Booysendal South Mine

Kopanya Solar Photovoltaic (PV) 2 Project



Final Rehabilitation, Decommissioning and Mine Closure Plan: Kopanya Solar Photovoltaic (PV) 2 Project

Report Information

This Report was compiled by Natural Evolution Group, by authors Anja van Deventer and William Macdonald.

Report title: Booysendal South Mine : Final Rehabilitation, Decommissioning and Mine Closure Plan: Kopanya Solar Photovoltaic (PV) 2 Project

Report status: Final

Report date: 30 October 2026

Report reference: NEG_PRJ_BOD_004

Disclaimer

This Final Decommissioning, Closure, and Rehabilitation Report (the "Report") has been prepared by Natural Evolution Group (NEG) for the exclusive use of Booysendal Platinum Proprietary Limited ("the Client"), a subsidiary of Northam Platinum Limited, specifically regarding the Kopanya Solar PV 2 Project ("the proposed Project") located within the Booysendal South (BS) Mining Right (MP 30/5/1/2/3/2/1 (127) (10333) MR).

In compiling this Report, NEG has relied extensively on technical data, site assessments, and project specifications provided by GCS Environment South Africa (Pty) Ltd (GCS) (the Environmental Consultant) and other third-party stakeholders.

While NEG has exercised professional judgement in reviewing the provided data, it has not independently or exhaustive verified the accuracy or completeness of information supplied by GCS or the Client.

NEG assumes no responsibility for any inaccuracies, omissions, or misinterpretations arising from data supplied by others.

The findings, conclusions, and rehabilitation recommendations contained herein are based on:

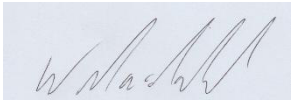
- The current preliminary design of the proposed Project infrastructure as of 29 October 2026.
- Existing environmental regulations within South Africa and the Thaba Chweu Local Municipality, which is part of the Ehlanzeni District Municipality in the Mpumalanga province of South Africa.
- The specific physical and geographical conditions of the site at the time of assessment.

Rehabilitation requirements and closure costs are subject to change due to evolving legislative frameworks, market fluctuations in Platinum Group Metals mining, or unforeseen environmental shifts.

This Report is based on the Department of Mineral Resources Regulation (Government Notice Regulation (GNR) 1147) as published in 2005 and is intended for submission to the regulator for the purpose of obtaining authorisation for the proposed Project.

The opinions expressed in this Report are made in good faith and represent the professional judgement of NEG. However, no warranty, expressed or implied, is made as to the professional advice included in this Report.





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Executive Summary

This Final Rehabilitation, Decommissioning and Mine Closure Plan (FRDCP) has been prepared for the proposed Kopanya Solar Photovoltaic (PV) 2 Project (the proposed Project), an up to 20 megawatts alternating current (MWAC) utility-scale photovoltaic facility to be developed within the existing Booysendal South (BS) Mining Right area in Mpumalanga. The Report has been compiled in accordance with the Department of Mineral Petroleum and Resources (DMPR) closure cost guidelines (2005 publication), the Mineral and Petroleum Resources Development Act (MPRDA), the National Environmental Management Act (NEMA), and the Financial Provisioning Regulations (Government Notice Regulation (GNR 1147). It establishes the closure objectives, rehabilitation methodology, environmental risk management measures, and financial liability associated with the eventual decommissioning of the facility.

The proposed Project forms part of Northam Platinum's renewable energy strategy to improve energy security, reduce greenhouse gas emissions, and decrease reliance on the national electricity grid. Although the operational life of the facility is expected to be approximately 25 years, closure planning has been incorporated into the Project design to ensure that environmental liabilities are appropriately managed from inception through to post-closure.

The proposed closure strategy is based on the complete removal of all photovoltaic infrastructure, associated electrical equipment, buildings, foundations where required, and ancillary infrastructure. Recyclable materials, including photovoltaic panels, steel mounting structures, electrical components and other recoverable materials, will be prioritised for reuse or recycling to minimise waste generation. Remaining waste streams will be managed in accordance with applicable waste management legislation and the Mine's approved waste management procedures.

Following infrastructure removal, disturbed areas will undergo comprehensive rehabilitation aimed at restoring land capability and returning the site to a self-sustaining indigenous grassland ecosystem consistent with the surrounding Sekhukhune Montane Grassland. Rehabilitation activities will include decompaction of disturbed surfaces, replacement of topsoil, erosion control, soil amelioration where required, revegetation using indigenous endemic species, and ongoing monitoring of vegetation establishment and ecosystem recovery. Particular emphasis is placed on the early detection and eradication of alien invasive plant species, identified as the primary long-term rehabilitation risk.

The environmental risk assessment indicates that the majority of decommissioning impacts are temporary, localised and readily mitigated through implementation of standard environmental management measures. Temporary increases in dust generation, vehicle emissions, noise, soil disturbance, waste generation and surface water sedimentation are anticipated during dismantling activities but reduce to low or negligible significance following mitigation. Conversely, rehabilitation activities generate substantial long-term positive environmental outcomes through improved soil function, increased biodiversity, enhanced water infiltration, restoration of ecological connectivity, improved landscape character and recovery of indigenous habitat.

The cumulative impact assessment similarly concludes that while short-term cumulative impacts may occur during dismantling, the successful implementation of rehabilitation measures will result in progressively increasing cumulative environmental benefits across the broader mining landscape. Restoration of vegetation cover, improved ecosystem functioning and integration with concurrent mine rehabilitation initiatives are expected to provide a positive contribution to regional environmental recovery.

The financial liability assessment has been prepared using the current DMPR Master Rates methodology, supplemented with market related costs where existing rates do not adequately address modern photovoltaic infrastructure. The estimated total closure liability for the proposed Project amounts to **R6 474 968 (including VAT)**, comprising direct rehabilitation costs, Preliminary and General costs, contingency allowances and statutory VAT. This estimate provides an appropriate financial provision to ensure that rehabilitation, decommissioning and closure obligations can be fully implemented should premature or planned closure occur.

Overall, the FRDCP demonstrates that the proposed Project can be decommissioned and rehabilitated in a manner that is technically achievable, environmentally responsible and consistent with current South African legislative requirements. Through progressive planning, appropriate financial provisioning and implementation of the prescribed rehabilitation measures, the Project is expected to achieve a sustainable post-closure land use that supports long-term ecosystem recovery and aligns with the closure objectives of the BS Mine.

Proposed Kopanya Solar PV 2 Project: Department of Petroleum and Resources Closure Cost Summary

	COST
SUM of Closure Components	R4 195 534
Weighting Factor 2	1.1
SUB TOTAL 1 (Excluding VAT, Preliminary and General, and Contingency)	R4 615 087
Preliminary and General 12%	R553 810
Contingency 10%	R461 509
SUB-TOTAL 2 (Preliminary and General + Contingency)	R1 015 319
SUB TOTAL 3 (Excluding VAT)	R5 630 407
VAT @15%	R844 561
GRAND TOTAL	R6 474 968

Abbreviations

BS	Booysendal South
BOQ	Bill of Quantities
DMPR	Department of Petroleum and Resources
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
FRDCP	Final Rehabilitation, Decommissioning and Closure Plan
GN	Government Notice
GNR	Government Notice Regulation
LoM	Life of Mine
LoP	Life of Project
MR	Mining Right
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002)
NEMA	National Environmental Management Act (Act No. 107 of 1998)
OEM	Original Equipment Manufacturer
PCS	Power Conversion System
PV	Photovoltaic
SANS	South African National Standard
WUL	Water Use Licence

Definitions

Annual Rehabilitation Plan	Means a plan contemplated in Regulations 6(a) and 11 (1)(a) of the Financial Provisioning Regulations of 2015 GNR 1147.
Decommissioning	Means the shutdown of an operation with the removal of buildings and the withdrawal from service of equipment, plant and machinery used in relation to an operation regulated in terms of the Mineral and Petroleum Resources Development Act.
Environmental Impact Assessment Regulations	Means the Regulations published in terms of sections 24(5) and 44 of the Act.
Final Rehabilitation, decommissioning and mine closure plan	Means a plan contemplated in regulation 6(b) and 11(1) (b) of the Financial Provisioning Regulations of 2015 GNR 1147.
Holder	Means the holder of- (a) an environmental authorisation for an activity for which the Minister has issued an exemption in terms of section 106(1) of the Mineral and Petroleum Resources Development Act; and (b) an old order right, permission, permit and right issued in terms of the Mineral and Petroleum.

Independent	in relation to a specialist or auditor conducting tasks identified in these Regulations, (a) such specialist or auditor has no business, financial, personal or other interest in undertaking such tasks excluding normal and fair remuneration for work performed in connection with such tasks; or (b) there are no circumstances that may compromise the objectivity of that specialist or auditor in performing such tasks; and (c) in the case of the oil and gas sector, such specialist or specialist team may be from a parent or affiliate company.
Low Risk Commodities	Means minerals which pose a low latent environmental risk when mined and are: (a) clay, (b) aggregate, (c) slate, (d) pebbles, (e) diamond, (f) sand, but excludes - (i) base metals; and (ii) minerals identified in (a) to (f) mined through underground mining methods.
Market Related	Means the total cost of delivering goods or services to a customer, exclusive of VAT;
Master Rate	Means the prescribed rate applied to specific mitigation and rehabilitation activities for an operation identified in regulation 7, to be undertaken progressively, at decommissioning and closure and post-closure to manage post-closure impacts.
Mitigate	Means to alleviate, reduce or make less severe.
Post-closure	Means the period after a closure certificate is issued in terms of the Mineral and Petroleum Resources Development Act.
Progressive Rehabilitation	Involves the staged mitigation and rehabilitation of disturbed areas throughout the life of the operation, as opposed to the large-scale works at the end of the operation.
Risk Profiling	Means to provide a non-subjective understanding of risks posed by a prospecting operation which includes the removal and disposal of a mineral and a mining, exploration or production operation by assigning numerical values to variables representing different types of environmental risks and the dangers they pose.
Specialists	Means a team of professionals who are qualified by virtue of their demonstrable knowledge, qualifications, skills or expertise in the mining, environmental science, water management and treatment, resource economy, engineering and quantity surveying.
Sustainable End State	Is the site specific situation for land, water and air at the time of reaching the risk threshold.

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1 Introduction

Booysendal is located approximately 33 kilometres (km) west of Mashishing (Lydenburg), 40 km south-southwest of Steelpoort, 32 km north of Dullstroom, and 21 km northeast of Roossenekal (refer to **Figure 1-1**). Booysendal operates under two mining rights, namely the Booysendal North mining right (Department of Mineral Resources and Energy (DMPR) reference number: LP 30/5/1/3/2/1 (188) MR) and the Booysendal South (BS) mining right (DMPR reference number: MP 30/5/1/2/3/2/1 (127) (10333) MR).

The following Report outlines the proposed development of the Kopanya Solar Photovoltaic (PV) 2 Project (the proposed Project). This initiative represents a strategic investment in renewable energy by Northam Platinum, aimed at bolstering the energy resilience of the BS Mine.

By integrating an up to 20 megawatts alternating current (MWAC) utility-scale solar facility directly into existing mining operations, the Project seeks to mitigate the risks of national grid instability, reduce carbon emissions, and manage escalating electricity costs.

This Report sets the closure planning and liability calculation of this Project in terms of the relevant legislation.

1.1. Purpose of the Final Rehabilitation, Decommissioning and Closure Plan

As the proposed Project is located within an existing mining right area, the financial provisioning assessment contained in this Report is based on the closure liability requirements applicable to mining operations, as outlined in **Section 1.2** below.

This Report defines the end-of-project rehabilitation parameters that form the basis for the calculation of the financial liability associated with the proposed development. The Final Rehabilitation, Decommissioning and Mine Closure Plan (FRDCP) is regarded as a living document and should therefore be updated periodically as new technologies, improved rehabilitation methodologies, and legislative amendments emerge. Practices that represent best practice at present may become outdated in the future as more effective and efficient rehabilitation approaches are developed.

Taking this into consideration, this Report has been prepared with due regard to applicable statutory requirements and recognised international best practice. NEG further adopts a holistic approach to rehabilitation, decommissioning, and closure, ensuring that environmental, technical, and long-term sustainability considerations are integrated into the closure planning process.

The objectives of this Report are as follows:

- Provide the vision, objectives, targets, and closure criteria for the FRDCP.
- Outline the design principles applicable to closure and rehabilitation.
- Explain the risk assessment approach and outcomes, including linking closure activities to identified rehabilitation risks.
- Detail the closure actions that will be implemented to mitigate and/or manage identified risks and describe the nature of any residual risks that will require monitoring and management during the post-closure phase.
- Commit to a schedule, budget, and clearly defined roles and responsibilities for rehabilitation, decommissioning, and closure of each relevant activity or item of infrastructure.
- Identify knowledge gaps and outline how these will be addressed or resolved over time.

- Detail the current estimated closure costs for the proposed Project.
- Provide life of Project closure cost estimates with increasing levels of accuracy as the Project develops and approaches closure, in alignment with the proposed final land use.
- Outline the monitoring, auditing, and reporting requirements associated with rehabilitation, decommissioning, and closure activities.

1.2. Legal Context of Closure Liability Calculations

This Report aligns with the Petroleum Resources Development Act (MPRDA) closure cost reporting structure, based on the DMPR closure guidelines published in 2005. It is important to note that the technology employed in the proposed Project was not widely implemented at the time these guidelines were developed. It was therefore necessary to include site specific cost items within the 2005 DMPR Master Rates Table (escalated by the Consumer Price Index (CPI)), with certain items costed using actual market related rates in accordance with the legislative framework set out below.

Regulation 54(1) of the Mineral and Petroleum Resources Development Regulations, 2004, states:

"The quantum of financial provision shall include a detailed itemisation of all actual costs required for: (a) premature closure; (b) decommissioning and final closure; and (c) post-closure management of residual and latent environmental impacts."

While the regulation refers to "actual costs", the DMPR historically provided a Master Rates Table to simplify cost estimation for commonly occurring closure activities.

The Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine (issued in 2005 under the authority of Regulation 54(1)) follows a standardised approach based on the published Master Rates. However, the guideline clarifies that:

- For items listed in the Master Rates Table, applicants may use the published rates, escalated annually using CPI.
- For items not listed in the Master Rates Table, or where the published rates are outdated, applicants must provide a detailed itemisation of actual costs based on specialist studies, contractor quotations, or project-specific estimates.

As of October 2026, the legislative framework governing financial provision for mine closure in South Africa remains in a transitional phase. The primary regulations currently in force are the Financial Provisioning Regulations, 2015, promulgated under National Environmental Management Act (NEMA). However, its full implementation has been delayed through several amendments and extensions.

In preparation for the full implementation of the NEMA Financial Provisioning Regulations (Government Notice Regulation (GNR 1147)) applicable to prospecting, exploration, mining, and production operations in South Africa, and specifically Appendix 3 of GNR 1147, this Report provides a structured framework for mine closure planning and for the development of Annual Rehabilitation Plans.

The latest regulations and current legal status are summarised below.

1.2.1 The Primary Legislation: Financial Provisioning Regulations, 2015

Promulgated under NEMA, these regulations replaced the previous financial provisioning requirements contained within the MPRDA regulatory framework. The regulations are designed to

ensure that the “polluter pays” principle is implemented and that mining operations maintain adequate ring-fenced financial provision for rehabilitation, decommissioning, and post-closure management.

1.2.2 The Latest Promulgated Update (February 2024)

The most significant recent regulatory update occurred on 1 February 2024, when the Minister of Forestry, Fisheries and Environment (DFFE) published an amendment to the transitional arrangements.

- Previous position: Existing holders (those who applied for mining rights before 20 November 2015) were required to comply with the 2015 Financial Provisioning Regulations by a specific deadline.
- Amendment: The February 2024 amendment introduced an indefinite extension for these existing rights holders.
- Current legal status: These rights holders are only required to comply with the 2015 Regulations by a future date to be published in the Government Gazette. Until such date is determined, they must continue to comply with the financial provisioning arrangements approved under their original MPRDA authorisations.

1.2.3 The "Replacement" of the Financial Provisioning Regulations, 2015 (Draft Status)

The 2015 Financial Provisioning Regulations, including draft revised regulations published in 2021, have not been fully implemented, and DFFE has therefore been developing a rerevised Financial Provisioning Regulations, 2022.

The proposed replacement regulations aim to:

- Simplify the financial provisioning calculation methodology.
- Address industry concerns regarding double funding of concurrent rehabilitation activities; and,
- Introduce a risk-based approach for certain mining operations.

The Final FRDCP will form a component of the Environmental Management Programme (EMPr) submitted in terms of Section 24N of NEMA and the Environmental Impact Assessment (EIA) Regulations, 2014. As such, the FRDCP will be subject to the same requirements applicable to the EMPr, including opportunities for stakeholder review and comment and independent auditing.

As of October 2026, these regulations have not yet been promulgated into law.

1.2.4 Site Specific Legal Obligations

The existing BS mining right and associated water use licence each carry their own legally binding closure obligations. Accordingly, both the mining right area and the authorised water use activities must comply with their respective closure and rehabilitation requirements.

The closure objectives presented in this Report have been derived from the applicable authorisations and supporting documentation and are incorporated into the closure planning framework discussed herein.

The financial closure liability calculation contained in this Report is based on the “existing mining right” methodology, using escalated DMPR Master Rates. Where new technologies or

infrastructure components are not included within the Master Rates Table, actual demolition and rehabilitation costs have been applied in the calculation.

2. Administrative Information

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Applicant	Booysendal Platinum Proprietary Limited
Right reference number	MP 30/5/1/2/3/2/1 (127) (10333) MR)
Commodity type	Platinum
Competent authority	Department of Mineral and Petroleum Resources

3. Description the Project

The following Project description has been provided by GCS Environment South Africa.

3.1. Introduction

Booysendal proposes to develop the proposed Project, comprising a utility-scale solar PV facility with a generation capacity of up to 20 MWac and associated infrastructure at the BS Mine.

The proposed Project forms part of Northam's broader energy resilience and sustainability strategy and supports Northam's strategic objectives to enhance energy security, reduce greenhouse gas emissions, and mitigate escalating electricity costs that exceed inflation. The Project is intended to primarily supply electricity to the BS Mine through self-generation and demand management, thereby reducing reliance on grid electricity amid ongoing load reductions and increasing energy

tariffs. Any surplus electricity generated by the facility will be exported to the national electricity grid within the Maximum Export Capacity.

3.2. Project Location and Site Context

The proposed Project will be developed within the existing BS Mine area and will occupy a development footprint of approximately 41 hectares (ha). The Project site is located on Portion 15 of the Farm No. 53 JT, near Mashishing, within the Thaba Chweu Local Municipality, which falls within the Ehlanzeni District Municipality in Mpumalanga Province, South Africa.

Associated grid connection infrastructure, including a proposed 132 kilovolt (kV) overhead power line, will traverse the Remaining Extent of Portion 8 and Portion 17 of the Farm No. 53 JT.

The proposed Project site is situated approximately 30 km west of Mashishing and is accessed via the R577 regional road, followed by established mine access roads.

3.3. Project Background

South Africa's electricity sector continues to experience structural challenges, including constrained generation capacity, ongoing load reductions, grid instability, and increasing electricity tariffs. These challenges present significant operational and financial risks to electricity-intensive industries such as mining, where continuous and reliable power supply is essential for safe and efficient operations.

In response to these challenges, Northam has adopted a broader energy resilience and sustainability strategy aimed at improving energy security, reducing greenhouse gas emissions, and limiting exposure to escalating grid electricity costs. This strategy includes the development of on-site renewable energy generation and improved demand management to supplement grid supply.

The proposed Project has been identified as a key component of this strategy. By enabling on-site renewable electricity generation, the Project will support the Mine's operational requirements while contributing to national renewable energy objectives and energy transition initiatives.

3.4. Need and Desirability

The need for the proposed Project arises from both national-level energy constraints and site-specific operational requirements at the BS Mine.

At a national level, the proposed Project supports South Africa's renewable energy and climate change mitigation objectives by contributing additional clean generation capacity and reducing reliance on fossil-fuel-based electricity. Solar PV facilities are widely recognised as a proven and reliable renewable energy technology capable of supporting grid stability and reducing greenhouse gas emissions.

At a site-specific level, the BS Mine requires a secure and reliable electricity supply to support underground mining operations, mineral processing activities, and associated infrastructure. Grid instability, ongoing load reductions, and increasing electricity tariffs pose risks to operational continuity and long-term economic viability.

The proposed Project is intended to primarily supply electricity to the BS Mine through self-generation and demand management, thereby reducing reliance on grid electricity amid ongoing

load reductions and increasing energy tariffs. Any surplus electricity generated by the facility will be exported to the national electricity grid within the Maximum Export Capacity. The proposed Project will therefore enhance energy security, improve operational resilience, and contribute to the long-term sustainability of mining operations in the region.

3.5. Description of the Proposed Development

3.5.1. Overview of the Proposed Facility

The proposed Project will comprise a utility-scale solar photovoltaic facility with an installed generation capacity of up to 20 MWAC. The facility will be developed within the existing BS Mine area and has been designed to integrate with existing mining and electrical infrastructure.

The Project will utilise single-axis tracking bifacial solar PV panels, enabling increased energy yield through improved solar exposure throughout the day. The development has been purposefully designed to minimise additional land disturbance by locating the facility within an established mining area and using modular, industry-standard infrastructure.

3.5.2. Solar PV Arrays and Tracking System

The solar PV facility will comprise up to approximately 35 000 bifacial solar panels, each with a typical wattage of greater than 600 watts (W). The panels will be mounted on single-axis tracking systems, allowing the panels to follow the sun's movement from east to west and optimise electricity generation.

The racking and tracking systems will be constructed from steel sections supported by driven piles, reducing the need for extensive concrete foundations and limiting ground disturbance. Panel structures will be designed to accommodate site specific geotechnical conditions, wind loading, and long-term operational requirements.

3.5.3. Electrical Infrastructure and Grid Connection

The Project will include the following electrical and grid connection infrastructure:

- A 132 kV overhead power line connecting the solar PV facility to the grid connection infrastructure;
- An on-site PV substation to collect and regulate electricity generated by the PV arrays;
- A step-down substation located adjacent to the existing Eskom substation; and
- Power transformer stations, inverters and associated electrical infrastructure housed in prefabricated units or electrical houses (e-houses).

Electricity generated by the facility will be used primarily to supply the BS Mine. Any surplus electricity generated will be exported to the national electricity grid, with Eskom remaining the grid operator.

3.5.4. Temporary Construction Infrastructure

Temporary infrastructure required during the construction phase will include:

- A construction yard and laydown areas of approximately 1 ha;
- Site offices, storage areas, and temporary ablution facilities;
- Temporary services required to support construction activities.

Construction of the proposed Project is anticipated to occur over a period of approximately 15 months. At peak construction, an estimated 300 personnel will be employed, comprising skilled and semi-skilled labour associated with civil works, electrical installation, and commissioning activities.

3.5.5. Permanent Operational Infrastructure

Permanent operational infrastructure associated with the proposed Project will include:

- Internal and access roads
- Buildings for operations, maintenance, control, and storage purposes;
- An operations and maintenance warehouse;
- Parking areas for operational staff and service vehicles; and
- Security facilities, including access control points.

The operational lifespan of the proposed Project is anticipated to be approximately 25 years, during which an estimated 20 personnel will be employed for routine operation, maintenance, and security functions.

3.5.6. Supporting Infrastructure and Services

Additional supporting infrastructure will include:

- Water supply and sanitation systems, utilising conservancy tanks;
- Internal and access roads, linking the facility to existing mine infrastructure;
- Security and access control infrastructure, including perimeter fencing of up to approximately 3 100 metres (m); and
- Telecommunications systems to support monitoring, control, and security operations.

Stormwater management infrastructure will be designed to maintain natural drainage patterns, promote dispersed runoff and infiltration, and minimise erosion, sedimentation and concentrated discharge into wetlands and drainage features. Depending on the final engineering design, measures may include vegetated swales, diversion berms, cross-drainage structures, energy dissipation measures and sediment control infrastructure.

3.5.7. Water Requirements and Management

Water will be required primarily during the construction phase of the proposed Project for activities such as dust suppression, concrete works, and general construction purposes. Total construction phase water demand is estimated to be approximately 1 790 cubic metres (m^3) over the construction period.

During the operational phase, water requirements will be limited and associated mainly with routine maintenance activities and domestic use within operational buildings. Operational water demand is estimated at approximately 518 m^3 per annum.

Water for both construction and operation will be sourced from existing Mine water supplies and/or boreholes, and no new water abstraction infrastructure is proposed as part of the Project. Water use will be managed in accordance with the Mine's approved water management procedures to ensure efficient utilisation and to prevent wastage.

The proposed Project will not involve any process water use, and no wastewater generation is anticipated during normal operation. Sanitation will be managed through conservancy tanks or

septic systems, with effluent removed and disposed of by appropriately licensed service providers, in accordance with applicable legislation and municipal requirements.

3.5.8. Waste Management

Waste will be generated during the construction, operational, and decommissioning phases of the proposed Project. All waste streams will be managed in accordance with the Mine's approved waste management procedures, the National Environmental Management: Waste Act no 59, 2008, and recognised industry best practice.

3.6. Construction Phase

During the construction phase, both non-hazardous and hazardous waste streams will be generated. Waste volumes are anticipated to be temporary and largely associated with civil works, installation activities, and workforce-related activities.

Non-hazardous waste will include:

- General domestic waste generated by construction personnel;
- Packaging materials associated with solar PV components, including wooden pallets, cardboard, plastics, polystyrene, and strapping materials;
- Scrap metal arising from mounting structures, tracker systems, cable trays, and minor steel off-cuts;
- Construction off-cuts, including electrical cabling, conduits, and plastic materials;
- Minor quantities of inert waste, such as concrete residues generated during foundation works; and
- Damaged, defective, or broken solar PV panels arising from transport, handling, or installation activities.

Solar PV panels damaged during delivery or installation will be handled with care to prevent further breakage. Intact but defective panels will, where possible, be returned to the supplier under warranty agreements. Broken panels will be stored in a designated, secure area to prevent glass dispersion and environmental contamination. Panels suitable for recycling will be sent to appropriately authorised recycling facilities.

Hazardous waste generated during construction will be limited in volume and will include:

- Small quantities of fuels, oils, and hydraulic fluids associated with construction vehicles and equipment;
- Oily rags, absorbent materials, used filters, and contaminated materials; and
- Empty containers that previously contained hazardous substances, such as oils, greases, and cleaning agents.

Hazardous waste will be stored in clearly demarcated, bunded areas with impermeable surfaces to prevent soil and groundwater contamination. All hazardous waste will be removed from site by licensed service providers and disposed of at authorised hazardous waste facilities in accordance with applicable legislation.

3.7. Operational Phase

Waste generation during the operational phase is expected to be minimal and largely associated with routine maintenance and administrative activities.

Non-hazardous waste during operation will primarily include:

- Limited domestic waste generated by operational and maintenance personnel;
- Minor packaging waste associated with spare parts and replacement components; and
- Scrap metal and redundant components arising from maintenance activities.

Hazardous waste during operation may include:

Used oils, lubricants, and cleaning materials associated with maintenance activities;

- Oily rags, absorbent materials, and used filters;
- Electrical components such as inverters or transformers containing oils or electronic parts.

Although intact PV panels are generally classified as general waste, damaged panels may contain glass, aluminium, silicon, polymers, and trace metals that require appropriate handling and controlled disposal or recycling. Damaged or replaced panels will be temporarily stored in a secure, weather-protected area to prevent environmental release of materials. Where feasible, panels will be recycled through specialised photovoltaic recycling facilities to recover reusable materials and minimise waste to landfill.

All operational waste will be collected, transported and disposed of in accordance with approved waste management procedures.

3.8. Decommissioning Phase

At the end of the proposed Project's operational lifespan, the facility may be decommissioned, repowered, or refurbished. The decommissioning phase will generate both non-hazardous and hazardous waste streams associated with dismantling and removal of infrastructure.

Waste generated during decommissioning will include:

- Non-hazardous waste, such as dismantled equipment, scrap metal, concrete material, fencing, and general waste associated with infrastructure removal;
- Solar PV panels, including damaged, obsolete, or end-of-life panels and associated mounting structures and electrical components; and
- Hazardous waste, including batteries (if applicable), electronic components, oils, and other hazardous materials.

Solar PV panels removed during decommissioning will represent one of the primary waste streams. Where panels remain functional, opportunities for reuse, resale, or repowering will be investigated. Panels that have reached end-of-life will be prioritised for recycling through specialised photovoltaic recycling facilities capable of recovering glass, aluminium frames, and other recyclable materials.

Electrical components, including inverters and transformers, will be assessed for potential refurbishment or recycling. Hazardous materials will be separated and managed in accordance with applicable waste legislation.

All decommissioning waste will be transported by licensed service providers to authorised waste management or recycling facilities. The decommissioning process will aim to maximise material recovery and recycling to support circular economy principles and minimise landfill disposal.

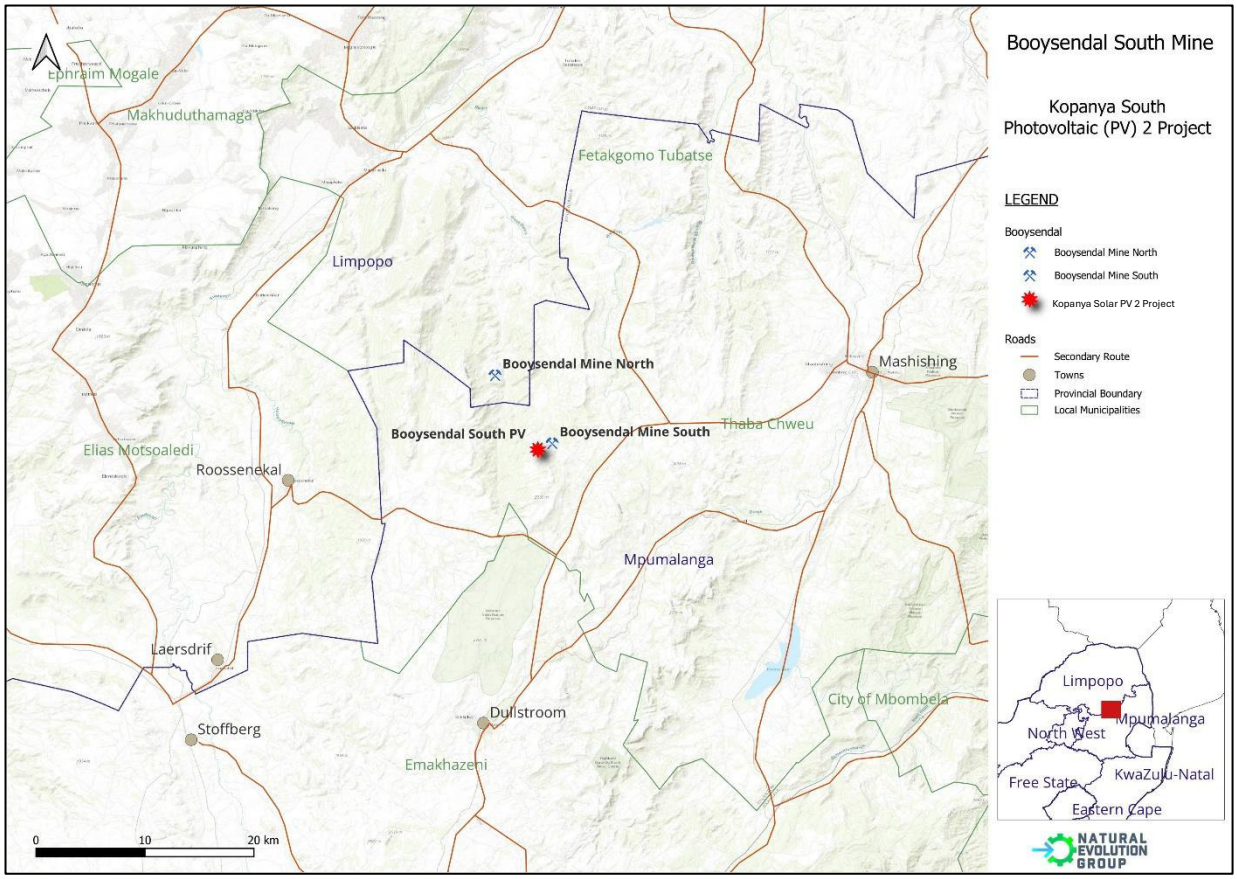


Figure -1-1: Project locality map

4. Closure Vision and Post-closure Land Use

The proposed Project area falls within the Sekhukhune Montane Grassland vegetation. It is characterised by summer rainfall, with very dry winters. The area falls within the summer rainfall regime with the Mean Annual Precipitation ranging from approximately 720 mm in the east to 600 mm in the west, much of the rain falling in the form of thunderstorms in summer from November to January. The mean daily temperature ranges from a minimum of 2.8ºC in winter to a maximum of 24.9ºC in summer. Daily temperatures vary considerably at different localities, with higher temperatures on the plains and lower temperatures on higher-lying plateaus (Mucina & Rutherford, 2018)

The Project specialist studies indicated that the area for the proposed Project is modified due to mining activities, that has resulted in lower biodiversity. The landscape has been further altered by alien invasive vegetation such as Black Wattle as well as vehicle movement.

The closure vision as per the EMPr of the mine states that all impacted areas should be rehabilitated to natural vegetation.

The closure process will start with the removal of infrastructure with the prospects of recycling all components that can be recycled. The waste that was identified are PV panels, inverters, posts and building rubble at an estimated tonnage of 569.5 tonnes.

After the removal all compacted surfaces needs to be ripped. The most compacted surfaces are the roads. This Project has a perimeter road covering an area of 15 322m^2, and two internal service roads covering an area of 1 771m^2 and 1 934m^2 respectively. A dedicated access road of 3 716m^2

will be constructed between the existing mine roads and the proposed Project area access point. The access road will require limited blasting as part of its construction. It is not envisaged that the blasting will have an impact on closure costs as it will be limited to surface blasts for the purpose of levelling the access road-bed.

The general surface rehabilitation is based on the EMPr requirement that the disturbance footprint is minimised, and vegetation removal be limited. No chemical applications will be used in this process. The assumption is thus that the soil will not be sterilised by any herbicide and mechanical methods of eradication only will be used during the life of the proposed Project.

The solar panels will however influence the growth of vegetation due to the shading effect. It is presumed that some seedbank will be available in the soil and the top 10 centimetres (cm) of the topsoil when all is placed back for surface rehabilitation.

The risk of alien invasion will be at its highest during the ripping and seeding phase of general surface rehabilitation because alien vegetation usually has seeds that is longer viable and more abundant in soil due to the high yields of such species.

Taking all of the above into account the general surface rehabilitation can be executed by ripping compacted areas, contouring with the topsoil from the topsoil stockpile, preparing the soil with the correct fertiliser or compost (depending on the soil analysis results) and revegetation with an indigenous, endemic seed mix.

This rehabilitation would need monitoring for at least 5 years with an alien invasive vegetation management plan of at least the first 2 years.

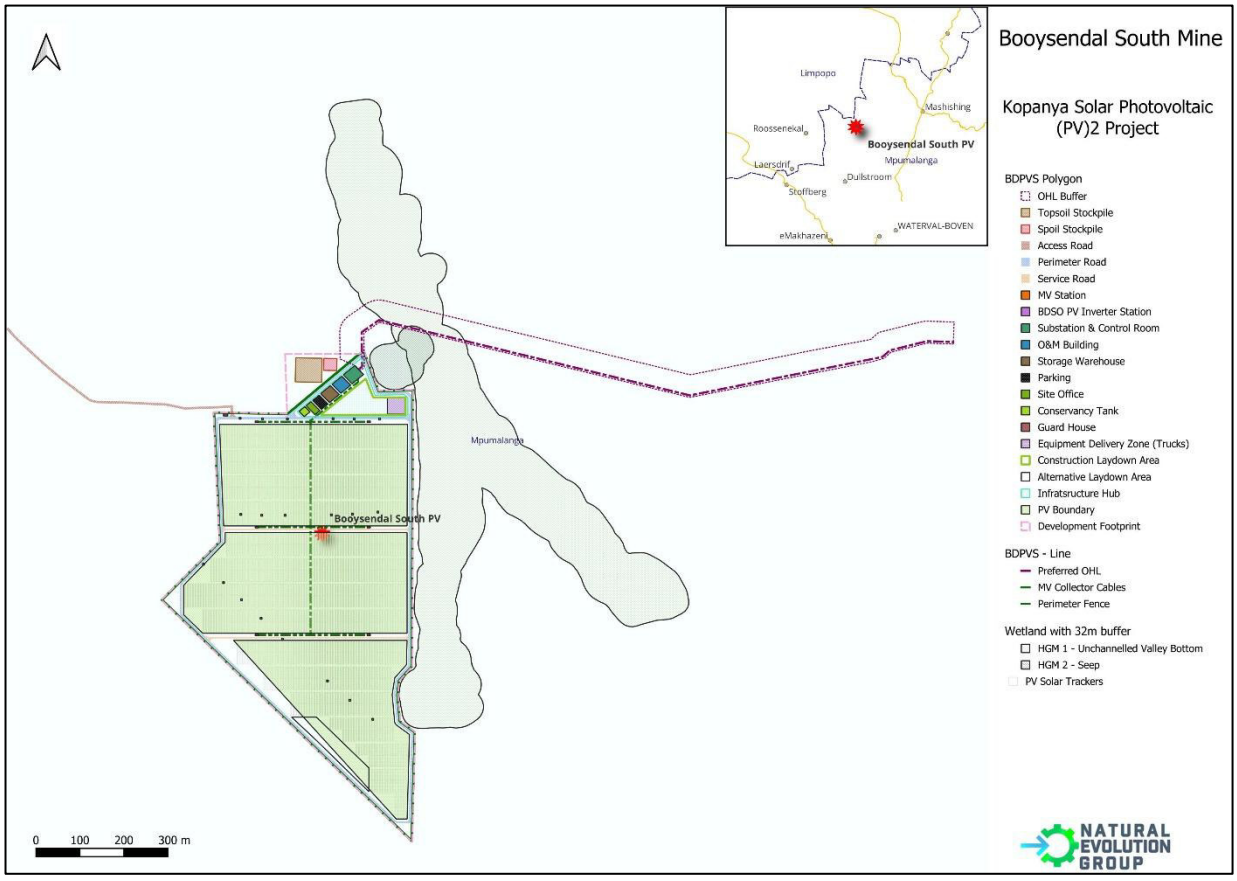


Figure 4-1: Site layout of the proposed PV plant on which the closure calculation and assumptions are based

5. Closure Risk Assessment

5.1. Methodology for Assessing Impacts

The impacts of the proposed Project will be assessed and rated according to the methodology described below and which was developed to align with the requirements of Appendix 3 of the EIA Regulations, 2014. The assessment process will follow a structured approach comprising four key activities:

- Identification and assessment of potential impacts likely to result from the proposed Project closure, decommissioning and rehabilitation activities.
- Prediction of the nature, magnitude, extent, and duration of these impacts, with specific focus on those that may be significant.
- Identification of appropriate mitigation measures to reduce, avoid, or manage the severity or significance of the potential impacts.
- Evaluation of residual impacts to determine the significance of the impact after implementation of mitigation measures.

The assessment of significance was guided by a set of criteria, including:

- Cumulative impacts in the broader environmental and social context.
- Nature of the impact, i.e., whether it is positive, negative, direct, or indirect.
- Extent of the impact, ranging from localised to regional or national scale.
- Probability of occurrence of the impact.
- Reversibility of the impact, i.e., whether it can be restored to pre-impact conditions.
- Irreplaceability of affected resources, considering whether resources lost can be substituted or recovered.
- Potential for mitigation, i.e., the extent to which the impact can be avoided, minimised, or offset.

The evaluation of significance followed a consequence–probability approach:

Consequence (Duration + Extent + Irreplaceability of resource) × Severity

The overall significance of an impact was then determined using the formula:

Significance (Consequence × Probability)

A summary of the criteria used to assess the significance of impacts is provided in **Table 5-1**, with detailed explanations presented in **Table 5-2**.

Table 5-1:Significance and impact table

Criteria	Rating Scales	Notes
Nature	Positive (+)	An evaluation of the effect of the impact related to the proposed development.
	Negative (-)	
Duration	Temporary (1)	The duration of the activity associated with the impact will last 0 - 6 months.
	Short-term (2)	The duration of the activity associated with the impact will last 6-18 months.
	Medium-term (3)	The duration of the activity associated with the impact will last 18 months - 5 years.
	Long-term (4)	The duration of the activity associated with the impact will last more than 5 years.
Extent	Footprint (1)	The impact only affects the area in which the proposed activity will occur.
	Site (2)	The impact will affect only the development area.
	Local (3)	The impact affects the development area and adjacent properties.
	Regional (4)	The effect of the impact extends beyond municipal boundaries.
	National (5)	The effect of the impact extends beyond more than 2 regional/ provincial boundaries.
	International (6)	The effect of the impact extends beyond country borders.
Severity	Low (1)	Where the impact affects the environment in such a way that natural, cultural, and social functions and processes are minimally affected.
	Moderate (2)	Where the affected environment is altered but natural, cultural, and social functions and processes continue albeit, in a modified way, and valued, important, sensitive, or vulnerable systems or communities are negatively affected.
	High (3)	Where natural, cultural, or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease, and valued, important, sensitive, or vulnerable systems or communities are substantially affected.

Criteria	Rating Scales	Notes
Potential for impact on irreplaceable resources	No (0)	No irreplaceable resources will be impacted.
	Yes (1)	Irreplaceable resources will be impacted.
Consequence	Extremely detrimental (-25 to -33)	A combination of extent, duration, intensity, and the potential for impact on irreplaceable resources.
	Highly detrimental (-19 to -24)	
	Moderately detrimental (-13 to -18)	
	Slightly detrimental (-7 to -12)	
	Negligible (-6 to 0)	
	Slightly beneficial (0 to 6)	
	Moderately beneficial (13 to 18)	
	Highly beneficial (19 to 24)	
	Extremely beneficial (25 to 33)	
Probability (the likelihood of the impact occurring)	Improbable (0)	It is highly unlikely or less than 50% likely that an impact will occur.
	Probable (1)	It is between 50 and 70% certain that the impact will occur.
	Definite (2)	It is more than 75% certain that the impact will occur or the impact will occur.
Significance	Very high – negative (-49 to -66)	A function of Consequence and Probability.
	High – negative (-37 to -48)	
	Moderate – negative (-25 to -36)	
	Low – negative (-13 to -24)	
	Neutral - Very low (0 to -12)	
	Low positive (0 to 12)	
	Moderate–positive (13 to 24)	
	High–positive (37 to 48)	
	Very high – positive (49 to 66)	

Table 5-2: Explanation of assessment criteria

Criteria	Explanation
Nature	This is an evaluation of the type of effect the construction, operation, and management of the proposed development would have on the affected environment. Will the impact of change on the environment be positive, negative, or neutral?
Extent or Scale	This refers to the spatial scale at which the impact will occur. The extent of the impact is described as footprint (affecting only the footprint of the development), site (limited to the site), and regional (limited to the immediate surroundings and closest towns to the site). The extent of scale refers to the actual physical footprint of the impact, not to the spatial significance. It is acknowledged that some impacts, even though they may be of a small extent, are of very high importance, e.g., impacts on species of very restricted range. To avoid "double counting," specialists have been requested to indicate spatial significance under "intensity" or "impact on irreplaceable resources" but not under "extent" as well.
Duration	The lifespan of the impact is indicated as temporary, short, medium, and long-term.
Severity	This is a relative evaluation within the context of all the activities and the other impacts within the framework of the project. Does the activity destroy the impacted environment, alter its functioning, or render it slightly altered?
Impact on irreplaceable resources	This refers to the potential for an environmental resource to be replaced should it be impacted. A resource could be replaced by natural processes (e.g., by natural colonisation from surrounding areas), through artificial means (e.g., by reseeding disturbed areas or replanting rescued species) or by providing a substitute resource, in certain cases. In natural systems, providing substitute resources is usually not possible, but in social systems, substitutes are often possible (e.g., by constructing new social facilities for those who are lost). Should it not be possible to replace a resource, the resource is essentially irreplaceable, e.g., red data species that are restricted to a particular site or habitat to a very limited extent.
Consequence	The consequence of the potential impacts is a summation of the above criteria, namely the extent, duration, intensity, and impact on irreplaceable resources.
Probability of occurrence	The probability of the impact occurring is based on the professional experience of the specialist with environments of a similar nature to the site and/or with similar projects. It is important to distinguish between the probability of the impact occurring and the probability that the activity causing a potential impact will occur. Probability is defined as the probability of the impact occurring, not as the probability of the activities that may result in the impact.

Criteria	Explanation
Significance	Impact significance is defined to be a combination of the consequence (as described below) and the probability of the impact occurring. The relationship between consequence and probability highlights that the impact (or impact significance) must be evaluated in terms of the seriousness (consequence) of the impact, weighted by the probability of the impact occurring. In simple terms, if the consequence and probability of an impact are high, then the impact will have a high significance. The significance defines the level to which the impact will influence the proposed development and/or environment. It determines whether mitigation measures need to be identified and implemented and whether the impact is important for decision-making.
Degree of confidence in predictions	Specialists and the environmental team were required to indicate the degree of confidence (low, medium, or high) that there is in the predictions made for each impact based on the available information and their level of knowledge and expertise. The degree of confidence is not considered in the determination of consequence or probability.
Mitigation measures	Mitigation measures are designed to reduce the consequence or probability of an impact or to reduce both consequence and probability. The significance of impacts has been assessed both with mitigation and without mitigation.

Cumulative impact, in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities."

The cumulative impact assessment will be undertaken using a structured, qualitative methodology, supported by quantitative indicators where feasible. The assessment will evaluate the contribution of the proposed Project in combination with existing developments and reasonably foreseeable future activities occurring within the surrounding landscape.

Cumulative impacts will be clearly defined and, where practicable, quantified, including but not limited to:

- Cumulative land transformation (expressed in hectares).
- Loss and fragmentation of natural and semi-natural habitats.
- Reduction in ecological connectivity.
- Cumulative pressure on aquatic systems and wetlands.
- Cumulative visual and landscape character change.
- Additive disturbance to biodiversity and ecosystem processes.

The identified cumulative impacts will be assessed and rated using the same significance rating methodology applied to project-specific impacts.

5.2. Cumulative Spatial Context

The cumulative decommissioning and closure assessment for the proposed Project considers the potential environmental effects associated with the eventual decommissioning, dismantling and rehabilitation of the facility at the end of its operational life. The decommissioning risk assessment demonstrates that while temporary adverse impacts will occur during dismantling, these are generally short-term, reversible and can be effectively mitigated through appropriate management measures. Furthermore, several environmental receptors are expected to experience long-term cumulative improvements following successful rehabilitation.

The principal cumulative impacts anticipated during the decommissioning phase include temporary increases in dust generation, vehicle emissions, noise, soil disturbance and waste generation resulting from the removal of photovoltaic panels, mounting structures, electrical infrastructure and associated facilities. These impacts may combine with other decommissioning or mining-related activities occurring within the surrounding landscape, potentially increasing cumulative pressure on air quality, local traffic, soil resources and visual amenity. Appropriate mitigation measures, including dust suppression, vehicle maintenance, adherence to site specific noise restrictions, planned traffic management and implementation of waste management procedures, substantially reduce these cumulative effects to acceptable levels.

Temporary cumulative impacts on soils and surface water resources may arise from increased vehicle movements, soil compaction, erosion risks and disturbed ground during dismantling and rehabilitation. If unmanaged, these impacts could contribute to increased sedimentation, reduced infiltration and deterioration of downstream water quality when considered alongside other land-disturbing activities in the region. The risk assessment concludes that implementation of stormwater management measures, contour ripping, erosion protection structures, appropriate soil amelioration and progressive revegetation will significantly reduce these cumulative impacts and facilitate the restoration of natural hydrological processes.

The assessment also identifies cumulative ecological benefits associated with rehabilitation. Although biodiversity may temporarily decline immediately following infrastructure removal due to disturbance, the re-establishment of indigenous vegetation is expected to improve habitat quality, ecological functioning and species diversity over time. Successful rehabilitation will increase vegetation cover, improve soil biological activity, enhance carbon cycling, restore ecological connectivity and provide suitable habitat for terrestrial fauna and avifauna. These positive cumulative outcomes become increasingly significant when considered together with other rehabilitation initiatives occurring within the broader mining landscape.

A key cumulative risk identified for the rehabilitation phase is the potential establishment and spread of alien invasive plant species. If invasive vegetation is not effectively controlled, this impact could combine with existing regional infestations, reducing rehabilitation success, suppressing indigenous vegetation and limiting biodiversity recovery. Consequently, long-term alien invasive species monitoring and eradication form a critical component of the rehabilitation strategy and are necessary to ensure the anticipated positive cumulative ecological outcomes are achieved.

From a landscape perspective, the removal of photovoltaic infrastructure will result in a gradual reversal of the visual changes introduced during the operational phase. Although temporary visual disturbance associated with earthworks, dust generation and rehabilitation activities will occur, the restoration of natural vegetation and landforms is expected to return the site to a condition more closely aligned with the surrounding landscape character. This represents a positive

cumulative outcome when considered alongside concurrent mine rehabilitation and landscape restoration activities within the region.

Overall, the cumulative assessment indicates that the decommissioning and rehabilitation of the proposed Project will result in predominantly short-term, manageable adverse cumulative impacts during dismantling, followed by progressively increasing long-term cumulative environmental benefits through ecosystem restoration, improved soil functionality, enhanced biodiversity, restored hydrological processes and recovery of landscape character. When the prescribed mitigation measures and rehabilitation commitments are fully implemented, the end-of-life phase is expected to make a positive contribution to the cumulative environmental condition of the broader landscape.

5.3. Risk Assessment Tables

The full risk assessment can be found in **Annexure 1** of this Report. The summary of the risk assessment is based on the information obtained from the specialist reports as well as the closure methodology.

A summary of the risk assessment is contained in **Table 5-3**.

Table 5-3: Risk assessment table summary

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre-Mitigation Significance	Recommended Mitigation Measures	Post Mitigation Significance
Air quality during decommissioning and rehabilitation	The dismantling process will cause more ambient dust as a result of the removal of infrastructure that served as a surface for dust accumulation as well as the movement of vehicles that is part of the dismantling process.	Impact in isolation	0	Hose down said infrastructure to remove excessive dust. Keep haul access roads moist.	0
		Cumulative impact	-2	Hose down said infrastructure to remove excessive dust. Keep haul access roads moist.	0
Air quality during decommissioning and rehabilitation	The vehicle emissions used in the dismantling and rehabilitation activities will be higher than the baseline emissions on this site during normal operations.	Impact in isolation	-2	Site vehicle management and inspections.	0
		Cumulative impact	-2	Site vehicle management and inspections.	0
Air Quality during rehabilitation activities	The ambient dust will be at its highest when the soil ripping, contouring and revegetation.	Impact in isolation	-4	Do not undertake this activity in the windy season (August) to minimise windblown dust.	-2
		Cumulative impact	-4	Do not undertake this activity in the windy season (August) to minimise windblown dust.	-2
Aesthetics during the decommissioning phase	Removal of infrastructure will remove the monotonous look of PV panels.	Impact in isolation	26	Stakeholder engagement.	26
		Cumulative impact	26	Stakeholder engagement.	26
Aesthetics during the rehabilitation phase	Ripping the compacted areas resulting in dust clouds.	Impact in isolation	-8	Do not undertake this activity in the winter or windy season (August) to minimise windblown dust.	-4

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre-Mitigation Significance	Recommended Mitigation Measures	Post Mitigation Significance
		Cumulative impact	-6	Do not undertake this activity in the winter or windy season (August) to minimise windblown dust.	-4
Aesthetics during the rehabilitation phase	Ripping, earth works, soil amelioration and seeding will be disturbing to the surrounding communities. Some soil ameliorants have got an unpleasant odour.	Impact in isolation	-4	Conduct revegetation efforts in the wet season to ensure rapid vegetation establishment. Ensure rehabilitation activities is streamlined so that no odours can occur.	0
		Cumulative impact	-4	Conduct revegetation efforts in the wet season to ensure rapid vegetation establishment. Ensure rehabilitation activities is streamlined so that no odours can occur.	0
Noise during decommissioning	Noise generated by equipment movement and dismantling of structures will be irregular and loud.	Impact in isolation	-2	Adhere to noise restrictions of the mine.	-2
		Cumulative impact	-2	Adhere to noise restrictions of the mine.	-2
Noise during rehabilitation	Noise generated by equipment movement during rehabilitation activities will be more of a constant drone of machinery.	Impact in isolation	-2	Adhere to noise restrictions of the mine.	-2
		Cumulative impact	-2	Adhere to noise restrictions of the mine.	-2
Surface Water quality during decommissioning	Potential increase in turbidity in surface water sources due to the runoff of disturbed soil.	Impact in isolation	-6	Ensure storm water drains downstream of the project is functioning.	-4
		Cumulative impact	-7	Ensure storm water drains downstream of the project is functioning.	-5

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre-Mitigation Significance	Recommended Mitigation Measures	Post Mitigation Significance
Surface Water quality during rehabilitation activities	Decreased sedimentation and turbidity in surface water sources as the vegetation act as a soil anker.	Impact in isolation	16	Vegetation maintenance will ensure erosion-prevention.	18
		Cumulative impact	20	Vegetation maintenance will ensure erosion-prevention.	22
Biodiversity implication of rehabilitation	This project will start with an initial decrease of biodiversity as some lizards and ants would have inhabited the facility but as the vegetation abundance and diversity increase the area will increase with biodiversity too.	Impact in isolation	16	Vegetation maintenance will ensure increase biodiversity.	18
		Cumulative impact	20	Vegetation maintenance will ensure increase biodiversity.	24
Biodiversity implication of rehabilitation	The higher percentage of alien invasive vegetation seed in the natural seedbank will pose a risk to the biodiversity of the project if it is not managed during the initial stages of rehabilitation.	Impact in isolation	-16	Alien eradication management to prevent vegetation.	-5
		Cumulative impact	-32	Alien eradication management to prevent vegetation.	-16
Soil land capability and agricultural potential	Compaction during the decommissioning phase will occur as a result in the increase of heavy machinery needed to dismantle and load waste and components.	Impact in isolation	-6	Planned removal to minimise repetitive traffic movement.	-6
		Cumulative impact	-6	Planned removal to minimise repetitive traffic movement.	-18
Soil land capability and agricultural potential	Potential hydrocarbon spillage from vehicles or breakdowns during the decommissioning phase.	Impact in isolation	-1	Adherence to the mine procedure for spillage management.	0
		Cumulative impact	-2	Adherence to the mine procedure for spillage management.	0
Soil land capability and agricultural potential	Increased bulk density, microbes and carbon cycling in the soil will happen during rehabilitation with the addition of ameliorants, ripping and seeding.	Impact in isolation	14	Rehabilitation maintenance and alien invasive eradication.	28
		Cumulative impact	14	Rehabilitation maintenance and alien invasive eradication.	32

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre-Mitigation Significance	Recommended Mitigation Measures	Post Mitigation Significance
Soil land capability and agricultural potential	Soil erosion can occur during the phase after ripping and before the revegetation have established sufficiently.	Impact in isolation	-24	Ripping along the contour of the escarpment and using erosion-prevention berms or mulch mattresses.	-6
		Cumulative impact	-20	Ripping along the contour of the escarpment and using erosion-prevention berms or mulch mattresses.	-4
Increase in waste in the decommissioning phase	Increase in recyclable materials to dispose during decommissioning and rehabilitation.	Impact in isolation	-4	Adherence to the mine waste management procedure.	-4
		Cumulative impact	-4	Adherence to the mine waste management procedure.	-4
Increase in waste in the decommissioning phase	Increase in general waste during decommissioning and rehabilitation.	Impact in isolation	-2	Adherence to the mine waste management procedure.	-4
		Cumulative impact	-2	Adherence to the mine waste management procedure.	-4
Increase in waste in the decommissioning phase	Potential increase in hazardous waste during decommissioning and rehabilitation.	Impact in isolation	-6	Adherence to the mine waste management procedure.	-4
		Cumulative impact	-6	Adherence to the mine waste management procedure.	-4
Increase in waste in the rehabilitation phase	Increase in general waste decommissioning and rehabilitation.	Impact in isolation	-2	Adherence to the mine waste management procedure.	-4
		Cumulative impact	-2	Adherence to the mine waste management procedure.	-4
Hydropedology during decommissioning	Potential reduction in water to the catchment as compaction of areas will increase during the decommissioning phase.	Impact in isolation	-14	Correct soil placement and amelioration.	0
		Cumulative impact	0	Correct soil placement and amelioration.	0
Hydropedology during rehabilitation	Increase water into the catchment recharge zone will occur once the soil structure and vegetation are established.	Impact in isolation	0	Correct rehabilitation and ripping depth.	0
		Cumulative impact	0	Correct rehabilitation and ripping depth.	0
Terrestrial sensitivity	Potential impact on terrestrial landform is	Impact in	0	Noise will scare away animals.	0

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre-Mitigation Significance	Recommended Mitigation Measures	Post Mitigation Significance
during decommissioning	low as this area will be mostly homogeneous in ecological structure and function.	isolation			
		Cumulative impact	0	Noise will scare away animals.	0
Terrestrial sensitivity during rehabilitation	Increase in impact on terrestrial biodiversity will occur in the soil and potential habitat with the establishment of vegetation.	Impact in isolation	0	Endemic vegetation used in rehabilitation.	12
		Cumulative impact	0	Endemic vegetation used in rehabilitation.	12
Aquatic biodiversity impact during decommissioning	Potential impact on wetland features is deemed to be low, but the compaction can decrease water infiltration into a wetland or excessive runoff can flood the wetland.	Impact in isolation	0	No wetland sensitivity was found in the area.	0
		Cumulative impact	0		0
Aquatic biodiversity impact during rehabilitation	Potential impact on wetland features will be positive as a slow gradual release of water will move into a wetland without a significant siltation from erosion.	Impact in isolation	0	No wetland sensitivity was found in the area.	0
		Cumulative impact	0		0
Avifauna impacts during decommissioning	Reduction of avifauna during decommissioning activities due to the erratic noise and movement in the area.	Impact in isolation	-12	Noise will scare away animals.	-12
		Cumulative impact	-12	Noise will scare away animals.	-12
Avifauna impacts during rehabilitation	Increase in avifauna after rehabilitation activities as more shelter and insects will be available for bird species. The area will most likely have less predatory birds as the perches are removed.	Impact in isolation	6	Increase in habitat.	24
		Cumulative impact	6	Increase in habitat.	24

5.4. Risk Assessment Conclusion

The environmental and social impact assessment for the proposed Project highlights distinct outcomes across the decommissioning and rehabilitation phases. During decommissioning, activities primarily generate short-term negative disturbances. Infrastructure removal and heavy vehicle movement release significant ambient dust and elevated exhaust emissions. Additionally, machinery movement causes irregular, loud noise that temporarily displaces local wildlife and avifauna, while heavy traffic increases the risks of soil compaction, potential hydrocarbon spills, and elevated waste volumes. Potential surface water turbidity and temporary reductions in catchment water infiltration also pose minor risks during this initial phase.

To offset these decommissioning impacts, several straightforward management procedures are recommended. Airborne dust can be controlled by keeping haul roads moist and hosing down structures before dismantling. Adhering strictly to established mine protocols regarding site vehicle management, noise limits, spillage response, and waste disposal effectively mitigates most physical and chemical hazards. Furthermore, carefully planning haulage routes minimises unnecessary traffic movement, preserving overall soil structure and hydropedological recharge functions.

Transitioning into the rehabilitation phase introduces considerable ecological and visual benefits, alongside a few temporary operational challenges. The physical removal of the solar panels inherently yields a strong positive aesthetic outcome by eliminating the artificial monotony of the array. While earthworks such as soil ripping, contouring, and adding ameliorants create temporary dust, noise, and unpleasant odours, these effects are short-lived. The primary long-term environmental risk during this phase stems from invasive alien seeds in the natural seedbank, which can aggressively outcompete local plant species if left unchecked.

Active rehabilitation measures dramatically improve environmental conditions overall. Conducting earthworks and revegetation outside the windy month of August prevents severe windblown dust, while performing planting during the wet season ensures rapid vegetation establishment and eliminates soil odours. Ripping along escarpment contours and using erosion-prevention berms or mulch mattresses protects against early soil erosion. As endemic vegetation takes root and is actively maintained alongside alien plant eradication programs, soil health and organic matter rapidly recover. This restored cover anchors the soil, filters surface water runoff, restores water infiltration into catchment recharge zones, and significantly boosts long-term biodiversity and bird habitats.

6. Financial Liability Calculation

6.1. Project Description for Decommissioning and Closure

Decommissioning and closure of the proposed Project will focus on systematically removing infrastructure and executing targeted land rehabilitation to align with the mine's EMPr closure vision, which dictates that all impacted areas must be restored to natural vegetation. Located within the Sekhukhune Montane Grassland, a region characterised by dry winters and summer rainfall averaging 600 mm to 720 mm, the site's baseline biodiversity is currently modified by historic mining activities, vehicle movement, and existing alien invasive species such as Black Wattle. Because solar panel shading has altered vegetation growth during operations, rehabilitation relies on preserving the existing seedbank in the top 10 cm of replaced topsoil, applying chemical-free mechanical land preparation, and carefully timing operations around local climatic patterns to ensure successful ecosystem recovery.

The decommissioning phase initiates the physical closure through the structured dismantling of the facility and the prioritisation of component recycling. Approximately 1,297.84 tonnes of waste, including PV panels, inverters, support posts, and building rubble, will be removed from the footprint. While necessary, these activities temporarily generate negative environmental impacts, including elevated noise levels that briefly displace local wildlife, heightened vehicle emissions, and airborne dust from dismantling and transport. Heavy equipment movement also introduces short-term risks of soil compaction, potential hydrocarbon spills, and temporary runoff turbidity into nearby catchments. To mitigate these operational disturbances, haul access roads will be kept moist, structures will be hosed down prior to removal, traffic routes will be optimised to prevent repetitive soil impact, and site teams will strictly adhere to mine protocols for noise limits, spill response, and waste disposal.

Following infrastructure removal, general surface rehabilitation will restore soil capability and hydropedological function across all disturbed footprints, particularly high-compaction areas like the 12,658.5 m^2 perimeter road and internal roads covering 2,212 m^2 and 1,708 m^2. The process involves ripping compacted soils to appropriate depths, contouring using stockpiled topsoil, and applying organic compost or fertilisers based on post-decommissioning soil analyses. Because chemical herbicides will not be used during the lifespan or closure of the site to avoid sterilising the soil, mechanical methods will be used to manage vegetation. Earthworks and revegetation will be strictly scheduled during the wet season and kept clear of the windy month of August to prevent severe windblown dust, eliminate soil ameliorant odours, and support rapid plant establishment. Additionally, ripping along escarpment contours alongside the use of erosion-prevention berms or mulch mattresses will protect against topsoil loss before vegetation anchors the site.

The ultimate objective of closure is to establish a self-sustaining, biodiverse terrestrial habitat that enhances long-term water infiltration into catchment recharge zones and creates shelter for native avifauna. The highest risk during the soil ripping and seeding phase is the rapid emergence of alien invasive plants, whose long-viable seeds outcompete native flora in disturbed soils. To counter this, surface rehabilitation will utilise an endemic indigenous seed mix paired with a dedicated alien invasive vegetation management plan for the first two years. Ongoing environmental monitoring will continue for at least five years post-closure to ensure alien species are continuously controlled, native plant abundance stabilises, and the landscape successfully transitions back to functional Sekhukhune Montane Grassland.

6.2. Cost Breakdown

The closure vision and proposed post-closure land use are based on the assumptions described below, which also form the basis of the financial liability calculation. The closure cost estimate has been prepared using information provided by the Client, specifically the 0426_BY Solar PV Project_v2.KMZ file and the Booysendal PV Land use Breakdown.xlsx. as well as the updated design 25-0608 Kopanya Solar Photovoltaic (PV) 2 Project received on 28/08/2026.

It has been assumed that approximately 15% of the solar PV array footprint will require surface preparation and revegetation, based on current industry experience for similar photovoltaic developments. Surface preparation will comprise mechanical ripping of compacted areas to improve soil bulk density and restore biological soil function prior to revegetation. This assumption is based on the operational commitment that vegetation management throughout the life of the Project will be undertaken using mechanical methods only. Should chemical vegetation control methods be introduced during operations, the rehabilitation methodology and associated closure cost estimates will require review and revision.

The road network included in the closure assessment consists of two internal gravel access roads between the solar panel arrays, a perimeter road used for security inspections and an access road linking to the existing mine roads.

No allowance has been made for the demolition or removal of concrete foundations beneath the solar panel support structures, as these are not included in the current Project design.

Rehabilitation costs have been calculated using the actual rates charged by the rehabilitation contractor currently operating on site, rather than the standard DMPR Master Rates, where these provide a more representative estimate of anticipated closure costs.

Based on these assumptions, the direct closure components amount to **R4 195 534**. A weighting factor of 1.1 has been applied in accordance with the DMPR financial provisioning methodology, resulting in a sub-total of **R4 615 087**, excluding Preliminary and General costs, contingency and VAT. After the inclusion of a 12% Preliminary and General allowance, a 10% contingency, and 15% VAT, the total financial provision required for closure is estimated at **R6 474 968**.

A detailed breakdown of the closure cost estimate is presented in **Table 6-1**.

Table 6-1: Cost breakdown table of the proposed Kopanya Solar PV 2 Project

ITEM	STANDARD ACTIVITY	CLOSURE DETAIL / ASSUMPTION	CODE	UNIT	QTY	RATE	COST
A	**DISTURBED AREAS**						**R663 531**
1	Area Covered by PV Infrastructure	General Surface Rehabilitation after removal of all infrastructure. Using 2026 actual contractor rate for Booysendal	16(A)	ha	4.75	R84 429.77	R401 025
2	Infrastructure Hub		16(A)	ha	1.87	R84 429.77	R157 898
3	Topsoil Stockpile		8(A)	ha	0.36	R210 524.02	R75 695
4	Spoil Stockpile		8(A)	ha	0.09	R210 524.02	R18 924
5	Parking	Not included with buildings	10	ha	0.06	R166 770.54	R9 990
B	**ROADS**						**R1 225 867**
1	Access Road	DMPR rate for rehabilitation of roads	3	m^2	3 716.44	R53.90	R200 313
2	Perimeter Road		3	m^2	15 322.35	R53.90	R825 863
3	Major Service Road		3	m^2	3 704.90	R53.90	R199 691
C	**BUILDINGS**						**306 636**
1	Conservancy Tank	Assumed concrete tank	2(B1)	m^2	25.00	R443.88	R11 097
2	Guard House	Assumed brick building	5	m^2	45.00	R602.40	R27 108
3	Site Office	Assumed brick building	5	m^2	50.00	R602.40	R30 120
4	Storage Warehouse	Assumed brick building	5	m^2	216.00	R602.40	R130 119
5	O&M Building	Assumed brick building	5	m^2	50.00	R602.40	R30 120
6	Substation & Control Room	Assumed brick building	5	m^2	129.60	R602.40	R78 071
D	**FENCING**						**R1 173 483**
1	Perimeter Fence	DMPR rate for fencing	12	m	6 168.68	R190.23	R1 173 483
E	**POWER LINES**						**R163 297**
1	OHL	33kV line is an MV line	16(B)	m	1 497.52	R54.64	R81 817
2	MV Collector Cable		16(D)	m	1 453.51	R13.00	R18 896
3	MV Collector Cable Trenching	Trenching to remove MV Collector Cables	16(G)	m^3	1 744.21	R35.88	R62 584
F	**PV INFRASTRUCTURE**						**R103 897**
1	PV Inverter Stations (Incl Posts)		1	m^3	857.61	R21.62	R18 544
2	MV Station		1	m^3	257.28	R21.62	R5 563
3	PV Arrays	Using actual PV panel dimensions	1	m^3	3 690.00	R21.62	R79 789
G	**WASTE DISPOSAL**						**R279 019**

1	Transport of Non-hazardous waste Assumed density of general rubble = 1.2	Mashishing/Lydenburg Landfill site = 54 km	8(F)	ton/km	30 754.08	R3.50	R107 639
2	Disposal of Non-hazardous waste	Mashishing/Lydenburg Landfill site	8(G)	ton	569.52	R300.92	R171 380
H	**Closure Studies**						**R72 430**
1	Rehabilitation performance audit/monitoring	Rehabilitation performance audit/monitoring	15(A)	Sum	1.00	R72 430.19	R72 430
I	**POST CLOSURE MAINTENANCE AND AFTERCARE**						**R207 374**
1	POST Closure and Aftercare - 2 to 3 years	Hectares	14	ha	9.34	R22 193.80	R207 374

SUM of Closure Components		**R4 195 534**
Weighting Factor 2		1.1
SUB TOTAL 1 (DMPR Weighting Factor 2)		**R4 615 087**
Preliminary and General	12%	R553 810
Contingency	10%	R461 509
SUB-TOTAL 2 (Preliminary and General + Contingency)		R1 015 319
SUB TOTAL 3 (Excluding VAT)		**R5 630 407**
VAT @15%	15%	R844 561
GRAND TOTAL		**R6 474 968**

7. Conclusion

This Final Rehabilitation, Decommissioning and Mine Closure Plan demonstrates that the proposed Project has been designed with closure considerations integrated throughout the project lifecycle. By incorporating rehabilitation objectives, environmental risk management and financial provisioning from the outset, the Project aligns with the principles of sustainable mine closure and the legislative requirements governing mining-related infrastructure within South Africa.

The environmental assessment confirms that the impacts associated with decommissioning are largely temporary, localised and manageable through the implementation of appropriate mitigation measures. Although activities such as infrastructure removal, increased vehicle movement, waste handling and soil disturbance will result in short-term environmental impacts, these can be effectively controlled through established operational procedures and environmental management practices. More importantly, the rehabilitation phase is expected to deliver significant long-term environmental improvements through the restoration of indigenous vegetation, recovery of soil functionality, improved hydrological processes, enhanced biodiversity and the gradual return of the landscape to a stable ecological condition.

The greatest long-term rehabilitation challenge remains the management of alien invasive plant species during the establishment phase of revegetation. Successful implementation of the prescribed monitoring programme, together with ongoing invasive species control and adaptive rehabilitation management, will be essential to achieving the desired post-closure land use and ensuring that rehabilitation objectives are realised.

The closure cost estimate provides a realistic and defensible assessment of the financial liability associated with the Project using the applicable DMPR methodology, supplemented by project-specific market related rates where necessary. The calculated financial provision of **R6 474 968 (including VAT)** is considered sufficient to implement the proposed decommissioning, rehabilitation and post-closure management measures based on the current Project design. As the Project advances through detailed design, construction and operation, this estimate should be reviewed and updated periodically to reflect changes in infrastructure, rehabilitation methodologies, legislative requirements and market conditions.

The FRDCP is intended to remain a living document throughout the life of the proposed Project. Regular review of rehabilitation performance, environmental monitoring results, closure assumptions and financial provisioning will ensure that closure planning remains aligned with best practice, regulatory requirements and evolving site conditions. Through ongoing commitment to progressive rehabilitation and responsible environmental stewardship, the proposed Project is expected to achieve a safe, stable and sustainable post-closure landscape that supports the long-term environmental objectives of the BS Mine.

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