

DONAWAY
ENVIRONMENTAL

VISUAL IMPACT ASSESSMENT

The Proposed Kopanya Solar PV 2 Project and Associated Infrastructure near Mashishing, Mpumalanga Province

PROJECT DETAILS

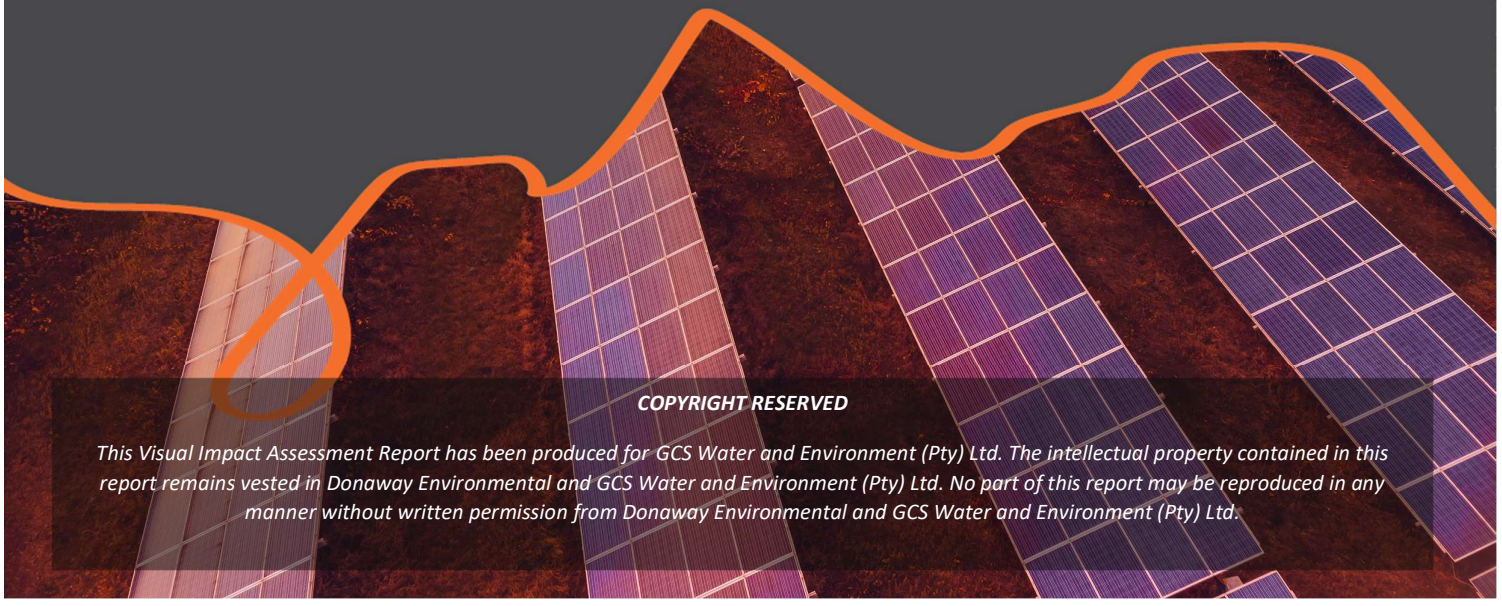
Project title: **Visual Impact Assessment –** The Proposed Kopanya Solar PV 2 Project and Associated Infrastructure near Mashishing, Mpumalanga Province

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EXECUTIVE SUMMARY

PROJECT BACKGROUND

The proposed Kopanya Solar PV 2 Project comprises the development of a utility-scale photovoltaic (PV) facility with an installed capacity of approximately 20 Megawatt-peak (MWp). The project is proposed within the Booysendal South Mine operational area, with Booysendal Platinum (Pty) Ltd as the applicant and project developer.. The proposed solar PV facility will be located on the remaining extent of Portion 15 of the Farm No. 53 JT, with associated grid connection infrastructure traversing Portions 8 and 17 of the Farm No. 53 JT, situated in proximity to the town of Mashishing, within the Thaba Chweu Local Municipality (Ehlanzeni District Municipality) in the Mpumalanga Province. Access to the project site will be obtained via the existing R577 road.

The project is intended to:

- Primarily supply electricity to the Booysendal Mine (Northam Platinum Limited) through self-generation and demand-side management;
- Enhance energy security for the Mine;
- Reduce greenhouse gas emissions;
- Mitigate escalating electricity costs that exceed inflation;
- Reduce reliance on grid-supplied electricity amid ongoing load reductions and increasing energy tariffs; and
- Export surplus electricity to the national grid, if available.

The total anticipated development footprint is approximately 42 hectares (ha), incorporating PV arrays, internal access roads, inverter stations, a collector substation, laydown areas (±1 ha), and associated on-site infrastructure including buildings for operations, maintenance, control and storage purposes, as well as designated parking areas. The PV plant will utilise single-axis tracking bifacial solar panels, typically in the range of ±650–800 Watt (W) per panel (typical module dimensions ±2.3 metres (m) x 1.2 m), mounted on pile-supported structures. Panel height is expected to be up to 5 m above ground level at maximum tilt. The facility is anticipated to comprise up to approximately 35,000 panels, subject to final detailed design optimisation.

Electrical infrastructure will include string inverter stations (typically), transformers (typically 1 x 20 Megavolt-ampere (MVA) or 2 x 10 MVA), an on-site PV substation, and a stepdown substation adjacent to the Eskom substation, with an associated 33 kilovolt (kV) overhead power line connecting to the Booysendal South substation (point of connection). Direct Current cabling will be buried and installed via mechanical trenching, with suitable protection measures (e.g., danger tape) included above installations. Transformers are anticipated to be housed within prefabricated e-house structures and/or mounted on platforms (final configuration to be confirmed).

Construction is expected to occur over a period of approximately 18 months, with a peak construction workforce of around 300 personnel. The operational lifespan of the facility is anticipated to be 25 years (or extended to the life of the Mine), with an estimated operational workforce of approximately 20 personnel. Water requirements are estimated at approximately 1,790 cubic metres (m^3) during construction and 518 m^3 per annum during operations, with water supply and sanitation to be provided (including the use of conservancy tanks for sanitation, where applicable). Stormwater, waste management, fire risk mitigation and related site services will be implemented in accordance with detailed engineering and environmental management specifications to be finalised during subsequent design phases.

KEY FINDINGS

According to **Table 2.2 to Table 2.4** used as guideline for this study, from Oberholzer (2005), the project's impact was initially predicted to be high. However, considering the findings outlined below, along with the implementation of mitigation measures, this impact could be reduced to a low impact.

The proposed Kopanya Solar PV 2 Project is located within a mountainous and highly undulating landscape characterised by prominent north–south orientated ridgelines, steep slopes and deeply incised valleys, with elevations ranging between approximately 886 metres above mean sea level (m amsl) and 2,331 m amsl. The rugged terrain plays a decisive role in shaping visibility patterns and visual exposure across the 10 kilometres (km) Project area of influence (PAOI).

Although the Zone of Theoretical Visibility (ZTV) indicates a high theoretical visibility within the 10 km radius, this rating is based purely on topography and excludes vegetation and infrastructure screening. As is typical in mountainous environments, visibility diminishes exponentially with distance, particularly beyond the 1 km radius. The valley/mid-slope positioning of the proposed PV facility avoids skyline intrusion and reduces long-distance visual prominence. Furthermore, atmospheric conditions, haze and humidity, common within mountainous regions, are likely to further reduce clarity over long distances.

The broader landscape is already influenced by mining activities, particularly toward Steelpoort to the north. The proposed development is located on Mine-owned property and will connect to existing mining-associated electrical infrastructure. The surrounding land uses comprise mining and agriculture, with limited human settlements. In this context, the PV infrastructure and associated overhead line will align with the established industrial-mining character of the area and will visually integrate with existing powerlines and Mine-related infrastructure. The development is therefore not considered visually incongruent within its receiving environment.

Sensitive receptors within the 10 km PAOI include scattered farmsteads, two small villages to the north (one located approximately 1.8 km north-east but separated by Mine infrastructure), a trout farm, two lodging facilities, and portions of Davel Private Nature Reserve and De Berg Nature Reserve (Ramsar site). One of South Africa’s highest mountain peaks, forming part of the 9 Peaks Challenge, is located approximately 4.3 km to the south. However, tourism in the area is limited, and the 9 Peaks Challenge is completed by a relatively small number of participants annually. Only certain elevated areas within the nature reserve are theoretically exposed, and intervening topography, distance and existing mining infrastructure significantly reduce direct visual exposure.

The visual sensitivity of the area is considered moderate due to the mountainous character; however, this sensitivity is reduced by the established mining and agricultural land uses and the absence of major tourism nodes. Receptor sensitivity ranges from low to moderate, influenced by rural settlement patterns, limited visitor numbers and the modified industrial landscape context.

The Visual Absorption Capacity (VAC) of the area is high due to strong topographic containment and vegetative screening. As a result, visual intrusion is expected to be moderate and largely localised, with no significant skyline impacts anticipated. Impact significance ratings reflected in the VIA impact tables indicate that, following mitigation, visual impacts during construction, operation and

decommissioning phases will be reduced to low significance levels, with moderate to high confidence. Cumulative visual impacts are considered negligible due to the strong screening effect of topography.

Overall, while a number of receptors are theoretically exposed, actual visual impact is moderated by landform, infrastructure screening and landscape character. The presence of existing mining infrastructure substantially reduces the perceived contrast of the proposed PV facility.

Conclusion

It is believed that renewable energy resources are essential to the environmental well-being of the country and planet (WESSA, 2012). Aesthetic characteristics are subjective, and some people find solar facilities and their associated infrastructure pleasant and optimistic while others may find it visually invasive; It is mostly perceived as symbols of energy independence, and local prosperity. The visual impact is also dependant on the land use of an area and the sensitivity thereof in terms of visual impact, such as protected areas, parks and other tourism related activities.

The proposed project aligns with South Africa's renewable energy goals while ensuring minimal disruption to the existing landscape. The development is also expected to provide substantial environmental and socio-economic benefits, including renewable energy generation, local employment opportunities, and contributions to national energy security.

From a visual perspective, the proposed Kopanya Solar PV 2 Project is considered acceptable within its receiving environment.

The development is strategically positioned within a valley/mid-slope location, avoiding prominent skyline intrusion and reducing long-distance visual prominence. The high VAC of the mountainous landscape further reduces visual impact potential.

Importantly, the project is situated within an existing mining-dominated landscape, especially to the north. The PV infrastructure and associated overhead line will align visually with existing industrial infrastructure and can reasonably be perceived as part of the broader mining-energy landscape. The development will therefore blend with the prevailing land use character rather than introduce a visually incongruent element.

Post-mitigation impact significance levels are low and largely localised, with negligible cumulative effects anticipated. No tourism nodes are directly affected.

On balance, and subject to the implementation of the recommended mitigation measures, the proposed Kopanya Solar PV 2 Project can be supported from a visual impact perspective, as it does not result in unacceptable or irreversible visual degradation of the surrounding landscape. **PLEASE NOTE** that commenting should be obtained from the South African Civil Aviation Authority (SACAA).

It is therefore Donaway Environmental's recommendation that the project, with the associated layout, be approved provided that mitigation measures are implemented.

TABLE OF CONTENTS

PROJECT DETAILS i

EXECUTIVE SUMMARY ii

TABLE OF CONTENTS v

LIST OF TABLES vii

LIST OF FIGURES viii

LIST OF ACRONYMS AND UNITS OF MEASURE ix

1. INTRODUCTION 1

1.1. Project Background 1

1.2. Need and Desirability 5

1.3. Project Description and Technical Detail 5

2. METHODOLOGY 8

2.1. Purpose of the Study 8

2.2. Terms of Reference 9

2.3. Approach to the Study 13

2.4. Triggers for Visual Specialist Input 13

2.5. Baseline Assessment 17

2.5.1. Methodology for Assessing Impacts 17

2.5.2. Cumulative Assessment Methodology 21

2.5.3. Cumulative Spatial Context 21

2.5.4. Use of Cumulative Impact Findings 22

2.6. Visual Impact Assessment Criteria 22

2.7. Zone of Theoretical Visibility 23

2.8. Department Forestry, Fisheries and the Environment Screening Tool – Site Sensitivity Verification 24

2.9. Assumptions and Limitations 24

2.9.1. Seasonality 24

2.9.2. Spatial Data Accuracy 24

2.9.3. Viewer Subjectivity 24

2.9.4. Site Access and Photos 24

2.9.5. Visual Receptors 24

2.10. Project Team and Experience 24

3. EXISTING LANDSCAPE 26

3.1. Landscape Character 26

3.1.1. Topography and Drainage 26

3.1.2. Vegetation Patterns 33
3.1.3. Land Use / Development 35
3.1.4. Sense of Place 37
4. VISUAL FEATURES AND SENSITIVE RECEPTORS 38
4.1. Objects Affecting Airspace and Applicable Legislation 39
4.2. Glare 40
5. VISUAL IMPACT ASSESSMENT CRITERIA 43
5.1. Visual Impact Assessment Criteria Assessed 43
5.2. Visual Representation of Operational PV Facilities 48
6. VISUAL IMPACT ASSESSMENT 58
6.1. Design & Construction Phase 58
6.2. Operational Phase 62
6.2.1. PV Facility 62
6.3. Cumulative Impacts 64
6.4. Decommissioning Phase 70
6.5. Assessment of Alternative Sites 72
6.6. Assessment of Impacts for the No-Go Alternative 72
7. MITIGATION MEASURES 73
8. KEY FINDINGS AND CONCLUSION 75
ANNEXURE A: CURRICULUM VITAE 78

LIST OF TABLES

Table 1.1: General site and location information 5
Table 2.1: Appendix 6 of GNR 982 – Report sections 9
Table 2.2: Categorisation of issues to be addressed by the visual assessment specialist (Oberholzer, B. 2005.) 14
Table 2.3: Key to Categories of Development 15
Table 2.4: Key to Categories of Issues 16
Table 2.5: Criteria and Rating Scales to be used in the Assessment of the Potential Impacts 18
Table 2.6: Explanation of Assessment Criteria 19
Table 2.7: Visual Impact Assessment Criteria 22
Table 2.8: Exposure Rating 23
Table 4.1: Landscape Features 38
Table 4.2: Potential Sensitive Receptors 38
Table 5.1: Visual Impact Assessment Criteria - Assessed 43
Table 6.1: Visual Impact – Construction Phase 61
Table 6.2: Visual Impact – Operational Phase 63
Table 6.3: A summary of related projects, that may have a cumulative impact, in a 50 km radius of the study area 64
Table 6.4: Visual Impact – Cumulative 69
Table 6.5: Visual Impact – Decommissioning Phase 71

LIST OF FIGURES

Figure 1.1: Locality Map.....4
Figure 1.2: Layout Map.....7
Figure 3.1: Topography Map.....27
Figure 3.2: Landscape photo near the substation taken towards the north.....28
Figure 3.3: Landscape photo on the PV site taken towards the east.....29
Figure 3.4: Landscape photo on the PV site taken towards the west.....30
Figure 3.5: Landscape photo on site showing existing vegetation.....31
Figure 3.6: Landscape photo near the Mine taken towards the north, showing a small village.....32
Figure 3.7: Vegetation Map.....34
Figure 3.8: Land Use and Landcover Map.....36
Figure 4.1: Reflection Characteristics of normal glass (left) and PV glass (right).....41
Figure 4.2: Reflection Comparison of everyday objects.....41
Figure 4.3: Solar Installations at George Airport in the Western Cape.....42
Figure 4.4: View of the Bokamoso PV facility from an aeroplane at a height of 36000 feet amsl.....42
Figure 5.1: ZTV Map: PV facility.....46
Figure 5.2: ZTV Map: OHL.....47
Figure 5.3: View towards the Droogfontein 2 SEF at 2 km: 6 m AGL.....49
Figure 5.4: View towards the Droogfontein 2 SEF at 2 km: 30 m AGL.....50
Figure 5.5: View towards the Droogfontein 2 SEF at 2 km: 50 m AGL.....51
Figure 5.6: View towards the Droogfontein 2 SEF at 1 km: 6 m AGL.....52
Figure 5.7: View towards the Droogfontein 2 SEF at 1 km: 30 m AGL.....53
Figure 5.8: View towards the Droogfontein 2 SEF at 1 km: 50 m AGL.....54
Figure 5.9: View towards the Enel Tobivox SEF at 370 m: eye hight (1.8 m AGL).....55
Figure 5.10: View towards the Enel Tobivox SEF at 370 m: 6 m AGL.....56
Figure 5.11: View towards the Enel Tobivox SEF at 370 m : 30 m AGL.....57
Figure 6.1: Cumulative map showing the location of other PV developments within 50 km of the Kopanya Solar PV 2 Project.....68

LIST OF ACRONYMS AND UNITS OF MEASURE

AMSL	Above Mean Sea Level
AGL	Above Ground Level
BAR	Basic Assessment Report
BESS	Battery Energy Storage System
BS	Booysendal South
CLO	Community Liaison Officer
DFFE	Department Forestry, Fisheries and the Environment
DMPR	Department of Mineral and Petroleum Resources
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GIS	Geographic Information System
NEMA	National Environmental Management Act, 1998 (No. 107 of 1998)
O&M	Operations and Maintenance
OHL	Overhead line
PAOI	Project area of influence
PV	Photovoltaic
REEA	Renewable Energy Environmental Impact Assessment Applications Database
REDZ	Renewable Energy Development Zone
SA-CAR	South African Civil Aviation Regulations
SACAA	South African Civil Aviation Authority
SEF	Solar Energy Facility
SPV	Special Purpose Vehicle
SSV	Site Sensitivity Verification
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment

ZTV	Zone of Theoretical Visibility
Unit / Symbol	**Description**
%	Percent
°	Degree
cm	Centimetre
ha	Hectare
km	Kilometre
kV	Kilovolt
m	Metre
m AGL	Metres Above Ground Level
m amsl	Metres Above Mean Sea Level
m^2	Square metre
m^3	Cubic metre
m^3/a	Cubic metres per annum*
MVA	Megavolt-ampere
MW	Megawatt
MWp	Megawatt-peak
W	Watt

1. INTRODUCTION

1.1. Project Background

The proposed Kopanya Solar PV 2 Project comprises the development of a utility-scale photovoltaic (PV) facility with an installed capacity of approximately 20 Megawatt-peak (MWp). The project is proposed within the Booysendal South Mine operational area, with Booysendal Platinum (Pty) Ltd as the applicant and project developer. The proposed solar PV facility will be located on the remaining extent of Portion 15 of the Farm No. 53 JT, with associated grid connection infrastructure traversing Portions 8 and 17 of the Farm No. 53 JT, situated approximately 30 kilometres (km) west of the town of Mashishing, within the Thaba Chweu Local Municipality (Ehlanzeni District Municipality) in the Mpumalanga Province (**Figure 1.1: Locality Map**). Access to the project site will be obtained via the existing R577 road.

The project is intended to:

- Primarily supply electricity to the Booysendal Mine (Northam Platinum Limited) through self-generation and demand-side management;
- Enhance energy security for the Mine;
- Reduce greenhouse gas emissions;
- Mitigate escalating electricity costs that exceed inflation;
- Reduce reliance on grid-supplied electricity amid ongoing load reductions and increasing energy tariffs; and
- Export surplus electricity to the national grid, if available.

The total anticipated development footprint is approximately 42 hectares (ha), incorporating PV arrays, internal access roads, inverter stations, a collector substation, laydown areas (±1 ha), and associated on-site infrastructure including buildings for operations, maintenance, control and storage purposes, as well as designated parking areas. The PV plant will utilise single-axis tracking bifacial solar panels, typically in the range of ±650–800 Watt (W) per panel (typical module dimensions ±2.3 metres (m) x 1.2 m), mounted on pile-supported structures. Panel height is expected to be up to 5 m above ground level at maximum tilt. The facility is anticipated to comprise up to approximately 35,000 panels, subject to final detailed design optimisation.

Electrical infrastructure will include string inverter stations (typically), transformers (typically 1 x 20 Megavolt-ampere (MVA) or 2 x 10 MVA), an on-site PV substation, and a stepdown substation adjacent to the Eskom substation, with an associated 33 kilovolt (kV) overhead power line connecting to the Booysendal South (BS) substation (point of connection). Direct Current cabling will be buried and installed via mechanical trenching, with suitable protection measures (e.g., danger tape) included above installations. Transformers are anticipated to be housed within prefabricated e-house structures and/or mounted on platforms (final configuration to be confirmed).

Construction is expected to occur over a period of approximately 18 months, with a peak construction workforce of around 300 personnel. The operational lifespan of the facility is anticipated to be 25 years or expended to the life of the Mine, with an estimated operational workforce of approximately 20 personnel. Water requirements are estimated at approximately 1,790 cubic metres (m^3) during construction and 518 m^3 per annum during operations, with water supply and sanitation to be

provided (including the use of conservancy tanks for sanitation, where applicable). Stormwater, waste management, fire risk mitigation and related site services will be implemented in accordance with detailed engineering and environmental management specifications to be finalised during subsequent design phases.

Certain technical elements (e.g. final module specifications, inverter configuration, detailed layout drawings, and confirmed routing/extent of grid connection works) remain subject to confirmation during detailed design; however, the overall project parameters are considered sufficiently defined for environmental assessment purposes at this stage.

Certain technical elements (e.g. final module specifications, inverter configuration, detailed layout drawings and traffic volumes) remain subject to confirmation during detailed design; however, the overall project parameters are considered sufficiently defined for environmental assessment purposes at this stage.

In 2022 the Climate Change Act, 2024 (Act No. 22 of 2024) was enacted to enable the development of an effective climate change response and facilitate South Africa's long-term just transition to a low-carbon and climate-resilient economy and society. The Act commenced on 17 March 2025, subject to the exclusion of certain provisions that have been deferred pending the development of supporting regulations. The Act provides a legislative framework for coordinating South Africa's climate change response, reducing greenhouse gas emissions and strengthening climate resilience.

Furthermore, as part of the 2026 State of the Nation Address, President Cyril Ramaphosa reaffirmed Government's commitment to energy sector reform and the accelerated transition towards a more reliable, competitive and cleaner electricity system. He indicated that by 2030, more than 40% of South Africa's energy supply is expected to come from renewable energy sources, supported by continued investment in renewable energy generation and increased private-sector participation. The address further confirmed the restructuring of Eskom and the establishment of a fully independent, state-owned transmission entity that will own and control transmission assets and operate the electricity market. Government also emphasised the expansion of the national transmission grid and the introduction of independent transmission projects to enable private investment in grid infrastructure. Collectively, these measures reinforce the central role of renewable energy in South Africa's long-term energy security and economic development strategy.

South Africa is also required to fulfil its international climate change commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, including commitments aimed at reducing greenhouse gas emissions and transitioning towards a low-carbon economy. Within this broader policy and legislative context, the continued development of renewable energy generation capacity contributes towards South Africa's climate change mitigation objectives and the progressive decarbonisation of the electricity sector.

The proposed development of the Kopanya Solar PV 2 Project requires Environmental Authorisation (EA) from the Department of Mineral and Petroleum Resources (DMPR) in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA), and the 2014 Environmental Impact Assessment (EIA) Regulations, as amended.

The Visual Impact Assessment (VIA) Report has been prepared by Donaway Environmental on behalf of GCS Environment South Africa (Pty) Ltd and is intended to provide input into the Basic Assessment Report (BAR) to be submitted to DMPR.

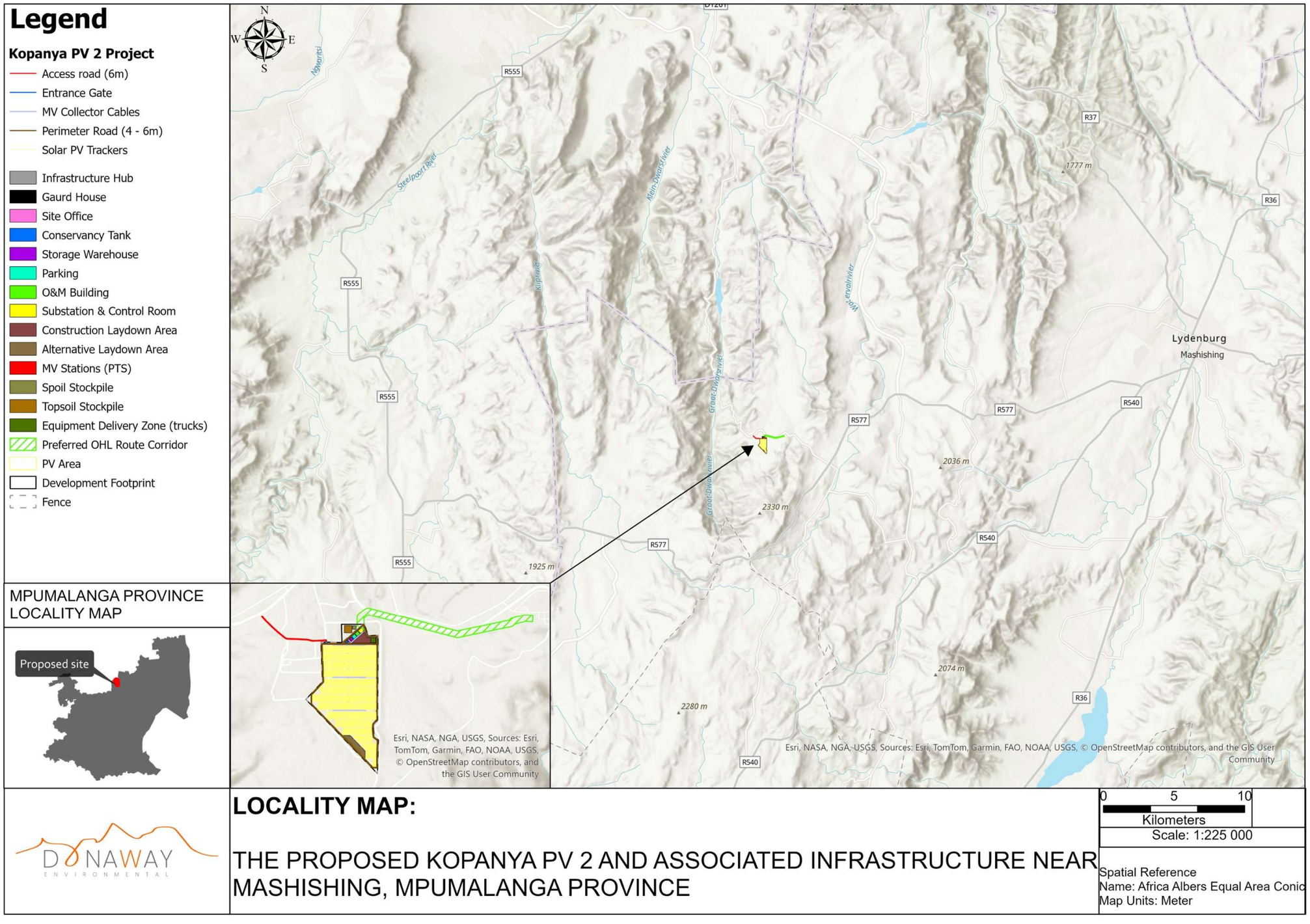


Figure 1.1: Locality Map

1.2. Need and Desirability

The need for the proposed Kopanya Solar PV 2 Project arises from both national-level energy constraints and site-specific operational requirements at the BS Mine.

At a national level, the 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 photovoltaic 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. The project will therefore enhance energy security, improve operational resilience, and contribute to the long-term sustainability of mining operations in the region.

1.3. Project Description and Technical Detail

Table 1.1: General site and location information

Component	Description / Specification
Project Name	Kopanya Solar PV 2 Project
Installed Capacity	±20 MWp (Direct Current)
Project Proponent	Booysendal Platinum (Pty) Ltd
Landowner	Northam Platinum Limited
Property Description	Remaining extent of Portion 15 of the Farm No. 53 JT
Associated Servitudes	Portions 8 and 17 of the Farm No. 53 JT (grid connection infrastructure)
Municipality	Thaba Chweu Local Municipality
District Municipality	Ehlanzeni District Municipality
Province	Mpumalanga Province
Access	Via existing R577 regional road
Development Footprint	±42 hectares
PV Technology	Single-axis tracking bifacial solar panels
Module Wattage (Typical)	±650–800 W per module
Module Dimensions (Typical)	±2.3 m x 1.2 m
Maximum Panel Height	Up to ±5 m above ground level at maximum tilt
Estimated Number of Panels	Up to ±35,000 panels (subject to optimisation)
Mounting System	Pile-supported steel structures
Inverter Configuration	Typically string inverters
Transformer Configuration	1 x 20 MVA or 2 x 10 MVA (subject to final design)

On-site Electrical Infrastructure	PV substation and associated switchgear
Grid Connection	33 kV overhead power line to Booysendal South Substation
Stepdown Substation	Located adjacent to Eskom substation
Direct Current Cabling	Buried via mechanical trenching with protective marking
Laydown Area	±1 hectare
Ancillary Infrastructure	O&M buildings, control room, storage facilities, parking
Construction Period	±18 months
Peak Construction Workforce	±300 personnel
Operational Lifespan	±25 years (or extended to the life of the Mine)
Operational Workforce	±20 personnel
Construction Water Demand	±1,790 m^3
Operational Water Demand	±518 m^3 per annum
Sanitation	Conservancy tanks and associated services (where applicable)

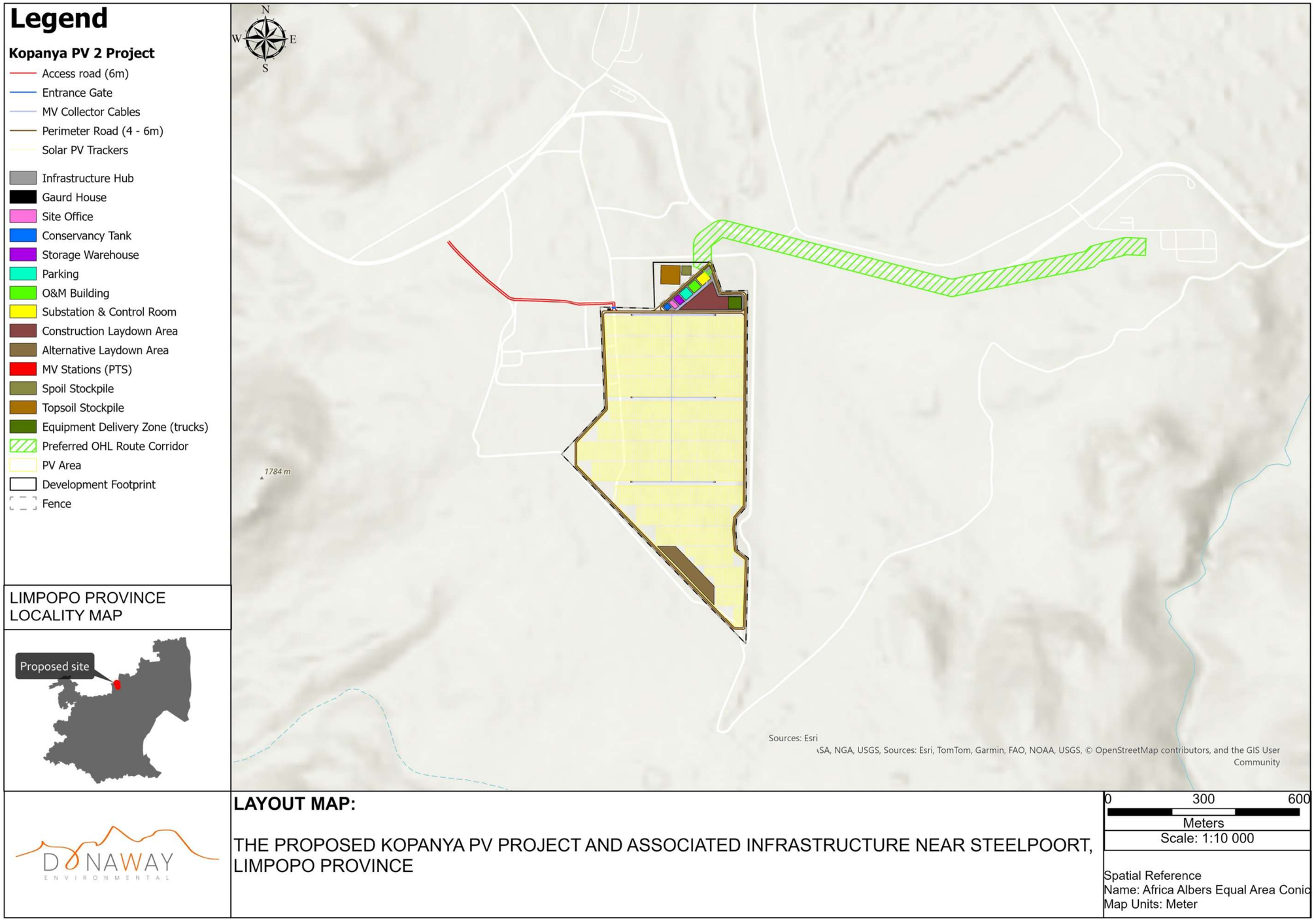


Figure 1.2: Layout Map

2. METHODOLOGY

A site inspection was conducted on the 6th of February 2026. Most of the visual receptors were determined by using Zone of Theoretical Visibility (ZTV) and geographical imagery within a 10 km radius before the site inspection.

2.1. Purpose of the Study

To determine the purpose of the study, one would first have to understand what a visual impact is: Visual impacts occur when changes in the landscape are noticeable to viewers looking at the landscape from their homes or from parks and conservation areas, highways and travel routes, and important cultural features and historic sites.

Visual impacts therefore relate to the changes that arise in the composition of views as a result of:

- Changes to the landscape;
- People's response to those changes; and
- The overall effect with respect to the scenic beauty of that landscape, which can be subjective.

Visual impact is therefore measured as the change or contrast to the existing visual environment and the extent to which that change compromises (negative impact) or enhances (positive impact) or maintains the visual quality of the landscape.

Visual impacts can be seen as an issue because it reduces the public's enjoyment and appreciation of the landscape and impair the character or quality of such a place as well as the aesthetic quality of the landscape if it is considered to be a national resource.

VIAs address the importance of the inherent aesthetics of the landscape, the public value of viewing that landscape, and the contrast or change in the landscape derived from the physical presence of a proposed project. For instance, sensitive geographical areas can be classified as sensitive properties that are evaluated for the potential for adverse visual impacts, based on the current land use or enjoyment of the view. The sensitivity of a certain geographical area is the degree to which a particular area can accommodate change. An example of a sensitive geographical area would be when scenic quality was influential in its being. In other words, a geographical area is not sensitive to visual impact if visual aspects of its feeling and setting are not part of what makes it eligible.

A project therefore has a significant visual impact in a certain geographical area when the proximity of the proposed project impairs aesthetic features or attributes of that area in a substantially visual way such that features, or attributes are considered important contributing elements to the value of the resource.

The purpose and objectives of this VIA report is to:

- Give the reader an overview of the aesthetics of the landscape.
- Determine the visual receptors present within the study area.
- Determine the receptors likely to be sensitive to the proposed development.
- Determine the extent and significance of the visual impact.

The scope of the assessment includes the proposed development area and its associated structures and infrastructure.

2.2. Terms of Reference

Specialist reports must comply with Appendix 6 of GNR 982 published under sections 24(5), and 44 of the NEMA, as amended and whereby the following are to be included:

Table 2.1: Appendix 6 of GNR 982 – Report sections

Requirements of Appendix 6 – GNR 982 EIA Regulations of 4 December 2014	Relevant Section In Report
The details of the specialist who prepared the report and the expertise of that specialist to compile a specialist report including a curriculum vitae.	Section 2.10 (Project Team and Experience): details and experience of the two specialists who prepared the report, Johan Botha and Michael Cloete of Donaway Environmental. Annexure A (Curriculum Vitae): CVs of both specialists, including qualifications and contact information. Project Details page: contact details of the company that prepared the report.
A declaration that the specialist is independent in a form as may be specified by the competent authority.	Not included in this report. A separate Declaration of Independence is commissioned for each project and sent to the Environmental Assessment Practitioner (EAP).
An indication of the scope of, and the purpose for which, the report was prepared.	Section 1 (Introduction): Section 1.1 states that the report is prepared for GCS Water and Environment (Pty) Ltd as input into the Basic Assessment Report (BAR) to be submitted to the Department of Mineral and Petroleum Resources for Environmental Authorisation. Section 1.3 describes the project. Section 2.1 (Purpose of the Study): states the purpose and objectives of the VIA and that the scope includes the proposed development area and its associated structures and infrastructure. Section 2.2 (Terms of Reference): lists the requirements for this VIA.
The date and season of the site investigation and the relevance of the season to the outcome of the assessment.	Section 2 (opening paragraph): the site inspection was conducted on 6 February 2026. Section 2.9.1 (Seasonality): seasonality is not deemed a limiting factor for visual fieldwork, and the fieldwork is considered sufficient for the nature of the project.
A description of the methodology adopted in preparing the report or carrying out the specialised process; the specific identified	Section 2 (Methodology), including Section 2.3 (Approach to the Study), Section 2.4 (Triggers for Visual Specialist Input, Tables 2.2 to 2.4), Section

Requirements of Appendix 6 – GNR 982 EIA Regulations of 4 December 2014	Relevant Section In Report
sensitivity of the site related to the activity and its associated structures and infrastructure.	2.5 (Baseline Assessment, Tables 2.5 and 2.6), Section 2.6 (VIA Criteria, Table 2.7) and Section 2.7 (Zone of Theoretical Visibility, Table 2.8). Sensitivity of the site: Section 2.8 (DFFE Screening Tool – Site Sensitivity Verification; a separate Site Sensitivity Report was submitted), Section 3 (Existing Landscape), Section 4 (Visual Features and Sensitive Receptors, Tables 4.1 and 4.2) and Section 5.1 (Table 5.1: visual sensitivity of the area rated moderate; receptor sensitivity rated low to moderate).
An identification of any areas to be avoided, including buffers.	No specific areas to be avoided, and no buffers, were identified in this report. Section 5.1 (Table 5.1) and Section 8: the facility is positioned in a valley / mid-slope location that avoids prominent skyline positions. Section 7 (Mitigation Measures): recommends maintaining natural or cultivated vegetation as a screen between receptors and the development and using existing roads and already disturbed areas.
A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers.	Section 1: Figure 1.1 (Locality Map) and Figure 1.2 (Layout Map). Section 3: Figure 3.1 (Topography Map), Figure 3.7 (Vegetation Map) and Figure 3.8 (Land Use and Landcover Map). Section 5.1: Figure 5.1 (ZTV Map: PV facility) and Figure 5.2 (ZTV Map: OHL), showing theoretical visibility within the 10 km project area of influence. Section 6.3: Figure 6.1 (Cumulative map of PV developments within 50 km). No buffers are shown, as no areas to be avoided were identified.
A description of any assumptions made and any uncertainties or gaps in knowledge.	Section 2.9 (Assumptions and Limitations): Section 2.9.1 Seasonality, Section 2.9.2 Spatial Data Accuracy, Section 2.9.3 Viewer Subjectivity, Section 2.9.4 Site Access and Photos and Section 2.9.5 Visual Receptors.

Requirements of Appendix 6 – GNR 982 EIA Regulations of 4 December 2014	Relevant Section In Report
	Section 2.7: the ZTV is based on terrain only (excludes vegetation and buildings) and the exposure ratings are theoretical. Section 1.3: certain technical elements remain subject to confirmation during detailed design.
A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment.	Section 5.1 (Table 5.1): rating of the six visual criteria. Section 6: impact assessment for the construction phase (Section 6.1, Table 6.1), operational phase (Section 6.2, Table 6.2), cumulative impacts (Section 6.3, Table 6.4) and decommissioning phase (Section 6.4, Table 6.5). Section 6.5 (Alternative Sites): no alternative sites were identified. Section 6.6 (No-Go Alternative). Section 8.1 (Key Findings): impact initially predicted to be high (Category 5), reduced to low with mitigation. The Executive Summary also summarises the findings.
Any mitigation measures for inclusion in the Environmental Management Programme (EMPr).	Section 6: mitigation measures per phase (Sections 6.1, 6.2 and 6.4) and in Tables 6.1, 6.2, 6.4 and 6.5. Section 7 (Mitigation Measures): general measures (vegetation, roads, infrastructure and lighting), Section 7.1 (construction and decommissioning phases) and Section 7.2 (operational phase).
Any conditions for inclusion in the environmental authorisation.	Section 7.3 (Monitoring Requirements): monitoring recommended to be included as conditions in the Environmental Authorisation. Section 8.2 (Conclusion): the recommendation for approval is subject to implementation of the mitigation measures, and comment should be obtained from the South African Civil Aviation Authority (SACAA). See also Section 4.1 (Objects Affecting Airspace).
Any monitoring requirements for inclusion in the EMPr or environmental authorisation.	Section 7.3 (Monitoring Requirements): the ECO and / or CLO to monitor litter, housekeeping and dust during construction; rehabilitation to be monitored for at least the first 6 months after construction; the permanent workforce to

Requirements of Appendix 6 – GNR 982 EIA Regulations of 4 December 2014	Relevant Section In Report
	monitor the health of added vegetation so screening is maintained; and any other requirements set by the EA, EMPr and SACAA.
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised, and if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan.	Section 8.2 (Conclusion): the project is considered acceptable from a visual perspective and can be supported, subject to the mitigation measures. Donaway Environmental recommends that the project, with the associated layout, be approved provided that mitigation measures are implemented. Mitigation for the EMPr: Section 7. Closure: Section 6.4 (Decommissioning Phase) describes dismantling and rehabilitation. No separate closure plan is included.
A description of any consultation process that was undertaken during preparing the specialist report.	N/A. Public Participation Process undertaken as part of the Basic Assessment (BA) executed by the EAP. This report serves as input into the BAR (Section 1.1).
A summary and copies of any comments received during any consultation process and where applicable all responses thereto.	N/A. Public Participation Process undertaken as part of the Basic Assessment executed by the EAP.
Any other information requested by the competent authority.	N/A.

In development of the above, specialists are expected to:

- Review the BAR, with specific reference to the Comments and Response Report to familiarise with all relevant issues or concerns relevant to their field of expertise.
- In development of the impacts listed in the BAR, identify any issue or aspect that needs to be assessed and provide expert opinion on any issue in their field of expertise that they deem necessary in order to avoid potential detrimental impacts.
- Assess the degree and extent of all identified impacts (including cumulative impacts) that the preferred project activity and its proposed alternatives, including that of the no-go alternative, may have.
- Identify and list all legislation and permit requirements that are relevant to the development proposal in context of the study.
- Reference all sources of information and literature consulted; and
- Include an executive summary to the report.

The terms of reference for this VIA requires providing the following:

- Conduct a desktop review of available information that can support and inform the specialist study;
- Describe the receiving environment and the visual absorption for the proposed project;
- Conduct a field survey to determine the actual or practical extent of potential visibility of the proposed development;
- Conduct a photographic survey of the landscape surrounding the development;
- Identify issues and potential visual impacts for the proposed project, to be considered in combination with any additional relevant issues that may be raised through the public consultation process;
- Identify possible cumulative impacts related to the visual aspects for the proposed project;
- Assess the potential impacts, both positive and negative, associated with the proposed project for the construction, operation and decommissioning phases;
- Identify management actions to avoid or reduce negative visual impacts; and to enhance positive benefits of the project; and
- Use mapping and photo-montage techniques as appropriate.

2.3. Approach to the Study

The approach to the study followed various guidelines for visual impact assessments that are available. This assessment will be undertaken in accordance with:

- Oberholzer, B. South African Provincial Government (Western Cape Province) – Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (2005);
- United States of America, Texas Department of Transportation - Standard Operating Procedure for Visual Impact Assessments (2012); and
- The Landscape Institute with the Institute of Environmental Management and Assessment – Guidelines for Landscape and Visual Impact Assessments, Second Edition (2002).

By using the above resources and guidelines, triggers for specialist input are identified.

2.4. Triggers for Visual Specialist Input

A 'trigger' refers to a characteristic of either the receiving environment or the proposed project that indicates the likelihood of visibility and aesthetics becoming significant concerns. In such cases, it may be necessary to engage a qualified and experienced specialist.

The following indicators can suggest the necessity of visual input, taking into account both the nature of the receiving environment and the characteristics of the project at hand.

The nature of the receiving environment:

- Areas with protection status, such as national parks or nature reserves;
- Areas with proclaimed heritage sites or scenic routes;

- Areas with intact wilderness qualities, or pristine ecosystems;
- Areas with intact or outstanding rural or townscape qualities;
- Areas with a recognised special character or sense of place;
- Areas lying outside a defined urban edge line;
- Areas with sites of cultural or religious significance;
- Areas of important tourism or recreation value;
- Areas with important vistas or scenic corridors; and
- Areas with visually prominent ridgelines or skylines.

The nature of the project:

- High intensity type projects including large-scale infrastructure;
- A change in land use from the prevailing use;
- A use that is in conflict with an adopted plan or vision for the area;
- A significant change to the fabric and character of the area;
- A significant change to the townscape or streetscape;
- Possible visual intrusion in the landscape; and
- Obstruction of views of others in the area.

To streamline specialist input, it is essential to identify key issues that necessitate their expertise. These issues encompass questions or concerns regarding the visual or scenic impact of the proposed development. However, in cases where stakeholders lack interest or knowledge in visual matters, these concerns may be overlooked. Hence, involving a visual specialist during the initial project phase becomes crucial, particularly when triggers indicate the potential significance of visibility.

Table 2.2 presents a range of environments, ranging from the most visually sensitive to the least sensitive, along one axis, and various development types, spanning from the least intensive to the most intensive, along the other axis (refer to **Table 2.3** for details).

This correlation between environment types and development types results in varying levels of expected visual impact, ranging from no impact to very high impact (see **Table 2.4**).

Table 2.2: Categorisation of issues to be addressed by the visual assessment specialist (Oberholzer, B. 2005.)

Type of environment	Type of development (see Table 2.3) Low to high intensity				
	Category 1 development	Category 2 development	Category 3 development	Category 4 development	Category 5 development
Protected/wild areas of international, national, or regional significance	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected	Very high visual impact expected
Areas or routes of high scenic, cultural,	Minimal visual impact	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected

Type of environment	Type of development (see Table 2.3) Low to high intensity				
	Category 1 development	Category 2 development	Category 3 development	Category 4 development	Category 5 development
historical significance	expected				
Areas or routes of medium scenic, cultural or historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual Impact expected
Areas or routes of low scenic, cultural, historical significance / disturbed	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected
Disturbed or degraded sites / run-down urban areas / wasteland	Little or no visual impact expected. Possible benefits	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected

Table 2.3: Key to Categories of Development

Type of Development	Description
Category 1 development	e.g., nature reserves, nature-related recreation, camping, picnicking, trails and minimal visitor facilities.
Category 2 development	e.g., low-key recreation / resort / residential type development, small-scale agriculture / nurseries, narrow roads and small-scale infrastructure.
Category 3 development	e.g., low density resort / residential type development, golf or polo estates, low to medium-scale infrastructure.
Category 4 development	e.g., medium density residential development, sports facilities, small-scale commercial facilities / office parks, one-stop petrol stations, light industry, medium-scale infrastructure.
Category 5 development	e.g., high density township / residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large-scale infrastructure generally. Large-scale development of agricultural land and commercial tree plantations. Quarrying and mining activities with related processing plants.

Explanation Of Terms Used:

Low-key development – generally small-scale, single-storey domestic structures, usually with more than 75% of the area retained as natural (undisturbed) open space.

Low density development - generally single or double-storey domestic structures, usually with more than 50% of the area retained as natural (undisturbed) open space.

Medium density development - generally 1 to 3-storey structures, including cluster development, usually with more than 25% of the area retained as green open space.

High density development - generally multi-storey structures, or low-rise high density residential development.

Table 2.4: Key to Categories of Issues

Very high visual impact expected:	Potentially significant effect on wilderness quality or scenic resources. Fundamental change in the visual character of the area. Establishes a major precedent for development in the area.
High visual impact expected:	Potential intrusion on protected landscapes or scenic resources. Noticeable change in visual character of the area. Establishes a new precedent for development in the area.
Moderate visual impact expected:	Potentially some effect on protected landscapes or scenic resources. Some change in the visual character of the area. Introduces new development or adds to existing development in the area.
Minimal visual impact expected:	Potentially low level of intrusion on landscapes or scenic resources. Limited change in the visual character of the area. Low-key development, similar in nature to existing development.
Little or no visual impact expected:	Potentially little influence on scenic resources or visual character of the area. Generally compatible with existing development in the area. Possible scope for enhancement of the area.

Explanation Of Terms Used:

Fundamental change – dominates the view frame and experience of the receptor.

Noticeable change – clearly visible within the view frame and experience of the receptor.

Some change – recognisable feature within the view frame and experience of the receptor.

Limited change – not particularly noticeable within the view frame and experience of the receptor.

Generally compatible – Practically not visible or blends in with the surroundings.

Project Specific Category

The project is identified as a **Category 5** development with the potential for a high visual impact. The visual impact can be linked to the potential intrusion on protected landscapes or scenic resources, change in visual character of the area and the establishment of a new precedent for development in the area. Although the project has the potential for a high visual impact, this

outcome might be different due to other influential factors and the results of the impact assessment.

2.5. Baseline Assessment

2.5.1. Methodology for Assessing Impacts

Impact assessment must take account of the nature, scale and duration of impacts on the visual receptors whether such impacts are positive or negative. Each impact was assessed according to density and number of sensitive visual receptors within designated radii, which were determined by using the ZTV, Google Earth (for visual receptors and development types) and the following project phases:

- Construction;
- Operation; and
- Decommissioning.

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 project 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 2.5** with detailed explanations presented in **Table 2.6**.

Table 2.5: Criteria and Rating Scales to be used in the Assessment of the Potential Impacts

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.
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	

Criteria	Rating Scales	Notes
	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 2.6: 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.

Criteria	Explanation
	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.
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

Criteria	Explanation
	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.

2.5.2. Cumulative Assessment Methodology

"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 in itself 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.

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

2.5.3. Cumulative Spatial Context

A transparent and traceable cumulative assessment process will be followed. The VIA report will be required to demonstrate:

- How surrounding developments were identified and spatially mapped.
- How cumulative interaction pathways were evaluated.
- How existing baseline degradation and development pressure were considered.
- How mitigation measures and findings from similar developments in the area informed the assessment.
- How proposed mitigation measures contribute to reducing cumulative effects.

This process will be clearly documented within the report.

2.5.4. Use of Cumulative Impact Findings

A clear cumulative impact environmental statement will be provided, indicating whether the proposed project should proceed in the context of existing and reasonably foreseeable developments within the surrounding area.

2.6. Visual Impact Assessment Criteria

In order to facilitate decision-making, ensuring consistency in the interpretation of impact assessment criteria is crucial when assessing and reporting potential impacts. **Table 2.7** provides several criteria specifically related to visual impact assessments. It is important to evaluate the proposed project against these criteria before attempting the baseline impact assessment set out in **Table 2.2**.

When determining the significance of impacts, it is essential to consider the projected impact of the proposed development in relation to the envisioned future of the area, rather than solely focusing on its effect on the existing baseline conditions.

Table 2.7: Visual Impact Assessment Criteria

Specific Criteria for Visual Impact Assessments **(Oberholzer, B. 2005.)**	
Visibility of the project	The geographic area from which the project will be visible, or view catchment area. (The actual zone of visual influence of the project may be smaller because of screening by existing trees and buildings). This also relates to the number of receptors affected. • ***High visibility*** – visible from a large area (e.g., several square kilometres). • ***Moderate visibility*** – visible from an intermediate area (e.g., several hectares). • ***Low visibility*** – visible from a small area around the project site.
Visual exposure	Based on distance from the project to selected viewpoints. Exposure or visual impact tends to diminish exponentially with distance. • ***High exposure*** – dominant or clearly noticeable (0-1km); • ***Moderate High exposure (included by the visual specialist)*** – somewhat significant and noticeable to the viewer, but not as dominant (1-3km); • ***Moderate exposure*** – recognisable to the viewer (3-5km); • ***Low exposure*** – not particularly noticeable to the viewer (5-10km);
Visual sensitivity of the area	The inherent visibility of the landscape, usually determined by a combination of topography, landform, vegetation cover and settlement pattern. This translates into visual sensitivity.

	• ***High visual sensitivity*** – highly visible and potentially sensitive areas in the landscape. • ***Moderate visual sensitivity*** – moderately visible areas in the landscape. • ***Low visual sensitivity*** – minimally visible areas in the landscape.
Visual sensitivity of receptors	The level of visual impact considered acceptable is dependent on the type of receptors. • ***High sensitivity*** – e.g., residential areas, nature reserves and scenic routes or trails; • ***Moderate sensitivity*** – e.g., sporting or recreational areas, or places of work; • ***Low sensitivity*** – e.g., industrial, mining or degraded areas.
Visual absorption capacity (VAC)	The potential of the landscape to conceal the proposed project, i.e., • ***High VAC*** – e.g., effective screening by topography and vegetation; • ***Moderate VAC*** - e.g., partial screening by topography and vegetation; • ***Low VAC*** - e.g., little screening by topography or vegetation.
Visual intrusion	The level of compatibility or congruence of the project with the particular qualities of the area, or its 'sense of place'. This is related to the idea of context and maintaining the integrity of the landscape or townscape. • ***High visual intrusion*** – results in a noticeable change or is discordant with the surroundings; • ***Moderate visual intrusion*** – partially fits into the surroundings, but clearly noticeable; • ***Low visual intrusion*** – minimal change or blends in well with the surroundings.

2.7. Zone of Theoretical Visibility

The ZTV maps reflects the visibility in term of proximity of viewers to the proposed development within a 10km Project area of influence (PAOI). **Table 2.8** below is used for visual exposure rating within the different radii:

Table 2.8: Exposure Rating

Distance (km)	Exposure Rating
0-1	High Exposure
1-3	Moderate High Exposure
3-5	Moderate Exposure

5-10	Low Exposure

The distances were calculated using satellite imagery, but the exposure rating was determined by using previous experiences, assumptions and opinions, it is therefore theoretical. The ZTV maps will give a clearer understanding of areas susceptible to line of sight within a 10 km PAOI which means, an imaginary line from the eye to a perceived object. The ZTV **did not consider existing screening such as buildings and vegetation cover but rather the terrain's above mean sea level (amsl) which indicates line of sight**. The receptors which were identified were subject to an impact assessment and the ZTV will form part of the VIA Criteria set out in **Section 2.5** of this report.

2.8. Department Forestry, Fisheries and the Environment Screening Tool – Site Sensitivity Verification

A separate Site Sensitivity Report was submitted.

2.9. Assumptions and Limitations

2.9.1. Seasonality

Seasonality is not deemed a limiting factor for visual fieldwork and that fieldwork is deemed sufficient for the nature of this project.

2.9.2. Spatial Data Accuracy

Spatial data used for visibility analysis originate from various sources and scales. Inaccuracy and errors are therefore inevitable. Where relevant, these are highlighted in the report. Every effort was made to minimise their effect.

2.9.3. Viewer Subjectivity

Viewer subjectivity plays a significant role when assessing the visual impacts of PV facilities. Individuals' perceptions and preferences can vary greatly, leading to subjective interpretations of visual impacts. Factors such as personal aesthetics, cultural background, and individual experiences influence how viewers perceive and evaluate the visual effects of PV facilities. Some viewers might appreciate the industrial character and economic benefits associated with renewable energy, while others may view it as an intrusion on natural landscapes.

2.9.4. Site Access and Photos

Site photos are taken at the best possible location.

2.9.5. Visual Receptors

All visual receptors are identified as far as practically possible. All homesteads, farmsteads and residential areas identified are assumed to be occupied at the time of the study.

2.10. Project Team and Experience

The project team consisted of Johan Botha and Michael Cloete.

Johan Botha has extensive knowledge and 15 years' experience on Renewable Energy, Mining, and large-scale Industrial projects, and more specifically, the Visual, Social and Shadow Flicker (WEFs) impacts surrounding these developments. He also has knowledge and experience in environmental management of Eskom power infrastructure projects as well as solar and wind energy facilities, focusing on EA and EMP implementation, as well as TOPS counts and permitting. He has completed 150+ Visual Impact Assessments, including Shadow Flicker Impact Assessments on Wind Energy Facilities, and 70+ Social Impact Assessments. Below is a list of the number of projects completed for each field of assessment:

- 6 Environmental Control Officer (ECO) Projects on Eskom Substation and Transmission lines in the Northern Cape Province
- 1 ECO Project on a Solar Power Plant in the Northern Cape Province
- 5 Environmental Audits on Solar Power plants and Wind Energy Facilities.
- 150+ Visual Impact Assessments for Photovoltaic Solar Energy Projects, Wind Energy, Electrical Infrastructure, Mines and large-scale industrial developments.
- 70+ Social Impact Assessments for Photovoltaic Solar Energy Projects, Wind Energy, Electrical Infrastructure, Mines and large-scale industrial developments.
- 12 Threatened or Protected Species Surveys and Permit Applications.

Michael Cloete has extensive knowledge and 5 years' experience in the environmental science field, in particular, social impacts, visual impacts, hydrogeology and GIS fields. Visual impacts assessment and the methodological approach formed the basis of his Master's and Honours studies, gaining extensive knowledge in the field. His recent focus involved renewable projects and the social and visual impact assessment studies. Below is a list of the number of projects completed for each field of assessment:

- 80+ Social Impact Assessments, with the majority associated with Photovoltaic Solar Energy Projects in the Free State, Limpopo, North West, Mpumalanga, Northern Cape, Gauteng and Western Cape Provinces. In addition, Battery Energy Storage Facilities, Wind Energy Facilities and Accommodation camps have formed part of the Social Impact Assessment.
- 30 VIA+ Visual Impact Assessments for Photovoltaic Solar Energy Projects, Wind Energy and Electrical Infrastructure projects across South Africa
- GIS applications for report writing and hydrogeological assessments, ranging from map creation to spatial analyst procedures.

3. EXISTING LANDSCAPE

This Section describes the types of landscape that may be impacted, indicating the likely degree of sensitivity.

3.1. Landscape Character

Landscape character is a composite of several influencing factors including:

- Topography and drainage.
- Vegetation patterns.
- Land use / development.
- Sense of place.

3.1.1. Topography and Drainage

The proposed Kopanya Solar PV 2 Project is located within a mountainous and highly undulating landscape. The broader area is characterised by prominent north–south orientated ridgelines, steep mountain slopes and deeply incised valleys, with elevations ranging approximately between 886 metres above mean sea level (m amsl) and 2,331 m amsl as reflected on the topographic map. The 20 m contour intervals illustrate significant relief across the landscape, with steep gradients along ridge crests and upper slopes, and comparatively moderate to gentler terrain occurring within valley bottoms and transitional mid-slope areas. The proposed development footprint is positioned within a valley/mid-slope setting rather than on prominent ridgelines, thereby avoiding the most topographically sensitive and visually exposed crest positions.

The drainage pattern is structurally controlled by the surrounding ridge systems, resulting in well-defined linear watercourses that follow the valley bottoms. Several rivers and tributaries traverse the broader assessment area, with surface water flowing downslope from elevated ridges into the main drainage corridors. Given the steep surrounding terrain, runoff may become concentrated during high rainfall events, increasing the potential for localised erosion along slopes and within drainage lines. The design of the proposed development will therefore need to incorporate appropriate stormwater management measures to maintain natural flow patterns, minimise erosion risk and protect existing watercourses within and downstream of the site.

For a better understanding of the visual landscape surrounding the proposed development, refer to the topography map below as well as photos of the surrounding environment.

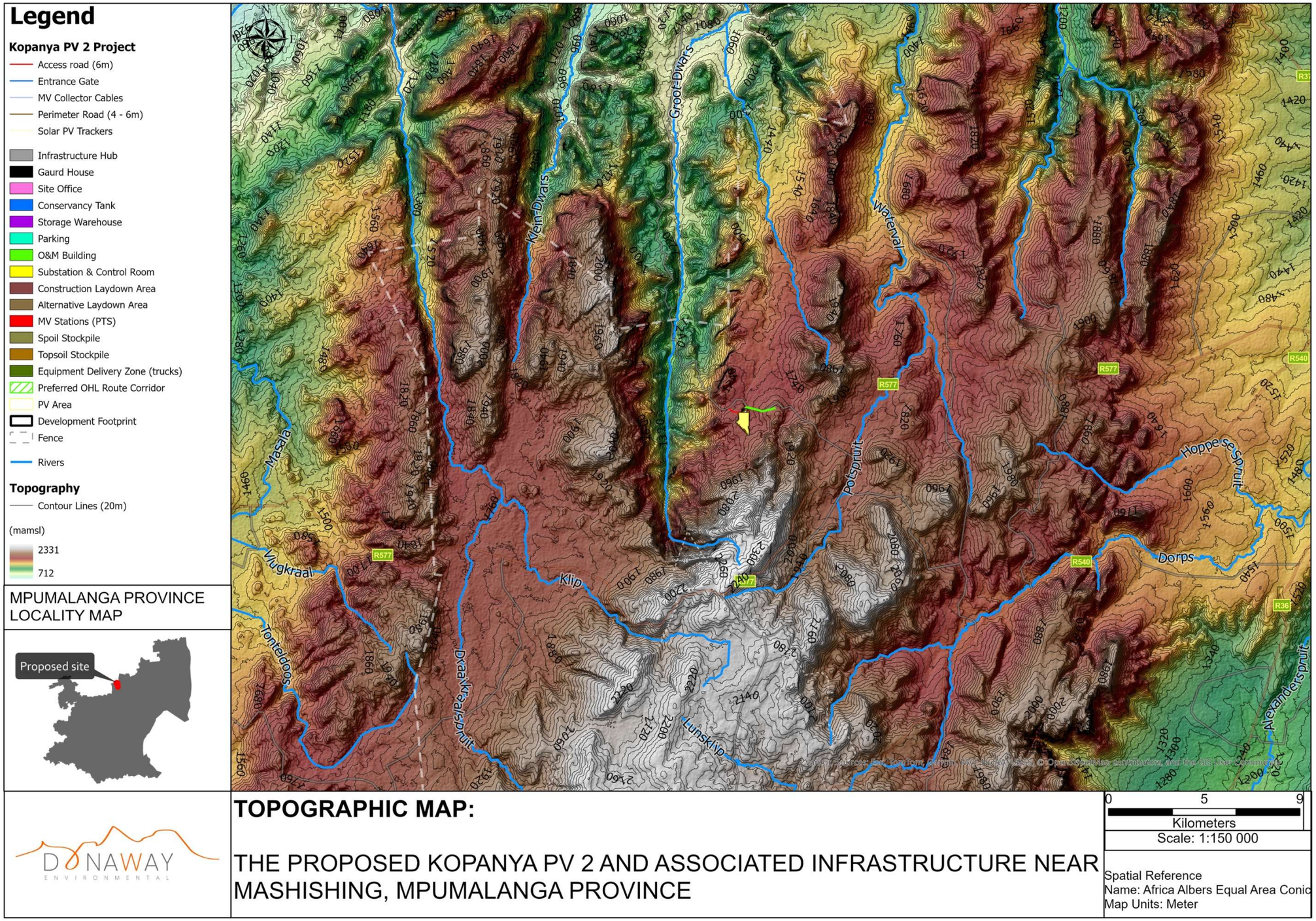


Figure 3.1: Topography Map



Figure 3.2: Landscape photo near the substation taken towards the north



Figure 3.3: Landscape photo on the PV site taken towards the east



Figure 3.4: Landscape photo on the PV site taken towards the west



Figure 3.5: Landscape photo on site showing existing vegetation



Figure 3.6: Landscape photo near the Mine taken towards the north, showing a small village

3.1.2. Vegetation Patterns

Visual impact extends beyond affecting only sensitive visual receptors; it also leaves its imprint on the surrounding landforms and vegetation. Vegetation can be regarded as a valuable visual asset, underscoring the significance of gaining insights into the specific vegetation that the proposed development may influence. By grasping the character of the vegetation in question, one can also draw preliminary findings of its screening potential in the given area.

According to Mucina and Rutherford (2006), the proposed project development footprint is situated within the Sekhukhune Montane Grassland vegetation type (Figure 3.7: Vegetation Map). This vegetation type occurs within parts of Mpumalanga and is generally associated with elevated, undulating to mountainous terrain at altitudes of approximately 1 300–1 960 m.

At a regional scale, Sekhukhune Montane Grassland is characterised by a varied landscape comprising hills, slopes and intervening plains. Vegetation generally consists of sour grassland, with localised occurrences of trees and shrubs, particularly within more sheltered habitats. The structure and composition of the vegetation vary according to local topography, soils and levels of disturbance.

Mucina and Rutherford (2006) classify Sekhukhune Montane Grassland as Vulnerable and note that the vegetation type has been subject to various forms of transformation and disturbance, including cultivation and mining. These characteristics describe the vegetation type across its broader geographical distribution and are therefore not necessarily representative of all conditions occurring within the project's Potential Area of Influence (PAOI). Site-specific landscape and vegetation characteristics within the PAOI are described separately where relevant to the visual assessment.

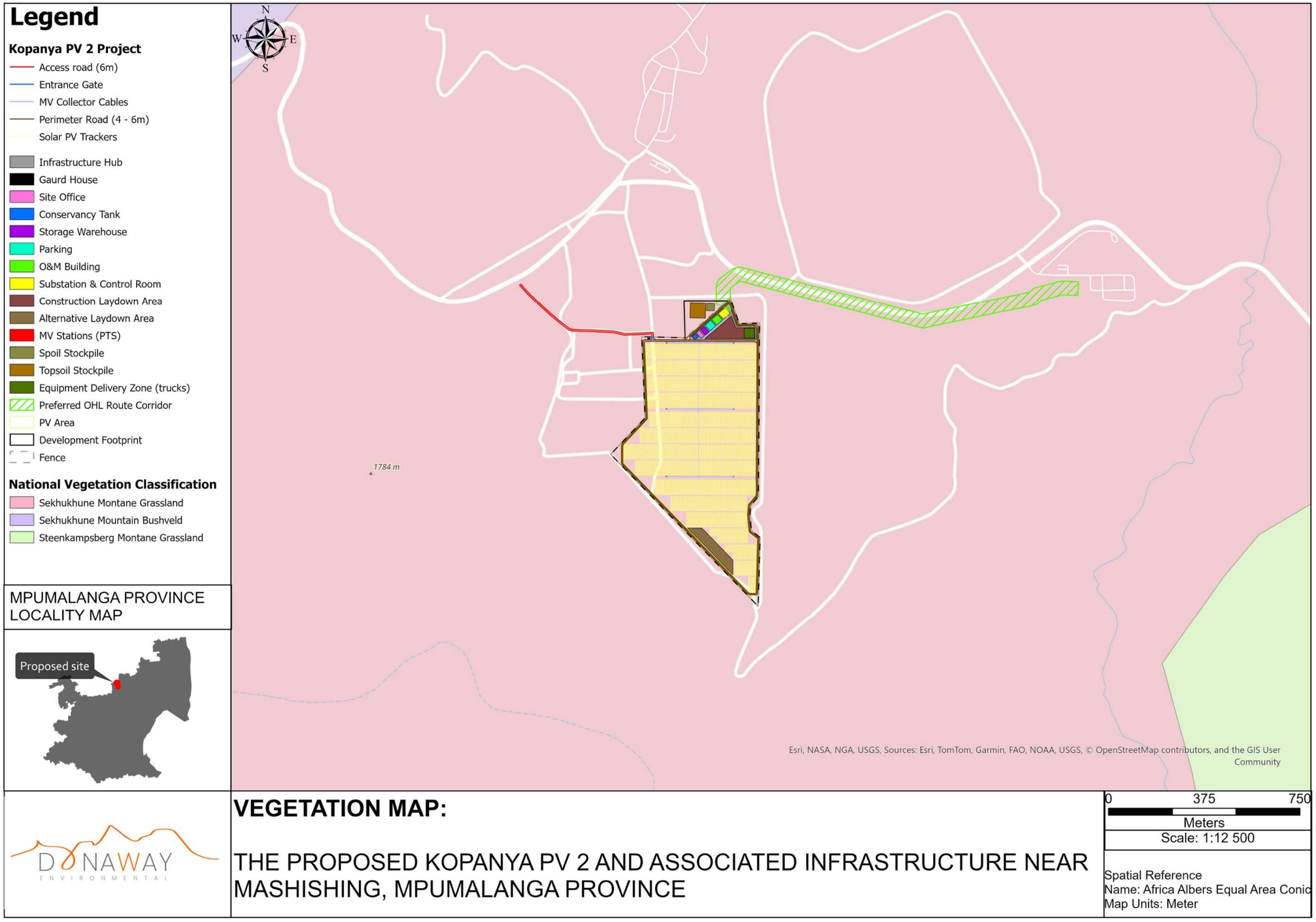


Figure 3.7: Vegetation Map

3.1.3. Land Use / Development

Development within the 10 km PAOI can be divided into the following types:

- **Industrial Development:** Mining represents the dominant industrial activity in the region, particularly toward Steelpoort to the north. The proposed development is located on existing Mine-leased property, with the nearest Mine-related infrastructure situated at the point where the proposed overhead line (OHL) will connect to the existing electrical Eskom network. Areas to the east, south and west are mainly utilised for agriculture, except for the very slopes as part of mountains.
- **Rural Settlements:** No formal urban development is present within the 10 km PAOI. Built-up development within the 10 km PAOI is limited and comprises two small villages located primarily to the north of the site. Although these settlements represent concentrations of built development, they are rural in character and occur within an otherwise predominantly rural landscape.
- **Sports and Recreational Development:** Formal sports and recreational facilities are largely absent within the study area. Informal hunting occurs within the broader rural landscape and forms part of the local cultural and subsistence practices typical of rural South African communities.
- **Agricultural Development:** Agriculture constitutes one of the principal land uses in the region. In proximity to the proposed development, agricultural activity is primarily small-scale or subsistence-based. Larger-scale, more commercial farming operations are located further to the east and south of the site.
- **Service Infrastructure:** Service infrastructure within the 10 km PAOI is limited. The road network is predominantly gravel and secondary roads, with only one tarred road located to the south-east. Existing powerlines are present, largely associated with mining operations. No major service developments occur within the immediate study area.
- **Tourism Development**: Tourism development within the 10 km PAOI is minimal. The local economy is primarily driven by mining and agriculture. A trout farm and two lodging facilities are located within the 10 km PAOI. Furthermore, one of South Africa's highest mountain peaks is located 4.3 km to the south. The peak is located within Davel Private Nature Reserve, which is part of De Berg Nature Reserve, classified as a Ramsar site. The peak sits at 2331 m amsl and is one of the nine highest peaks in South Africa and part of the 9 Peaks Challenge. The 9 Peaks Challenge is a South African endurance hiking challenge that involves summiting the highest peak in each of the country's nine provinces. Participants must reach the summit of each provincial high point within a 12-month period to officially complete the challenge. According to the organisers, the challenge has been completed by a limited number of participants since its inception in 2014.

Refer to the Land Use and Landcover Map (**Figure 3.8**) below for an indication of the landcover and developments.

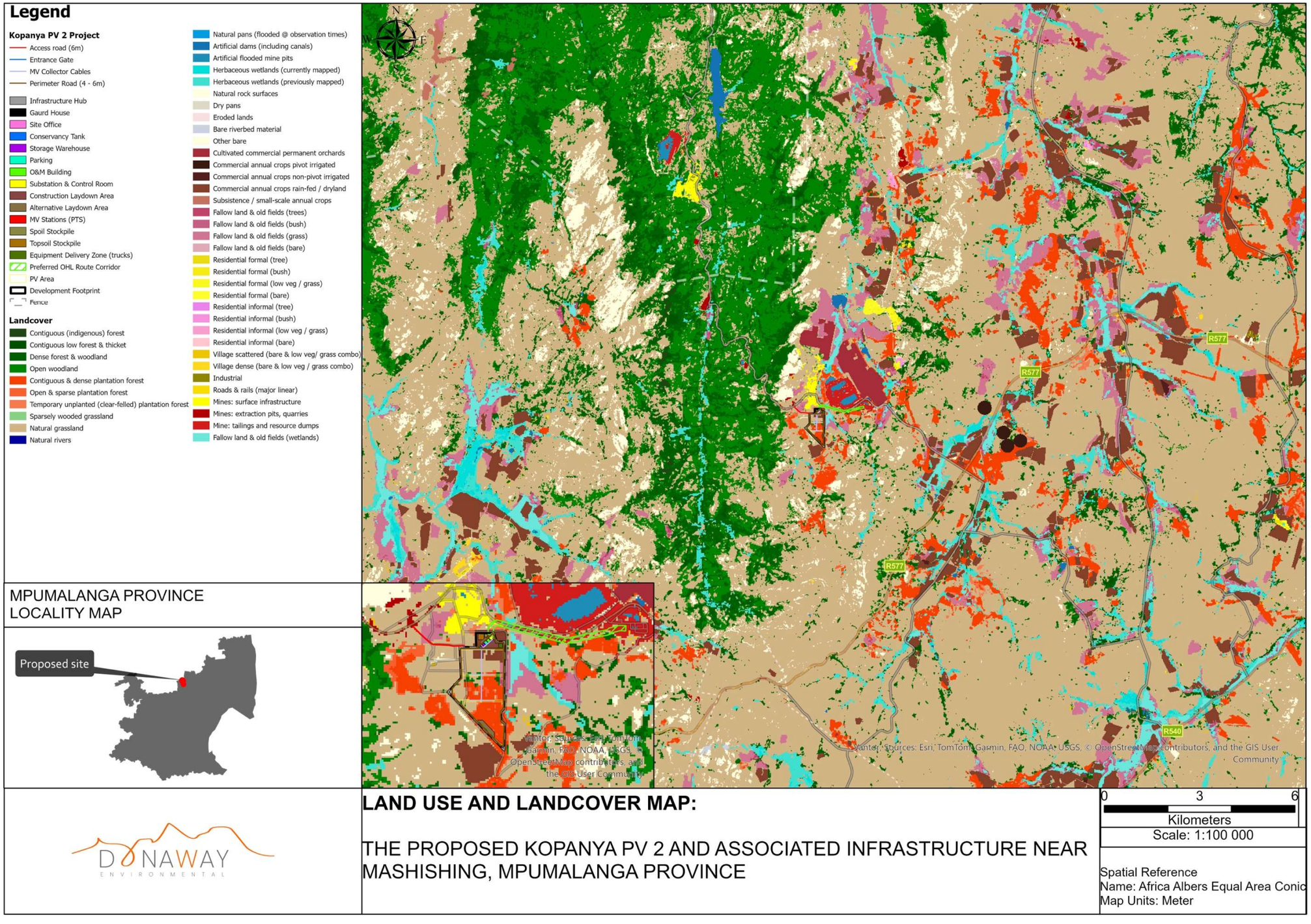


Figure 3.8: Land Use and Landcover Map

3.1.4. Sense of Place

The proposed Kopanya Solar PV 2 Project is located approximately 30 km west of Mashishing (Lydenburg) in Mpumalanga Province, within a distinctly mountainous and elevated landscape. The region is characterised by prominent ridgelines, steep slopes and deeply incised valleys that create strong spatial definition and a sense of enclosure. The terrain contributes to a landscape that feels rugged, expansive and visually dynamic, with long views from elevated areas and contained valley systems below.

The site falls within the Sekhukhune Montane Grassland vegetation type. This vegetation community gives the area a more open and upland character, with grass-dominated slopes and plateau areas creating a pronounced Highveld-like atmosphere. Seasonal variations in grass cover, particularly during the summer rainfall period, contribute to changing visual textures and colour contrasts across the landscape. Rocky outcrops and exposed slopes further enhance the dramatic quality of the mountainous terrain.

Although montane grassland dominates the immediate site, the broader region forms part of a transitional landscape system. Bushveld vegetation is present in valley systems and on warmer slopes, creating a mosaic between more open grassland uplands and denser vegetation in lower-lying areas. This transition between grassland and Bushveld contributes to a layered and diverse sense of place.

Mining activities form a prominent component of the wider regional identity. Extensive mining operations are concentrated within valley systems to the north, with the most concentrated infrastructure occurring toward the Steelpoort area. While the mountainous terrain provides significant visual screening in many directions, mining infrastructure, haul roads and associated facilities contribute to an established industrial presence within the broader landscape. As a result, the region reflects a dual character: scenic mountainous grassland landscapes alongside a strong mining-driven economic identity.

The area conveys a rural-industrial character rather than an urban one, with economic activity closely linked to mineral extraction and some agricultural use. Much of the steep mountainous terrain is not ideally suited to intensive or sustainable agricultural production, further reinforcing the dominance of mining within the regional land use profile.

Overall, the sense of place can be described as a rugged montane grassland landscape shaped by its dramatic topography and long-standing mining economy. The combination of open upland grassland, enclosed valley systems and visible mining activity creates a landscape that is both scenic and functional, where natural mountainous qualities coexist with established economic infrastructure.

4. VISUAL FEATURES AND SENSITIVE RECEPTORS

The study area is characterised by some landscape features that possess a visual or scenic value. These natural elements along with potential sensitive visual receptors serve as a visual baseline for assessing the surroundings. The following landscape features and potential sensitive visual receptors can be observed:

Table 4.1: Landscape Features

Scenic resource	Landscape features within the 10 km PAOI (assessment radius).
Topographic Features	The proposed Kopanya Solar PV 2 Project is located within a mountainous and highly undulating landscape. The broader area is characterised by prominent north–south orientated ridgelines, steep mountain slopes and deeply incised valleys.
Water Features	Water features to note is: • The Groot-Dwars River located 3.3 km to the west. • Der Brochen Dam. Located 9.4 km to the north-west. The dam is not open to the public and is located on Mine properties. • De Berg Nature Reserve, classified as a Ramsar site. Located 2.7 km to the south. None of the above water features are known to attract a large number of tourists.
Vegetation Features	The area surrounding the proposed development consists mostly of mountainous grassland vegetation with some scenic qualities. Please refer to **Section 3.1.2: Vegetation Patterns** for a detailed overview.
Cultural Landscapes	No specific cultural landscape except for the surrounding agricultural developments where farms may be carried over down family generations.

Table 4.2: Potential Sensitive Receptors

Sensitive receptors	Potential sensitive receptors within the 10 km PAOI.
Nature reserves and national parks	One property with two nature reserves declared on the property: • Davel Private Nature Reserve, declared in 1965. • De Berg Nature Reserve, classified as a Ramsar site, declared in 2024. The property is located approximately 2.8 km to the south of the proposed development.

Sensitive receptors	Potential sensitive receptors within the 10 km PAOI.
Human settlements and farmsteads	A number of farm dwellings, one trout farm and two lodging facilities are located within the 10 km PAOI. Two small villages are also located within the 10 km PAOI at the following distances: • 1.8 km north-east, near the Booysendal South Mine. Mine infrastructure are located between the village and the proposed PV facility. • 7.2 km to the north.
Scenic routes and arterial roads	One arterial road is located approximately 3.9 km to the south-east of the proposed PV facility, namely the R577 regional road. All roads in the area can be classified as scenic as they mainly traverse a scenic mountainous landscape.
Cultural and heritage sites	These form part of the heritage study. A development might have a visual impact on cultural or heritage sites only if these sites are visited frequently by tourists or interested parties.
Tourism facilities / sites	Two tourism facilities to note: • The peak within De Berg Nature Reserve which is part of the 9 Peaks Challenge. The peak is located approximately 4.3 km to the south of the proposed PV facility. • A trout farm located approximately 5.1 km to the south-east of the proposed development. It is important to note the area does not attract a large number of tourists or visitors. Tourists mainly flock around Dullstroom 27 km to the south-west.

4.1. Objects Affecting Airspace and Applicable Legislation

Any communications structure, building or other structure, whether temporary or permanent, which has the potential to endanger aviation in navigable airspace, or has the potential to interfere with the operation of navigation or surveillance systems or Instrument Landing Systems, including meteorological systems for aeronautical purposes, is considered an obstacle and shall be submitted to the Commissioner for Civil Aviation for evaluation (refer to SA-CAR Part 139.01.33).

As navigable airspace is any airspace where "heavier than air" craft can operate, it means that any obstacle, anywhere, needs to be evaluated.

The main reason is to control or prevent structures that could have a serious effect on aviation safety, especially in the vicinity of an aerodrome. It also follows that the knowledge of where obstacles are, will add to aviation safety.

Power lines

Power lines, overhead wires and cables are considered as obstacles and the detail shall be communicated to the Commissioner for Civil Aviation at an early planning stage.

The Commissioner shall require the route of the power line, the co-ordinates (latitude and longitude in degree, minute, seconds and tenth of seconds format) of turning points in the line, the maximum height of the structures above ground level and the name of the power line. The Commissioner shall evaluate the route and require those sections of the line (if any), which is considered a danger to aviation to be marked or rerouted.

Power lines shall be marked when crossing a river, valley or major highway with marker spheres of a diameter of not less than 60 centimetres (cm). The spheres shall be of one colour and displayed alternately orange/red and white or a colour that is in sharp contrast to the background as seen from an airborne perspective. The spacing between the spheres and between the spheres and the supporting towers shall not exceed 30 m. On lines with multiple cables, the spheres shall be fitted to the highest cable.

The marker spheres shall be visible from at least 1000 m from an airborne perspective and 300 m from the ground.

Where power lines cross a river or valley, the co-ordinates (latitude and longitude in degree, minute, seconds and tenth of seconds format) and the height of the line above the valley or river, shall be communicated to the Commissioner for publication in the appropriate media.

The Commissioner may require that supporting towers be marked and lighted.

Cranes

Where cranes are erected, prior permission shall be obtained from the Commissioner. The co-ordinates (latitude and longitude in degree, minute, seconds and tenth of seconds format), the ground elevation of the site above mean sea level, the height of the crane, the dimensions of the jib as well as the erecting date and duration of the project must be communicated to the Commissioner for evaluation and publication in the relevant media.

The Commissioner shall specify markings, if required.

4.2. Glare

Solar panels are designed to absorb light, and accordingly only reflect a small amount of the sunlight that falls on them compared to most other everyday objects (Refer to **Figure *4.1*** to **Figure 4.4**). Most notably, solar panels reflect significantly less light than flat water.

In fact, glass, one of the uppermost and important components of a solar panel, reflects only a small portion of the light that falls on it–about 2-4%, depending on whether it has undergone an anti-reflective treatment. These days, to increase solar panel efficiency and power output, most panels are treated with anti-reflective coating.

The potential glint and glare effects for bifacial panels remains the same due to both faces consisting of a reflective surface, it is deemed very unlikely that significant glare effects from the underside are possible for static, single and dual axis trackers. This is because this face will almost always be facing away from the Sun. On static systems (north facing with a 20-degree elevation angle, for example), the underside of the panel will be angled downward towards the ground. Considering the path of the Sun throughout a typical day in South Africa, any reflections will only ever go towards the floor. The possibility of glare effects for the optimised face (the face orientated towards the Sun) remains the same.



Figure 4.1: Reflection Characteristics of normal glass (left) and PV glass (right)

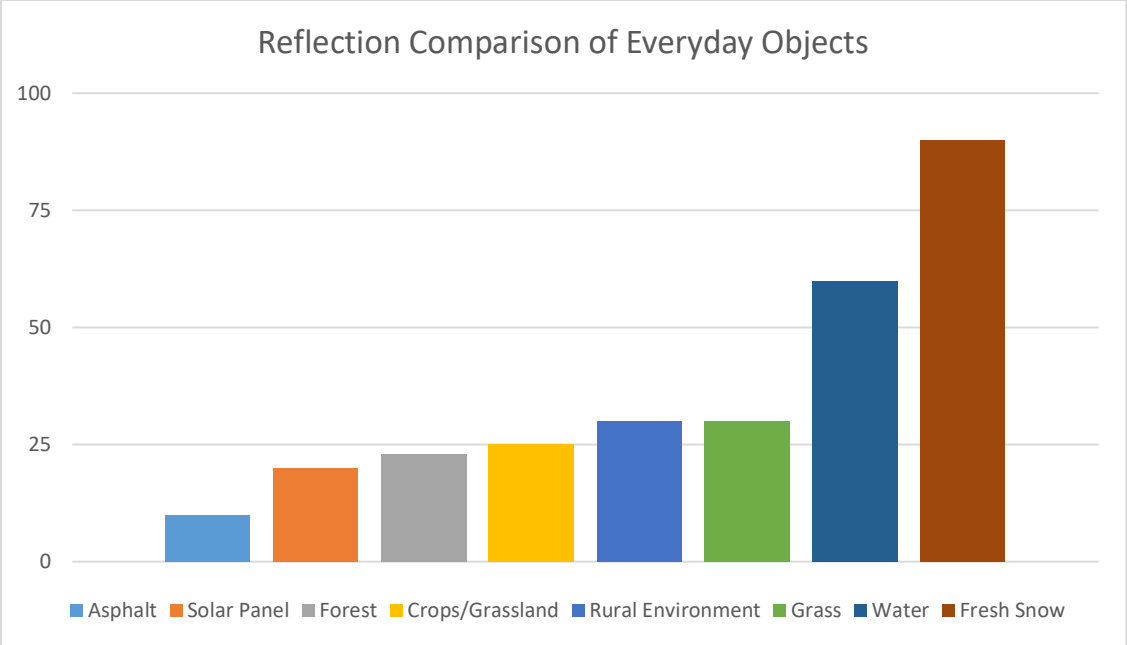


Figure 4.2: Reflection Comparison of everyday objects

Numerous airports around the world have solar installations located on their premises (Refer to **Figure 4.3**). Airports Company South Africa has commissioned three solar powered airports, George Airport in the Western Cape, followed by Kimberley Airport and Upington International Airport, both in the Northern Cape. Most examples in which solar panels have been installed at, on or near airports are testament to fact that they are not automatically a hazard to pilots.



Figure 4.3: Solar Installations at George Airport in the Western Cape

(www.lifegate.com/george-airport-south-africa-solar-power)



Figure 4.4: View of the Bokamoso PV facility from an aeroplane at a height of 36000 feet amsl

5. VISUAL IMPACT ASSESSMENT CRITERIA

Please refer to **Section 2 (Methodology)** of this report for a detailed understanding of the VIA Criteria.

5.1. Visual Impact Assessment Criteria Assessed

Table 5.1: Visual Impact Assessment Criteria - Assessed

Specific Criteria for Visual Impact Assessments	
VISIBILITY OF THE PROJECT	**HIGH VISIBILITY** The rating is solely based on the size of the Zone of Theoretical Visibility (ZTV) and serves as an indicator of the potential visual impacts of the development on the surrounding region according to topography, excluding vegetation and infrastructure screening. A high visibility does not necessarily imply a significant visual impact or exposure, although it may have one if the region has a dense population of sensitive visual receptors together with sparse vegetation and infrastructure screening. The ZTV maps below indicate a "High Visibility", according to the Specific Criteria for Visual Impact Assessment (Oberholzer, B. 2005), for the entire 10 km radius. Visibility within the 10 km (Project area of influence) PAOI covers thousands of hectares, with a significant percentage within the 1 km radius for both the OHL and PV facility. Exposure percentage up to 1 km is high but starts to diminish exponentially beyond the 1 km radius, especially for the PV facility. It is important to note that proposed development has a much lower visibility than other projects of similar nature, primarily due to the mountainous landscape. Furthermore, air quality and atmospheric conditions play a crucial role in determining visibility levels. Poor air quality, characterised by high levels of pollutants and particulate matter, can significantly reduce visibility by scattering and absorbing light. Fine particulate matter, such as smoke, haze, and smog, can absorb and scatter sunlight, creating a hazy or foggy appearance. Similarly, pollutants like sulphur dioxide and nitrogen dioxide can react with other compounds in the atmosphere to form smog, which further impairs visibility. Atmospheric conditions, such as humidity and temperature inversions, also affect visibility. High humidity levels can lead to the formation of fog and mist, reducing visibility to mere metres. Temperature inversions occur when a layer of warm air traps cooler air near the ground, causing pollutants and

	particulate matter to be trapped closer to the surface and reducing visibility. In summary, air quality and atmospheric conditions are closely linked to visibility, with poor air quality and specific weather phenomena significantly impacting the clarity of our surroundings.
VISUAL EXPOSURE	As mentioned above, the exposure rating is based on the ZTV (line of sight influenced solely by topography) and not existing visual screening such as vegetation cover and / or other infrastructure. The receptors listed below are exclusively those that have the potential to visually observe or perceive the project. Visual exposure diminishes exponentially with distance. A number of receptors are exposed. These include farmsteads, the two villages and De Berg Nature Reserve. It is important to note that only certain areas of De Berg Nature Reserve / Davel Private Nature Reserve is exposed.
VISUAL SENSITIVITY OF THE AREA	**MODERATE VISUAL SENSITIVITY** The visual sensitivity of the Kopanya Solar PV 2 Project (South) is influenced primarily by the mountainous topography, the existing mining context and the relatively low density of surrounding receptors. The broader landscape is characterised by prominent north–south orientated ridgelines and deeply incised valleys; however, the proposed development footprint is located within a valley/mid-slope position rather than on elevated ridgelines. This reduces potential skyline intrusion and limits long-distance visibility from surrounding areas. The presence of existing mining infrastructure and associated powerlines further moderates the visual sensitivity of the landscape, as the area is not pristine or undeveloped in character, but rather forms part of a working industrial-mining environment. Sensitive visual receptors within the 10 km PAOI are limited and include scattered rural homesteads and small villages located mainly to the north, as well as users of local gravel and secondary roads. The absence of significant tourism nodes and formal recreational facilities within the immediate vicinity lowers the overall visual sensitivity. While elevated ridgelines in the broader area may offer potential vantage points toward the site, intervening landforms and vegetation are likely to provide partial screening. On balance, the visual sensitivity of the site can be considered moderate within a rugged landscape context, but reduced by its location within an established mining and agricultural setting and by its avoidance of prominent crest positions.
VISUAL SENSITIVITY	**LOW TO MODERATE RECEPTOR SENSITIVITY**

OF RECEPTORS	Please refer to the ZTV maps below and Section 4 of this report for an indication of sensitive visual receptors in the area. Visual receptor sensitivity within the 10 km PAOI is generally low to moderate, largely due to the rural and industrial character of the surrounding landscape. The dominant land uses in the region are mining and subsistence agriculture, and the presence of existing mining infrastructure, powerlines and disturbed areas reduces the perceived visual quality and naturalness of the landscape. As such, receptors already experience a modified environment, which lowers overall sensitivity to additional infrastructure of a similar industrial nature. Residential receptors are limited to two small villages located primarily to the north, scattered rural homesteads, and the low number of visitors as part of the 9 Peaks Challenge. Most receptors may experience moderate sensitivity due to their permanent occupancy and prolonged exposure to views; however, distance from the site and intervening topography and Mine infrastructure prevent direct views towards the PV facility. No significant tourism nodes were identified within the immediate study area, further reducing overall receptor sensitivity. Overall, receptor sensitivity within the study area is considered to range from low to moderate, depending on proximity and elevation relative to the proposed development.
VISUAL ABSORPTION CAPACITY (VAC)	**HIGH VAC** The area surrounding the proposed development boasts an excellent VAC due to topography, limiting exposure and visibility. The surrounding area also includes some vegetation adding to screening.
VISUAL INTRUSION	**MODERATE VISUAL INTRUSION** The potential visual intrusion of the Kopanya Solar PV 2 Project is expected to be moderate and largely localised due to the site's location within a valley/mid-slope position and the screening effect of surrounding ridgelines. The development avoids prominent skyline positions, thereby limiting long-distance visibility. Although the solar arrays will introduce additional infrastructure into the landscape, the presence of existing mining activities and associated powerlines reduces the overall visual contrast.

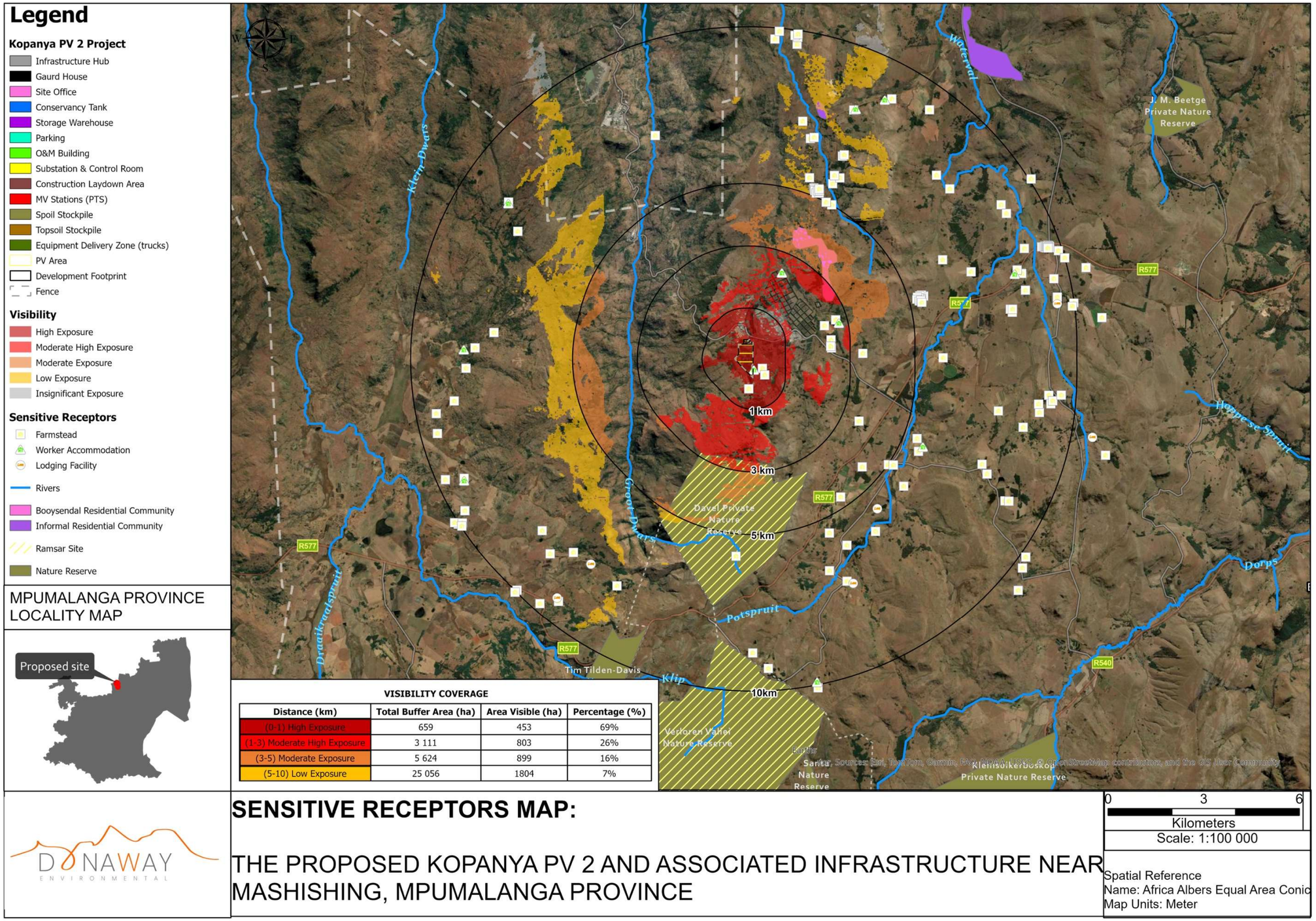


Figure 5.1: ZTV Map: PV facility

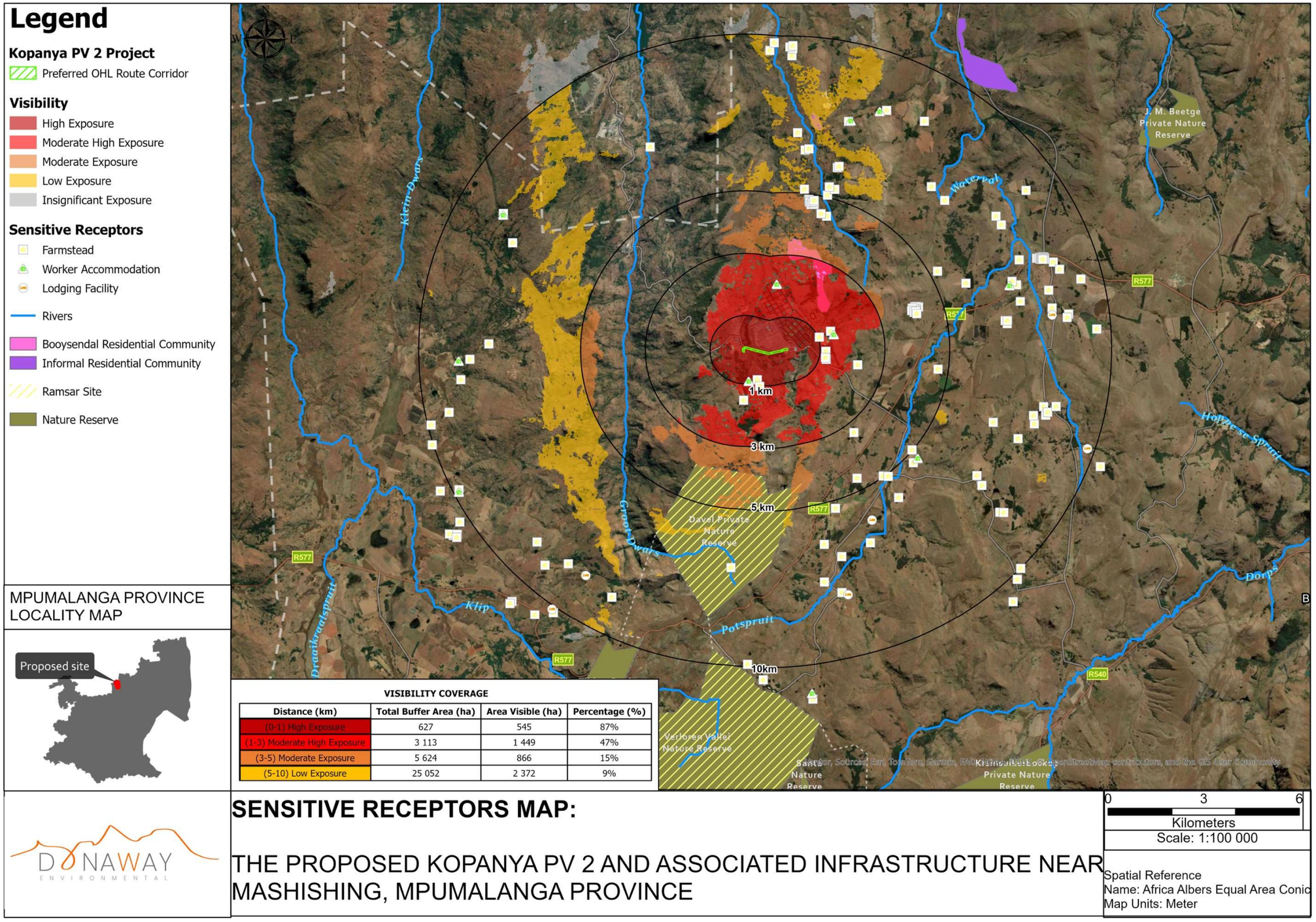


Figure 5.2: ZTV Map: OHL

5.2. Visual Representation of Operational PV Facilities

The photos in **Figure 5.3 to Figure 5.8** offer a view of the operational 200-hectare Matla A Bokone Solar Power Plant near Kimberley in the Northern Cape Province, formerly known as Droogfontein 2. They were taken from distances of approximately 1km and 2km, with three different angles of 6 m, 30 m, and 50 m above ground level (AGL). These images vividly illustrate the almost negligible visibility of the solar power plant in its operational phase at these distances, together with the absence of substantial screening. In contrast, **Figure 5.9 to Figure 5.11** showcase the Enel Tobivox SEF near Tom Burke in the Limpopo Province. These photographs were taken at eye level (1.8 m AGL), 6m AGL, and 30 m AGL, and at a distance of approximately 370 m. Here, the effectiveness of some vegetation screening becomes evident, in this case primarily attributed to the bush encroaching sickle bush tree (*Dichrostachys cinerea*), a deciduous shrub or small tree.



Figure 5.3: View towards the Droogfontein 2 SEF at 2 km: 6 m AGL



Figure 5.4: View towards the Droogfontein 2 SEF at 2 km: 30 m AGL



Figure 5.5: View towards the Droogfontein 2 SEF at 2 km: 50 m AGL



Figure 5.6: View towards the Droogfontein 2 SEF at 1 km: 6 m AGL



Figure 5.7: View towards the Droogfontein 2 SEF at 1 km: 30 m AGL



Figure 5.8: View towards the Droogfontein 2 SEF at 1 km: 50 m AGL



Figure 5.9: View towards the Enel Tobivox SEF at 370 m: eye hight (1.8 m AGL)



Figure 5.10: View towards the Enel Tobivox SEF at 370 m: 6 m AGL



Figure 5.11: View towards the Enel Tobivox SEF at 370 m : 30 m AGL

6. VISUAL IMPACT ASSESSMENT

This Section provides a detailed description and assessment of the potential visual impacts that were identified during the VIA process for the detailed design and construction, operation, and decommissioning phases of the proposed project.

The **Category 5** classification indicates an initial potential for High visual impact and therefore triggers the need for detailed specialist assessment. The project-specific assessment subsequently considers the actual receiving environment, visibility, exposure, receptor sensitivity, VAC and visual intrusion. These factors indicate that the inherent visual impact is lower than the generic Category 5 classification would suggest. Mitigation then further reduces the severity of the impact, resulting in a lower residual significance.

6.1. Design & Construction Phase

The design and construction phase are expected to take approximately 18 months to complete. It is anticipated that the following activities would be included and would form part of the detailed design and construction phase:

- **Pre-planning:** Several post-authorisation factors are expected to influence the final design of the facility and could result in small-scale modifications of the positioning of the PV array and / or associated infrastructure. The construction process is dynamic and unforeseen changes to the project specifications may occur. The final facility design is required to be approved by DMPR prior to any construction activities commencing on-site. Should any substantive changes or deviations from the original scope or layout of the project reflected in the EIA process occur, DMPR would need to be notified thereof, and where applicable additional approval may need to be obtained.
- **Conduct surveys**: Prior to initiating construction, several surveys will be required. These include, but are not limited to, confirmation of the micro-siting footprint (i.e., confirming the precise location of the PV panels, substation, and the plant's associated infrastructure) and a geotechnical survey.
- **Procurement and employment**: At the peak of construction the project is likely to create up to 300 employment opportunities. Employment opportunities generated during the construction phase will include low skilled, semi-skilled, and skilled opportunities. Solar PV projects make use of large numbers of unskilled and semi-skilled labour so there will be good opportunity to use local labour. The injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area. Most of the labour force is expected to be sourced from the surrounding cities. No labourers will be accommodated on-site during the construction period.
- **Establishment of an access road to the site:** The majority of the access road will follow existing, Mine roads connecting to the R577 regional road. An internal site road network will also be required to provide access to the solar field and associated infrastructure. The final layout will be determined following the identification of site related sensitivities.

- **Undertake site preparation:** Site preparation activities will include clearance of vegetation. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and / or spread on site.
- **Transport of components and equipment to site:** The national, regional, secondary and proposed internal access roads will be used to transport all components and equipment required during the construction phase of the solar facility. Some of the components (i.e., substation transformer) may be defined as abnormal loads in terms of the National Road Traffic Act, 1996 (No. 93 of 1996) by virtue of the dimensional limitations. Typical civil engineering construction equipment will need to be brought to the site (e.g., excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the mounting of the PV support structures, construction of the substation and site preparation.
- **Establishment of laydown areas on site:** Laydown and storage areas will be required for typical construction equipment. Once the required equipment has been transported to site, a dedicated equipment construction camp and laydown area will need to be established adjacent to the workshop area. The equipment construction camp serves to confine activities and storage of equipment to one designated area to limit potential impacts associated with this phase of development. The laydown area will be used for the assembly of the PV panels and the general placement / storage of construction equipment.
- **Erect PV arrays and construct substation and inverters:** The construction phase involves installation of the PV solar panels and structural and electrical infrastructure required for the operation of the facility. In addition, preparation of the soil and improvement of the access roads is likely to continue for most of the construction phase. For array installations, vertical support posts are driven into the ground. The posts will hold the support structures (tables) on which the PV modules would be mounted. Trenches are dug for the underground Alternating Current and Direct Current cabling and the foundations of the inverter enclosures and transformers are prepared if necessary. Underground cables and overhead circuits connect the Power Conversion Stations to the on-site Alternating Current electrical infrastructure and ultimately the solar facility's on-site substation. The construction of the substation will require a survey of the site, site clearing and levelling and construction of access road(s) (where applicable), construction of a level terrace and foundations, assembly, erection, installation and connection of equipment, and rehabilitation of any disturbed areas, and protection of erosion sensitive areas.
- **Establishment of ancillary infrastructure:** Ancillary infrastructure will include workshop, storage and laydown areas, gatehouse and security complex, as well as a temporary contractor's equipment camp. The establishment of the ancillary infrastructure and support buildings will require the clearing of vegetation and levelling of the development site, and the excavation of foundations prior to construction. Laydown areas for building materials and equipment associated with these buildings will also be required.
- **Undertake site rehabilitation:** Once construction is completed and all construction equipment has been removed, the site will be rehabilitated where practical and reasonable.

In addition, on full commissioning of the solar facility, any access points which are not required during operation must be closed and rehabilitated accordingly.

The majority of visual impacts associated with the project are anticipated to occur during the operational phase of the development. Impacts during the construction phase of the solar PV project are typical of the type of visual impacts generally associated with construction activities. Impacts associated with the design and construction phase of a project are usually of a short duration and temporary in nature but could have long term effects on the surrounding visual environment if not planned or managed appropriately. It is therefore necessary that the design phase be conducted in such a manner so as not to result in permanent impacts associated with the ill placement of project components or associated infrastructure. Impacts during the construction phase of the project mainly relate to construction activities, dust generation and there may be a notable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and landowners in the area.

Mitigation: Planning

- Retain and maintain natural vegetation, where possible.

Mitigation: Construction

- Ensure that vegetation is not unnecessarily removed during the construction phase.
- Plan the placement of laydown areas and temporary construction equipment camps to minimise vegetation clearing (i.e., in already disturbed areas) where possible.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- Ensure that rubble, litter, etc. are appropriately stored (if it can't be removed daily) and then disposed of regularly at a licensed waste site.
- Reduce and control dust during construction by utilising dust suppression measures.
- Limit construction activities to daylight hours, where feasible, to reduce the impacts of construction lighting.
- Rehabilitate all disturbed areas immediately after the completion of construction work and maintain good housekeeping.

No-go Alternative:

- The current status quo is maintained due to no impact.

Residual Impacts:

- Following implementation of the recommended mitigation measures, temporary residual visual impacts will remain during the construction period, primarily associated with construction activity, exposed/disturbed surfaces, machinery, vehicles, dust and temporary infrastructure. The majority of these impacts are expected to be of Low significance. Following completion of construction and successful rehabilitation of temporarily disturbed areas, these effects are expected to reduce further over time.

Table 6.1: Visual Impact – Construction Phase

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre- Mitigation						Recommended Mitigation Measures	Post Mitigation							Confidence
			Duration	Extent	Potential for impact on irreplaceable resources	Severity	Consequence	Probability	Significance		Duration	Extent	Severity	Potential for impact on irreplaceable resources	Consequence	Probability	Significance	
									-28								-24	
									-24								-20	
									-20								-10	
									-30								-30	
									-24								-8	

6.2. Operational Phase

The project is anticipated to operate permanently (minimum of 25 years or extended for the life of the Mine). The development will operate continuously, 7 days a week. Key elements of the Operation and Management (O&M) Plan include monitoring and reporting the performance of the project, conducting preventative and corrective maintenance, receiving visitors, and maintaining security.

6.2.1. PV Facility

Mitigation: Planning

- Retain/re-establish and maintain natural vegetation, where possible.

Mitigation: Operations

- Maintain general appearance of the development.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Residual Impacts:

- The visual presence of the PV facility and associated infrastructure cannot be fully mitigated and will remain for the operational life of the project. However, following implementation of the recommended mitigation measures, the majority of the residual visual impact is expected to be Low and largely localised. This is primarily due to the topographic containment of the site, avoidance of prominent skyline positions, existing vegetation and landscape screening, and the presence of existing mining and electrical infrastructure within the surrounding landscape. Mitigation will maintain localised visual contrast.

Table 6.2: Visual Impact – Operational Phase

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre- Mitigation							Recommended Mitigation Measures	Post Mitigation							Confidence
			Duration	Extent	Potential for impact on irreplaceable resources	Severity	Consequence	Probability	Significance		Duration	Extent	Severity	Potential for impact on irreplaceable resources	Consequence	Probability	Significance	
									-32								-32	
									-16								-16	
									-7								-7	
									-16								-8	

6.3. Cumulative Impacts

The EIA Regulations, 2014 determine that cumulative impacts, "*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 in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities*." Cumulative impacts can be incremental, interactive, sequential or synergistic. EIAs have traditionally failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires coordinated institutional arrangements;
- Complexity - dependent on numerous fluctuating influencing factors which may be completely independent of the controllable actions of the proponent or communities; and
- Project level investigations are ill-equipped to deal with broader biophysical, social and economic considerations.

According to the DFFE's database six other solar PV plant applications have been submitted to the Department within the geographic area of investigation, of which one has lapsed. One other project is not yet included, but in progress (refer to **Table 6.3**and **Figure 6.1**for an overview of solar PV facilities within a 50 km radius of the project site).

Table 6.3: A summary of related projects, that may have a cumulative impact, in a 50 km radius of the study area

Project name	Distance from study area	Proposed generating capacity	DFFE reference	EIA process	Project status
Projects included in the Renewable Energy Environmental Impact Assessment Applications Database (November 2025)					
The proposed Glencore Lydenburg Solar Photovoltaic Facility at the Lydenburg Smelter, Thaba Chweu Local Municipality, Mpumalanga Province.	33 km	300 MW	DEA/EIA/0002708/2024	S&EIA	Approved

The proposed up to 130MW Platinum PV Facility, near Steelpoort in the Limpopo Province.	20 km	130 MW	DEA/EIA/0002297/2023	S&EIA	Approved
Environmental Authorisation for the 60MWp Photovoltaic Plant associated with the Tubatse Ferrochrome Smelte, Steelpoort, Fetakgomo Tubatse Local Municipality.	39 km	60 MW	DEA/EIA/0001536/2021	S&EIA	Approved
Proposed Construction Of A 40mw Photovoltaic Facility On Portion 915 Mapochsgron de In Roossenekal, Limpopo Province.	22 km	40 MW	DEA/EIA/2617/2011	S&EIA	Approved
Proposed construction of 10MW solar farm to be established on portion 121 Mapochs ground JS in Rossenakal	30 km	10 MW	DEA/EIA/0000942/2012	BAR	Lapsed

within Elias Motsoaledi Local Municipality, Greater Sekhukhune District.					
The ABO Serval Solar Energy Facility 4 (SEF) and associated infrastructure located near Middelburg in the eMakhazeni Local Municipality and the Nkangala District, in the Mpumalanga Province.	49 km	40 MW	DEA/EIA/0002556/2023	IEM-REDZ	Approved
Projects not included in the REEA database					
The Proposed Kopanya Solar PV Project (North) and Associated Infrastructure near Mashishing, Mpumalanga Province.	8 km	20 MW	TBC	S&EIA	In progress

***It is unclear whether other projects not related to renewable energy is or has been constructed in this area, and whether other projects are proposed. In general, development activity in the area is focused on agricultural and mining activities. It is quite possible that future solar PV developments may take place within the general area.*

The potential for cumulative impacts to occur as a result of these projects are negligible due to topography screening. Furthermore, the infrastructure might be seen as mining infrastructure, blending in with the current land use.

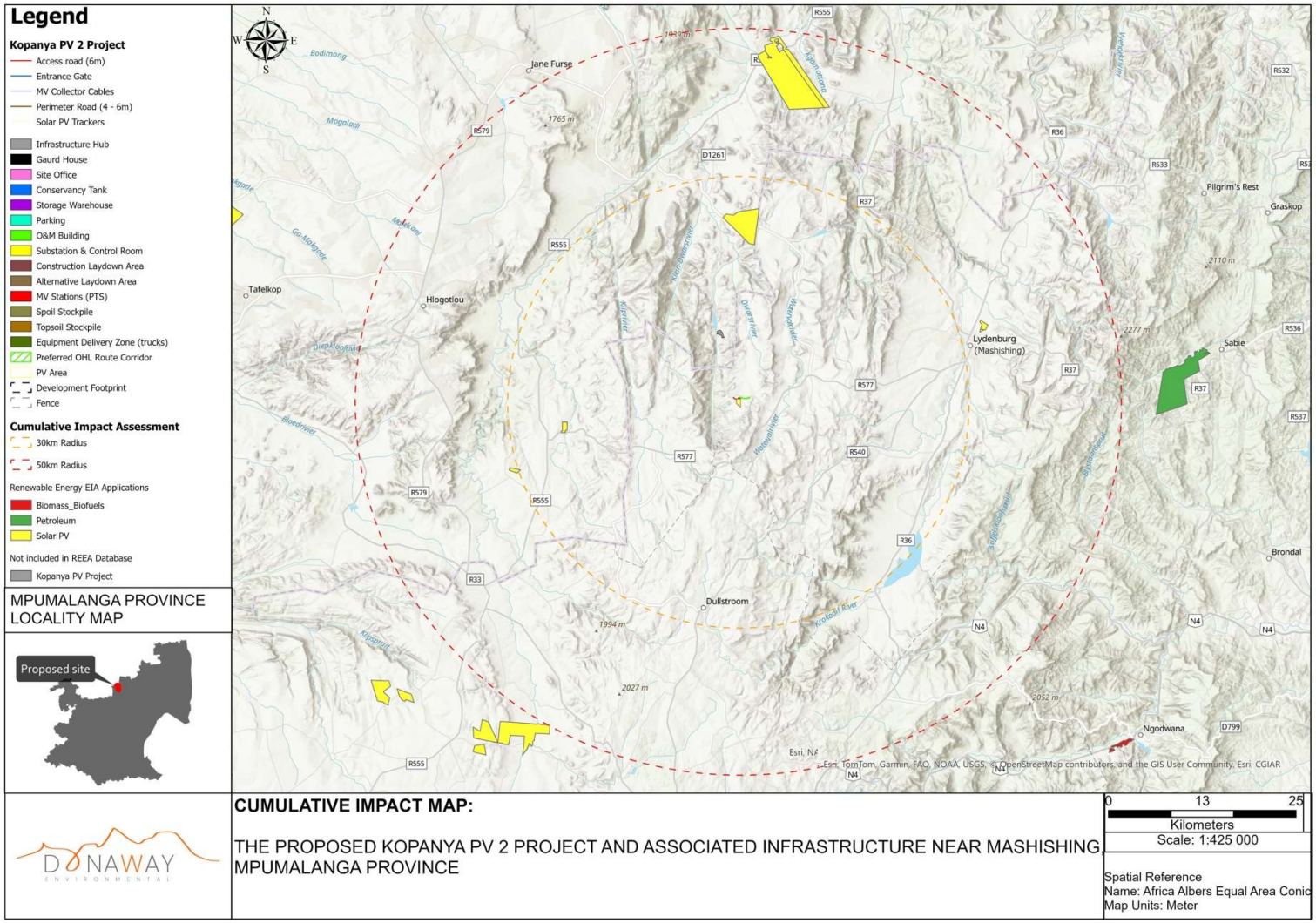


Figure 6.1: Cumulative map showing the location of other PV developments within 50 km of the Kopanya Solar PV 2 Project

Table 6.4: Visual Impact – Cumulative

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre- Mitigation							Recommended Mitigation Measures	Post Mitigation							Confidence
			Duration	Extent	Potential for impact on irreplaceable resources	Severity	Consequence	Probability	Significance		Duration	Extent	Severity	Potential for impact on irreplaceable resources	Consequence	Probability	Significance	
									0								0	

6.4. Decommissioning Phase

The decommissioning phase will commence at the end of the operational lifespan of the facility (anticipated to be approximately 25 years (or extended to the life of the Mine)), unless repowering or life extension is approved. This phase will involve the systematic dismantling and removal of the solar PV infrastructure and the rehabilitation of the site. Activities are expected to be temporary in nature and comparable, although generally less intensive, than those undertaken during the construction phase.

Key activities during decommissioning may include the removal of PV modules, mounting structures, inverters, transformers, cabling (where feasible), the on-site substation, ancillary buildings, internal roads (where required), and security infrastructure. Components suitable for reuse or recycling will be transported off-site, while waste materials will be disposed of at licensed facilities. Heavy vehicles and construction equipment will again be present on site for a limited period.

Visual impacts during decommissioning will primarily relate to the presence of machinery, stockpiling of dismantled materials, increased traffic, and temporary disturbance of the landscape. These impacts will be short-term and reversible. Following the removal of infrastructure, disturbed areas will be rehabilitated to a condition aligned, as far as reasonably practicable, with the pre-development land capability and surrounding landscape character.

Overall, visual impacts associated with the decommissioning phase are anticipated to be temporary and of limited significance, with long term visual effects reduced through appropriate rehabilitation measures.

Table 6.5: Visual Impact – Decommissioning Phase

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre- Mitigation							Recommended Mitigation Measures	Post Mitigation							Confidence
			Duration	Extent	Potential for impact on irreplaceable resources	Severity	Consequence	Probability	Significance		Duration	Extent	Severity	Potential for impact on irreplaceable resources	Consequence	Probability	Significance	
									-28								-14	
									-20								-8	
									-30								-8	
									-24								-8	
									-24								-8	

6.5. Assessment of Alternative Sites

The properties proposed for the development are considered suitable for the development by the Applicant and therefore the area has been demarcated and indicated as being preferred. No other properties have been identified for the development in the area.

6.6. Assessment of Impacts for the No-Go Alternative

The “no-go” alternative is the option of not constructing the project. The implementation of the development is expected to result in several negative visual impacts, but if the project is not constructed the following positive impacts will be lost:

- Potential direct and indirect employment opportunities.
- Potential economic multiplier effect.
- Development of processing infrastructure to concentrate income locally.

7. MITIGATION MEASURES

The primary visual impact, which is associated with the layout and appearance of the infrastructure is not mitigatable to the point where the visual impact can be eliminated, but it can be reduced by implementing best practice measures. The functionality of the project cannot be changed to reduce the possible visual impact, but the following measures can be put in place to reduce the possible visual impact:

- It is recommended that vegetation cover (i.e., either natural or cultivated) be maintained, where possible, during all phases of the development. This will minimise the visual impact through the presence of a buffer screen between the visual receptors and the development.
- Existing roads should be utilised wherever possible. New roads should be planned to take due cognisance of the topography to limit cut and fill requirements. The construction/upgrade of roads should be undertaken properly, with adequate drainage structures in place to minimise the risk of erosion.
- In terms of on-site associated infrastructure and buildings, it is recommended that proper planning is implemented to minimise vegetation clearing. Consolidating infrastructure as much as possible and making use areas that already disturbed, where possible.
- Mitigation of lighting impacts include the pro-active design, planning and specification of lighting for the development. The correct specification and placement of lighting fixtures for the proposed development will go far in containing, rather than spreading the light. As far as practically possible, mitigation measures include:
    - Shielding the sources of light by physical barriers (walls, vegetation, or structures.)
    - Limiting mounting heights of lighting fixtures, or alternatively using footlights or bollard level lights.
    - Making use of minimum lumen or wattage lights.
    - Making use of downlighters or shielded fixtures.

The following mitigation and monitoring requirements are recommended to ensure the visual impact of the proposed development is limited:

7.1. Mitigation Measures during the Construction and Decommissioning Phases

- An Environmental Control Officer should be appointed during the construction and decommissioning phase to oversee environmental compliance.
- Ensure that vegetation is not unnecessarily cleared or removed during the construction period.
- Reduce the construction period through careful logistical planning and productive implementation of resources.
- Plan the placement of laydown areas and potential temporary construction camps in order to minimise vegetation clearing (i.e., in already disturbed areas) where possible.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.

- Implement good housekeeping through the removal of rubble, litter and construction material, if it is not removed daily to a registered landfill site, then it should be stored appropriately until removal can take place.
- Dust suppression should be implemented during construction as and when required.
- Restrict construction activities to daylight hours, where feasible, in order to negate or reduce the visual impact associated with lighting.
- Rehabilitate all disturbed areas immediately after the completion of construction works.

7.2. Mitigation Measures during the Operational Phase

- Maintenance and good housekeeping of the development.
- Roads must be maintained to eliminate erosion and suppress dust.
- Rehabilitated areas must be monitored for rehabilitation failure and remedial action must then be implemented as and when required.

7.3. Monitoring Requirements

The following monitoring requirements are recommended to be included as conditions in the EA to ensure the visual impact of the proposed development is limited:

- The Environmental Control Officer (ECO) and / or Community Liaison Officer (CLO) should monitor the amount of litter on site during construction on a daily basis to ensure litter prevention.
- The ECO and / or CLO should monitor housekeeping during construction to ensure neat and tidy laydown areas.
- The ECO and / or ELO should monitor the amount of dust seen on and surrounding the site during construction. Dust suppression should be implemented as required.
- The ECO and / or ELO should ensure and monitor all rehabilitation after construction for at least the first 6 months to ensure all vegetation is established in a proper and healthy way. This will also depend on the amount of rainfall and season after construction which might shorten the monitoring requirement.
- Permanent workforce should monitor the health and progress of the added vegetation to ensure proper screening is maintained.
- Any other monitoring requirements set out by the EA, Environmental Management Programme and SACAA.

8. KEY FINDINGS AND CONCLUSION

8.1. Key Findings

According to **Table 2.2 to Table 2.4** used as guideline for this study, from Oberholzer (2005), the project's impact was initially predicted to be high. However, considering the findings outlined below, along with the implementation of mitigation measures, this impact could be reduced to a low impact.

The proposed Kopanya Solar PV 2 Project is located within a mountainous and highly undulating landscape characterised by prominent north–south orientated ridgelines, steep slopes and deeply incised valleys, with elevations ranging between approximately 886 m amsl and 2,331 m amsl. The rugged terrain plays a decisive role in shaping visibility patterns and visual exposure across the 10 km PAOI.

Although the ZTV indicates a high theoretical visibility within the 10 km radius, this rating is based purely on topography and excludes vegetation and infrastructure screening. As is typical in mountainous environments, visibility diminishes exponentially with distance, particularly beyond the 1 km radius. The valley/mid-slope positioning of the proposed PV facility avoids skyline intrusion and reduces long-distance visual prominence. Furthermore, atmospheric conditions, haze and humidity, common within mountainous regions, are likely to further reduce clarity over long distances.

The broader landscape is already influenced by mining activities, particularly toward Steelpoort to the north. The proposed development is located on Mine-leased property and will connect to existing mining-associated electrical infrastructure. The surrounding land uses comprise mining and agriculture, with limited human settlements. In this context, the PV infrastructure and associated OHL will align with the established industrial-mining character of the area and will visually integrate with existing powerlines and Mine-related infrastructure. The development is therefore not considered visually incongruent within its receiving environment.

Sensitive receptors within the 10 km PAOI include scattered farmsteads, two small villages to the north (one located approximately 1.8 km north-east but separated by Mine infrastructure), a trout farm, two lodging facilities, and portions of Davel Private Nature Reserve and De Berg Nature Reserve (Ramsar site). One of South Africa’s highest mountain peaks, forming part of the 9 Peaks Challenge, is located approximately 4.3 km to the south. However, tourism in the area is limited, and the 9 Peaks Challenge is completed by a relatively small number of participants annually. Only certain elevated areas within the nature reserve are theoretically exposed, and intervening topography, distance and existing mining infrastructure significantly reduce direct visual exposure.

The visual sensitivity of the area is considered moderate due to the mountainous character; however, this sensitivity is reduced by the established mining and agricultural land uses and the absence of major tourism nodes. Receptor sensitivity ranges from low to moderate, influenced by rural settlement patterns, limited visitor numbers and the modified industrial landscape context.

The Visual Absorption Capacity (VAC) of the area is high due to strong topographic containment and vegetative screening. As a result, visual intrusion is expected to be moderate and largely localised, with no significant skyline impacts anticipated. Impact significance ratings reflected in the VIA impact tables indicate that, following mitigation, visual impacts during construction, operation and decommissioning phases will be reduced to low significance levels, with moderate to high confidence. Cumulative visual impacts are considered negligible due to the strong screening effect of topography.

Overall, while a number of receptors are theoretically exposed, actual visual impact is moderated by landform, infrastructure screening and landscape character. The presence of existing mining infrastructure substantially reduces the perceived contrast of the proposed PV facility.

8.2. Conclusion

It is believed that renewable energy resources are essential to the environmental well-being of the country and planet (WESSA, 2012). Aesthetic characteristics are subjective, and some people find solar facilities and their associated infrastructure pleasant and optimistic while others may find it visually invasive; It is mostly perceived as symbols of energy independence, and local prosperity. The visual impact is also dependant on the land use of an area and the sensitivity thereof in terms of visual impact, such as protected areas, parks and other tourism related activities.

The proposed project aligns with South Africa's renewable energy goals while ensuring minimal disruption to the existing landscape. The development is also expected to provide substantial environmental and socio-economic benefits, including renewable energy generation, local employment opportunities, and contributions to national energy security.

From a visual perspective, the proposed Kopanya Solar PV 2 Project is considered acceptable within its receiving environment.

The development is strategically positioned within a valley/mid-slope location, avoiding prominent skyline intrusion and reducing long-distance visual prominence. The high VAC of the mountainous landscape further reduces visual impact potential.

Importantly, the project is situated within an existing mining-dominated landscape, especially to the north. The PV infrastructure and associated OHL will align visually with existing industrial infrastructure and can reasonably be perceived as part of the broader mining-energy landscape. The development will therefore blend with the prevailing land use character rather than introduce a visually incongruent element.

Post-mitigation impact significance levels are low and largely localised, with negligible cumulative effects anticipated. No tourism nodes are directly affected.

On balance, and subject to the implementation of the recommended mitigation measures, the proposed Kopanya Solar PV 2 Project can be supported from a visual impact perspective, as it does not result in unacceptable or irreversible visual degradation of the surrounding landscape. **PLEASE NOTE** that commenting should be obtained from the South African Civil Aviation Authority (SACAA).

It is therefore Donaway Environmental's recommendation that the project, with the associated layout, be approved provided that mitigation measures are implemented.

REFERENCES

DEA. 2017. National Environmental Management Act. GNR 326: Specialist Reports. Appendix 6.

Mucina and Rutherford. 2006. The vegetation of South Africa, Lesotho and Swaziland**.** Strelitzia 19, South African National Biodiversity Institute, Pretoria, South Africa (2006).

NLA. Visual Impact Assessment. NLA, accessed June 6, 2024. https://www.newla.co.za/via.php.

Oberholzer, B. 2005. Guideline for involving visual & aesthetic specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 F. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

Further Reading

The Landscape Institute. 2002. Guidelines for Landscape and Visual Impact Assessment 2nd ed., New York: Spon Press.

World Bank Group. 2015. Environmental, Health, and Safety Guidelines for Wind Energy. Available at: http://www.ifc.org/wps/wcm/connect/2c410700497a7933b04cf1ef20a40540/FINAL_Aug+2015_Wind+Energy_EHS+Guideline.pdf?MOD=AJPERES. [accessed Jul 19, 2017].

Young, G, Maxibuko, B., and Muller, L. 2009. Visual Impacts of Power Lines in Eskom, Eskom Research and Innovation Department Technology, Strategy and Planning, Research Report, Report Number RES/RR/08/30193.

ANNEXURE A: CURRICULUM VITAE

Johan Botha

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Personal Information

Date of Birth:	18 February 1985
Nationality:	South African
Profession:	Environmental Consultant
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Key Qualifications

- Honours in Environmental Management (Hons.Env.Man.), North West University (NWU), SA (2010)
- B. Ed. in Geography & Technology, North West University (NWU), SA (2004–2008)

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Contact Information

Johan Botha has extensive knowledge and experience on Renewable Energy projects and more specifically the visual and social impacts surrounding photovoltaic solar energy facilities and wind energy facilities in South Africa. He also has knowledge and experience in environmental management of Eskom power infrastructure projects as well as solar energy facilities, focusing on EA and EMP implementation as well as TOPS counts and permitting. He has completed 150+ Visual Impact Assessments and 70+ Social Impact Assessments for renewable energy projects and mining. Below is a list of the number of projects completed for each field of assessment:

- 6 Environmental Control Officer (ECO) Projects on Eskom Substation and Transmission lines in the Northern Cape Province
- 1 ECO Project on a Solar Power Plant in the Northern Cape Province
- 150+ Visual Impact Assessments for Photovoltaic Solar Energy Projects, Wind Energy and alluvial Diamond Mines across South Africa
- 70+ Social Impact Assessments for Photovoltaic Solar Energy Projects across South Africa
- 12 Threatened or Protected Specie Surveys and Permit Applications.

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Personal Information

Date of Birth: 23 March 1996
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- MSc. Geography and Environmental Management North West University (2020)
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- BSc. Geology and Geography North West University (2017)

Contact Information

Michael Cloete has extensive knowledge and experience in the environmental science field, in particular social impacts, hydrogeology and GIS fields. Visual impacts assessment and the methodological approach formed the basis of his Masters and Honours studies, gaining extensive knowledge in the field. His recent focus involved renewable projects and the social and visual impact assessment studies. Below is a list of the number of projects completed for each field of assessment:

- 50+ Social Impact Assessments, with the majority associated with Photovoltaic Solar Energy Projects in the Free State, Limpopo, North West, Mpumalanga, Northern Cape, Gauteng and Western Cape Provinces. In addition, Battery Energy Storage Facilities and Accommodation camps has formed part of Social Impact Assessment.
- 80+ Hydrogeological Assessments regarding water use licencing for agriculture, industrial and mining activities.
- Hydropedological studies relating to water-feeding systems of wetlands.
- Water use licence auditing and reporting.
- GIS applications for report writing and hydrogeological assessments, ranging from map creation to spatial analyst procedures.