VISUAL IMPACT ASSESSMENT

1.6 GW Photovoltaic (PV) Energy Facility at Hopefield, Western Cape: Portugeese Fontyn RE/167 & 2/167, Theewatervlei 315

PRODUCED FOR:

SolarCapital
RENEWABLE ENERGY

ON BEHALF OF:

eco·compliance
ENVIRONMENTAL COMPLIANCE MANAGERS

COMPILED BY:

ILUNGELO LAMI
CONSULTING PROFESSIONALS

NOVEMBER 2023

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INDEPENDENT VIA SPECIALIST

Ilungelo Lami is a multi-disciplinary consulting company, specializing in consulting services to governmental as well as the private sector. The company is situated in Durban, KwaZulu Natal. Ilungelo Lami was tasked by Eco-Compliance to undertake a Visual Impact Assessment (VIA) for a Photovoltaic (PV) Solar Facility Project situated next to the town of Hopefield. The project site is located as follows:

- **Province:** Western Cape
- **District Municipality:** West Coast
- **Local Municipality:** Saldanha Bay
- **Farm Portions:** Remainder of the Farm Portugeese Fontyn 167
Portion 2 of the Farm Portugeese Fontyn 167
The farm Theewatervlei 315

The site location is approximately 3km outside the town of Hopefield, and 115km north of Cape town.

Willem Richter, who is leading the visual assessment, is a GIS consultant registered with SAGC as a GISc Technologist (Reg nr.: G0931), and holds a MSc GISc degree in GIS. The visual assessment team is well-versed with the requirements for a visual impact assessment. The assessment follows the main guidelines as stipulated by the "Guideline for involving visual and aesthetic specialists in EIA processes" (Oberholzer, B. 2005). Guidelines from the Visual Resource Management manual, US Bureau of Land Management, as well as supplementary details from several assessments related to solar energy projects are also incorporated to provide a holistic approach and methodology for such assessments. The complete list of references can be reviewed under Section 11.

DECLARATION OF INDEPENDENCE

I, Wilhelm Richter, ID nr.: 7309015177080, representing Ilungelo Lami , hereby declares that I am an independent consultant appointed to provide specialist input for a VIA study. I confirm that I have no other interest in the project except for remuneration of the VIA study itself, and neither I nor Ilungelo Lami will benefit in any other way from the outcomes of this VIA study.

Signed: .... Date: 08 December 2023

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List of Abbreviations

DEA & DP ....Department of Environmental Affairs & Development Planning
DEM ....Digital Elevation Model
EIA ....Environmental Impact Assessment
GIS ....Geographic Information System
KOP ....Key Observation Points
NGI ....National Geo-spatial Information
VIA ....Visual Impact Assessment
VAC ....Visual Absorption Capacity
WC ....Western Cape
REDZ ....Renewable Energy Designated Zone

List of Definitions

Key issue	An issue raised during the scoping process that has not received an adequate response and which requires further investigation before it can be resolved.
Landscape integrity	The relative intactness of the existing landscape or townscape, whether natural, rural or urban, and with an absence of intrusions or discordant structures.
Receptors	Individuals, groups or communities who are subject to the visual influence of a particular project. Also referred to as viewers, or viewer group.
Sense of place	The unique quality or character of a place, whether natural, rural or urban. Relates to uniqueness, distinctiveness or strong identity. Sometimes referred to as genius loci meaning 'spirit of the place'.
Scenic corridor	A linear geographic area that contains scenic resources, usually, but not necessarily, defined by a route. See also view corridor.
Scenic route	A linear movement route, usually in the form of a scenic drive, but which could also be a railway, hiking trail, horse-riding trail or 4x4 trail.
Stakeholders	A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties.
View catchment area	A geographic area, usually defined by the topography, within which a particular project or other feature would generally be visible. Sometimes called the visual envelope.
View corridor	A linear geographic area, usually along movement routes, that is visible to users of the route.
Viewpoint	A selected point in the landscape from which views of a particular project or other feature can be obtained.
Viewshed	The outer boundary defining a view catchment area, usually along crests and ridgelines. Similar to a watershed.
View shadow	An area within the view catchment visually obscured from a particular project or feature by the topography, vegetation or buildings.
Visual absorption capacity	The ability of an area to visually absorb development as a result of screening topography, vegetation or structures in the landscape.
Visual exposure	The relative visibility of a project or feature in the landscape. See also zone of visual influence.
Zone of visual influence	An area subject to the direct visual influence of a particular project.

1 Introduction

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The assessment only assessed the anticipated visual impact of the actual solar components. The study excludes ancillary components such as borrow pits, quarries, laydown areas, and physical construction on site.

2 Project Description

The project entails the development of a renewable electricity generation facility utilising a fixed field Photovoltaic (PV) system. This system uses solar panels to convert sunlight into electricity.

The facility will have a name plate electrical generation capacity of **1.6 GW,** and will be known as the Hopefield Solar Energy Facility.

A typical solar panel farm can be seen in the image below:

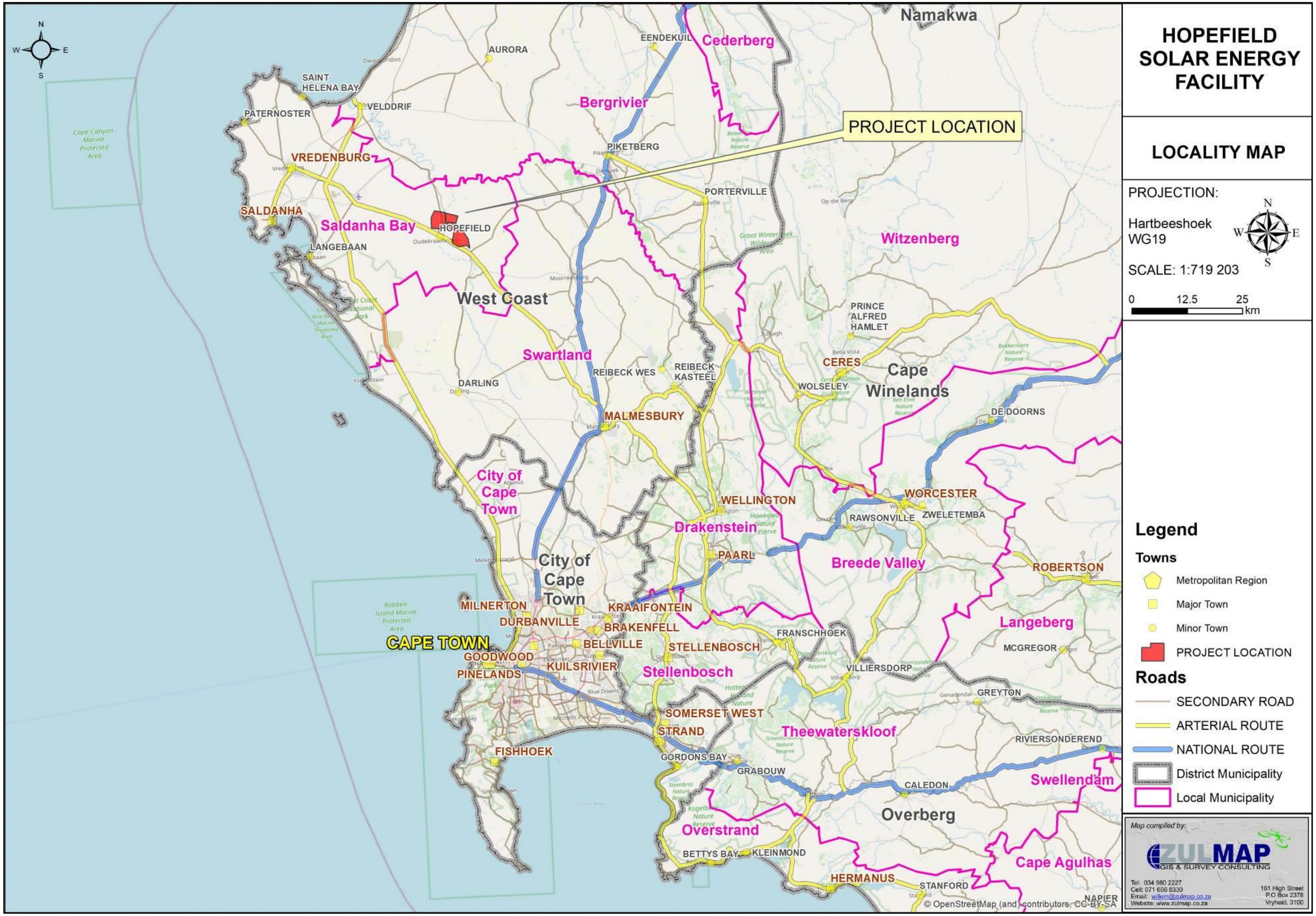
Figure 1: Typical solar panel farm

3 Project Location

The facility is to be established over an area of approximately 3 250 hectares on the following farm portions:

- Remainder of the Farm Portugeese Fontyn 167
- Portion 2 of the Farm Portugeese Fontyn 167
- The farm Theewatervlei 315

The closest town is Hopefield approximately 3km south of the proposed site, and 115km north of Cape Town.


HOPEFIELD SOLAR ENERGY FACILITY
LOCALITY MAP
PROJECTION:
Hartbeeshoek WG19
SCALE: 1:719 203
0 12.5 25 km
Legend
Towns
Metropolitan Region
Major Town
Minor Town
PROJECT LOCATION
Roads
SECONDARY ROAD
ARTERIAL ROUTE
NATIONAL ROUTE
District Municipality
Local Municipality
Map compiled by:
ZULMAP GIS & SURVEY CONSULTING
PROJECT LOCATION
Namakwa
Cederberg
Bergrivier
Witzenberg
Saldanha Bay
West Coast
Swartland
Cape Winelands
City of Cape Town
Drakenstein
Breede Valley
Langeberg
Stellenbosch
Theewaterskloof
Overstrand
Overberg
Swellendam
Cape Agulhas
CAPE TOWN
HOPEFIELD
SALDANHA
VREDENBURG
PATERNOSTER
SAINT HELENA BAY
VELDDRIF
AURORA
EENDEKUIL
PIKETBERG
PORTERVILLE
LANGEBAAN
DARLING
REIBECK WES
REIBECK KASTEEL
MALMESBURY
CERES
WOLSELEY
PRINCE ALFRED HAMLET
DE DOORNS
WELLINGTON
WORCESTER
RAWSONVILLE
ZWELETEMBA
PAARL
ROBERTSON
MILNERTON
DURBANVILLE
KRAAIFONTEIN
BRAKENFELL
BELLVILLE
STELLENBOSCH
GOODWOOD
PINELANDS
KUILSRIVIER
FRANSCHHOEK
MCGREGOR
VILLIERSDORP
GREYTON
SOMERSET WEST
STRAND
GORDONS BAY
GRABOUW
RIVIERSONDEREND
FISHHOEK
CALEDON
BETTYS BAY
KLEINMOND
HERMANUS
STANFORD
NAPIER
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4 Description and Significance of Affected Environment

The Saldanha Local Municipality falls within a medium-high photovoltaic power potential area in South Africa, and is therefore suitable for solar renewable energy technologies.

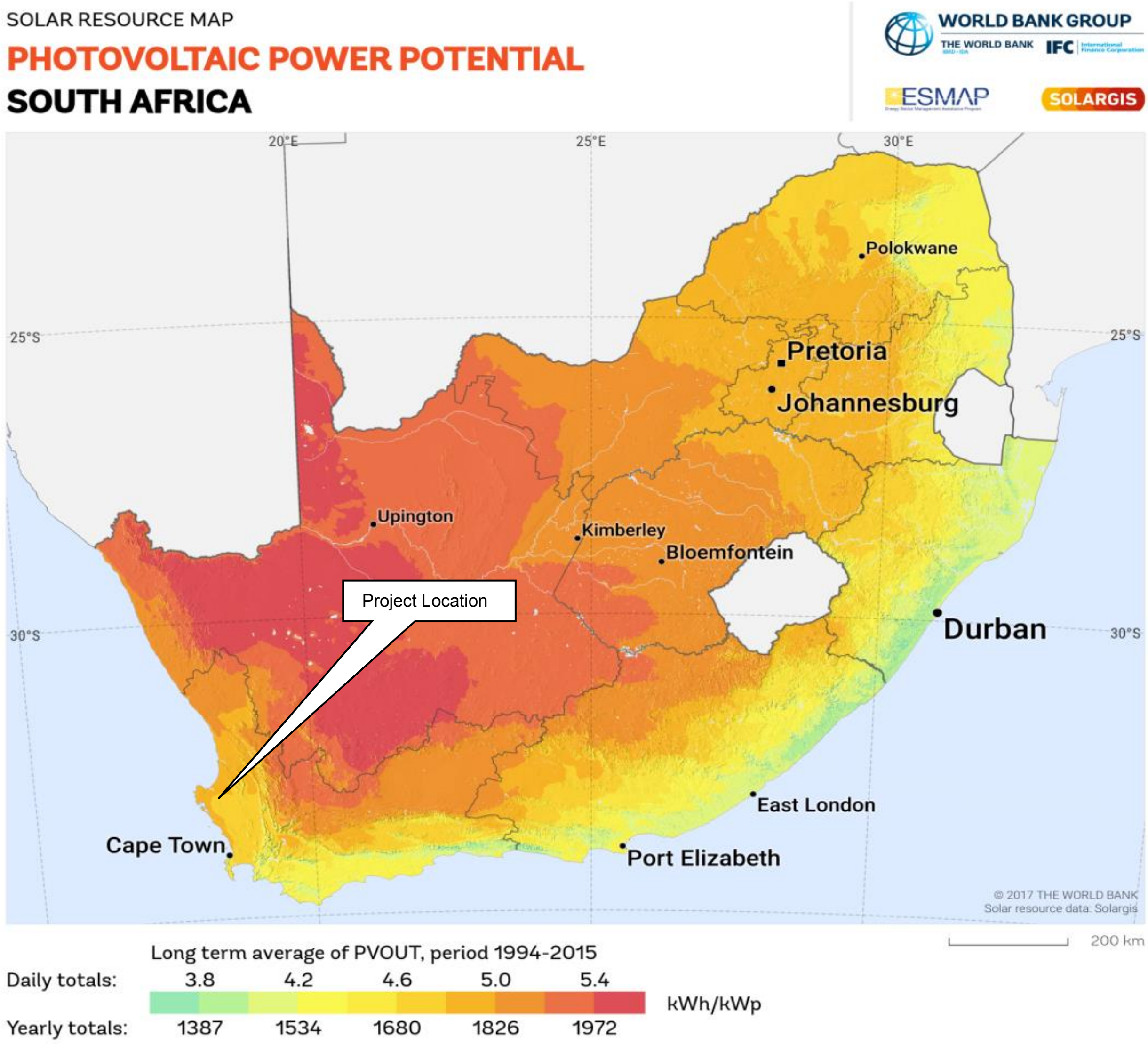

Figure 3: Long-term Photovoltaic Power Potential, RSA (The World Bank, 2019)

The project area furthermore falls across both the Western as well as Central Power Corridors in South Africa. These power corridors are favourable for development of renewable energy sources. The project location is therefore very favourable towards renewable energy supply.

Several EIA applications for renewable energy have already been done in the region, with the closest one being the Umoya Energy Wind Farm (umoyaenergy.co.za, 2023), which is adjacent to the project location and in operation.

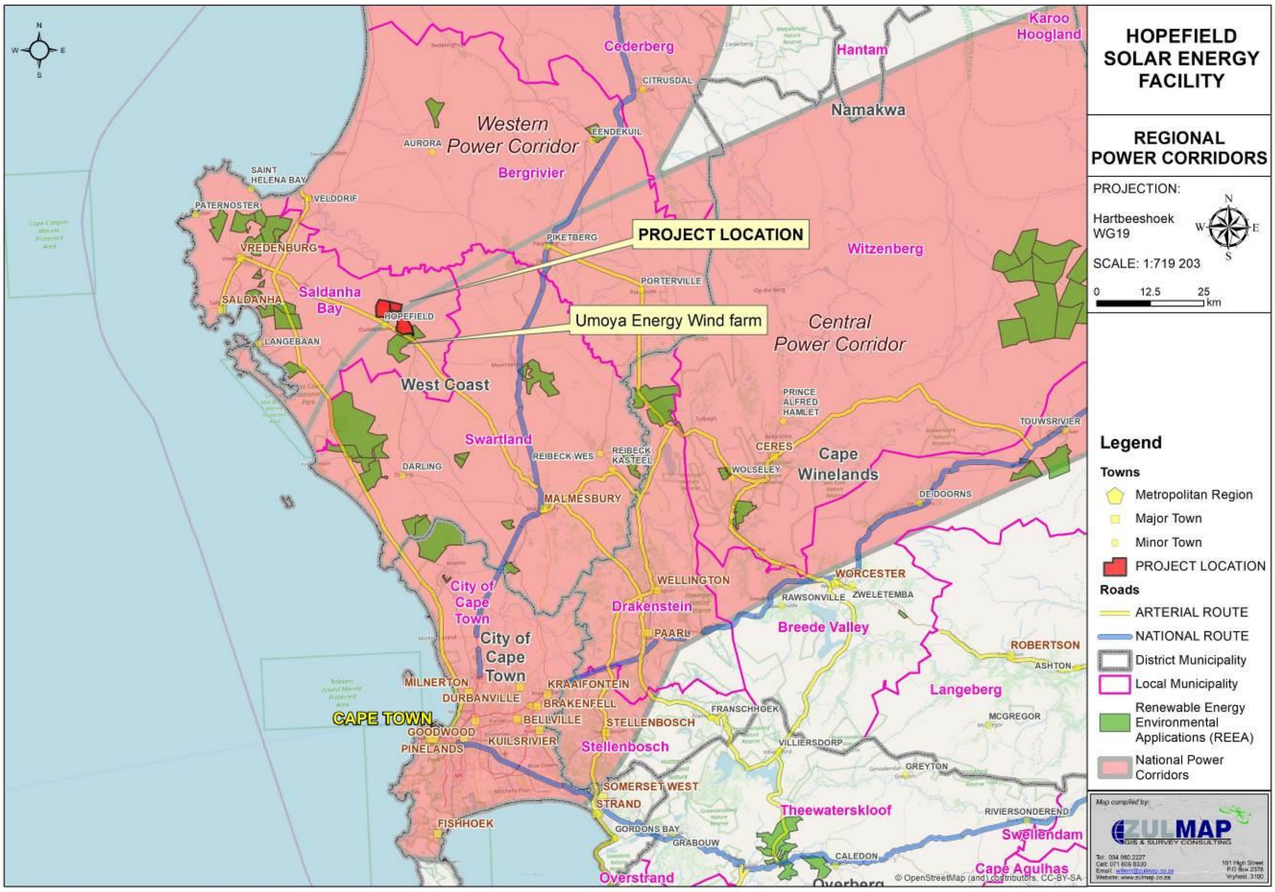

Figure 4:National Power Corridors & Renewable Energy Applications

The project area is characterised by the following:

- **Existing Landuse:** Partial Agricultural
- **Groundcover:** Predominantly shrubland
- **Cultural or historical value:** None
- **Significance of area:** Rural Karoo landscape

The project area is in proximity of the Hopefield town boundary to the northern side, and borders on the R45 provincial road to the southern side. The R27 secondary road and a railway line cross the northern part of the project area. It also shares a farm boundary with the existing Umoya Wind Farm Facility on the south-eastern side.

The project area falls within the Cape West Coast Biosphere Reserve, with the Hopefield Private Nature Reserve and portions of the West Coast National Park across the R45 to the south-western side.

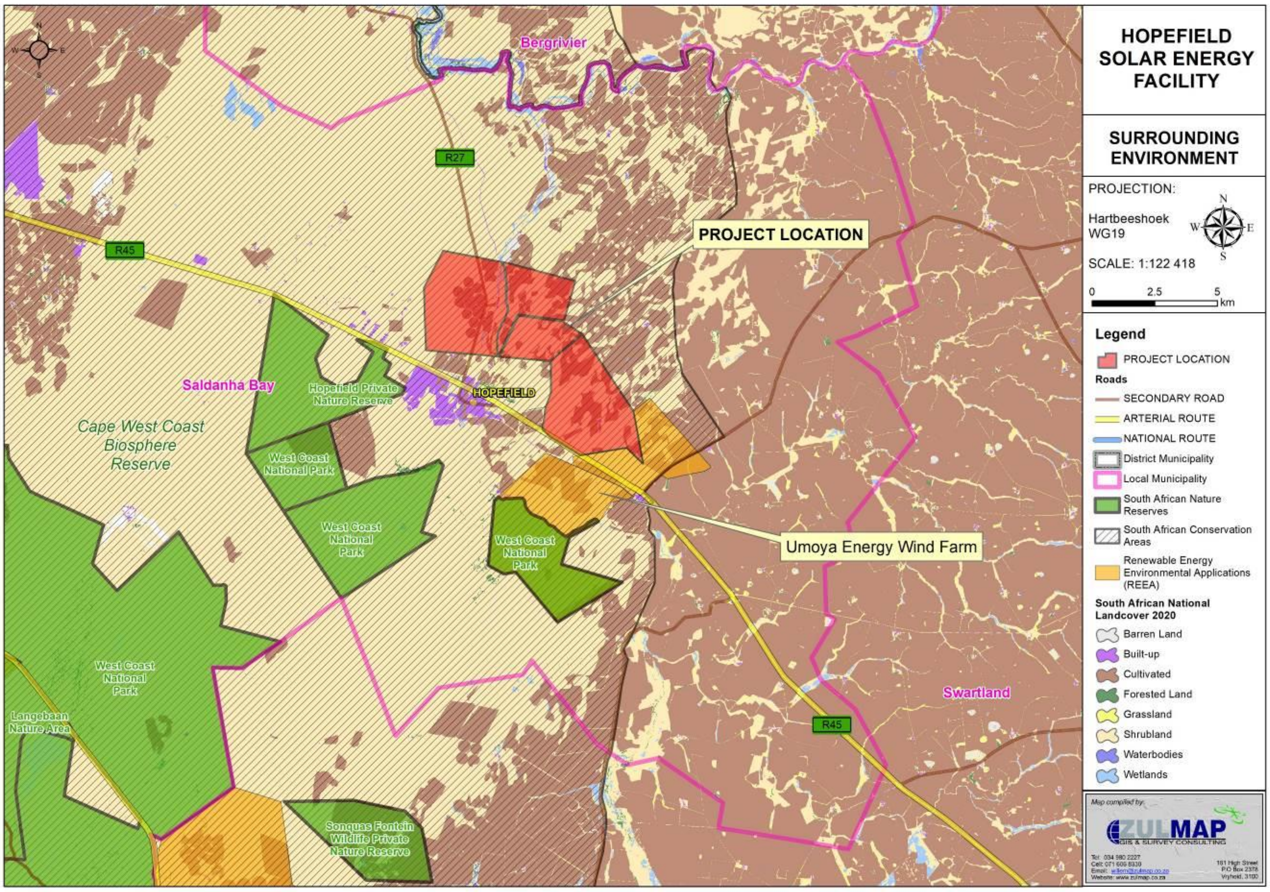

Figure 5: Surrounding Environment

There are high voltage power lines to the south of Hopefield, with two high voltage sub-stations. The Hopefield energy farm will be connected to the existing Eskom high voltage electrical grid through transmission lines erected to the most suitable sub-station.

There are numerous local farm houses surrounding the project area, as well as Hopefield town itself. Based on the topography and potential visibility of the planned infrastructure, the Phase 1 Screening Report is a desktop study to determine the anticipated visual impact that the planned infrastructure could have on the surrounding dwellings, as well as nearby roads.

The Phase 1 Screening Report furthermore determines what type of Visual Impact Assessment will be required based on the anticipated visual impact on the surrounding area.

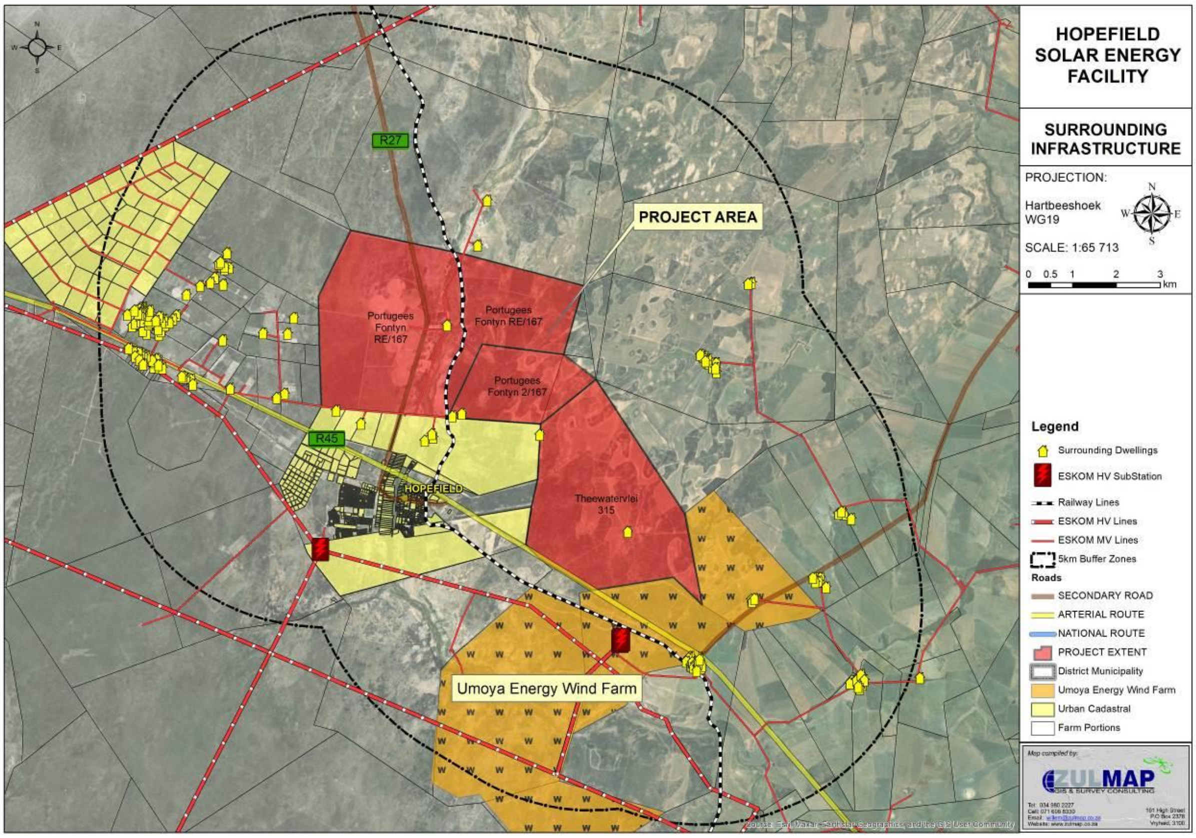

Figure 6: Surrounding Infrastructure

5 Objectives and Terms of Reference

Objective of report

The objective of this report is to perform a visual impact assessment of the project area, and provide mitigation measures or recommend alternatives if necessary to achieve the following:

- Preserve the sense of place for the project area
- Minimise the anticipated visual intrusion that the project will have on the surrounding area

Terms of Reference

The terms of reference for this report is to assess the anticipated visual impacts that the proposed project will have on the surrounding area, local residents as well as from roads in the surrounding area. Key issues to be addressed are listed below:

- Determine type and level of VIA required
- Baseline survey of visual / scenic resources
- Mapping of landscape with viewshed analysis
- Digital terrain modeling and visual simulations
- Assessments of visual impacts and their relative significance, including recommended mitigation and management measurements.
- Conclusion and recommendations.

6 Assumptions and Limitations

All required spatial data sets required for the purpose of this report could be sourced.

3D models of the solar farm and surrounding fencing are not available for this VIA report and is beyond the scope of the final VIA. Photos from similar completed solar farms were however used in the final photomontages to create a visual perspective of what the anticipated infrastructure should look like when completed.

The type of lighting to be used for security purposes at night have not been finalised at the time of the final VIA report. Assumptions and recommendations will therefore be provided on the lighting aspect, such as avoidance steps and recommendations to minimise negative visual impacts to local residents and motorists.

The initial Viewshed map is computer-generated and does not take into account local and visual interruptions such as trees, buildings, landforms etc., as well as flat topography where visibility is usually much lower. The visibility of these maps may be overstated as a result of this. The on-site assessment to determine Key Observation Points however deals with this further on in the report.

The assessment only assessed the anticipated visual impact of the actual solar components. The study excludes ancillary components such as borrow pits, quarries, laydown areas, and physical construction on site.

7 Approach & Methodology

7.1 Approach

The main approach for the final VIA report follows the guidelines as stipulated by the "Guideline for involving visual and aesthetic specialists in EIA processes" (Oberholzer, B. 2005). Guidelines from the Visual Resource Management manual, US Bureau of Land Management, as well as supplementary details from several assessments related to solar energy projects will also be incorporated to provide a holistic approach for the final assessment.

7.2 Methodology

The methodology for this assessment is based both on qualitative as well as quantitative measurements and aspects of the project characteristics. The following procedures and steps will be followed to obtain relevant details needed for the final visual assessment:

a) **Phase 1: Screening**

Determine the anticipated type of visual impact based on:

I. The characteristics of the environment, as well as the scale and type of proposed development.
II. Derive the type of approach and level of assessment required from the above outcome.

b) **Phase 2: Scoping**

I. Review public comments / concerns.
II. Site visit.
III. Post site visit analysis: viewshed analysis, view corridors, KOP's and receptors and photomontages. 3D modeling with and without mitigation is provided where needed.

IV. Potential lighting impact at night.
V. Interpreting assessment criteria, including mitigation measures.

c) **Phase 3: Visual Assessment Ratings**

I. Visual assessment results and scoring

Phase 1 will be discussed in further details in the proceeding section.

8 Assessment Implementation

The following section will give an overview of the assessment implementation.

8.1 PHASE 1: SCREENING

The following section details the screening process that was followed to determine the type and level of assessment that is required based on several criteria.

8.1.1 Characteristics of surrounding environment

The Hopefield surrounding areas are earmarked by a rural landscape, consisting predominantly of flat Karoo veld with low shrubland, as well as some agricultural land.

The project area falls within the existing Cape West Biosphere Reserve, with the Soutrivier running through part of the project area.

The project area in relation to the surrounding environment can be reviewed below.

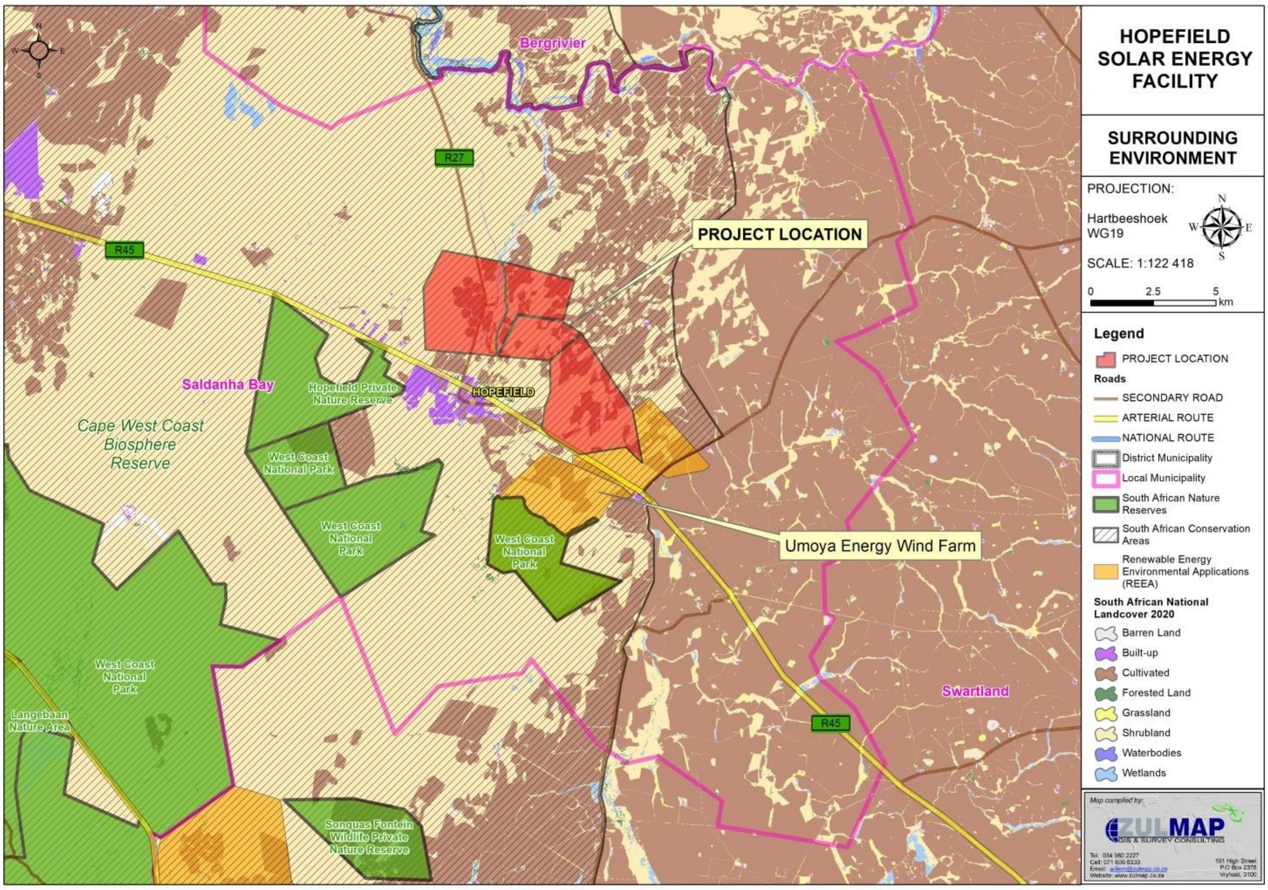

Figure 7: Surrounding Environment

Figure 8 shows a closer look at the surrounding infrastructure. The R27 public road as well as a railway line crosses the project area on the northern side, with the Theewatervlei farm portion adjacent to the R45 on the south-eastern boundary. The Theewatervlei portion is also adjacent to the existing Umoya Energy Wind Farm on the south-eastern side.

An ESKOM HV Substation is situated on the Umoya Energy Wind Farm, with a second HV substation just south of the Hopefield town. Several farm houses are located close to the project area.

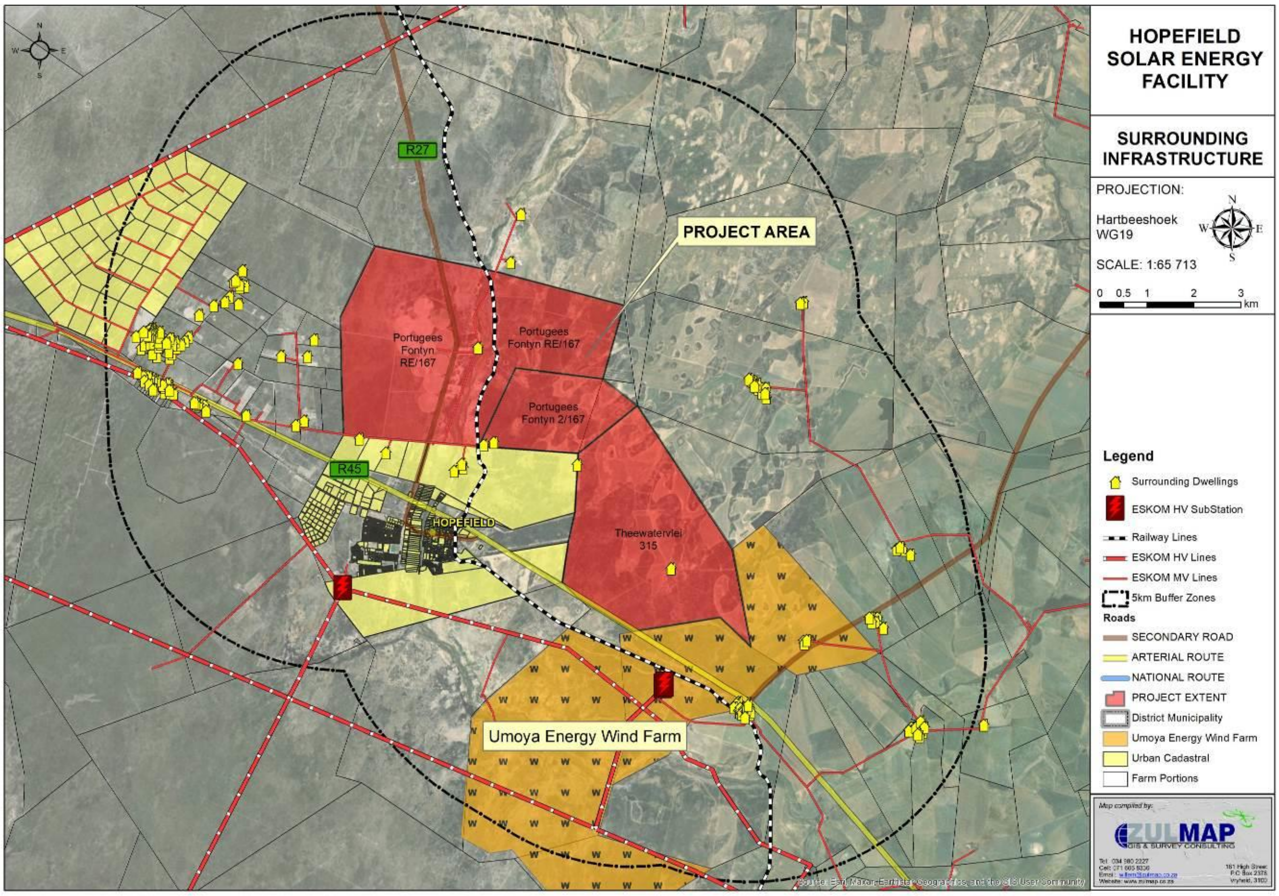

Figure 8: Surrounding Infrastructure

The project area itself as well as the surrounding area has a flat topography.

Although the project footprint covers a significant area, the visibility of the proposed solar farm was anticipated to not have a high visible impact from far distances due to the flat topography and the fact that most of the solar farm structures are quite low in height. The solar farm infrastructure could however have a high visual impact on motorists travelling on the public roads, as well as on the surrounding farm dwellings.

The topography can be reviewed in Figure 9.

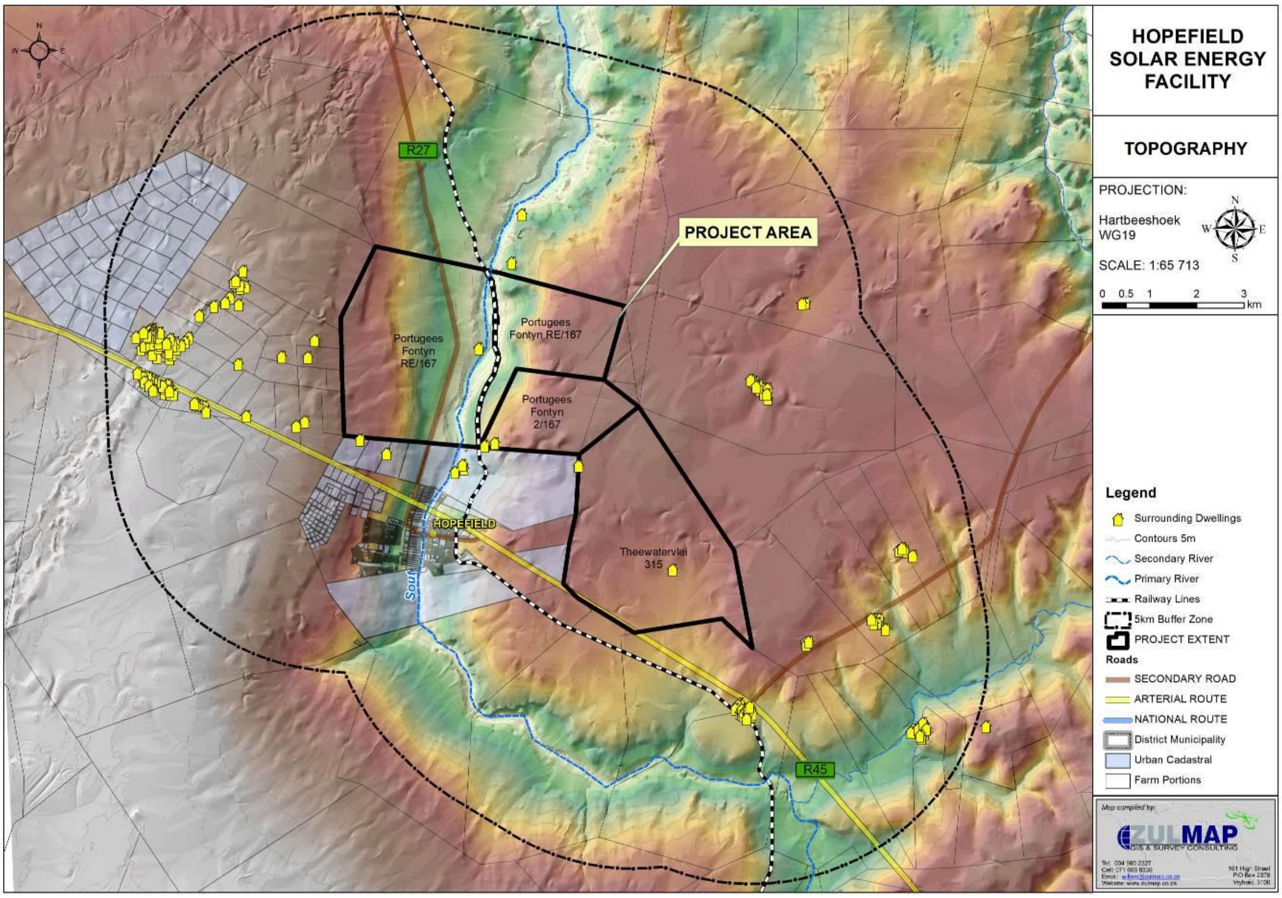

Figure 9: Topography

An initial viewshed analysis was done for Phase 1 on a distance of 5km. It was expected that the potential visual exposure of the proposed project infrastructure should not be significantly noticeable beyond a distance of 5km due to the flat topography.

Elevated views of the project area were generated in Google Earth and can be reviewed under Figure 10 and 11.

Figure 10: Elevated View 1

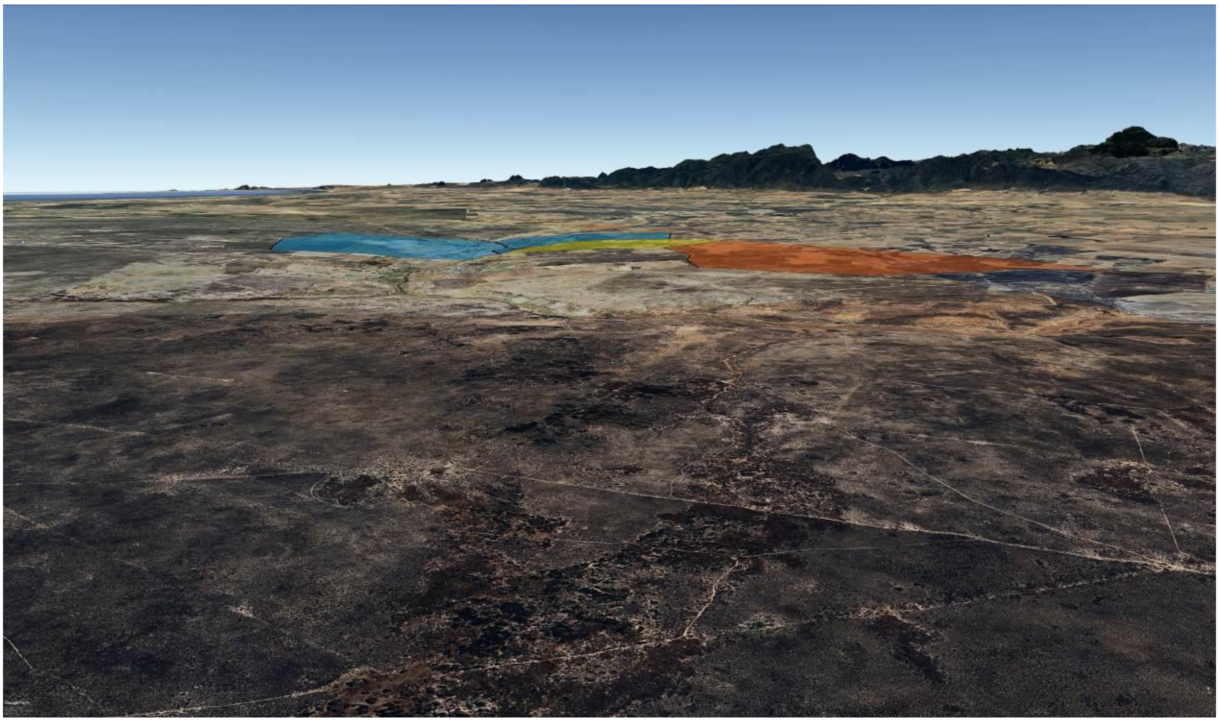

Figure 11: Elevated View 2

An initial computerized viewshed analysis was done, which indicates anticipated visibility areas from potential observation points. The viewshed analysis can be reviewed in Figure 12.

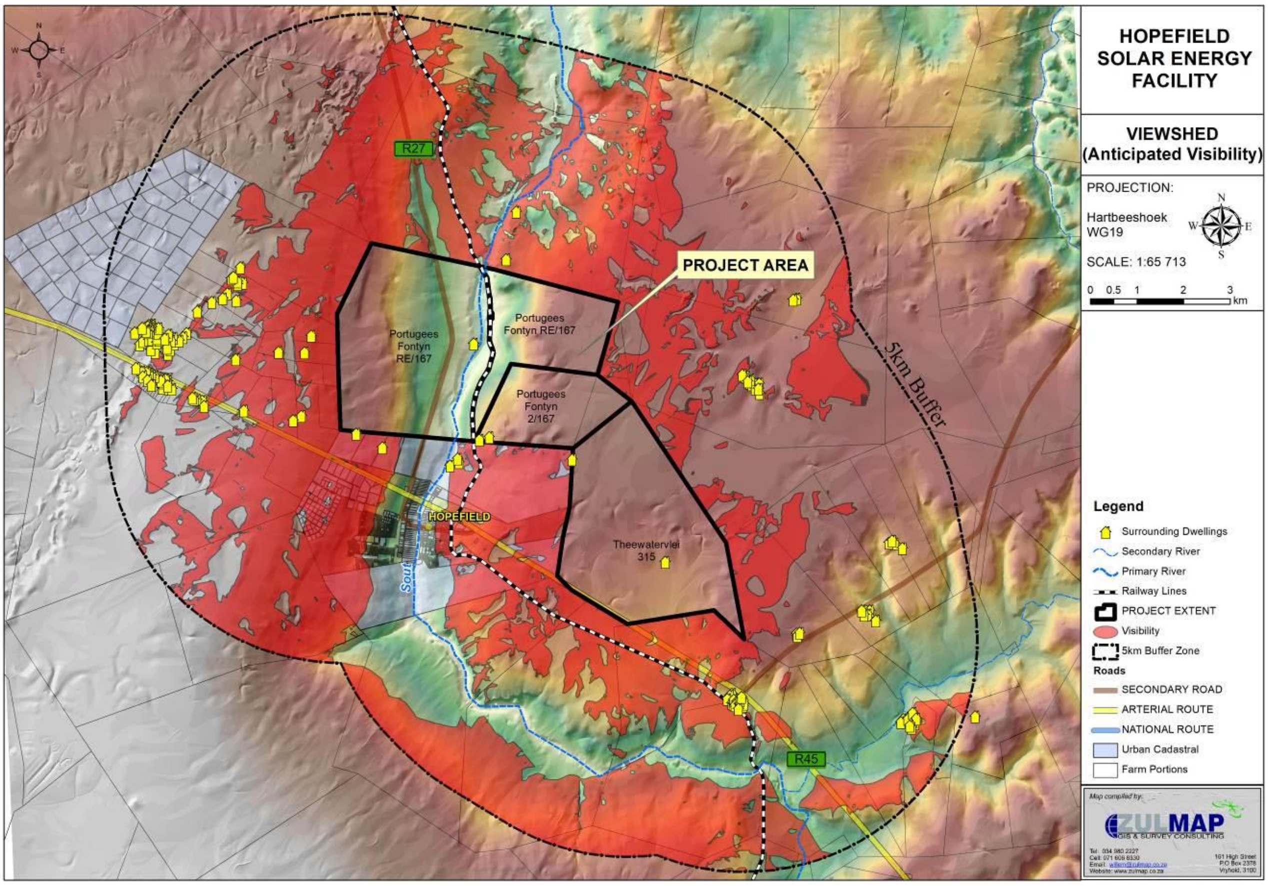

Figure 12: Viewshed Analysis

8.1.2 Anticipated Visual Impact

According to the DEA & DP Guidelines of the Western Cape (Oberholzer, B. 2005), varying levels of expected visual impact can be derived from the correlation between environmental types and development types. This ranges on a scale from no visual impact to very high expected visual impact. In Table 1 below, the correlation can be reviewed between the environmental and development types:

Table 1: Visual impact screening

Type of environment	**Type of development (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, historical significance	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected	**Very high visual impact 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

The development categories are explained below:

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.

Figure 13: Development categories

The explanations of the above terms used can be reviewed next:

- **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 development1 - 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.

The expected visual impact ratings from low to high are defined below:

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 affect 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.

Figure 14: Expected visual impact ratings

The above screening process can however not be regarded as a comprehensive list of criteria, and should therefore not replace the need for a comprehensive, systematic scoping process to identify the range of issues arising from a particular development.

The above process has therefore only been used to screen the level of anticipated visual impact on the proposed project for the Phase 1 Screening Process, and the outcome can be reviewed below:

- **Type of environment**: Areas or routes of low scenic, cultural, historical significance / disturbed
- **Type of development**: Category 5 (large-scale development, eg. energy farm)
- **Anticipated Visual Impact**: **High Visual Impact Expected**

8.1.3 Assessment level

From the above screening process outcome, the type of visual impact assessment approach was determined in Phase 1. The type of assessment levels can be reviewed below (Adapted from Oberholzer, B. 2005):

Table 2: Assessment levels

Anticipated level of visual impact	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	**Very high visual impact expected**
Level of visual input recommended	**Level 1** visual input	**Level 2** visual input	**Level 3** visual input	**Level 4** visual input	**Level 5** visual input

The associated scope of works for each of the above levels should include the following aspects (Oberholzer, B. 2005):

Level 1 input:
Identification of issues, and site visit;
Brief comment on visual influence of the project and an indication of the expected impacts / benefits.

Level 2 input:
Identification of issues raised in scoping phase, and site visit;
Description of the receiving environment and the proposed project;
Establishment of view catchment area and receptors;
Brief indication of potential visual impacts, and possible mitigation measures.

Level 3 assessment:
Identification of issues raised in scoping phase, and site visit;
Description of the receiving environment and the proposed project;
Establishment of view catchment area, view corridors, viewpoints and receptors;
Indication of potential visual impacts using established criteria;
Inclusion of potential lighting impacts at night;
Description of alternatives, mitigation measures and monitoring programmes.
Review by independent, experienced visual specialist (if required).

Level 4 assessment:
As per Level 3 assessment, plus complete 3D modeling and simulations, with and without mitigation.
Review by independent, experienced visual specialist (if required).

Figure 15: Scope of works for visual impact levels

A **LEVEL 4** assessment for Phase 2: Scoping Report was concluded based on the above scoring methodology. This required a site visit to establish the impact of the proposed development on the surrounding areas.

Where there are areas or observation points at which a high visual impact is anticipated, the scoping report also provides mitigation measures to reduce the anticipated high visual impact from those key observation points.

8.2 PHASE 2: SCOPING

The visibility or visual exposure of any development or structure is the point of departure for any visual impact analysis. If a particular project or development is not visible to an observer, no impact would occur. The following section therefore details the requirements to be addressed / observed for the visual assessment itself.

8.2.1 Public comments / concerns

The public participation consultation is still ongoing with all relevant stakeholders and interested and affected parties. While the proposed project will have far less visual intrusion compared to the Umoya Energy wind farm in the area, all comments/concerns are being attended to by the PPP team.

A normal concern for these typical types of solar panel farms has to do with the incorrect assumption that a solar farm will cause a negative influence due to glare and reflection created by the solar panels. Since the whole concept of efficient solar power is to absorb as much light as possible while reflecting as little light as possible, standard solar module produces less glare and reflectance than standard window glass. Several reports and case studies on the risk of solar panels blinding pilots at air fields have proven that solar panels do not have a significant visual impact to observers in terms of glint or glare (Pfaff, J. 2010., SunPower Co., 2009).

An example can be seen of the Touws River solar farm just south of Touws River town. Motorists travelling in a southern direction straight towards the solar farm are not affected by sunglare at all. The panels appear as a mere light grey structure.

Figure 16: Existing Touws River Solar Farm

8.2.2 Site visit

A. Locality

The proposed site location was visited on the 24th of November 2023, from 09h00 to 13H00. Figure 11 on the proceeding page shows suitable sites within the project area for erecting solar units.

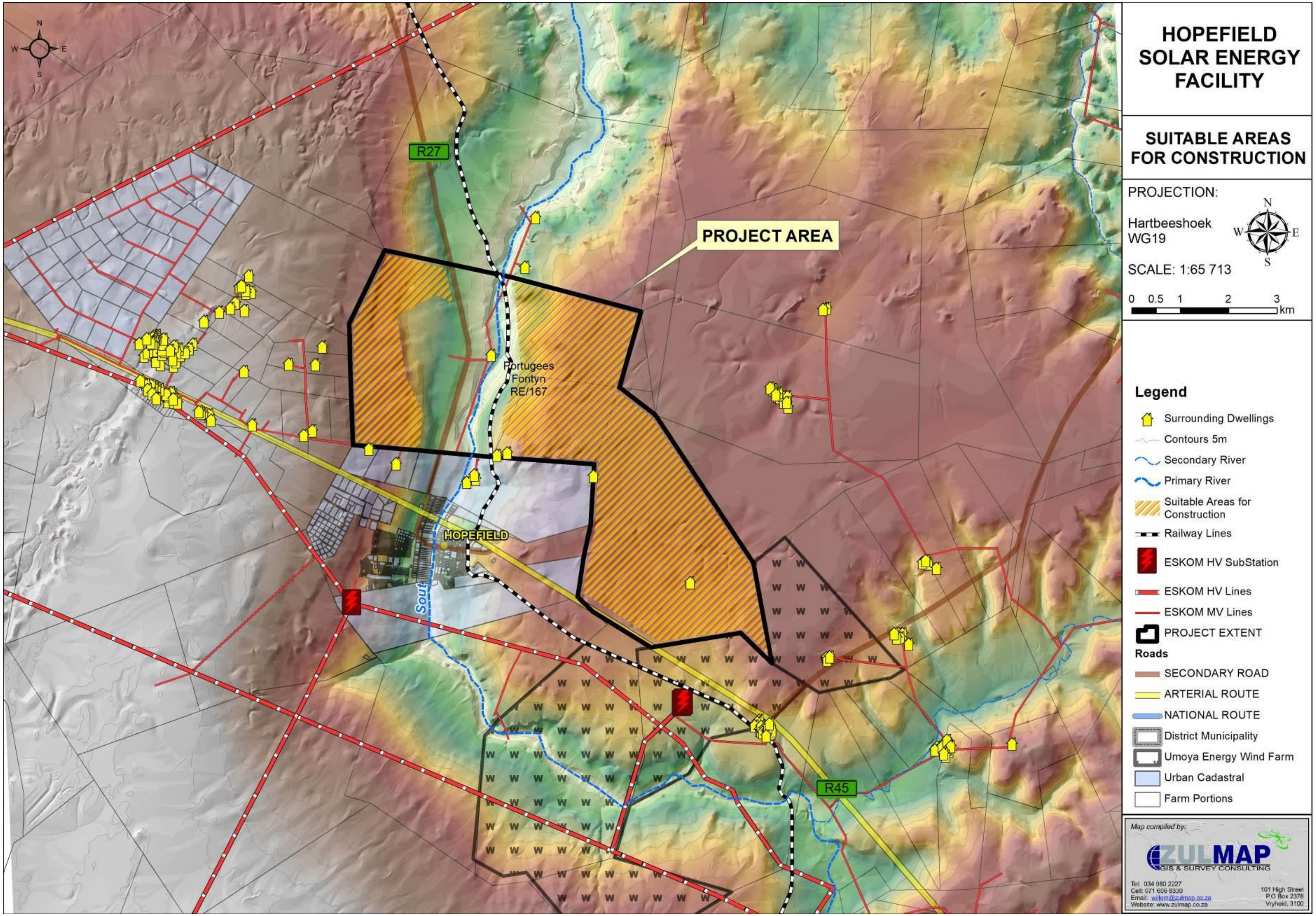

Figure 17: Suitable Areas for Erecting Solar Units

The area designated for the proposed solar farm is characterized by Karoo veld and shrubs, with smallholdings and some agricultural activities surrounding the project area.

Figure 18: Characteristics of surrounding area

The existing Umoya Energy Wind Farm and high voltage powerlines to the south and south-east of the project area already lends itself towards an evolving environment characterized by power generation.

Pictures of the Energy Wind Farm can be seen below.

Figure 19: Existing Renewable Power Infrastructure

B. Anticipated Visual Impact Locations

The maximum visible distance of the proposed infrastructure was initially estimated to be approximately 5km in the Phase 1 report due to the flat topography. A viewshed with a distance of 5km from the site location was used to determine where anticipated areas should have line of sight to the site location (The details pertaining to viewshed analysis will be described later-on). Dwellings and routes within this viewshed area were used to determine anticipated visual impact locations from where the proposed infrastructure could have a significant impact.

Figure 20 on the proceeding page indicates these locations. During the actual site visit, photographs were taken at these locations and photomontages created of the project area view. These photomontages provide a more accurate indication of the proposed site visibility.

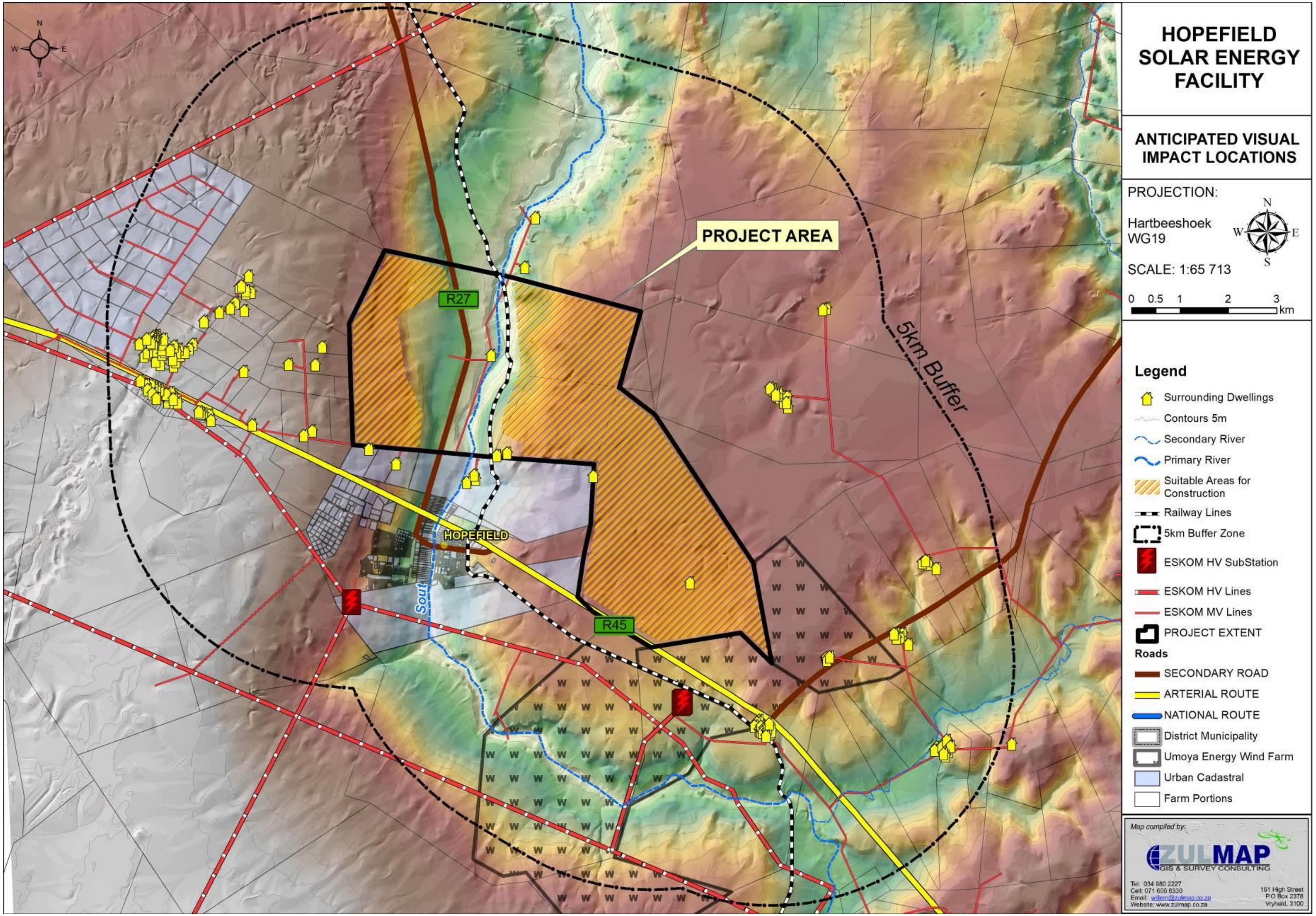

Figure 20: Anticipated Visual Impact Locations

Photos were taken from these observations points at a standing height of approximately 1.7m. Camera specifications are as follows:

- Canon 7D SLR camera with a Canon 17-85mm lens.
- Focal length was set to 75mm. This focal length provides a true representation of the scale of the site location against the surrounding area when creating photomontages (Landscape Institute, 2011)
- Aperture: F11
- ISO: 200
- White balance: "Auto"

Photomontages, sharpening, colour and exposure corrections were done with Adobe Photoshop software after completion of the site visit to produce a more accurate representation of the photographed areas. Photomontages were furthermore stretched vertically by a factor of between 40 to 70% to eliminate the "squashed" effect that is typical to photomontage compilations (SNH, 2006). This provides a more realistic representation of the scale and visibility of the real-life scenery.

The circular traffic sign in the two examples below shows the difference before and after photomontages are corrected by stretching them vertically.

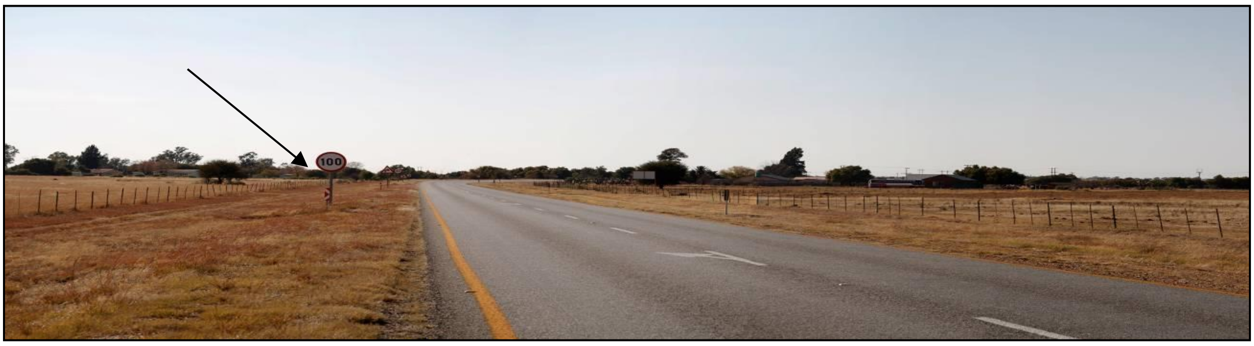

Figure 21: Photomontage before vertical stretching

Figure 22: Photomontage after vertical stretching

C. Landscape Characteristics

The landscape characteristics and visual absorption of the landscape and vegetation were recorded for post site visit analysis. Figure 23 depicts the land cover and current landuse characteristics around the project area.

The surrounding area is flat with predominantly shrub Karoo veld. Several main powerlines are located south of the project area. The existing Umoya Energy Wind Farm dominates the view from the R45 to the South-West of the project area.

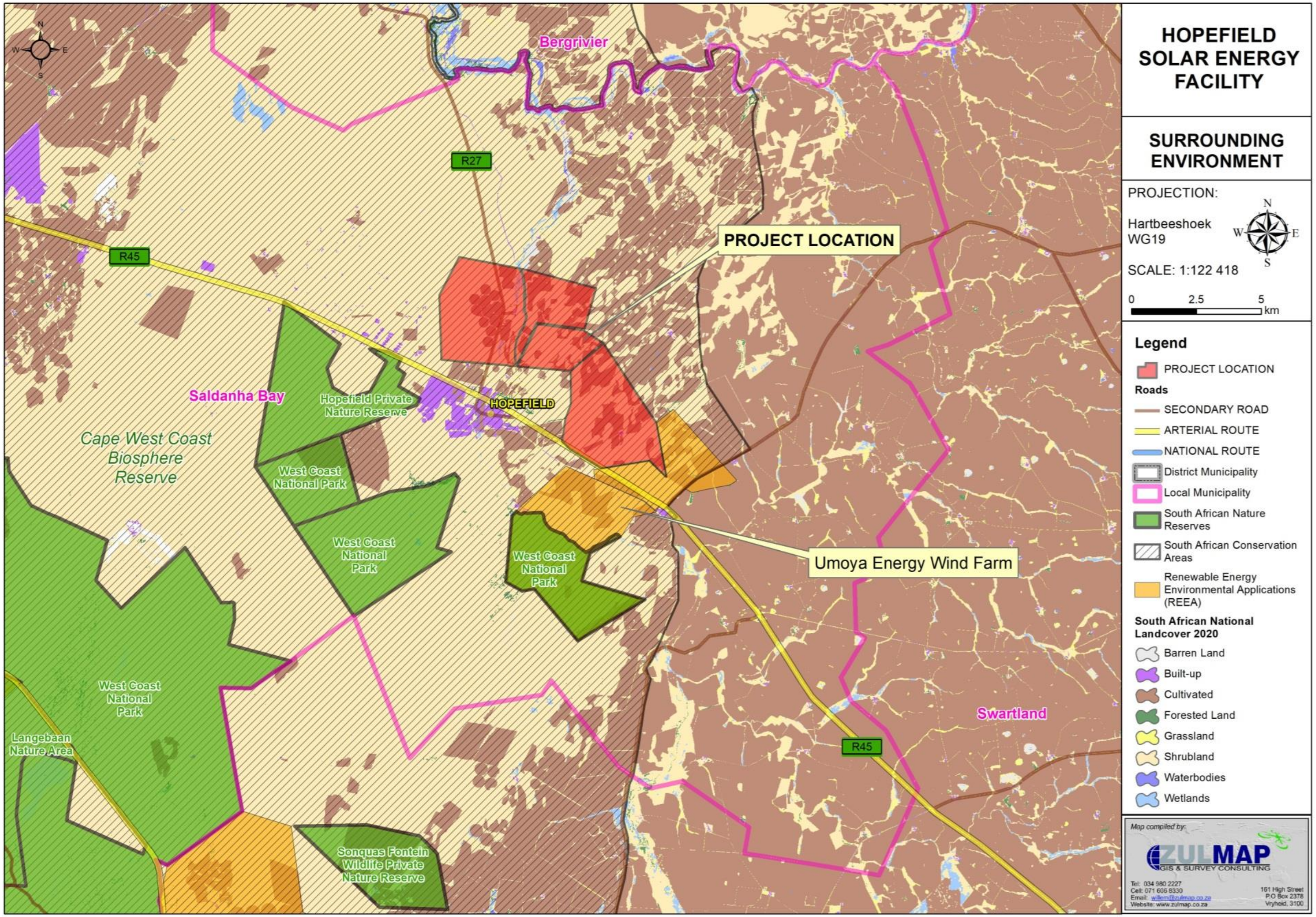

Figure 23: Landscape Characteristics

8.2.3 Visual observations / analysis

The following section details the required visual observations and analysis steps based on the details obtained from the site visit, as well as post processing of relevant information. Items include the following, and will be discussed individually:

- A. Potential visual exposure (Viewshed)
- B. Visual distance
- C. Visual Absorption Capacity (VAC)
- D. Key Observation Points (KOP'S)
- E. Viewer incidence / perception
- F. Colour, Material and View Angle
- G. Lighting

A. Potential Visual Exposure

The ESRI ArcMAP software was used for GIS analysis and mapping functionality. GIS provides powerful tools to anticipate the visibility of a particular point or area. One of these tools is the Viewshed function, which is based on line-of-sight analysis. Input data required for this analysis includes creating a Digital Elevation Model (DEM) from elevation data sets, as well as heights of the structure and the expected observer. Perimeters that were used for this report are listed below:

Table 3: Viewshed parameters

Input criteria	Details	Input value
Height of structure	Solar Units	3 meters
Average observer height	Pedestrians and motorists along public roads, as well as local residents	1.7 meters
Visual Distance	Aniticpated maximum visual distance	5km

For the purpose of this project, a DEM was created from a contour data set with 5 meter intervals obtained from National Geo-spatial Information in Cape Town (NGI, 2018). The ground resolution for the DEM is 10 meters, which provided a high resolution raster image for the viewshed analysis. The viewshed was overlaid on the latest aerial imagery obtained from Google Earth Pro baselayers in ArcMap. Finally a hillshade data set was derived from the DEM for better visual perception of elevations. The final outcome can be reviewed under Figure 24.

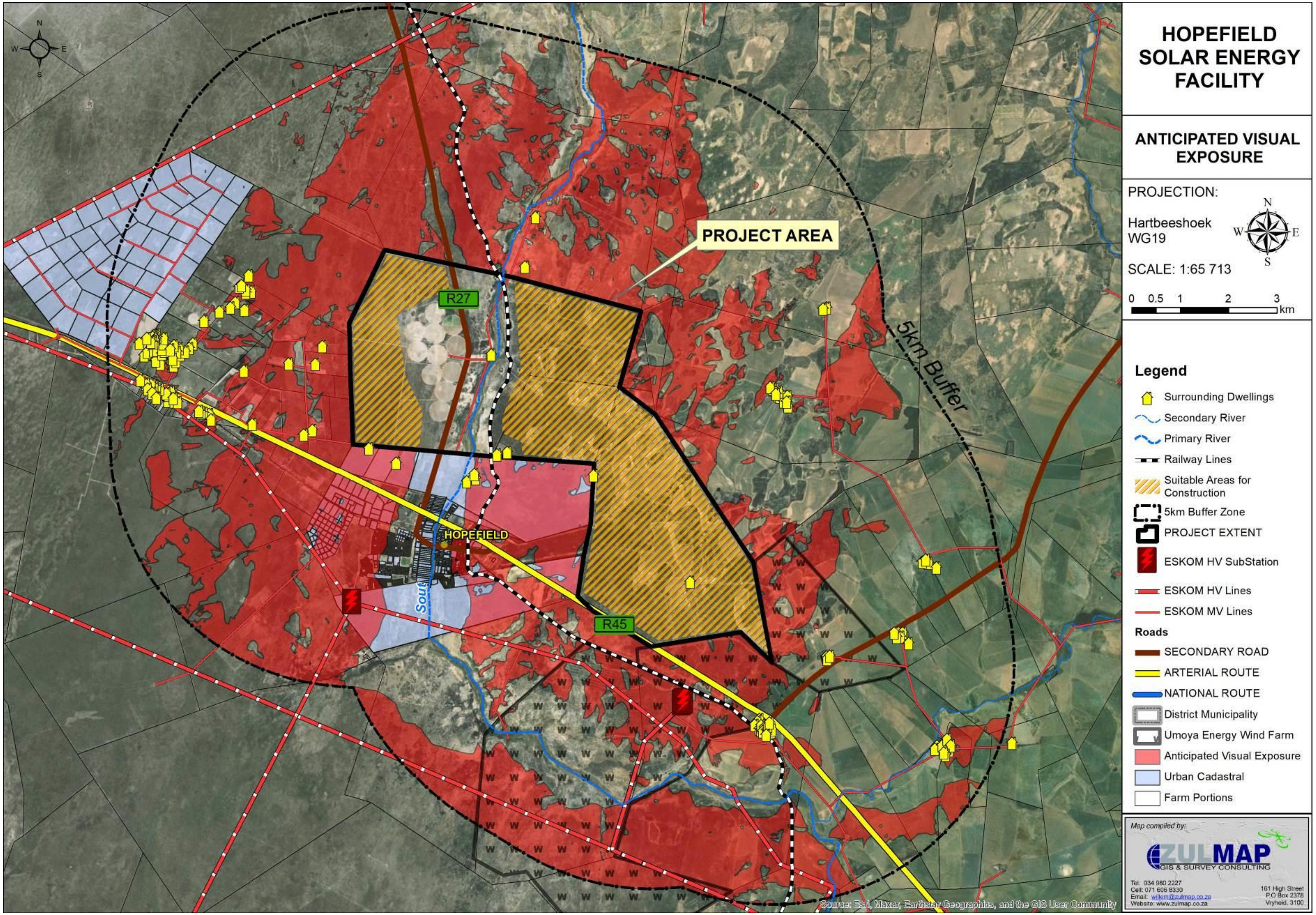

Figure 24: Anticipated Visual Exposure

The Viewshed analysis is not an absolute indicator of visibility of a particular structure, but an indication of potential visibility based purely on a line-of-sight method. The viewshed does however provide a basis for other aspects and contributing factors to be taken into consideration for final analysis on the anticipated visibility of the proposed structure or development.

B. Visual Distance

Exposure, or visual distance, pays a significant role in visibility of objects, and will diminish exponentially with distance (Oberholzer, B. 2005). This tendency is well documented in visual analysis literature (Hull, R.B, Bishop, I.E, 1988). Atmospheric conditions cause the air to appear greyer, diminishing details, and therefore reducing the visibility of a development or structure.

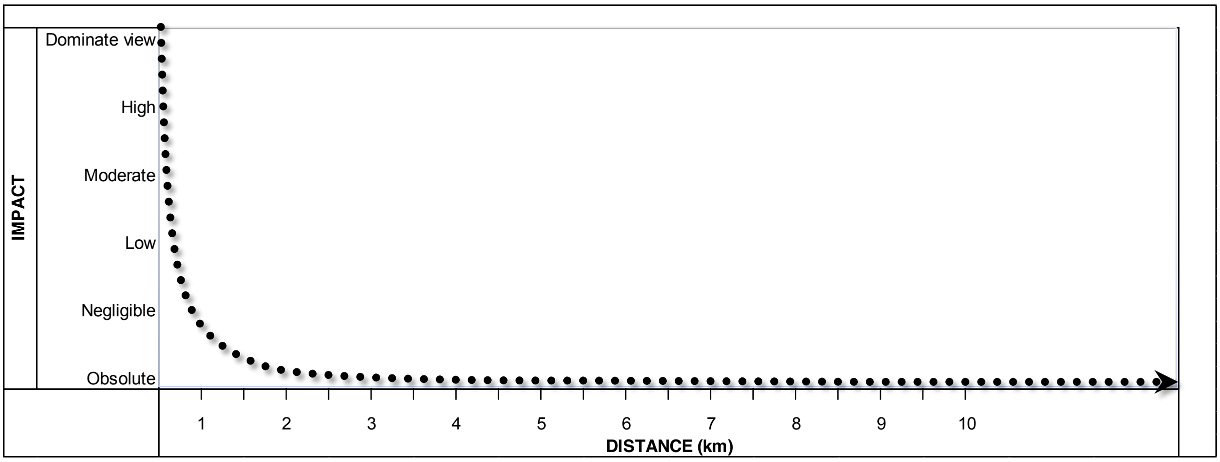

Figure 25: Visual impact versus distance

The Western Cape DEA & DP Visual and Aesthetic Guidelines provide the following classification for visual distance purposes (Oberholzer, b., 2005):

- High: Dominant or clearly noticeable
- Moderate: Recognisable to the viewer
- Low: Minimally visible areas in the landscape

Areas falling outside the above classification are seen as obsolete with no expected visual impact.

The anticipated observation points were used during the site visit to determine the visibility of the proposed project from various distances. Observations were done during daytime from 09H00 to 13H00. Weather conditions were sunny and visibility was very good. Based on the visual distances and visibility of the site location, the following classifications were made:

- Dominate view: 0 – 250m
- High: 250m – 500m
- Moderate: 500m - 1km
- Low: 1km – 1.5km
- Obsolete: >1.5km

In the next figure these distances were created on the GIS as buffer zones, indicating where various levels of visual impact based on distance were anticipated.

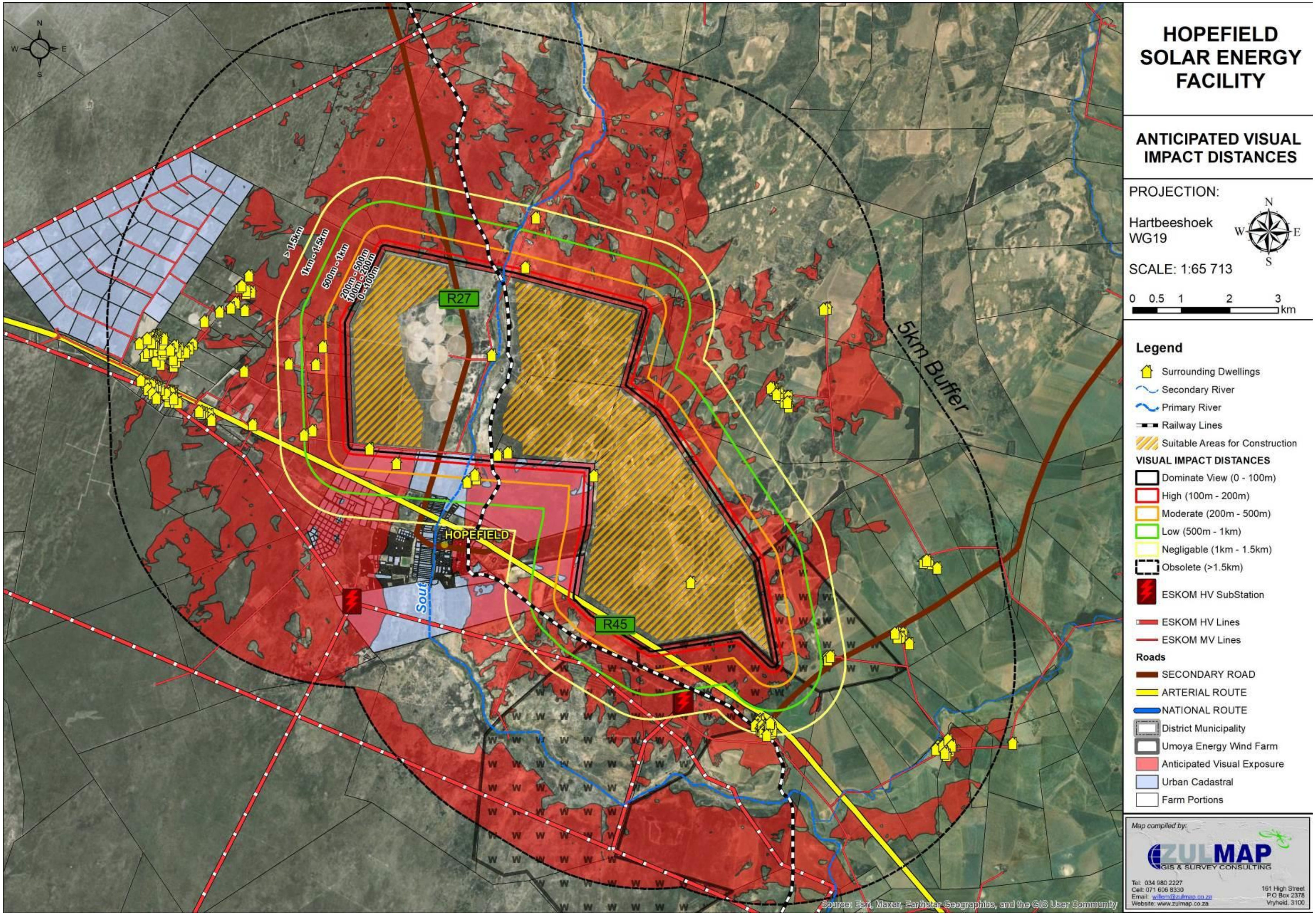

Figure 26: Anticipated Visual Impact Distances

Although visual distance plays a significant role in the visibility of a structure or development, several other factors also play an important role to determine the level of visibility. Such factors include the structure material, structure form, colour etc., and will be discussed further-on.

C. Visual Absorption Capacity (VAC)

VAC is the ability of the surrounding environment to conceal the proposed development or activities. Land cover surrounding a site location or along visible routes such as tall grass, trees or bushes are typical examples . This provides a good absorption capacity to conceal the site location, called view shadowing. The photos below give a perception of this:

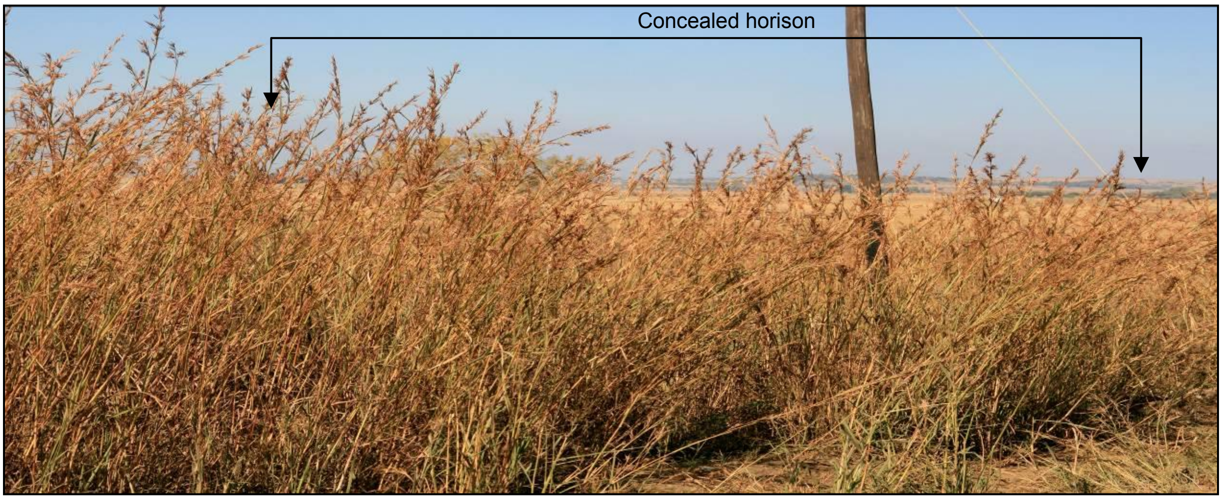

Figure 27: Visual absorption capacity from tall Highveld grass next to road

Figure 28: Visual absorption capacity from indigenous trees

The final viewable areas within the viewshed area can be reviewed under Figure 29. The influence of visual absorption capacity on key observation points within these areas was to be assessed onsite.

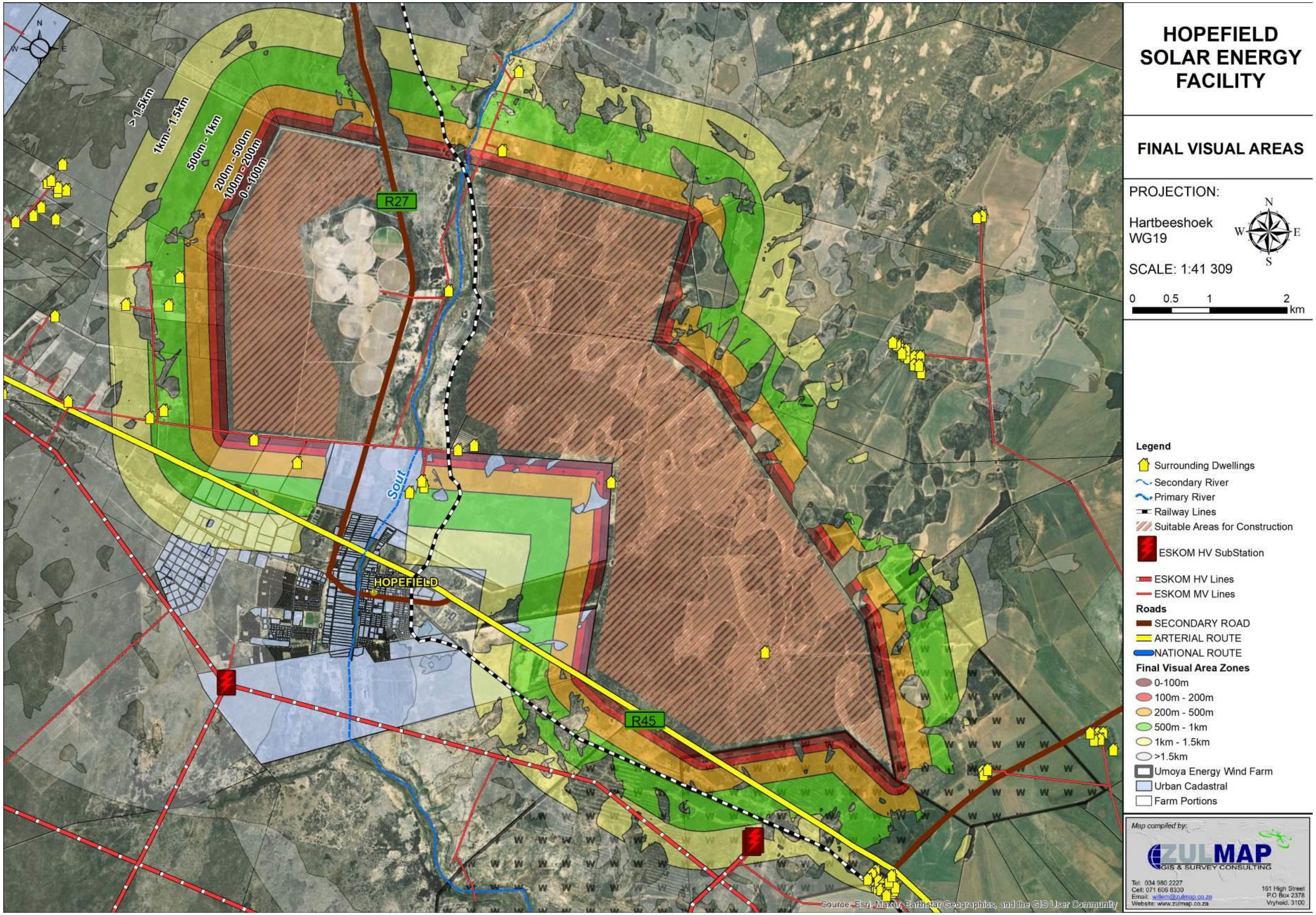

Figure 29: Final Visual Areas

D. Key Observation Points (KOP's)

KOP's are defined by the BLM Visual Resource Management (BLM, 2004) as the people located in strategic locations surrounding the project location who will make consistent use of the views around the project location. The following selection criteria were used to define the final KOP's from the initial observation points:

- Viewshed coverage to see where anticipated observations points are falling within the viewshed coverage.
- Locations such as public roads, farmsteads and farm houses.
- View angle and zone of influence of observation points.
- Visual distances from project location.
- View shadow areas.

The final KOP's in relation to the viewshed can be reviewed under Figure 30. A field of view is indicated as a perception of who and how the observer will observe the project area. The average field of view of a person is approximately 40 degrees (Landscape Institute, 2011). Unless attention is drawn away from the road ahead, a motorist travelling along the main provincial road should therefore not easily notice objects outside this range while looking ahead. Local residents and pedestrians will however have a surrounding field of view since their focus is not on driving.

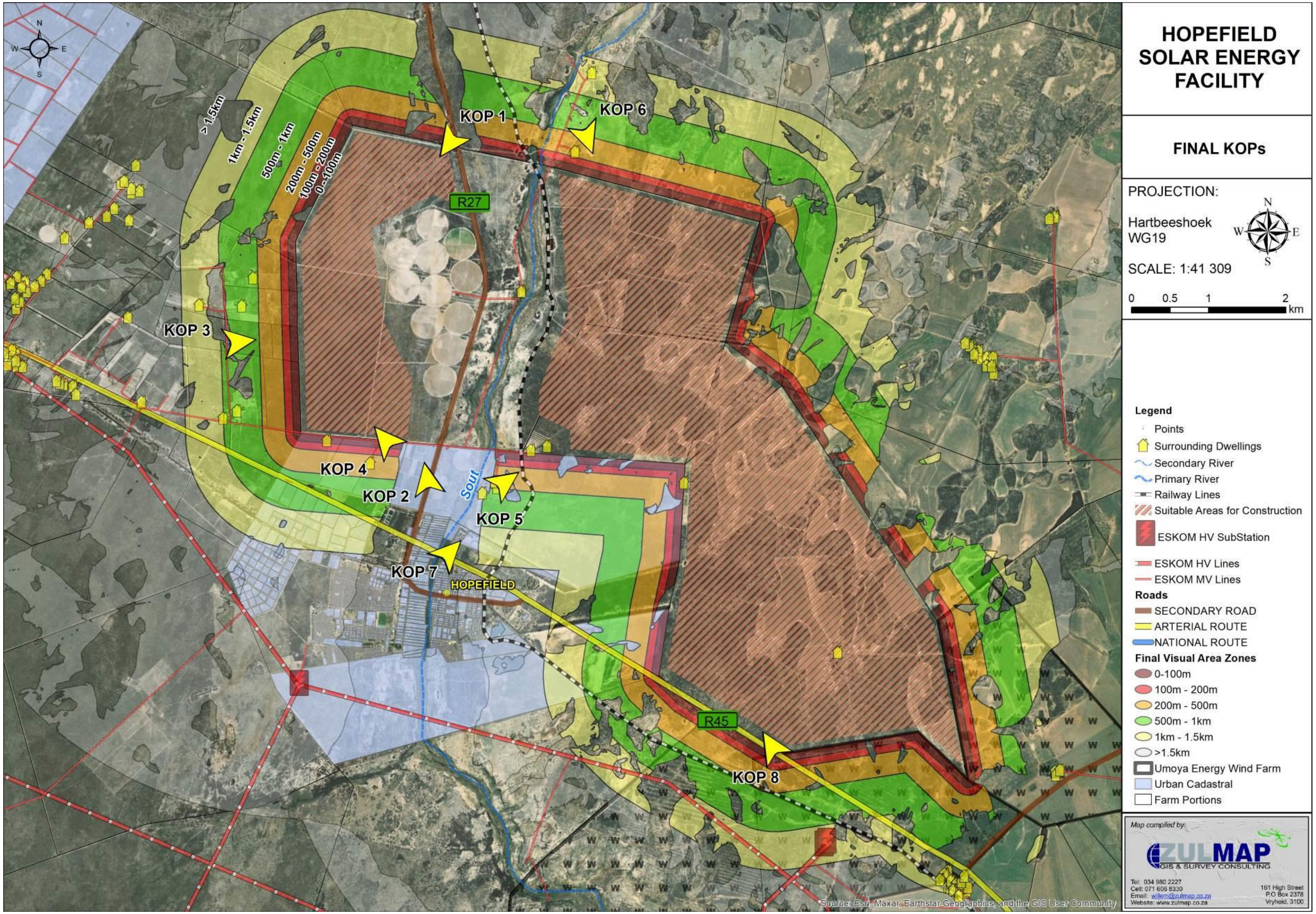

Figure 30: Final Key Observation Points (KOP's)

E. Viewer Incidence and Perception

The number of observers and their perception of a structure determine the concept of visual impact. If there are no observers, then there would be no visual impact. If the visual perception of the structure is favourable to all the observers, then the visual impact would be positive. It is therefore necessary to identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed solar facility and its related infrastructure. It would be impossible not to generalise the viewer incidence and sensitivity to some degree, as there are many variables when trying to determine the perception of the observer; regularity of sighting, cultural background, state of mind and purpose of sighting which would create a myriad of options.

F. Colour, Material and View Angle

Color & Material Selection

Most of the time, color selection will have the greatest impact on the visual success or failure of your projects. Strong contrasts in color create easily recognizable visual conflicts in the landscape. Where possible materials should also be selected that will blend in with the surrounding area and environment. However, this is not always possible, but should be taken into consideration when mitigation is required to reduce visual impact severity. The following considerations can be helpful in making color selections:

- Natural surfaces are usually well-textured and have shade and shadow effects that darken them; surfaces of structures are usually smooth and reflect light even if dull-finish paint is used. Therefore, as a general rule of thumb, colors on smooth man-made structures need to be two or three shades darker than the background colors to compensate for the shadow patterns created by naturally textured surfaces that make colors appear darker.

- The color selection for all structures should be made to achieve the best blending with the surrounding landscape in both summer and winter.

- Galvanized steel on utility structures should be darkened to prevent glare. Low luster paints should be used wherever possible to help reduce glare. It is almost impossible to remove all sun glare.

BLM, in collaboration with the paint industry and other governmental agencies, has developed a chart of standard environmental colors that best represent the typical colors found in landscapes (BLM. 2004). The colours shown below are close representations of this colour chart:

Figure 31: Typical Landscape Colours

View Angle

The angle at which a receptor or observer looks at a given object can make a significant difference in the visibility of the object. If an object is viewed against a hill for example, it can blend in with the colours and shades of the hill and vegetation. If an object is located on the horizon at a high-angle view, it will drastically increase the visibility of the object to an observer over a much longer viewing distance. An example of this can be seen in the image below:

The solar farm structures are low and with the Bontberg mountain in the background, the low visual angle will aid in minimizing the visual impact of the solar farm structures.

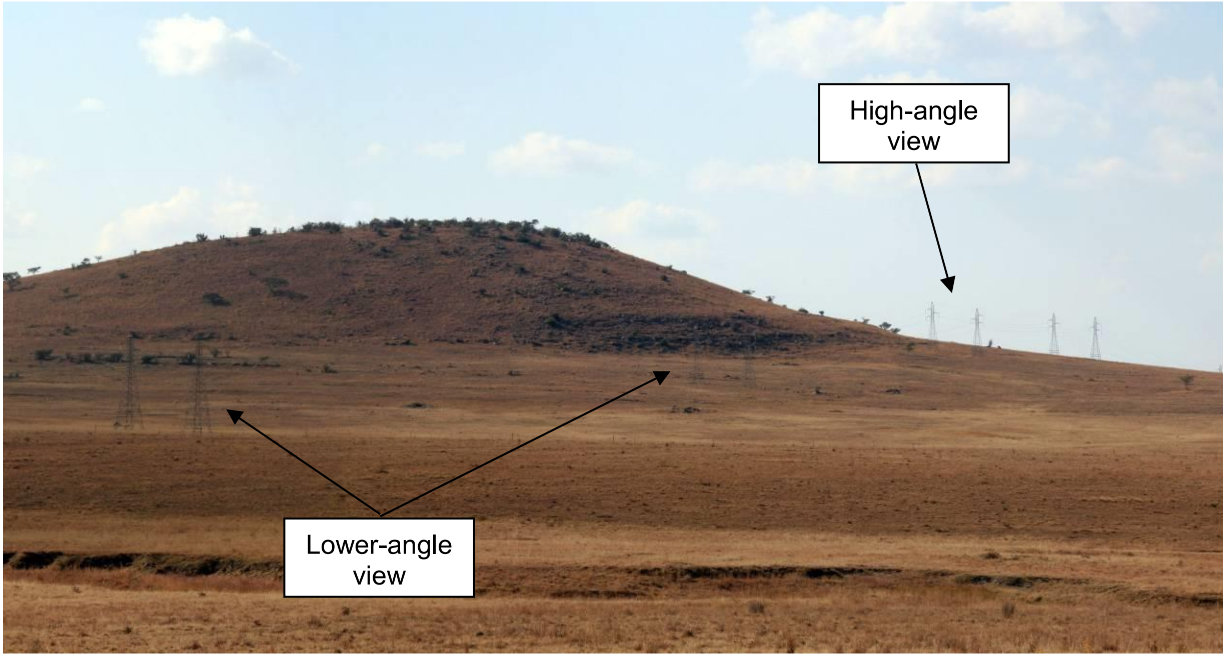

Figure 32: Visual impact of low and high visual angles

G. Lighting

Two aspects of lighting need to be taken into consideration for this VIA, namely day time and night time lighting. These two aspects will be explained in further details in this section.

Day time lighting

A common concern for solar-related infrastructure is the intensity that the reflection of the sun on the solar panels will have on receptors. Two terms however need to be understood first:

- **Glint / Reflection**
  Glint is also known as the specular reflection of the sun on objects.

- **Glare**
  Glare is a continuous source of brightness, relative to diffused lighting. This is not a direct reflection of the sun, but rather a reflection of the bright sky around the sun on objects. Glare is significantly less intense than glint.

Since the whole concept of efficient solar power is to absorb as much light as possible while reflecting as little light as possible, standard solar module produces less glare and reflectance than standard window glass.

In a report done by SunPower Corporation in 2009, the glint and glare comparison between that of solar panels and other common reflective materials are provided in Figure 26 (SunPower Co., 2009) on the proceeding page.

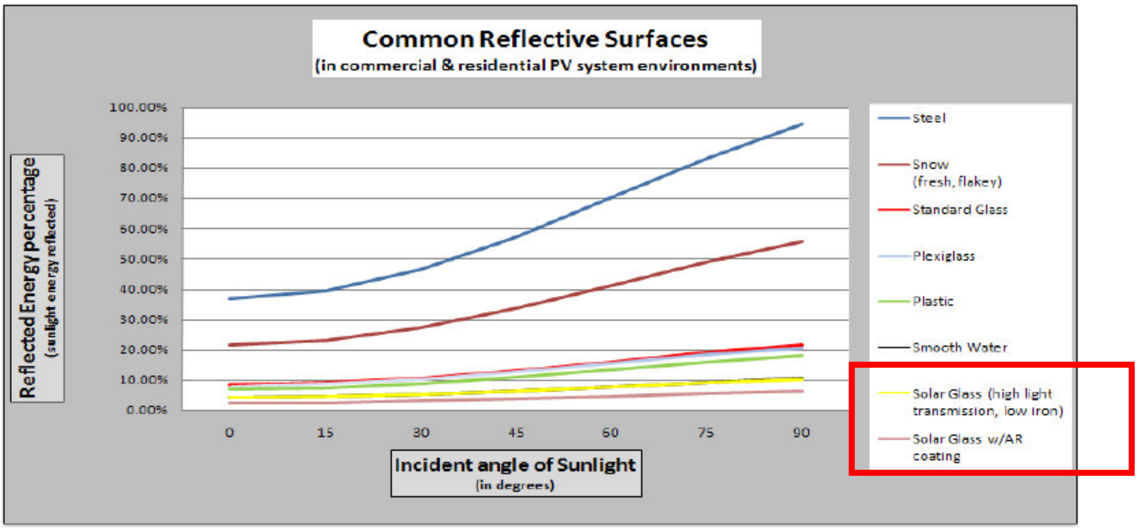

Figure 33: Comparison: Common Reflective Surfaces

Several reports and case studies on the risk of solar panels blinding pilots at air fields have proven that solar panels do not have a significant visual impact to observers in terms of glint or glare (Pfaff, J. 2010., SunPower Co., 2009). More details on the above two terms can be reviewed in the EIA report for this project (Silk, G. 2012):

Night time lighting (Light pollution)

Light pollution is a term that describes the release of light that serves no useful purpose as it falls outside the required area this may affect your enjoyment of your property due to light through windows or reduce your view of the night sky (darkskiesawareness.org, 2009)

Light pollution can take any of the following forms:

- **Sky glow**
  The release of light into the night sky brightening the horizon, creating what is known as sky glow (as can been seen over most towns and city's) and reduces the enjoyment of the night sky reducing the visibility of stars.

- **Spill light / light trespass**
  Where the light falls onto adjacent property or through windows affecting the owner's enjoyment of that property.

- **Over-illumination**
  Artificial lighting that is brighter and on longer than required for a specific activity

Preventing light pollution

Careful consideration at the design / planning stage can ensure that the task that requires lighting can be achieved whist controlling light pollution and the first question has to be "do I need to light it?" If this is the case then the design must ensure that only the right amount of light is provided for the required task and that this is controlled to avoid light pollution.

The use of specifically designed equipment to maximise the light where it is required whilst minimising it to all other areas is recommended to achieve this. The following image shows examples of different light installations, and the impact that each installation has on light pollution (darkskiesawareness.org, 2009):

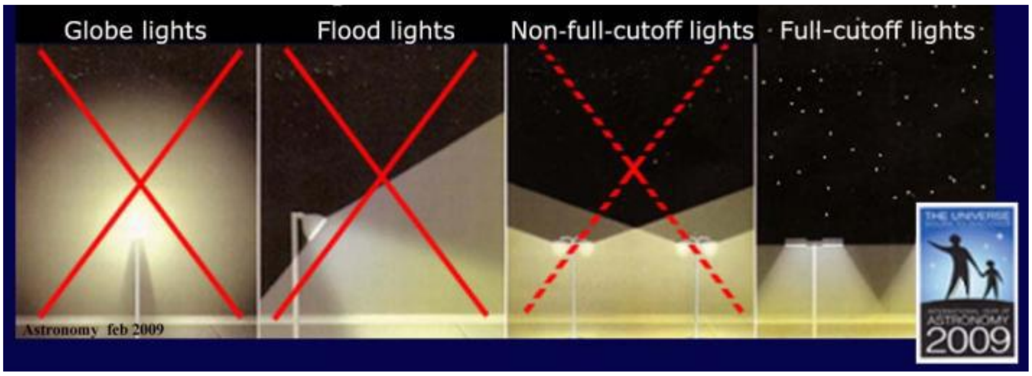

Figure 34: Anticipated night-time lighting visibility

Advantages of night-sky-friendly lighting

- can be aesthetically attractive & enhance neighbourhood appearance
- allows people to move around safely – they are not blinded by glare
- keeps light on ground - where it is needed
- prevents light trespass onto other's property and into their homes
- saves energy, money, and the environment

Specific details regarding the type and method of lighting to be used for this project were not available at the time of this report. However, recommendations to avoid light pollution will be made where needed in this report.

H. Construction Phase and Landform Change

Although temporary, the construction phase usually also pose a visual impact. Excessive clearing and stripping of topsoil within the project area, cut and fill areas resulting in exposed natural areas, uncontrolled exploitation of borrow pits, activities by large plant machinery, and new roads will all have a high visual impact during the construction phase.

It is recommended that a suitably qualified person be appointed to give attention to such activities to minimise the visual impact that the construction phase will have on the area. This will include a proper rehabilitation programme for any areas such as borrow pits or where the natural environment has been excessively disturbed.

8.3 PHASE 3: VISUAL ASSESSMENT RATINGS

The following section will give an overview of the scoring methods and assessment results, and to determine the significance of the anticipated visual impact from each KOP.

8.3.1 Defining visual impact significance

Thresholds of significance define the level or limit at which point an impact changes from low to medium significance, or medium to high significance. These thresholds are often determined by current societal values which define what would be acceptable or unacceptable to society and may be expressed in the form of legislated standards, guidelines or objectives.

Challenges relating to thresholds:

- Unlike water quality or air quality, thresholds for visual or scenic quality cannot be easily quantified, as they tend to be abstract, and often relate to cultural values or perceptions.
- A second difficulty is that natural, rural and urban landscapes are constantly changing, and the assessment will therefore need to consider this in determining the significance of impacts.
- A third difficulty may be the divergence of opinion on what constitutes 'acceptable' change, by the individual, the community or society in general.

8.3.2 Visual index

A quantitative method, using weighted criteria, was used in determining the final anticipated significance of the visual impact that each KOP will have. Taking the above aspects into consideration, careful attention was given in assigning values and weights as input to ensure an objective approach and outcomes.

According to the guidelines set by the DEA&DP (Oberholzer, B. 2005), the following components should form part of the visual index:

- Direct (primary) effects
- Indirect (secondary) effects
- Cumulative (tertiary) effects

Ratings provided for each of the above components in the guidelines were used as a basis to assign criteria for the visual index scoring, which can be seen in the following figures

(Oberholzer, B. 2005). Additional criteria were also incorporated to provide a holistic approach to the visual index scoring:

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;
- *Moderate exposure* – recognisable to the viewer;
- *Low exposure* – not particularly noticeable to the viewer;

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.

Figure 35: Direct (Primary) Effects

Extent – the spatial or geographic area of influence of the visual impact, i.e.:
- *site-related:* extending only as far as the activity;
- *local:* limited to the immediate surroundings;
- *regional:* affecting a larger metropolitan or regional area;
- *national:* affecting large parts of the country;
- *international:* affecting areas across international boundaries.

Duration - the predicted life-span of the visual impact:
- *short term,* (e.g. duration of the construction phase);
- *medium term,* (e.g. duration for screening vegetation to mature);
- *long term,* (e.g. lifespan of the project);
- *permanent,* where time will not mitigate the visual impact.

Intensity – the magnitude of the impact on views, scenic or cultural resources.
- *low,* where visual and scenic resources are not affected;
- *medium,* where visual and scenic resources are affected to a limited extent;
- *high,* where scenic and cultural resources are significantly affected.

Probability – the degree of possibility of the visual impact occurring:
- *improbable,* where the possibility of the impact occurring is very low;
- *probable,* where there is a distinct possibility that the impact will occur;
- *highly probable,* where it is most likely that the impact will occur; or
- *definite,* where the impact will occur regardless of any prevention measures.

Significance – The significance of impacts can be determined through a synthesis of the aspects produced in terms of their nature, duration, intensity, extent and probability, and be described as:
- *low,* where it will not have an influence on the decision;
- *medium,* where it should have an influence on the decision unless it is mitigated; or
- *high,* where it would influence the decision regardless of any possible mitigation.

Figure 36: Indirect (Secondary) Effects

Cumulative effects can be:
- **Additive:** the simple sum of all the effects, (eg sprawl effect of houses along a scenic route);
- **Synergistic:** effects interact to produce a total effect greater than the sum of individual effects, (eg incremental urban development eventually results in total loss of rural or wilderness character of an area);
- **Time crowding:** frequent, repetitive impacts on a visual resource at the same time (eg constant movement of heavy vehicles through an area).
- **Space crowding:** high spatial density of impacts on a rural environment (eg rapid informal settlement).
- **Neutralizing:** where effects may counteract each other to reduce the overall effect (eg provision of new structures, accompanied by removal of redundant structures).

Figure 37: Cumulative (Tertiary) Effects

The final index scoring for each KOP can be reviewed in the table below. The scoring counts up to a total of 100 points, and the associated level of impact is broken up as follows:

- 0 – 10 Negligible / Obsolete
- 11 – 25 Low
- 26 – 40 Low to Medium
- 41 – 60 Medium
- 61 – 80 Medium to High
- 81 – 90 High
- 90 – 100 Dominant

The scoring table can be reviewed in the proceeding table.

Table 4: Viewshed parameters

CATEGORY	TOTAL POINTS	Items	Each item %	Description	Rating	Weight	Weight Score	RATING
DIRECT	70	8	8.75	Visibility	Negligible	1	1.75	4
					Low	2		
					Medium	3		
					High	4		
					Dominent	5		
				Visual exposure	Low	1	2.92	3
					Medium	2		
					High	3		
				Visual sensitivity of area	Low	1	2.92	2
					Medium	2		
					High	3		
				Visual sensitivity of receptors	Low	1	2.92	2
					Medium	2		
					High	3		
				Visual absoption	Low	1	(2.92)	1
					Medium	2		
					High	3		
				Visual intrusion	Low	1	2.92	3
					Medium	2		
					High	3		
				Lighting (Day)	Low	1	2.92	0
					Medium	2		
					High	3		
				Lighting (Night)	Low	1	2.92	3
					Medium	2		
					High	3		
INDIRECT	20	4	5	Extent	Site specific	1	1.00	2
					Local	2		
					Regional	3		
					National	4		
					International	5		5
				Duration	Short-term	1	1.25	3
					Medium-term	2		
					Long-term	3		
					Permanent	4		
				Intensity	Low	1	1.67	2
					Medium	2		
					High	3		
				Probability	Improbable	1	1.25	3
					Probable	2		
					Highly probable	3		
					Definite	4		
CUMULATIVE	10	5	2	Additive	Low	1	0.67	3
					Medium	2		
					High	3		
				Synergy	Low	1	0.67	2
					Medium	2		
					High	3		
				Time crowding	Low	1	0.67	2
					Medium	2		
					High	3		
				Space crowding	Low	1	0.67	3
					Medium	2		
					High	3		
				Neutralizing	None	0	(0.67)	1
					Low	1		
					Medium	2		
					High	3		
TOTAL	100							

Where visual impact is expected to exceed a medium visual impact, mitigation measures are recommended to decrease the visual impact.

It is important to note that the printed version of the proposed infrastructure on the photomontage will, in most cases, look less intrusive than in real life due to limited printable size. A degree of space and perspective is lost, but this is taken into consideration when performing the Visual Index Scoring.

KOP 1 Current View

Driving south towards the R45, the tar road is slightly lower in elevation as opposed to the terrain on the right. The terrain is mainly fynbos 1 – 1,5m in height with scattered casuarina’s & eucalyptus trees 10 – 15m in height lining the farm and fence boundaries adjacent to the road. All this factors combined will make it very difficult to observe the solar plant. Visual observation would be estimated between 5 & 10%..

Figure 38: KOP 1: Current View

Table 5: KOP 1: Visual Index Score

CATEGORY	Total Points	Criteria	Rating	Total Score
Direct	70	Visibility	Medium	16.92
		Visual exposure	Medium	
		Visual sensitivity of area	Low	
		Visual sensitivity of receptors	Low	
		Visual absoption capacity (VAC)	Medium	
		Visual intrusion	Medium	
		Lighting (Day)	None	
		Lighting (Night)	Medium	
Indirect	20	Extent	Local	9.92
		Duration	Long-term	
		Intensity	Medium	
		Probability	Medium	
Cumulative	10	Additive	Medium	4.00
		Synergy	Medium	
		Time crowding	Low	
		Space crowding	Medium	
		Neutralizing	None	
			Visual Index Score	**30.83**
			Visual Index Rating	**Low - Medium**

Mitigation Required to meet VIA objectives:

Although meeting VIA objectives, the visibility of infrastructure from KOP 1 may be visible if constructed adjacent to the road.

Recommended mitigation:

- ► Allow a buffer zone between the road and energy farm fence line.
- ► Indigenous trees to be planted in between road and fence line to shield motorists' view of site.
- ► Full cut-off lights to be used on and around premises (night-sky friendly lighting).

KOP 2 Current View

Driving north from the R45 towards KOP 1, on the same tar road and conditions as KOP 1, including a much more dense & prominent 2 – 3m hedge lining the farm & fence boundaries combined, makes it almost if not completely non-visible. Visual intrusion would be obsolete. No scoring matrix is required.

Figure 39: KOP 2: Current View

KOP 3 Current View

Driving on a rural farm road, the road has a lower elevation then it surroundings. The terrain in an easterly direction is uneven with covered with Fynbos 1 – 1.5m in height. Casuarina’s line the side of the road in part. Visual observation would be estimated between 5 – 15%. No scoring matrix is required.

Figure 40: KOP 3: Current View

KOP 4 Current View

Driving along a farm access road, in a westerly direction, the terrain is mainly flat rising very slightly in elevation away from the road. The terrain has a grass and Fynbos mix up to 1m in height. Visual observation would dominate the northern view.

Figure 41: KOP 4: Current View

KOP 4 View with Proposed infrastructure

The following figure provides a simulated idea of the visibility that the proposed solar infrastructure will have for motorists.

Figure 42: KOP 4: View with proposed infrastructure

KOP 4 Proposed Infrastructure with Mitigation

By planting natural trees and large shrubs in between the road and the site perimeter, the solar infrastructure can be shielded off to significantly reduce the visual impact.

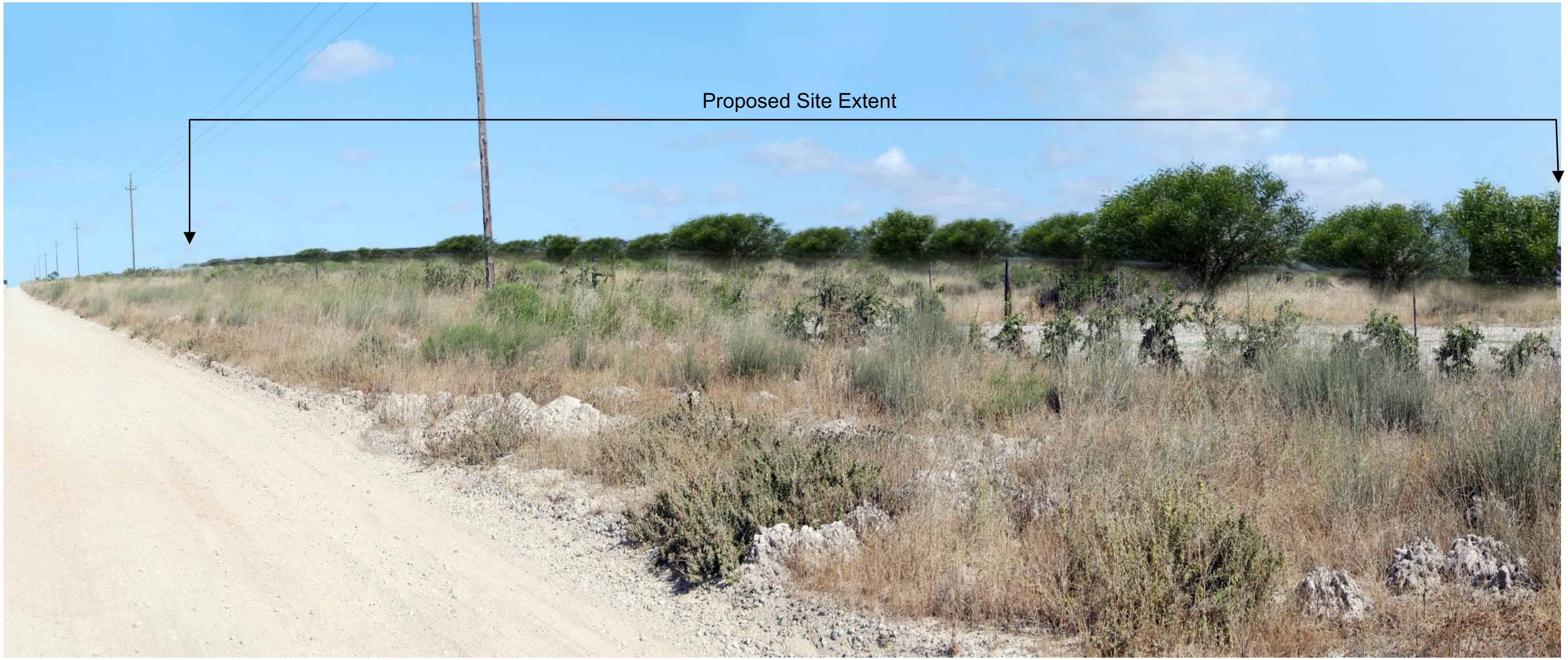

Figure 43: KOP 4: View with proposed infrastructure after mitigation

KOP 4 Visual Index Scoring

Table 6: KOP 4: Visual Index Score before mitigation

CATEGORY	Total Points	Criteria	Rating	Total Score
Direct	70	Visibility	High	49.58
		Visual exposure	High	
		Visual sensitivity of area	Medium	
		Visual sensitivity of receptors	Medium	
		Visual absoption capacity (VAC)	Low	
		Visual intrusion	High	
		Lighting (Day)	None	
		Lighting (Night)	High	
Indirect	20	Extent	Local	14.08
		Duration	Long-term	
		Intensity	High	
		Probability	Definite	
Cumulative	10	Additive	High	6.00
		Synergy	Low	
		Time crowding	Medium	
		Space crowding	High	
		Neutralizing	None	
			Visual Index Score	**69.67**
			Visual Index Rating	**High**

Table 7: KOP 4: Visual Index Score after mitigation

CATEGORY	Total Points	Criteria	Rating	Total Score
Direct	70	Visibility	Low	9.33
		Visual exposure	Low	
		Visual sensitivity of area	Low	
		Visual sensitivity of receptors	Low	
		Visual absoption capacity (VAC)	High	
		Visual intrusion	Low	
		Lighting (Day)	None	
		Lighting (Night)	Low	
Indirect	20	Extent	Local	9.92
		Duration	Long-term	
		Intensity	Low	
		Probability	Probable	
Cumulative	10	Additive	Low	3.33
		Synergy	Medium	
		Time crowding	Low	
		Space crowding	Low	
		Neutralizing	None	
			Visual Index Score	**22.58**
			Visual Index Rating	**Low**

Mitigation Required to meet VIA objectives:

Recommended mitigation:

- ► Colour of buildings and fencing to be neutral colours to blend in with surrounding vegetation.
- ► Indigenous trees to be planted along site boundary to shield motorists' view of site.
- ► Full cut-off lights to be used on and around premises (night-sky friendly lighting).

KOP 5 Current View

Driving along a farm access road, in a north easterly direction, the terrain is mainly flat falling very slightly in elevation away from the road. The terrain has a grass and Fynbos mix up to 1 - 2m in height & eucalyptus trees 10 – 15m in height scattered here & there. Visual intrusion would be estimated between 5 – 10%. No scoring matrix is required.

Figure 44: KOP 5: Current View

KOP 6 Current View

Driving along a farm access road, in a south easterly direction, the terrain is mainly undulating, rising and falling away in elevation. The terrain has a grass and Fynbos mix up to 1 - 2m in height. Because of the undulating effect, it is very difficult to determine the horizon or far reaching structures or trees. Visual observation would be estimated between 5 – 10%. No scoring matrix is required.

Figure 45: KOP 6: Current View

KOP 7 Current View

Observing from the R45, in a south easterly direction, the terrain is mainly flat and lower in elevation. The terrain is grassy but mainly a mix of Fynbos & Port Jackson 2 -5m in height. Eucalyptus, Casuarinas & Pine trees are well scattered in-between. All these factors combined will make it highly difficult to observe any part of the solar plant. Visual observation would be obsolete and no scoring matrix is required.

Figure 46: KOP 7: Current View

KOP 8 Current View

Observing from the R45, in a north westerly direction, the terrain is mainly flat. The terrain is mainly a mix of Fynbos 1m in height. Visual observation would dominate the view along the R45 for approximately 2km.

Figure 47: KOP 8: Current View

KOP 8 View with Proposed infrastructure

The following figure provides a simulated idea of the visibility that the proposed solar infrastructure will have for motorists.

Figure 48: KOP 8: View with proposed infrastructure

KOP 8 Proposed Infrastructure with Mitigation

By planting natural thorn trees and large shrubs in between the road and the site perimeter, the solar infrastructure can be shielded off to significantly reduce the visual impact.

Figure 49: KOP 8: View with proposed infrastructure after mitigation

KOP 8 Visual Index Scoring

Table 8: KOP 8: Visual Index Score before mitigation

CATEGORY	Total Points	Criteria	Rating	Total Score
Direct	70	Visibility	High	49.58
		Visual exposure	High	
		Visual sensitivity of area	Medium	
		Visual sensitivity of receptors	Medium	
		Visual absoption capacity (VAC)	Low	
		Visual intrusion	High	
		Lighting (Day)	None	
		Lighting (Night)	High	
Indirect	20	Extent	Local	14.08
		Duration	Long-term	
		Intensity	High	
		Probability	Definite	
Cumulative	10	Additive	High	6.00
		Synergy	Low	
		Time crowding	Medium	
		Space crowding	High	
		Neutralizing	None	
			Visual Index Score	**69.67**
			Visual Index Rating	**High**

Table 9: KOP 8: Visual Index Score after mitigation

CATEGORY	Total Points	Criteria	Rating	Total Score
Direct	70	Visibility	Low	9.33
		Visual exposure	Low	
		Visual sensitivity of area	Low	
		Visual sensitivity of receptors	Low	
		Visual absoption capacity (VAC)	High	
		Visual intrusion	Low	
		Lighting (Day)	None	
		Lighting (Night)	Low	
Indirect	20	Extent	Local	9.92
		Duration	Long-term	
		Intensity	Low	
		Probability	Probable	
Cumulative	10	Additive	Low	3.33
		Synergy	Medium	
		Time crowding	Low	
		Space crowding	Low	
		Neutralizing	None	
			Visual Index Score	**22.58**
			Visual Index Rating	**Low**

Mitigation Required to meet VIA objectives:

Recommended mitigation:

- ► Colour of buildings and fencing to be neutral colours to blend in with surrounding vegetation.
- ► Indigenous trees to be planted along site boundary to shield motorists' view of site.
- ► Full cut-off lights to be used on and around premises (night-sky friendly lighting).

9 Summary

The following section provides a summary of the visual assessment.

Table 10: Visual Assessment Summary

Observation Point ID	Location	Anticipated Visual Impact	Anticipated Visual Impact with Mitigation
KOP 1	Along public road, R45	Low - Medium	N/A
KOP 2	Along public road, R45	None	N/A
KOP 3	Along rural farm access road	Low	N/A
KOP 4	Along farm access road	High	Low
KOP 5	Along farm access road	Low	N/A
KOP 6	Along farm access road	Low	N/A
KOP 7	Within Hopefield town looking north	None	N/A
KOP 8	Along public road, R45	High	Low

10 Conclusion

The proposed site location is **very favourable** for the purpose of power generation. The surrounding area is situated across the Western and Central Power Corridor for renewable energy.

The project area is very well suited for the proposed PV solar infrastructure. The flat topography and surrounding vegetation secludes most of the project area from the public. The only anticipated high visibility area for the proposed infrastructure will be for motorists travelling on the R45 road as well as a local farm road adjacent to the project area, but this can easily be reduced to a low-level visual impact with the recommended mitigation measures.

Although there are a number of designated nature reserves close-by, the project area is well secluded to not have a negative impact on these reserves. The sense of place has furthermore dramatically changed with the construction of the Umoya Wind Energy Farm.

The benefits of this project include the following:

- Local economic development in terms of job creation.
- Supplementing the high demand for electricity.
- Contribute to minimising carbon footprint in generating electricity.

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