CHAPTER 10:

Visual Impact Assessment

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VISUAL SPECIALIST ASSESSMENT:

Scoping and Environmental Impact Assessment (EIA) Processes for the Proposed Development of a Solar Photovoltaic Facility (Kudu Solar Facility 10) and associated infrastructure, near De Aar, Northern Cape Province

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List of Abbreviations

BA	Basic Assessment
BESS	Battery Energy Storage System
DEM	Digital Elevation Model
DFFE	Department of Forestry, Fisheries and the Environment
EAP	Environmental assessment practitioner
EGI	Electricity Grid Infrastructure
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GN	Government Notice
GPS	Global Positioning System
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas
PV	Photovoltaic
REEA	Renewable Energy EIA Application Database
SAPAD	South African Protected Areas Database
SEA	Strategic Environmental Assessment
VIA	Visual Impact Assessment

Glossary

Definitions	
Receptor	Individuals, groups or communities who are subject to the visual influence of a particular project.
Viewpoint	A selected point in the landscape from which views of the project are ascertained.
Viewshed	The outer boundary defining a view catchment area, used to determine the zone of visual influence.
View shadow	An area within the view catchment visually obscured from the project, usually by topography.
Visual absorption capacity	The ability of an area to visually absorb development by means of screening topography, vegetation or buildings.

VISUAL IMPACT ASSESSMENT

1. Introduction

1.1. Scope, Purpose and Objectives of this Specialist Input to the EIA Report

This report serves as the Visual Impact Assessment (VIA) as part of the Environmental Impact Assessment (EIA) Process for the proposed development of a Solar Photovoltaic (PV) Facility (Kudu Solar Facility 10) and associated infrastructure, near De-Aar, Northern Cape Province (**Map 1**).

The purpose of the VIA is to provide inputs to the Scoping and EIA Reports for the Kudu Solar PV project as required by the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) EIA Regulations (2014, as amended). The intention is that the VIA used to determine layouts for the Solar PV site based on the visual sensitivities identified, as well as those by other specialists.

During the scoping phase, the specialists considered the entire study area, which included the Original Scoping Buildable Areas that included the development of up to 14 Solar PV Facilities. However, following the identification of sensitivities, discussions with landowners and other considerations such as the capacities of the upcoming Bidding Windows, the proposed projects were re-clustered and a total of up to 12 Solar PV Facilities are now being proposed.

Separate reports have been compiled for each PV facility. This report covers the Kudu Solar Facility 10 and associated infrastructure.

1.2. Details of Specialist

The visual specialist assessment has been undertaken by Bernard Oberholzer (BOLA) and Quinton Lawson (QARC). BOLA is registered with the South African Council for the Landscape Architectural Profession (SACLAP), with Registration Number 87018, and QARC with the South African Council for the Architectural Profession (SACAP), with Registration Number 3686. A curriculum vitae is included in Appendix A of this specialist input report and a signed specialist statement of independence is included in Appendix B.

1.3. Terms of Reference

The Terms of Reference for the visual scoping and EIA specialist studies include the following:

- Undertake a site inspection to identify existing scenic resources/visual characteristics on and around the proposed project sites.
- Determine visual constraints and sensitivity levels in terms of solar PV development. Verify these in terms of the National Screening Tool to confirm or dispute identified environmental sensitivities.
- Determine viewsheds, view corridors and important viewpoints in order to assess the visual influence of the proposed project.
- Review the legal framework that may have implications for visual/scenic resources.
- Identify and assess possible visual impacts that could result from the proposed project.
- Determine possible cumulative visual impacts in relation to other renewable energy projects in the region.
- Identify possible mitigation measures to reduce the significance of negative visual impacts for inclusion into the project design.

2. Approach and Methodology

The approach and methodology for the VIA specialist study includes the following:

- A 3D digital terrain model of the study area is used to determine the viewshed of the proposed project.
- Potential sensitive receptors, such as farmsteads and settlements in the surrounding area, are identified using the viewshed map and Google Earth.
- Landscape features and sensitive receptors are mapped together with recommended buffers.
- Field work is used to verify the existence and significance of landscape features and receptors.
- A photographic record is made with the emphasis on views from potential sensitive receptors of the proposed project at varying distances.
- The panoramic photographs, which include GPS positions, are then used to create the post-mitigation photomontages.

A Site visit was carried out on 15 and 16 March 2022. The track used during the fieldwork is indicated on **Map 3**. The season was not a consideration for the visual survey, but clear visibility was required.

The methodology is based on the 'Guideline for Involving Visual and Aesthetic Specialists in EIA Processes' (Oberholzer, 2005).

Potential visual impacts identified in this specialist study have been assessed based on the criteria and methodology outlined in Appendix D. Refer to Appendix E for table of compliance with Appendix 6 of the 2014 NEMA EIA Regulations (as amended).

2.1. Information Sources

A List of the main databases and information sources is given in Table 1 below. The quality of base data was considered adequate for the visual assessment.

Table 1: Sources of information

Data / Information	Source	Date	Type	Description
Project Data	ABO Wind Renewable Energies (PTY) LTD	2023	Vector Digital Spatial Data	Project Component Layout provided by proponent
South African National Protected Areas Database (SAPAD)	Department of Forestry, Fisheries and the Environment (DFFE)	2022, Q1	Vector Digital Spatial Data	Spatial delineation of protected areas in South Africa, updated quarterly
South African Renewable Energy EIA Application Database (REEA)	Department of Forestry, Fisheries and the Environment (DFFE)	2022, Q2	Vector Digital Spatial Data	Spatial delineation of Renewable Energy EIA Applications in South Africa, updated quarterly
ESKOM EGI Power Corridors	Department of Forestry, Fisheries and the Environment (DFFE)	2015	Vector Digital Spatial Data	Spatial delineation of EGI Power Corridors in South Africa
ESKOM Infrastructure Spatial Data	ESKOM: Electricity Grid Infrastructure (EGI) Database	2008	Vector Digital Spatial Data	Spatial delineation of ESKOM EGI Transmission, Distribution and Substation Data
Geological Data	Council for Geoscience	2011	Vector Digital Spatial Data	Geological Map of South Africa: Spatial Dataset

Data / Information	Source	Date	Type	Description
1:50 000 Topographic Series GIS Data	Chief Directorate National Geo-spatial Information (CDNGI)	2008	Vector Digital Spatial Data	Spatial Data of the 1:50 000 Topographic Series including elevational data (20m contours)
1:50 000 Topographic Series Maps	Chief Directorate National Geo-spatial Information (CDNGI)	2005	Georeferenced Raster Data	3024AA Potfontein, 3024AB Jakkalskuil 3024AC Houtkraal, 3024AD Philipstown
South Africa Road and Terrain Data	Google Maps (maps.google.com)	2022	Online Data	South Africa Road and Terrain Data
South Africa Satellite Imagery	Google Earth Pro	2022	Online Data	South Africa Satellite Imagery

2.1.1. Assumptions, Knowledge Gaps and Limitations

The detailed design of the solar arrays that may be used have not been determined at this stage, but a height of 3,5m was used to prepare the viewshed map.

Assumptions were made regarding the configuration and finishes of the proposed substation and battery energy storage system (BESS), as well as lighting related to the proposed project.

3. Description of Project Aspects relevant to the Visual Assessment

The Kudu project will entail the proposed development of up to 12 Solar PV Facilities ranging from up to 50 MWac to 350 MWac, as well as associated infrastructure, near De Aar, Northern Cape. This report focuses on Kudu Solar PV Facility 10.

The proposed project will make use of PV solar technology with the solar PV facility having associated infrastructure, including, but not limited to, an on-site substation complex and BESS (+-1 ha and max. height 10m). Each On-Site Substation Complex (extending up to 8 ha) could include an on-site Independent Power Producer (IPP) or Facility Substation (+-1 ha), and O&M buildings (up to 0,5 ha), as well as other infrastructure that would be subjected to the separate assessment processes. **Maps 2 and 3** indicate the affected farm portions, as well as the proposed PV areas for all 12 projects.

Various Electrical Grid Infrastructure (EGI) are being proposed to enable and facilitate connection of the proposed projects to the national grid, and that these EGI will be assessed as part of separate Basic Assessment processes or similar[1].

4. Baseline Environmental Description

4.1. Study Area Definition

The study area for all the proposed Kudu Solar Facilities is the full extent of the eight affected farm properties on which the proposed PV Facilities will be constructed. The full extent of these properties has been assessed in this study in order to identify environmental sensitivities and no-go areas. The total **study area** for all the Kudu Solar Facilities is approximately 8 150 hectares (ha).

At the commencement of this Scoping and EIA Process, the **Original Scoping Buildable Areas** were identified by the Project Developer, following the completion of high-level environmental screening based on the Screening Tool.

[1] However, for completeness, the external EGI corridor and power lines (Projects 13 to 26) are shown on some of the maps in this report. Note these are not part of this current assessment, and are still to be finalised.

Following the identification of sensitivities during the Scoping Phase, the Project Developer considered such sensitivities and formulated the **Revised Buildable Areas**. The Revised Scoping Buildable Areas were used to inform the design of the layout, and further assessed during this EIA Phase of the project in order to identify the preferred development footprint of the proposed project on the approved site as contemplated in the accepted Scoping Report. The development footprint is where the actual development will be located, i.e. the footprint containing the PV solar arrays and associated infrastructure.

4.2. General Description

A brief description of scenic features and receptors in the surrounding area that can potentially be affected by visual impacts arising from the proposed project are described below. These are indicated on **Map 9** together with the proposed development, and in the photographs below.

The study area lies within an expansive flattish landscape, composed of Ecca Group shales, interspersed with dolerite-capped koppies, providing topographic relief, these being the main scenic features of the area (**Map 5** and Figure 1). The elevation ranges from 1000 to 1500m in the region.

The vegetation is Northern Upper Karoo type (Mucina and Rutherford, 2006), consisting of dwarf shrubland and grassland. The grassland was unusually lush after the good summer rains experienced this year in the region, (Figure 2), and the local district roads were very muddy. The dolerite koppies are covered with open shrubland along with grasses.

The main agricultural activity is open-range sheep farming with both merino and dorper sheep occurring, along with cattle farming and some horses. A main Eskom powerline (i.e. Hydra/Perseus 1 765kV) traverses several of the proposed Kudu Solar PV sites, constituting an existing visual impact.

Farmsteads nestled among tree copses in the surrounding area tend to be 2 km or more apart (Figures 4 and 5). Three of the farmsteads, Louwsvilla, Zionsheuwel and Rooidam, were derelict and not occupied (Figure 3). Two farmsteads, Wolwekuil farmstead (situated on Farm 42/RE), and Basberg, are located within the overall project area, and it was therefore assumed that these are not sensitive receptors.

Figure 1: Grass-covered dolerite koppies provide the main landscape relief in the area

Figure 2: The grassland plains near Louwsvilla are used for sheep grazing

Figure 3: Louwsvilla farmstead to the south of the proposed Kudu Solar PV facilities is derelict

Figure 4: Karee Kloof farmstead, surrounded by tall cypresses, would be 2,8km from the proposed Kudu project

Figure 5: View towards Middelplaas-Noord farmstead and the flat-topped Basberg in the middle distance

The only known guest farm / game farm in the area, which provides visitor facilities, is Jakkalskuil, and the nearest nature reserves are in the vicinity of the Van Der Kloof Dam more than 30km to the north-east (**Map 1**). According to the Social Impact Assessment (SIA), game occurs on most of the study area properties, several of which offer annual (winter) hunting opportunities. There are no known airfields in the local area.

The viewshed, or zone of visual influence of the proposed solar PV site potentially extends for some 5km. Given the height of the solar arrays (about 3,5m), the viewshed of the proposed solar facility would be fairly localised (see **Map 6**). Estimated degrees of visibility, based on the scale and height of all the PV facilities and related infrastructure, and on the distance from various viewpoints, are indicated in Tables 2 and 3 below.

Table 2: Degrees of Visibility of Proposed PV Facilities

Very high visibility	0-500m	Prominent feature within the observer's view frame
High visibility	500m-1km	Relatively prominent within observer's view frame
Moderate visibility	1-2km	Only prominent as part of the wider landscape
Low visibility	2-4km	Visible as a minor element in the landscape
Very low visibility	>4km	Hardly visible with the naked eye in the distance

Table 3: Viewing Distances and Potential Visibility from Receptors

View-point	Receptor	Latitude	Longitude	Distance to PV arrays	Potential Visibility/ Closest PV Project
VP1	Bokkraal	30.318559 S	24.354662 E	13.98 km	Very Low to hardly visible.
VP2	Zionsheuwel (derelict)	30.267535 S	24.374876 E	8.46 km	Not Visible
VP3	Rooidam (derelict)	30.281976 S	24.362026 E	9.89 km	Very Low to hardly visible.
VP4	Louwsvilla (derelict)	30.294538 S	24.308752 E	12.32 km	Not Visible
VP5	Karee Kloof (Swartkoppies)	30.281137 S	24.276414 E	12.67 km	Not Visible
VP6	Vrede	30.256084 S	24.270718 E	11.05 km	Not Visible
VP7	Tafelkop	30.185034 S	24.234760 E	12.04 km	Not Visible.
VP8	Middelplaas-Noord	30.187386 S	24.300348 E	5.7 km	Very Low to hardly visible.
VP9	Jakobsrus	30.161906 S	24.328036 E	3.36 km	Low visibility. Mostly obscured.
VP10	Wolwekuil (Farm 42/1)	30.167089 S	24.410270 E	3.89 km	Not Visible
VP11	Grasbult	30.149474 S	24.418840 E	5.54 km	Very Low to hardly visible.

4.3. Project Specific Description

The description of the baseline environment for Kudu Solar Facility 10 is similar to the general description given above. Landscape and scenic features have generally been avoided in the proposed solar PV layout and features of 'very high' visual sensitivity have been avoided.

4.4. Identification of Environmental Sensitivities

4.4.1. Sensitivities identified by the National Web-Based Environmental Screening Tool

The proposed project study area has been overlaid on the landscape sensitivity map generated by the Department of Forestry, Fisheries and the Environment (DFFE) Screening Tool, and on a more detailed project-scale sensitivity map, that has been verified by the specialists, (see Appendix C).

The Screening Tool 'Landscape' Sensitivity Map indicates areas of ridges and steep slopes in the northern and southern parts of the study area (**Map 8**). These were, however, mapped at the regional scale linked to the Phase 1 Wind and Solar 2015 Strategic Environmental Assessment (SEA), and a more accurate map of landscape features with recommended buffers has been prepared at the local project scale by the specialists, (see **Map 10** and Tables 4 and 5).

4.4.2. Visual Sensitivity Analysis and Verification

Landscape features of visual or scenic value, along with potential sensitive receptors in the surroundings, are listed in Table 4 below. Visual features are indicated on **Map 9**.

Table 4: Scenic Features and Sensitive Receptors

Landscape features within or adjacent to the study area.	
Topographic features	Characteristic landforms include the dolerite *koppies* contributing to the scenic value of the area, and providing visual interest or contrast to the flat grassy plains.
Water Features	In the dry landscape, drainage features and larger dams provide scenic and amenity value.
Cultural landscapes	The area contains modest farmsteads with tree copses, grazing pasture and minimal cultivation.
Receptors adjacent to the PV project or in the local surroundings.	
Protected Areas	There are no known proclaimed nature reserves or private reserves in close proximity to the study area, the nearest being Van der Kloof Nature reserve some 30km away.
Human settlements	The nearest settlements are Philipstown and Petrusville, over 20 km away, and De Aar about 50 km away.
Scenic and arterial routes	There are no major arterial or scenic routes within the vicinity of the solar PV site.

Scenic resources and sensitive receptors within the study area have been categorised into no-go (very high), high, medium and low visual sensitivity zones, for the proposed solar PV facility, as indicated in Tables 5 and 6 below. The visual sensitivity mapping categories are spatially indicated on **Map 10**.

Substations, BESS, internal power lines and access roads would have minor buffers. The buffers in Table 5 are based on those for landscape resources in the National Wind and Solar SEA (Lawson and Oberholzer, 2014).

Table 5: Visual Sensitivity Mapping Categories for the Proposed Kudu Solar Facility 10

Scenic Resources	Very high sensitivity	High visual sensitivity	Medium visual sensitivity	Low visual sensitivity
Topographic features	Feature	Within 250m	-	-
Steep slopes	Slopes > 1:4	Slopes > 1:10	-	-
Drainage courses	Feature	Within 50m	-	-
Cultural landscapes	within 250m	within 500m	-	
Protected Landscapes / Sensitive Receptors				
Nature reserves / game farms	within 500m	within 1 km	within 2 km	-
Farmsteads outside site	within 500m	within 1 km	within 2 km	-
Farmsteads inside site	within 250m	within 500m	-	
Arterial routes n/a	within 250m	within 500m	within 1km	-
District roads	within 50m	within 100m	within 250km	-

Table 6: Visual Sensitivity Categories

Very high	Areas or features considered of such sensitivity or importance that any adverse effects upon them may be regarded as a fatal flaw.
High	Development to be limited and remain within acceptable limits of change determined by the specialist, and comply with restrictions or mitigation measures identified by the specialist.
Medium	Areas considered to be developable, but to remain within acceptable limits of change as determined by the specialist, and comply with restrictions or mitigation measures identified by the specialist.
Low	Low sensitivity areas that are considered to be developable. However, specialists may still wish to define acceptable limits of change where necessary.

4.4.3. Sensitivity Analysis Summary Statement

More accurate mapping of landscape features has been provided at the detailed project scale, being a refinement of the DFFE's Screening Tool Landscape Sensitivity Map. No significant landscape or scenic features would be affected by the currently proposed Kudu Solar facility. The sensitivities noted below are based on the identified 'Buildable Areas', (i.e. development footprints).

Table 7: Visual Sensitivity Analysis of the Proposed Solar Facility

Kudu Solar Facility	Scenic Resources / Receptors	Sensitivity
Kudu Solar Facility 10 related infrastructure	The proposed solar PV borders on a local district road but outside the no-go buffer area. The nearest surrounding farmstead, Jacobsrus, is about 3,36 km away, and well outside the buffer area.	Low visual sensitivity

As indicated above, following the identification of sensitivities during the Scoping Phase, the Project Developer considered such sensitivities and formulated the Revised Buildable Areas. The Revised Scoping Buildable Areas led to the identification of the development footprints and detailed layouts in the EIA Phase which are considered suitable from a visual perspective, as the sensitivities identified above have been taken into consideration as shown on **Map 10**.

Changes to the detailed layouts are deemed acceptable if the changes remain within the approved buildable areas / development footprints assessed during the Scoping and EIA Process with no-go sensitive areas avoided.

5. Issues, Risks and Impacts

5.1. Identification of Potential Impacts/Risks

Potential visual impacts arising from the proposed Kudu Solar PV Facility and associated infrastructure on landscape features and receptors identified above are listed below for each of the project phases, including cumulative impacts. No indirect impacts have been identified.

Construction Phase

- Impact 1: Potential effect of dust and noise from trucks and construction machinery during the construction period, and the effect of this on nearby farmsteads and visitors to the area.
- Impact 2: Potential visual effect of haul roads, access roads, stockpiles and construction camps in the visually exposed landscape.

Operational Phase

- Impact 1: Potential visual intrusion of solar arrays and related infrastructure on receptors including glint and glare.
- Impact 2: Potential visual impact of an industrial type activity on the pastoral / rural character and sense of place of the area.

Decommissioning Phase

- Impact 1: Potential visual effect of any remaining structures, platforms and disused roads on the landscape.

Cumulative Impacts

- Impact 1: Potential combined visual effect of the proposed 12 solar PV facilities in the study area, seen together with other existing and proposed renewable energy facilities in the area, are indicated on **Map 11** and could potentially increase the overall cumulative visual impact.

5.2. Summary of Issues identified during the Public Consultation Phase

Visual related issues were raised by Interested and Affected Parties (I&APs) and Stakeholders during the 30-day review period on the Draft Scoping Report. A summary of these issues is listed below, together with responses from the Visual Specialists.

KEY ISSUE	RESPONSE
Requests for information on the visual impact of the development on neighbouring farm portions as relating to farming and tourism activities. Specifically: • Please provide information and sketches about the visual impact that this development will have on farm Vanwyngaardspan and farming. • Please provide information and sketches about the visual impact that this development will have on farm Jakkalskuil and farming activities like the offering of hunting- and photographic safaris to clients from all over the world.	• The location of farm Vanwyngaardspan was confirmed with the landowner during the EIA Phase. Farm Vanwyngaardspan is more than 25 km away from the northern-most corner of Kudu Solar Facility 11 (and even further from the Kudu Solar Facility 10). The proposed Kudu Solar Facilities would not be visible from this area. There are also two koppies - Aasvoëlkop and Ongelukskop, which are 85m higher than the Kudu Solar Facility 11, which would block the line of sight of the proposed Kudu Solar Facilities. Refer to the VIA for Kudu Solar Facility 11 for additional information. • The Jakkalskuil farmstead is 5,84 km from the proposed project area and the Kudu Solar Facility would therefore not be visible. Refer to the VIA for Kudu Solar Facility 12 for additional information. However, the farm boundary is directly adjacent to the Kudu Solar Facility 12 and the visibility would be very high at 360m distance. The viewshed, or zone of visual influence, potentially extends for some 5 km, hence the Jakkalskuil farmstead was not included in the Visual Scoping Level Assessment. Impacts on adjacent farmsteads have therefore been identified and considered in the VIA specialist study.
Request to ensure that the visual impact on the nearest farmstead, Vrede, is adequately assessed.	Various impacts are identified and assessed in the VIA, such as the potential effect of dust and noise from trucks and construction machinery during the construction period, and the effect of this on nearby farmsteads and visitors to the area, as well as the potential visual impact of a solar energy facility on the pastoral / rural character and sense of place of the area. The Vrede farmstead is located some 11 km away from the proposed Kudu PV 10 project, which would not be visible from the farmstead.

6. Visual Impact Assessment

This section provides an assessment of the potential visual impacts of the proposed project. Comment on the no-go alternative is also provided.

Criteria for determining visual impact included the following:

Visual Exposure: (**Map 6**)
The viewshed, or zone of visual influence, potentially extends for some 5km.

Visibility:
Possible degrees of visibility from a number of viewpoints are indicated on **Map 3** and in Table 3. (See also photo-montages). Visibility of lights at night would not be significant because of the localised need for lighting and the distance of receptors. Visibility for Kudu PV 10 varies from not visible to low visibility.

Landscape Integrity:
The natural landscape intactness of the area, and its pastoral sense of place, has been altered to some extent by the main Eskom powerline (i.e. Hydra/Perseus 1 765kV) that runs through the study area. The character and sense of place of the rural landscape would potentially be affected by the proposed solar PV development.

Visual Absorption Capacity:
The area around the proposed site is generally flat to gently undulating with scattered koppies, and low grass vegetation cover. It is therefore relatively visually exposed, with low to moderate visual absorption capacity, i.e. little potential to screen any proposed structures.

Visually Sensitive Resources:
Natural and cultural landscapes, or scenic resources, form part of the 'National Estate' and may have local or regional significance. The study area has few significant features, most of these being minor dolerite koppies, which have been avoided in the layout**.**

Visual Impact Intensity:
The overall potential visual impact intensity (magnitude) is determined in Table 8 below by combining the above criteria. Visual impact intensity is in turn used to assess impact consequence.

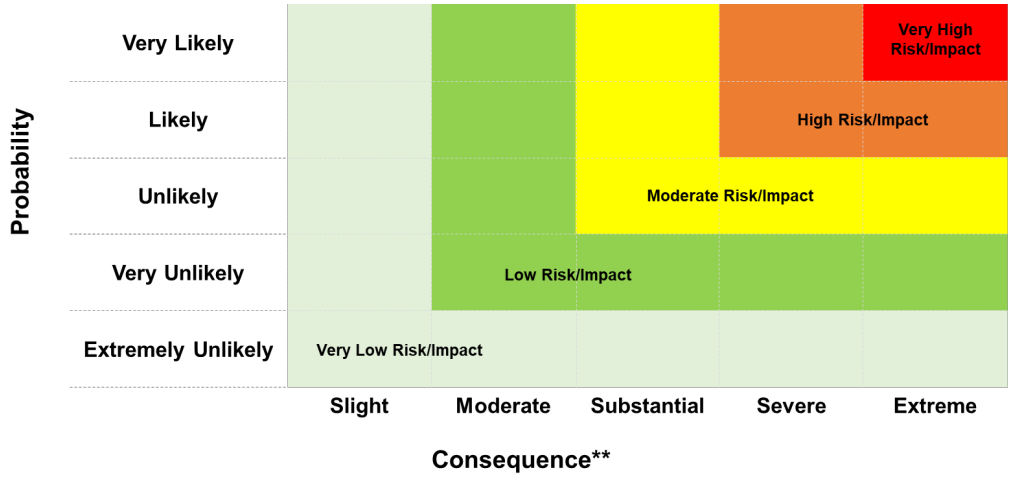
No-go Alternative

The ‘no-go’ alternative is the option of not constructing the Project in which case the *status quo* of the current landscape character would prevail, the disadvantage being that no solar energy would be produced for export to the national grid. The potential visual impact would be neutral where the *status quo* is maintained, with neither impacts or benefits occurring.

Table 8: Visual Impact Intensity for Kudu Solar Facility 10

Visual Criteria	Comments	Intensity
Visual exposure	Viewshed is related to the height of the solar arrays. Some areas are in a view shadow.	Medium-low
Visibility	Visible mainly from nearby farmsteads and local district roads. Distance is a mitigatory factor in most cases.	Low
Visual absorption capacity (VAC)	Visually exposed landscape with some undulations. Generally low VAC.	Medium
Landscape integrity / intactness	Effect on landscape character / sense of place.	Medium-high
Landscape / scenic sensitivity	Landscape features are generally avoided.	Low
Impact intensity	Summary	**Medium**

The quantification of overall visual impact significance for the proposed Kudu Solar Facility is based on the methodology provided by the CSIR (2022), as used in Tables 9 to 12 below. The assessment criteria are included in Appendix D of this report, and the significance rating is based on Figure 6 below.



[Qualitatively determined based on Spatial Extent, Duration, Reversibility and Irreplaceability]

Figure 6: Visual impact risk chart

6.1. Potential Visual Impacts during the Construction Phase

This section includes a description of the potential visual impacts during the Construction Phase.

- ***Impact 1: Potential effect of dust and noise from trucks and construction machinery during the construction period, and the effect of this on nearby farmsteads and visitors to the area.***

The above impact is rated as a negative, direct impact that extends locally and is of a short-term duration. The consequence is rated as moderate, and the probability identified as very likely, resulting in an impact significance of low, without the implementation of mitigation measures. With mitigation, the significance would remain low significance. Mitigation measures include ensuring that the Environmental Management Programme (EMPr) is implemented during the construction phase via the appointment of an Environmental Control Officer (ECO); and ensuring that construction camp and other facilities are located in visually unobtrusive areas, away from public roads. The impact summary is given in Table 9.

- ***Impact 2: Potential visual effect of haul roads, access roads, stockpiles and construction camps in the visually exposed landscape.***

This impact is rated as a negative, direct impact with a short-term duration and local spatial extent. The consequence and probability are respectively rated as moderate and very likely, rendering a low impact significance, without the implementation of mitigation measures. With mitigation, the significance of this impact would remain low significance. The same mitigation measures identified for Impact 1 above apply to Impact 2.

Table 9: Construction Phase: Visual Impact Assessment

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
CONSTRUCTION PHASE						
Potential visual effect of construction activities, haul roads, construction camps (Impacts 1 and 2)	*Status*	**Negative**	**Low risk (Level 4)**	Locate construction camps, batching plants and stockpiles in visually unobtrusive areas, away from public roads. Implement EMPr with ECO during construction.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Short Term**				
	Consequence	**Moderate**				
	Probability	**Very Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				

6.2. Potential Impacts during the Operational Phase

This section includes a description of the potential visual impacts during the Operational Phase.

- ***Impact 1 for the above facility: Potential visual intrusion of solar arrays and related infra-structure on receptors including glint and glare***

This impact is rated as a negative, direct impact that extends locally and is of a long term duration. The consequence is rated as moderate, and the probability identified as very likely, resulting in an impact significance of low risk, without the implementation of mitigation measures. With mitigation, the significance of this impact remains low risk significance. Mitigation measures include:

- Locate the substations and BESS in unobtrusive low-lying areas, away from public roads.
- Use muted natural colours and non-reflective finishes for structures generally.
- Keep internal access roads as narrow as possible, and use existing roads or tracks as far as possible.
- Fit outdoor/ security lighting with reflectors to obscure the light source, and minimise light spillage.
- Locate internal powerlines (i.e. 22 kV or 33 kV) underground where possible. (In some cases, such as stream crossings, internal powerlines may need to be above ground).
- Use discrete outdoor signage and avoid commercial / billboard signage.

- ***Impact 2 for the above solar facility: Potential visual impact of an industrial type activity on the pastoral / rural character and sense of place of the area***

This impact is rated as a negative, direct impact with a long-term duration and local spatial extent. The consequence and probability are respectively rated as moderate and very likely, rendering a low risk impact significance, without the implementation of mitigation measures. With mitigation, the significance of this impact remains low risk significance. The same mitigation measures identified for Impact 1 above apply to Impact 2. The impact summary is given in Table 10.

Table 10: Operational Phase: Visual Impact Assessment

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
OPERATIONAL PHASE						
Impact 1: Potential visual intrusion of solar arrays and related infrastructure on receptors, including glint and glare. Impact 2: Effect of an industrial type activity on the pastoral/rural character and sense of place.	*Status*	**Negative**	**Low risk (Level 4)**	Substation and BESS to be located in an unobtrusive low-lying area, away from public roads. Muted natural colours and non-reflective finishes to be used for structures generally. Internal access roads to be as narrow as possible, and existing roads or tracks used as far as possible. Outdoor/ security lighting to be fitted with reflectors to obscure the light source, and to minimise light spillage. Internal powerlines (i.e. 22 kV or 33 kV) to be located underground where possible. (In some cases, such as stream crossings, internal powerlines may need to be above ground). Outdoor signage to be discrete and commercial / billboard signage avoided.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Long Term**				
	Consequence	**Moderate**				
	Probability	**Very Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				

6.3. Potential Impacts during the Decommissioning Phase

This section includes a description of the potential visual impacts during the Decommissioning Phase.

- ***Impact 1: Potential visual effect of any remaining structures, platforms and disused roads on the landscape.***

This impact is rated as a negative, direct impact that extends locally and is of a short-term duration. The consequence is rated as moderate, and the probability identified as very likely, resulting in an impact significance of low, without the implementation of mitigation measures. With mitigation, the significance of this impact is rated as very low significance. Mitigation measures include ensuring that the solar arrays and infrastructure are removed and recycled; and access roads that are no longer required are ripped and regraded, and that exposed or disturbed areas are revegetated to blend with the surroundings. The impact summary is given in Table 11.

Table 11: Decommissioning Phase: Visual Impact Assessment

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
DECOMMISSIONING PHASE						
Potential visual effect of any remaining structures, platforms and disused roads on the landscape.	*Status*	**Negative**	**Low risk (Level 4)**	Solar arrays and infra-structure to be removed and recycled. Access roads no longer required to be ripped and regraded. Exposed or disturbed areas to be revegetated to blend with the surroundings.	**Very low risk (Level 5)**	**High**
	Spatial Extent	**Local**				
	Duration	**Short Term**				
	Consequence	**Moderate**				
	Probability	**Very Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				

6.4. Cumulative Impacts

This section includes a description of the potential cumulative visual impacts during the Construction, Operational and Decommissioning Phases.

There are a number of other renewable energy and EGI projects within 30km of the site, (see **Map 11**), not all of which will be within the same viewshed as the proposed Kudu Solar PV 10 facility. The projects numbered on Map 11 are as follows:

- Project 1: Kalkbult Solar PV (Operational)
- Project 2: Longyuan Mulilo De Aar 2 North Wind Energy Facility (WEF) (Operational)
- Project 3: Longyuan Mulilo De Aar Maanhaarberg WEF (Operational)
- Project 4: EGI for the Longyuan Mulilo De Aar 2 North WEF
- Project 5: EGI for the De Aar 2 WEF
- Project 6: Proposed Castle WEF
- Project 7: Proposed Swartwater PV
- Project 8: Proposed Solar Power Plant in Phillipstown area
- Project 9: Proposed PV facility on farm Jakhalsfontein near De Aar
- Project 10: Proposed Solar Power Plant in Petrusville
- Project 11: Proposed Keren Energy Odyssey Solar PV Facilities (Eight PV Facilities)
- Project 12: Proposed Crossroads Green Energy Cluster of Renewable Energy Facilities and Grid Connection Infrastructure. The Cluster entails the development of up to 21 solar energy facilities, with the Scoping and EIA Processes consisting of three phases. Phases 1, 2 and 3 consist of 9, 6 and 6 solar facilities, respectively. The Phase 1 Scoping and EIA Processes were launched in January 2023.

Cumulative visual impacts would mainly be the combined visual effect of the 12 Kudu Solar PV facilities, as well as those solar projects within about 5 km of the Kudu PV 10 site, as well as the existing and proposed Eskom powerlines shown on **Map 11.**

The potential combined visual effect of the proposed 12 solar PV facilities and adjacent proposed solar facilities, seen together, is rated as a negative, cumulative impact for the construction, operational and decommissioning phases. The duration for the impact is rated as short term for the construction and decommissioning phases; and long term for the operational phase. The impacts have been rated with a local spatial extent. The consequence of the impact has been rated as substantial for the operational phase; and moderate for the construction and decommissioning phases; and the probability has been rated as very likely for the three phases. Without the implementation of mitigation measures, the impact is rated as low significance for the construction and decommissioning phases, and moderate

significance for the operational phase. With mitigation, the significance of this impact is rated as low, moderate and very low significance for the construction, operational, and decommissioning phases, respectively.

Table 12: Cumulative Visual Impact Assessment

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
CONSTRUCTION PHASE						
Potential combined visual effect of proposed 12 solar PV facilities seen together during construction phase.	*Status*	**Negative**	**Low risk (Level 4)**	Mitigation measures as for construction phase, Table 9.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Short Term**				
	Consequence	**Moderate**				
	Probability	**Very Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				
OPERATIONAL PHASE						
Potential combined visual effect of proposed 12 solar PV facilities seen together during operational phase.	*Status*	**Negative**	**Moderate risk (Level 3)**	Mitigation measures as for operational phase, Table 10.	**Moderate risk (Level 3)**	**High**
	Spatial Extent	**Local**				
	Duration	**Long Term**				
	Consequence	**Substantial**				
	Probability	**Very Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				
DECOMMISSIONING PHASE						
Potential combined visual effect of proposed 12 solar PV facilities seen together during decommissioning phase.	*Status*	**Negative**	**Low risk (Level 4)**	Mitigation measures as for decommissioning phase, Table 11.	**Very low risk (Level 5)**	**High**
	Spatial Extent	**Local**				
	Duration	**Short Term**				
	Consequence	**Moderate**				
	Probability	**Very Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				

6.5. Substation and BESS

Lithium-Ion BESS and Redox Flow BESS were both considered for the proposed project. For Redox Flow BESS, various chemical compositions are likely, such as Vanadium. Refer to Chapter 15 of this EIA Report for a High-Level Safety, Health and Environment Risk Assessment, which provides high level information on the safety, health and environmental risks of the BESS technologies.

The substation and BESS have been considered as an integral part of the solar facility and mitigations for these have been included in the assessment tables above. Both BESS technologies are considered viable from a visual perspective.

7. Impact Assessment Summary

The overall visual impact significance findings, post-mitigation, are indicated in the Table 13 below:

Table 13: Overall Visual Impact Significance (Post Mitigation)

Phase	**Overall Impact Significance**
Construction	**Low risk (level 4)**
Operational:	**Low risk (level 4)**
Decommissioning	**Very low risk (level 5)**
Nature of Impact	**Overall Impact Significance**
Cumulative - Construction	**Low risk (level 4)**
Cumulative - Operational	**Moderate risk (level 3)**
Cumulative - Decommissioning	**Very low risk (level 5)**

8. Legislative and Permit Requirements

No permits, licenses or other authorizations are specifically required in terms of landscape or visual issues. Visual assessments are sometimes required in terms of the National Heritage Act, being part of the 'national estate', and would be included with the heritage assessment in those cases.

Although the proposed Kudu Solar PV project is located in the Northern Cape, the Western Cape guideline for involving visual and aesthetic specialists in EIA processes has been used.

National Heritage Resources Act (Act 25 of 1999 NHRA)	The Act includes protection of national and provincial heritage sites, as well as areas of environmental or cultural value, and proclaimed scenic routes. Natural heritage, including scenic resources, form part of the 'national estate'.
Provincial Government of the Western Cape 2005: Guideline for Involving Visual and Aesthetic Specialists in EIA Processes. B. Oberholzer.	A guideline document for specialist visual input with respect to determining potential visual impacts, along with criteria for rating the significance of impacts.

9. Environmental Management Programme Inputs

Mitigation measures have been recommended for the solar facility and related infrastructure in the tables above, in order to minimise visual impacts on scenic resources and sensitive receptors.

Visual input into the Environmental Management Programme (EMPr) is discussed below. This should be included in the Environmental Authorisation for the project.

Design Phase Monitoring:

Review signed off designs to ensure that the substation and BESS are located in an unobtrusive low-lying area, away from public roads; muted natural colours and non-reflective finishes are used for structures; internal access roads are designed to be as narrow as possible, and existing roads or tracks used as far as possible; outdoor/security lighting to be fitted with reflectors; internal powerlines (i.e. 22 kV or 33 kV) to be located underground where possible (in certain cases, such as stream crossings, internal powerlines may need to be aboveground); and outdoor signage to be discrete and commercial / billboard signage avoided.

Responsibility: Project Developer and ECO.

Timeframe: During the planning and design phase.

Construction Phase Monitoring:

Ensure that visual management measures are included as part of the EMPr, monitored by an Environmental Control Officer (ECO), including siting of any construction camps, stockpiles, temporary laydown areas and batching plants outside of identified no-go areas unless otherwise approved by the visual specialists, as well as the implementation of dust suppression and litter control measures. Rehabilitation efforts to commence immediately after construction activities are completed.

Responsibility: ECO / Contractor.

Timeframe: Preparation of EMPr during the planning phase. Monitoring during the construction phase.

Operation Phase Monitoring:

Ensure that visual mitigation measures are monitored by management on an on-going basis, including the maintenance of rehabilitated areas, as well as control of any signage, lighting and waste at the proposed solar project, with interim inspections by the responsible environmental officer.

Responsibility: Solar Farm Operator.

Timeframe: During the operational life of the project.

Decommissioning Phase Monitoring:

Ensure that procedures for the removal of structures and stockpiles during decommissioning are implemented, including recycling of materials and rehabilitation of the site to a visually acceptable standard, and signed off by the delegated authority.

It is assumed that some access roads and concrete pads would remain. Those that are not required should be ripped and regraded, and vegetation or cropland reinstated to match the surroundings.

Exposed or disturbed areas to be revegetated to blend with the surroundings. The revegetation measures are not described here as they would fall under the auspices of the vegetation/ biodiversity specialist.

Responsibility: ECO / Contractor / qualified rehabilitation ecologist or horticulturist.

Timeframe: During the decommissioning contract phase, as well as a prescribed maintenance period thereafter (usually one year).

10. Visual Specialist Statement and Authorisation Recommendation

The VIA is based on the currently provided layout for the proposed Kudu PV 10 facility. Mitigation measures have been recommended in Tables 9 to 12 above. These have been included where possible in the project layout. A photomontage has been attached to depict the current layout.

The visual assessment findings are the following:

- The viewshed is fairly localised given the modest height of the solar facilities.
- There are a number of visual receptors in the surroundings these being mainly small farmsteads. However, these are fairly distant, the Jacobsrus farmstead being the closest at 3,36 km.

- The overall visual impact significance for the Kudu PV 10 facility has been rated as low during the operational and construction phases, both before and after mitigation. The main visual impact is that there would be some change in character to the rural area.
- The cumulative visual impact significance of the proposed 12 Kudu solar energy facilities, seen in combination with other renewable energy projects in the adjacent area, as well as existing and proposed Eskom powerlines, could be substantial and has been rated as moderate using the rating methodology provided by the CSIR.

The fact that there will be similar proposed solar facilities adjacent to the site tends to reduce the visual sensitivity of the Kudu PV 10 site as the area would be seen as a node for solar energy.

Conclusion, Reasoned Opinion, and Impact Statement

The layout of the Kudu PV 10 facility has been subject to revisions, based on the various specialist findings, including the mapping of scenic resources and sensitive receptors. The currently proposed layout succeeds in avoiding visually sensitive areas as indicated on the visual sensitivity map (**Map 10**).

The cumulative visual impact of the solar facilities and related infrastructure, such as the substations, battery facilities and grid connection powerlines, together with other existing and proposed renewable energy facilities in the area, could affect the rural quality of the area (**Map 11**).

Specialist Recommendations for Inclusion in the EA

It is the opinion of the Visual Specialists that provided the recommended mitigation measures and EMPr are implemented, the Kudu PV 10 project would not present a potential fatal flaw in visual terms and could be authorised

11. References

CSIR, April 2022. Terms of Reference for Specialist Studies for the Environmental Impact Assessments and Basic Assessments for the proposed development of 15 Solar PV Facilities and Associated Infrastructure, near De Aar, Northern Cape.

DFFE, 2022. Screening Report for an Environmental Authorisation as Required by the 2014 EIA Regulations – Proposed Site Environmental Sensitivity: Kudu PV Project.

Lawson, Q. and Oberholzer, B. 2014. National Wind and Solar PV SEA Specialist Report: Landscape Assessment, with CSIR for Department of Environmental Affairs.

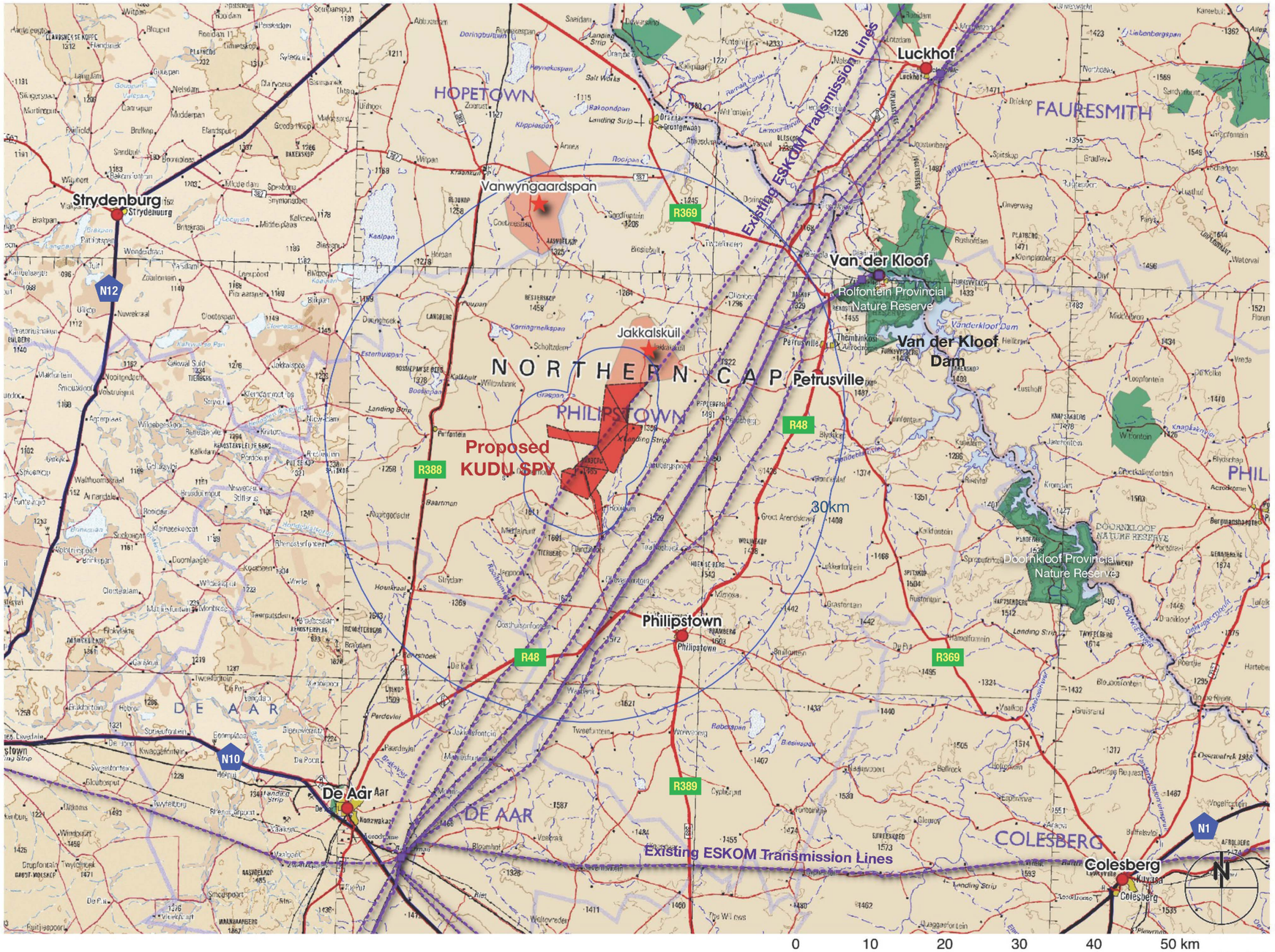
Mucina, L. and Rutherford, M.C. (eds) 2006.The Vegetation of South Africa, Lesotho and Swaziland. *Strelizia* 19. SANBI, Pretoria.

Oberholzer, B. 2005. Guideline for Involving Visual and Aesthetic Specialists in EIA Processes: Edition 1 CSIR Report No. ENV-S-C 2005 053 F. Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning.

MAPS

LEGEND :

- KUDU SPV Farm Properties
- SAPAD Protected Areas
- Existing ESKOM Transmission Lines



base map : NGI 500K Topographic Series : 2920-3124 Prieska, 2924-3128 Bloemfontein

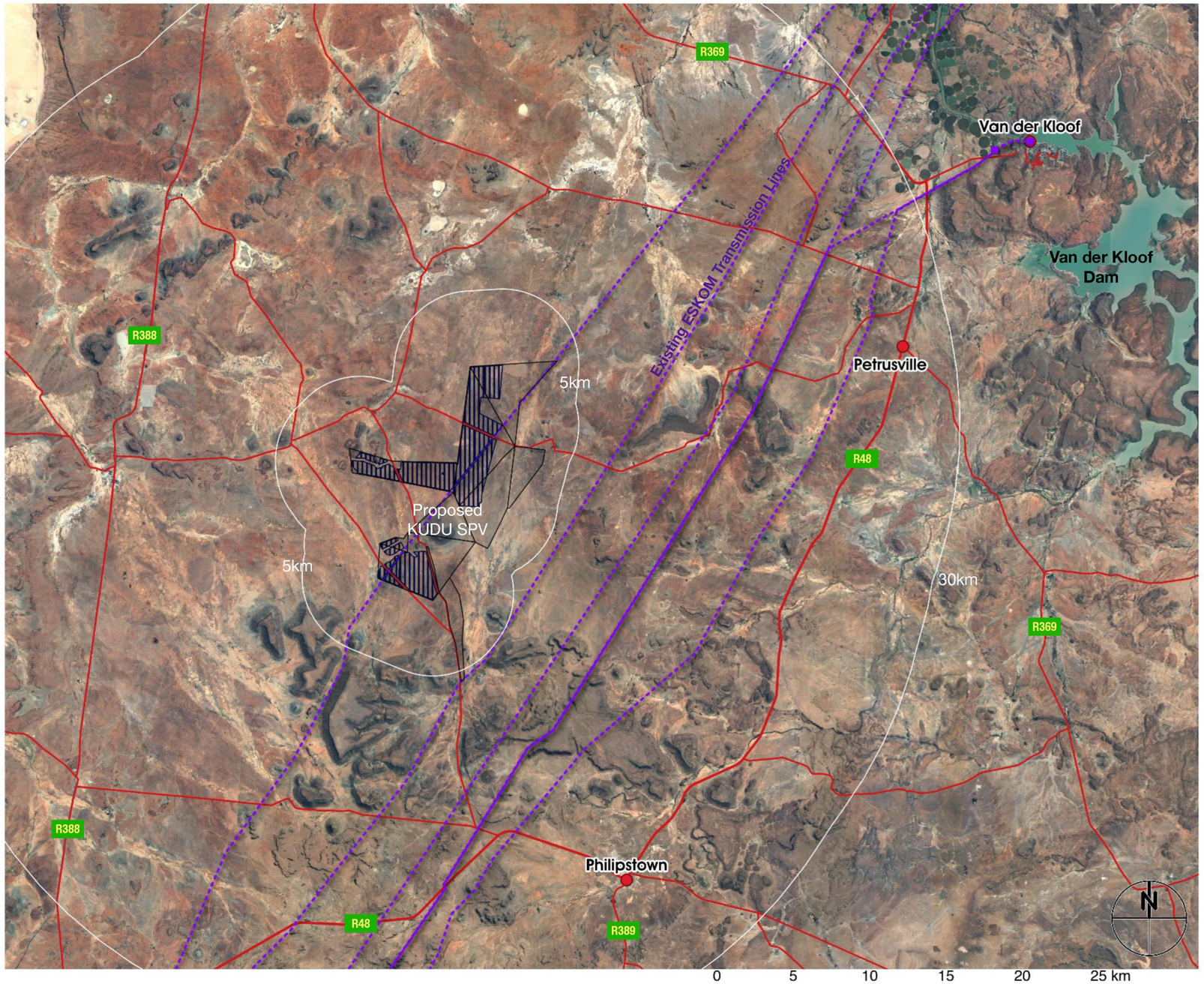
map 1 : KUDU SPV 10 Regional Locality

LEGEND :

KUDU SPV Farm Properties

KUDU SPV Areas

Existing ESKOM Transmission Lines

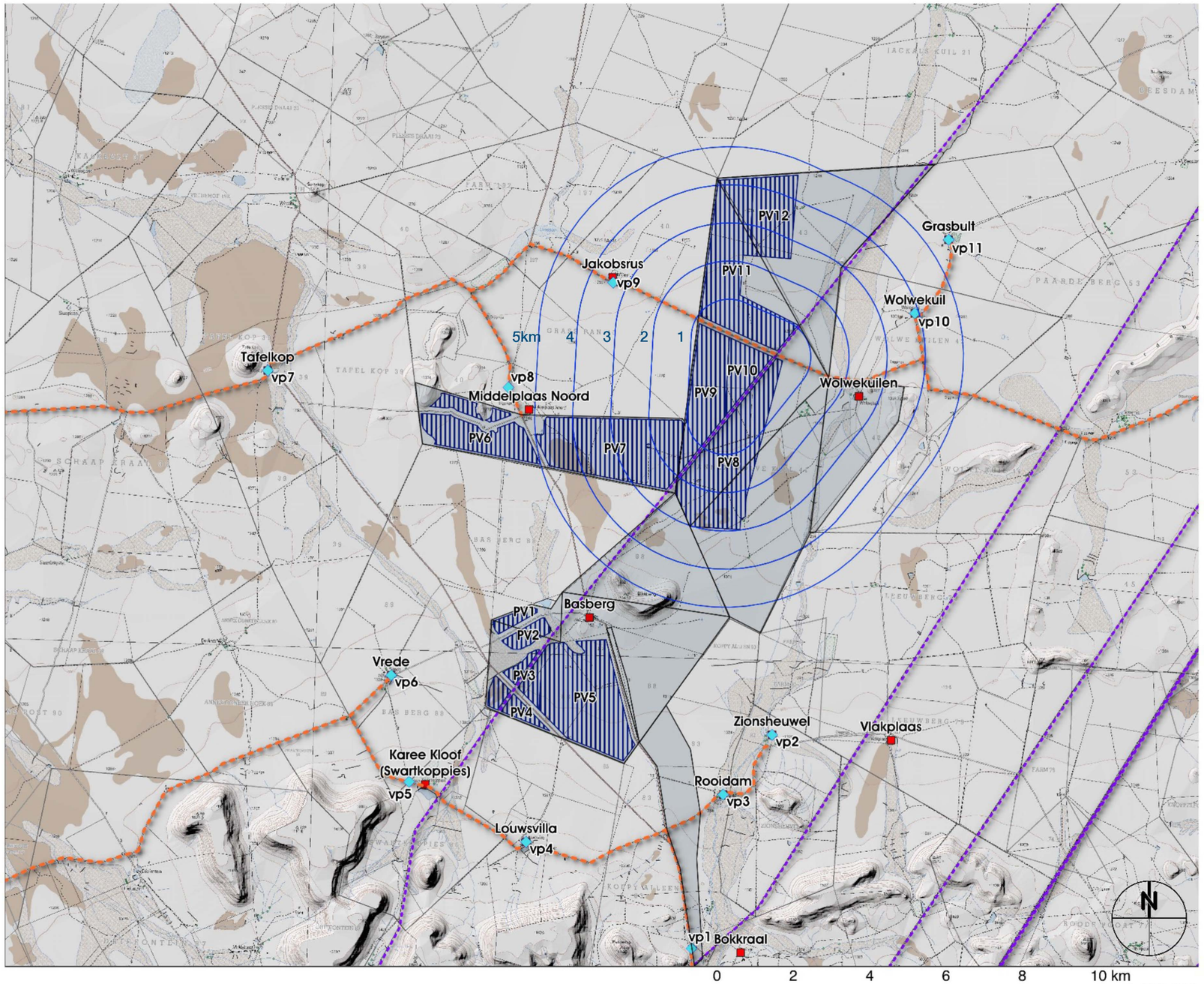


base map : Google Earth 2023

map 2 : KUDU SPV 10 Local Context

LEGEND :

- KUDU SPV Farm Properties
- KUDU SPV Areas
- Fieldwork Viewpoints
- Field Track Route



base map : NGI 50K Topographic Series : 3024 AA Potfontein, AB Jakkalskuil, AC Houtkraal, AD Philipstown

map 3 : KUDU SPV 10 • Fieldwork and Viewpoints

FACILITIES LEGEND :

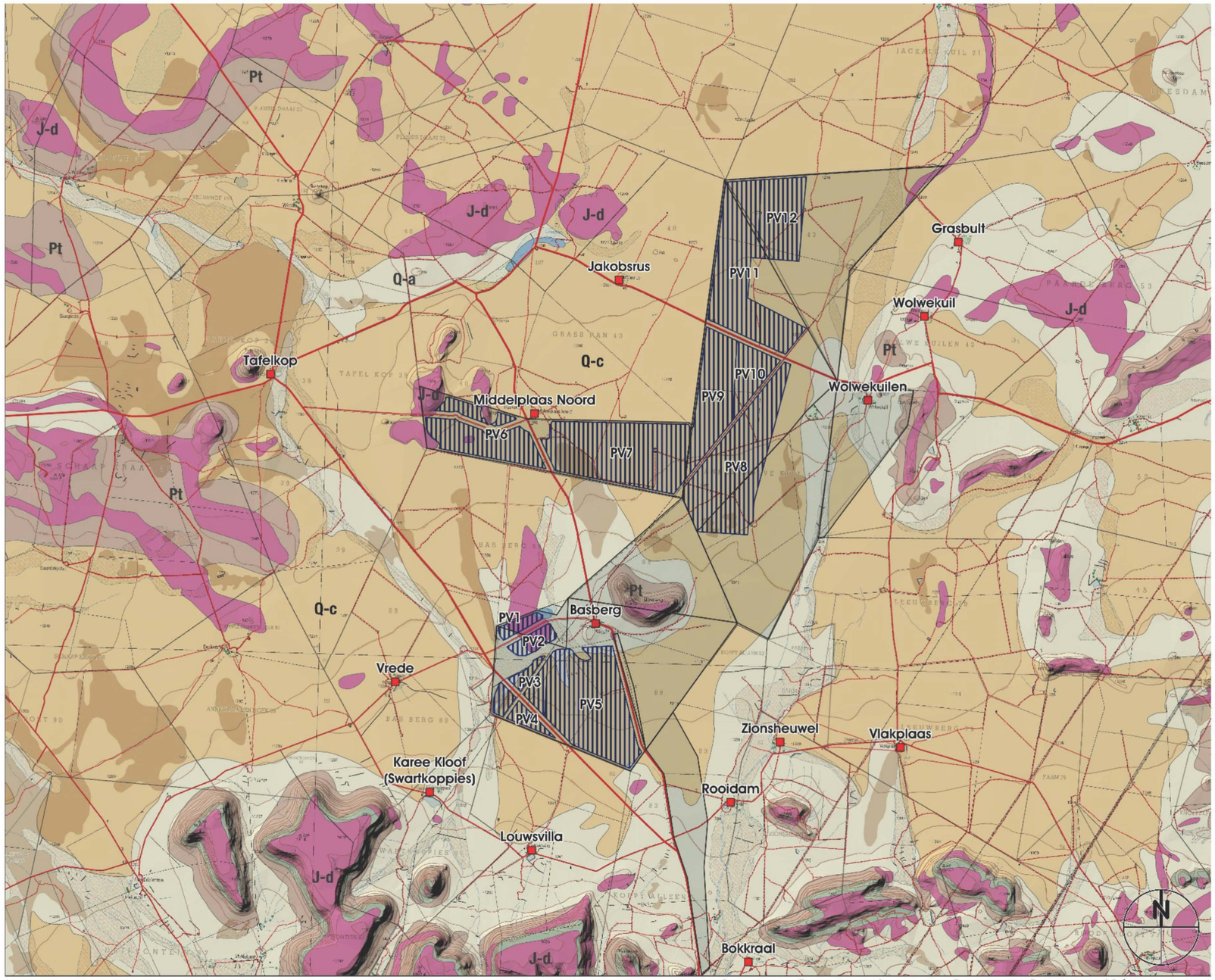
- Fence Line
- Substation Complex
- Laydown Areas
- O&M Buildings
- Substation
- BESS
- SPV Module Arrays
- Inverters
- Access and Internal Roads
- Overhead Powerline

base map : Google Earth 2023

map 4 : KUDU SPV 10 • Facilities Layout

GEOLOGY LEGEND :

Q-a	Alluvium
Q-c	Calcrete
J-d	Dolerite
Pa	Beaufort Group Mudstones and Sandstones
Pt	Ecca Group Shale, Siltstone and Sandstones

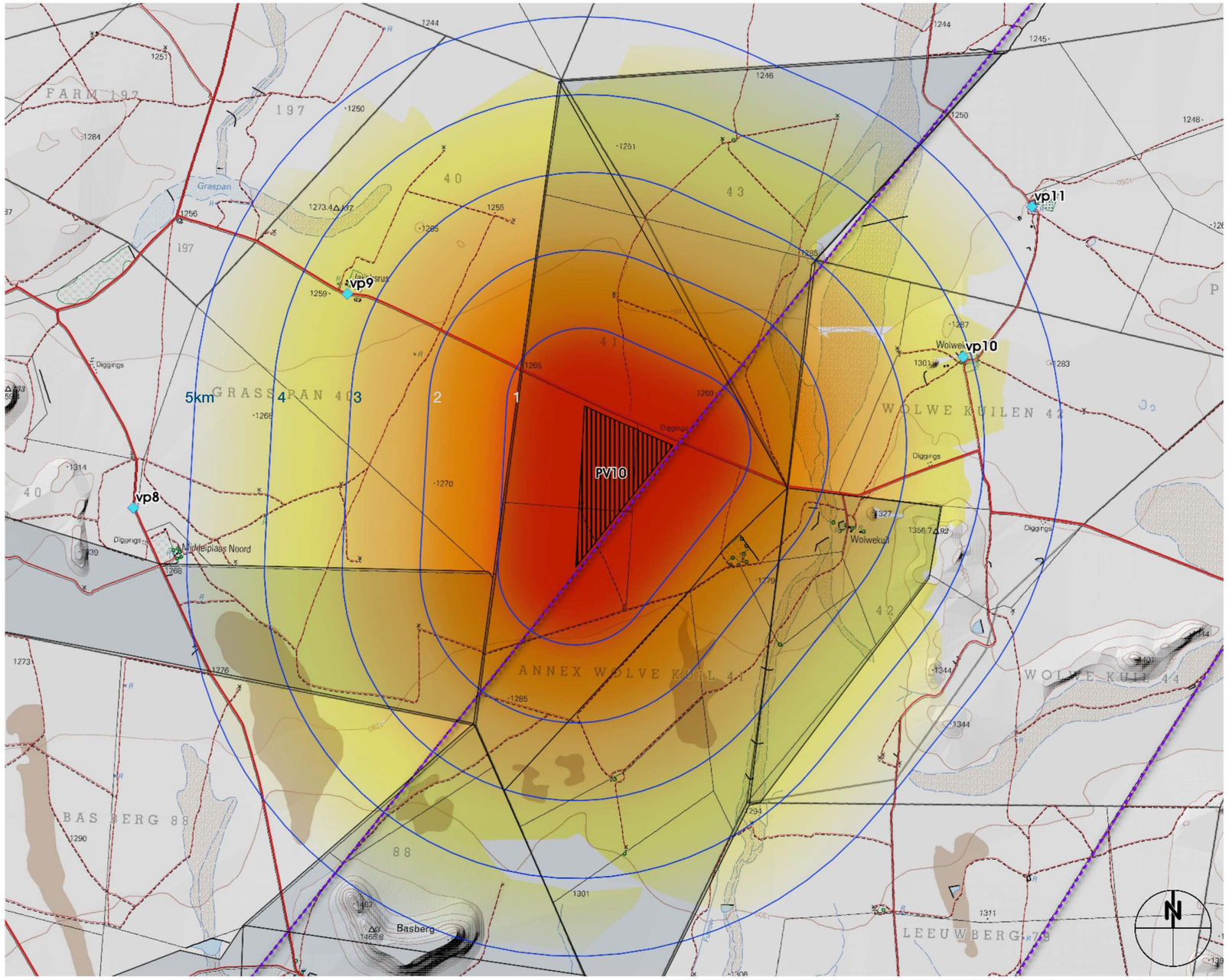


base map : CGS 1:250K Geological Series 3024 Colesberg

map 5 : KUDU SPV 10 Geology

Viewshed Legend :

- High Visibility
- Medium Visibility
- Low Visibility
- No Visibility (View Shadow)

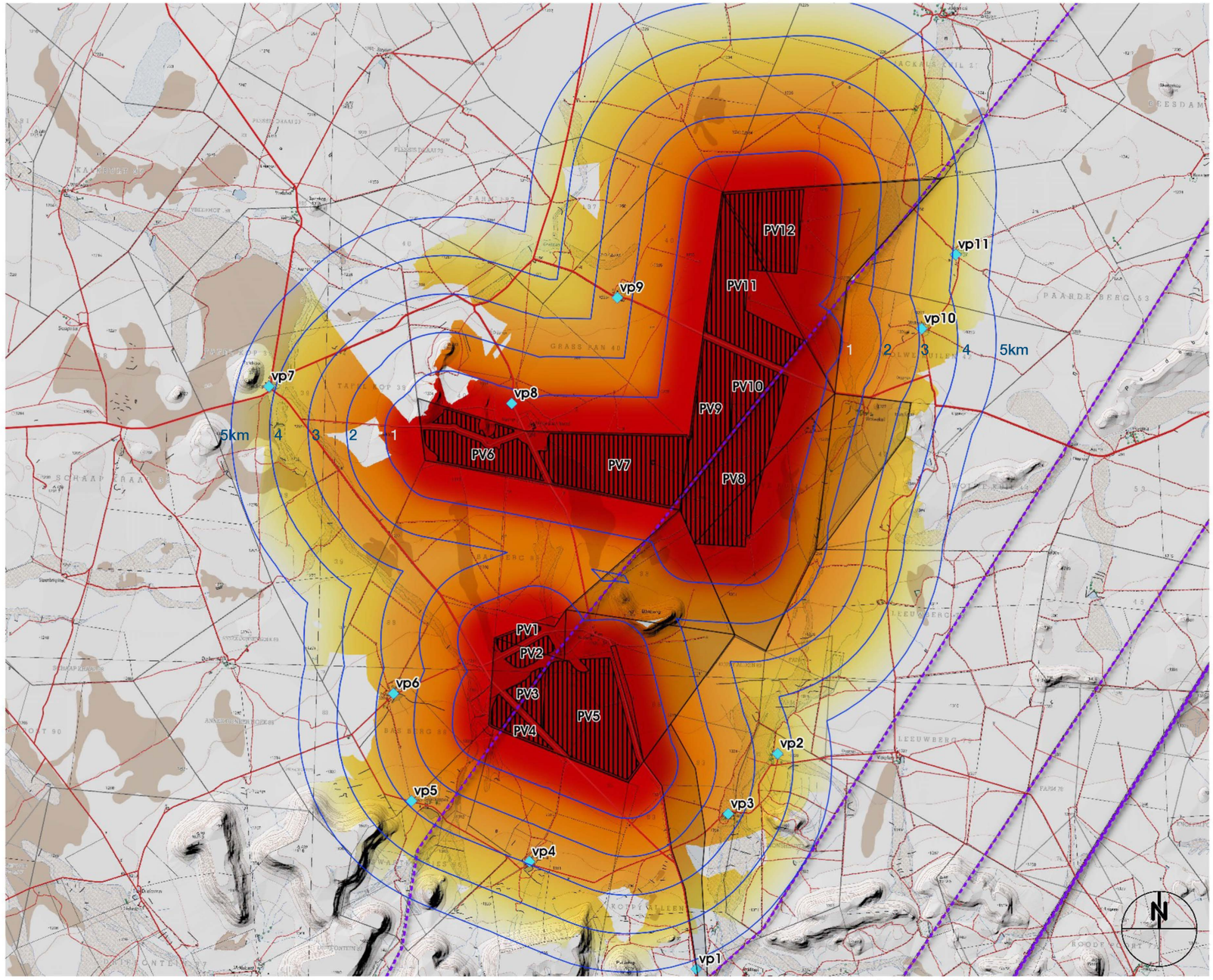


base map : NGI 50K Topographic Series : 3024 AA Potfontein, AB Jakkalskuil, AC Houtkraal, AD Philipstown

map 6 : KUDU SPV 10 • Nominal Viewshed : PV Arrays 3.5m High

Viewshed Legend :

- High Visibility
- Medium Visibility
- Low Visibility
- No Visibility (View Shadow)

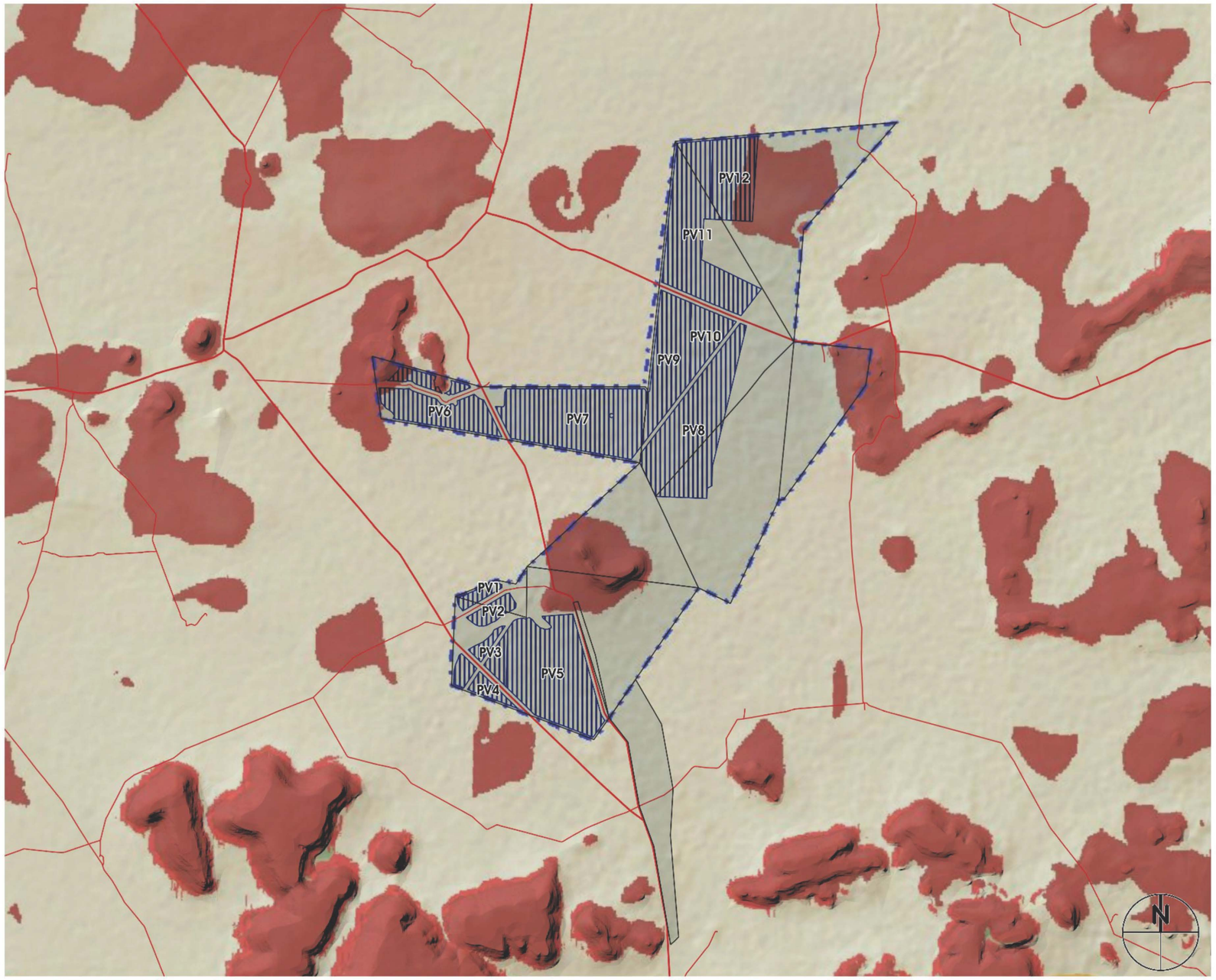


base map : NGI 50K Topographic Series : 3024 AA Potfontein, AB Jakkalskuil, AC Houtkraal, AD Philipstown

map 7 : KUDU SPV • Combined Viewshed : PV Arrays 3.5m High

Sensitivity Features:

Sensitivity	Feature(s)
High	Slope between 1:4 and 1:10
Low	Slope less than 1:10
Very High	Mountain tops and high ridges
Very High	Slope more than 1:4



Legend:
- Very High
- High
- Medium
- Low

map 8 : KUDU SPV 10 : DFFE Screening Tool : Landscape (Solar) Theme

LEGEND :

Topographic Features

YELLOW <1:10 slopes
ORANGE 1:10 - 1:4 slopes,
RED >1:4 + slopes

Drainage Courses

Farmsteads

District Roads

Substation, O&M Buildings and BESS Complex

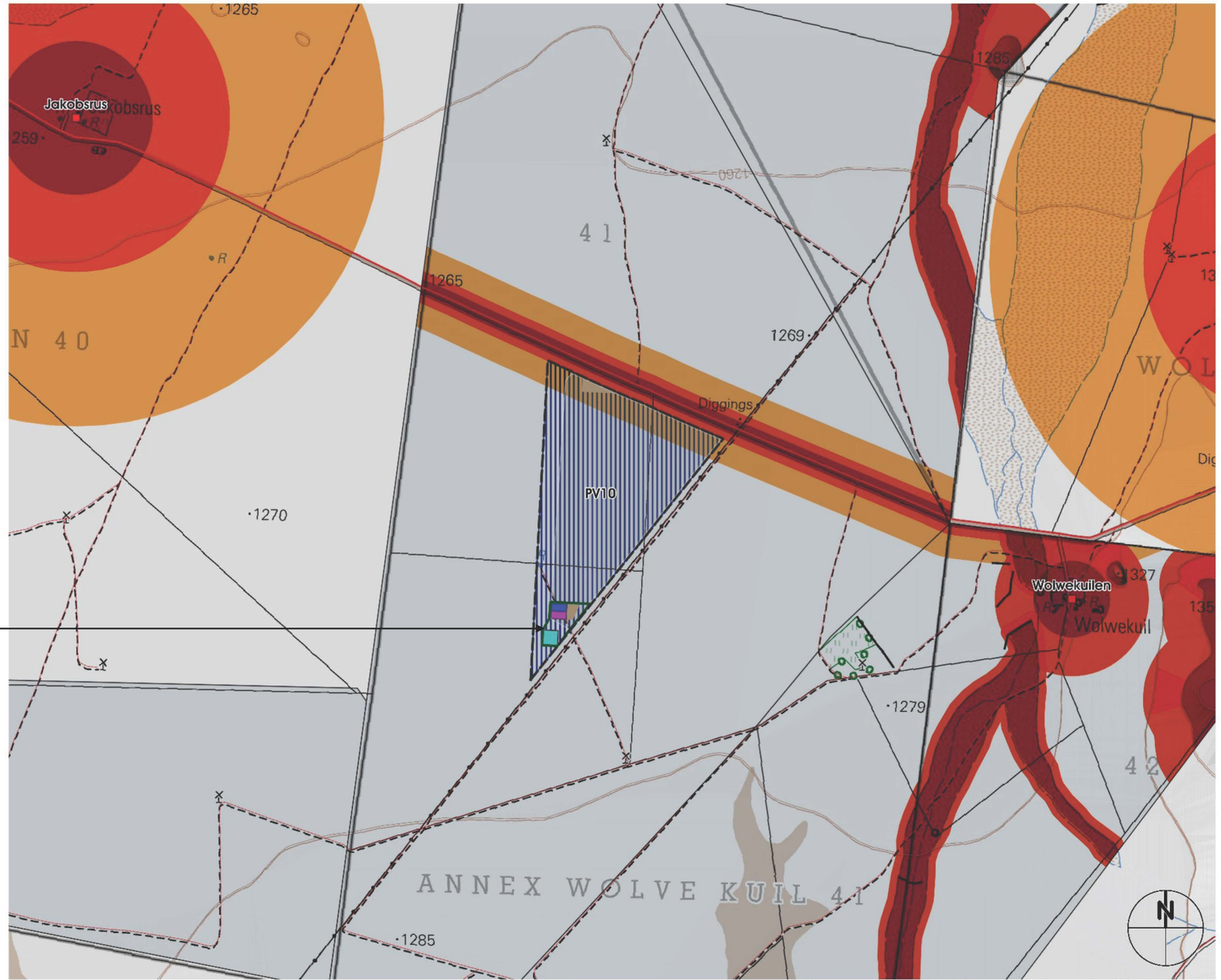
base map : NGI 50K Topographic Series : 3024 AB Jakkalskuil, AD Philipstown

map 9 : KUDU SPV 10 • Visual Features

VISUAL SENSITIVITY

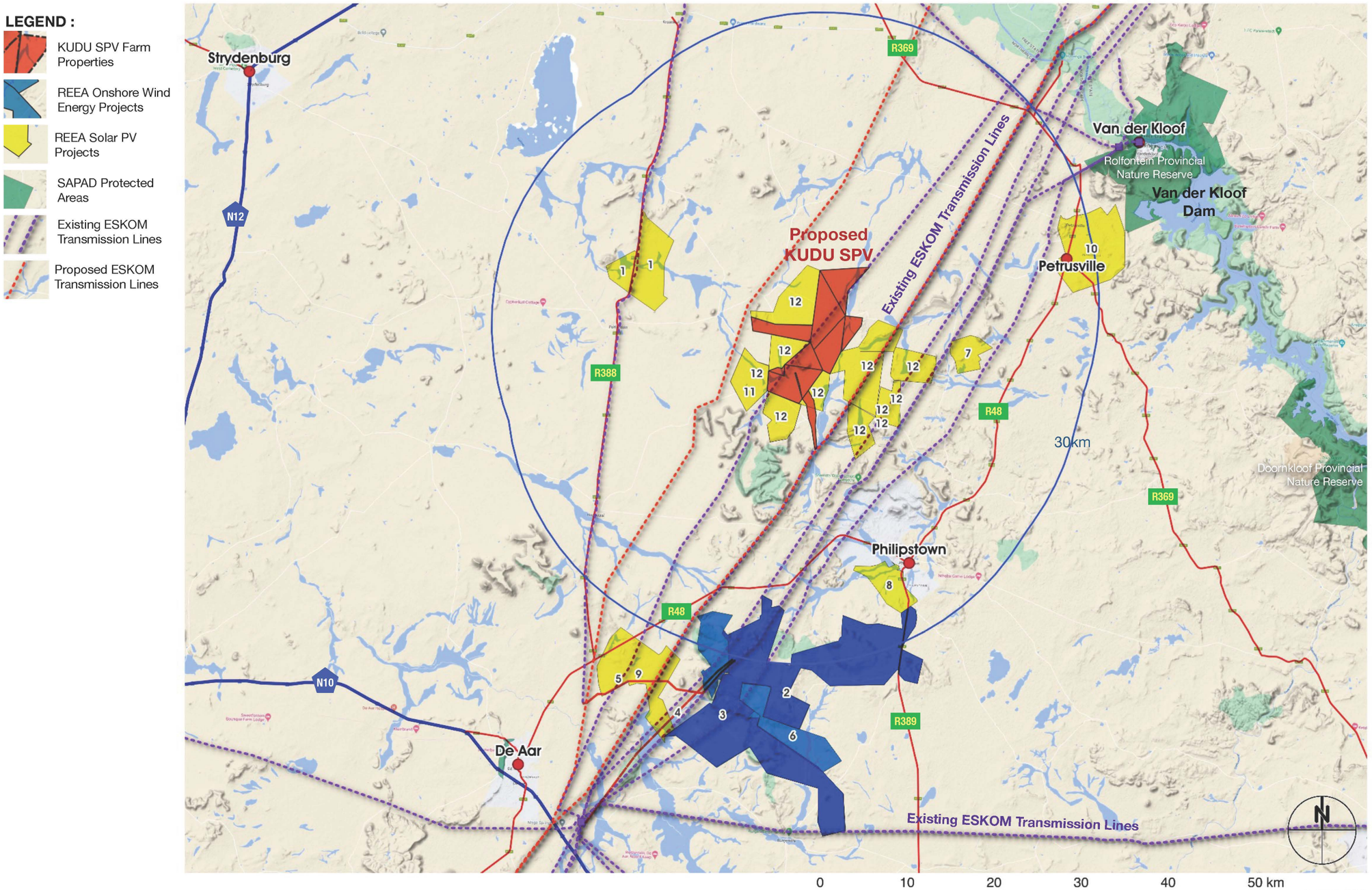
- Very High - NoGo
- High Visual Sensitivity
- Medium Visual Sensitivity
- Low Visual Sensitivity

Substation, O&M Buildings and BESS Complex



base map : NGI 50K Topographic Series : 3024 AB Jakkalskuil, AD Philipstown

map 10 : KUDU SPV 10 • Visual Sensitivity



base map : Google Maps Terrain 2023

map 11 : KUDU SPV Cumulative Renewable Energy Projects • REEA - SAHRIS Projects 25/04/2023

vp9 : Looking South-East from farm road near Jakobsrus *30.161906S 24.328036E Distance 3.36km*

Photomontage : KUDU SPV 10 • Viewpoint 9 : Jakobsrus

Appendix A: Visual Specialist Expertise

Bernard Oberholzer, Landscape Architect
PO Box 471, Stanford, Western Cape, 7210
Email: bernard.bola@gmail.com

Quinton Lawson, Architect
8 Blackwood Drive, Hout Bay 7806
Email: quinton@openmail.co.za

Expertise

Bernard Oberholzer has a Bachelor of Architecture (UCT) and Master of Landscape Architecture (U. of Pennsylvania), and has more than 25 years' experience in undertaking visual impact assessments. He has presented papers on *Visual and Aesthetic Assessment Techniques*, and is the author of *Guideline for Involving Visual and Aesthetic Specialists in EIA Processes,* prepared in association with the CSIR for the Dept. of Environmental Affairs and Development Planning, Provincial Government of the Western Cape, 2005.

Quinton Lawson has a Bachelor of Architecture Degree (Natal) and has more than 15 years' experience in visual assessments, specializing in 3D modelling and visual simulations. He has previously lectured on visual simulation techniques in the Master of Landscape Architecture Programme at UCT.

The authors have been involved in visual assessments for a wide range of residential, industrial and renewable energy projects. They prepared the 'Landscape/Visual Assessment' chapter in the report for the *National Wind and Solar PV Strategic Environmental Assessment (SEA)*, as well as the *National Electricity Grid Infrastructure SEA* in association with the CSIR, for the Department of Environmental Affairs in 2014-2015.

Appendix B: Specialist Statement of Independence

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Scoping and Environmental Impact Assessment Processes for the Proposed Development of 12 Solar Photovoltaic (PV) Facilities and associated infrastructure (i.e. Kudu Solar Facility 1 - 12), near De Aar, Northern Cape

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

Details of Specialist, Declaration and Undertaking Under Oath

Page 1 of 3

1. SPECIALIST INFORMATION

Specialist Company Name:	BOLA			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	Level 5	Percentage Procurement recognition	
Specialist name:	Bernard Oberholzer			
Specialist Qualifications:	B.Arch, MLA			
Professional affiliation/registration:	SACLAP			
Physical address:	16 Caledon Street			
Postal address:	PO Box 471, Stanford			
Postal code:	7210	Cell:		
Telephone:	083 513 5696	Fax:		
E-mail:	bernard.bola@gmail.com			

2. DECLARATION BY THE SPECIALIST

I, B. Oberholzer, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

BO

Signature of the Specialist

BOLA

Name of Company:

20 May 2023

Date

Details of Specialist, Declaration and Undertaking Under Oath

Page 2 of 3

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, B. Oberholzer, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

BJO

Signature of the Specialist

BOLA

Name of Company

20 May 2023

Date

Karin Sfreddo

Signature of the Commissioner of Oaths

20 May 2023

Date

COMMISSIONER OF OATHS
KARIN T. SFREDDO
9/1/8/2 PRETORIA (A...)
805 STANZA BOPAPE STR. ARCA...

Details of Specialist, Declaration and Undertaking Under Oath

Page 3 of 3

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Scoping and Environmental Impact Assessment Processes for the Proposed Development of 12 Solar Photovoltaic (PV) Facilities and associated infrastructure (i.e. Kudu Solar Facility 1 - 12), near De Aar, Northern Cape

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	qarc			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100%
Specialist name:	Quinton Lawson			
Specialist Qualifications:	BArch (Natal)			
Professional affiliation/ registration:	SACAP 3686			
Scientific Organisation Registration / Member Number	-			
Status of Registration / Membership	Current			
Physical address:	8 Blackwood Drive, Hout Bay, Cape Town			
Postal address:	As above			
Postal code:	7806	Cell:	083 309 3338	
Telephone:	021 790 5119	Fax:	-	
E-mail:	quinton@openmail.co.za			

2. DECLARATION BY THE SPECIALIST

I, **Quinton Lawson**, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

qarc

Name of Company:

28 / 11 / 2022

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Quinton Lawson**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

qarc

Name of Company

28 / 11 / 2022

Date

Signature of the Commissioner of Oaths

HOUTBAAI 7872
Post Office
28 NOV 2022
POSTAL

28 / 11 / 2022

Date

I certify that the DEPONENT has acknowledged that he / she knows and understands the contents of this affidavit, that he / she does not have any objection to taking the oath, and that he / she considers it to be binding on his / her conscience, and which was sworn to and signed before me and that the administering oath complied with regulations contained in Government Gazette No. R 1258 of 21 July 1972, as amended.

SIGNATURE
Commissioner of Oaths
Designation: BRANCH MANAGER ex officio Republic of South Africa
Date: 28/11/2022
Place:
Business Address: SARS HOUTBAY.

Details of Specialist, Declaration and Undertaking Under Oath

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Appendix C: Site Sensitivity Verification

Part A of the Assessment Protocols published in Government Notice (GN) 320 on 20 March 2020 (i.e. Site sensitivity verification requirements where a specialist assessment is required but no specific assessment protocol has been prescribed) is applicable where the Department of Forestry, Fisheries and the Environment (DFFE) Screening Tool has the relevant themes to verify. This is applicable to the Visual Impact Assessment, as the Landscape Theme relevant to Solar PV developments is relevant.

Prior to commencing with the specialist assessment in accordance with Appendix 6 of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014, a site sensitivity verification was undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the DFFE National Web-Based Environmental Screening Tool (Screening Tool).

The details of the site sensitivity verification are noted below:

Date of Site Visit	15 and 16 March 2022
Specialist Name	Bernard Oberholzer and Quinton Lawson
Professional Registration Number	South African Council for the Landscape Architectural Profession (SACLAP) 87018 South African Council for the Architectural Profession (SACAP) 3686
Specialist Affiliation / Company	BOLA and QARC

The site sensitivity verification was undertaken using the following means:

(a) desk top analysis, using 1:50 000 topographic series maps and Google Earth satellite imagery;
(b) preliminary on-site inspection; and
(c) various databases, including the South African Protected Areas Database (SAPAD).

A screening report was compiled using the DFFE Screening Tool. The Report includes a 'Map of Relative Landscape (Solar) Theme Sensitivity', based on mapping prepared for the Phase 1 Wind and Solar SEA by the CSIR for DFFE in 2015 (DEA, 2015).

The current visual sensitivity mapping included in this Visual Impact Assessment is in greater detail (at the site scale) for the proposed solar photovoltaic (PV) study area, taking into account detailed viewshed mapping and local site conditions.

Outcome of the site sensitivity verification:

(a) The DFFE screening tool findings for the Landscape Theme (Figure 1 below) was refined, based on more detailed project-scale mapping of landscape features.

(b) Evidence is provided by means of detailed feature mapping and the application of visual sensitivity buffers as contained in the Visual Impact Assessment Report. (Figure 2 below).

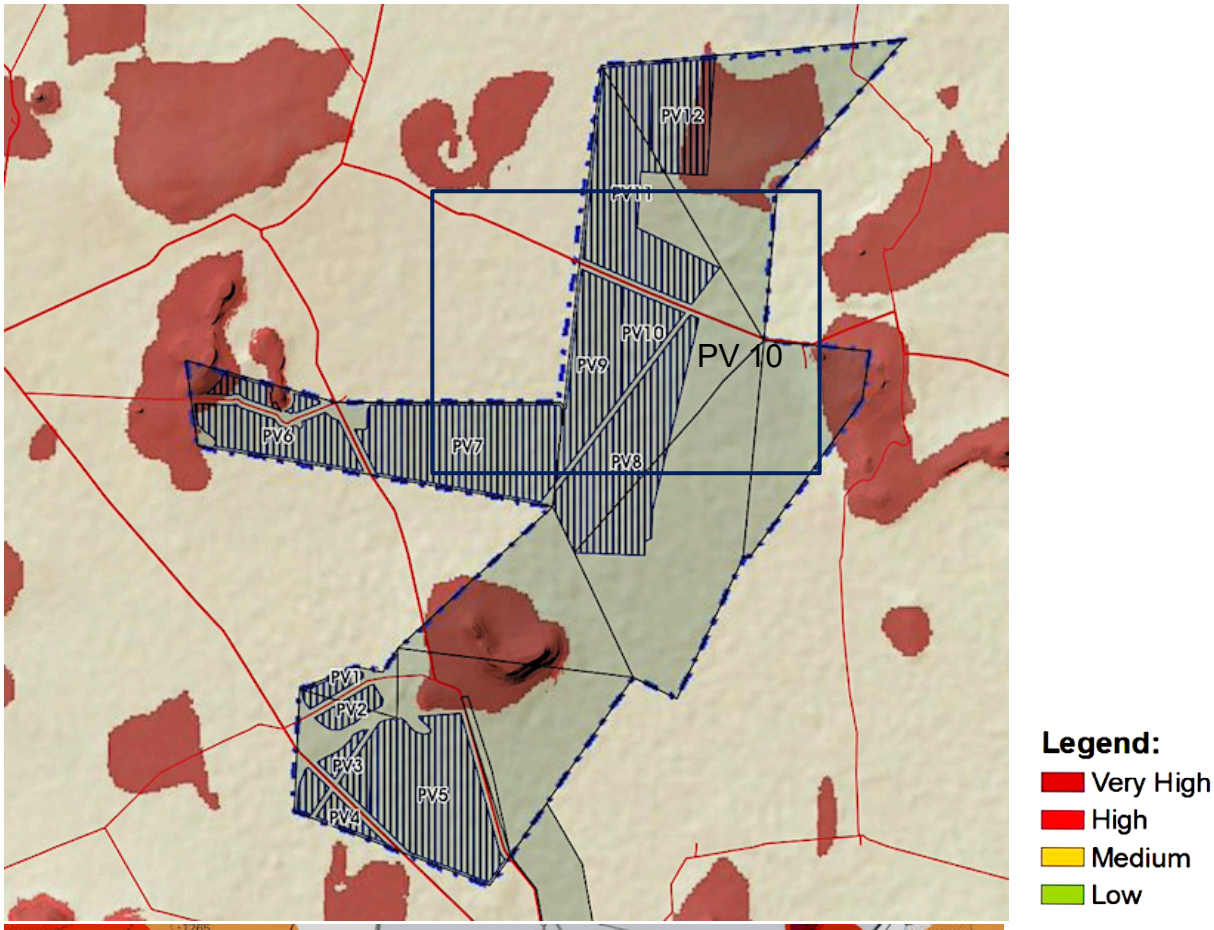


Figure 1

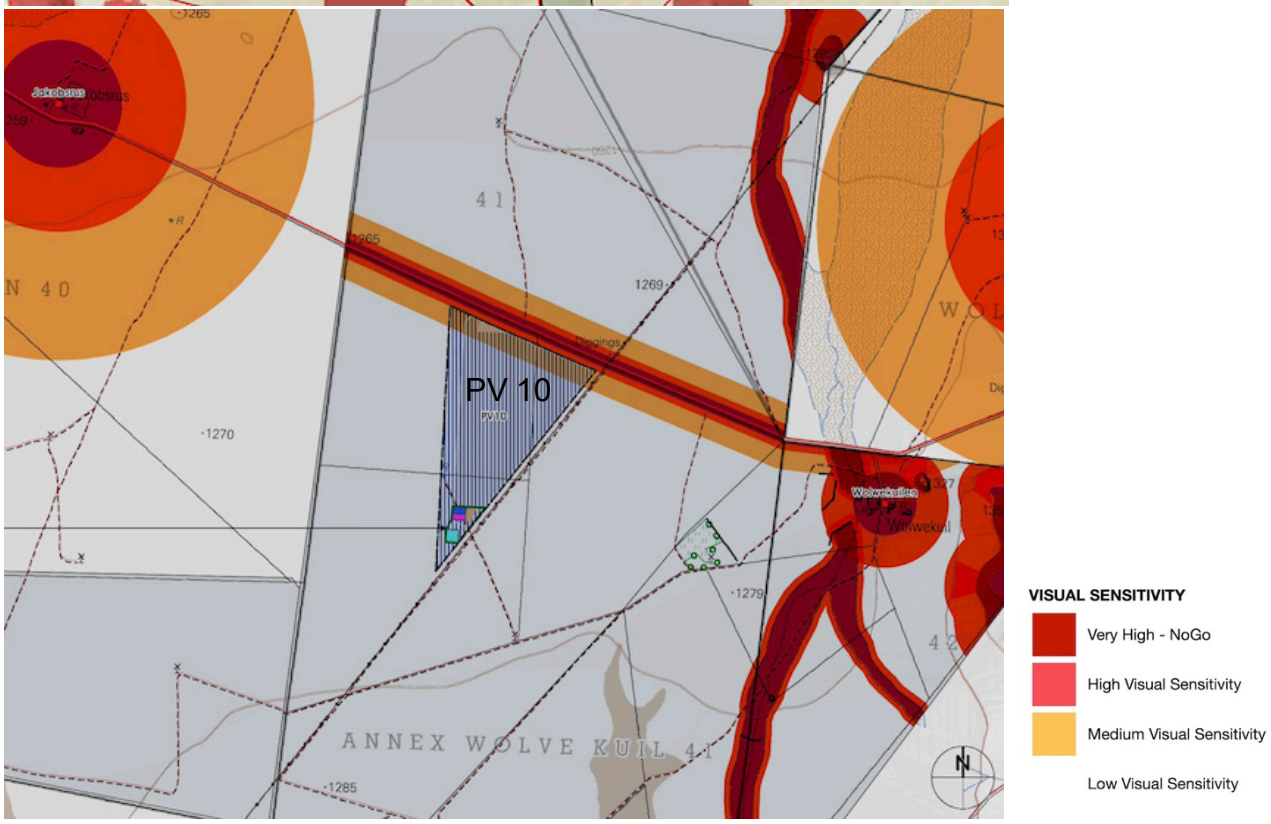


Figure 2

Appendix D: Impact Assessment Methodology

The impact assessment includes:

- *the nature, status, significance and consequences of the impact and risk;*
- *the extent and duration of the impact and risk;*
- *the probability of the impact and risk occurring;*
- *the degree to which impacts and risks can be mitigated;*
- *the degree to which the impacts and risks can be reversed; and*
- *the degree to which the impacts and risks can cause loss of irreplaceable resources.*

Terminology used in impact assessment can overlap. To avoid ambiguity, please note the following clarifications (that are based on NEMA and the EIA Regulations):

- *The term environment is understood to have a broad interpretation that includes both the natural (biophysical) environment and the socio-economic environment. The term socio-ecological system is also used to describe the natural and socio-economic environment and the interactions amongst these components.*
- *Significance = Consequence x Probability, which means that significance is equivalent to risk.*
- *The impact can have a positive or negative status. The significance of a negative impact may be called a risk, and the significance of a positive impact may be called an opportunity.*

The following principles are to underpin the application of this methodology:

- *Transparent and repeatable process - specialists are to describe the thresholds and limits they apply in their assessment, wherever possible.*
- *Adapt parameters to context (where justified) – the methodology proposes some thresholds (e.g. for spatial extent, in Step 3 below), however, if the nature of the impact requires a different definition of the categories of spatial extent, then this can be provided and described.*
- *Combination of a quantitative and qualitative assessment – where possible, specialists are to provide quantitative assessments (e.g. areas of habitat affected, decibels of noise, number of jobs), however, it is recognised that not all impacts can be quantified, and then qualitative assessments are to be provided.*

As per the DFFE Guideline 5: Assessment of Alternatives and Impacts, the following methodology is applied to the prediction and assessment of impacts and risks. Potential impacts and risks have been rated in terms of the direct, indirect and cumulative:

- *Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.*
- *Indirect impacts of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.*
- *Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.*

The impact assessment methodology includes the aspects described below.

- ***Step 1**: **Nature** of impact/risk - The type of effect that a proposed activity will have on the environment.*

- ***Step 2**: **Status** - Whether the impact/risk on the overall environment will be:*
  - *Positive - environment overall will benefit from the impact/risk;*
  - *Negative - environment overall will be adversely affected by the impact/risk; or*
  - *Neutral - environment overall not be affected.*

- ***Step 3**: **Qualitatively** determine the **consequence** of the impact/risk by identifying the **a) SPATIAL EXTENT; b) DURATION; c) REVERSIBILITY; AND d) IRREPLACEABILITY**.*

  - ***A) Spatial extent** – The size of the area that will be affected by the impact/risk:*
    - *Site specific;*
    - *Local (<10 km from site);*
    - *Regional (<100 km of site);*
    - *National; or*
    - *International (e.g. Greenhouse Gas emissions or migrant birds).*

  - ***B) Duration** – The timeframe during which the impact/risk will be experienced:*
    - *Very short term (instantaneous);*
    - *Short term (less than 1 year);*
    - *Medium term (1 to 10 years);*
    - *Long term (the impact will cease after the operational life of the activity (i.e. the impact or risk will occur for the project duration)); or*
    - *Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient (i.e. the impact will occur beyond the project decommissioning)).*

  - ***C) Reversibility** of the Impacts - the extent to which the impacts/risks are reversible assuming that the project has reached the end of its life cycle (decommissioning phase):*
    - *High reversibility of impacts (impact is highly reversible at end of project life i.e. this is the most favourable assessment for the environment);*
    - *Moderate reversibility of impacts;*
    - *Low reversibility of impacts; or*
    - *Impacts are non-reversible (impact is permanent, i.e. this is the least favourable assessment for the environment).*

  - ***D) Irreplaceability** of Receiving Environment/Resource Loss caused by impacts/risks – the degree to which the impact causes irreplaceable loss of resources assuming that the project has reached the end of its life cycle (decommissioning phase):*
    - *High irreplaceability of resources (project will destroy unique resources that cannot be replaced, i.e. this is the least favourable assessment for the environment);*
    - *Moderate irreplaceability of resources;*
    - *Low irreplaceability of resources; or*
    - *Resources are replaceable (the affected resource is easy to replace/rehabilitate, i.e. this is the most favourable assessment for the environment).*

*Some of the criteria are quantitative (e.g. spatial extent and duration) and some may be described in a quantitative or qualitative manner (e.g. reversibility and irreplaceability). The specialist then combines these criteria in a qualitative manner to determine the **consequence**.*

The consequence terms ranging from slight to extreme must be calibrated per Specialist Study so that there is transparency and consistency in the way a risk/impact is measured. For example, from a

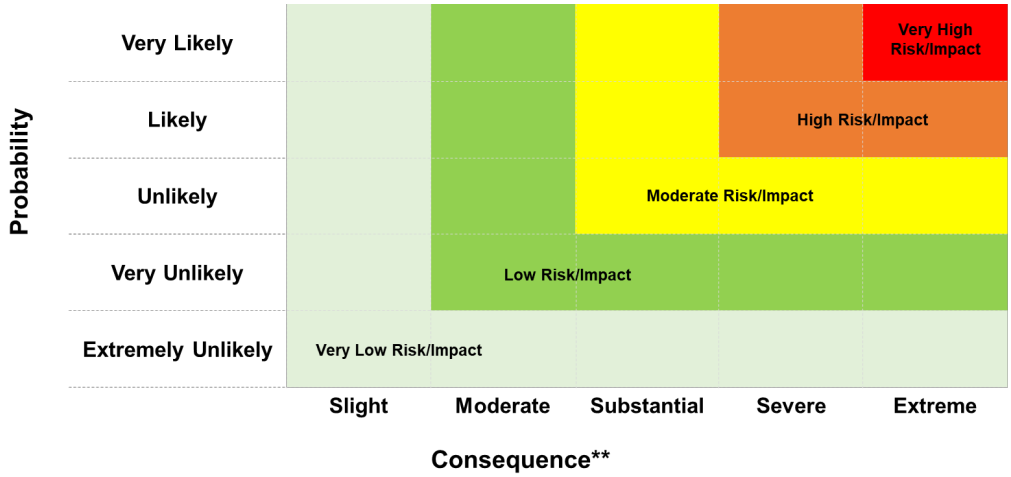
biodiversity and ecology perspective, the consequence ratings could be defined according to a reduction in population or occupied area in relation to Species of Conservation Concern (SCC) status, ranging from slight consequence for defined areas of Least Concern, to extreme consequence for defined areas that are Critically Endangered. For example, from a social perspective, a slight consequence could refer to small and manageable impacts, or impacts on small sections of the community; a moderate consequence could refer to impacts which affect the bulk of the local population negatively or may produce a net negative impact on the community; and an extreme consequence could refer to impacts which could result in social or political violence or institutional collapse.

- ***Consequence*** *– The anticipated consequence of the risk/impact is generally defined as follows:*
    - *Extreme (extreme alteration of natural or socio-economic systems, patterns or processes, i.e. where environmental or socio-economic functions and processes are altered such that they permanently cease);*
    - *Severe (severe alteration of natural or socio-economic systems, patterns or processes, i.e. where environmental or socio-economic functions and processes are altered such that they temporarily or permanently cease);*
    - *Substantial (substantial alteration of natural or socio-economic systems, patterns or processes, i.e. where environmental or socio-economic functions and processes are altered such that they temporarily or permanently cease;*
    - *Moderate (notable alteration of natural or socio-economic systems, patterns or processes, i.e. where the natural or socio-economic environment continues to function but in a modified manner; or*
    - *Slight (negligible and transient alteration of natural or socio-economic systems, patterns or processes, i.e. where natural systems/environmental or socio-economic functions, patterns, or processes are not affected in a measurable manner, or if affected, that effect is transient and the system recovers).*

- ***Step 4****: Rate the* ***probability*** *of the impact/risk using the criteria below:*

    - ***Probability*** *– The probability of the impact/risk occurring:*
        - *Extremely unlikely (little to no chance of occurring);*
        - *Very unlikely (<30% chance of occurring);*
        - *Unlikely (30-50% chance of occurring)*
        - *Likely (51 – 90% chance of occurring); or*
        - *Very Likely (>90% chance of occurring regardless of prevention measures).*

- ***Step 5****: Use both the* ***consequence*** *and* ***probability*** *to determine the* ***significance*** *of the identified impact/risk (qualitatively as shown in Figure 1). Significance definitions and rankings are provided below:*



[Qualitatively determined based on Spatial Extent, Duration, Reversibility and Irreplaceability]

Figure 1. Guide to assessing risk/impact significance as a result of consequence and probability.

- ***Significance*** *– Will the impact cause a notable alteration of the environment?*
    - *Very low (the risk/impact may result in very minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);*
    - *Low (the risk/impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);*
    - *Moderate (the risk/impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated);*
    - *High (the risk/impact will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making); and*
    - *Very high (the risk/impact will result in very major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making (i.e. the project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating)).*

With the implementation of mitigation measures, the residual impacts/risks are ranked as follows in terms of significance:

- *Very low = 5;*
- *Low = 4;*
- *Moderate = 3;*
- *High = 2; and*
- *Very high = 1.*

The specialists must provide a written supporting motivation of the assessment ratings provided.

- ***Step 6****: Determine the* ***Confidence Level*** *– The degree of confidence in predictions based on available information and specialist knowledge:*
    - *Low;*
    - *Medium; or*
    - *High.*

Appendix E: Appendix 6 of the 2014 NEMA EIA Regulations (as amended)

NEMA requirements for Specialist Reports		
	Specialist Report content as required by the NEMA 2014 EIA Regulations, as amended	**Section**
1 (1)(a)	(i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	Section 1 Appendix A
(b)	a declaration that the specialist is independent in a form as may be specified by the competent authority;	Appendix B
(c)	an indication of the scope of, and the purpose for which, the report was prepared;	Section 1
(cA)	an indication of the quality and age of the base data used for the specialist report;	Section 2
(cB)	a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 6
(d)	the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 2
(e)	a description of the methodology adopted in preparing the report or carrying out the specialised process, inclusive of equipment and modelling used;	Section 2
(f)	details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 6
(g)	an identification of any areas to be avoided, including buffers;	Section 4
(h)	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;	Map 10
(i)	a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2
(j)	a description of the findings and potential implications of such findings on the impact of the proposed activity, or activities;	Section 7
(k)	any mitigation measures for inclusion in the EMPr;	Section 6 tables
(l)	any conditions for inclusion in the environmental authorisation;	Section 6
(m)	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 6
(n)	a reasoned opinion- (i) whether the proposed activity or portions thereof should be authorised; and (iA) regarding the acceptability of the proposed activity or activities; and (ii) 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 10
(o)	a description of any consultation process that was undertaken during the course of preparing the specialist report;	n/a
(p)	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	n/a
(q)	any other information requested by the competent authority.	
2	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	Appendix C