.11
SR3		0.19	28.42	1.51	3.48	0.17	0.49	0.02	0.22	0.48	0.03	1.11	3.10	3.27
SR4		0.27	29.42	2.55	3.27	0.29	0.55	0.05	1.52	0.57	0.06	6.76	6.80	3.66
SR5		0.71	28.02	4.50	2.93	0.48	0.33	0.04	1.51	0.38	0.07	7.48	4.29	2.28
SR6		0.13	20.54	0.94	2.14	0.10	0.28	0.01	0.11	0.30	0.02	0.61	2.13	1.90
SR7		0.17	20.95	0.96	2.31	0.11	0.29	0.02	0.14	0.34	0.02	0.84	1.95	2.00
SR8		0.34	19.37	2.32	2.11	0.27	0.61	0.06	1.51	0.64	0.07	9.96	5.64	4.22
SR9		0.12	27.65	2.27	2.85	0.25	0.28	0.02	0.97	0.39	0.04	2.81	3.47	1.90
SR10		0.07	6.46	0.65	0.77	0.07	0.28	0.01	0.27	0.27	0.02	0.47	2.20	1.90
SR11		0.28	16.37	2.08	1.68	0.23	0.27	0.03	0.99	0.29	0.04	5.17	3.34	1.86
SR12		0.11	19.24	1.07	1.99	0.12	0.25	0.02	0.46	0.31	0.02	1.16	3.13	1.72
SR13		0.11	20.29	1.46	2.22	0.16	0.18	0.02	0.66	0.25	0.02	2.98	2.36	1.25
SR14		0.18	12.35	1.47	1.32	0.16	0.18	0.02	0.75	0.22	0.03	3.80	2.45	1.32
SR15		0.05	12.05	0.93	1.28	0.10	0.20	0.01	0.50	0.20	0.02	1.52	2.39	1.33

Notes:

Red	-	Exceeds IRMA, UNECE or WHO IT1 (as applicable)
Orange	-	Exceeds WHO IT2
Yellow	-	Exceeds WHO IT3
Green	-	Exceeds WHO IT4
Blue	-	Exceeds WHO AQG guideline (as applicable)

Figure 9-5: Annual Average DFO Dry Deposition (mg/m²/day)

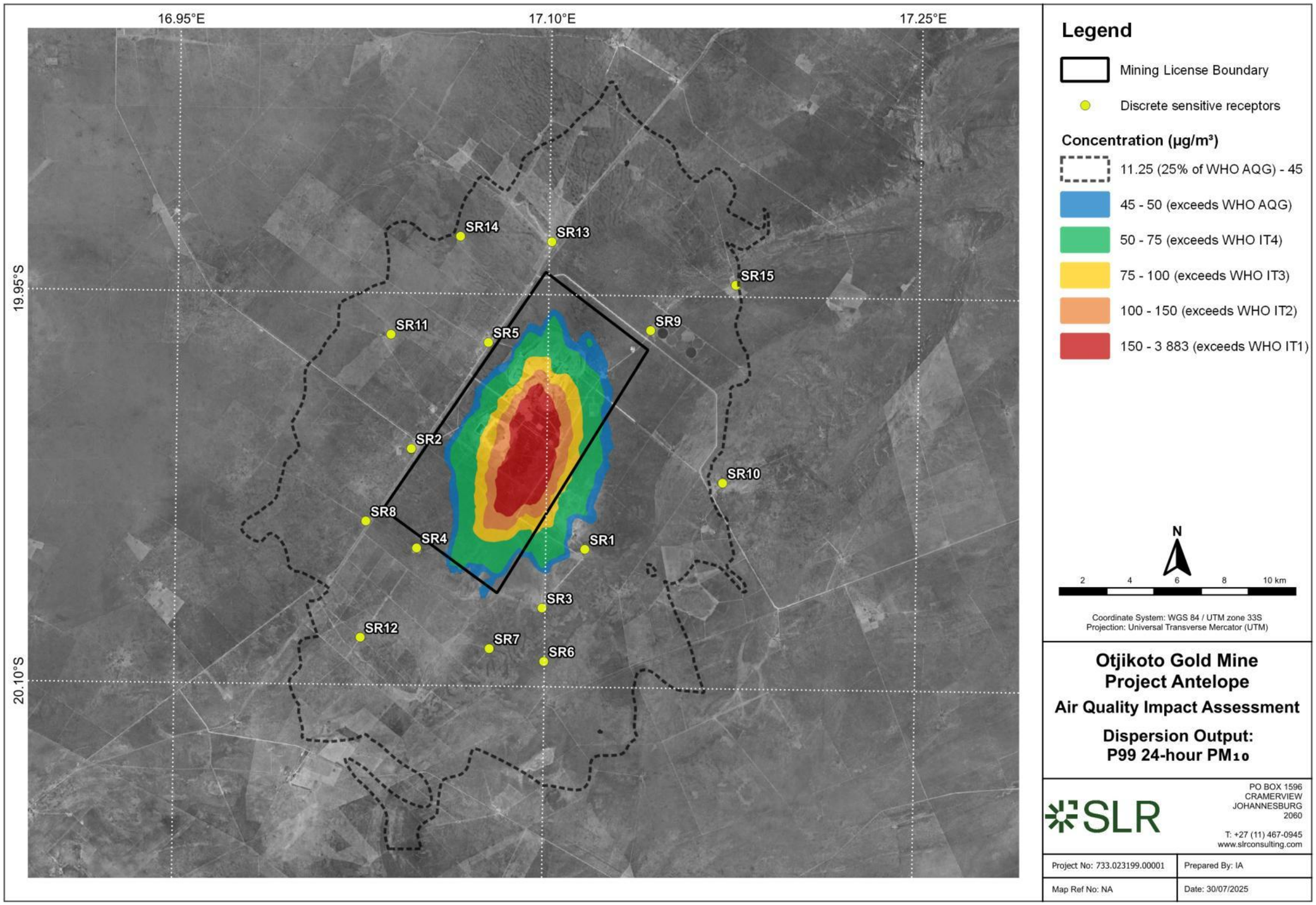


Figure 9-6: P99 24-hour Average PM_{10} (µg/m³)

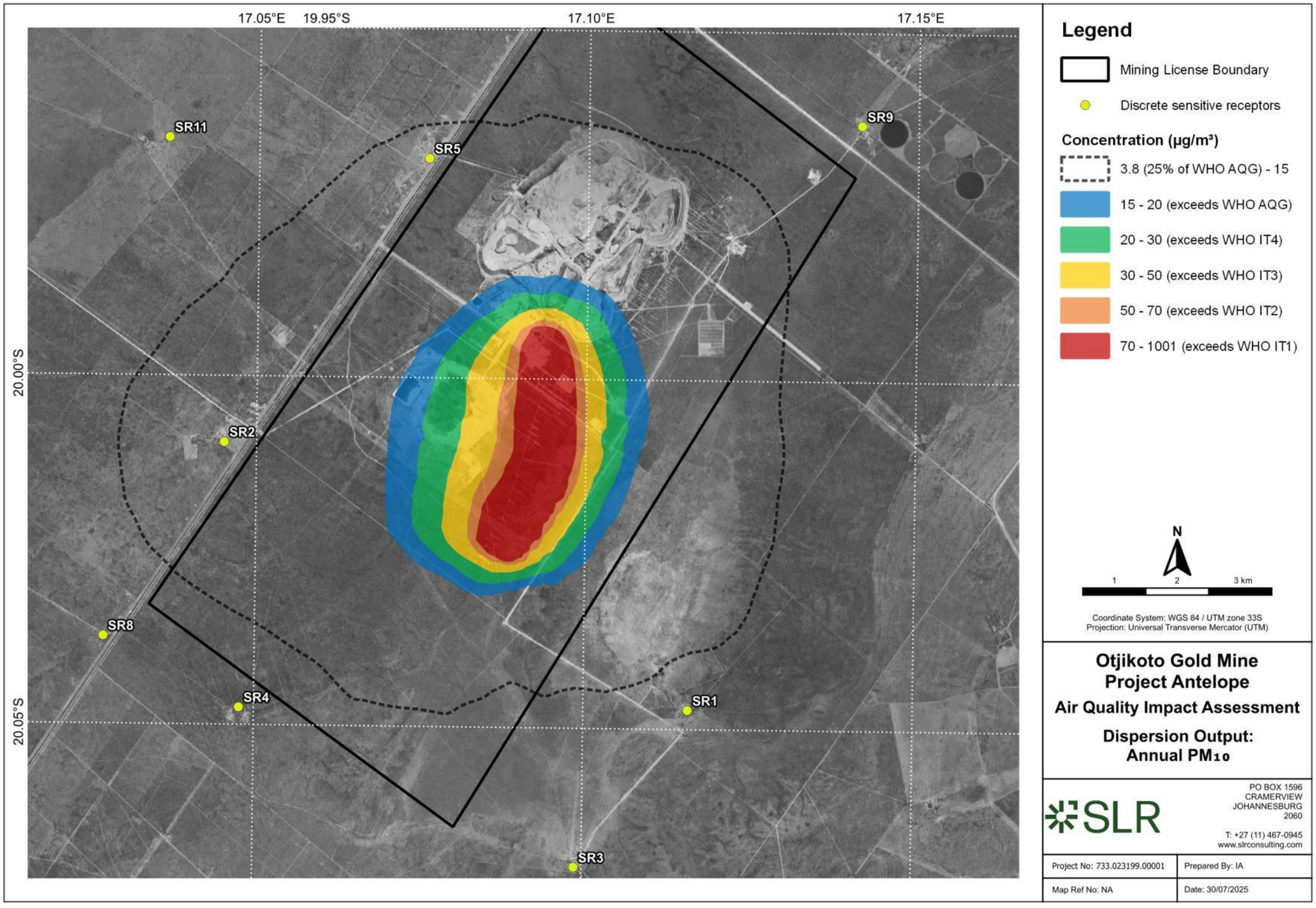


Figure 9-7: Annual Average PM_{10} (µg/m³)

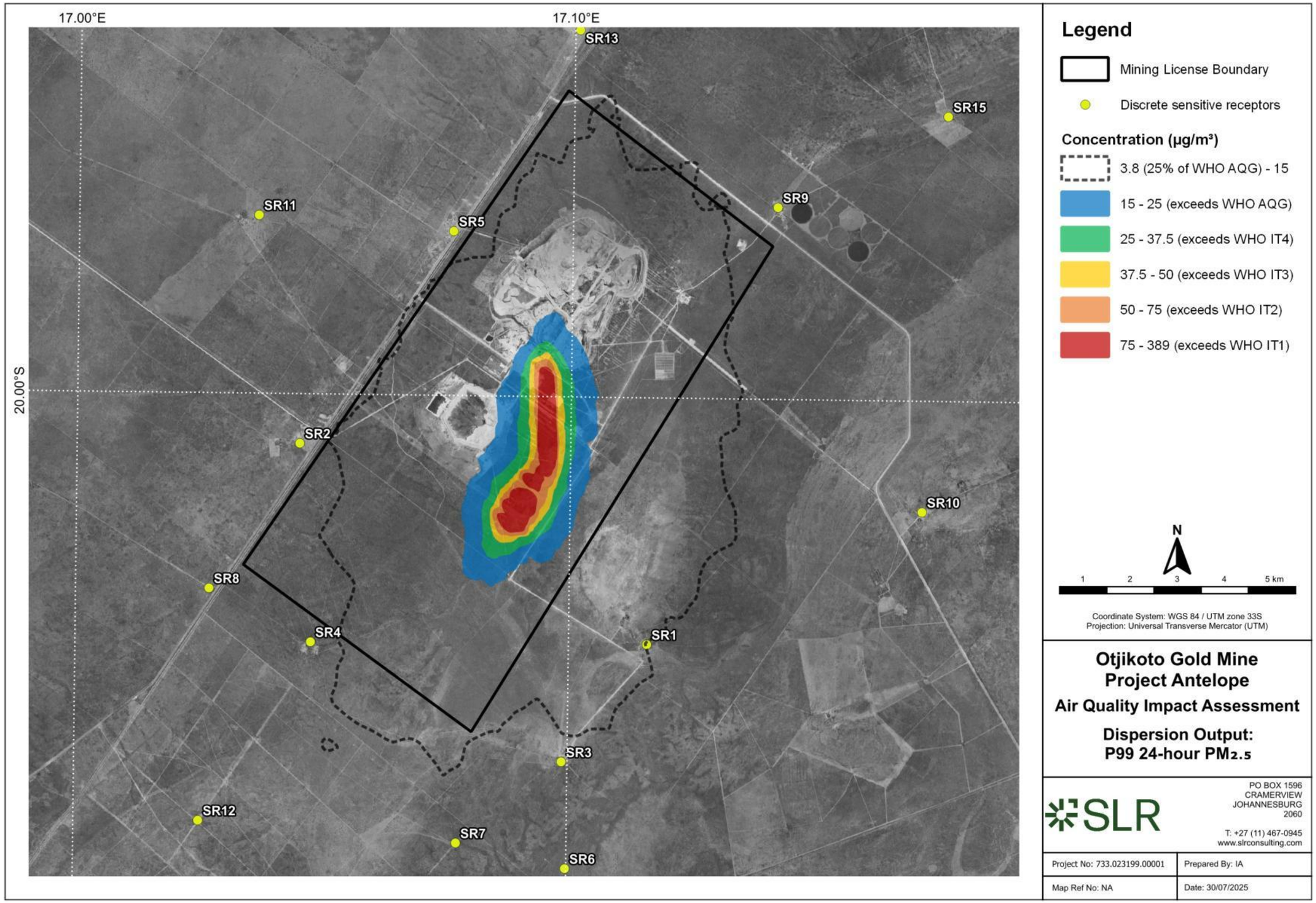


Figure 9-8: P99 24-hour Average $PM_{2.5}$ (µg/m³)

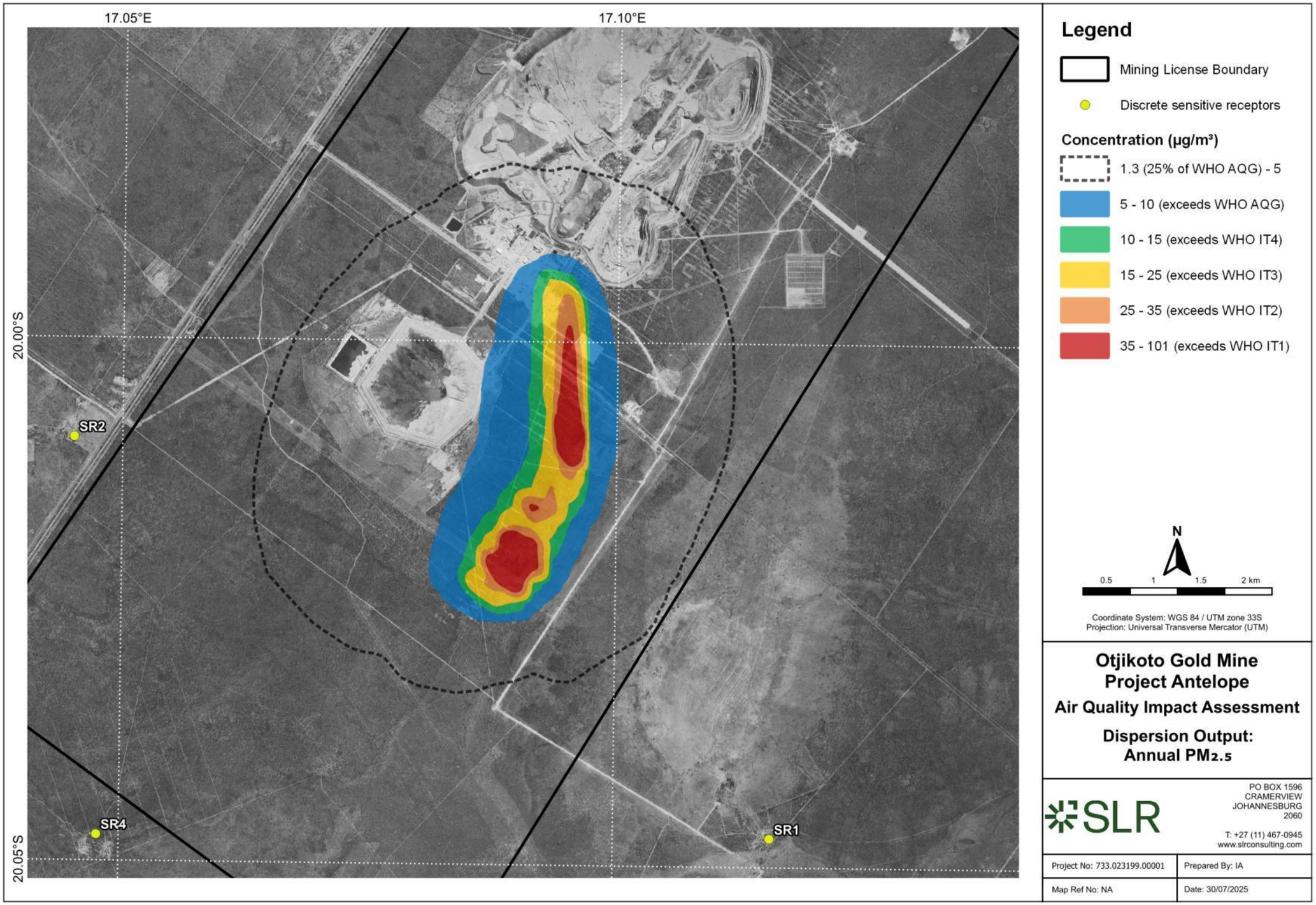


Figure 9-9: Annual Average $PM_{2.5}$ (µg/m³)

Figure 9-10: P99 24-hour Average SO_2 (µg/m³)

Figure 9-11: Annual Average SO_2 (µg/m³)

Figure 9-12: P99 1-hour Average NO_2 (µg/m³)

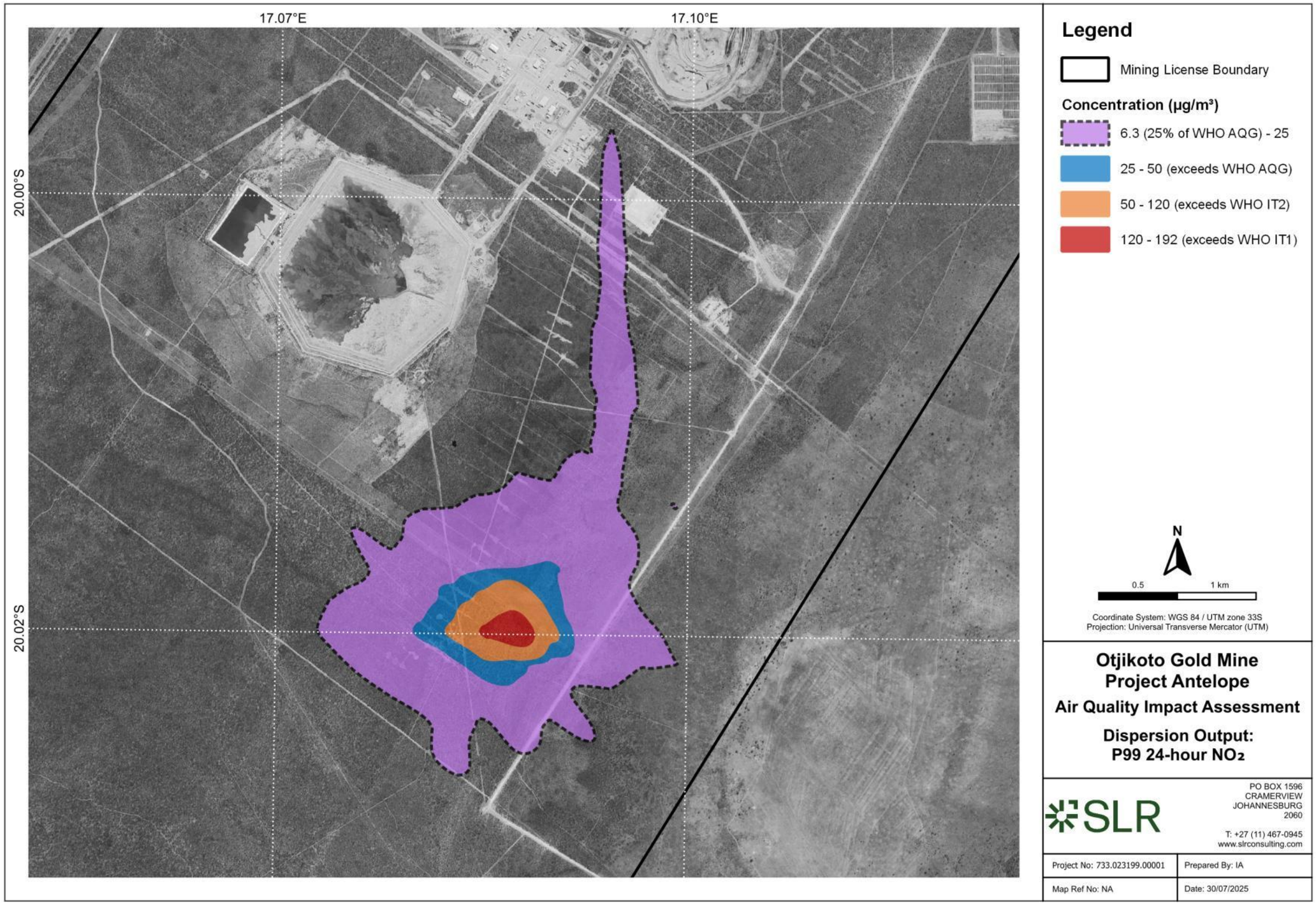


Figure 9-13: P99 24-hour Average NO_2 (µg/m³)

Figure 9-14: Annual Average NO_2 (µg/m³)

Figure 9-15: P99 24-hour Average CO (µg/m³)

9.3 Cultural Heritage Impacts

Information provided in this Section was sourced from the Heritage Impact Assessment (RCHeritage Services CC, 2025) included in Appendix I.

9.3.1 NHC Impact Assessment Methodology

In Namibia, the significance and vulnerability ratings of heritage impact assessments follow a standardised methodology developed by the Quaternary Research Services (Kinahan, J, 2012) and adopted by the NHC based on an evaluation within its Guidelines for Heritage Impact Assessment (National Heritage Council, 2021) shown in Table 9-22 and Table 9-23. Therefore, the impact assessment methodology for the impacts on cultural heritage resources will differ from the SLR impact assessment methodology.

To measure the sensitivity of archaeological sites, considering their significance and vulnerability ratings in Table 9-22 and Table 9-23, the assessment also estimated the extent, magnitude, and duration of the possible impacts on sensitive heritage resources. The scales of estimation developed by Quaternary Research Services (Kinahan, J, 2012) are replicated below in Table 9-24.

Table 9-22: Heritage Significance Rating Table with Key Attributes (National Heritage Council, 2021)

Level of Significance	Grading	Description
Exceptional/upper higher	5	• Major national heritage resources. • Rare & outstanding example. • Containing unique evidence of high regional & national significance.
Considerable high	4	• Very important to the heritage of the region. • High degree of integrity/ authenticity. • Multi-component site and objects. • High research potential.
Moderate	3	• Contributes to the heritage of the locality and region. • Has some altered or modified elements, not necessarily detracting from the overall significance of the place. • Forming part of an identifiable local distribution or group. • Research potential.
Low	2	• Isolated minor finds in undisturbed primary context, with diagnostic materials. • Makes some contribution to the heritage of the locality, usually in the combination with similar places or objects.
Little	1	• Makes little contribution to the heritage resources of the locality. • Heritage resources in a disturbed or secondary context, without diagnostic or associated heritage.
Zero/ no significance	0	• Absence of heritage resources. • Highly disturbed or secondary context, without diagnostic or associated heritage.

Table 9-23: The Vulnerability Rating Table with Key Attributes (National Heritage Council, 2021)

Vulnerability Rating
0. Not Vulnerable. 1. No threat posed by current or proposed development activities. 2. Low or indirect threat from possible consequences of development (e.g. soil erosion). 3. Probable threat from inadvertent disturbance due to proximity of development. 4. High likelihood of partial disturbance or destruction due to close proximity of development. 5. Direct and certain threat of major disturbance or total destruction.

Table 9-24: Assessment Criteria for the Evaluation of Impacts on Archaeological Heritage Sites

Criteria	Category	Description
Extent or spatial influence of impact	National Regional Local	Within Namibia Within the Region On site or within 200m of the site impact
Magnitude of impact (at the indicated spatial scale)	High Medium Low Very Low Zero	Social and/or natural functions and/ or processes are severely altered. Social and/or natural functions and/ or processes are notably altered. Social and/or natural functions and/ or processes are slightly altered. Social and/or natural functions and/ or processes are negligibly altered. Social and/or natural functions and/ or processes remain unaltered.
Duration of impact	Short Term Medium Term Long Term	Up to 3 years 4 to 10 years after construction More than 10 years after construction

9.3.2 Impact: Direct Loss or Damage to Burial Cairn

Information provided in this Section was sourced from the Heritage Impact Assessment (RCHeritage Services CC, 2025) included in Appendix I.

Impact Description

Mining-related project activities have the potential to adversely affect cultural heritage resources within the Project Area. Vegetation clearance, earthworks, excavation, and infrastructure development can result in the direct physical disturbance or destruction of archaeological sites, historical structures, burial cairns, and other heritage features. Such impacts may lead to the permanent loss of irreplaceable cultural heritage, diminishing the historical, scientific, and social value of these resources for present and future generations.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project phase	Activity/infrastructure
Construction	• Site preparation (clearance for all Project infrastructure), including bulk earthworks and construction of laydown area. • Construction of structural foundations. • Construction of buildings and facilities. • Establishment of roads, powerline and water supply infrastructure. • Waste management (non-mineralised). • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.
Operational	• Operation of the new on-site facilities. • Underground gold mining extraction. • Operation of the existing processing plant. • Operation and maintenance of transport systems. • Operation and use of power supply infrastructure. • Operation and maintenance of water supply and use of infrastructure. • Operation and use of mineralised and non-mineralised waste management facilities. • Removal of waste rock from underground using drilling and blasting to the new WRD. • Ore stockpiles (low-grade material and the ROM ore stockpile). • Tailings from underground operations are disposed of into the existing TSF. • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.
Decommissioning	• Clearance of land during the removal of infrastructure from the site. • Dismantling and demolition of all infrastructure and removal of equipment. • Slope stabilisation, erosion control and landscaping. • Revegetation of final landforms remaining in perpetuity (WRD and TSF). • Re-vegetation of disturbed areas and where infrastructure is removed.
Closure	• Rehabilitation, maintenance and aftercare of rehabilitated areas and final landforms.

Impact Discussion

The original layout plan had a direct impact on the identified burial cairn. The proposed powerline and heavy vehicle road were planned to traverse directly through the burial cairn which would have resulted in direct impacts from physical destruction due to construction, excavation, and/or changes in ground level associated with this development. The pre-mitigation impact was assessed as having a **VULNERABILITY RATING OF 5**. The severity of such impacts will be irreversible, as burial sites are extremely significant historical and cultural resources in terms of the National Heritage Act (No. 27 of 2004), thereby retaining a **SIGNIFICANT RATING OF 5**. The expected duration of such impacts would be permanent, thereby receiving a high rating. The site clearing and construction associated with these two proposed infrastructures and visual or other sensory impacts (e.g., noise, vibration) may also

have indirect impacts on the site, including changes to soil stability and reduced vegetation cover that may affect the cairn's setting or accessibility in the likely event that the devised recommended mitigation measures are not implemented.

The impact was mitigated by amending the layout plan which involved re-routing the proposed powerline and heavy vehicle road (the current preferred alternative layout plan) to provide a 20 m buffer around the site to avoid the sensitive site. At least three 'no-go signages' were recommended to be erected at 10 m, 20 m, and 30 m radius around the site to avoid both direct damage and encroachment to the site and its immediate landscape. The amended layout plan resulted in avoidance of the burial cairn and it is proposed to protect this heritage resource and treat it as a "no-go' zone. The post-mitigation impact was assessed as having a **VULNERABILITY RATING OF 0** and a **SIGNIFICANT RATING OF 0.**

B2Gold must continue to protect cultural heritage resources in accordance with the existing Archaeology Management Plan. The objective of the mitigation measures is to prevent the unacceptable loss of archaeological sites and related historical information.

Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)
Key mitigation measures to be implemented include: • 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." • 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. • 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. • 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. • 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. • 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.

9.4 Socio-economic Impacts

9.4.1 Visual

This impact was assessed qualitatively by SLR.

9.4.1.1 Impact: Generation of Negative Visual Views Affecting Sense of Place

Impact Description

Mining related activities and infrastructure have the potential to alter the visual environment and aesthetics of an area. Visual impacts on the receiving environment may be caused by activities and infrastructure associated with the mining activities, as well as night-time

illumination at these sites. Visual/aesthetic value is the emotional response derived from the experience of the environment with its natural attributes. visual impact will occur during all mine phases prior to closure. Activities and infrastructure in all mine phases may have visual impacts on this receiving environment. The more significant visual impacts relate to the larger infrastructure components (such as WRDs and TSF) and the long-term infrastructure that will remain post-closure (WRD and TSF).

The Impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur are tabulated below.

Project phase	Activity/Infrastructure
Construction	• Site preparation (clearance for all Project infrastructure), including bulk earthworks and construction of laydown area. • Construction of structural foundations. • Construction of buildings and facilities. • Establishment of roads, powerline and water supply infrastructure. • Waste management (non-mineralised). • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.
Operational	• Operation of the new on-site facilities. • Underground gold mining extraction. • Operation of the existing processing plant. • Operation and maintenance of transport systems. • Operation and use of power supply infrastructure. • Operation and maintenance of water supply and use of infrastructure. • Operation and use of mineralised and non-mineralised waste management facilities. • Removal of waste rock from underground using drilling and blasting to the new WRD. • Ore stockpiles (low-grade material and the ROM ore stockpile). • Tailings from underground operations are disposed of into the existing TSF. • Storage and handling of new and used materials and chemicals (including hydrocarbons). • Management of dirty water.
Decommissioning	• Clearance of land during the removal of infrastructure from the site. • Dismantling and demolition of all infrastructure and removal of equipment. • Slope stabilisation, erosion control and landscaping. • Revegetation of final landforms remaining in perpetuity (WRD and TSF). • Re-vegetation of disturbed areas and where infrastructure is removed.
Closure	• Rehabilitation, maintenance and aftercare of rehabilitated areas and final landforms.

Impact Discussion

The presence of the existing OGM as an already built environment has already resulted in existing "degradation" of the visual environment and thus the new proposed surface infrastructure is considered to be less of a visual impact than if there was no existing built

infrastructure visible. Visual impacts will occur throughout all phases of the Project, with the most significant effects expected during all mine phases prior to closure.

Large construction vehicles, equipment and construction material stockpiles will alter the natural character of the Project area and expose visual receptors to impacts associated with construction. Dust emissions and dust plumes from increased traffic on gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. Surface disturbance during construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment. Vegetation clearance required for the construction of the proposed mine is expected to increase dust emissions and alter the natural character of the surrounding area, thus creating a visual impact.

During the operational phase the Project may be perceived as an unwelcome visual intrusion. Site / vegetation clearance will reduce the screening properties that the natural vegetation has on the environment making the Project more visible to receptors. The proposed final height and footprint size of plant infrastructure and WRD would be visually prominent infrastructure and would create negative visual impacts. Transportation via trucking would create traffic and dust in the natural landscape. Night-time lighting would illuminate and create “light spill” that intrudes on the rural nightscape.

During the decommissioning phase, infrastructure will be dismantled, and rehabilitation activities to achieve closure objectives will commence. Decommissioning activities can still be perceived as a visual intrusion due to the movement of equipment of vehicles. Rehabilitation of the development site will however start to reduce the intrusive visual views, particularly as infrastructure will be removed from site.

During the closure phase, most of the infrastructure will have been removed from site with only the final landforms remaining (TSF and WRDs). In the closure phase, if rehabilitation measures are not successful, the post-closure impact can be permanent. However, with successful rehabilitation, site generation of negative visual views reduces once rehabilitation has been re-established.

Considering the above, the unmitigated intensity of visual impact is assessed as high, but it can be reduced to medium with appropriate mitigation measures. The visual impact will be for the life of the mine in both the mitigated and unmitigated scenarios. The visual impact be limited to the whole site and surroundings in both the unmitigated and mitigated scenario. In the absence of mitigation, the probability of the visual impact occurring during all phases is considered definite. With the implementation of appropriate mitigation measures, the local sense of place can be maintained.

The significance of the unmitigated scenario will be **MEDIUM** and can be reduced to a **LOW** with mitigation.

Table 9-25: Impact Summary - Generation of Negative Visual Views Affecting Sense of Place

Generation of Negative Visual Views Affecting Sense of Place		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	All	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Moderate change (Medium)
Duration	Long-term (10 to 20 years)	Long-term (10 to 20 years)

Extent	Whole site and nearby surroundings	Whole site and nearby surroundings
Consequence	Medium	Medium
Probability	Definite / Continuous (Very high)	Possible / frequent (Medium)
Significance	**Medium -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage visual aesthetics in accordance with the existing Visual Management Plan. The objective of the mitigation measures is to minimise the visual impacts of mining operations on the community and public through progressive rehabilitation. Key mitigation measures to be implemented include: • Restrict vegetation clearing to the minimum area required and undertake progressive rehabilitation of cleared areas at the earliest opportunity. • Maintain a clean and orderly construction site through the regular removal of rubble and waste materials. • Ensure the consistent implementation of effective dust suppression measures to mitigate dust generation during construction activities. • Implement concurrent rehabilitation and revegetation during operations to reduce visual impact and dust. • Ensure surface infrastructure remains within the approved final footprint sizes and heights. • Use downward-directed, low-intensity lighting to avoid light spill. • Select lighting fixtures with minimal wattage and mount them at low heights or use bollard/foot-level lights. • Incorporate motion detectors on security lighting, where feasible. • Paint buildings in natural tones to blend with the surrounding environment. • Use non-reflective materials where possible to reduce glare. • Remove all infrastructure not required after decommissioning. • Rehabilitate all disturbed areas using indigenous grass species. • Ensure shaping and contouring of the remaining TSF and WRDs are congruent with the surrounding landform. • Ensure the remaining TSF and WRDs remain constantly vegetated.		

9.4.2 Traffic

This impact was assessed qualitatively by SLR.

9.4.2.1 Impact: Increase in Traffic Volumes Affecting the Safety of Road Users

Impact Description

An increase in traffic volumes resulting from mining activities can significantly impact the safety of road users, particularly when large numbers of heavy vehicles are introduced onto public or shared roads. These vehicles pose safety risks due to their size, limited manoeuvrability, and reduced visibility, especially in areas with mixed traffic, livestock, and pedestrians. Vulnerable groups, such as children, the elderly, and animals, are at heightened risk, particularly where road infrastructure is inadequate. These risks are present throughout all phases of the mine, prior to closure.

The impact sources linked to the mine's activities and facilities, and in which phases they are likely to occur are tabulated below.

Project Phase	Activity/Infrastructure
Construction	• Heavy vehicle transport of construction materials. • Light vehicle transport of construction employees.
Operational	• Heavy vehicle transport of ore and materials. • Light vehicle transport of mine staff.
Decommissioning	• Heavy vehicle transport of materials. • Light vehicle transport of employees.

Impact Discussion

The traffic volumes in the area have historically already been impacted by the development of the existing OGM. An increase in traffic, particularly heavy vehicles associated with mining operations, raises the risk of road accidents and poses safety concerns for third-party road users, animals as well as mine personnel. These risks are exacerbated in areas where road infrastructure is poorly maintained, intersections are inadequately designed for high traffic loads, or where pedestrian movements are high and unmanaged. The road users likely to be affected (travelling from both Otavi and Otjiwarongo directions daily using the B1 road) include pedestrians (including school children and marketgoers), bicycles and motorcycles, public transport vehicles (buses and local taxis), light vehicles, stray animals and mine employees operating or travelling in company vehicles.

Without mitigation, incidents such as injuries or fatalities involving third parties or animals would constitute high-intensity impacts. While impacts are temporary relative to the LOM, any death or permanent injury would have a long-term consequence, extending beyond the Project's operational timeline, without mitigation. In the mitigated scenario, the overall intensity of traffic-related safety impacts is reduced to medium, primarily due to the implementation of targeted mitigation measures such as speed controls, signage, designated pedestrian crossings and community awareness campaigns. The duration of the impact is confined to the LOM, as these measures are expected to remain effective throughout the operational phase of the Project. Additionally, the probability of traffic incidents occurring is significantly reduced with the application of these interventions, as they aim to address the root causes of risk, including unmanaged pedestrian movement, poor visibility, inadequate road infrastructure, and unsafe driving behaviour.

The significance of the unmitigated scenario will be **MEDIUM** and can be reduced to a **LOW** with mitigation.

Table 9-26: Impact Summary - Increase in Traffic Volumes Affecting the Safety of Road Users

Increase in Traffic Volumes Affecting the Safety of Road Users		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction, Operation and Decommissioning	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Moderate change (Medium)
Duration	Permanent (> 20 years)	Medium-term (5 to 10 years)
Extent	Beyond site	Beyond site
Consequence	High	Medium

Probability	Probable (High)	Conceivable (Low)
Significance	High -	Low -
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage traffic in accordance with the existing Traffic Management Plan. The objective of the mitigation measures is to reduce the potential for safety and vehicle related impacts on road users. Key mitigation measures to be implemented include: • All drivers will receive safety training, including modules on vulnerable groups, and vehicles will be regularly maintained and monitored. • A grievance mechanism will be in place for communities to report unsafe driving or incidents, enabling adaptive management of traffic risks.		

9.4.3 Socio-economic

These impacts were assessed qualitatively by SLR.

9.4.3.1 Benefit: Economic Benefit to National and Local Economies

Impact Description

Mining activities play a pivotal role in driving economic growth at both the national and local levels. The industry generates significant economic benefits through various channels, including job creation, revenue generation, and the stimulation of local businesses. At the national level, mining contributes to economic stability by generating substantial tax revenues, attracting foreign investment, and boosting export earnings. Locally, the procurement of supplies and services from local businesses further strengthens the local economy. Economic benefits to the national and local economy are primarily limited to the operation phase when a product is generated.

The impact sources linked to the mine's activities and facilities, and in which phases they are likely to occur are tabulated below.

Project Phase	Activity/Infrastructure
Construction	• All activities associated with the employment of goods and services for the proposed Project.
Operational	• All activities associated with the employment of goods and services for the proposed Project.

Impact Discussion

The construction of the Project's components will boost the local, regional and national economy during the construction phase. During operations, benefits to all level of the economy should arise through incomes to employees, contractors and service providers and to the government through taxation.

The PEA for the Project highlighted the following economic benefits (B2Gold, 2025):

- LOM after-tax free cash flow of $185 million at $2,400 per ounce gold price;
- Assuming a discount rate of 5.0%, net present value ("NPV") after-tax of $131 million generating an after-tax internal rate of return ("IRR") of 35%, with a project payback on pre-production capital of 1.3 years; and
- Estimated pre-production capital cost of $129 million.

In summary, the Proposed Project will bring significant economic benefits to the local area. Direct economic benefits include income from product sales, wages and benefits for workers, and taxes paid by employees, contractors, and suppliers. Indirect impacts come from the purchase of Namibian inputs for mining and processing, as well as services outsourced to local companies. Encouraging the purchase of Namibian-made goods will further support the economy. Overall, the Project will have a positive impact on the national, regional, and local economy. These positive impacts can be enhanced with the implementation of procurement policies that promote the use of small and medium enterprises owned and/or managed by previously disadvantaged Namibians.

The positive economic contribution from operating the Project is definite, and will occur for the LOM, of 5 years, compared to the no go option, which is nearing the end of its productive life. In the unmitigated and unmitigated scenarios, this is a **VERY HIGH POSITIVE** impact.

Table 9-27: Impact Summary - Economic Benefit to National and Local Economies

Economic Benefit to National and Local Economies		
Type of Impact	Direct	
Nature of Impact	Positive	
Phases	Construction and Operation	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Severe change (Very high)	Severe change (Very high)
Duration	Long-term (10 to 20 years)	Long-term (10 to 20 years)
Extent	Regional/National	Regional/National
Consequence	Very high	Very high
Probability	Definite / Continuous (Very high)	Definite / Continuous (Very high)
Significance	**Very High +**	**Very High +**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to enhance socio-economic benefits in accordance with the existing Socio-economic Management Plan. The objective of the mitigation measures is to enhance the positive impacts associated with job creation and investment. Key mitigation measures to be implemented include: • Source goods and services locally (e.g. contractors, accommodation, equipment, perishable goods) during construction wherever practicable. • Promote small and medium enterprises in B2Gold's procurement policies and procedures. • 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.		

9.4.3.2 Benefit: Job Creation and Skills Development

Impact Description

The presence of a mine in a local area offers significant training and skills development opportunities that can have a lasting impact on that area. As the mine requires a workforce with a variety of skills, training programs are often established to equip local residents with the necessary technical abilities. These programs not only prepare individuals for immediate employment in the mining sector but also provide them with transferable skills that can be applied to other industries. By investing in the development of the local workforce, the mine helps to build a more skilled and capable community, empowering residents to pursue

broader economic opportunities beyond the LOM. This focus on training and skills development fosters long-term social and economic benefits, contributing to the overall resilience and prosperity of the area.

The impact sources linked to the mine's activities and facilities, and in which phases they are likely to occur are tabulated below.

Project Phase	Activity/Infrastructure
Construction	• All activities associated with the employment of goods and services for the proposed Project.
Operational	• All activities associated with the employment of goods and services for the proposed Project.
Decommissioning	• All activities associated with the employment of goods and services for the proposed Project.

Impact Discussion

The Project will result in the creation of employment opportunities and an increase in local business. In addition to employment, the Project also holds the potential for skills development and transfer. Skills development is a requisite for human resource development and will have a lasting impact on the local economy.

During the construction phase of the Project, approximately 225 jobs will be created. While specific skills required are not detailed, it is common for construction workforces in Namibia to be on contract, working shifts around the clock. Most of these jobs will be for semi-skilled and skilled personnel, typically hired by a large construction company.

The construction phase will involve land clearance, bulk earthworks, road construction, water supply setup, power supply setup and general buildings and facilities (batch plant, workshop/fuel bay, change room/lamp room, compressor). B2Gold and its contractors are expected to prioritize hiring local people, especially for unskilled and semi-skilled labour. During operations, the total workforce is estimated to be about 122 people.

Although foreign-owned companies might prefer to bring in their senior management and highly skilled operators, the Ministry of Home Affairs, Immigration, Safety and Security enforces strict requirements to maximize Namibian employment. Highly skilled personnel may be sourced nationally or internationally if necessary.

Indirect and induced jobs will also be created through Namibian suppliers of goods and services to the Project and its workforce. These jobs will span various sectors, including cement manufacturing, metal fabrication, construction, transport, hospitality, entertainment, retail, fresh produce production, security, laundry, and cleaning. The jobs created, whether short-term or permanent, will support families, with an estimated dependency ratio of one worker to seven dependents. It is culturally common for employed individuals to share their income to support the basic needs and education costs of their extended family members.

Taking the above into consideration, the severity of the impact is regarded as high positive and can be further enhanced. The duration of these impacts relating to job creation and skills development is permanent as work experience builds the human capacity for a lifetime and for the nation's sustainable development. The spatial scale is high as people will be employed from across the country as it will be unlikely that the education levels and skills will be sufficient locally. The consequence of these positive impacts is very high due to their high intensity, their widespread nature and long duration. The probability of these impacts occurring is high.

The significance is therefore regarded as **VERY HIGH POSITIVE** and can be further enhanced by implementing a policy that promotes preferential procurement from local Small,

Medium, and Micro-sized Enterprises (SMME) which will increase the number of local indirect jobs created.

Table 9-28: Impact Summary - Benefits of Job Creation and Skills Development

Benefits of Job Creation and Skills Development		
Type of Impact	Direct	
Nature of Impact	Positive	
Phases	Construction, operation, decommissioning and closure	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Severe change (Very high)
Duration	Permanent (> 20 years)	Permanent (> 20 years)
Extent	Regional/National	Regional/National
Consequence	Very high	Very high
Probability	Probable (High)	Definite / Continuous (Very high)
Significance	**Very High +**	**Very High +**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to enhance socio-economic benefits in accordance with the existing Socio-economic Management Plan. The objective of the mitigation measures is to enhance the positive impacts associated with job creation and investment. Key mitigation measures to be implemented include: • Adopt a human resources policy that prioritises the selection of women for recruitment, training and development. • Ensure skills development strategies and programmes are in place to maximise the use of local labour force. • Support employees and community members to continue learning and developing skills, to offer labour flexibility and productivity. • Promote continuous learning programmes to diversify and upgrade skills. • Provide recognised, documented and accredited skills upgrading / training. • Maximise the recruitment of permanent workforce.		

9.4.3.3 Impact: Loss and Sterilisation of Mineral Resources

Impact Description

Mineral resources can be sterilized or lost through the disposal of mineral resources onto mineralised waste facilities (WRDs). The disposal of mine waste on WRD facilities can lead to resource sterilisation, where deposited material potentially contains valuable ore material, which may become inaccessible for future extraction. The engineering design of WRDs prioritises long-term stability and environmental containment, making it highly costly to recover any mineralised material that has been deposited.

During the operational phase, resource sterilization occurs throughout the duration of mining activities as waste materials are continuously deposited. In the decommissioning and closure phases, minerals contained within rehabilitated waste facilities become permanently inaccessible, resulting in a perpetual loss of those resources.

It is important to note that a certain degree of sterilization is inherent to mining operations to maintain safe underground workings. This routine sterilisation, which is necessary to ensure

structural integrity and worker safety, is not assessed in this context, as it is an essential component of responsible mining practices.

The impact sources linked to the mine's activities and facilities, and in which phases they are likely to occur, are tabulated below.

Project Phase	Activity/Infrastructure
Construction	• Disposal of waste rock on designated WRDs.
Operational	• Rehabilitation of final landforms (WRD).
Closure	• Rehabilitated final landforms (WRD).

Impact Discussion

During mining operations, valuable ore is often inadvertently discarded alongside waste rock when deposited in designated WRDs. This occurs because waste material can contain low-grade or uneconomical ore, which, under current market conditions or processing limitations, is not considered viable for extraction. However, over time, as processing technologies advance or market demand shifts, these previously discarded minerals may become economically valuable, yet remain inaccessible due to their disposal within waste storage facilities.

The intensity of mineral resource sterilisation in this context is considered high, given the significant economic value lost when potentially mineable resources become unrecoverable. Unlike other mining impacts that may subside post-closure, the impact of sterilisation persists indefinitely, as once minerals are encapsulated within WRDs, they are physically inaccessible and economically unfeasible to recover. Even if future technologies enable reprocessing of tailings or waste rock, the cost and complexity of excavation and processing may outweigh the potential benefits, further cementing the permanent nature of the loss.

Beyond the direct implications for the mining operation itself, the economic impact of mineral sterilisation extends beyond the boundaries of the Project area. The loss of accessible mineral resources reduces the long-term economic potential of the region, as resources that could otherwise contribute to local and national economic growth, employment, and industrial development remain unrealized. This impact is particularly relevant for resource-dependent economies, where the availability of mineral deposits plays a crucial role in sustaining economic development and attracting investment.

Without mitigation, the probability of resource sterilisation is considered high, as it is a well-documented and common occurrence in the mining industry. However, in a mitigated scenario, strategic design optimisation of WRDs, along with improved mine planning and ore sorting techniques, can help minimise sterilization risks. By integrating efficient waste management strategies, the long-term impact of sterilisation can be significantly reduced.

In the unmitigated scenario, the significance of the impact would be **VERY HIGH**, which can be reduced to **LOW** in the mitigated scenario.

Table 9-29: Impact Summary - Loss and Sterilisation of Mineral Resources

Loss and Sterilisation of Mineral Resources		
Type of Impact	Indirect	
Nature of Impact	Negative	
Phases	Operational, Decommissioning and Closure	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Severe change (Very high)	Moderate change (Medium)

Duration	Permanent (> 20 years)	Long-term (10 to 20 years)
Extent	Local area, far beyond site	Local area, far beyond site
Consequence	Very High	High
Probability	Probable (High)	Unlikely / improbable (Very low)
Significance	Very High -	Low -
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
Key mitigation measures to be implemented include: • Regularly monitor and test tailings for remaining valuable minerals, adjusting processing methods as needed to minimise resource loss. • Engage with mining engineers and metallurgists to optimise current processing methods, focusing on reducing the discard rate of valuable ore.		

9.4.3.4 Impact: In-migration Impacts on Local Communities and Service Provision

Impact Description

In-migration to mining areas often brings both opportunities and challenges for local communities. On the positive side, it can drive economic growth, create jobs, and stimulate the development of infrastructure and services such as roads, schools, and healthcare facilities. However, it can also strain existing resources, disrupt traditional ways of life, and lead to social tensions between newcomers and long-term residents. Environmental degradation, increased demand for housing, and rising costs of living are common issues, alongside potential public health risks from pollution and overburdened services. The overall impact of in-migration depends on how well these challenges are managed and whether the benefits of economic development are equitably distributed among all community members.

The impact sources linked to the mine's activities and facilities, and in which phases they are likely to occur are tabulated below.

Project Phase	Activity/Infrastructure
Construction	• All activities associated with the employment of goods and services for the proposed Project.
Operational	• All activities associated with the employment of goods and services for the proposed Project.

Impact Discussion

The in-migration of Project personnel and job seekers to Otjiwarongo and Otavi will bring economic benefits, as it can stimulate the local economy and community organization, as mineworkers will need housing, which will boost construction. Their wages and salaries will also inject money into the local economy. On the other hand, it could also lead to risks to community health and safety and put a strain on the provision of infrastructure to meet the basic needs of residents – notably housing, potable water, sewerage, housing, schools and health facilities.

B2Gold expects that both construction and operations personnel will mostly reside in Otjiwarongo, leading to an influx of new people with disposable income, as well as many job seekers. The Project is expected to induce significant in-migration to Otjiwarongo, with people moving to the town in anticipation of or in response to the mine's construction and operational phases. These migrants will include workers from the area, Project employees

from outside the area with or without their families, entrepreneurs in both formal and informal sectors, and job seekers of varying skill levels.

Given the size and popularity of the Project in Namibia, the in-migration of job seekers is high. The duration of impacts relating to in-migration are high, as although they will be felt mostly during construction and into operations, many people will stay, even after closure, until a better economic opportunity arises elsewhere. The spatial scale is local and will extend to beyond the site boundary. The consequence in the unmitigated scenario is high. Even though the severity in the mitigated scenario will be reduced, the consequence remains high because the duration of the impact remains high. The probability of the impacts occurring is considered to be high in the unmitigated scenario and low in the mitigated scenario.

The impact significance in the unmitigated scenarios is **HIGH** and can be reduced to **MEDIUM** with mitigation, also taking into consideration the positive impacts associated with in-migration.

Table 9-30: Impact Summary - In-Migration Impacts on Local Communities and Service Provision

In-migration Impacts on Local Communities and Service Provision		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction and Operation	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Moderate change (Medium)
Duration	Permanent (> 20 years)	Permanent (> 20 years)
Extent	Local area, far beyond site	Local area, far beyond site
Consequence	High	High
Probability	Possible/frequent (Medium)	Conceivable (Low)
Significance	**High -**	**Medium -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to enhance socio-economic benefits in accordance with the existing Socio-economic Management Plan. The objective of the mitigation measures is to limit the impacts associated with inward migration. Key mitigation measures to be implemented include: • Give preferential recruitment to Otjozondjupa residents. • 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). • Develop community wellness programmes in consultation with the neighbouring towns and farms. (Include Human Immunodeficiency Virus / Acquired immunodeficiency Syndrome / Tuberculosis related issues).		

9.4.3.5 Impact: Hazardous Excavations and Infrastructure which can be Harmful to Third Parties and Animals

Impact Description

Surface excavations and infrastructure include all structures that third parties (humans and animals) can fall into or off and be harmed by. Included in this category are facilities that can

fail (such as mineralised waste facilities). Surface excavations and infrastructure occur in all Project phases from construction through operation to decommissioning and closure. In the construction and decommissioning phases, these surface excavations and infrastructure are usually temporary in nature, usually existing for a few weeks to a few months. The operational phase will present more long-term surface excavations and infrastructure, and the closure phase will present final landforms that are considered hazardous.

The impact sources linked to the mine's activities and infrastructure, and in which phases they are likely to occur, are tabulated below.

Project Phase	Activity/Infrastructure
Construction	• Site preparation (clearance for all Project infrastructure), including bulk earthworks and construction of laydown area. • Construction of structural foundations. • Construction of buildings and facilities. • Establishment of roads, powerline and water supply infrastructure. • Waste management (non-mineralised).
Operational	• Operation of the new on-site facilities. • Operation and maintenance of transport systems. • Operation and use of power supply infrastructure. • Operation and maintenance of water supply and use of infrastructure. • Operation and use of mineralised and non-mineralised waste management facilities. • Removal of waste rock from underground using drilling and blasting to the new WRD. • Ore stockpiles (low-grade material and the ROM ore stockpile). • Tailings from underground operations are disposed of in the existing TSF.
Decommissioning	• Clearance of land during the removal of infrastructure from the site. • Dismantling and demolition of all infrastructure and removal of equipment. • Slope stabilisation, erosion control and landscaping. • Revegetation of final landforms remaining in perpetuity (WRD and TSF). • Re-vegetation of disturbed areas and where infrastructure is removed.
Closure	• Rehabilitation, maintenance and aftercare of rehabilitated areas and final landforms.

Impact Discussion

In the unmitigated scenario, most of the identified surface excavations and infrastructure present a potential risk of injury and/or death to third parties (which includes third parties). This is a potential high intensity in the unmitigated scenario. With mitigated scenario, the number of hazards excavations and infrastructure present on site will be limited to those which are absolutely necessary. In the context of this assessment, death or permanent injury is considered a long-term impact in both the unmitigated and mitigated scenarios. For the most part, the direct impacts will be located within the infrastructure footprint, but the indirect impacts will extend to the communities to which the people belong. In both the unmitigated and mitigated scenario, the consequence of this potential impact is high. In the unmitigated scenario, it is possible that the surface excavations and infrastructure present a risk to unaccompanied third parties during all phases. The mitigation measures focus on infrastructure safety and on limiting access to third parties and animals which reduces the probability of the impact occurring.

In the unmitigated scenario, the significance of the impact would be **MEDIUM**, which can be reduced to **LOW** in the mitigated scenario.

Table 9-31: Impact Summary - Hazardous Excavations and Infrastructure Which Can Be Harmful to Third Parties and Animals

Hazardous Excavations and Infrastructure which can be Harmful to Third Parties and Animals		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	All	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Prominent change (High)	Moderate change (Medium)
Duration	Long-term (10 to 20 years)	Long-term (10 to 20 years)
Extent	Local area, far beyond site	Local area, far beyond site
Consequence	High	High
Probability	Possible / frequent (Medium)	Unlikely / improbable (Very low)
Significance	**Medium -**	**Low -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		
B2Gold must continue to manage safety risks in accordance with the existing Safety and Security Management Plan The objective of the mitigation measures is to prevent physical harm to third parties (including animals) from surface excavations and infrastructure. Key mitigation measures to be implemented include: • The working area of the ML will be fenced; • Warning signs will be erected and maintained on the site boundary; • 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; • 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; • 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 • 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.		

9.4.3.6 Impact: Mine Decommissioning and Closure Resulting in Loss of Jobs and Economic Benefits

Impact Description

Decommissioning and closure will bring loss of jobs to the Project workforce and incomes to the companies and individuals who have been suppliers of goods and services to the mine. Mine closures can result in the decline of local economies and a decrease in population (particularly when an operation draws its workforce locally), which may have adverse 'knock-on' effects on social services, schools, labour markets, employment, housing prices and other impacts. The closure plan objective will be to return the land to pre-mining potential, rehabilitating the disturbed areas and making the pit sides safe. At a conceptual level, decommissioning can be considered a reverse of the construction phase with a similar skill-

level workforce demolishing and removing the majority of surface infrastructure. Almost all of the direct, indirect and induced economic benefits of the Project will stop.

The mine activities/infrastructure likely to cause mine decommissioning and closure-related issues include:

Project Phase	Activity/Infrastructure
Decommissioning	• Decommissioning of the mine.
Closure	• Rehabilitation, maintenance and aftercare.

Impact Discussion

On decommissioning, the operational workers will have to be retrenched and B2Gold must follow the process laid down in the Labour Act. The LoM of the Project is currently estimated to be 5 years. There will be reduced demand for municipal services in Otjiwarongo, reduced business turnover of suppliers, service industries, and government revenue, loss of contributions to pension and social security funds, and bad debts are likely to occur. Some skilled people may find new employment. Low and semi-skilled members of the workforce may struggle to find new employment in the area unless other mines are developed, and the region has diversified its economy. Loss of employment may also occur amongst suppliers of goods and services to the mine as their turnover drops, negatively impacting the wider communities.

The duration of these negative impacts is short term as people and businesses will need time to adapt. The spatial scale is high in the unmitigated scenario as these negative economic impacts would be felt regionally and nationally. The consequence of closure-induced negative economic impacts is high due to the high intensity, medium to high duration and widespread nature of the economic impacts. The probability of these impacts occurring is high as the resource is finite.

The impact will cause a severe change to the lives of workers who may have to uproot and move to find work in another area, resulting in **HIGH** significance when unmitigated. Mitigation measures can reduce the impact for some workers to **MEDIUM** significance.

Table 9-32: Impact Summary - Mine Decommissioning and Closure Resulting in Loss of Jobs and Economic Benefits

Mine Decommissioning and Closure Resulting in Loss of Jobs and Economic Benefits		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Decommissioning and Closure	
Criteria	**Without Mitigation**	**With Mitigation**
Intensity	Severe change (Very high)	Moderate change (Medium)
Duration	Short-term (1 to 5 years)	Short-term (1 to 5 years)
Extent	Regional/National	Local area, far beyond site
Consequence	High	Medium
Probability	Definite / Continuous (Very high)	Definite / Continuous (Very high)
Significance	**High -**	**Medium -**
Summary of Key Mitigation Measures (Detailed mitigation measures included in the EMP)		

B2Gold must manage the impacts associated with mine closure in accordance with the existing Decommissioning and Closure Management Plan. The objective of the Plan is to prepare for changes in employment conditions at closure (negative social effects on people dependent on the mine) and to understand closure risks and prepare to mitigate impacts on associated communities and dependent businesses.

Key mitigation measures to be implemented include:

- 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.
- 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.
- Where retrenchments are unavoidable, they should be managed humanely according to legislative requirements.
- 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.

9.5 Summary of Positive and Negative Impacts

A summary of the results from the impact assessment is provided in Table 9-33.

Table 9-33: 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
	Increase in Ambient Air Pollutant Concentrations for Proximate Sensitive Receptors	X			Medium	Low
			X		Medium	Medium

	Issue	Relevant Project Phase			Significance Rating Impact Assessment	
		Construction	Operation	Decommissioning and Closure	Unmitigated Scenario	Mitigated Scenario
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

9.6 Cumulative Impacts

The EIA Regulations 2012 require that cumulative impacts be assessed. Cumulative impacts are defined as those impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity (development) when added to other existing, planned, and/or reasonably anticipated future developments.

This section provides a description and analysis of the potential cumulative effects of the Project, considering the effects of any changes on the biophysical, cultural heritage and socio-economic conditions.

The cumulative impact scoping comprises:

- Identification of the Valued Environmental Components (VECs) to be studied and the spatial and temporal boundaries of each VEC.
- Identification of neighbouring past, present and future projects and natural and social stressors.

9.6.1 Cumulative Impact Scoping

9.6.1.1 Identification of VECs

VECs were identified by the EIA team based on their assessment of the environmental, cultural and social impacts and discussions with stakeholders during stakeholder engagement activities. The VECs identified in Table 9-34 below are based on their importance to local communities and ecosystems.

Table 9-34: Selection of VECs for the Cumulative Impact Assessment

VEC	Rationale for selection	Boundaries	
		Spatial	Temporal
VEC Scoped in			
Groundwater aquifer	Infrastructure and project activities by the Project and other developments in the area can cumulatively lower groundwater levels which can affect third party supply	Simulated cone of drawdown at the Antelope underground mine	LOM and post-closure
	Improper management of potential contamination sources by the Project and other developments in the area can lead to long-term contamination of groundwater	Mining License boundary (as the mass transport modelling plume was not undertaken)	LOM
Terrestrial Biodiversity	Habitat loss and fragmentation which can alter species composition (especially floral SCC), potentially reducing local biodiversity and ecosystem function	A 200 m buffer around the Project footprint	LOM
	Faunal disturbance (especially faunal SCC) such as reduced landscape permeability (displacement and barrier effects), breeding disturbances, and increased risk of poaching and illegal harvesting		
	Degradation of habitat and functional ecosystems due to edge effects, invasive plant proliferation, erosion from altered runoff, and bush encroachment		

VEC	Rationale for selection	Boundaries	
		Spatial	Temporal
Noise	Cumulative increase in noise levels for surrounding sensitive receptors	A 7 km buffer around the Project footprint	LOM
Air Emissions	Cumulative increase in ambient PM concentrations for proximate sensitive receptors	A 5 km buffer around the Project footprint	LOM
Socio-economic	Contribution to economy and employment opportunities.	Project area and beyond boundary	All Project phases prior to closure
VEC scoped out			
Soil and Land Capability	VEC is unlikely to experience significant cumulative pressure in the region. Soils are affected at a localised site level and are managed through standard rehabilitation measures (and the existing Soil Management Plan).		
Legally Protected Areas	The Project footprint does not overlap with any formally protected area. The adjacent Otjikoto Nature Reserve was developed by B2Gold in 2012 in parallel with the OGM.		
Cultural Heritage	VEC is unlikely to experience significant cumulative pressure in the region, as there are no direct impacts on cultural heritage (avoided with layout change). The existing Archaeology Management Plan also manages any potential impacts that may arise.		
Blasting and Vibration	VEC is unlikely to experience significant cumulative pressure in the region. Blasting and vibration impacts are managed through the existing Noise and Vibrations Management Plan and monitoring.		
Visual	VEC is unlikely to experience significant cumulative pressure in the region. Visual aesthetics are already impacted by the existing OGM and impacts are managed through design and rehabilitation (and the existing Visual Management Plan).		
Traffic	VEC is unlikely to experience significant cumulative pressure in the region. Traffic is already impacted by the existing OGM and impacts are managed through the existing Traffic Management Plan.		

9.6.1.2 Neighbouring Projects (Past, Present and Future)

In the region, the following current projects situated near the Project area were considered, in addition to the existing operations at the OGM (Otjikoto open pit and Wolfshag underground mine):

- Okanjande Graphite Mine (near Otjiwarongo);
- Okorusu Fluorspar Mine (north of Otjiwarongo); and
- Namwater Omarassa-Omatjenne-Otjiwarongo Water Supply Scheme.

9.6.1.3 Anthropogenic Activities

As part of the cumulative impact assessment, other anthropogenic (human-caused) activities in the same area that can interact and add to impacts, in addition to the Proposed Project, must be considered.

Mining

The existing OGM mining operations (Otjikoto open pit and Wolfshag underground) have commenced since 2014. These mining operations include activities such as dewatering. Other mining projects such as Okorusu and Okanjande occur within 40 to 80km away from OGM. These mining operations also include activities such as dewatering. Mines need to

manage mineralized waste (TSF and WRDs) as well as non-mineralized waste (general and hazardous waste) to prevent contamination of the surrounding environment.

Commercial Livestock Farming

Cattle ranching and game farming activities are known to occur within the surrounding areas of OGM. These ranches and game farms could potentially rely on boreholes or artificial waterholes for water supply which can contribute to abstraction pressure in the area and collectively lower groundwater levels. Nitrate contamination from livestock manure and urine may seep into the groundwater resource contributing to degradation of groundwater quality.

Agriculture

The adjacent Farm Erhardtshof produces maize. Maize farming activities could potentially rely on boreholes for irrigation which can place demand on the local aquifer and collectively lower groundwater levels. Nitrate contamination from fertilisers and chemicals from pesticides or herbicides may seep into the groundwater resource contributing to contamination of groundwater quality.

Otjikoto Nature Reserve

The reserve may potentially rely on boreholes or artificial waterholes for water supply which can contribute to abstraction pressure in the area and collectively lower groundwater levels. The reserve generates minor domestic and sanitary waste that needs to be managed accordingly to prevent contamination of the surrounding environment.

Rural Settlements

The closest rural settlements are Otavi (~50 km east) and Otjiwarongo (~70 km south). Rural settlements depend almost entirely on boreholes for domestic water supply, contributing to the abstraction pressure in the area. Pit latrines and septic tanks are commonly the primary form of sanitation available in rural areas. These can contribute to faecal contamination which may seep into the groundwater resource affecting groundwater quality.

No formal waste collection and management systems for household waste disposal is available in rural settlements. No communal waste system bins and waste collection trucks exist. Sanitary and domestic wastewater is typically discharged without safe treatment. Poor waste management practises result in pollution of soil and water resources including related impacts on biodiversity, air pollution, spread litter, spread diseases and affect the aesthetics of the landscape.

9.6.1.4 Environmental Stressors

As a result of current and future climate change, potential risks exist to the Project that can result in negative impacts to the Project. Global climate change is largely attributed to human activities, such as burning of fossil fuels, population influx and vehicle emissions. These ongoing and future global activities thus have a cumulative effect on climate and weather globally, contributing to the impact.

9.6.2 Assessment of Cumulative Impacts

The assessment considers projects, anthropogenic activities, external factors and environmental stressors in the catchment that could contribute to the alteration of the baseline conditions of each VEC. For each VEC, a parameter is identified that is used as a metric to estimate the relative contribution of each contributor (project, activity, factor, stressor) to the overall alteration of the VEC. Cumulative impacts are considered significant when there is more than one main contributor to the overall impact. The cumulative impact on each VEC is discussed in the following paragraphs.

9.6.2.1 Groundwater

Description of the VEC and the Spatial and Temporal Boundaries

Groundwater in the area surrounding the mine is used primarily for livestock watering, crop irrigation and domestic purposes. The mine itself is dependent on groundwater abstraction for mining operations and office/domestic use. Water supply to the mine is provided from various boreholes abstracting groundwater from the Karibib Marbles to the east and southeast of the OGM. Mine dewatering also currently takes place at the OGM.

In terms of groundwater levels that could be lowered (affecting flow direction and third party supply), the spatial boundaries are those of the simulated COD at the proposed Antelope underground mine. This is because the lowering of groundwater levels from Project activities is expected to extend beyond the license area. The assessment covers the LOM during which mining activities (such as dewatering) take place. Dewatering impacts remain post-closure of the mine and thus this phase is included.

In terms of long-term contamination of groundwater, the spatial boundaries are those of the OGM ML boundary area (as the mass transport modelling plume was not undertaken). The assessment covers the LOM during which mining activities (such as management of mine residue deposits, i.e. the TSF and WRD) and management of non-mineralized waste take place.

Assessment Metrics

Since cumulative impacts cannot easily be measured directly with the level of information of other projects available, proxy metrics have been selected to indicate the likely scale of the impact. Assessment metrics selected as proxies for the assessment of impacts comprise the following:

- Level of groundwater – proxy for aquifer drawdown and availability.
- Borehole yield – proxy for third-party user impacts.
- Groundwater quality parameters, such as nitrate concentration – proxy for non-mineralized waste contamination.
- Groundwater quality parameters, such as sulphate concentration – proxy for mineralized waste contamination.

Assessment

The current COD caused by the existing Wolfshag underground mine is within the OGM ML boundary area. However, the addition of the Proposed Project may result in a COD overlap and thus an increase in the extent of the COD beyond the ML boundary area. The numerical modelling indicates that boreholes used for irrigation at the adjacent Farm Erhardshof (owned by B2Gold) may be impacted as a worst-case scenario. This could mean that there is a potential risk of water level decline on these boreholes because dewatering reduces the available groundwater within the area of the COD. There is also a potential risk to the boreholes located south of the Project area within the Karibib Marbles (NamWater supply boreholes for Otjiwarongo), but this has not been modelled yet. After mine closure, water tables will recover until a state of equilibrium is reached, and groundwater flow patterns is likely to return to pre-mining conditions. The other surrounding land uses that may contribute to this cumulative impact are listed below in Table 9-35.

The current mass transport modelling plumes (for 50-year post closure) caused by the existing Wolfshag underground mine is within the OGM ML boundary area. The addition of the Proposed Project was not modelled and thus the predicted impact on the plume is unknown. However, contaminant plumes are expected to remain within the OGM ML boundary area, assuming the liners stay intact. However, the possibility for cumulative

impacts exists where potential contaminant plumes from the Antelope WRD may overlap with spillages within the proposed infrastructure footprint. The other surrounding land uses that may contribute to this cumulative impact are listed below in Table 9-36.

Table 9-35 and Table 9-36 below provides a summary of the assessment of the cumulative impacts on groundwater.

Table 9-35: Assessment of Cumulative Impacts on Groundwater Levels

Contributors to Cumulative Impact	Description of Impact on Groundwater	Spatial / Temporal Overlap of Impacts
Lowering of groundwater levels affecting flow direction and availability for third party supply		
Proposed Project		
Proposed Project	Mine dewatering – Increase in the extent of the existing COD and overlap with the existing Wolfshag COD, further lowering groundwater levels	X
Significance Pre-mitigation: Medium -		
Significance Post-mitigation: Low -		
Existing Anthropogenic Activities		
Existing OGM	Mine dewatering – Existing Wolfshag COD lowering groundwater levels Abstraction boreholes for water supply – adding to aquifer stress	X
Other mines within 40 to 80km radius	Mine dewatering – lowering of groundwater levels Abstraction boreholes for water supply – adding to aquifer stress	X
Commercial Livestock Farming	Abstraction boreholes or artificial waterholes for water supply – adding to aquifer stress	X
Agriculture	Boreholes for irrigation – adding to aquifer stress	X
Otjikoto Nature Reserve	Abstraction boreholes or artificial waterholes for water supply – adding to aquifer stress	X
Rural Settlements	Abstraction boreholes for water supply – adding to aquifer stress	X
Future Environmental Stressors		
Climate Change	No impact on the groundwater level.	

Table 9-36: Assessment of Cumulative Impacts on Groundwater Contamination

Contributors to Cumulative Impact	Description of impact on Groundwater	Spatial / temporal overlap of impacts
Contamination of groundwater		
Proposed Project		
Proposed Project	Improper mineralized waste (TSF and WRD) and non-mineralized waste (general and hazardous waste) management – Increase in the extent of the existing	X

Contributors to Cumulative Impact	Description of impact on Groundwater	Spatial / temporal overlap of impacts
	contamination plume, further increasing the exceedance of groundwater quality parameters	
Significance Pre-mitigation: Medium -		
Significance Post-mitigation: Low -		
Existing Anthropogenic Activities		
Existing OGM	Improper mineralized waste (TSF and WRD) and non-mineralized waste (general and hazardous waste) management – Existing contamination plume	X
Other mines within 40 to 80km radius	Improper mineralized waste (TSF and WRD) and non-mineralized waste (general and hazardous waste) management – adding to groundwater contamination	X
Commercial Livestock Farming	Improper non-mineralized waste management (nitrate contamination) – adding to groundwater contamination	X
Agriculture	Improper non-mineralized waste management (nitrate contamination) – adding to groundwater contamination	X
Otjikoto Nature Reserve	Improper non-mineralized waste management (domestic and sanitary waste) – adding to groundwater contamination	X
Rural Settlements	Improper non-mineralized waste management (domestic and sanitary waste) – adding to groundwater contamination	X
Future Environmental Stressors		
Climate Change	No impact on the groundwater contamination.	

Significance of the Cumulative Impact

It is assessed that the cumulative impact on groundwater levels is possible, with a **Medium** significance rating pre-mitigation. However, the level of uncertainty shown in the extrapolated numerical modelling results for the Proposed Project do not provide sufficient results causing the confidence of the modelling results to be low, requiring more site-specific drilling, aquifer testing and modelling to determine the extent of the impact more accurately. However, impacts to groundwater levels are able to be minimised to a **Low** significance rating through the mitigation measures summarised in Table 9-4.

In the absence of the contamination plume modelling results for the Proposed Project, it is assessed that the cumulative impact on groundwater contamination is possible, with a **Medium** significance rating pre-mitigation. The impacts to groundwater contamination are able to be minimised to a **Low** significance rating through the mitigation measures summarised in Table 9-5 and Table 9-6.

9.6.2.2 Terrestrial Biodiversity

Description of the VEC and the Spatial and Temporal Boundaries

The Project area intersects a mosaic of vegetation types, including Karstveld, Thornbush Shrubland, and Northern Kalahari Woodland, each supporting unique ecological communities and ecological functions. Although the Project footprint includes areas of historical disturbance, key habitats such as ephemeral pans and Sandy Savanna patches remain structurally intact and ecologically functional. The Rocky Shrubland was classified as moderately sensitive, primarily due to the presence of sparse protected trees and its

importance for faunal use. The Dense Woodland and remaining plains were considered to have lower ecological sensitivity, but still contained some large or protected trees. The 2025 survey recorded four floral SCC and several protected tree species.

In terms of habitat loss and fragmentation faunal disturbance and degradation of functional ecosystems, the spatial boundaries are defined by the area likely to be affected by Project activities, associated infrastructure, or indirect impacts on biodiversity and ecosystem services. Given the potential for edge effects and the importance of maintaining habitat connectivity, it is essential that the area of influence extend beyond the immediate Project footprint to ensure an ecologically meaningful assessment. This approach allows for the identification of sensitive receptors, ecological corridors, and species that may be indirectly impacted by habitat modification, fragmentation, or increased human activity. In this context (and considering that the broader area has already undergone a baseline assessment), a buffer of 200 m beyond the proposed infrastructure boundary is assessed to adequately capture potential ecological sensitivities and connectivity pathways.

The temporal boundaries extend across the full LOM, as these pressures persist for the duration of active mining and associated infrastructure operation.

Assessment Metrics

Since cumulative impacts cannot easily be measured directly with the level of information of other projects available, proxy metrics have been selected to indicate the likely scale of the impact. Assessment metrics selected as proxies for the assessment of impacts comprise the following:

- Extent of habitat loss – proxy for reduction in available habitat for flora and fauna.
- Number of floral SCC affected – proxy for alteration of species composition.
- Habitat fragmentation and connectivity – proxy for reduced landscape permeability and increased barriers to fauna movement.
- Disturbance indices (noise, lighting, blasting, traffic) – proxy for breeding disturbance
- Incidents of poaching or illegal harvesting – proxy for faunal disturbance
- Extent and spread of AIP species – proxy for habitat degradation
- Indicators of erosion and altered runoff – proxy for habitat degradation

Assessment

The existing OGM has contributed to historical biodiversity impacts in the Project area including habitat loss, fragmentation of faunal corridors, illegal harvesting pressure, and ecosystem degradation. The addition of the Proposed Project will contribute to these existing impacts by resulting in additive pressure on local biodiversity. Specific risks include reduced habitat extent and quality, barriers to faunal movement, increased poaching access, and long-term disruption to ecological functioning and connectivity.

GIS-based habitat mapping (e.g. from RLE and regional biodiversity layers) shows that natural vegetation is being lost incrementally in the region due to multiple land uses. If unmanaged, cumulative impacts may reduce landscape permeability, intensify disturbance to fauna (especially SCC), and degrade functional ecosystems.

Table 9-37, Table 9-38 and Table 9-39 below provides a summary of the assessment of the cumulative impacts on terrestrial biodiversity.

Table 9-37: Assessment of Cumulative Impacts on Habitat Loss and Fragmentation

Contributors to Cumulative Impact	Description of impact on Terrestrial Biodiversity	Spatial / Temporal Overlap of Impacts
Habitat loss and fragmentation		
Proposed Project		
Proposed Project	Clearance of vegetation – Reduction in the extent of intact Sandy Savanna and Shrubland Plains and further loss of floral SCC	X
Significance Pre-mitigation: High -		
Significance Post-mitigation: Medium -		
Existing Anthropogenic Activities		
Existing OGM	Clearance of vegetation – Reduction in the extent of sensitive habitat and loss of habitat for floral SCC	X
Other mines within 40 to 80km radius	Clearance of vegetation – Reduction in the extent of sensitive habitat and loss of habitat for floral SCC	X
Commercial Livestock Farming	Clearance of vegetation – Reduction in the extent of sensitive habitat and loss of habitat for floral SCC	X
Agriculture	Clearance of vegetation – Reduction in the extent of sensitive habitat and loss of habitat for floral SCC	X
Otjikoto Nature Reserve	Conservation of sensitive habitat.	-
Rural Settlements	Clearance of vegetation – Reduction in the extent of sensitive habitat and loss of habitat for floral SCC	X
Future Environmental Stressors		
Climate Change	Climate change may affect habitat disturbances through wildfires.	

Table 9-38: Assessment of Cumulative Impacts on Faunal Disturbance

Contributors to Cumulative Impact	Description of Impact on Terrestrial Biodiversity	Spatial / Temporal Overlap of Impacts
Disturbance of fauna		
Proposed Project		
Proposed Project	Fragmentation of movement corridors – Displacement of terrestrial fauna and barriers to movement Increased susceptibility of fauna to disturbance – Breeding disturbance of large birds and raptors Increased susceptibility of fauna to exploitation – heightened risk of poaching and illegal harvesting.	X
Significance Pre-mitigation: High -		
Significance Post-mitigation: Medium -		
Existing Anthropogenic Activities		
Existing OGM	Disturbance of fauna – barriers to fauna movement and increased susceptibility of fauna	X

Contributors to Cumulative Impact	Description of Impact on Terrestrial Biodiversity	Spatial / Temporal Overlap of Impacts
Other mines within 40 to 80 km radius	Disturbance of fauna – barriers to fauna movement and increased susceptibility of fauna	X
Commercial Livestock Farming	Disturbance of fauna – barriers to fauna movement and increased susceptibility of fauna	X
Agriculture	Disturbance of fauna – barriers to fauna movement and increased susceptibility of fauna	X
Otjikoto Nature Reserve	Conservation of fauna.	-
Rural Settlements	Disturbance of fauna – barriers to fauna movement and increased susceptibility of fauna	X
Future Environmental Stressors		
Climate Change	Climate change may affect fauna through wildfires.	

Table 9-39: Assessment of Cumulative Impacts on Continued Habitat Degradation

Contributors to Cumulative Impact	Description of Impact on Terrestrial Biodiversity	Spatial / Temporal Overlap of Impacts
Continual habitat degradation		
Proposed Project		
Proposed Project	Mining infrastructure and activities – Causes edge effects, AIP proliferation, erosion from altered runoff and bush encroachment	X
Significance Pre-mitigation: Medium -		
Significance Post-mitigation: Low -		
Existing Anthropogenic Activities		
Existing OGM	Existing surrounding habitat degradation – Edge effects, AIP proliferation, erosion from altered runoff and bush encroachment	X
Other mines within 40 to 80km radius	Existing surrounding habitat degradation – Edge effects, AIP proliferation, erosion from altered runoff and bush encroachment	X
Commercial Livestock Farming	Existing surrounding habitat degradation – Edge effects, AIP proliferation, erosion from altered runoff and bush encroachment	X
Agriculture	Existing surrounding habitat degradation – Edge effects, AIP proliferation, erosion from altered runoff and bush encroachment	X
Otjikoto Nature Reserve	Conservation of sensitive habitat.	-
Rural Settlements	Existing surrounding habitat degradation – Edge effects, AIP proliferation, erosion from altered runoff and bush encroachment	X
Future Environmental Stressors		
Climate Change	Climate change may affect habitat disturbances through wildfires.	

Significance of the Cumulative Impact

It is assessed that the cumulative impact on habitat loss and fragmentation is likely, with a **High** significance rating pre-mitigation. However, the cumulative footprint of habitat loss can be significantly reduced to a **Medium** significance rating through careful layout design and implementation of the mitigation measures in Table 9-7.

The cumulative impact on faunal communities and SCC is likely, with a **High** significance rating pre-mitigation. The Proposed Project is situated within a landscape already experiencing ecological pressures from mining, agriculture, linear infrastructure, and human settlements. These existing pressures have resulted in habitat loss, fragmentation of movement corridors, and increased susceptibility of fauna to disturbance and exploitation. The Project may contribute cumulatively to: (i) breeding disturbance of large birds and raptors due to noise and vegetation clearance; (ii) displacement of terrestrial fauna and barriers to movement; and (iii) heightened risk of poaching and illegal harvesting due to increased access. Without effective mitigation, these combined pressures may lead to long-term declines in local faunal populations. However, the impact can be reduced to a **Medium** significance rating implementation of the mitigation measures in Table 9-8.

It is assessed that the cumulative impact on continued habitat degradation is possible, with a **Medium** significance rating pre-mitigation. The Project may exacerbate ongoing regional habitat degradation trends, especially where other land uses lack adequate rehabilitation or AIP control. However, the impact can be reduced to a **Low** significance rating through implementation of the mitigation measures in Table 9-9.

9.6.2.3 Noise

Description of the VEC and the Spatial and Temporal Boundaries

The existing mining activities at OGM generates ambient noise on site. Some operational areas which exceed the noise thresholds include the plant mills and the primary crusher during the night period. The predominant sources of noise that the surrounding farms experience are attributed to the B1 road traffic and animal activities, more so than the mining operations. The prevailing ambient noise levels throughout the Project area are created by traffic, birds, industrial type activities and domestic activities.

Sensitive receptors within 7 km of the OGM ML boundary were selected for discrete modelling. The temporal boundaries extend across the full LOM, as these pressures persist for the duration of active mining and associated infrastructure operation.

Assessment Metrics

Since cumulative impacts cannot easily be measured directly with the level of information of other projects available, proxy metrics have been selected to indicate the likely scale of the impact. Assessment metrics selected as proxies for the assessment of impacts comprise the following:

- Noise levels – proxy for noise impacts
- Complaints register – proxy for excessive noise levels

Assessment

Noise emissions from OGM are primarily associated with mining operations such as drilling, blasting, ore hauling, crushing, and processing activities. These sources generate intermittent and continuous noise, but impacts are generally confined to the immediate ML area. When considered in combination with other existing developments in the region, such as agricultural activities (mechanised farming equipment, irrigation pumps), livestock and game farming operations (vehicle movements, fencing activities), and rural settlements (domestic and small-scale commercial noise), the potential for cumulative noise impacts is

moderate. Table 9-40 below provides a summary of the assessment of the cumulative impacts on noise levels.

Table 9-40: Assessment of Cumulative Impacts on Noise Levels

Contributors to Cumulative Impact	Description of Impact on Groundwater	Spatial / Temporal Overlap of Impacts
Lowering of groundwater levels affecting flow direction and availability for third party supply		
Proposed Project		
Proposed Project	Mining activities – Contributing to elevated noise levels	X
Significance Pre-mitigation: Medium -		
Significance Post-mitigation: Low -		
Existing Anthropogenic Activities		
Existing OGM	Mining activities – Contributing to elevated noise levels	X
Other mines within 40 to 80km radius	Mining activities – Contributing to elevated noise levels	X
Commercial Livestock Farming	Farming operations use mechanised farming equipment, vehicles, fencing activities – Contributing to minimal elevated noise levels	X
Agriculture	Agricultural activities use mechanised farming equipment and irrigation pumps – Contributing to minimal elevated noise levels	X
Otjikoto Nature Reserve	Natural environment noise	-
Rural Settlements	People within households, schools, shops, roads, etc – Contributing to elevated noise levels	X
Future Environmental Stressors		
Climate Change	No impact on noise levels.	

Significance of the Cumulative Impact

It is assessed that the cumulative impact on noise is possible due the rural nature of the area, with a **Medium** significance rating pre-mitigation. However, the impact can be reduced to a **Low** significance rating through implementation of mitigation measures and especially because OGM implements existing noise management practices (e.g., controlled blasting schedules, equipment maintenance) which limits the intensity and frequency of noise emissions at the property boundary.

9.6.2.4 Air Emissions

Description of the VEC and the Spatial and Temporal Boundaries

The Project area is remote and sparsely populated, classified as rural. It is bordered by the Otjikoto Nature Reserve, with isolated homesteads and livestock paddocks dispersed in all directions. Sensitive receptors occur adjacent to the OGM. The existing OGM contributes to air emissions from mining activities. Sensitive receptors within ~5 km of the OGM ML boundary were selected for discrete modelling. The temporal boundaries extend across the full LOM, as these pressures persist for the duration of active mining and associated infrastructure operation.

Assessment Metrics

Since cumulative impacts cannot easily be measured directly with the level of information of other projects available, proxy metrics have been selected to indicate the likely scale of the impact. Assessment metrics selected as proxies for the assessment of impacts comprise the following:

- Dust fallout rates – proxy for air emissions.
- Fine particulates (PM_{10} and $PM_{2.5}$) – proxy for air emissions.
- Gases (SO_2 and NO_2) – proxy for air emissions

Assessment

Table 9-41 (for DFO) and Table 9-42 (for fine particulates and gases) presents measured concentrations, modelled concentrations at the measurement location, cumulative concentrations (measured values plus simulated concentrations), and the percentage contribution of the proposed Project to post-development cumulative scenario.

Key findings are as follows:

- Dry dust deposition (DFO): Baseline DFO levels exceed the IRMA guideline at DB6 (Haul Road) and DB12 (Evaporation Pond). Modelling predicts that the Proposed Project will increase dry dust deposition at these sites by 0.1% and 0.4%, respectively, with the highest increase projected at DB7 (TSF) at 17.9% above current levels.
- Fine particulates (PM_{10} and $PM_{2.5}$):
  - Baseline 24-hour PM_{10} exceeds the WHO AQG at all sites except PM2 (Smit). Model predicted increases in short-term PM_{10} range from 44.5% (Lappa) to 356.9% (Powerplant). Baseline annual PM_{10} exceeds the WHO AQG at all MiniVol monitoring sites with modelled long-term increases ranging from 4.7% (Lappa) to 386.5% (Powerplant).
  - Baseline 24-hour and annual average $PM_{2.5}$ exceeds the WHO AQG at all Atmos monitoring sites. Modelled short-term $PM_{2.5}$ increases range from 6.3% (Khoi Khoi) to 43.6% (Powerplant), and long-term increases from 5.7% (Khoi Khoi) to 44.7% (Powerplant).
- Gases (SO_2 and NO_2): Baseline 24-hour and annual averages comply with UNECE and WHO AQG limits at all sites.

Table 9-41: Cumulative Dry Dust Deposition Rates (mg/m²/day)

Sampling Location		Measured Deposition Rate (2024)	Modelled Deposition Rate (2022-2024)	Cumulative Deposition Rate	Percentage Increase from Baseline
AQ-DB1	Platveld	120	1.9	122	1.6%
AQ-DB2	Smit	73	0.7	74	0.9%
AQ-DB3	Weather station	127	4.7	132	3.7%
AQ-DB5	Lappa	64	0.2	64	0.3%
AQ-DB6	Haul road	1 322	0.7	1 323	0.1%
AQ-DB7	TSF	71	12.7	84	17.9%
AQ-DB8	Access road	267	2.1	269	0.8%

Sampling Location		Measured Deposition Rate (2024)	Modelled Deposition Rate (2022-2024)	Cumulative Deposition Rate	Percentage Increase from Baseline
AQ-DB12	Evaporation pond	809	2.9	812	0.4%
AQ-DB13	Airstrip	29	0.1	29	0.5%
AQ-DB14	TSF west	204	3.5	208	1.7%
AQ-DB15	Pit east	85	0.4	86	0.5%

Notes:

Red - Exceeds IRMA guideline (350 mg/m²/day)

Table 9-42: Cumulative Fine Particulates and Gases (µg/m³)

Pollutant			PM_{10}		$PM_{2.5}$		SO_2		NO_2	
Averaging period			24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual
Percentile			P99	N/A	P99	N/A	P99	N/A	P99	N/A
Unit			µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Guideline	UNECE		-	-	-	-	-	20	-	30
	WHO -IT1		150	70	75	35	125	-	120	40
	WHO -IT2		100	50	50	25	50	-	50	30
	WHO -IT3		75	30	37.5	15	-	-	-	20
	WHO -IT4		50	20	25	10	-	-	-	-
	WHO AQG		45	15	15	5	40	-	25	10
Measured concentration	AQ-PM/SOX1	Platveld	79.8	38.5	-	-	1.5	0.7	2.6	1.7
	AQ-PM/SOX2	Smit	31.9	21.7	-	-	0.6	0.4	5.8	5.0
	AQ-PM5	Lappa	76.7	35.6	-	-	-	-	-	-
	AQ-PM/SOX9	Powerplant	393.2	123.8	-	-	1.6	1.2	5.3	3.4
	AQ-PM/SOX12	Landfill	217.4	113.3	-	-	3.9	1.8	4.5	2.5
	Atmos_PP	Powerplant	52.1	9.6	43.3	8.5	-	-	-	-
	Atmos_KK	Khoi Khoi	57.4	9.8	46.7	8.1	-	-	-	-
	Atmos_CP	Camp	52.0	9.8	42.0	8.7	-	-	-	-
	Atmos_LF	Landfill	64.6	11.2	58.1	10.0	-	-	-	-
Modelled concentration	AQ-PM/SOX1	Platveld	33.5	7.7	3.5	0.8	0.6	0.1	0.8	0.1
	AQ-PM/SOX2	Smit	27.6	4.3	2.9	0.5	0.4	0.0	0.4	0.1
	AQ-PM5	Lappa	34.2	1.7	3.7	0.2	0.4	0.0	0.5	0.0
	AQ-PM/SOX9	Powerplant	187.9	37.5	19.1	3.8	0.8	0.1	1.5	0.3

Pollutant			PM_{10}		$PM_{2.5}$		SO_2		NO_2	
Averaging period			24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual
Percentile			P99	N/A	P99	N/A	P99	N/A	P99	N/A
Unit			µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Guideline	UNECE		-	-	-	-	-	20	-	30
	WHO -IT1		150	70	75	35	125	-	120	40
	WHO -IT2		100	50	50	25	50	-	50	30
	WHO -IT3		75	30	37.5	15	-	-	-	20
	WHO -IT4		50	20	25	10	-	-	-	-
	WHO AQG		45	15	15	5	40	-	25	10
	AQ-PM/SOX12	Landfill	112.3	30.6	11.7	3.2	0.7	0.1	1.2	0.3
	Atmos_PP	Powerplant	186.0	37.1	18.9	3.8	0.8	0.1	1.5	0.3
	Atmos_KK	Khoi Khoi	27.6	4.3	2.9	0.5	0.4	0.0	0.4	0.1
	Atmos_CP	Camp	46.9	5.0	5.0	0.5	0.6	0.0	0.7	0.1
	Atmos_LF	Landfill	112.3	30.6	11.7	3.2	0.7	0.1	1.2	0.3
Cumulative concentration	AQ-PM/SOX1	Platveld	113.3	46.2	-	-	2.1	0.8	3.4	1.8
	AQ-PM/SOX2	Smit	59.6	26.0	-	-	0.9	0.4	6.2	5.0
	AQ-PM5	Lappa	110.9	37.3	-	-	-	-	-	-
	AQ-PM/SOX9	Powerplant	581.1	161.3	-	-	2.4	1.3	6.8	3.7
	AQ-PM/SOX12	Landfill	329.7	143.9	-	-	4.7	1.9	5.7	2.8
	Atmos_PP	Powerplant	238.2	46.8	62.2	12.3	-	-	-	-
	Atmos_KK	Khoi Khoi	85.0	14.1	49.7	8.6	-	-	-	-
	Atmos_CP	Camp	98.9	14.8	47.0	9.2	-	-	-	-
	Atmos_LF	Landfill	177.0	41.7	69.8	13.2	-	-	-	-

Pollutant			PM_{10}		$PM_{2.5}$		SO_2		NO_2	
Averaging period			24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual
Percentile			P99	N/A	P99	N/A	P99	N/A	P99	N/A
Unit			µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Guideline	UNECE		-	-	-	-	-	20	-	30
	WHO -IT1		150	70	75	35	125	-	120	40
	WHO -IT2		100	50	50	25	50	-	50	30
	WHO -IT3		75	30	37.5	15	-	-	-	20
	WHO -IT4		50	20	25	10	-	-	-	-
	WHO AQG		45	15	15	5	40	-	25	10
Percentage increase from baseline	AQ-PM/SOX1	Platveld	42.0%	20.0%	-	-	43.1%	9.6%	28.9%	6.5%
	AQ-PM/SOX2	Smit	86.6%	20.0%	-	-	64.3%	10.6%	6.9%	1.3%
	AQ-PM5	Lappa	44.5%	4.7%	-	-	-	-	-	-
	AQ-PM/SOX9	Powerplant	47.8%	30.3%	-	-	46.9%	5.4%	28.3%	8.9%
	AQ-PM/SOX12	Landfill	51.7%	27.0%	-	-	18.1%	4.6%	26.7%	11.0%
	Atmos_PP	Powerplant	356.9%	386.5%	43.6%	44.7%	-	-	-	-
	Atmos_KK	Khoi Khoi	48.2%	44.4%	6.3%	5.7%	-	-	-	-
	Atmos_CP	Camp	90.1%	51.0%	11.9%	6.1%	-	-	-	-
	Atmos_LF	Landfill	173.8%	273.6%	20.1%	31.6%	-	-	-	-

Notes:

Red	-	Exceeds WHO IT1
Orange	-	Exceeds WHO IT2
Yellow	-	Exceeds WHO IT3
Green	-	Exceeds WHO IT4

Pollutant			**PM_{10}**		**$PM_{2.5}$**		**SO_2**		**NO_2**	
Averaging period			24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual
Percentile			P99	N/A	P99	N/A	P99	N/A	P99	N/A
Unit			µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Guideline		UNECE	-	-	-	-	-	20	-	30
		WHO -IT1	150	70	75	35	125	-	120	40
		WHO -IT2	100	50	50	25	50	-	50	30
		WHO -IT3	75	30	37.5	15	-	-	-	20
		WHO -IT4	50	20	25	10	-	-	-	-
		WHO AQG	45	15	15	5	40	-	25	10
Blue	-	Exceeds WHO AQG								

Table 9-43 below provides a summary of the assessment of the cumulative impacts on terrestrial biodiversity.

Table 9-43: Assessment of Cumulative Impacts on Air Emissions

Contributors to Cumulative Impact	Description of Impact on Air Emissions	Spatial / Temporal Overlap of Impacts
Cumulative increase in ambient PM concentrations for proximate sensitive receptors		
Proposed Project		
Proposed Project	Mining activities – Contributing to elevated levels of air emissions	X
Significance Pre-mitigation: High -		
Significance Post-mitigation: High -		
Existing Anthropogenic Activities		
Existing OGM	Mining activities – Contributing to elevated levels of air emissions	X
Other mines within 40 to 80km radius	Mining activities – Contributing to elevated levels of air emissions	X
Commercial Livestock Farming	Farming operations include biomass burning – Contributing to elevated levels of air emissions Farming operations include herd movement – Causing dust emissions	X
Agriculture	Agricultural activities include biomass burning – Contributing to elevated levels of air emissions and wind erosion	X
Otjikoto Nature Reserve	Does not contribute to the cumulative impact.	-
Rural Settlements	Burning of waste, burning of domestic fuel (for cooking and heating), vehicle exhausts – contributing to elevated levels of air emissions	X
Future Environmental Stressors		
Climate Change	Climate and weather patterns are the principal factor driving the transportation, dispersion, dilution, and transformation of air pollutants in the local context. Seasonal and diurnal pollutant concentration levels fluctuate in response to the changing state of atmospheric stability.	

Significance of the Cumulative Impact

It is highlighted that SLR were appointed to simulate the impacts of the proposed project. Cumulative impacts were assessed by combining project emissions with baseline monitoring. Mining developments that impact upon baseline were not quantitatively assessed. This would include changes to power generation and proposed pit closures. To incorporate the positive effect of these on the baseline would require simulations of these sources, which is outside of the scope of the assessment. It is conservatively assumed baseline will not change from the established monitoring period and the project will contribute there to. This can be considered an environmentally conservative approach It is expected that the **HIGH** cumulative impact significance would be offset by the above improvements in baseline air quality. However, since these are not quantified here, the degree of offset is unknown, and the significance rating remains **HIGH**.

The cumulative outcome shows the additive concentrations from the proposed mining activity contribute significantly to this baseline with ambient PM concentrations at all monitoring locations, some of which are offsite sensitive receptors, continually exceed the WHO AQG.

For the proposed cumulative scenario (including mitigation/emissions control where stipulated as existing emissions control procedure in OGM's EMP):

- Targets, limits and thresholds of concern are continually exceeded. This intensity is defined by the impact rating methodology as "very high".
- The impact is assessed for sensitive receptors located beyond the site boundary. This extent is defined by the impact rating methodology as "beyond site".
- The impact will cease at the end of the operational life of the activity. This duration is defined by the impact rating methodology as "long-term".
- Air emissions from mining are certain to occur and will result in increases in ambient concentrations at proximate receptors. Although these increases do not exceed AQG, subclinical to clinical health impacts (in sensitive individuals) from air pollution exposure may still occur. Probability is therefore conservatively rated as "definite" as a precautionary approach.
- Very high intensity + beyond site extent + long-term duration = high consequence.
- High consequence + definite probability = **HIGH** impact significance.

For the additional mitigation scenario (assuming additional mitigation):

- Targets, limits and thresholds of concern are continually exceeded. This intensity is defined by the impact rating methodology as "very high".
- The impact is assessed for sensitive receptors located beyond the site boundary. This extent is defined by the impact rating methodology as "beyond site".
- The impact will cease at the end of the operational life of the activity. This duration is defined by the impact rating methodology as "long-term".
- Air emissions from mining are certain to occur and will result in increases in ambient concentrations at proximate receptors. Although these increases do not exceed AQG, subclinical to clinical health impacts (in sensitive individuals) from air pollution exposure may still occur. Probability is therefore conservatively rated as "definite" as a precautionary approach.
- Very high intensity + beyond site extent + long-term duration = high consequence.
- High consequence + definite probability = **HIGH** impact significance.

9.6.2.5 Socio-economic

Description of the VEC and the Spatial and Temporal Boundaries

Mining activities play a pivotal role in driving economic growth at the regional, national and local levels. In the broadest sense, all activities associated with a mine bring employment and business opportunities to local villages. The creation of jobs from a mine provides direct employment opportunities which support local livelihoods. Locally, the mining sector supports community development by creating employment opportunities and increasing the purchasing power of residents, which in turn stimulates demand for goods and services, particularly during the construction and operational phases of the mine.

The spatial boundaries extend beyond the OGM ML boundary as these impacts influence livelihoods and the broader economy. The assessment covers the LOM during which mining activities take place.

Assessment Metrics

Since cumulative impacts cannot easily be measured directly with the level of information of other projects available, proxy metrics have been selected to indicate the likely scale of the impact. Assessment metrics selected as proxies for the assessment of impacts comprise the following:

- Number of jobs created – proxy for employment creation.
- Household income levels – proxy for the wellbeing of affected communities.
- Local procurement and expenditure by OGM – proxy for the performance of the local and regional economy.

Assessment

The construction of the Project's components will boost the local, regional and national economy during the construction phase. During operations, benefits to all level of the economy should arise through incomes to employees, contractors and service providers and to the government through taxation. Direct economic benefits include income from product sales, wages and benefits for workers, and taxes paid by employees, contractors, and suppliers. Indirect impacts come from the purchase of Namibian inputs for mining and processing, as well as services outsourced to local companies. Encouraging the purchase of Namibian-made goods will further support the economy. Overall, the Project will have a positive impact on the national, regional, and local economy.

The Project will result in the creation of employment opportunities and an increase in local business.

Table 9-44 below provides a summary of the assessment of the cumulative impacts on groundwater.

Table 9-44: Assessment of Cumulative Impacts on Socio-Economic Aspects

Contributors to Cumulative Impact	Description of impact on Socio-economic aspects	Spatial / temporal overlap of impacts
Contribution to economy and employment opportunities		
Proposed Project		
Proposed Project	All construction and mining activities – Increased job creation and positive contribution to the economy	X
Significance Pre-mitigation: Very High +		
Significance Post-mitigation: Very High +		
Existing Anthropogenic Activities		
Existing OGM	All construction and mining activities – Increased job creation and positive contribution to the economy	X
Other mines within 40 to 80km radius	All construction and mining activities – Increased job creation and positive contribution to the economy	X

Contributors to Cumulative Impact	Description of impact on Socio-economic aspects	Spatial / temporal overlap of impacts
Commercial Livestock Farming	Farming operations – Increased job creation and positive contribution to the economy	X
Agriculture	Agricultural activities – Increased job creation and positive contribution to the economy	X
Otjikoto Nature Reserve	Reserve operation – Increased job creation and positive contribution to the economy	X
Rural Settlements	Does not contribute to the cumulative impact.	-
Future Environmental Stressors		
Climate Change	No impact on socio-economic aspects.	

Significance of the Cumulative Impact

It is assessed that the cumulative impact on these socio-economic aspects is definite, with a **High** significance rating. The Project will enhance these positive impacts to maximise local benefits.

9.7 Residual Impacts

9.7.1 Residual Impact Screening Process

A residual impact refers to the remaining environmental or social impact after all feasible mitigation measures have been applied. These impacts are those that cannot be entirely avoided, reduced, or offset despite the implementation of the mitigation hierarchy. The following Section provides an assessment of the potential residual impacts. To identify if any residual impacts are likely to be associated with any of the biophysical, cultural and socio-economic impacts discussed in Section 9, the following screening process was followed (please also see Table 9-45):

- Impact Identification: List all potential environmental, cultural and social impacts of the Project.
- Aim of the mitigation measure: Outline the overarching aim of the mitigation measures.
- Assess the effectiveness of the mitigation measures: Evaluate the effectiveness of the mitigation measures by assessing the following criteria:
    - Relevance: Does the mitigation measure address the impacts?
    - Practicality: Is the mitigation measure feasible to implement?
    - Sustainability: Will the mitigation measure continue to be effective over time?

Following the screening process, where any residual impacts have been identified, these have been assessed separately.

Table 9-45: Residual Impact Screening Process

Aspect	Project Impact	Mitigation Measures	Effectiveness of Mitigation Measure
Biophysical Environmental Impacts			
Soils and Land Capability	Loss of soil and land capability through contamination Loss of soil and land capability through physical disturbance	The removal of contaminating infrastructure and activities and the implementation of the existing Soil Management Plan, in addition to the final remediation activities, will ensure that no infrastructure or activities on site can impact soil resources and related land capability.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, with engineered solutions, the mitigation measures will be effective over time.
Groundwater	Lowering of groundwater levels can affect third-party supply Contamination of groundwater that could influence the availability of a third-party supply	Implement the existing Groundwater Management Plan Monitoring Plan. Cessation of dewatering issues to allow for the natural groundwater levels to rebound. Removal of contaminating facilities and activities at closure. Successful rehabilitation of final landforms.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, the mitigation measures will be effective over time.
Terrestrial Biodiversity	Habitat loss and fragmentation Faunal disturbance Continued habitat degradation	The residual impacts are expected to be minimal as the mine site will be rehabilitated and remediated to ensure long-term biodiversity restoration.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, through effective rehabilitation and AIP control, the mitigation measures will be effective over time.
Noise	Disturbing noise levels affecting potentially sensitive noise receptors	Mitigation measures focus on noise control. In addition to this, once the mine ceases operations and has undertaken the rehabilitation and closure activities, all noise producing activities associated with the mine will be removed.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, the mitigation measures will be effective over time.

Aspect	Project Impact	Mitigation Measures	Effectiveness of Mitigation Measure
Blasting and Vibration	Blasting activities can affect sensitive receptors and third party infrastructure through ground vibration, airblast, fly rock, blast fumes and dust	Manage blasting activities in accordance with the existing Noise and Vibrations Management Plan. Conduct a test blast to define acceptable vibration levels and calibrate future blasts. Communicate planned blast times to communities and install notification signage.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, the mitigation measures will be effective over time.
Air Quality	Increase in dust and ambient particulates affecting human health Increase in ambient gases affecting human health	Mitigation measures focus on air quality management, monitoring, dust suppression and long-term pollution prevention. Further to this, once the mine ceases operations and has undertaken the rehabilitation and closure activities, all dust and gases producing activities and infrastructure associated with the mine will be removed.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, the mitigation measures will be effective over time.
Cultural Heritage Impacts			
Cultural Heritage and Palaeontological Resources	Loss or damage to burial cairn	Cultural Heritage resources will be avoided.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, the mitigation measures will be effective over time.
Socio-economic Impacts			
Visual	Generation of negative visual views affecting sense of place	Mitigation measures focus on limiting vegetation clearance, engineering designs of the more prominent mine features, and rehabilitation. No residual visual impacts are expected once the mine's activities have been concluded (post-closure). During closure, all the mine infrastructure will be removed, and the area will be rehabilitated.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, the mitigation measures will be effective over time.

Aspect	Project Impact	Mitigation Measures	Effectiveness of Mitigation Measure
Traffic	Increase in traffic volume affecting the safety of road users	Mitigation measures focus on implementing the existing Traffic Management Plan and speed limits. In addition to this, once the Project has concluded operations, any mine-related traffic will cease.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, the mitigation measures will be effective over time
Socio-economic	Economic benefit to national and local economies Job creation and skills development	Mitigation measures focussed on maximising employment and socio-economic development opportunities.	• **Relevance:** Yes, the mitigation measures enhance the impacts. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** No, while the mitigation measures can enhance economic benefits, job creation and development opportunities, they will not provide these opportunities post-closure. The economic benefits and job opportunities will cease.
	Loss and sterilisation of mineral resources	Mitigation of mineral sterilisation focuses on optimising resource recovery and minimising ore loss. Key measures include annual testing of tailings for residual value and refining processing methods in collaboration with metallurgists. These steps aim to ensure long-term economic efficiency and reduce residual resource loss.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, the mitigation measures will be effective over time.
	In-migration impacts on local communities and service provision	Implement the existing Socio-economic Management Plan. Preferential recruitment must be given to Otjozondjupa residents. 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). Develop community wellness programmes in consultation with the neighbouring	• **Relevance:** Yes, the mitigation measures enhance impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, the mitigation measures will be effective over time.

Aspect	Project Impact	Mitigation Measures	Effectiveness of Mitigation Measure
		towns and farms. (Include HIV / AIDS / TB related issues).	
	Hazardous excavations and infrastructure resulting in safety risks to third parties and animals	Mitigation focuses on preventing harm to communities and animals from hazardous mine areas through access control, conducting community awareness programs, and managing the TSF in line with international safety standards. These actions, together with the rehabilitation of final landforms, aim to eliminate residual safety risks throughout the project lifecycle.	• **Relevance:** Yes, the mitigation measures address the impact. • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** Yes, the mitigation measures will be effective over time.
	Mine decommissioning and closure resulting in job losses, loss of household income, loss of economic benefits	The closure plan objective will be to return the land to pre-mining potential, rehabilitating the disturbed areas and making the pits safe. Through the Decommissioning and Closure Management Plan, socio-economic impacts must be minimised (including the loss of employment) through careful planning and preparation for closure. 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. 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.	• **Relevance:** No, the mitigation measures can reduce the level of impact, but the impact remains (loss of jobs and economic benefits). • **Practicality:** Yes, the mitigation measures are feasible to implement. • **Sustainability:** No, the mitigation measures are short-term and reliant on the OGM's funding.

9.7.2 Socio-economic Residual Impact: Mine Closure Resulting in a Loss of Jobs and Economic Benefits

The closure of the OGM will result in residual socio-economic impacts, primarily due to the loss of approximately 350 jobs and the associated income that many individuals depend on as their primary source of livelihood. Almost all of the direct, indirect and induced economic benefits of the Project will stop. The transition from active mining to post-closure can create significant challenges, as the abrupt cessation of operations typically results in the loss of employment and income for a substantial portion of the local workforce. By investing in local workforce development, B2Gold aims to build a more skilled and adaptable community, thereby empowering residents to pursue diverse economic opportunities beyond the mine's operational lifespan. Such proactive measures are designed to address and mitigate the long-term socio-economic impacts of mine closure, fostering resilience and economic diversification in the local area. However, even with the implementation of mitigation measures, B2Gold may not fully eliminate the residual effects. Despite efforts to offer alternative employment opportunities and support for transitioning workers, some individuals may experience prolonged unemployment or challenges in securing new jobs.

Mine closure planning is crucial for effectively managing the socio-economic impacts associated with the end of mining operations, particularly the loss of income that is commonly experienced by communities reliant on mining activities. This impact is often exacerbated by the community's deep reliance on the mine as a primary economic driver.

To address these issues, comprehensive mine closure planning must be integrated from the early stages of the Project and continuously updated throughout its lifecycle. This planning must involve consideration of several key components:

1 Economic Diversification: A central focus of mine closure planning should be developing strategies to diversify the local economy. This may include identifying and investing in alternative economic activities that can provide new sources of income for affected communities. For example, post-closure land use can be planned to support agriculture, tourism, or small-scale industries, creating new job opportunities and reducing dependency on mining.

2 Community Engagement: Engaging with the community throughout the closure planning process is vital to addressing their needs and concerns. Stakeholder consultations can help identify local priorities and preferences for post-closure land use, ensuring that the planned activities align with the community's aspirations and capabilities.

3 Infrastructure and Support Services: The closure planning process should also consider developing infrastructure and support services that facilitate economic transition. This could involve improving transportation links, establishing business support services, and enhancing access to education and training resources.

4 Long-Term Monitoring and Evaluation: Post-closure plans should include mechanisms for ongoing monitoring and evaluation to assess the effectiveness of the implemented strategies. This ensures that any unforeseen challenges can be addressed promptly and that the community continues to benefit from the planned interventions.

By addressing these components, mine closure planning aims to minimise the socio-economic impacts of mine closure and support communities in adapting to a new economic reality. Effective planning helps to ensure that the loss of income from mining is mitigated through the creation of sustainable alternatives, fostering long-term resilience and economic stability in the affected areas.

10.0 Public Consultation Process

The Public Consultation Process (PCP) has been undertaken per the requirements of Regulation/Part 21 of the EMA. Regulation 21 requires that a person (proponent, specialist, EAP, or other professional) who undertakes public participation as part of an environmental impact assessment process to obtain an ECC, must do the public consultation process in compliance with the following:

- "(2) The person conducting a public consultation process must give notice to all potential I&APs of the application which is subjected to public consultation by –
    a. fixing a notice board at a place conspicuous to the public at the boundary or on the fence of the site where the activity to which the application relates is or is to be undertaken;
    b. giving written notice to -
        i. the owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site;
        ii. the local authority council, regional council, and traditional authority, as the case may be, in which the site or alternative site is situated;
        iii. any other organ of state having jurisdiction in respect of any aspect of the activity; and
        iv. advertising the application once a week for two consecutive weeks in at least two newspapers circulated widely in Namibia.
- (3) A notice, notice board, or advertisement referred to in sub-regulation (2) must -
    a. give details of the application which is subjected to public consultation; and
    b. state -
        i. that the application is to be submitted to the Environmental Commissioner in terms of these regulations;
        ii. the nature and location of the activity to which the application relates;
        iii. where further information on the application or activity can be obtained: and the manner in which and the person to whom representations in respect of the application may be made.
- (4) A notice board referred to in sub-regulation (2) must be of a size at least 60 cm by 42 cm.
- (5) If a deviation from sub-regulation (2) is appropriate the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner agreed by the Environmental Commissioner after consultation with the competent authority.
- (6) When complying with this regulation, the person conducting the public consultation process must ensure that -
    a. information containing all relevant facts in respect of the application is made available to potential I&APs; and
    b. consultation by potential I&APs is facilitated in such a manner that all potential I&APs are provided with a reasonable opportunity to comment on the application.
- (7) The public consultation process -

a. in respect of an application for an environmental clearance certificate in terms of regulation 6(1); and the notification of an application and an assessment report in terms of regulation 16(1)(h),

b. must be completed within 21 days."

The PCP is aligned with Regulation 21 of the EIA Regulations 2012 and is being conducted as follows:

- Project Initiation Phase;
- Scoping phase (2023 site layout plan);
- EIA/EMP Phase (2024 site layout plan); and
- Authority Decision Phase.

10.1 Project Initiation Phase

IAPs were notified of the Project and application process in June 2025 and were invited to provide initial comments during the Project initiation phase. Notification was undertaken via the following methods:

- Newspaper adverts were published in The Namibian (on 19 and 24 June 2025) and Market Watch (on 19 and 24 June 2025);
- Site Notices; and
- Emails containing the BID and SMSes.

The comments received from stakeholders to date include:

Table 10-1: Key Comments and Responses

Comments	Responses
Registration of IAPs to be involved in the process.	IAPs added to database.
Adjacent farmers have concerns that the Project will have groundwater impacts such as depletion of the resource, as they are dependent on boreholes for water.	A farmers meeting was held at the Platveld Boerevereniging on the 03 September 2025. There were no oppositions to the project. Enquiries were related to continued groundwater supply. Farmers were informed that no groundwater supply will be interrupted - the expansion project will make use of existing sources available, the current abstraction license for the ML is capped at 1.8millioin cubes and will not be exceeded. A rigid groundwater monitoring system is in place and effective. The farmers concurred that they have never experienced a shortage of groundwater supply since the mine's operation. Social issues with regards to an influx of new workers were raised at the meeting. It was confirmed that new workers would be sourced and based in Otjiwarongo and not on-site.
Adjacent guesthouse has concerns that the Project will entail a new camp for workers and the associated impacts.	All construction workers are expected to be based in the nearby towns of Otjiwarongo and Otavi as no construction camp will be established on the site. Workers would therefore be transported from these locations to site and back each day.

Verbatim stakeholder communications and commenting authority correspondence are included in Appendix K.

10.2 EIA Phase

Ongoing consultation with the different authorities was undertaken during the EIA process. The EIA phase only commenced after the MEFT reviewed the ECC Amendment Application and Project BID, and MEFT issued an environmental screening notice on 08 August 2025 requesting that an EIA Report and EMP be compiled and submitted to them for consideration of the ECC Amendment Application.

This draft EIA is made available for a 14-day commenting period from 17 October 2025 to 31 October 2025. Registered IAPs will be notified of the availability of the draft EIA through email, which will include a revised BID summarising the revisions made to the layout plan.

Comments and issues raised by IAPs during the commenting period will be consolidated into an updated Comments and Responses Report (CRR), which will be appended to the Final EIA Report. The Final EIA Report will then be submitted to the MEFT and MME for decision-making.

10.3 Authority Decision Phase

Once the MEFT has issued its decision on the ECC Amendment Application based on its review of the Final EIA Report and EMP, SLR will inform all registered IAPs of the decision and the appeals process. Consultation with MEFT, and MME, if necessary, will continue until a decision is made on the ECC Amendment Application.

Error! Not a valid bookmark self-reference. details the PCP tasks undertaken for the entire Project.

Table 10-2: Public Participation Process

Project Phase	Task	Activities	Date
Project Initiation	**Notification of Project to Regulatory Authorities and Registered Interested and Affected Parties**		
	Stakeholder Identification and Database Development	IAPs were identified, and contact details were obtained where possible using the database from the 2019 EIA, engagements with key stakeholders, and meetings. A stakeholder database was developed and will be maintained throughout the process (Please refer to Appendix K for a copy of the Stakeholder Database).	May – June 2025
	Background Information Document (BID)	A BID (Appendix K) describing the Project and the legal requisites associated with the Authorisation process was compiled. The BID included a Reply Form, which provided the public with an opportunity to register as an IAP, and to raise queries or concerns regarding the Project.	June 2025
	Emails and SMS	Where possible, the BID was distributed via email to IAPs on the Stakeholder Database. Copies of the BID were also made available on request to SLR. Notification of the Project via SMS was undertaken to IAPs who did not have an email address.	June 2025
	Newspaper Advertisements	Newspaper advertisements providing information on the Project, the availability of the BID, and the time and opportunity to register as IAP were placed in newspapers (circulated widely in Namibia) as follows: • English advertisement in Market Watch; and • English advertisement in the Namibian Sun. Please refer to Appendix K for copies of the advertisements placed.	19 and 24 June 2025
	Site Notices	English site notices (Sized 60 cm x 42 cm) were placed at the OGM.	June 2025

Project Phase	Task	Activities	Date
	Focus Group Meetings	A focus group meeting was held with surrounding landowners at Farm Osnia on 03 September 2025.	3 September 2025
	Comments and Responses	The CRR can be found in Appendix K detailing all comments and responses received thus far.	October 2025
EIA and EMP	**Review and Comment on the EIA and EMP and Consultation Meetings**		
	Notification of availability of the EIA Report for review and comment	All IAPs registered on the Project database (Appendix K) will be notified of the availability of the draft EIA Report for review comment and review period through a notification letter (sent via e-mail). To facilitate the commenting process, a revised BID and copy of a Non-Technical Summary (in English) was attached to the notification letter. The notification letter and BID is also included (see Appendix K). Proof of notifications will be provided in the Final EIA Report.	October 2025
	EIA Report/EMP Review and Comment Period	All stakeholders will be provided an opportunity to review and comment on the EIA Report and EMP over a 14-day period between 17 October 2025 to 31 October 2025. All comments received and responses provided to stakeholders by the EIA team will be included in an updated CRR which will be appended to the Final EIA Report.	October 2025
	Comments and Responses	The CRR detailing all comments and responses received thus far is included in Appendix K.	November 2025
Decision	Notifications to IAPs regarding the ECC Amendment decision (granted or refused) and appeals process will be distributed (via email) to all registered IAPS on the stakeholder database.		

11.0 Assumptions and Limitations

While every effort has been made to compile a robust assessment of the environmental and social impacts associated with the Project, there remain certain assumptions, uncertainties, and limitations that are applicable to the assessment in general as well as those applicable to each of the individual specialist assessments.

11.1 General

The following assumptions and limitations are applicable to the EIA and EMP:

- SLR assumes that all relevant project information has been provided by B2Gold and that it was correct and valid at the time it was provided;
- No significant changes to the Project description or surrounding environment will occur between the submission of the Final EIA Report and EMP, and implementation of the Project that could substantially influence findings and recommendations with respect to mitigation and management measures;
- SLR assumes that B2Gold will comply with all legislation pertaining to the activities of this Proposed Project and that all permits and licenses that may be required will be identified and applied for prior to the commencement of the Project; and
- SLR assumes that B2Gold will implement the measures contained in the EMP and will adhere to any monitoring procedures developed for the Project. A monitoring and evaluation system, including auditing, will be established, and operationalised to track the implementation of the EMP, ensuring that management measures are effective to avoid, minimise and mitigate impacts and that corrective action is being undertaken to address shortcomings and/or non-conformances.

These assumptions and limitations, however, are not considered to have any negative implications in terms of the credibility of the results of the EIA process.

11.2 Specialist Studies

The assumptions and limitations applicable to the specialist's assessment completed as part of this EIA are tabulated in Table 11-1.

Table 11-1: Specialist Studies Assumptions and Limitations

Specialist Assessment	Assumptions/ Limitations/ Uncertainties
Hydrogeological Appraisal	• No dedicated aquifer testing was undertaken for the Proposed Project yet. This resulted in low confidence of the modelling flow results. More site-specific drilling, aquifer testing and modelling is required to determine the extent of the impact more accurately and refine the placement of the planned infrastructure to ensure that it is not located directly on the Karibib Marble aquifer, which is a major groundwater resource. • Mass transport modelling has not been conducted to simulate the predicted impact of disposing additional materials from the Project at the existing TSF. • No static or kinetic geochemical testing has been undertaken for the Antelope Area to determine the acid rock generation potential and metal leach results of the deposit yet. additional geochemical testing of core and tailings test material from the Antelope area will be required to confirm this • The planned mine surface infrastructure such as the Antelope WRD, ROM pad at the Antelope site was not included in any mass transport model. This will have to be considered in the updated model when additional data from drilling of monitoring and dewatering boreholes is available to quantify the expected impact more accurately.
Terrestrial Biodiversity Assessment	• The report draws on two primary sources of ecological information: o A 2008 specialist report prepared as part of the original ESIA for the Otjikoto Mine, and o A rapid ecological assessment conducted in 2025, focusing on the proposed extension of underground mining operations. • It is assumed that the information contained in these reports is accurate and remains representative of the current ecological baseline, particularly where field verification was not possible. However, given the time elapsed since the 2008 assessment, some ecological dynamics, such as species composition, habitat integrity, or disturbance regimes, may have changed. • The recent (2025) field survey team encountered access restrictions along the northwestern boundary of the study area, adjacent to the existing TSF, and along linear infrastructure extending from the northern boundary. As a result, direct ground-truthing in these areas was not possible. Habitat delineations for these portions of the site were therefore inferred using recent high-resolution satellite imagery (dated May 2025) and desktop delineated (Game farm Fence and northern portion of the Powerline), supplemented with professional judgement and field knowledge from accessible areas. While every effort was made to ensure accuracy, the ecological condition of these inaccessible zones may differ slightly from what is presented. • The 2025 assessment was conducted during a limited field campaign, which may not have captured the full seasonal variation in species presence, particularly for cryptic, migratory, or ephemeral taxa (e.g., certain amphibians, annual plants,

Specialist Assessment	Assumptions/ Limitations/ Uncertainties
	or seasonal pollinators). Observations represent a snapshot in time and therefore may not fully reflect long-term ecological trends or annual variation. Data captured during the 2008 assessment was used to supplement gaps in the information. • In areas where direct access or recent field verification was not possible, it was assumed that the structure, species composition, and disturbance regime of habitats are consistent with those observed in ecologically similar and adjacent areas. This assumption applies particularly to disturbed habitats and transitional zones. • While desktop tools (e.g., GIS and satellite imagery) allow for broad-scale habitat delineation, they are limited in their ability to detect subtle variations in habitat quality, degradation, or species presence. Features such as low-level bush encroachment, grazing intensity, invasive plant colonisation, and small ephemeral pans may be under- or overrepresented without field validation. • It is assumed that the delineated boundaries of existing infrastructure (e.g., TSF, roads, pipelines) provided for analysis are spatially accurate and align with ground conditions. Any inaccuracies in these spatial datasets may influence the extent of assessed habitat impact and receptor sensitivity. • The report assumes that cumulative ecological impacts from historical and ongoing activities in the area (e.g., previous mining, grazing, fire) are reflected in the current state of the habitat. However, no detailed cumulative impact modelling was conducted. • Where data gaps existed, professional judgement informed by regional ecological knowledge and experience with similar biomes was applied to interpret habitat condition, resilience, and biodiversity value.
Noise Impact Assessment	• The noise level meters were calibrated before and after completion of a series of noise readings. • The daytime noise levels were the same as the nighttime noise levels as this is a 24-hour mining operation. • Partially opencast mining will take place during the construction and operational phases pf the proposed Project. • Power Plant, Processing Plant, Crushing Plant with some of the workshops will continue with the activities. • The noise calculations and risk assessment was based on historic data, which did not necessarily comply with the IFC's guidelines instead of new environmental noise data for day and nighttime respectively. • Atmospheric conditions such as wind speed not exceeding 5.0m/s were taken into consideration. • An easterly wind was blowing during the noise survey.
Air Quality Impact Assessment	• Unless otherwise stated, operational information was extracted from available documents provided to SLR by OGM as referenced throughout. It is assumed this information is true and accurate. Any errors, limitations, or assumptions inherent in this data may therefore extend to this study. • SLR has prepared this report in a manner that is consistent with the level of care and skill ordinarily exercised by members of the engineering and science professions currently practising under similar conditions in the jurisdiction in which the services are provided.

Specialist Assessment	Assumptions/ Limitations/ Uncertainties
	• Various assumptions associated with the source inventory are explicit in this report. These include operational assumptions and the application of generic emission factors. Where applicable, environmentally conservative assumptions were applied. • Where emissions are based on activity data provided for extended timescale (e.g. throughput per annum), it was assumed that activity levels were constant over the specified activity period and averages applied. • An emissions inventory and proposed site layout were approved by the Client prior to the commencement of dispersion modelling. The approved layout positioned the HDV haul road running along the northeastern side of the ROM Pad and WRD areas. The site layout was subsequently revised, with the HDV haul road now surrounding these operational areas on all sides. This change was communicated after modelling was completed and the draft AQIA submitted for comment. As such, the dispersion model does not reflect the updated haul road layout, however, this change is not expected to materially affect the dispersion results or overall findings of this assessment. • The estimation of emissions from mining activities (e.g. hauling) has a lower confidence than in the assessment of stationary combustion sources, where emission estimates are based on vendor data or legislated emission limits and well-known physical parameters such as exhaust volume flow rates, velocity, temperature and a fixed release height. • Although AERMOD is equipped with algorithms for modelling dry deposition of dust, there are inherent limitations associated with modelling dust fallout, and thus modelling results should be viewed as indicative.
Cultural Heritage Impact Assessment	• This survey and impact assessment assumes that all background information provided by the proponent is accurate and up to date. The assessment therefore focused mainly on the Proposed Project area and its immediate surroundings. It does not apply to and may not be used for any other future developments and expansions of the Project outside the assessed areas. • This heritage field survey and assessment were only limited to the extensive examination of the Project surfaces. Therefore, no sub-surface research was conducted. It is always possible that hidden or subsurface heritage remains could be overlooked. Consequently, the appended Chance Find Procedure Guidelines should be adopted for use in managing such subsurface or previously unidentified remains. • With regard to the issues of accessibility to the Project sites, access to the mine and reserve, which is made up of various commercial farms, is restricted and required clearance from Otjikoto Mine's environmental department. A valid Heritage Research Permit 01/2025 issued to the author from the National Heritage Council facilitated this heritage study.

12.0 Environmental Statement and Conclusion

SLR has undertaken the ECC amendment application process and subsequent reporting – including the EIA Report and EMP – for the Project in full compliance with the requirements of the EMA. The primary objective of this EIA and EMP is to assess and present the identified positive and negative environmental and socio-economic impacts associated with the revised Proposed Project activities.

The EIA process has incorporated a transparent public participation component, ensuring the identification of relevant stakeholders, providing them with sufficient opportunities to engage in the process, and guiding technical investigations conducted during the Impact Assessment Phase. The assessment has been informed by extensive specialist studies on key environmental aspects previously considered in the 2012 and 2019 EIAs. The studies that have been updated to reflect the revised layout plan include the groundwater impact assessment, heritage and archaeological assessment, biodiversity impact assessment (covering avifauna, vertebrates, flora, and invertebrates), noise impact assessment, and air quality impact assessment.

A summary of the EIA is presented in Table 9-33. The assessment indicates that the Project's impacts post-mitigation ranges from highly positive and Very Low to Medium negative.

A comparative analysis of the impacts assessed in the 2012 and 2019 EIA indicates that the revised Proposed Project will not result in increased adverse impacts. The changes in layout and LOM have led to an expanded operation with an extended LOM, contributing to impacts with a higher positive significance rating. While certain potential impacts identified during the Impact Assessment Phase were classified as highly significant, appropriate mitigation measures, as outlined in the EMP, can effectively minimize these adverse effects. Implementation of the EMP will be subject to ongoing monitoring and auditing to evaluate the efficacy of the prescribed mitigation measures.

From an Environmental Assessment Practitioner’s (EAP) perspective, based on the current Project description and findings derived from existing and recent site-specific studies, there are no identified constraints that would preclude the proposed development, provided that the recommended mitigation measures are effectively implemented.

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Declaration of Authorship

Application Number:	250711006097
Project Title:	Otjikoto Gold Mine Environmental Clearance Certificate Amendment

I, Kristy van der Hoven, (full name of Environmental Assessment Practitioner - EAP) understand and agree that the information I have furnished in this submission will be reviewed by the Office of the Environmental Commissioner (OEC). I accept that the Environmental Commissioner, will hold me accountable in terms of Section 43(1)(b) of the *Environmental Management Act*, Act No. 7 of 2007 for any inaccurate or misleading information knowingly provided in the following documentation.

Tick the box (es) applicable to your submission:

☐ Pro Forma Environmental Contract for Mining Claim(s)

☐ Environmental Questionnaire For Mining

☐ Scoping report

☒ Environmental Impact Assessment (EIA)

☒ Environmental Management Plan (EMP),

☐ Consent from Relevant Authority

I certify, and, acknowledge that the provision of such information will impede the lawful carrying out of the duties, responsibilities and functions of the Environmental Commissioner. I declare that the information submitted is my own work. All direct or indirect sources used are acknowledged as references.

Consultancy Name:	SLR Environmental Consulting (Namibia) (Proprietary) Limited

EAP Signature:	
Date:	13 October 2025

NB- To be submitted jointly with Scoping Report, EIA, EMP documents to the Office of the Environmental Commissioner

Record of Report Distribution

SLR Reference:	733.023119.00001
Title:	Environmental Impact Assessment
Client:	B2Gold Namibia (Pty) Ltd
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Appendix A Latest Environmental Clearance Certificate

Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

SLR Project No.: 733.023119.00001

ECC Application No: 250711006097

17 October 2025

Appendix B Project Team CVs

Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

SLR Project No.: 733.023119.00001

17 October 2025

Appendix C ECC Amendment Application

Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

SLR Project No.: 733.023119.00001

17 October 2025

Appendix D MEFT Environmental Screening Notice

Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

SLR Project No.: 733.023119.00001

17 October 2025

Appendix E Air Quality Impact Assessment

Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

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Appendix F Desktop Hydrogeological Appraisal

Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

SLR Project No.: 733.023119.00001

17 October 2025

Appendix G Terrestrial Biodiversity Specialist Report

Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

SLR Project No.: 733.023119.00001

17 October 2025

Appendix H Noise Impact Assessment

Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

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Appendix I Heritage Impact Assessment

Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

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Appendix J Environmental Management Plan

Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

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Appendix K Public Consultation Record

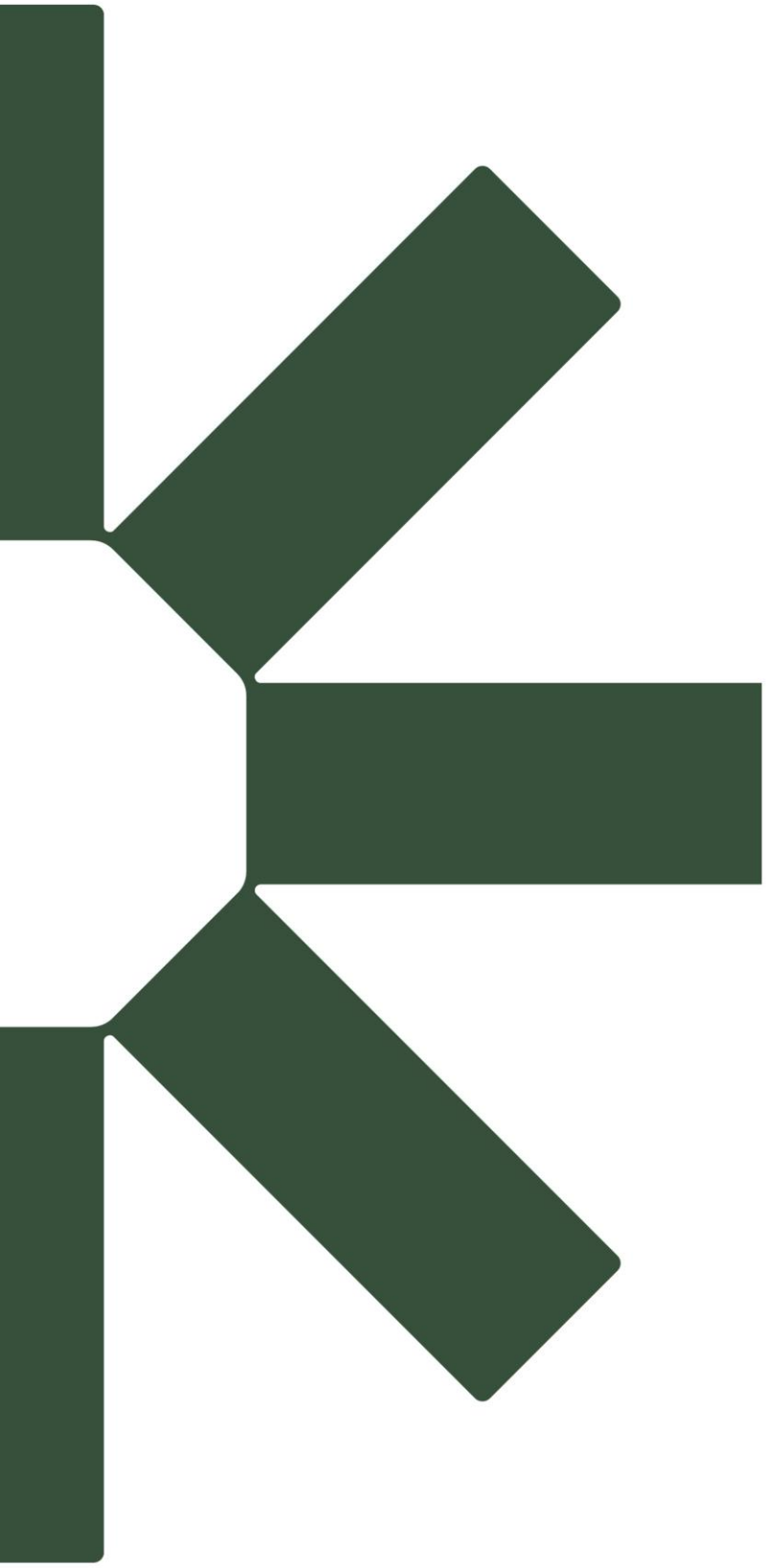
Environmental Impact Assessment

Otjikoto Gold Mine Environmental Clearance Certificate Amendment – Antelope Project

B2Gold Namibia (Pty) Ltd

SLR Project No.: 733.023119.00001

17 October 2025



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