WILDEBEESTKUIL PV GENERATION (PTY) LTD

Proposed Construction of Two (2) 9.9MW Wildebeestkuil Solar Photovoltaic (PV) Plants and 132kV Power Lines near Leeudoringstad, North West Province

Visual Impact Assessment Report – Basic Assessment

DEDECT Reference: *To be allocated*
Report Prepared by: SiVEST SA (Pty) Ltd
Issue Date: 7 September 2020
Version No.: 1

Date:	7-09-2020
Document Title:	Proposed Construction of Two (2) 9.9MW Wildebeestkuil Solar Photovoltaic (PV) Plants and 132kV Power Lines near Leeudoringstad, North West Province (Wildebeestkuil 1 Solar PV Plant & 132kV Power Line and Wildebeestkuil 2 Solar PV Plant & 132kV Power Line): **Visual Impact Assessment Report – Basic Assessment**
Version Number:	1
Author:	**Kerry Schwartz** BA (Geography), University of Leeds
Checked by:	**Stephan Jacobs** B.Sc. (Hons) Environmental Management & Analysis (UP) B.Sc. Environmental Sciences (UP)
Approved by:	**John Richardson** B.Sc. (Hons) Environmental Science (UKZN)
Signature:	
Client:	Wildebeestkuil PV Generation (Pty) Ltd

Confidentiality Statement

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VISUAL IMPACT ASSESSMENT REPORT – BASIC ASSESSMENT

EXECUTIVE SUMMARY

It should be noted that a combined report has been compiled for both proposed projects due to the fact that the proposed solar photovoltaic (PV) plants and power line corridors are located on the same properties, are identical in nature and have the same associated impacts and recommended mitigation measures. Where certain findings and/or mitigation measures are project specific, this has been indicated in the relevant section of this report.

The Visual Impact Assessment (VIA) conducted for the proposed Wildebeestkuil 1 and Wildebeestkuil 2 Solar Photovoltaic (PV) Energy facilities (SPEFs), associated on-site infrastructure and 132kV power lines found that much of the study area has a partly natural visual character with some rural or pastoral elements. As such, solar PV facilities, power lines and associated infrastructure would alter the visual character and contrast significantly with the typical land use and/or pattern and form of human elements present across the broader study area. However, areas in close proximity to the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site exhibit high levels of human transformation resulting from urban and infrastructural development such as the Kgakala township, R502 and R504 regional roads, high voltage power lines, Leeubos TR 132kV Traction Substation and the existing railway line. These elements have resulted in a significant degree of landscape degradation, and thus the introduction of Solar PV facilities and associated power lines into this setting would be considered to be less visually intrusive than if there was no existing built infrastructure visible.

A broad-scale assessment of landscape sensitivity, based on the physical characteristics of the study area, economic activities and land use that predominates, determined that the area would have a **low** visual sensitivity. However, an important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs.

No visually sensitive receptors were identified within the study area. This is most likely due to the fact that the study area is not typically valued or utilised for its tourism significance. Additionally, the R502 and R504 regional roads, which traverse the visual assessment zone, are used almost exclusively as local access roads and do not form part of any scenic tourist routes and are not specifically valued or utilised for their scenic or tourism potential.

A total of sixty-five (65) potentially sensitive receptors were however identified within the study area, many of which appear to be existing farmsteads. These farmsteads are regarded as potentially sensitive visual receptors as they are located within a mostly rural setting and the proposed developments will

likely alter natural vistas experienced from these locations, although the residents' sentiments toward the proposed developments are unknown.

The receptor impact rating conducted in respect of these potentially sensitive receptors found that none of these potentially sensitive receptors are expected to experience high levels of visual impact from the proposed SPEFs or the 132kV power lines. Thirty-one (31) of the potentially sensitive visual receptors identified within the study area, will experience moderate levels of visual impact as a result of the proposed Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant projects and twenty-five (25) potentially sensitive receptors will experience moderate levels of impact as a result of the proposed 132kV power line associated with each solar PV plant. Twenty-seven (27) potentially sensitive visual receptors will be subjected to low levels of visual impact as a result of the proposed SPEFs while seventeen (17) will experience low levels of impact as a result of the 132kV power line associated with each solar PV plant.

The overall impact rating revealed that the Wildebeestkuil 1 and WIldebeestkuil 2 SPEFs and 132kV power lines are expected to have a (negative) low visual impact rating during both construction and decommissioning phases. During operation, visual impacts from the solar PV facility arrays would be of (negative) medium significance with relatively few mitigation measures available to reduce the visual impact. Impacts from the associated infrastructure and 132kV power lines would however be of (negative) low significance during operation.

Several renewable energy developments are being proposed within a 50 km radius of the Wildbeestkuil 1 and 2 SPEF application site and power line corridors. These renewable energy developments have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other could significantly alter the sense of place and visual character in the broader region. It was determined that only three (3) of these would have any significant impact on the landscape within the visual assessment zone, namely the 9.9MW Leeuwbosch 1 Solar PV Plant, 9.9MW Leeuwbosch 2 Solar PV Plant and Bokamoso Solar Energy Facility (SEF). These projects, in conjunction with the proposed Leeudoringstad Solar Plant Substation (part of separate BA process), located on the Leeuwbosch 1 and Leeuwbosch 2 Solar PV Plant application site, will alter the inherent sense of place and introduce an increasingly industrial character into a largely natural, pastoral landscape, thus giving rise to significant cumulative impacts. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures stipulated for each of these developments by the visual specialists. In light of this and the significant degree of human transformation and landscape degradation evident in close proximity to the proposed developments, cumulative impacts have been rated as medium.

No design and layout alternatives for the PV development areas, Switching Substations, Guard houses and Temporary Building Zones (and all other associated infrastructure) for the respective projects were considered and assessed as part of this VIA as these were considered as part of a previous BA process that was never completed. As such the PV development areas, Switching Substations, Guard houses and Temporary Building Zones (and all other associated infrastructure) have been placed to avoid site sensitivities previously identified. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layouts being proposed as part of the current projects. The results of the updated specialist

assessments have informed the layouts being proposed as part of the current BA processes. The proposed layouts have therefore been informed by the identified environmental sensitive and/or “no-go” areas.

Three (3) proposed power line corridor alternatives have however been comparatively assessed for each proposed solar PV plant project in this VIA and no fatal flaws were identified in respect of any of the alternatives. For both the WIldebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant and Power Line projects, Options 1 and 2A were found to be favourable, but Option 2B was found to be the preferred alternative due to fact that this alternative will be located underground thus minimising any visual impacts.

From a visual perspective therefore, the proposed Wildebeestkuil 1 and Wildebeestkuil 2 SPEFs and 132kV Power Line projects are deemed acceptable and the respective Environmental Authorizations (EAs) should be granted. SiVEST is of the opinion that the visual impacts associated with the construction, operation and decommissioning phases for each respective solar PV and power line project can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) (NEMA) AND ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 (AS AMENDED) - REQUIREMENTS FOR SPECIALIST REPORTS (APPENDIX 6)

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	**Section of Report**
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	**Section 1.3** Specialist CV's are included in **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** **APPENDIX C**
(cA) an indication of the quality and age of base data used for the specialist report;	**Section 1.4**
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	**Section 5 & 6**
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	**Section 1.4**
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	**Section 1.4**
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 6.2** **Section 6.5**
g) an identification of any areas to be avoided, including buffers;	**Section 6.2** **Section 6.5**
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;	**Section 6.5**
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, (including identified alternatives on the environment) or activities;	**Section 6**
k) any mitigation measures for inclusion in the EMPr;	**Section 8.7**
l) any conditions for inclusion in the environmental authorisation;	No specific conditions relating to the visual environment need to be included in the respective environmental authorisations (EAs)
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	**Section 8.7**
n) a reasoned opinion- i. (as to) whether the proposed activity, activities or portions thereof should be authorised;	**Section 10.1**

(iA) regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities 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;	
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	**N/A** - No feedback has yet been received from the public participation process regarding the visual environment
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	**N/A** - No feedback has yet been received from the public participation process regarding the visual environment
q) any other information requested by the competent authority.	**N/A** - No information regarding the visual study has been requested from the competent authority to date.
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.	**N/A**

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VISUAL IMPACT ASSESSMENT REPORT– BASIC ASSESSMENT

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Glossary of Terms

DEFINITIONS

Anthropogenic feature: An unnatural feature resulting from human activity.

Cultural landscape: A representation of the combined worlds of nature and of man illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal (World Heritage Committee, 1992).

Sense of place: The unique quality or character of a place, whether natural, rural or urban. It relates to uniqueness, distinctiveness or strong identity.

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.

Sensitive visual receptors: An individual, group or community that is subject to the visual influence of the proposed development and is adversely impacted by it. They will typically include locations of human habitation and tourism activities.

Slope Aspect: Direction in which a hill or mountain slope faces.

Study area / Visual assessment zone: The study area or visual assessment zone is assumed to encompass a zone of 5km from the outer boundary of the proposed Solar PV Facilities' application site and respective power line corridor alternatives.

Viewpoint: A point in the landscape from where a particular project or feature can be viewed.

Viewshed / Visual Envelope: The geographical area which is visible from a particular location.

Visual character: The pattern of physical elements, landforms and land use characteristics that occur consistently in the landscape to form a distinctive visual quality or character.

Visual contrast: The degree to which the developments would be congruent with the surrounding environment. It is based on whether or not the developments would conform with the land use, settlement density, forms and patterns of elements that define the structure of the surrounding landscape.

Visual exposure: The relative visibility of a project or feature in the landscape.

Visual impact: The effect of an aspect of the proposed developments on a specified component of the visual, aesthetic or scenic environment within a defined time and space.

Visual receptors: An individual, group or community that is subject to the visual influence of the proposed developments but is not necessarily adversely impacted by it. They will typically include commercial activities, residents and motorists travelling along routes that are not regarded as scenic.

Visual sensitivity: The inherent sensitivity of an area to potential visual impacts associated with a proposed development. It is based on the physical characteristics of the area (visual character), spatial distribution of potential receptors, and the likely value judgements of these receptors towards the new development, which are usually based on the perceived aesthetic appeal of the area.

List of Abbreviations

ABBREVIATIONS

BA	Basic Assessment
DBAR	Draft Basic Assessment Report
DEDECT	Department of Economic Development, Environment, Conservation and Tourism
DFFE	Department of Forestry, Fisheries and the Environment
DM	District Municipality
DoE	Department of Mineral Resources and Energy
DTM	Digital Terrain Model
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
FBAR	Final Basic Assessment Report
GIS	Geographic Information System
HA	Hectares
I&AP	Interested and/or Affected Party
IPP	Independent Power Producer
LM	Local Municipality
kV	Kilovolt
MW	Megawatt
NEMA	National Environmental Management Act
NGI	National Geo-Spatial Information
O&M	Operation and Maintenance
PPA	Power Purchase Agreement
PV	Photovoltaic
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SANBI	South African National Biodiversity Institute
SPEF	Solar Photovoltaic Energy Facility
VIA	Visual Impact Assessment
VR	Visual Receptor
WEF	Wind Energy Facility

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VISUAL IMPACT ASSESSMENT REPORT – BASIC ASSESSMENT

1. INTRODUCTION

The original Basic Assessment (BA) process for the proposed Wildebeestkuil PV Generation (Pty) Ltd (hereafter referred to as "Wildebeestkuil PV Generation") Solar Photovoltaic (PV) Plant and associated 132 kilovolt (kV) power line was initiated in August 2016. All specialist studies were undertaken and subsequently all site sensitivities were identified. The specialist studies and draft basic assessment reports (DBARs) were completed and released for 30-day public review. The BA was however put out on hold prior to submitting the final basic assessment report (FBAR) to the Department of Environmental Affairs (DEA)[1]. In February 2017, the proposed capacity and layout of the solar PV plant was amended, and a new connection point and associated power line corridors were assessed. However, the project was put on hold prior to submitting the application forms to the DEA or commencing with the legislated public participation process. In the interim (namely in August 2020), the proponent (namely Wildebeestkuil PV Generation) has revised their development proposals to accommodate two (2) separate solar PV energy facilities (SPEFs), including grid connection infrastructure (namely the Wildebeestkuil 1 Solar PV Plant & 132kV Power Line and Wildebeestkuil 2 Solar PV Plant & 132kV Power Line), each with a capacity of up to 9.9 megawatts (MW), near the town of Leeudoringstad, North West Province, outside of all site sensitivities that were identified in 2016. As such, specialist studies have been commissioned to assess and verify the now two (2) solar PV plants and 132kV power lines under the new Gazetted specialist protocols[2].

The proposed Wildebeestkuil SPEFs and associated 132kV power lines will require Environmental Authorisation (EA) and as such, each project is the subject of a separate BA process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended. Accordingly, SiVEST SA (Pty) Ltd (hereafter referred to as "SiVEST") has been appointed to undertake the required BA.

[1] Now known as the Department of Forestry, Fisheries and the Environment (DFFE)

[2] GOVERNMENT GAZETTE No. 43110, PROCEDURES FOR THE ASSESSMENT AND MINIMUM CRITERIA FOR REPORTING ON IDENTIFIED ENVIRONMENTAL THEMES IN TERMS OF SECTIONS 24(5)(a) AND (h) AND 44 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998, WHEN APPLYING FOR ENVIRONMENTAL AUTHORISATION, 20 MARCH 2020.

In terms of sections 24(5)(a), (h) and 44 of the National Environmental Management Act, 1998, prescribe general requirements for undertaking site sensitivity verification and for protocols for the assessment and minimum report content requirements of environmental impacts for environmental themes for activities requiring environmental authorisation, as contained in the Schedule hereto. When the requirements of a protocol apply, the requirements of Appendix 6 of the Environmental Impact Assessment Regulations, as amended, (EIA Regulations), promulgated under sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), are replaced by these requirements. Each protocol applies exclusively to the environmental theme identified within its scope. Multiple themes may apply to a single application for environmental authorisation, and assessments for these themes must be undertaken in accordance with the relevant protocol, or where no specific protocol has been prescribed, in accordance with the requirements of the EIA Regulations.

1.1 Scope and Objectives

This visual impact assessment (VIA) is being undertaken as part of the required BA processes. The aim of this VIA is to revise and update the VIA report previously compiled and to assess and verify the amended development proposals under the new Gazetted specialist protocols[2].

As per the original VIA, this VIA will determine the potential visual issues associated with the development of the proposed SPEFs and associated grid connection infrastructure (i.e. 132kV power lines), as well as to determine the potential extent of visual impacts. This involves characterising the visual environment of the area and identifying areas of potential visual sensitivity that may be subject to visual impacts. This visual assessment focuses on the potentially sensitive visual receptor locations and provides an assessment of the magnitude and significance of the visual impacts associated with the proposed developments.

It should be noted that a combined report has been compiled for both proposed projects due to the fact that the proposed solar PV plants and power line corridors are located on the same properties, are identical in nature and have the same associated impacts and recommended mitigation measures. Where certain findings and/or mitigation measures are project specific, this has been indicated in the relevant section of this report.

1.2 Terms of Reference

The terms of reference for this VIA are included in **Appendix A**.

1.3 Specialist Credentials

This VIA was undertaken by Kerry Schwartz, a GIS specialist with more than 25 years' experience in the application of GIS technology in various environmental, regional planning and infrastructural projects undertaken by SiVEST. Kerry's GIS skills have been extensively utilised in projects throughout South Africa and in other Southern African countries. In recent years, Kerry has become increasingly involved in the compilation of VIA reports. Kerry's relevant VIA project experience is listed in the table below.

Environmental Practitioner	SiVEST (Pty) Ltd – Kerry Schwartz
Contact Details	kerrys@sivest.co.za
Qualifications	BA (Geography), University of Leeds 1982
Expertise to carry out the Visual Impact Assessment.	**Visual Impact Assessments:** ▪ VIA (BA) for the proposed Oya Solar Photovoltaic (PV) Facility, near Matjiesfontein in the Western Cape Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Mooi Plaats, Wonderheuvel and Paarde Valley solar PV plants near Noupoort in the Northern and Eastern Cape Provinces.

	▪ VIAs (Scoping and Impact Phase) for the proposed Sendawo 1, 2 and 3 solar PV energy facilities near Vryburg, North West Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Tlisitseng 1 and 2 solar PV energy facilities near Lichtenburg, North West Province. ▪ VIA for the proposed Nokukhanya 75MW Solar PV Power Plant near Dennilton, Limpopo Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Helena 1, 2 and 3 75MW Solar PV Energy Facilities near Copperton, Northern Cape Province. ▪ VIA (EIA) for the proposed Paulputs WEF near Pofadder in the Northern Cape Province. ▪ VIA (BA) for the proposed Gromis WEF, near Kleinzee in the Northern Cape Province. ▪ VIA (BA) for the proposed Komas WEF, near Kleinzee in the Northern Cape Province. ▪ VIA (EIA) for the proposed development of the Rondekop WEF near Sutherland in the Northern Cape Province. ▪ VIA (BA) for the proposed development of the Tooverberg WEF near Touws Rivier in the Western Cape Province. ▪ VIA (BA) for the proposed development of the Kudusberg WEF near Sutherland, Northern and Western Cape Provinces. ▪ VIA (Scoping and Impact Phase) for the proposed development of the Kuruman Wind Energy Facility near Kuruman, Northern Cape Province. ▪ VIA (Scoping and Impact Phase) for the proposed development of the Phezukomoya Wind Energy Facility near Noupoort, Northern Cape Province. ▪ VIA (Scoping and Impact Phase) for the proposed development of the San Kraal Wind Energy Facility near Noupoort, Northern Cape Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Graskoppies Wind Farm near Loeriesfontein, Northern Cape Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Hartebeest Leegte Wind Farm near Loeriesfontein, Northern Cape Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Ithemba Wind Farm near Loeriesfontein, Northern Cape Province. ▪ VIAs (Scoping and Impact Phase) for the proposed Xha! Boom Wind Farm near Loeriesfontein, Northern Cape Province ▪ Visual Impact Assessments for 5 Solar Power Plants in the Northern Cape ▪ Visual Impact Assessments for 2 Wind Farms in the Northern Cape ▪ Visual Impact Assessment for Mookodi Integration Project (132kV distribution lines) ▪ Landscape Character Assessment for Mogale City Environmental Management Framework

A full CV is attached as **Appendix B** and a signed specialist declaration of independence is included in **Appendix C** of this specialist assessment.

1.4 Assessment Methodology

This VIA has been based on a desktop-level assessment supported by field-based observation.

1.4.1 Physical landscape characteristics

Physical landscape characteristics such as topography, vegetation and land use are important factors influencing the visual character and visual sensitivity of the study area. Baseline information about the physical characteristics of the study area was initially sourced from spatial databases provided by NGI, the South African National Biodiversity Institute (SANBI) and the South African National Land Cover Dataset (Geoterraimage – 2018). The characteristics identified via desktop analysis were later verified during the site visits.

1.4.2 Identification of sensitive receptors

Visual receptor locations and routes that are sensitive and / or potentially sensitive to the visual intrusion of the proposed developments were identified and assessed (by desktop means) in order to determine the impact of the proposed developments on each of the identified receptor locations.

1.1.1 Fieldwork and photographic review

Fieldwork was originally undertaken in October 2016 (early summer) as part of a visual assessment undertaken for preliminary solar PV development proposals on the Wildebeestkuil application site and associated grid connection infrastructure. Given the time that has elapsed since the original fieldwork was undertaken between the 12th and 13th of August 2020 (late winter). As most rainfall occurs in this area during the summer months, visual impacts resulting from the proposed developments will be greater during winter when the vegetation cover provides less potential screening.

The purpose of the site visits was to:

- verify the landscape characteristics identified via desktop means;
- conduct a photographic survey of the study area;
- identify any additional visually sensitive receptor locations within the study area; and
- inform the impact rating assessment of visually sensitive receptor locations (where possible).

1.1.2 Visual Sensitivity

The application site and power line corridor alternatives were assessed to identify any areas of significant visual sensitivity, these being areas where the establishment of PV panels, power lines or other associated infrastructure would result in the greatest probability of visual impacts on potentially sensitive visual receptors.

In addition, the Landscape Theme of the Department of Forestry, Fisheries and the Environment's (DFFE's) National Environmental Screening Tool[3] was used to determine the relative landscape sensitivity for the proposed developments.

1.1.3 Impact Assessment

A rating matrix was used to objectively evaluate the significance of the visual impacts associated with the proposed developments, both before and after implementing mitigation measures. Mitigation measures were identified (where possible) to minimise the visual impact of the proposed developments. The rating matrix made use of several different factors including geographical extent, probability, reversibility, irreplaceable loss of resources, duration and intensity, in order to assign a level of significance to the visual impact of the projects.

A separate rating matrix was used to assess the visual impact of the proposed developments on each visual receptor location (both sensitive and potentially sensitive), as identified. This matrix is based on three (3) parameters, namely the distance of an identified visual receptor from the proposed developments, the presence of screening factors and the degree to which the proposed developments would contrast with the surrounding environment.

1.1.4 Consultation with I&APs

Continuous consultation with Interested and Affected Parties (I&APs) undertaken during the public participation process will be used (where available) to help establish how the proposed developments will be perceived by the various receptor locations and the degree to which the impact will be regarded as negative. Although I&APs have not yet provided any feedback in this regard, the report will be updated to include relevant information as and when it becomes available. If no relevant comments are received requiring the report to be updated, the report will automatically inform the final BA report.

2. ASSUMPTIONS AND LIMITATIONS

- Given the nature of the receiving environment and the height of the proposed PV panels and associated infrastructure elements, the study area or visual assessment zone is assumed to encompass an area of 5km from the boundary of the application site. This limit on the visual assessment zone relates to the fact that visual impacts decrease exponentially over distance. Thus, although the proposed developments may still be visible beyond 5km, the degree of visual impact would diminish considerably. As such, the need to assess the impact on potential receptors beyond this distance would not be warranted.

[3] https://screening.environment.gov.za/screeningtool/#/pages/application_category

- In assessing the potential visual impacts for the proposed 132kV power lines, the visual assessment zone is assumed to encompass a zone of 5km from the outer boundary of the combined power line assessment corridors for each respective proposed development.

- Due to the extent of the study area and the potentially large number of receptor locations, the identification of visual receptors was undertaken via desktop means only, using Google Earth imagery. As such, several broad assumptions have been made in terms of the likely sensitivity of the receptors to the proposed developments. It should be noted that not all receptor locations would necessarily perceive the proposed developments in a negative way. This is usually dependent on the use of the facility, the economic dependency of the occupants on the scenic quality of views from the facility and on people's perceptions of the value of "Green Energy". Sensitive receptor locations typically include sites such as tourism facilities and scenic locations within natural settings which are likely to be adversely affected by the visual intrusion of the proposed developments. Thus, the presence of a receptor in an area potentially affected by the proposed developments does not necessarily mean that any visual impact will be experienced.

- Site visits were undertaken during the initial phase of the project in October 2016 and again in August 2020 with the aim of verifying the visual character and level of transformation in the area and conducting a photographic survey of the area.

- For the purposes of the VIA, all analysis is based on a worst-case scenario where PV panel heights are assumed to be 4m and the tower heights for the proposed overhead power line is assumed to be 30m.

- Due to the varying scales and sources of information; maps may have minor inaccuracies. Terrain data for the study area derived from the National Geo-Spatial Information (NGI)'s 25m DEM is fairly coarse and somewhat inconsistent and as such, minor topographical features or small undulations in the landscape may not be depicted on the DEM.

- No viewsheds were generated during this visual study, as the topography within the study area is relatively flat and no detailed contour information was available. Within this context, minor topographical features, vegetative screening, or man-made structures would be the most important factors influencing the degree of visibility and these would not be factored into the viewsheds.

- The impact rating assessment of the proposed developments on some of the potentially sensitive visual receptor locations was undertaken via desktop means. Although the use of the farmsteads / residential dwellings could not be established during the field investigation, they were still regarded as being potentially sensitive to the visual impacts associated with the proposed developments and were assessed as part of the VIA.

- The potential visual impact at each visual receptor location was assessed, via desktop means, using a matrix developed for this purpose. The matrix is based on three main parameters relating to visual impact and, although relatively simplistic, it provides a reasonably accurate indicative assessment of the degree of visual impact likely to be experienced at each receptor location as a result of the proposed developments. It is however important to note the limitations of quantitatively assessing a

largely subjective or qualitative type of impact and as such the matrix should be seen merely as a representation of the likely visual impact at a receptor location.

- The assessment of receptor-based impacts has been based on the solar PV power plant layouts and power line route alignments provided by the proponent. It is recognised however that these layouts are preliminary, and are subject to changes based on a number of potential factors, including the findings of the BA studies. The PV panel areas, associated infrastructure and power line corridors may thus move, which may result in greater or lesser visual impacts on receptor locations.

- No feedback regarding the visual environment has been received from the public participation process to date. Any feedback from the public during the review period of the respective Wildebeestkuil Draft Basic Assessment Reports (DBARs) will however be incorporated into further drafts of these reports, if relevant.

- At the time of undertaking the visual study no information was available regarding the type and intensity of lighting that will be required for the proposed developments and therefore the potential impact of lighting at night has not been assessed at a detailed level. However, lighting requirements are relatively similar for all Solar PV Energy Facilities (SPEFs) and as such, general measures to mitigate the impact of additional light sources on the ambiance of the nightscape have been provided.

- This study includes an assessment of the potential cumulative impacts of other renewable energy developments on the existing landscape character and on the identified sensitive receptors. This assessment is based on the information available at the time of writing the report and where information has not been available, broad assumptions have been made as to the likely impacts of these developments.

- SiVEST made every effort to obtain information for the surrounding planned renewable energy developments (including specialist studies, assessment reports and Environmental Management Programmes), however, some of the documents are not currently publicly available for download. The available information was factored into the cumulative impact assessment (**Section 8.4**).

- No photomontages (visualisation models) were undertaken for the proposed developments. This can however be provided should the Public Participation process identify the need for this exercise.

- Most rainfall within the area occurs from October to March, during the summer months. During winter months, the visual impact of the proposed developments may be greater, particularly from farmhouses surrounded by tall deciduous trees. The surrounding vegetation is however expected to provide only minimal potential screening. Hence the site visit (in August 2020), was undertaken at a time when the local vegetation cover would provide little screening of the proposed developments.

- Clear weather conditions tend to prevail throughout most of the year in this area, and in these clear conditions, PV panels and power lines would present a greater contrast with the surrounding landscape than they would on an overcast day. Weather conditions were clear during the site visit and this was taken into consideration when undertaking this VIA.

3. TECHNICAL DESCRIPTION

3.1 Project Location

The proposed Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Energy Facilities (SPEFs) and 132kV power lines are located approximately 4.7km north-east of the town of Leeudoringstad in the Maquassi Hills Local Municipality in the North West Province (**Figure 1)**.

The application site for both SPEFs, includes the following properties and is situated directly adjacent to the R502 Main Road:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59; and
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59.

The total extent of these properties is approximately 115.5 hectares (ha), although each respective PV plant will only occupy an area of less than 18ha.

The power line corridor alternatives associated with each proposed SPEF traverse the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 5 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 7 of the Farm hh No. 44;
- Remainder of Portion 29 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59;
- Portion 35 of the Farm Leeuwbosch No. 44;
- Portion 36 of the Farm Leeuwbosch No. 44;
- Portion 37 of the Farm Leeuwbosch No. 44; and
- Portion 38 of the Farm Leeuwbosch No. 44.

The power line corridor alternatives provide a link from each proposed SPEF, along the R502 Main Road, to the proposed Leeudoringstad Solar Plant Substation (subject to a separate BA process).

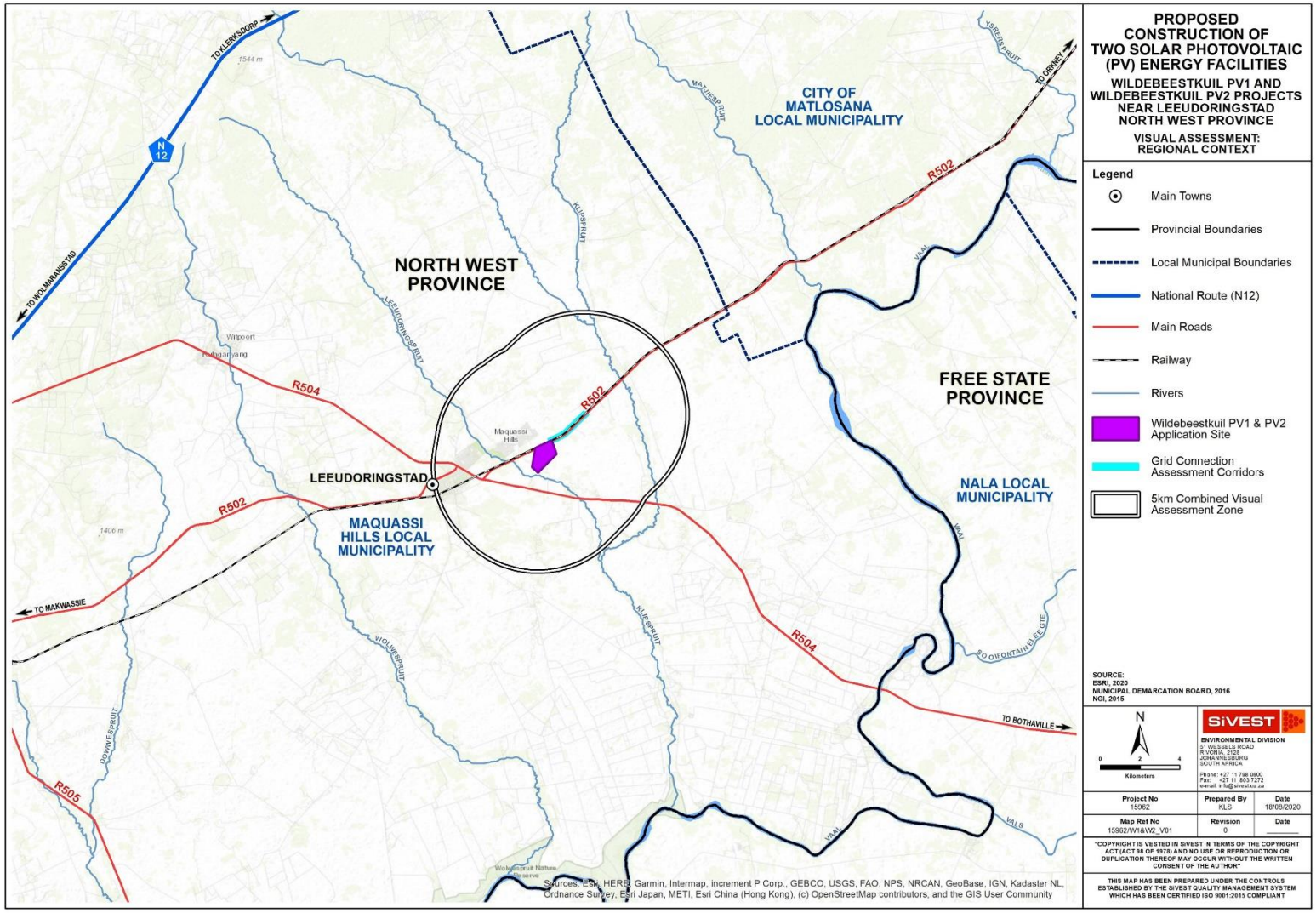

Figure 1: Regional Context – Wildebeestkuil 1 and Wildebeestkuil 2 SPEF & 132kV Power Lines

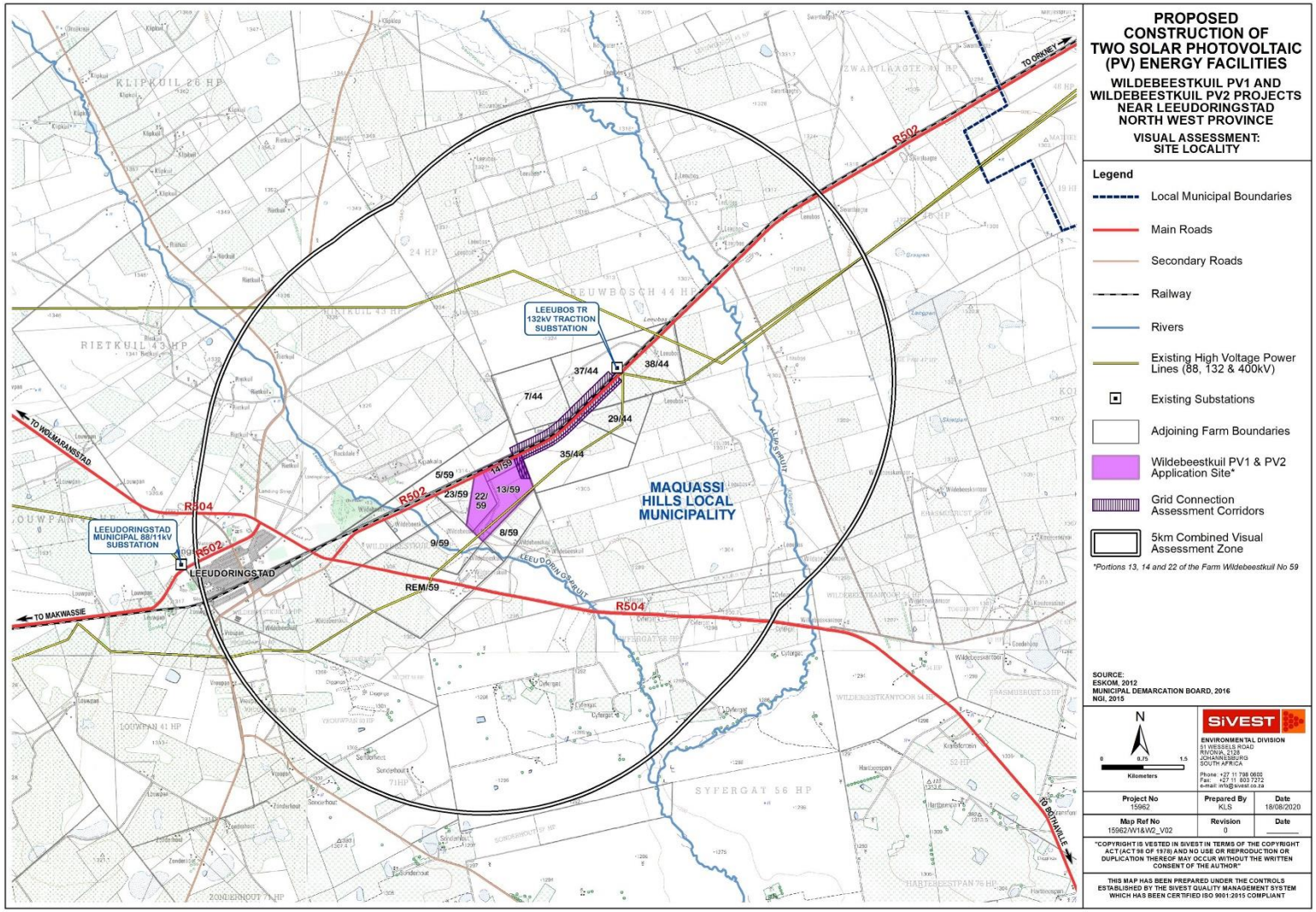

Figure 2: Site Locality - Wildebeestkuil 1 and Wildebeestkuil 2 SPEF & 132kV Power Lines

3.2 Project Description

Two (2) BA processes will be undertaken in respect of these projects and will run concurrently. These are as follows:

- Wildebeestkuil 1 Solar PV Plant, associated on-site infrastructure and 132kV Power Line; and
- Wildebeestkuil 2 Solar PV Plant, associated on-site infrastructure and 132kV Power Line.

The key components to be constructed for each proposed SPEF are listed below:

- Solar PV field (arrays) comprising multiple PV modules
- PV panel mountings. PV panels will be single axis tracking mounting, and the modules will be either crystalline silicon or thin film technology
- Each PV module will be approximately 2.5m long and 1.2m wide and mounted on supporting structures above ground. The final design details will become available during the detailed design phase of the proposed developments, prior to the start of construction
- The foundations will most likely be either concrete or rammed piles. The final foundation design will be determined at the detailed design phase of the proposed development.

In addition, related infrastruture required includes:

- Underground cabling (≈0.8m × 0.6 wide)
- Permanent Guard House (≈871m²)
- Temporary building zone (≈2994m²)
- Switching Substation (≈2000m²)
- Internal gravel roads (≈3.5m width)
- Upgrade to existing roads; and
- Site fencing (≈2.1m high)
- 132kV power line from each of the Wildebeestkuil Solar PV Plants to the proposed Leeudoringstad Solar Plant Substation (approximately 2.8km in length).

The proposed 132kV power line will consist of a series of towers located approximately 200m to 250m apart. The type of power line towers will be determined during the final design stages of the proposed developments, prior to construction commencing. The height will vary based on the terrain, but will ensure minimum overhead line (OHL) line clearances with buildings and surrounding infrastructure. The exact location of the towers will be determined during the final design stages of the proposed developments.

Power line corridors between approximately 60m and 150m wide are being proposed to allow flexibility when determining the final route alignment. The proposed power line however only requires a 32m wide servitude and as such, this servitude would be positioned within the assessed corridor.
The construction phase will be between 12 and 24 months and the operational lifespan will be approximately 20 years, depending on the length of the power purchase agreement with the relevant off taker.

Once fully developed, the intention is to generate electricity (by capturing solar energy) to feed into the national electricity grid and “wheel” the power to customers based on a power purchase agreement. Additionally, an agreement is in place to sell the energy to PowerX, who hold a National Energy Regulator of South Africa (NERSA)-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and sell it on to its customers.

3.2.1 Layout Alternatives

No design or layout alternatives for the PV development areas, Switching Substations, Guard houses and Temporary Building Zones (and all other associated infrastructure) are being considered or assessed as part of the current BA processes. Design and layout alternatives were considered and assessed as part of a previous BA process that was never completed, and as such the PV development areas, Switching Substations, Guard houses and Temporary Building Zones (and all other associated infrastructure) have been placed to avoid site sensitivities identified as part of a previous BA process as well as the current BA processes. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layouts being proposed as part of the current projects. The results of the updated specialist assessments have informed the layouts being proposed as part of the current BA processes. The proposed layouts have therefore been informed by the identified environmental sensitive and/or "no-go" areas.

Proposed site layouts for the Wildebeestkuil 1 and Wildebeestkuil 2 SPEFs are shown in Error! Reference source not found. and Error! Reference source not found. below.

3.2.2 132kV Power Line Corridor Route Alternatives

The proposed 132kV power lines will link the switching substations on each respective PV development site to the proposed Leeudoringstad Solar Plant Substation on Portion 37 of the Farm Leeuwbosch No. 44 to the north-east, over a maximum distance of approximately 2.8kms (part of a separate BA process). As stated, power line corridors between approximately 60m and

Three (3) power line corridor route alternatives have been considered for each respective solar PV project, including above ground and below ground options as follows:

- **Option 1:** This involves an overhead power line which will run north of the R502, from the switching substation located within the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[4]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.
- **Option 2A:** This involves an overhead power line which will run south of the R502, from the switching substation located within the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA

[4] 132kV power line corridor route associated with each proposed solar PV plant intrinsically linked to Leeudoringstad Solar Plant Substation site (part of separate on-going BA process). Leeudoringstad Solar Plant Substation site chosen as "preferred" by respective specialists as part of that separate BA process therefore informed connection point for power line corridors being proposed as part of this BA process.

process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[4]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44 .

- **Option 2B:** This involves an underground power line which will run south of the R502, from the switching substation located within the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[4]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil PV1 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

The proposed power line corridor route alternatives for each solar PV project are shown in **Figure 5** and **Figure 6** below.

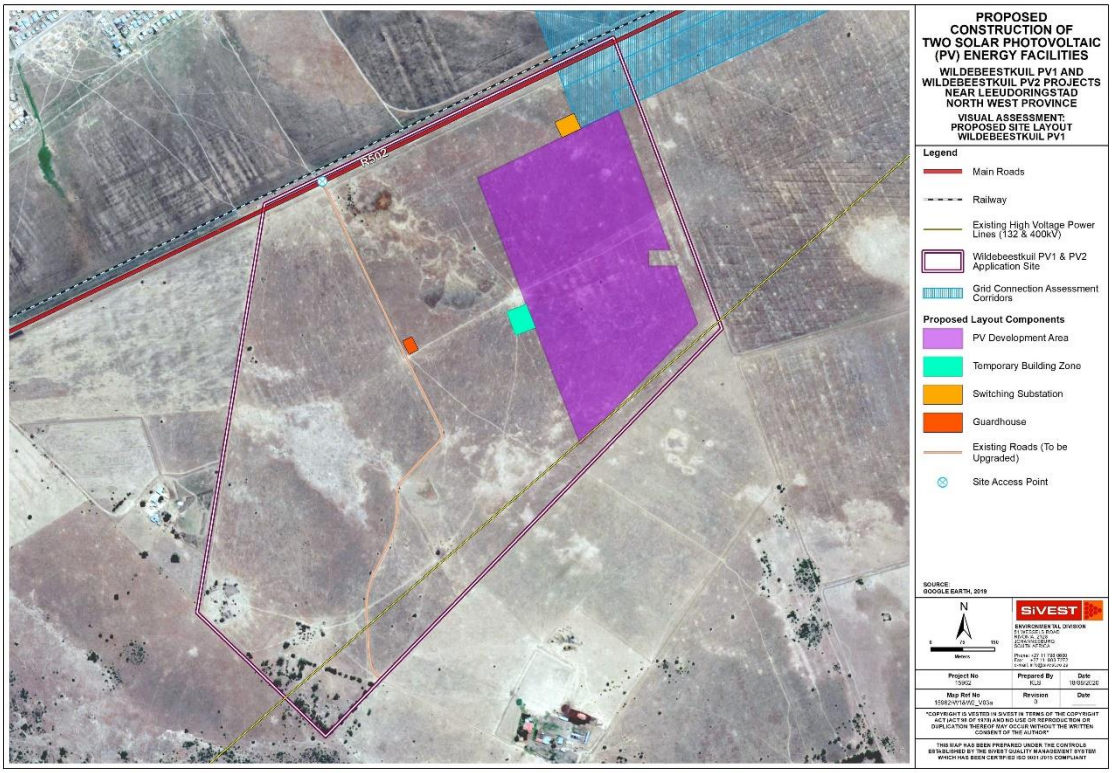

Figure 3: Wildebeestkuil 1 Solar PV Plant and 132kV Power Line - Proposed Site Layout

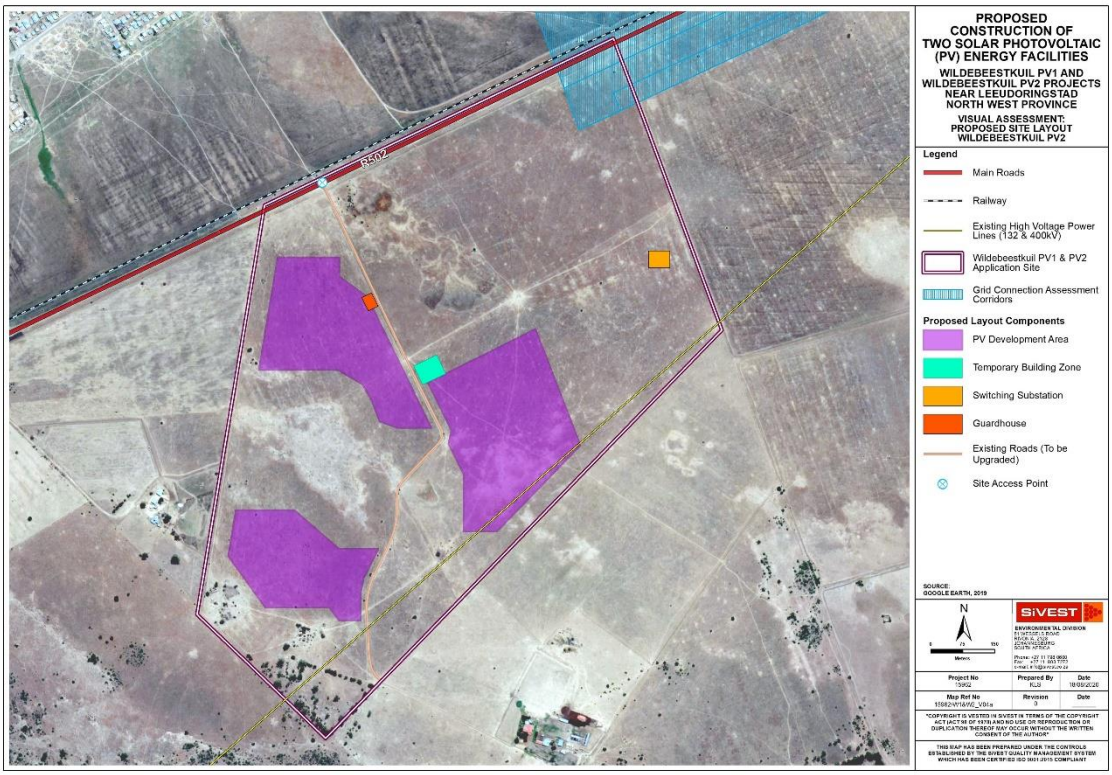

Figure 4: Wildebeestkuil 2 Solar PV Plant and 132kV Power Line - Proposed Site Layout

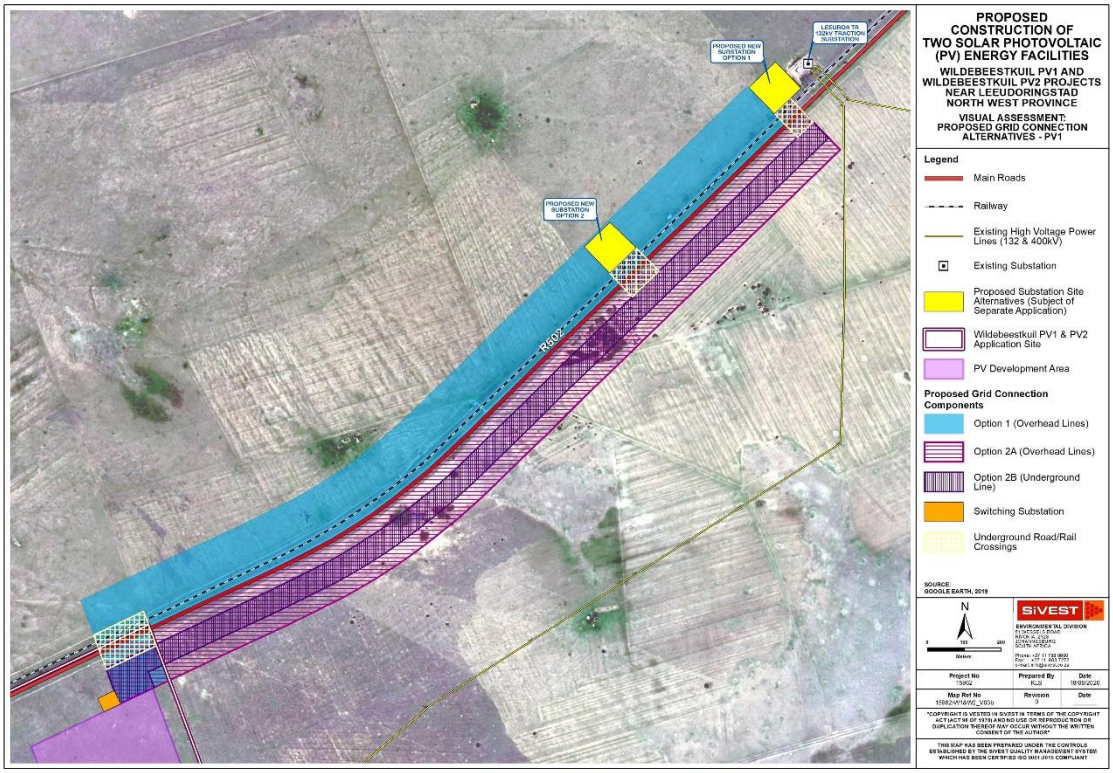

Figure 5: Wildebeestkuil 1 Solar PV Plant and 132kV Power Line - Power Line Assessment Corridors

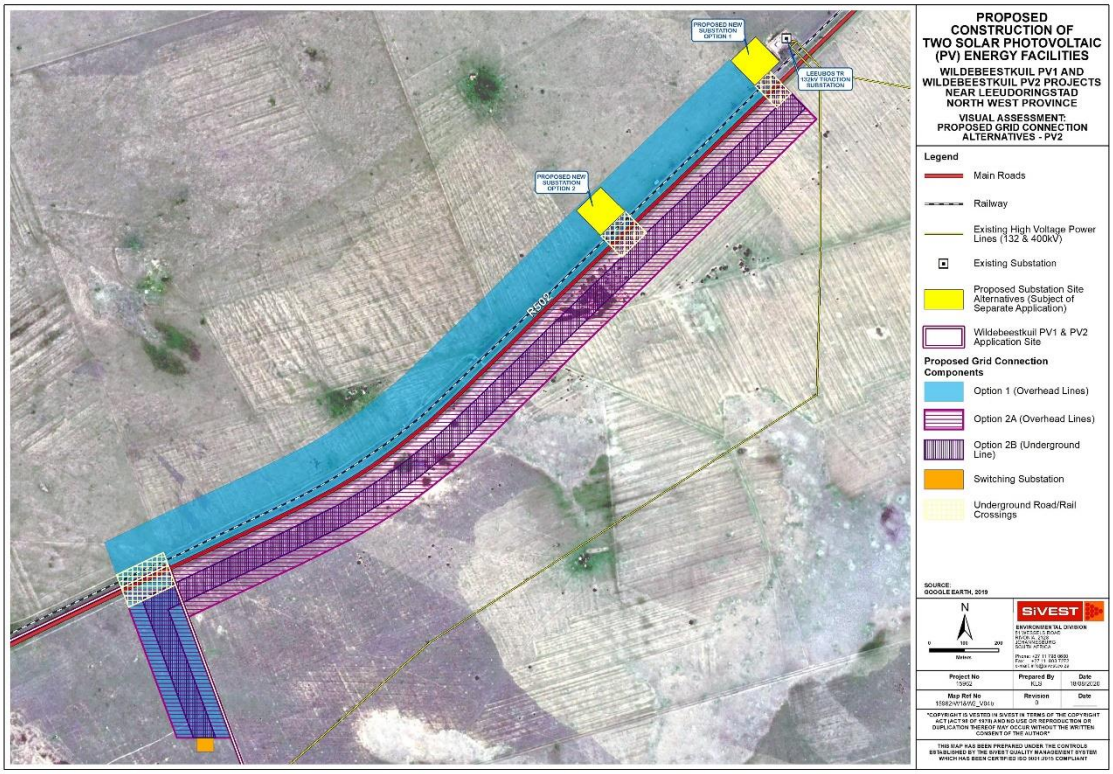

Figure 6: Wildebeestkuil 2 Solar PV Plant and 132kV Power Line - Power Line Assessment Corridors

4. LEGAL REQUIREMENT AND GUIDELINES

Key legal requirements pertaining to the proposed developments are as follows:

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended, the each of the proposed SPEF and power line projects include listed activities which require a BA to be undertaken for each respective project. As part of these BA processes, the need for a specialist VIA to be undertaken has been identified in order to assess the visual impact of the proposed developments.

There is currently no legislation within South Africa that explicitly pertains to the assessment of visual impacts, however, visual specialist studies are subject to the requirements of Appendix 6 of the Environmental Impact Assessment Regulations, as amended, (EIA Regulations), promulgated under sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

In addition to the NEMA, the following legislation has relevance to the protection of scenic resources:

- National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
- National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)

Based on these Acts, protected or conservation areas and sites or routes with cultural or symbolic value have been taken into consideration when identifying sensitive and potentially sensitive receptor locations and rating the sensitivity of the study area.

5. DESCRIPTION OF THE RECEIVING ENVIRONMENT[5]

5.1 Physical and Land Use Characteristics

5.1.1 Topography

The topography within and in the immediate vicinity of the proposed application site is characterised by a mainly flat to gently undulating landscape, sloping down in a south-easterly direction.

In addition, the topography in the wider visual assessment zone is largely characterised by level plains with little noticeable relief and very gradual slopes (**Figure 7**).

[5] Proposed solar PV plants and 132kV power line corridors are located on the same properties and are identical in nature. The receiving environment for both proposed solar PV plants and 132kV power lines will therefore be identical. Where certain information is project specific, this has been indicated in the relevant sub-section.

Figure 7: Level plains with little noticeable relief resulting in wide-ranging vistas

Maps showing the topography and slopes within and in the immediate vicinity of the assessment area are provided in Error! Reference source not found. and **Figure 9** below.

Visual Implications

The largely flat terrain in the immediate vicinity of the application site results in generally wide-ranging vistas throughout the study area.

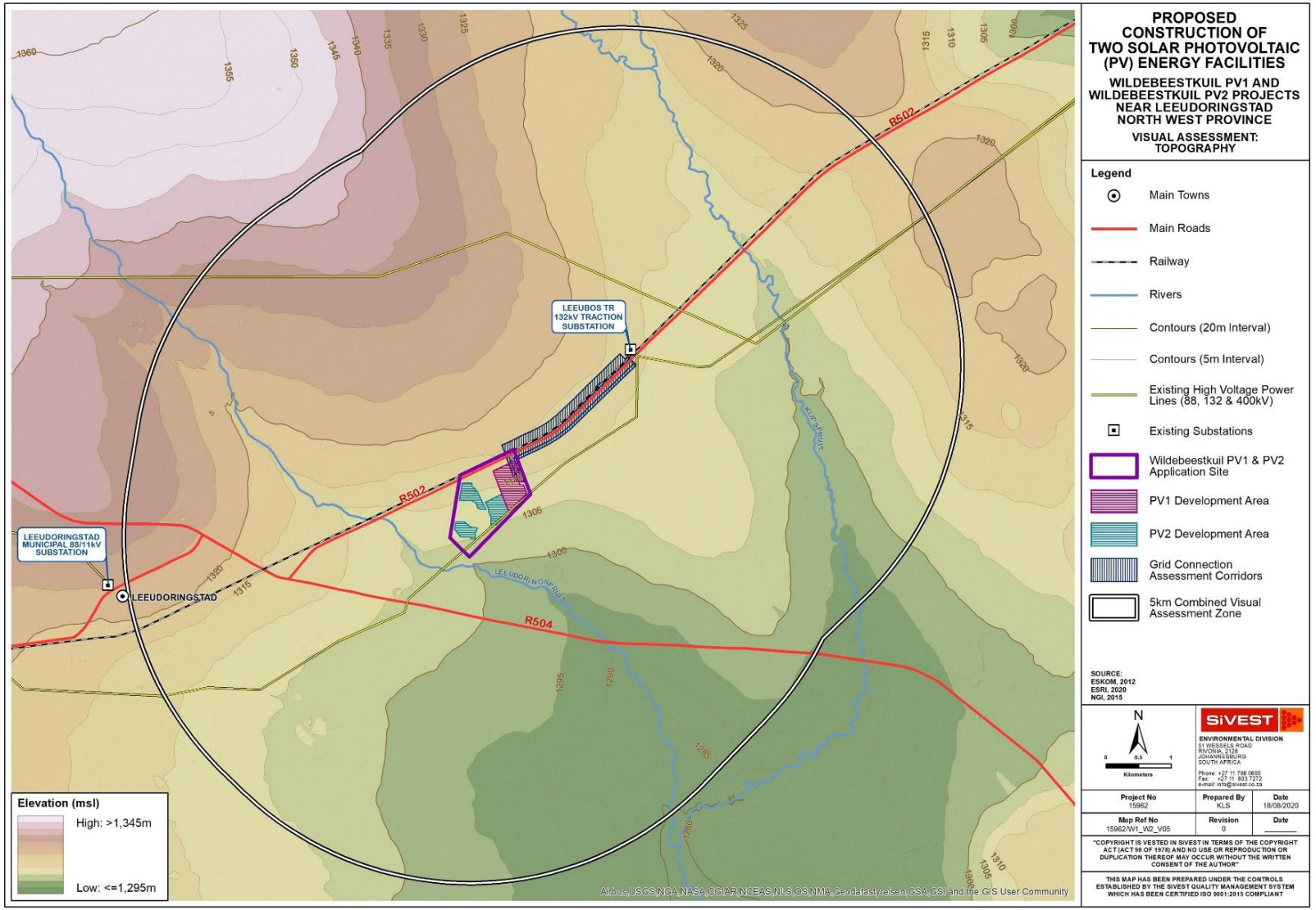

Figure 8: Topography within the study area – Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plants & 132kV Power Lines

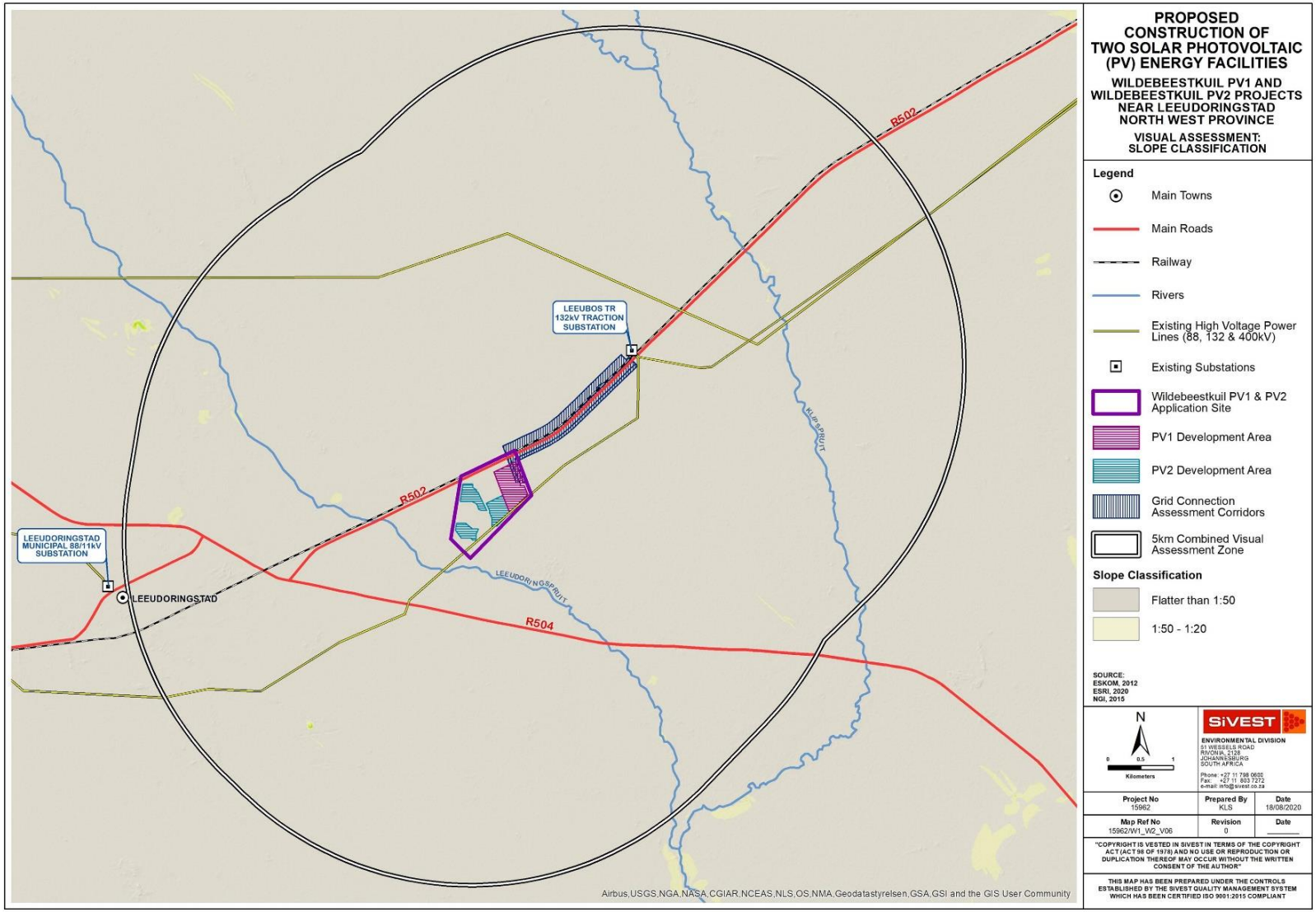

Figure 9: Slope Classification in the study area - Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plants & 132kV Power Lines

5.1.2 Vegetation

According to Mucina and Rutherford (2006), the entire study area is lies in the Vaal-Vet Sandy Grassland vegetation unit (**Figure 12**). The vegetation and landscape features of the Vaal-Vet Sandy Grassland vegetation unit are associated with plains-dominated landscapes with some scattered, slightly irregular and undulating plains and hills. Mainly low-tussock grasslands are prevalent with an abundant karroid element. The dominance of *Themeda triandra* is an important feature of this vegetation unit. Locally, low cover of *T. triandra* and the associated increase in *Elionurus muticus*, *Cymbopogon pospischilii* and *Aristida congesta* is attributed to heavy grazing and/or erratic rainfall. Much of the study area is therefore characterised by low grassland, however with a scattering of low acacia trees (Vachellia Karoo) in evidence (**Figure 10**).

Figure 10: Typical grassland vegetation with acacia trees in evidence.

In some parts of the study area, anthropogenic activities such as cultivation and livestock rearing have had an impact on the natural vegetation. Cultivated and fallow or burned fields are evident and in some instances, tall trees (sometimes exotic) and other typical garden vegetation have been established over many years around farmsteads (**Figure 11**).

Figure 11: Tall exotic tree species typically found in the study area

Visual Implications

The predominant open grassland results in wide-open vistas across most of the study area and as such the existing vegetation cover will provide little visual screening. In some instances, however, tall trees (sometimes exotic) established around farmhouses would provide some degree of visual screening.

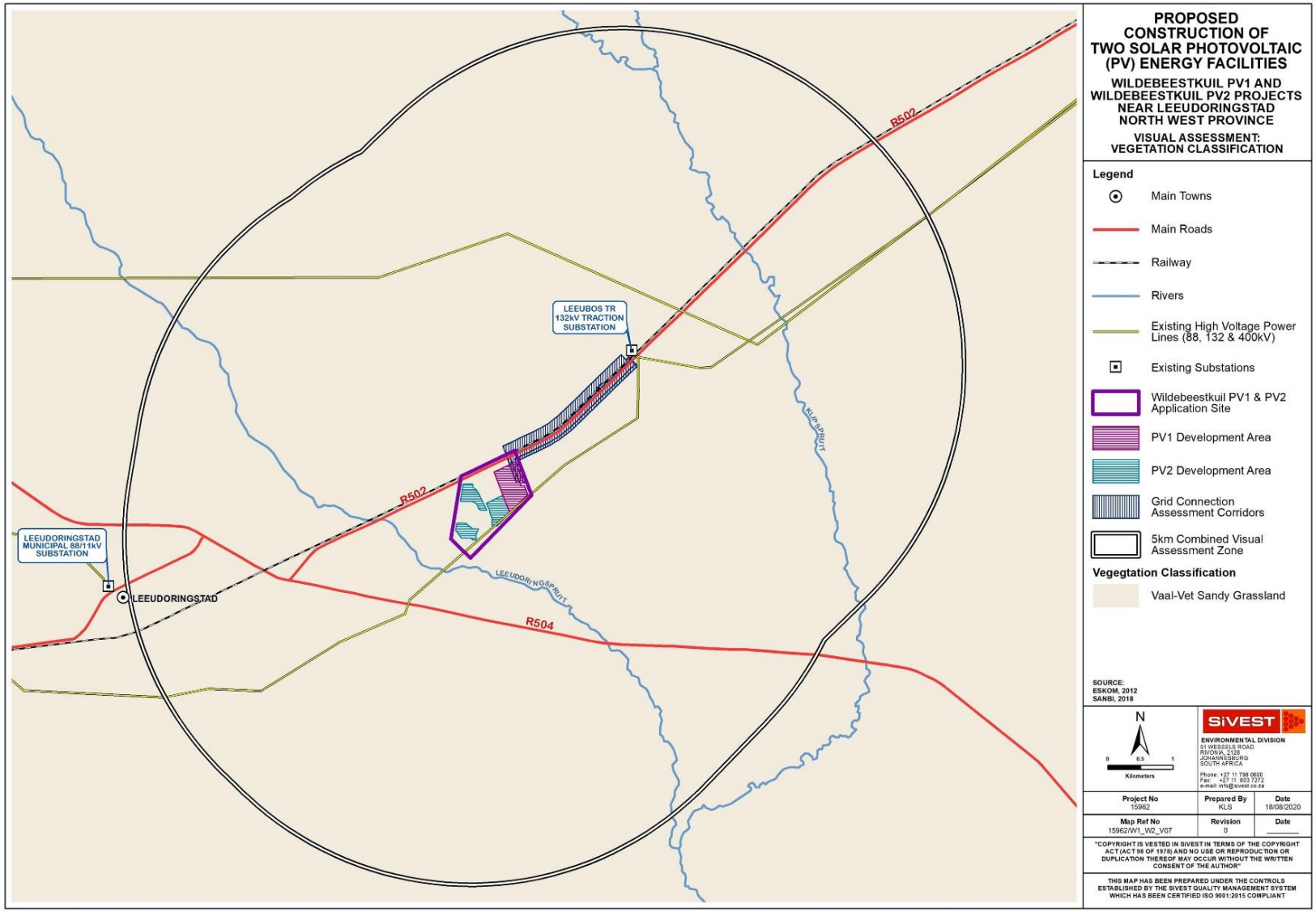

Figure 12*:* Vegetation Classification in the study area - Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plants & 132kV Power Lines

5.1.3 Land Use

According to the South African National Land Cover dataset (GeoTerra Image 2018), much of the visual assessment area is characterised by natural vegetation which is dominated by natural grassland (***Figure 20***). There are however significant patches of land classified as "cultivated land" throughout the study area, although much of this land appears to be fallow grasslands. Hence, livestock farming is the dominant agricultural activity in the study area, although livestock densities appear to be relatively low.

Farm properties in the study area tend to be relatively large resulting in a low density of rural settlement. Built form is largely characterised by scattered farmsteads and ancillary farm buildings (**Figure 13**), gravel access roads, telephone lines, fences and the remnants of disused workers' dwellings. Other human influence is visible in the area in the form of road, rail and electricity infrastructure. This includes the R502 regional road which traverses the visual assessment zone in a north-east to south-west direction (along the southern boundary of the application site) and the R504 regional road which traverses the south-western section of the visual assessment zone. In addition, an operational railway line runs directly adjacent to the R502 (**Figure 14**) and several high voltage power lines (**Figure 15**) feed into the Leeubos TR 132kV Traction Substation located approximately 2.5kms north-east of the application site. The tall steel structures of the Traction Substation, as well as the tall steel towers of the power lines are expected to be visible from various parts of the study area (**Figure 16**).

Figure 13: Isolated Farmhouse visible from R504 Main Road

Figure 14: Railway infrastructure adjacent to the R502 Main Road

Figure 15: High voltage power lines in the study area

Figure 16: Power lines feeding into the Leeubos TR 132kV Traction Substation

The closest built-up areas include the Kgakala Township and the town of Leeudoringstad. In addition, there some urban smallholdings on the outskirts of the town of Leeudoringstad as well as some mining / quarrying activity in the southern section of the visual assessment zone.

The town of Leeudoringstad, which is located approximately 3.3km south-west of the application site, is essentially a small agricultural service centre comprising a mix of commercial, service industrial and residential land use (***Figure 17***) with associated road, rail and electricity infrastructure. Human influence within and also on the outskirts of the town has significantly altered the visual character in this sector of the study area.

Figure 17: Typical urban development in the town of Leeudoringstad

The presence of Kgakala Township, located approximately 500m north-west of the application site, has further altered the visual character of this sector of the study area. Within close proximity to this township, human influence is visible in the form of urban development and electricity infrastructure (**Figure 18**). General degradation of the visual character of the area has been exacerbated by significant amounts of litter in the township and the surrounding area, and the presence of an informal dumping site located on the outskirts of the township (**Figure 19**) contributes to the overall disturbed nature of the Kgakala area.

Figure 18: Urban and infrastructural built form of Kgakala Township

Figure 19: Informal dumping site on the outskirts of Kgakala Township

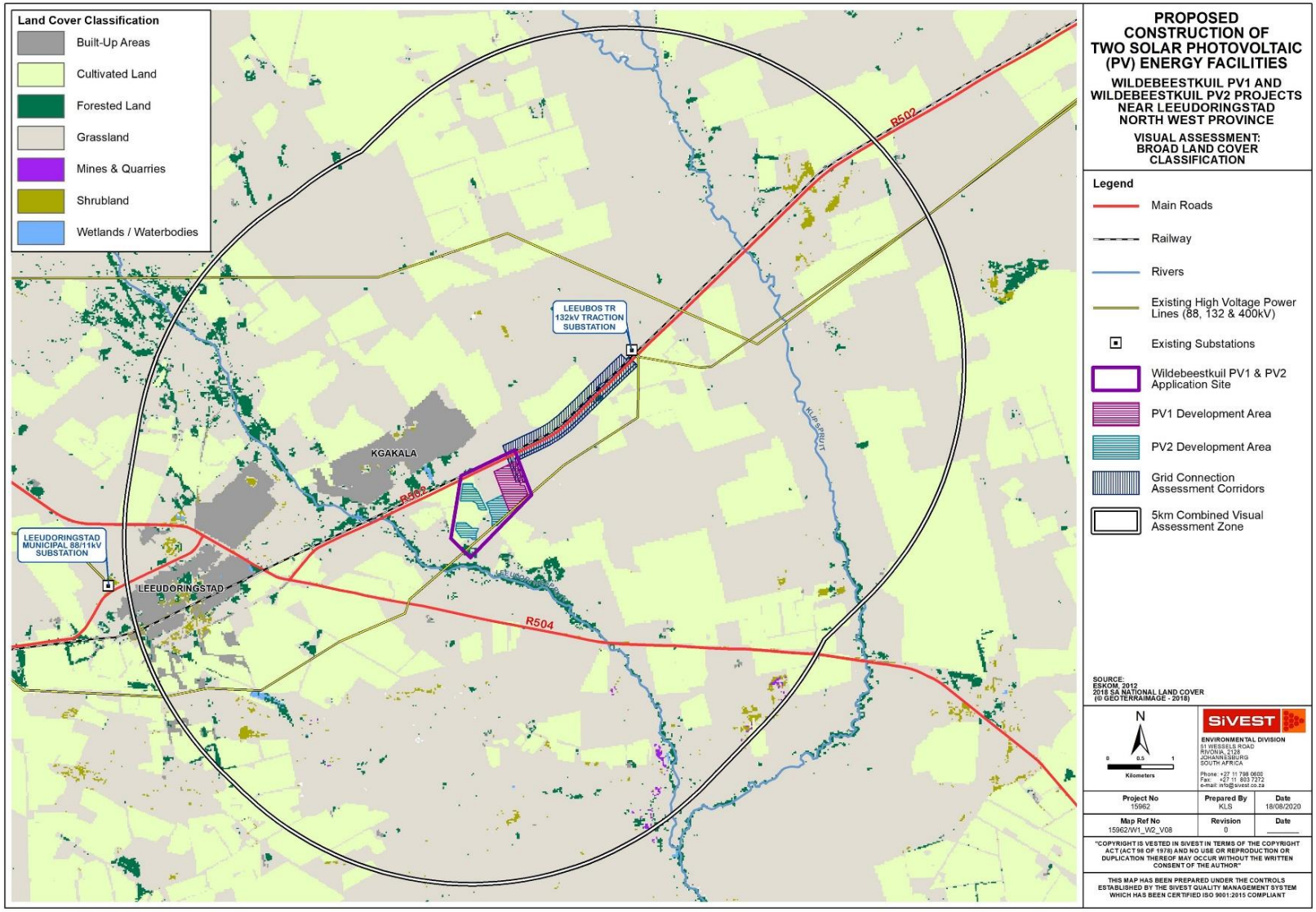

Figure 20: Land cover classification in the study area - Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plants & 132kV Power Lines

Visual Implications

The relatively low density of human habitation and presence of natural vegetation cover across large portions of the study area would give the viewer the general impression of a largely natural setting with some pastoral elements resulting from cultivation and livestock rearing activities. High levels of human transformation and visual degradation become evident in the vicinity of the town of Leeudoringstad and Kgakala Township. Urban development and associated infrastructure significantly alter the visual character within the urban areas and on their periphery. General landscape degradation in the vicinity of Kgakala Township has been exacerbated by significant amounts of litter and a dumping site on the periphery of the township, thus contributing to the overall disturbed and degraded visual character of the surrounding area.

It should also be noted that the presence of road, rail and electricity infrastructure result in a more urban or industrial landscape character. Hence, the visual impacts associated with the proposed developments are expected to be relatively insignificant in these areas as they have been relatively transformed and / or degraded.

The influence of the level of human transformation on the visual character of the area is described in more detail below.

6. SPECIALIST FINDINGS[6]

6.1 Visual Character and Cultural Value

The above physical and land use-related characteristics of the study area contribute to its overall visual character. Visual character largely depends on the level of change or transformation from a natural baseline in which there is little evidence of human transformation of the landscape. Varying degrees of human transformation of a landscape would engender differing visual characteristics to that landscape, with a highly modified urban or industrial landscape being at the opposite end of the scale to a largely natural undisturbed landscape. Visual character is also influenced by the presence of built infrastructure such as buildings, roads and other elements such as rail or electrical infrastructure. The visual character of an area largely determines the sense of place relevant to the area. This is the unique quality or character of a place, whether natural, rural or urban which results in a uniqueness, distinctiveness or strong identity.

As mentioned above, much of the study area is characterised by rural areas with natural unimproved vegetation. Agriculture in the form of cultivation and livestock rearing is the dominant land use, which has transformed the natural vegetation in some areas. However, a large portion of the study area has retained a natural appearance due to the presence of the low shrubs and grasslands and the introduction of solar PV plants, power lines and associated infrastructure into this environment could be considered to be a degrading factor.

[6] Due to the fact that the proposed solar PV plants and power line corridor alternatives are located on the same properties and are identical in nature, the findings and impacts identified are applicable to both proposed solar PV plant and 132kV power projects. In addition, the recommended mitigation measures are applicable for both proposed solar PV plants and 132kV power lines.

The most prominent anthropogenic elements in these areas include the R502 and R504 regional roads, rail infrastructure, high voltage power lines, the Leeubos TR 132kV Traction Substation, and other linear elements such as telephone poles, communication poles and farm boundary fences. However, the town of Leeudoringstad and Kgakala Township and their environs appear more urban or disturbed, thus altering the overall visual character of the study area. In addition, litter in and around Kgakala Township and the presence of a dumping site on the outskirts of the township contribute to the overall disturbed nature of the area and will ultimately further degrade the visual character of the surrounding area.

The presence of the anthropogenic elements in the landscape is an important factor in this context, as the introduction of the proposed developments would result in less visual contrast where other anthropogenic elements are already present. As such, the proposed developments are not expected to result in significant visual impacts within these transformed areas.

The greater area surrounding the development site is an important component when assessing visual character. The area can be considered to be typical of a rural farming landscape that consists of largely flat areas of natural low shrubland and grassland interspersed with farmsteads, windmills, livestock holding pens and agricultural land. Livestock farming and other forms of agriculture are evident within the area. In addition, cultivation is considered to be an important land use within the study area. This can be attributed to the fact that the headquarters of “Suidwes Landbou”, one of the largest agricultural companies in South Africa, is located in the town of Leeudoringstad.

The small farming town of Leeudoringstad was established in 1920 and named after the Lion-thorn tree that was once characteristic of the farm Rietkuil, upon which the village was laid out. With the passing of time hunters gradually reduced the numbers of game in the area and the natural vegetation, including the “lion thorn” also gradually disappeared. The town made newspaper headlines on 17 July 1932 when a train carrying 320 to 330 tons of dynamite from the De Beers factory at Somerset West to the Witwatersrand exploded in the town centre, killing five people and numerous livestock, as well as damaging almost every building in the town. "The Star" newspaper of July 18th, 1932 carried extensive articles regarding this incident. This above-mentioned incident is described in the Leeudoringstad Museum (http://www.stayza.com/leeudoringstad/). In addition, pieces of the explosion can be found in the Koos Russouw Collection (http://www.mullersgazette.co.za/Leeudoringstad.html).

Considering the historical significance of the area, the broader area could potentially be seen to have some significance as a “cultural landscape” in the South African context. Although the cultural landscape concept is relatively new, it is becoming an increasingly important concept in terms of the preservation and management of rural and urban settings across the world (Breedlove, 2002). In 1992 the World Heritage Committee[7] adopted the following definition for cultural landscapes:

Cultural landscapes represent the combined worlds of nature and of man illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal.

Cultural Landscapes can fall into three categories (according to the Committee's Operational Guidelines):

[7] UNESCO, 2005. Operational Guidelines for the Implementation of the World Heritage Convention. UNESCO World Heritage Centre. Paris

- "a landscape designed and created intentionally by man";
- an "organically evolved landscape" which may be a "relict (or fossil) landscape" or a "continuing landscape"; and
- an "associative cultural landscape" which may be valued because of the "religious, artistic or cultural associations of the natural element".

Based on the above, the study area can be regarded as a type 'ii' organically evolving cultural landscape. It can be considered both a relict landscape, due to the relatively rich history dating back to the 1930's, and a continuing landscape as the typical rural farming landscape represents how the environment has been shaped by the predominant land use and economic activity practiced in the area, as well as the patterns of human habitation and interaction. The presence of small farming towns, such as Leeudoringstad, engulfed by an otherwise rural environment, form an integral part of the wider landscape.

In light of this, it is important to assess whether the introduction of solar PV plants with associated infrastructure and 132kV power lines into the study area would be a degrading factor in the context of the rural farming character of the landscape. In this instance however, visual impacts on the cultural landscape would be reduced by the fact that the visual character has been significantly transformed and degraded by urban and infrastructural development and also the fact there are relatively few tourism or nature-based leisure facilities in the study area.

6.2 Visual Sensitivity

Visual sensitivity can be defined as the inherent sensitivity of an area to potential visual impacts associated with a proposed development. It is based on the physical characteristics of the area (i.e. topography, landform and land cover), the spatial distribution of potential receptors, and the likely value judgements of these receptors towards a new development (Oberholzer: 2005). A viewer's perception is usually based on the perceived aesthetic appeal of an area and on the presence of economic activities (such as recreational tourism) which may be based on this aesthetic appeal.

In order to assess the visual sensitivity of the area, SiVEST has developed a matrix based on the characteristics of the receiving environment which, according to the Guidelines for Involving Visual and Aesthetic Specialists in the EIA Processes, indicate that visibility and aesthetics are likely to be 'key issues' (Oberholzer: 2005).

Based on the criteria in the matrix (Error! Reference source not found.), the visual sensitivity of the area is broken up into a number of categories, as described below:

i) **High** - The introduction of a new development such as a solar PV facility would be likely to be perceived negatively by receptors in this area; it would be considered to be a visual intrusion and may elicit opposition from these receptors.
ii) **Moderate** – Receptors are present, but due to the nature of the existing visual character of the area and likely value judgements of receptors, there would be limited negative perception towards the new development as a source of visual impact.
iii) **Low** - The introduction of a new development would not be perceived to be negative, there would be little opposition or negative perception towards it.

The table below outlines the factors used to rate the visual sensitivity of the study area. The ratings are specific to the visual context of the receiving environment within the study area.

Table 1: Environmental factors used to define visual sensitivity of the study area – Wildebeestkuil 1 and Wildebeestkuil 2

FACTORS	DESCRIPTION	RATING									
		LOW									*HIGH*
		1	2	3	4	5	6	7	8	9	10
Pristine / natural / scenic character of the environment	Study area is largely natural with areas of scenic value and some pastoral elements.										
Presence of potentially sensitive visual receptors	Relatively few potentially sensitive receptors have been identified in the study area.										
Aesthetic sense of place / visual character	Visual character is typical of Karoo Cultural landscape.										
Irreplaceability / uniqueness / scarcity value	Although there are areas of scenic value within the study area, these are not rated as highly unique.										
Cultural or symbolic meaning	Much of the area is typical of a Karoo Cultural landscape.										
Protected / conservation areas in the study area	No protected or conservation areas were identified in the study area.										
Sites of special interest present in the study area	No sites of special interest were identified in the study area.										
Economic dependency on scenic quality	Few tourism/leisure-based facilities in the area										
International / regional / local status of the environment	Study area is typical of Karoo landscapes										
**Scenic quality under threat / at risk of change	Introduction of Solar PV facilities and associated power lines will alter the visual character and sense of place. In addition, the development of other renewable energy facilities in the broader area as planned or under construction will introduce an increasingly industrial character, giving rise to significant cumulative impacts										

Low				Moderate					High
10	20	30	40	50	60	70	80	90	100

Based on the above factors, the total score for the study area is 29, which according to the scale above, would result in the area being rated as having a **LOW** visual sensitivity. This is mainly due to significant landscape transformation and degradation resulting from urban and infrastructural development (such as the town of Leeudoringstad, Kgakala Township, R502 and R504 regional roads, high voltage power lines, Leeubos TR 132kV Traction Substation and the existing railway line) which would have reduced the scenic quality of the area.

It should be stressed, however, that the concept of visual sensitivity has been utilised indicatively to provide a broad-scale indication of whether the landscape is likely to be sensitive to visual impacts, and is based on the physical characteristics of the study area, economic activities and land use that predominates. An important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs.

No formal protected areas were identified in the study area and although a significant number of potentially sensitive receptors were identified in the study area, most of these appear to be existing farmsteads. These farmsteads are regarded as potentially sensitive visual receptors because they are located within a mostly rural setting and the proposed developments will likely alter natural vistas experienced from these locations, although the residents' sentiments toward the proposed developments are unknown.

6.3 Sensitive Visual Receptors

A sensitive visual receptor location is defined as a location from where receptors would potentially be impacted by a proposed development. Adverse impacts often arise where a new development is seen as an intrusion which alters the visual character of the area and affects the 'sense of place'. The degree of visual impact experienced will however vary from one receptor to another, as it is largely based on the viewer's perception.

A distinction must be made between a receptor location and a sensitive receptor location. A receptor location is a site from where the proposed developments may be visible, but the receptor may not necessarily be adversely affected by any visual intrusion associated with the developments. Less sensitive receptor locations include locations of commercial activities and certain movement corridors, such as roads that are not tourism routes. More sensitive receptor locations typically include sites that are likely to be adversely affected by the visual intrusion of the proposed development. They include tourism facilities, scenic sites and residential dwellings in natural settings.

The identification of sensitive receptors is typically based on a number of factors which include:

- the visual character of the area, especially taking into account visually scenic areas and areas of visual sensitivity;
- the presence of leisure-based (especially nature-based) tourism in an area;
- the presence of sites or routes that are valued for their scenic quality and sense of place;
- the presence of farmsteads in a largely natural setting where the development may influence the typical character of their views; and

- feedback from interested and affected parties, as raised during the public participation process conducted as part of the BA study.

Viewing distance is also a critical factor in the experiencing of visual impacts. As the visibility of the developments would diminish exponentially over distance (refer to **section 7.4** below), receptor locations which are closer to the proposed developments would experience greater adverse visual impacts than those located further away.

The degree of visual impact experienced will however vary from one inhabitant to another, as it is largely based on the viewer's perception. Factors influencing the degree of visual impact experienced by the viewer include the following:

- Value placed by the viewer on the natural scenic characteristics of the area.
- The viewer's sentiments toward the proposed structures. These may be positive (a symbol of progression toward a less polluted future) or negative (foreign objects degrading the natural landscape).
- Degree to which the viewer will accept a change in the typical rural / pastoral character of the surrounding area.

6.3.1 Receptor Identification

During the VIA, a significant number potentially sensitive visual receptor locations were identified within the study area by desktop means, most of which appear to be existing farmsteads. These farmsteads are regarded as potentially sensitive visual receptors as they are located within a mostly rural setting and the proposed developments will likely alter natural vistas experienced from these locations, although the residents' sentiments toward the proposed developments are unknown.

None of these receptor locations were identified as being sensitive. This is mainly due to the relative scarcity of leisure-based or nature based tourism activities in the assessment area. In addition, the only significant concentrations of human habitation in the study area are the town of Leeudoringstad and Kgakala Township which are both characterised by urban land uses and a high degree of transformation. Although there is a relatively high concentration of receptors in this area, these receptors are not expected to be sensitive to the visual impact of the proposed developments due to the existing visual degradation within these areas.

In many cases, roads, along which people travel, are considered to be sensitive receptors. The primary thoroughfares in the broader area the R502 and R504 Main Roads. The R502 regional road traverses the visual assessment zone in a north-east to south-west direction, connecting the town of Leeudoringstad in the west with the town of Orkney to the north-east. A section of this road abuts the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site. The R504 regional road traverses the south-western section of the visual assessment zone, linking the town of Leeudoringstad with the town of Bothaville to the south-east. The roads are single carriageway tar roads, primarily used as access routes by local residents.

These roads do not form part of any formal scenic tourist routes, and are not specifically valued or utilised for their scenic or tourism potential. As such, they are not considered to be visually sensitive.

Other thoroughfares in the study area include gravel access / secondary roads which are primarily used by local farmers to gain access to surrounding farms / properties. These roads are therefore not regarded as visually sensitive as they do not form part of any scenic tourist routes, and are not specifically valued or utilised for their scenic or tourism potential.

There are therefore no visually sensitive roads within the visual assessment zone.

The potentially sensitive visual receptor locations in relation to the zones of visual impact are indicated in **Figure 21** below.

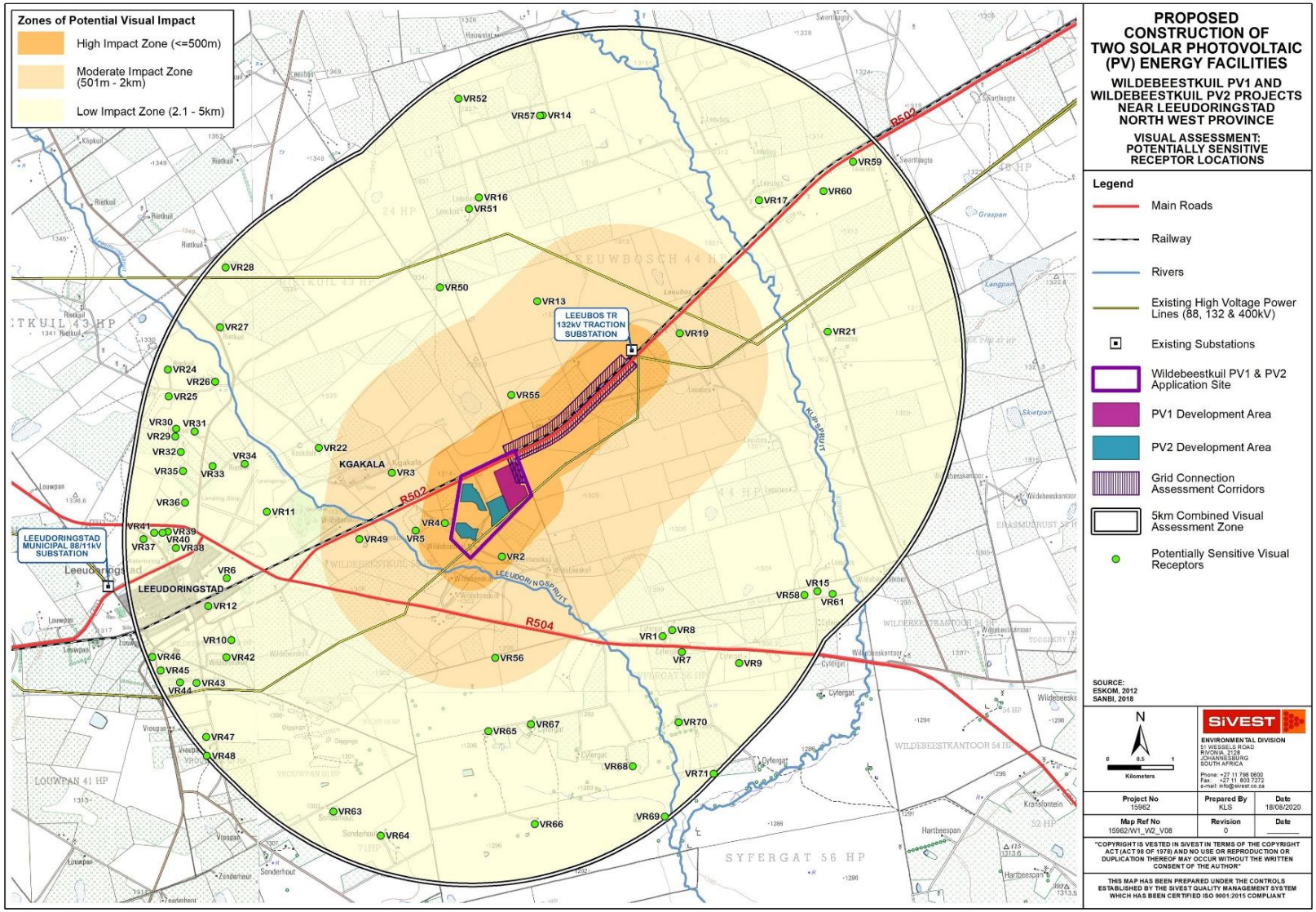

Figure 21: Visual Receptors in the study area – Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plants & 132kV Power Lines

6.4 Visual Absorption Capacity

Visual absorption capacity is the ability of the landscape to absorb a new development without any significant change in the visual character and quality of the landscape. The level of absorption capacity is largely based on the physical characteristics of the landscape (topography and vegetation cover) and the level of transformation present in the landscape.

Although the relatively flat topography in the study area and the relative lack of screening vegetation would reduce the visual absorption capacity, this would be offset to some degree by the presence of urban, peri-urban and infrastructural development in the vicinity of the proposed SPEFs and power lines.

Visual absorption capacity in the study area is therefore rated as **MODERATE**.

6.5 Site Sensitivity Verification

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 (as amended), 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 National Web-Based Environmental Screening Tool (Screening Tool[3]).

Visual sensitivity of the broader area surrounding the proposed Wildebeestkuil 1 and Wildebeestkuil 2 SPEF development site was found to be low largely due to the to the presence of degraded land and anthropogenic elements such as the town of Leeudoringstad, Kgakala Township, R502 and R504 regional roads, high voltage power lines, Leeubos TR 132kV Traction Substation and the existing railway line) which would likely reduce the scenic quality of the area.

As a result of the relatively flat terrain and the lack of screening vegetation, PV arrays placed on the site are expected to be at least partially visible from most of the potentially sensitive receptors and as such, no areas on the site were significantly more sensitive than the remainder of the site.

In assessing the visual sensitivity of the proposed Wildebeestkuil 1 and Wildebeestkuil 2 SPEF application site, consideration was given to the Landscape Theme of the National Environmental Screening Tool. Under this theme, the tool identifies areas of “High” and “**Medium”** sensitivity in respect of solar PV development on the application site. The identification of areas of “High” landscape sensitivity in this instance is related to the proximity of the site to Kgakala Township to the north-west and the Leeudoringspruit to the south of the application site. **Figure 22** below is an extract from the Screening Tool Report generated for the Wildebeestkuil 1 and Wildebeestkuil 2 SPEF application site.

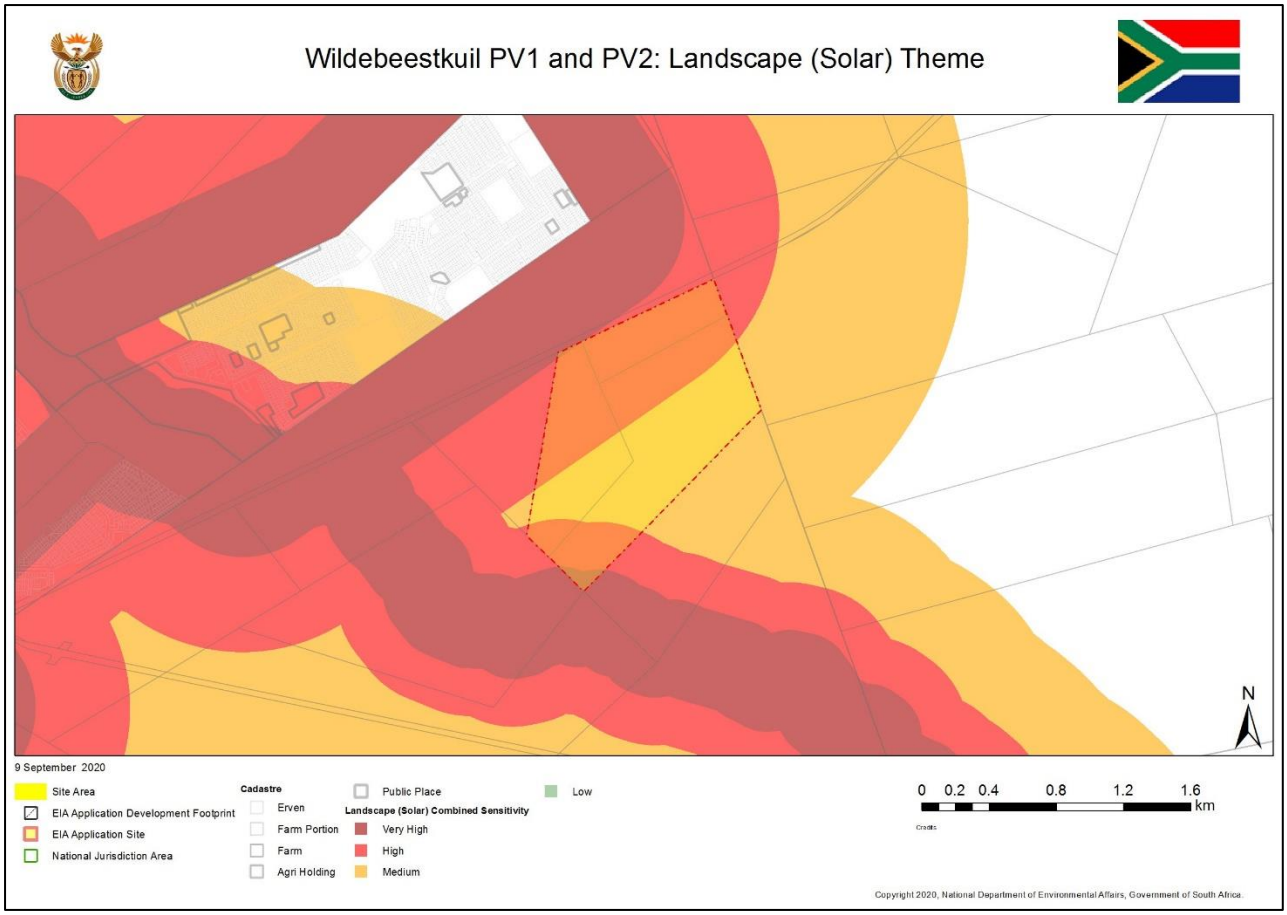

Figure 22: Relative Landscape Sensitivity for the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site

This VIA has however found that, although there is a relatively high concentration of receptors in the Kgakala Township, these receptors are not expected to be sensitive to the visual impact of the proposed developments due to the existing visual degradation within these areas. In addition, the site investigation did not confirm any landscape sensitivity associated with the Leeudoringspruit. In fact, views towards the watercourse from the R502 main road show significant degradation largely due to litter (***Figure 23***).

The National Environmental Screening Tool does not identify any landscape sensitivities in respect of the proposed power lines.

Figure 23: Views towards the Leeudoringspruit showing visual degradation due to litter

It should be noted that the Screening Tool is a very high level, desktop study and as such the results of the study must be viewed against the findings of the field investigation as well as factors affecting visual impact, such as:

- the presence of visual receptors;
- the distance of those receptors from the proposed developments; and
- the likely visibility of the developments from the receptor locations.

This issue is further examined in the Site Sensitivity Verification Report in **Appendix D**.

7. FACTORS INFLUENCING VISUAL IMPACT

7.1 Subjective experience of the viewer

The perception of the viewer / receptor toward an impact is highly subjective and involves 'value judgements' on behalf of the receptor. It is largely based on the viewer's perception and is usually dependent on the age, gender, activity preferences, time spent within the landscape and traditions of the viewer (Barthwal, 2002). Thus, certain receptors may not consider a Solar PV Facility or a power line to be a negative visual impact as the development is often associated with employment creation, social upliftment and the general growth and progression of an area, and thus the development could even have positive connotations.

7.2 Visual environment

SPEFs and power lines are not features of the natural environment but are rather a representation of human (anthropogenic) alteration. As such, these developments are likely to be perceived as visually intrusive when placed in largely undeveloped landscapes that have a natural scenic quality and where tourism activities, based upon the enjoyment of (or exposure to) the scenic or aesthetic character of the area, are practiced. Residents and visitors to these areas could perceive the PV panels, associated infrastructure and power lines to be highly incongruous in this context and may regard these features as an unwelcome intrusion which degrade the natural character and scenic beauty of the area, and which could potentially even compromise the practising of tourism activities in the area. The experience of the viewer is however highly subjective and there are those who may not perceive these features as a visual intrusion.

The presence of other anthropogenic features associated within the built environment may not only obstruct views but also influence the perception of whether a development is a visual impact. In industrial areas for example, where other infrastructure and built form already exists, the visual environment could be considered to be 'degraded' and thus the introduction of Solar PV facilities or power lines into this setting may be considered to be less visually intrusive than if there was no existing built infrastructure visible.

7.3 Type of visual receptor

Visual impacts can be experienced by different types of receptors, including people living, working or driving along roads within the viewshed of the proposed developments. The receptor type in turn affects the nature of the typical 'view', with views being permanent in the case of a residence or other places of human habitation, or transient in the case of vehicles moving along a road. The nature of the view experienced affects the intensity of the visual impact experienced.

It is important to note that visual impacts are only experienced when there are receptors present to experience this impact. Thus, where there are no human receptors or viewers present there are not likely to be any visual impacts experienced.

7.4 Viewing distance

Viewing distance is a critical factor in the experiencing of visual impacts, as beyond a certain distance, even large developments tend to be much less visible, and difficult to differentiate from the surrounding landscape. The visibility of an object is likely to decrease exponentially as one moves away from the source of impact, with the impact at 1 000m being considerably less than the impact at a distance of 500m (**Figure 24**).

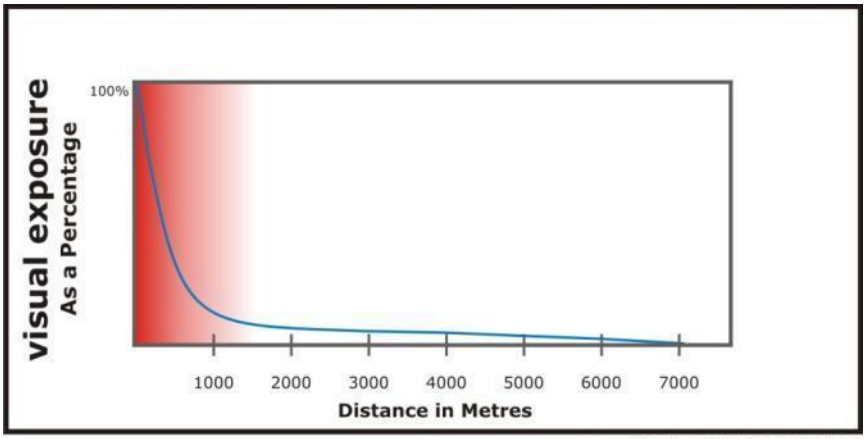

Figure 24: Conceptual representation of diminishing visual exposure over distance

8. ASSESSMENT OF IMPACTS[8]

8.1 Generic Visual Impacts Associated with Solar PV Facilities

In this section, the typical visual issues related to the establishment of solar PV facilities, associated on-site infrastructure and power lines as proposed are discussed. It is important to note that the renewable energy industry is still relatively new in South Africa and as such this report draws on international literature and web material (of which there is significant material available) to describe the generic impacts associated with solar PV energy facilities.

8.1.1 Solar PV Fields

The solar PV component of the respective proposed SPEFs consists of PV panels, which grouped together form a 'solar field'. As mentioned above, each PV panel is a large structure that is typically between 1 and 4m high (***Figure 25***). The height of these objects will make them visible, especially in the context of a relatively flat landscape.

[8] Due to the fact that the proposed solar PV plants and power line corridor alternatives are located on the same properties and are identical in nature, the impacts identified are applicable to both proposed solar PV plant and 132kV power projects. In addition, the recommended mitigation measures are applicable for both proposed solar PV plants and 132kV power lines.

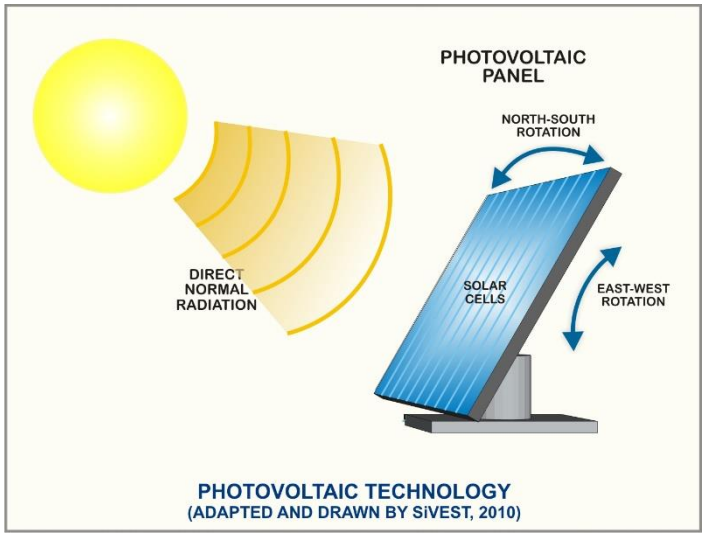

Figure 25: Typical components of a solar PV Panel

More importantly, the concentration of these panels will increase their visibility, depending on the number of panels in each solar field. Solar fields with a large spatial extent (footprint) will become distinctly visible features that contrast with the landscape, especially where the landscape is natural in character or undeveloped. In this context the solar field could be considered a visual intrusion, potentially altering the visual environment towards a more industrial character.

The establishment of solar PV facilities generally requires some levelling of the terrain and the clearance of taller shrubs and vegetation. This will intensify the visual prominence of the solar PV energy facility, particularly in natural locations where little transformation has taken place (**Figure 26**).

Figure 26: Kathu Solar Power Plant (photo courtesy of "visits to the park"), near Kathu, Northern Cape Province.

8.1.2 Associated On-Site Infrastructure

The infrastructure associated with the proposed Wildebeestkuil 1 and Wildebeestkuil 2 SPEFs will include the following (in addition to the PV arrays):

- Underground cabling (approximately 0,8 m x 0,6 wide);
- Permanent Guard house (≈871m^2);
- Temporary building zone (≈2994m^2);
- Switching Substation (≈2000m^2)
- Internal gravel roads (as required) (≈3.5m width);
- Upgrades to existing roads; and
- Site fencing (approximately 2.1m high).

Switching substations are generally large, highly visible structures which are relatively industrial in character. As they are not features of the natural environment, but are representative of human (anthropogenic) alteration, substations will be perceived to be incongruous when placed in largely natural landscapes. In this instance, each switching substation is intended to serve each proposed SPEF and as such, is likely to be perceived as part of the greater solar PV facility. Thus, the visual impact of the substation will be relatively minor when compared to the visual impact associated with the development as a whole.

Surface clearance for cable trenches, road upgrading and temporary building zones areas may result in the increased visual prominence of these features, thus increasing the level of contrast with the surrounding landscape. Buildings and associated infrastructure placed in prominent positions such as on ridge tops may break the natural skyline, drawing the attention of the viewer. In addition, security lighting on the site may impact on the nightscape (Section 8.3).

However, the visual impact of infrastructure associated with the proposed developments is generally not regarded as a significant factor when compared to the visual impact associated with large PV arrays. The infrastructure would, however, increase the visual "clutter" of the proposed developments and magnify the visual prominence of the developments if located on ridge tops or flat sites in natural settings where there is limited tall wooded vegetation to conceal the impact.

8.1.3 132kV Power Lines

As previously mentioned, three (3) power line corridor alternatives have been considered for each respective solar PV project The proposed power line corridor alternatives have been aligned to run parallel to the R502 in a north-eastern direction, culminating at the proposed Leeudoringstad Solar Plant Substation on Portion 37 of the Farm Leeuwbosch No 44 (part of a separate BA process).

Power line towers and substations are by their nature very large objects and thus highly visible. Although no information has been provided regarding tower heights, for the purposes of this VIA, it is assumed that the maximum tower height for the proposed overhead power line is assumed to be 30m (equivalent in height to a ten storey building). Although a pylon / tower structure would be less visible than a building, the height of the structure means that the pylon would still typically be visible from a considerable distance. Visibility would

be increased by the fact that the power line comprises a series of towers typically spaced approximately 200m to 400m apart in a linear alignment.

As described above, power lines are not features of the natural environment, but are representative of human (anthropogenic) alteration of the natural environment. Thus, elements of grid connection infrastructure could be perceived to be highly incongruous in the context of a largely natural landscape. The height and linear nature of the power lines will exacerbate this incongruity, as the towers may impinge on views within the landscape. In addition, the practice of clearing taller vegetation from areas within the power line servitude can increase the visibility and incongruity of the power lines. In a largely natural, bushy setting, vegetation clearance will cause fragmentation of the natural vegetation cover, thus making the power lines more visible and drawing the viewer's attention to the servitude.

In this instance, the proposed power line corridor alternatives run through an area which is significantly transformed due to the presence of urban development and existing electrical, road and rail infrastructure. This factor is therefore expected to lessen the visual contrast associated with the introduction of new power lines. In addition, the proposed power line developments are intended to serve the proposed Wildebeestkuil 1 and Wildebeestkuil 2 SPEFs and as such, will only be built if the respective SPEF projects go ahead. The power lines are therefore likely to be perceived as part of the greater SPEF developments and the visual impact will be relatively minor when compared to the visual impact associated with the SPEFs as a whole.

8.2 Receptor Impact Rating

In order to assess the impact of the proposed solar PV facilities, 132kV power lines and associated infrastructure on the identified potentially sensitive receptor locations, a matrix that takes into account a number of factors has been developed and is applied to each receptor location.

The matrix is based on a number of factors as listed below:

- Distance of a receptor location away from the proposed developments (zones of visual impact)
- Presence of screening elements (topography, vegetation etc.)
- Visual contrast of the developments with the landscape pattern and form

These factors are considered to be the most important factors when assessing the visual impact of a proposed developments on a potentially sensitive receptor location in this context. It should be noted that this rating matrix is a relatively simplified way of assigning a likely representative visual impact, which allows a number of factors to be considered. Experiencing visual impacts is however a complex and qualitative phenomenon and is thus difficult to quantify accurately. The matrix should therefore be seen as a representation of the likely visual impact at a receptor location. Part of its limitation lies in the quantitative assessment of what is largely a qualitative or subjective impact.

8.2.1 Distance

As described above, the distance of the viewer / receptor location from the developments is an important factor in the context of experiencing visual impacts which will have a strong bearing on mitigating the potential visual impact. A high impact rating has been assigned to receptor locations that are located within 500m of the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site. Beyond 5km, the visual impact of a solar PV facilities and the associated infrastructure diminishes considerably, as the development would appear to merge with the elements on the horizon. Hence, receptor locations beyond this distance have not been included in the receptor impact rating.

As both the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant share the same application site, zones of visual impact were delineated according to distance from the boundary of the application site. Based on the height and scale of the solar PV projects, the distance intervals chosen for the zones of visual impact are as follows:

- 0 - 500m (high impact zone)
- 500m – 2km (moderate impact zone)
- 2km - 5km (low impact zone)

Zones of visual impact for the 132kV power lines were delineated according to distance from the outer boundary of the combined power line assessment corridors. Based on the assumed height of the power line towers, the distance intervals chosen for the zones of visual impact are as follows:

- 0 - 500m (high impact zone)
- 500m – 2km (moderate impact zone)
- 2km - 5km (low impact zone)

8.2.2 Screening Elements

The presence of screening elements is an equally important factor in this context. Screening elements can be vegetation, buildings and topographic features. For example, a grove of trees or a series of low hills located between a receptor location and an object could completely shield the object from the receptor. As such, where views of the proposed developments are completely screened, the receptor has been assigned an overriding nil impact rating, as the developments would not impose any impact on the receptor.

8.2.3 Visual Contrast

The visual contrast of a development refers to the degree to which the development would be congruent with the surrounding environment. This is based on whether or not the development would conform to the land use, settlement density, structural scale, form and pattern of natural elements that define the structure of the surrounding landscape. Visual compatibility is an important factor to be considered when assessing the impact of the developments on receptors within a specific context. A development that is incongruent with the

surrounding area could have a significant visual impact on sensitive receptors as it may change the visual character of the landscape.

The matrix returns a score which in turn determines the visual impact rating assigned to each receptor location (**Table 2**) below.

Table 2: Rating Scores

Rating	Overall Score
High Visual Impact	8-9
Moderate Visual Impact	5-7
Low Visual Impact	3-4
Negligible Visual Impact	(overriding factor)

An explanation of the matrix is provided in **Error! Reference source not found.** below.

Table 4 below presents a summary of the overall visual impact of the proposed development on each of the potentially sensitive visual receptor locations which were identified within 5kms of the proposed Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site and the combined 132kV power line assessment corridors.

Table 3: Visual assessment matrix used to rate the impact of the proposed developments on potentially sensitive receptors – Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant & 132kV Power Line

VISUAL FACTOR	VISUAL IMPACT RATING			
	HIGH	**MODERATE**	**LOW**	**OVERRIDING FACTOR: NEGLIGIBLE**
Distance of receptor away from proposed development	<= 500m **Score 3**	500m < 2km **Score 2**	2km < 5km **Score 1**	>5km
Presence of screening factors	No / almost no screening factors – development highly visible **Score 3**	Screening factors partially obscure the development **Score 2**	Screening factors obscure most of the development **Score 1**	Screening factors completely block any views towards the development, i.e. the development is not within the viewshed
Visual Contrast	**High contrast** with the pattern and form of the natural landscape elements (vegetation and land form), typical land use and/or human elements (infrastructural form) **Score 3**	**Moderate contrast** with the pattern and form of the natural landscape elements (vegetation and land form), typical land use and/or human elements (infrastructural form) **Score 2**	**Corresponds** with the pattern and form of the natural landscape elements (vegetation and land form), typical land use and/or human elements (infrastructural form) **Score 1**	

Table 4 Summary Receptor Impact Rating - Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant & 132kV Power Line

Receptor Location	Distance from PV Application Site	Distance from combined Power Line Assessment Corridor	Screening	Contrast	IMPACT RATING (SPEF)	IMPACT RATING (POWER LINE)
VR 1 - Farmstead	Low (1)	Low (1)	Moderate (2)	High (3)	**MODERATE (6)**	**MODERATE (6)**
VR 2 - Farmstead	High (3)	Moderate (2)	Moderate (2)	Moderate (2)	**MODERATE (7)**	**MODERATE (6)**
VR 3 – Kgakala Township	Moderate (2)	Moderate (2)	Low (1)	Low (1)	**LOW (4)**	**LOW (4)**
VR 4 - Farmstead	High (3)	Moderate (2)	Moderate (2)	Moderate (2)	**MODERATE (7)**	**MODERATE (6)**
VR 5- Farmstead	Moderate (2)	Moderate (2)	Moderate (2)	Moderate (2)	**MODERATE (6)**	**MODERATE (6)**
VR 6 – Leeudoringstad Golf Course	Low (1)	Low (1)	Low (1)	Low (1)	**LOW (3)**	**LOW (3)**
VR 7 - Farmstead	Low (1)	Low (1)	Moderate (2)	Moderate (2)	**MODERATE (5)**	**MODERATE (5)**
VR 8 - Farmstead	Low (1)	Low (1)	Moderate (2)	Moderate (2)	**MODERATE (5)**	**MODERATE (5)**
VR 9 - Farmstead	Low (1)	Low (1)	Moderate (2)	Moderate (2)	**MODERATE (5)**	**MODERATE (5)**
VR10 - Farmstead	Low (1)	Low (1)	Moderate (2)	Low (1)	**LOW (4)**	**LOW (4)**
VR 11 – Leeudoringstad Residential Community	Low (1)	Low (1)	Low (1)	Low (1)	**LOW (3)**	**LOW (3)**
VR 12 – Leeudoringstad Town	Low (1)	>5km	Low (1)	Low (1)	**LOW (3)**	**NEGLIGIBLE**
VR 13 - Farmstead	Low (1)	Moderate (2)	Moderate (2)	Moderate (2)	**MODERATE (5)**	**MODERATE (6)**

Receptor Location	Distance from PV Application Site	Distance from combined Power Line Assessment Corridor	Screening	Contrast	IMPACT RATING (SPEF)	IMPACT RATING (POWER LINE)
VR 14 - Farmstead	>5km	Low (1)	Moderate (2)	High (3)	**NEGLIGIBLE**	**MODERATE (6)**
VR 15 - Farmstead	Low (1)	Low (1)	Moderate (2)	High (3)	**MODERATE (6)**	**MODERATE (6)**
VR 16 - Farmstead	Low (1)	Low (1)	Moderate (2)	High (3)	**MODERATE (6)**	**MODERATE (6)**
VR 17 - Farmstead	>5km	Low (1)	Low (1)	Moderate (2)	**NEGLIGIBLE**	**LOW (4)**
VR 19 - Farmstead	Low (1)	Moderate (2)	Moderate (2)	Moderate (2)	**MODERATE (5)**	**MODERATE (6)**
VR 21 - Farmstead	>5km	Low (1)	Low (1)	High (3)	**NEGLIGIBLE**	**LOW (4)**
VR 22 - Farmstead	Low (1)	Low (1)	Low (1)	Low (1)	**LOW (3)**	**LOW (3)**
VR 24 - Farmstead	Low (1)	>5km	Low (1)	Moderate (2)	**LOW (4)**	**NEGLIGIBLE**
VR 25 - Farmstead	Low (1)	>5km	Low (1)	Moderate (2)	**LOW (4)**	**NEGLIGIBLE**
VR 26 - Farmstead	Low (1)	Low (1)	Low (1)	Moderate (2)	**LOW (4)**	**LOW (4)**
VR 27 - Farmstead	Low (1)	Low (1)	Low (1)	High (3)	**MODERATE (5)**	**MODERATE (5)**
VR 28 - Farmstead	Low (1)	>5km	Low (1)	High (3)	**MODERATE (5)**	**NEGLIGIBLE**
VR 29 - Farmstead	Low (1)	>5km	Low (1)	Moderate (2)	**LOW (4)**	**NEGLIGIBLE**
VR 30 - Farmstead	Low (1)	>5km	Low (1)	Moderate (2)	**LOW (4)**	**NEGLIGIBLE**
VR 31 - Farmstead	Low (1)	Low (1)	Low (1)	Moderate (2)	**LOW (4)**	**LOW (4)**
VR 32 - Farmstead	Low (1)	Low (1)	Low (1)	Moderate (2)	**LOW (4)**	**LOW (4)**

Receptor Location	Distance from PV Application Site	Distance from combined Power Line Assessment Corridor	Screening	Contrast	IMPACT RATING (SPEF)	IMPACT RATING (POWER LINE)
VR 33 - Farmstead	Low (1)	Low (1)	Low (1)	Moderate (2)	**LOW (4)**	**LOW (4)**
VR 34 - Farmstead	Low (1)	Low (1)	Low (1)	Low (1)	**LOW (3)**	**LOW (3)**
VR 35 - Farmstead	Low (1)	Low (1)	Low (1)	Low (1)	**LOW (3)**	**LOW (3)**
VR 36 - Farmstead	Low (1)	Low (1)	Low (1)	Low (1)	**LOW (3)**	**LOW (3)**
VR 37 - Smallholding	Low (1)	>5km	Low (1)	Low (1)	**LOW (3)**	**NEGLIGIBLE**
VR 38 - Smallholding	Low (1)	>5km	Low (1)	Low (1)	**LOW (3)**	**NEGLIGIBLE**
VR 39 - Smallholding	Low (1)	>5km	Low (1)	Low (1)	**LOW (3)**	**NEGLIGIBLE**
VR 40 - Smallholding	Low (1)	>5km	Low (1)	Low (1)	**LOW (3)**	**NEGLIGIBLE**
VR 41 - Smallholding	Low (1)	>5km	Low (1)	Low (1)	**LOW (3)**	**NEGLIGIBLE**
VR 42 - Farmstead	Low (1)	>5km	Low (1)	Moderate (2)	**LOW (4)**	**NEGLIGIBLE**
VR 43- Farmstead	Low (1)	>5km	Low (1)	Low (1)	**LOW (3)**	**NEGLIGIBLE**
VR 44 - Farmstead	Low (1)	>5km	Low (1)	Low (1)	**LOW (3)**	**NEGLIGIBLE**
VR 45 - Farmstead	Low (1)	>5km	Low (1)	Low (1)	**LOW (3)**	**NEGLIGIBLE**
VR 46 - Farmstead	Low (1)	>5km	Low (1)	Low (1)	**LOW (3)**	**NEGLIGIBLE**
VR 47 - Farmstead	Low (1)	>5km	Low (1)	Moderate (2)	**LOW (4)**	**NEGLIGIBLE**
VR 48 - Farmstead	Low (1)	>5km	Low (1)	Moderate (2)	**LOW (4)**	**NEGLIGIBLE**

Receptor Location	Distance from PV Application Site	Distance from combined Power Line Assessment Corridor	Screening	Contrast	IMPACT RATING (SPEF)	IMPACT RATING (POWER LINE)
VR 49 - Farmstead	Moderate (2)	Low (1)	Low (1)	Moderate (2)	**MODERATE (5)**	**LOW (4)**
VR 50 - Farmstead	Low (1)	Low (1)	Moderate (2)	Moderate (2)	**MODERATE (5)**	**MODERATE (5)**
VR 51 - Farmstead	Low (1)	Low (1)	Moderate (2)	High (3)	**MODERATE (6)**	**MODERATE (6)**
VR 52 - Farmstead	>5km	Low (1)	Moderate (2)	High (3)	**NEGLIGIBLE**	**MODERATE (6)**
VR 55 - Farmstead	Moderate (2)	Moderate (2)	Moderate (2)	Moderate (2)	**MODERATE (6)**	**MODERATE (6)**
VR 56 - Farmstead	Moderate (2)	Low (1)	Low (1)	High (3)	**MODERATE (6)**	**LOW (4)**
VR 57 - Farmstead	>5KM	Low (1)	Moderate (2)	High (3)	**NEGLIGIBLE**	**MODERATE (6)**
VR 58 - Farmstead	Low (1)	Low (1)	Moderate (2)	High (3)	**MODERATE (6)**	**MODERATE (6)**
VR 59 - Farmstead	>5KM	Low (1)	Low (1)	Moderate (2)	**NEGLIGIBLE**	**LOW (4)**
VR 60 - Farmstead	>5KM	Low (1)	Low (1)	Moderate (2)	**NEGLIGIBLE**	**LOW (4)**
VR 61 - Farmstead	Low (1)	Low (1)	Low (1)	High (3)	**MODERATE (5)**	**MODERATE (5)**
VR 63 - Farmstead	Low (1)	>5km	Low (1)	High (3)	**MODERATE (4)**	**NEGLIGIBLE**
VR 64 - Farmstead	Low (1)	>5km	Low (1)	High (3)	**MODERATE (5)**	**NEGLIGIBLE**
VR 65 - Farmstead	Low (1)	Low (1)	Low (1)	High (3)	**MODERATE (5)**	**MODERATE (5)**
VR 66 - Farmstead	Low (1)	>5km	Low (1)	High (3)	**MODERATE (5)**	**NEGLIGIBLE**
VR 67 - Farmstead	Low (1)	Low (1)	Low (1)	High (3)	**MODERATE (5)**	**MODERATE (5)**

Receptor Location	Distance from PV Application Site	Distance from combined Power Line Assessment Corridor	Screening	Contrast	IMPACT RATING (SPEF)	IMPACT RATING (POWER LINE)
VR 68 -Farmstead	Low (1)	Low (1)	Low (1)	High (3)	**MODERATE (5)**	**MODERATE (5)**
VR 69 - Farmstead	Low (1)	>5km	Low (1)	High (3)	**MODERATE (5)**	**NEGLIGIBLE**
VR 70 - Farmstead	Low (1)	Low (1)	Moderate (2)	High (3)	**MODERATE (6)**	**MODERATE (6)**
VR 71 - Farmstead	Low (1)	>5km	Moderate (2)	High (3)	**MODERATE (6)**	**NEGLIGIBLE**

Although the proposed developments would theoretically be visible (to a degree) from most of the potentially sensitive visual receptor locations, none of these potentially sensitive receptor locations are expected to experience high levels of visual impact as a result of the proposed developments. As indicated above, thirty-one (31) of the potentially sensitive visual receptors identified within the study area, will experience moderate levels of visual impact as a result of the proposed Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant projects and twenty-five (25) potentially sensitive receptors will experience moderate levels of impact as a result of the proposed 132kV power lines. None of these receptors are tourism-related facilities, and as such they are not considered to be Sensitive Receptors. Thus the moderate impact rating assigned will not affect the overall impact ratings determined in Section **8.7**.

Twenty-seven (27) potentially sensitive visual receptors will be subjected to low levels of visual impact as a result of the respective proposed SPEFs, while seventeen (17) will experience low levels of impact as a result of the 132kV power lines.

8.3 Night-time Impacts

The visual impact of lighting on the nightscape is largely dependent on the existing lighting present in the surrounding area at night. The night scene in areas where there are numerous light sources will be visually degraded by the existing light pollution and therefore additional light sources are unlikely to have a significant impact on the nightscape. In contrast, introducing new light sources into a relatively dark night sky will impact on the visual quality of the area at night. It is thus important to identify a night-time visual baseline before exploring the potential visual impact of the proposed developments at night.

The town of Leeudoringstad and Kgakala Township, located approximately 3.3km to the south-west and 0.5km north of the application site respectively, are the main sources of light within the surrounding area. These built-up areas are therefore expected to have a significant impact on the night scene in the vicinity of the Wildebeestkuil SPEF and power line projects. Another prominent light source within the study area at night is the security lighting at the existing Leeubos TR 132kV Traction Substation. It is expected that the lights from this substation will be visible at night from relatively far away. Other sources of light are limited to localised lighting from the surrounding farmsteads and residential dwellings. These farmsteads are located within largely undisturbed / untransformed parts of the study area and are therefore characterised by limited amounts of lighting at night. Accordingly, the visual character of the night environment within the study area is considered to be slightly ‘polluted’ and will therefore not be regarded as pristine.

Due to the fact that a significant amount of light is already present within the surrounding area, the nightscape is not expected to be sensitive to the impact of additional lighting at night. The relatively natural dark character of the nightscape experienced from many of the identified farmsteads is however expected to be moderately sensitive to the impact of additional lighting at night as these areas are characterised by limited disturbance / transformation. Existing night time views from these areas are characteristic of a relatively dark night scene with some light sources visible in the distance as well as those from the Kgakala Township, the town of Leeudoringstad and the existing Leeubos TR 132kV Traction substation.

The security lighting required for the proposed solar PV plants and associated infrastructure is expected to intrude slightly on the nightscape and create additional glare, which would increase the existing light pollution

in the surrounding area. Power lines and associated towers or pylons however are not generally lit up at night and thus the proposed 132kV power lines are not expected to result in significant lighting impacts.

8.4 Cumulative Impacts

Although it is important to assess the visual impacts of the proposed solar PV facilities specifically, it is equally important to assess the cumulative visual impact that could materialise if other renewable energy facilities (both wind and solar facilities) and associated infrastructure projects are developed in the broader area. Cumulative impacts occur where existing or planned developments, in conjunction with the proposed developments, result in significant incremental changes in the broader study area. In this instance, such developments would include renewable energy facilities and associated infrastructure development.

Renewable energy facilities have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other could significantly alter the sense of place and visual character in the broader region and also exacerbate the visual impacts on surrounding visual receptors, once constructed. Although power lines and substations are relatively small developments when compared to renewable energy facilities, they may still introduce a more industrial character into the landscape, thus altering the sense of place.

Seven (7) renewable energy projects were identified within a 50 km radius of the proposed developments as shown in **Figure 27** below. The projects, as listed **Table 5**, were identified using the DFFE's Renewable Energy EIA Application Database for SA. It is assumed that all of these renewable energy developments include grid connection infrastructure, although few details of this infrastructure were available at the time of writing this report.

Table 5: Renewable energy developments proposed within a 50km radius of the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Facilities & 132kV Power Lines

Applicant	Project	Technology	Capacity	Status of Application / Development
Bokomoso Energy (Pty) Ltd	Bokomoso PV Solar Energy Facility	Solar PV	75MW	Under Construction
Kabi Solar (Pty) Ltd	Kabi Vaalkop Solar PV Facility	Solar PV	75MW	Approved
Kabi Solar (Pty) Ltd	Kabi Witkop Solar PV Facility	Solar PV	75MW	In process
Genesis Orkney Solar (Pty) Ltd	Orkney PV SEF	Solar PV	100MW	Approved
Blue Wave Capital SA (Pty) Ltd	Wolmaransstad Solar Energy Facility	Solar PV	75MW	In process
Upgrade Energy (Pty) Ltd	Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plants	Solar PV	9.9MW	In process
Upgrade Energy (Pty) Ltd	Leeuwbosch 1 Solar PV Plant	Solar PV	9.9MW	In process
Upgrade Energy (Pty) Ltd	Leeuwbosch 2 Solar PV Plant	Solar PV	9.9MW	In process

It should be noted that, applications in respect of most of these facilities were submitted many years ago and as such, efforts to obtain additional information about the proposed projects have been largely unsuccessful. The assessment of the likely cumulative impacts of these developments has therefore been largely based on some broad assumptions regarding the likely impacts of solar energy developments.

Four (4) of the SPEFs identified are located more than 30kms from the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site, these being the Wolmaransstad Solar Energy Facility to the west, and Orkney PV and the two (2) Kabi SPEFs to the north-east of the application site. These projects are therefore well outside the visual assessment zone for this study and although the introduction of an increasingly industrial character into the broader area is inevitable, it is not anticipated that these developments will result in any significant cumulative impacts affecting the landscape or the visual receptors within the visual assessment zone.

Figure 27 below shows that the remaining three (3) sites proposed for SPEF development are located within 10kms of the application site and in close proximity to the R502 Main Road, these being the Leeuwbosch 1 Solar PV Plant, Leeuwbosch 2 Solar PV Plant and Bokamoso Solar Energy Facility (SEF). The proposed Leeuwbosch 1 Solar PV Plant and Leeuwbosch 2 Solar PV Plant projects are the subject of separate respective BA processes which are currently being undertaken in parallel to the BA processes for the proposed Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant & 132kV Power Line projects. It should also be noted that, related to the renewable energy developments, is a significant electrical infrastructure project in the form of the proposed Leeudoringstad Solar Plant Substation. This proposed substation is located on the Leeuwbosch 1 Solar PV Plant and Leeuwbosch 2 Solar PV Plant application site and is intended to serve the respective Leeuwbosch Solar PV projects as well as the respective Wildebeestkuil Solar PV projects. The proposed substation is the subject of a separate BA process which is currently being undertaken in parallel with the Wildebeestkuil and Leeuwbosch Solar PV project BAs.

As the proposed Leeuwbosch 1 and Leeuwbosch 2 Solar PV Plant projects are located within 5kms of the Wildebeestkuil Solar PV and Power Line projects and the proposed solar plant substation, it is anticipated that the identified potentially sensitive visual receptors will experience significant cumulative visual impacts should all of these SPEF Projects be constructed. Bokamoso SEF is however some 3km outside the visual assessment zone for the Wildebeestkuil Solar PV and Power Line projects and is only expected to affect the few receptors located in the eastern sector of the assessment zone. It is however important to note that the sensitivity of these farmsteads is largely subjective.

Areas in close proximity to the R503 have already undergone noticeable change as a result of road, rail and electricity infrastructure and this will be exacerbated with the development of additional SPEFs and associated infrastructure in these areas as proposed. Impacts of this transformation will however be reduced by the fact that the landscape in the vicinity of the proposed Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant & 132kV Power Line projects has already been disturbed by anthropogenic elements such as the built-up areas of the town of Leeudorinstad and Kgakala Township, the R502 and R504 regional roads, high voltage power lines, Leeubos TR 132kV Traction Substation and the existing railway line. In addition, it is possible that the Wildebeestkuil and Leeuwbosch Solar PV projects and associated grid connection infrastructure, located in close proximity to each other, could be seen as one large SPEF rather than separate developments. Although this will not necessarily reduce impacts on the visual character of the area, it could potentially reduce the cumulative impacts on the landscape.

An examination of the literature available for the environmental assessments undertaken for some of these renewable energy applications showed that the visual impacts identified and the recommendations and mitigation measures provided are largely consistent with those identified in this report. Where additional, relevant mitigation measures were provided in respect of the other renewable energy applications, these have been incorporated into this report, where relevant.

From a visual perspective, the further concentration of renewable energy facilities as proposed will inevitably change the visual character of the area and alter the inherent sense of place, introducing an increasingly industrial character into the broader area, and resulting in significant cumulative impacts. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures put forward by the visual specialists in their respective reports.

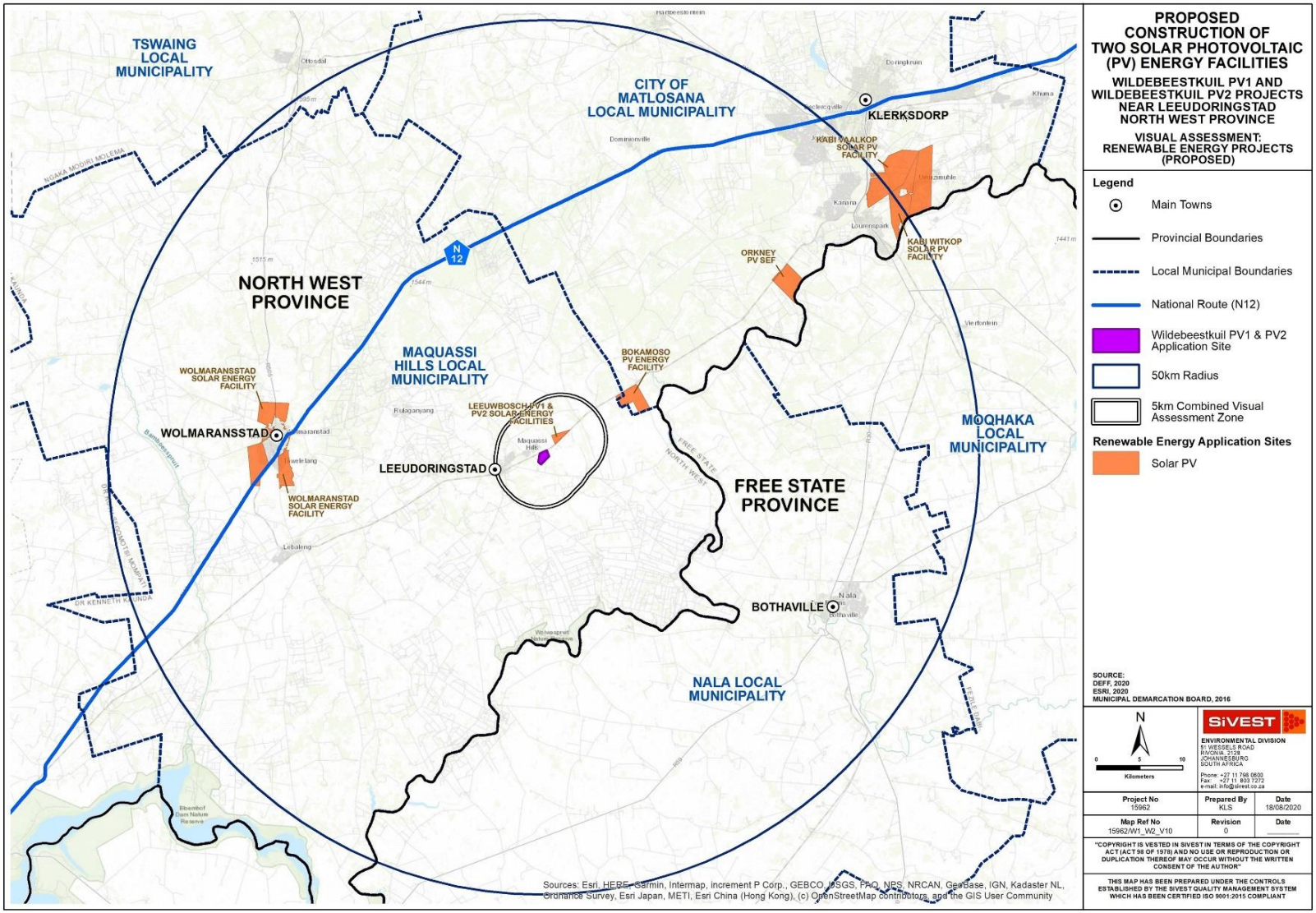

Figure 27: **Renewable energy facilities proposed within a 50km radius of the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site**

8.5 Summary of Key Issues identified

The potential visual issues / impacts identified during the VIA for the proposed Wildebeestkuil 1 and Wildebeest 2 SPEF projects, associated infrastructure and 132kV power lines include:

- Potential alteration of the visual character of the area during both construction and operation of the SPEFs and the 132kV power lines;
- Potential visual impact on receptors in the study area;
- Potential visual intrusion resulting from vehicles and equipment during construction and decommissioning phases;
- Potential impacts of increased dust emissions from construction / decommissioning activities and related traffic during construction and decommissioning phases;
- Potential impacts of increased dust emissions from maintenance vehicles accessing the site and the power line servitude;
- Potential visual scarring of the landscape as a result of site clearance and earthworks during construction;
- Potential visual intrusion resulting from PV arrays and power lines during operation;
- Potential visual clutter in the landscape resulting from the PV arrays and associated on-site infrastructure;
- Potential alteration of the night time visual environment as a result operational and security lighting at the proposed solar PV facilities;
- Potential visual intrusion of any remaining infrastructure on the site during decommissioning; and
- Combined visual impacts (i.e. cumulative visual impacts) from other renewable energy facilities in the broader area could potentially alter the sense of place and visual character of the area.

No comments or feedback pertaining to the visual environment have been received from the public participation process to date. Accordingly, any issues raised of a visual nature during the public participation process will be incorporated into this report.

8.6 Potential Impacts

It is anticipated that the potential visual issues / impacts resulting from the proposed Wildebeestkuil 1 Solar PV Plant project and associated 132kV power line will the same as those resulting from the proposed Wildebeestkuil 2 Solar PV Plant project and associated 132kV power line. These impacts are outlined below.

8.6.1 Construction Phase

- Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction.
- Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings.
- Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers.

- Surface disturbance during construction would expose bare soil (scarring) which could visually contrast with the surrounding environment.
- Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.
- The night time visual environment will be altered as a result of construction-related lighting at the proposed solar PV facilities.

8.6.2 Operational Phase

- The PV arrays, on-site infrastructure and 132kV power lines may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings.
- The proposed solar PV facilities, on-site infrastructure and 132kV power lines will alter the visual character of the surrounding area and expose potentially sensitive visual receptor locations to visual impacts.
- Dust emissions and dust plumes from maintenance vehicles accessing the site and power line servitude via gravel roads may evoke negative sentiments from surrounding viewers.
- The night time visual environment will be altered as a result of operational and security lighting at the proposed PV facilities.

8.6.3 Decommissioning Phase

- Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts.
- Decommissioning activities may be perceived as an unwelcome visual intrusion.
- Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers.
- Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the surrounding environment.
- Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.

8.6.4 Cumulative Impacts

- Additional renewable energy developments in the broader area will alter the natural character of the study area towards a more industrial landscape and expose a greater number of receptors to visual impacts.
- Visual intrusion of multiple renewable energy developments may be exacerbated, particularly in more natural undisturbed settings.
- Additional renewable energy facilities in the area would generate additional traffic on gravel roads thus resulting in increased impacts from dust emissions and dust plumes.
- The night time visual environment could be altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area.

8.6.5 No Go Alternative

The 'No Go' alternative is essentially the option of not developing the Solar PV Facilities, Power Lines or associated infrastructure in this area. The area would thus retain its visual character and sense of place and no visual impacts would be experienced by any locally occurring receptors.

8.7 Overall Impact Rating[8]

The EIA Regulations, 2014 (as amended) require that an overall rating for visual impact be provided to allow the visual impact to be assessed alongside other environmental parameters. **Tables 6** to **12** below present the impact matrix for visual impacts associated with the proposed construction and operation of the Wildebeestkuil 1 and Wildebeestkuil 2 SPEFs, associated on-site infrastructure and 132kV power lines. Preliminary mitigation measures have been determined based on best practice and literature reviews.

Please refer to **Appendix E** for an explanation of the impact rating methodology.

8.7.1 Wildebeestkuil 1 SPEF

Table 6: Impact Rating for Wildebeestkuil 1 SPEF

WILDEBEESTKUIL 1 SOLAR PV PLANT																				
ENVIRONMENTAL PARAMETER	**ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE**	**ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION**									**RECOMMENDED MITIGATION MEASURES**	**ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION**								
		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
Construction Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area	▪ Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction. ▪ Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during construction	2	3	1	2	1	2	18	-	Low	▪ Carefully plan to mimimise the construction period and avoid construction delays. ▪ Inform receptors within 500m of the site of the construction programme and schedules. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Where possible, re-vegetate all reinstated cable trenches with the same vegetation that existed prior to the cable being laid.	2	2	1	2	1	2	16	-	Low

	would expose bare soil (scarring) which could visually contrast with the surrounding environment. ▪ Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										▪ Establish erosion control measures on areas which will be exposed for long periods of time. This is to reduce the potential impact heavy rains may have on the bare soil. ▪ Suitable buffers of intact natural vegetation should be provided along the perimeter of the development area. ▪ Maintain a neat construction site by removing rubble and waste materials regularly. ▪ Where possible, underground cabling should be utilised. ▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the construction site, where possible. ▪ Ensure that dust suppression techniques are implemented: ▪ on all access roads; ▪ in all areas where vegetation clearing has taken place; ▪ on all soil stockpiles. ▪ Restrict construction activities to daylight hours in order to negate									

											or reduce the visual impacts associated with lighting.									
Operational Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area. ▪ Potential visual impact on the night time visual environment.	▪ The PV arrays may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ The proposed solar PV facility will alter the visual character of the surrounding area and expose potentially sensitive visual receptor locations to visual impacts. ▪ Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers. ▪ The night time visual environment will be altered as a result of operational and security lighting at the proposed PV facility.	2	3	3	3	3	2	28	-	Medium	▪ Restrict vegetation clearance on the site to that which is required for the correct operation of the facility. ▪ Ensure that the PV arrays are not located within 500m of any farmhouses in order to minimise visual impacts on these dwellings. ▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the site. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ Only clear vegetation on site and adjacent to the site which is required to be cleared for the correct operation of the facility. ▪ As far as possible, limit the amount of security and operational lighting present on site. ▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill.	2	3	3	2	2	2	24	-	Medium

											▪ If possible, light sources should be shielded by physical barriers (walls, vegetation, or the structure itself); ▪ Lighting fixtures should make use of minimum lumen or wattage. ▪ Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used. ▪ If economically and technically feasible, make use of motion detectors on security lighting. ▪ Care should be taken with the layout of the security lights to prevent motorists on the R502 from being blinded by lights.									
Decommissioning Phase (Direct Impacts)																				
▪ Potential visual intrusion resulting from vehicles and equipment involved in the de-commissioning process; ▪ Potential visual impacts of increased dust emissions from de-	▪ Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts. ▪ Decommissioning activities may be perceived as an unwelcome visual intrusion.	2	3	1	2	1	2	18	-	Low	▪ All infrastructure that is not required for post-decommissioning use should be removed. ▪ Carefully plan to minimize the decommissioning period and avoid delays. ▪ Maintain a neat decommissioning site by removing rubble and waste materials regularly.	2	2	1	2	1	2	16	-	Low

commissioning activities and related traffic; and ▪ Potential visual intrusion of any remaining infrastructure on the site.	▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the surrounding environment. ▪ Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										▪ Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase. ▪ All cleared areas should be rehabilitated as soon as possible ▪ Rehabilitated areas should be monitored post-decommissioning and remedial actions implemented as required.									
Cumulative Impacts																				
▪ Potential alteration of the visual character and sense of place in the broader area. ▪ Potential visual impact on receptors in the study area. ▪ Potential visual impact on the night time visual environment.	▪ Additional renewable energy developments in the broader area will alter the natural character of the study area towards a more industrial landscape and expose a greater number of receptors to visual impacts. ▪ Visual intrusion of multiple renewable energy developments may be exacerbated, particularly in more	3	3	3	3	3	2	30	-	Medium	▪ Restrict vegetation clearance on development sites to that which is required for the correct operation of the facility. ▪ Ensure that the PV arrays are not located within 500m of any farmhouses in order to minimise visual impacts on these dwellings. ▪ As far as possible, limit the number of maintenance vehicles	3	3	3	2	2	2	26	-	Medium

	natural undisturbed settings. ▪ Additional renewable energy facilities in the area would generate additional traffic on gravel roads thus resulting in increased impacts from dust emissions and dust plumes. ▪ The night time visual environment could be altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area.									which are allowed to access the facility. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ As far as possible, limit the amount of security and operational lighting present on site. ▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill. ▪ If possible, light sources should be shielded by physical barriers (walls, vegetation, or the structure itself); ▪ Lighting fixtures should make use of minimum lumen or wattage. ▪ Mounting heights of lighting fixtures should be limited, or alternatively foot-light or bollard level lights should be used. ▪ If possible, make use of motion detectors on security lighting. ▪ The operations and maintenance (O&M) buildings should not be illuminated at night, unless for safety purposes. ▪ The O&M buildings should be painted in									

											natural tones that fit with the surrounding environment. ▪ Non-reflective surfaces should be utilised where possible.									

Table 7: Impact Rating for On-Site Infrastructure associated with Wildebeestkuil 1 SPEF

WILDEBEESTKUIL 1 SOLAR PV PLANT ASSOCIATED INFRASTRUCTURE (Switching substation, temporary building zone and permanent guard house)																				
ENVIRONMENTAL PARAMETER	**ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE**	**ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION**									**RECOMMENDED MITIGATION MEASURES**	**ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION**								
		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
Construction Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area	▪ Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction. ▪ Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during construction would expose bare soil (scarring) which could	2	3	1	2	1	2	18	-	Low	▪ Carefully plan to mimimise the construction period and avoid construction delays. ▪ Inform receptors within 500m of the site of the construction programme and schedules. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Maintain a neat construction site by removing rubble and waste materials regularly.	2	2	1	1	1	2	14	-	Low

	visually contrast with the surrounding environment. ▪ Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										▪ Where possible, underground cabling should be utilised. ▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the construction site, where possible. ▪ Ensure that dust suppression techniques are implemented: ▪ on all access roads; ▪ in all areas where vegetation clearing has taken place; ▪ on all soil stockpiles. ▪ Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.									
Operational Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place.	▪ The on-site infrastructure may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings.	2	3	2	2	3	1	12	-	Low	▪ Restrict vegetation clearance on the site to that which is required for the correct operation of the facility.	2	3	2	2	3	1	12	-	Low

▪ Potential visual impact on receptors in the study area. ▪ Potential visual impact on the night time visual environment.	▪ The on-site infrastructure will alter the visual character of the surrounding area and expose potentially sensitive visual receptor locations to visual impacts. ▪ Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers. ▪ The night time visual environment will be altered as a result of operational and security lighting at the proposed PV facility.										▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the site. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ As far as possible, limit the amount of security and operational lighting present on site. ▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill. ▪ If possible, light sources should be shielded by physical barriers (walls, vegetation, or the structure itself); ▪ Lighting fixtures should make use of minimum lumen or wattage. ▪ Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used. ▪ If economically and technically feasible, make use of motion detectors on security lighting. ▪ Care should be taken with the layout of the security lights to prevent motorists on the R502									

											from being blinded by lights. ▪ The operations and maintenance (O&M) buildings should not be illuminated at night unless for security measures. ▪ The on-site buildings should be painted in natural tones that fit with the surrounding environment.									
Decommissioning Phase (Direct Impacts)																				
▪ Potential visual intrusion resulting from vehicles and equipment involved in the de-commissioning process; ▪ Potential visual impacts of increased dust emissions from de-commissioning activities and related traffic; and ▪ Potential visual intrusion of any remaining infrastructure on the site.	▪ Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts. ▪ Decommissioning activities may be perceived as an unwelcome visual intrusion. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the	2	3	1	2	1	2	18	-	Low	▪ All infrastructure that is not required for post-decommissioning use should be removed. ▪ Carefully plan to minimise the decommissioning period and avoid delays. ▪ Maintain a neat decommissioning site by removing rubble and waste materials regularly. ▪ Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase. ▪ All cleared areas should be rehabilitated as soon as possible ▪ Rehabilitated areas should be monitored	2	2	1	1	1	2	14	-	Low

	surrounding environment. ▪ Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										post-decommissioning and remedial actions implemented as required.									

Table 8: Impact Rating for 132kV Power Line to serve the Wildebeestkuil 1 SPEF

WILDEBEESTKUIL 1 SPEF - 132kV POWER LINE																				
ENVIRONMENTAL PARAMETER	**ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE**	**ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION**									**RECOMMENDED MITIGATION MEASURES**	**ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION**								
		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
Construction Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area	▪ Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction. ▪ Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during construction would expose bare soil (scarring) which could	2	3	1	2	1	2	18	-	Low	▪ Carefully plan to mimimise the construction period and avoid construction delays. ▪ Inform receptors within 500m of the site of the construction programme and schedules. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Maintain a neat construction site by removing rubble and waste materials regularly.	2	2	1	1	1	2	14	-	Low

	visually contrast with the surrounding environment. ▪ Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										▪ Where possible, underground cabling should be utilised. ▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the construction site, where possible. ▪ Ensure that dust suppression techniques are implemented: ▪ on all access roads; ▪ in all areas where vegetation clearing has taken place; ▪ on all soil stockpiles. ▪ Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.									
Operational Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area.	▪ The proposed power line may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ The proposed power line will alter the visual character of the surrounding area and expose potentially sensitive visual receptor	2	3	2	2	3	1	12	-	Low	▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the site. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads.	2	3	2	2	3	1	12	-	Low

	locations to visual impacts. ▪ Dust emissions and dust plumes from maintenance vehicles accessing the power line servitude via gravel roads may evoke negative sentiments from surrounding viewers.																			
Decommissioning Phase (Direct Impacts)																				
▪ Potential visual intrusion resulting from vehicles and equipment involved in the de-commissioning process; ▪ Potential visual impacts of increased dust emissions from de-commissioning activities and related traffic; and ▪ Potential visual intrusion of any remaining infrastructure on the site.	▪ Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts. ▪ Decommissioning activities may be perceived as an unwelcome visual intrusion. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the surrounding environment.	2	3	1	2	1	2	18	-	Low	▪ All infrastructure that is not required for post-decommissioning use should be removed. ▪ Carefully plan to minimise the decommissioning period and avoid delays. ▪ Maintain a neat decommissioning site by removing rubble and waste materials regularly. ▪ Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase. ▪ All cleared areas should be rehabilitated as soon as possible ▪ Rehabilitated areas should be monitored post-decommissioning and remedial actions	2	2	1	1	1	2	14	-	Low

	▪ Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										implemented as required.									
Cumulative Impacts																				
▪ Potential alteration of the visual character and sense of place in the broader area. ▪ Potential visual impact on receptors in the study area.	▪ Additional renewable energy developments and associated grid connection infrastructure in the broader area will alter the natural character of the study area towards a more industrial landscape and expose a greater number of receptors to visual impacts. ▪ Visual intrusion of multiple renewable energy developments may be exacerbated, particularly in more natural undisturbed settings. ▪ Additional renewable energy facilities in the area would generate additional traffic on gravel roads thus resulting in increased impacts from dust emissions and dust plumes. ▪ The night time visual environment could be	3	3	2	3	3	2	26	-	Medium	▪ As far as possible, limit the number of maintenance vehicles using access roads. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads.	3	3	2	2	2	2	24	-	Medium

	altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area.																			

8.7.2 Wildebeestkuil 2 SPEF

Table 9: Impact Rating for Wildebeestkuil 2 SPEF

WILDEBEESTKUIL 2 SOLAR PV PLANT																				
ENVIRONMENTAL PARAMETER	**ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE**	**ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION**									**RECOMMENDED MITIGATION MEASURES**	**ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION**								
		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
Construction Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area	▪ Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction. ▪ Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers.	2	3	1	2	1	2	18	-	Low	▪ Carefully plan to mimimise the construction period and avoid construction delays. ▪ Inform receptors within 500m of the site of the construction programme and schedules. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Where possible, re-vegetate all reinstated cable trenches with the same vegetation that existed prior to the cable being laid.	2	2	1	2	1	2	16	-	Low

	▪ Surface disturbance during construction would expose bare soil (scarring) which could visually contrast with the surrounding environment. ▪ Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										▪ Establish erosion control measures on areas which will be exposed for long periods of time. This is to reduce the potential impact heavy rains may have on the bare soil. ▪ Suitable buffers of intact natural vegetation should be provided along the perimeter of the development area. ▪ Maintain a neat construction site by removing rubble and waste materials regularly. ▪ Where possible, underground cabling should be utilised. ▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the construction site, where possible. ▪ Ensure that dust suppression techniques are implemented: ▪ on all access roads; ▪ in all areas where vegetation clearing has taken place; ▪ on all soil stockpiles. ▪ Restrict construction activities to daylight hours in order to negate									

											or reduce the visual impacts associated with lighting.									
Operational Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area. ▪ Potential visual impact on the night time visual environment.	▪ The PV arrays may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ The proposed solar PV facility will alter the visual character of the surrounding area and expose potentially sensitive visual receptor locations to visual impacts. ▪ Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers. ▪ The night time visual environment will be altered as a result of operational and security lighting at the proposed PV facility.	2	3	3	3	3	2	28	-	Medium	▪ Restrict vegetation clearance on the site to that which is required for the correct operation of the facility. ▪ Ensure that the PV arrays are not located within 500m of any farmhouses in order to minimise visual impacts on these dwellings. ▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the site. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ Only clear vegetation on site and adjacent to the site which is required to be cleared for the correct operation of the facility. ▪ As far as possible, limit the amount of security and operational lighting present on site. ▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill.	2	3	3	2	2	2	24	-	Medium

											▪ If possible, light sources should be shielded by physical barriers (walls, vegetation, or the structure itself); ▪ Lighting fixtures should make use of minimum lumen or wattage. ▪ Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used. ▪ If economically and technically feasible, make use of motion detectors on security lighting. ▪ Care should be taken with the layout of the security lights to prevent motorists on the R502 from being blinded by lights.									
Decommissioning Phase (Direct Impacts)																				
▪ Potential visual intrusion resulting from vehicles and equipment involved in the de-commissioning process; ▪ Potential visual impacts of increased dust emissions from de-	▪ Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts. ▪ Decommissioning activities may be perceived as an unwelcome visual intrusion.	2	3	1	2	1	2	18	-	Low	▪ All infrastructure that is not required for post-decommissioning use should be removed. ▪ Carefully plan to minimize the decommissioning period and avoid delays. ▪ Maintain a neat decommissioning site by removing rubble and waste materials regularly.	2	2	1	2	1	2	16	-	Low

commissioning activities and related traffic; and ▪ Potential visual intrusion of any remaining infrastructure on the site.	▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the surrounding environment. ▪ Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										▪ Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase. ▪ All cleared areas should be rehabilitated as soon as possible ▪ Rehabilitated areas should be monitored post-decommissioning and remedial actions implemented as required.									
Cumulative Impacts																				
▪ Potential alteration of the visual character and sense of place in the broader area. ▪ Potential visual impact on receptors in the study area. ▪ Potential visual impact on the night time visual environment.	▪ Additional renewable energy developments in the broader area will alter the natural character of the study area towards a more industrial landscape and expose a greater number of receptors to visual impacts. ▪ Visual intrusion of multiple renewable energy developments may be exacerbated, particularly in more	3	3	3	3	3	2	30	-	Medium	▪ Restrict vegetation clearance on development sites to that which is required for the correct operation of the facility. ▪ Ensure that the PV arrays are not located within 500m of any farmhouses in order to minimise visual impacts on these dwellings. ▪ As far as possible, limit the number of maintenance vehicles	3	3	3	2	2	2	26	-	Medium

	natural undisturbed settings. ▪ Additional renewable energy facilities in the area would generate additional traffic on gravel roads thus resulting in increased impacts from dust emissions and dust plumes. ▪ The night time visual environment could be altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area.										which are allowed to access the facility. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ As far as possible, limit the amount of security and operational lighting present on site. ▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill. ▪ If possible, light sources should be shielded by physical barriers (walls, vegetation, or the structure itself); ▪ Lighting fixtures should make use of minimum lumen or wattage. ▪ Mounting heights of lighting fixtures should be limited, or alternatively foot-light or bollard level lights should be used. ▪ If possible, make use of motion detectors on security lighting. ▪ The operations and maintenance (O&M) buildings should not be illuminated at night, unless for safety purposes. ▪ The O&M buildings should be painted in									

											natural tones that fit with the surrounding environment. ▪ Non-reflective surfaces should be utilised where possible.									

Table 10: Impact Rating for On-Site Infrastructure associated with Wildebeestkuil 2 SPEF

WILDEBEESTKUIL 2 SOLAR PV PLANT ASSOCIATED INFRASTRUCTURE (Switching substation, temporary building zone and permanent guard house)																				
ENVIRONMENTAL PARAMETER	**ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE**	**ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION**									**RECOMMENDED MITIGATION MEASURES**	**ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION**								
		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
Construction Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area	▪ Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction. ▪ Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during construction would expose bare soil (scarring) which could visually contrast with the	2	3	1	2	1	2	18	-	Low	▪ Carefully plan to mimimise the construction period and avoid construction delays. ▪ Inform receptors within 500m of the site of the construction programme and schedules. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Maintain a neat construction site by removing rubble and waste materials regularly. ▪ Where possible, underground cabling should be utilised.	2	2	1	1	1	2	14	-	Low

	surrounding environment. ▪ Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the construction site, where possible. ▪ Ensure that dust suppression techniques are implemented: ▪ on all access roads; ▪ in all areas where vegetation clearing has taken place; ▪ on all soil stockpiles. ▪ Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.									
Operational Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area.	▪ The on-site infrastructure may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ The on-site infrastructure will alter the visual character of the surrounding area and	2	3	2	2	3	1	12	-	Low	▪ Restrict vegetation clearance on the site to that which is required for the correct operation of the facility. ▪ As far as possible, limit the number of maintenance vehicles	2	3	2	2	3	1	12	-	Low

▪ Potential visual impact on the night time visual environment.	expose potentially sensitive visual receptor locations to visual impacts. ▪ Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers. ▪ The night time visual environment will be altered as a result of operational and security lighting at the proposed PV facility.										which are allowed to access the site. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads. ▪ As far as possible, limit the amount of security and operational lighting present on site. ▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill. ▪ If possible, light sources should be shielded by physical barriers (walls, vegetation, or the structure itself); ▪ Lighting fixtures should make use of minimum lumen or wattage. ▪ Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used. ▪ If economically and technically feasible, make use of motion detectors on security lighting. ▪ Care should be taken with the layout of the security lights to prevent motorists on the R502 from being blinded by lights.									

											▪ The operations and maintenance (O&M) buildings should not be illuminated at night unless for security measures. ▪ The on-site buildings should be painted in natural tones that fit with the surrounding environment.									
Decommissioning Phase (Direct Impacts)																				
▪ Potential visual intrusion resulting from vehicles and equipment involved in the de-commissioning process; ▪ Potential visual impacts of increased dust emissions from de-commissioning activities and related traffic; and ▪ Potential visual intrusion of any remaining infrastructure on the site.	▪ Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts. ▪ Decommissioning activities may be perceived as an unwelcome visual intrusion. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the	2	3	1	2	1	2	18	-	Low	▪ All infrastructure that is not required for post-decommissioning use should be removed. ▪ Carefully plan to minimise the decommissioning period and avoid delays. ▪ Maintain a neat decommissioning site by removing rubble and waste materials regularly. ▪ Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase. ▪ All cleared areas should be rehabilitated as soon as possible ▪ Rehabilitated areas should be monitored post-decommissioning and remedial actions	2	2	1	1	1	2	14	-	Low

	surrounding environment. ▪ Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										implemented as required.									

Table 11: Impact Rating for 132kV Power Line to serve the Wildebeestkuil 1 SPEF

WILDEBEESTKUIL 1 SPEF - 132kV POWER LINE																				
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area	▪ Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction. ▪ Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during construction would expose bare soil (scarring) which could	2	3	1	2	1	2	18	-	Low	▪ Carefully plan to mimimise the construction period and avoid construction delays. ▪ Inform receptors within 500m of the site of the construction programme and schedules. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Maintain a neat construction site by removing rubble and waste materials regularly.	2	2	1	1	1	2	14	-	Low

	visually contrast with the surrounding environment. ▪ Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										▪ Where possible, underground cabling should be utilised. ▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the construction site, where possible. ▪ Ensure that dust suppression techniques are implemented: ▪ on all access roads; ▪ in all areas where vegetation clearing has taken place; ▪ on all soil stockpiles. ▪ Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.									
Operational Phase (Direct Impacts)																				
▪ Potential alteration of the visual character and sense of place. ▪ Potential visual impact on receptors in the study area.	▪ The proposed power line may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ The proposed power line will alter the visual character of the surrounding area and expose potentially sensitive visual receptor	2	3	2	2	3	1	12	-	Low	▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the site. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads.	2	3	2	2	3	1	12	-	Low

	locations to visual impacts. ▪ Dust emissions and dust plumes from maintenance vehicles accessing the power line servitude via gravel roads may evoke negative sentiments from surrounding viewers.																			
Decommissioning Phase (Direct Impacts)																				
▪ Potential visual intrusion resulting from vehicles and equipment involved in the de-commissioning process; ▪ Potential visual impacts of increased dust emissions from de-commissioning activities and related traffic; and ▪ Potential visual intrusion of any remaining infrastructure on the site.	▪ Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts. ▪ Decommissioning activities may be perceived as an unwelcome visual intrusion. ▪ Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. ▪ Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the surrounding environment.	2	3	1	2	1	2	18	-	Low	▪ All infrastructure that is not required for post-decommissioning use should be removed. ▪ Carefully plan to minimise the decommissioning period and avoid delays. ▪ Maintain a neat decommissioning site by removing rubble and waste materials regularly. ▪ Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase. ▪ All cleared areas should be rehabilitated as soon as possible ▪ Rehabilitated areas should be monitored post-decommissioning and remedial actions	2	2	1	1	1	2	14	-	Low

	▪ Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.										implemented as required.									
Cumulative Impacts																				
▪ Potential alteration of the visual character and sense of place in the broader area. ▪ Potential visual impact on receptors in the study area.	▪ Additional renewable energy developments and associated grid connection infrastructure in the broader area will alter the natural character of the study area towards a more industrial landscape and expose a greater number of receptors to visual impacts. ▪ Visual intrusion of multiple renewable energy developments may be exacerbated, particularly in more natural undisturbed settings. ▪ Additional renewable energy facilities in the area would generate additional traffic on gravel roads thus resulting in increased impacts from dust emissions and dust plumes. ▪ The night time visual environment could be	3	3	2	3	3	2	26	-	Medium	▪ As far as possible, limit the number of maintenance vehicles using access roads. ▪ Ensure that dust suppression techniques are implemented on all gravel access roads.	3	3	2	2	2	2	24	-	Medium

	altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area.																			

8.7.3 'No-Go' Alternative

Table 12: Impact Rating for 'No-Go' Alternative – Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant & 132kV Power Line

'NO-GO' ALTERNATIVE																				
ENVIRONMENTAL PARAMETER	**ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE**	**ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION**									**RECOMMENDED MITIGATION MEASURES**	**ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION**								
		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**		E	**P**	**R**	**L**	**D**	**I / M**	**TOTAL**	**STATUS (+ OR -)**	**S**
▪ Potential alteration of the visual character and sense of place in the broader area. ▪ Potential visual impact on receptors in the study area. ▪ Potential visual impact on the night time visual environment.	▪ If the Solar PV Facility is not developed in this area, there will be no change in the visual character or the sense of place. There will be no visual impacts on receptors or on the night-time visual environment.	NIL	NIL	NIL	NIL	NIL	NIL	0	-	NIL	▪ N / A	NIL	NIL	NIL	NIL	NIL	NIL	0	-	NIL

9. COMPARATIVE ASSESSMENT OF ALTERNATIVES

As previously stated, no design or layout alternatives for the PV development areas, Switching Substations, Guard houses and Temporary Building Zones (and all other associated infrastructure) are being considered or assessed as part of the current BA processes. Design and layout alternatives were considered and assessed as part of a previous BA process that was never completed, and as such the PV development areas, Switching Substations, Guard houses and Temporary Building Zones (and all other associated infrastructure) have been placed to avoid site sensitivities identified as part of a previous BA process as well as the current BA processes. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layouts being proposed as part of the current projects. The results of the updated specialist assessments have informed the layouts being proposed as part of the current BA processes. The proposed layouts have therefore been informed by the identified environmental sensitive and/or "no-go" areas. Accordingly, no further comparative assessment of these alternatives is required.

Three (3) power line corridor route alternatives have however been considered for each respective solar PV project in this updated VIA, including above ground and below ground options (as discussed in **Section 3.2.1**). These corridor alternatives are comparatively assessed in **Table 13** below.

The aim of the comparative assessment is to determine which of the corridor alternatives would be preferred from a visual perspective. Preference ratings for each alternative are provided in the tables below. The alternatives are rated as preferred, favourable, least-preferred or no-preference.

The degree of visual impact and the preference rating has been determined based on the following factors:

- The location of each alternative in relation to areas of high elevation, especially ridges, koppies or hills;
- The location of each alternative in relation to sensitive visual receptor locations; and
- The location of each alternative in relation to areas of natural vegetation (clearing site for the development worsens the visibility).

KEY

PREFERRED	The alternative will result in a low impact / reduce the impact
FAVOURABLE	The impact will be relatively insignificant
LEAST PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

Table 13: Comparative Assessment of Alternatives: Wildebeestkuil 1 Solar PV Plant - 132kV Power Line

Alternative	Preference	Reasons (incl. potential issues)
WILDEBEESTKUIL PV1: PROPOSED 132KV POWER LINE CORRIDOR ALTERNATIVES		
Wildebeestkuil 1 Solar PV Plant Overhead Power Line Corridor Option 1	Favourable	▪ Option 1 is located on relatively flat terrain and as such would only be moderately exposed on the skyline. ▪ No potentially sensitive receptors are located within 500m of this corridor option and the closest receptor is approximately 650m away, this being VR55. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. Most of the remaining receptors are all more than 2kms away and, would only be subjected to low levels of impact. ▪ This option is located in in an area which is characterised by significant levels of transformation and/or disturbance resulting from urban development as well as road, rail and electricity infrastructure. As such the landscape has already undergone some transformation from its natural state and the impacts of the proposed 132kV power line would be reduced. ▪ In light of the above, there are no fatal flaws associated with Option 1 and this alternative is considered favourable from a visual perspective.
Wildebeestkuil 1 Solar PV Plant Overhead Power Line Corridor Option 2A	Favourable	▪ Option 2A is located on relatively flat terrain and as such would only be moderately exposed on the skyline. ▪ No potentially sensitive receptors are located within 500m of this corridor option and the closest receptor is approximately 800m away, this being VR55. The visual impacts from Option 2A affecting this receptor are therefore rated as moderate. Most of the remaining receptors are all more than 1km away and, would only be subjected to moderate or low levels of impact. ▪ This option is located in in an area which is characterised by significant levels of transformation and/or disturbance resulting from urban development as well as road, rail and electricity infrastructure. As such the landscape has already undergone some transformation from its natural state and the

Alternative	Preference	Reasons (incl. potential issues)
		impacts of the proposed 132kV power line would be reduced. ▪ In light of the above, there are no fatal flaws associated with Option 2A and this alternative is considered favourable from a visual perspective.
Wildebeestkuil 1 Solar PV Plant Underground Power Line Corridor Option 2B	Preferred	▪ Option 2B will be located underground and as such would not be visible from any sensitive receptor locations. Accordingly, no significant visual impacts are expected to result from this option. ▪ In light of the above, there are no fatal flaws associated with Option 2B and this alternative is considered preferred from a visual perspective.

Table 14: Comparative Assessment of Alternatives: Wildebeestkuil 2 Solar PV Plant - 132kV Power Line

Alternative	Preference	Reasons (incl. potential issues)
WILDEBEESTKUIL PV2: PROPOSED 132KV POWER LINE CORRIDOR ALTERNATIVES		
Wildebeestkuil 2 Solar PV Plant Overhead Power Line Corridor Option 1	Favourable	▪ Option 1 is located on relatively flat terrain and as such would only be moderately exposed on the skyline. ▪ No potentially sensitive receptors are located within 500m of this corridor option and the closest receptor is approximately 650m away, this being VR55. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. Most of the remaining receptors are all more than 2kms away and, would only be subjected to low levels of impact. ▪ This option is located in in an area which is characterised by significant levels of transformation and/or disturbance resulting from urban development as well as road, rail and electricity infrastructure. As such the landscape has already undergone some transformation from its natural state and the impacts of the proposed 132kV power line would be reduced. ▪ In light of the above, there are no fatal flaws associated with Option 1 and this alternative is considered favourable from a visual perspective.
Wildebeestkuil 2 Solar PV Plant Overhead Power Line Corridor Option 2A	Favourable	▪ Option 2A is located on relatively flat terrain and as such would only be moderately exposed on the skyline. ▪ No potentially sensitive receptors are located within 500m of this corridor option and the closest receptor is approximately 800m away, this being VR55. The visual impacts from Option 2A affecting this receptor are therefore rated as moderate. Most of the remaining receptors are all more than 1km away and, would only be subjected to moderate or low levels of impact. ▪ This option is located in in an area which is characterised by significant levels of transformation and/or disturbance resulting from urban development as well as road, rail and electricity infrastructure. As such the landscape has already undergone some transformation from its natural state and the

Alternative	Preference	Reasons (incl. potential issues)
		impacts of the proposed 132kV power line would be reduced. ▪ In light of the above, there are no fatal flaws associated with Option 2A and this alternative is considered favourable from a visual perspective.
Wildebeestkuil 2 Solar PV Plant Underground Power Line Corridor Option 2B	Preferred	▪ Option 2B will be located underground and as such would not be visible from any sensitive receptor locations. Accordingly, no significant visual impacts are expected to result from this option. ▪ In light of the above, there are no fatal flaws associated with Option 2B and this alternative is considered preferred from a visual perspective.

10. CONCLUSION

A visual study was conducted to assess the magnitude and significance of the visual impacts associated with the development of the proposed Wildebeestkuil 1 and Wildebeestkuil 2 SPEFs, 132kV power lines and associated infrastructure near the town of Leeudoringstad in the North West Province. The VIA has demonstrated that overall, much of the study area has a partly natural visual character, with certain areas displaying a rural or pastoral component where cultivation and farmsteads occur. As such, solar PV developments with associated 132kV power lines would alter the visual character and contrast significantly with this typical land use and/or pattern and form of human elements present across the broader study area. However, areas in close proximity to the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site exhibit high levels of human transformation resulting from urban and infrastructural development such as the Kgakala Township, R502 and R504 regional roads, high voltage power lines, Leeubos TR 132kV Traction Substation and the existing railway line. These elements have resulted in a significant degree of landscape degradation, and thus the introduction of solar PV facilities and 132kV power lines into this setting would be considered to be less visually intrusive than if there was no existing built infrastructure visible.

A broad-scale assessment of landscape sensitivity, based on the physical characteristics of the study area, economic activities and land use that predominates, determined that the area would have a **low** visual sensitivity. However, an important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs.

No visually sensitive receptors were identified within the study area. This is most likely due to the fact that the study area is not typically valued or utilised for its tourism significance. Additionally, the R502 and R504 regional roads, which traverse the visual assessment zone, are used almost exclusively as local access roads, do not form part of any scenic tourist routes and are not specifically valued or utilised for their scenic or tourism potential.

A total of sixty-five (65) potentially sensitive receptors were however identified within the study area, many of which appear to be existing farmsteads. These farmsteads are regarded as potentially sensitive visual receptors as they are located within a mostly rural setting and the proposed developments will likely alter natural vistas experienced from these locations, although the residents' sentiments toward the proposed developments are unknown.

The receptor impact rating conducted in respect of these potentially sensitive receptors found that none of these potentially sensitive receptors are expected to experience high levels of visual impact from the proposed SPEFs or the 132kV power lines. Thirty-one (31) of the potentially sensitive visual receptors identified within the study area, will experience moderate levels of visual impact as a result of the proposed Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant projects and twenty-five (25) potentially sensitive receptors will experience moderate levels of impact as a result of the proposed 132kV power lines. Twenty-seven (27) potentially sensitive visual receptors will be subjected to low levels of visual impact as a result of the proposed SPEFs while seventeen (17) will experience low levels of impact as a result of the 132kV power lines.

An overall impact rating was also conducted in order to allow the visual impact to be assessed alongside other environmental parameters. The assessment revealed that impacts associated with the proposed Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Facilities, associated infrastructure and the proposed 132kV power lines will be of (negative) low significance during both construction and decommissioning phases.

During operation, visual impacts from the solar PV facilities' would be of (negative) medium significance with relatively few mitigation measures available to reduce the visual impact. Impacts from the associated on-site infrastructure and 132kV power lines would however be of (negative) low significance during operation.

Several other renewable energy developments and infrastructure projects, either proposed or in operation, were identified within a 50km radius of the proposed Wildebeestkuil 1 and Wildebeestkuil 2 SPEFs and 132kV power lines. It was however determined that only three (3) of these would have any significant impact on the landscape within the visual assessment zone, namely the Leeuwbosch 1 Solar PV Plant, Leeuwbosch 2 Solar PV Plant and Bokamoso Solar Energy Facility (SEF). These projects, in conjunction with the proposed Leeudoringstad Solar Plant Substation (part of separate BA process), located on the Leeuwbosch 1 and Leeuwbosch 2 Solar PV Plant application site, will alter the inherent sense of place and introduce an increasingly industrial character into a largely natural, pastoral landscape, thus giving rise to significant cumulative impacts. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures stipulated for each of these developments by the visual specialists. In light of this and the significant degree of human transformation and landscape degradation evident in close proximity to the proposed developments, cumulative impacts have been rated as medium.

No design and layout alternatives for the Wildebeestkuil 1 and Wildebeestkuil 2 SPEFs were considered and assessed as part of this VIA as these were considered as part of a previous BA process. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layouts being proposed as part of the current projects. The results of the updated specialist assessments have informed the layouts being proposed as part of the current BA processes. The proposed layouts have therefore been informed by the identified environmental sensitive and/or "no-go" areas.

Three (3) proposed power line corridor route alternatives have however been comparatively assessed for each respective solar PV plant project in this VIA and no fatal flaws were identified in respect of any of the alternatives. For both the WIldebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant and 132kV Power Line projects, Options 1 and 2A were found to be favourable, but Option 2B was found to be the preferred alternative due to fact that this alternative will be located underground thus minimising any visual impacts.

10.1 Impact Statement

It is SiVEST's opinion that the visual impacts associated with the proposed Wildebeestkuil 1 and Wildebeestkuil 2 SPEFs, 132kV Power Lines and associated infrastructure are of moderate significance. Given the relative absence of sensitive receptors and the significant degree of human transformation and landscape degradation in areas close to the Wildebeestkuil 1 and Wildebeestkuil 2 Solar PV Plant application site and power line corridors, the projects are deemed acceptable from a visual impact perspective and the EAs should be granted for the respective BA applications. SiVEST is of the opinion that the visual impacts associated with the construction, operation and decommissioning phases of each proposed solar PV plant and power line project can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

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Appendix A

TERMS OF REFERENCE

PROPOSED DEVELOPMENT OF THE 9.9MW WILDEBEESTKUIL 1 SOLAR PHOTOVOLTAIC (PV) PLANT, 132kV POWER LINE AND ASSOCIATED INFRASTRUCTURE NEAR LEEUDORINGSTAD IN THE NORTH WEST PROVINCE, MAQUASSI HILLS LOCAL MUNICIPALITY IN THE DR KENNETH KAUNDA DISTRICT MUNICIPALITY

TERMS OF REFERENCE (ToR) FOR SPECIALIST STUDIES

1 INTRODUCTION

The purpose of the Terms of Reference (ToR) is to provide the specialist team with a consistent approach to the specialist studies that are required as part of the Basic Assessment (BA) process being conducted in respect of the proposed solar photovoltaic (PV) plant and associated power line development. This will enable comparison of environmental impacts, efficient review, and collation of the specialist studies into the BA report, in accordance with the latest requirements of the EIA Regulations, 2014 (as amended).

2 PROCESS

In terms of the Environmental Impact Assessment (EIA) Regulations, which were published on 04 December 2014 and amended on 07 April 2017 [promulgated in Government Gazette 40772 and Government Notice (GN) R326, R327, R325 and R324 on 7 April 2017], various aspects of the proposed development are considered listed activities under GNR 327 and GNR 324 (this project is considered a BA process due to energy capacity thresholds of under 20MW and vegetation clearance thresholds of under 20ha), which may have an impact on the environment and therefore require authorisation from the provincial competent authority, namely the North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT), prior to the commencement of such activities.

3 PROJECT DESCRIPTION

3.1 Project history

The original BA process for the proposed Wildebeestkuil PV Generation (Pty) Ltd (hereafter referred to as "Wildebeestkuil PV Generation") solar photovoltaic (PV) plant was initiated in August 2016. All specialist studies were undertaken and subsequently all site sensitivities were identified. The specialist studies and draft basic assessment reports (DBARs) were completed and released for 30-day public review. The BA was however put out on hold prior to submitting the final basic assessment reports (FBARs) to the Department of Environmental Affairs (DEA). In February 2017, the proposed capacity and layout of the solar PV plant was amended, and a new connection point and associated power line corridors were assessed. However, the project was put on hold prior to submitting the application forms to the DEA or commencing with the legislated public participation process. In August of 2020, Wildebeestkuil PV Generation proposed an additional 9.9MW PV plant on the Wildebeestkuil site (now referred to as the Wildebeestkuil 1 Solar PV Plant & 132kV Power Line and Wildebeestkuil 2 Solar PV Plant & 132kV Power Line) outside of all site sensitivities that were identified in 2016, and as such specialist studies have been commissioned to assess and verify the now two (2) solar PV plants and 132kV power lines under the new Gazetted specialist protocols[1].

3.2 Project location

Wildebeestkuil PV Generation is proposing to construct a solar PV plant, 132kV power line and associated infrastructure approximately 4km east of the town of Leeudoringstad in the Maquassi Hills Local Municipality, which falls within the Dr Kenneth Kaunda District Municipality in the North West Province of South Africa (hereafter referred to as the "proposed development") (Department Ref No.: To be Allocated). The proposed development will have a total maximum generation capacity of up to approximately 9.9 megawatt (MW) and will be referred to as the Wildebeestkuil 1 Solar PV Plant and 132kV Power Line. SiVEST Environmental Division (hereafter referred to as "SiVEST") has subsequently been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the BA process for the proposed construction of the Wildebeestkuil 1 Solar PV Plant, 132kV power line and associated infrastructure. The overall objective of the solar PV plants and power lines is to generate electricity (by capturing solar energy) to feed into the national electricity grid and "wheel" the power to customers based on a power purchase agreement. Additionally, an agreement is in place to sell the energy to PowerX, who hold a National Energy Regulator of South Africa (NERSA)-issued

[1] GOVERNMENT GAZETTE No. 43110, PROCEDURES FOR THE ASSESSMENT AND MINIMUM CRITERIA FOR REPORTING ON IDENTIFIED ENVIRONMENTAL THEMES IN TERMS OF SECTIONS 24(5)(a) AND (h) AND 44 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998, WHEN APPLYING FOR ENVIRONMENTAL AUTHORISATION, 20 MARCH 2020.

In terms of sections 24(5)(a), (h) and 44 of the National Environmental Management Act, 1998, prescribe general requirements for undertaking site sensitivity verification and for protocols for the assessment and minimum report content requirements of environmental impacts for environmental themes for activities requiring environmental authorisation, as contained in the Schedule hereto. When the requirements of a protocol apply, the requirements of Appendix 6 of the Environmental Impact Assessment Regulations, as amended, (EIA Regulations), promulgated under sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), are replaced by these requirements. Each protocol applies exclusively to the environmental theme identified within its scope. Multiple themes may apply to a single application for environmental authorisation, and assessments for these themes must be undertaken in accordance with the relevant protocol, or where no specific protocol has been prescribed, in accordance with the requirements of the EIA Regulations.

electricity trading license which allows them to purchase energy generated from clean and renewable resources and sell it to its customers.

The proposed solar PV plant will be located on the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59; and
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59.

The combined extent of the above-mentioned properties is approximately 115.5 hectares (ha). The proposed solar PV plant and associated infrastructure assessed as part of this BA will however only occupy a portion of the above-mentioned properties.

The power line corridor alternatives associated with each proposed solar PV plant which were assessed as part of the respective BA processes traverse the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 5 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 7 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 29 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59;
- Portion 35 of the Farm Leeuwbosch No. 44;
- Portion 36 of the Farm Leeuwbosch No. 44;
- Portion 37 of the Farm Leeuwbosch No. 44; and
- Portion 38 of the Farm Leeuwbosch No. 44.

The proposed development is located directly west of the Harvard Substation, where the current supply of electricity for the local areas and businesses is extracted from.

3.3 Solar PV Plant Components

The key components to be constructed are listed below:

- Solar PV field (arrays) comprising multiple PV modules.
- PV panel mountings. PV panels will be single axis tracking mounting, and the modules will be either crystalline silicon or thin film technology.
- Each PV module will be approximately 2.5m long and 1.2m wide and mounted on supporting structures above ground. The final design details will become available during the detailed design phase of the proposed development, prior to the start of construction.
- The foundations will most likely be either concrete or rammed piles. The final foundation design will be determined at the detailed design phase of the proposed development.

In addition, related infrastructure required are:

- Underground cabling (≈0.8m × 0.6 wide)
- Permanent Guard House (≈876m²)
- Temporary building zone (≈2994m²)
- Switching Substation (≈2000m²)

- Internal gravel roads (≈3.5m width)
- Upgrade to existing roads; and
- Site fencing (≈2.1m high)

In addition to the above, the electricity generated by the proposed solar PV plant will be fed into the national electricity grid via a 132kV power line, which will connect to the Leeudoringstad Solar Plant Substation (part of a separate BA process)[2]. The proposed 132kV power line will consist of a series of towers anticipated to be located approximately 200m to 250m apart at this stage. The type of power line towers will be determined during the final design stages of the proposed development, prior to construction commencing. The height will vary based on the terrain, but will ensure minimum overhead line (OHL) line clearances with buildings and surrounding infrastructure. The exact location of the towers will be determined during the final design stages of the proposed development.

For the purpose of this BA, corridors between approximately 60m and 150m wide were assessed for the proposed power line corridor route alternatives (see **Section 4** below). This is to allow for flexibility to route the power lines within the assessed corridors. As such, the selected preferred power lines will be routed within the assessed corridors. The final servitudes will be routed within the power line corridors, and it expected that the servitude swill not exceed 32m.

Once fully developed, the intention is to generate electricity (by capturing solar energy) to feed into the national electricity grid and “wheel” the power to customers based on a power purchase agreement. Additionally, an agreement is in place to sell the energy to PowerX, who hold a NERSA-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and sell it to its customers.

The construction phase will be between 12 and 24 months and the operational lifespan will be approximately 20 years, depending on the length of the power purchase agreement with the relevant off taker.

4 BA ALTERNATIVES

4.1 Location alternatives

No site alternatives for the proposed developments are being considered as the placement of solar PV installations and power lines is dependent on several factors, all of which are favourable at the proposed site location. This included land availability and topography, environmental sensitivities, distance to the national grid, solar resource site accessibility and current land use.

4.2 Technology alternatives

No other activity / technology alternatives are being considered. Renewable energy development in South Africa is highly desirable from a social, environmental and development point of view. Based on the flat terrain, the climatic conditions and current land use being agricultural, it was determined that the proposed site would be best-suited for a solar PV plant and associated power line, instead of any

[2] Proposed Leeudoringstad Solar Plant Substation part of separate BA process and will be authorised under a separate EA.

other type of renewable energy technology. It is generally preferred to install wind energy facilities (WEFs) on elevated ground. In addition, concentrated solar power (CSP) installations are not feasible because they have a high water requirement and the project site is located in a relatively arid area. There is also not enough rainfall in the area to justify a hydro-electric plant. Therefore, the only feasible technology alternative on this site is solar PV with associated power line, and as such this is the only technology alternative being considered.

4.3 Layout alternatives

No design or layout alternatives for the PV development area, Switching Substation, Guard house and Temporary Building Zone (and all other associated infrastructure) are being considered or assessed as part of the current BA process. Design and layout alternatives were considered and assessed as part of a previous BA process that was never completed, and as such the PV development area, Switching Substation, Guard house and Temporary Building Zone (and all other associated infrastructure) have been placed to avoid site sensitivities identified as part of a previous BA process as well as the current BA process. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layout being proposed as part of the current project. The results of the updated specialist assessments have informed the layout being proposed as part of the current BA process. The proposed layout has therefore been informed by the identified environmental sensitive and/or “no-go” areas.

Three (3) power line corridor route alternatives for the proposed 132kV power line were however identified and assessed by the respective specialists as part of the current BA process. These alternatives essentially provide for different power line route alignments contained within an assessment corridor. The power line corridor route alternatives were informed by the identified environmental sensitive and/or “no-go” areas. The various power line corridor alternatives are described in **Section 5.10** below.

4.4 The operational aspects of the activity

No operational alternatives were assessed in the BA, as none are available for solar PV installations and power lines.

4.5 ‘No-go’ alternative

The “no-go” alternative is the option of not fulfilling the proposed project. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report. Implementing the “no-go” option would entail no development.

The “no-go” option is a feasible option; however, this would prevent the Wildebeestkuil 1 Solar PV Plant & 132kV Power Line from contributing to the environmental, social and economic benefits associated with the development of the renewables sector.

5 SPECIALIST REPORT REQUIREMENTS

The specialist assessments should include the following sections:

5.1 Project Description

The specialist report must include the project description as provided above.

5.2 Terms of Reference (ToR)

The specialist report must include an explanation of the Terms of Reference (ToR) applicable to the specialist study. In addition, a table must be provided at the beginning of the specialist report listing the requirements for specialist reports in accordance with Appendix 6 of the EIA Regulations, 2014 (as amended) and cross referencing these requirements with the relevant sections in the report. An MS Word version of this table will be provided by SiVEST.

5.3 Legal Requirements and Guidelines

The specialist report must include a thorough overview of all applicable best practice guidelines, relevant legislation and authority requirements.

5.4 Methodology

The report must include a description of the methodology applied in carrying out the specialist assessment.

5.5 Specialist Findings / Identification of Impacts

The report must present the findings of the specialist studies and explain the implications of these findings for the proposed development (e.g. permits, licenses etc.). This section of the report should also identify any sensitive and/or 'no-go' areas on the development site which should be avoided.

The reports should be accompanied with spatial datasets (shapefiles, KML) and accompanying text documents if required.

5.6 Impact Rating Methodology

The impacts of the proposed solar PV plant and 132kV power line (during the Construction, Operation and Decommissioning phases) are to be assessed and rated according to the methodology developed by SiVEST. Specialists will be required to make use of the impact rating matrix provided (in Excel format) for this purpose. Please note that the significance of Cumulative Impacts should also be rated in this section. Both the methodology and the rating matrix will be provided by SiVEST.

Please be advised that this section must include mitigation measures aimed at minimising the impact of the proposed development.

5.7 Input to The Environmental Management Program (EMPr)

The report must include a description of the key monitoring recommendations for each applicable mitigation measure identified for each phase of the proposed development for inclusion in the Environmental Management Program (EMPr) or Environmental Authorisation (EA).

Please make use the Impact Rating Table (in Excel format) provided for each of the phases (i.e. Design, Construction, Operation and Decommissioning).

5.8 Cumulative Impact Assessment

Cumulative impact assessments must be undertaken for the proposed solar PV plant in order to determine the cumulative impact that will materialise should other Renewable Energy Facilities (REFs) and large-scale industrial developments be constructed within 50km of the proposed development.

The cumulative impact assessment must contain the following:

- A cumulative environmental impact statement noting whether the overall impact is acceptable; and
- A review of the specialist reports undertaken for other REFs and an indication of how the recommendations, mitigation measures and conclusion of the studies have been considered.

In order to assist the specialists in this regard, SiVEST will provide the following documentation / data:

- A summary table listing all REFs identified within 50km of the proposed solar PV plant;
- A map showing the location of the identified REFs;
- KML files; and
- Relevant EIA / BA reports that could be obtained.

The list of renewable energy facilities that must be assessed as part of the cumulative impact will be provided.

5.9 “No-Go” Alternative

Consideration must be given to the “no-go” option in the BA process. The “no-go” option assumes that the site remains in its current state, i.e. there is no construction of a Solar PV Plant, 132kV power line and associated infrastructure in the proposed project area and the status quo would proceed.

5.10 Comparative Assessment of Alternatives

As mentioned, layout alternatives, which subsequently informed the area for the potential erection of PV panels for the proposed solar PV plant, were identified and comparatively assessed as part of the BA process undertaken in 2016. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layout being proposed as part of the current project. The results of the updated specialist assessments have informed the layout being proposed as part of the current BA process.

As the positions of the proposed PV development area, Switching Substation, Guard house and Temporary Building Zone (as well as all other associated infrastructure) have already been determined taking the identified environmental sensitive and/or "no-go" areas into consideration, the specialist is to update the comparative assessment as per the latest table provided by SiVEST.

Three (3) power line corridor route alternatives for the proposed 132kV power line were however identified and assessed by the respective specialists as part of the current BA process. These alternatives essentially provide for different power line route alignments contained within an assessment corridor. The power line corridor route alternatives were informed by the identified environmental sensitive and/or "no-go" areas. The various power line corridor route alternatives are described below.

1) Power Line Corridor Option 1:

This involves an overhead power line which will run north of the R502, from the switching substation located within the Wildebeestkuil PV1 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[3]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil PV1 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

2) Power Line Corridor Option 2A:

This involves an overhead power line which will run south of the R502, from the switching substation located within the Wildebeestkuil PV1 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[3]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil PV1 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

3) Power Line Corridor Option 2B:

This involves an underground power line which will run south of the R502, from the switching substation located within the Wildebeestkuil PV1 Solar PV Plant application site to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation (part of separate BA process), depending on the alternative chosen as 'preferred' for the Leeudoringstad Solar Plant Substation site[3]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil PV1 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

The specialist is therefore also to undertake comparative assessment for the above-mentioned power line corridor alternatives as per the table provided by SiVEST.

Key

PREFERRED	The alternative will result in a low impact / reduce the impact / result in a positive impact

[3] 132kV power line corridor route associated with solar PV plant intrinsically linked to Leeudoringstad Solar Plant Substation site (part of separate on-going BA process). Leeudoringstad Solar Plant Substation site chosen as "preferred" by respective specialists as part of that separate BA process therefore informed connection point for power line corridor being proposed as part of this BA application.

FAVOURABLE	The impact will be relatively insignificant
LEAST PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

Alternative	Preference	Reasons (incl. potential issues)
Power Line Corridor Route Alternative		
Option 1		
Option 2A		
Option 2B		

5.11 Conclusion / Impact Statement

The conclusion section of the specialist reports must include an **Impact Statement**, indicating whether any fatal flaws have been identified and ultimately whether the proposed development can be authorised or not (i.e. whether EA should be granted / issued or not).

5.12 Executive Summary

Specialists must provide an Executive Summary which summarises the findings of their report to allow for easy inclusion in the BA reports.

6 DELIVERABLES

All specialists will need to submit the following deliverables:

- 1 x Draft Specialist Report for inclusion in DBAR no later than 07 September 2020 and updated version based on EAP and applicant review no later than 11 September 2020;
- 1 x Final Specialist Report for inclusion in FBAR (should updates and/or revisions be required);
- A copy of the Specialist Declaration of Interest (DoI) form, containing original signatures. This form will be provided to the specialists. ***Please note that the undertaking / affirmation under oath section of the report must be signed by a Commissioner of Oaths***; and
- All data relating to the studies, such as shape files, photos and maps (see **Section 7** below).

7 GENERAL SUBMISSION REQUIREMENTS

Please ensure that your specialist report includes the following:

- A detailed description of the study's methodology; indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisations;
- Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the correct season and providing that as a limitation will not be allowed;

- All specialist studies must be final, and provide detailed / practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA;
- Should a specialist recommend specific mitigation measures, these must be clearly indicated;
- Regarding cumulative impacts:
    - Clearly defined cumulative impacts and where possible the size of the identified impact must be quantified and indicated, i.e. hectares of cumulatively transformed land.
    - A detailed process flow to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.
    - Identified cumulative impacts associated with the proposed development must be rated with the significance rating methodology used in the process.
    - The significance rating must also inform the need and desirability of the proposed development.
    - A cumulative impact environmental statement on whether the proposed development must proceed.
- The report must in line with the DEA Screening Tool Specialist Theme Protocols (As gazetted 20 March 2020) if they apply. If they do not, the report must be written in accordance with Appendix 6 of the EIA Regulations, 2014 (as amended);
- A table at the beginning of your report cross referencing how the requirements for specialist according to Appendix 6 of the EIA Regulations, 2014 (as amended) has been adhered to. An MS Word version will be provided;
- A thorough overview of all applicable legislation, policies, guidelines. etc.;
- Identification of sensitive and/or “no-go” areas to be avoided;
- Please note that the Department considers a “no-go” area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure is allowed in the “no-go” areas;
- Should the specialist definition of “no-go” area differ from the Departments definition; this must be clearly indicated. The specialist must also indicate the “no-go” area's buffer if applicable;
- Recommend mitigation measures in order to minimise the impact of the proposed development;
- Provide implications of specialist findings for the proposed development (e.g. permits, licenses etc.);
- Specify if any further assessment will be required;
- Include an Impact Statement, concluding whether any fatal flaws have been identified and ultimately whether the proposed development can be authorised or not (i.e. whether EA should be granted / issued or not); and
- A copy of the Specialist Declaration of Interest (DoI) form, containing original signatures, must be appended to all Draft and Final Reports. This form will be provided to the specialists. ***Please note that the undertaking / affirmation under oath section of the report must be signed by a Commissioner of Oaths.***

8 DEADLINES AND REPORT SUBMISSION

- Draft Specialist Report for inclusion in DBAR no later than 07 September 2020 and updated version based on EAP and applicant review no later than 11 September 2020.
- Any changes arising based on stakeholder engagement no later than 16 October 2020

9 REPORT / DATA FORMATS

- All specialist reports must be provided in MS Word format;
- Where maps have been inserted into the report, SiVEST will require a separate map set in PDF format for inclusion in our submission;
- Where figures and/or photos have been inserted into the report, SiVEST will require the original graphic in .jpg format for inclusion in our submission; and
- ***Delineated areas of sensitivity must be provided in either ESRI shape file format or Google Earth KML format. Sensitivity classes must be included in the attribute tables with a clear indication of which areas are "No-Go" areas.***

10 SPECIALIST SPECIFIC ISSUES

Terrestrial Ecology

- Describe the terrestrial ecology features of the project area, with focus on features that are potentially impacted by the proposed project. The description should include the major habitat forms within the study site, giving due consideration to terrestrial ecology (flora), terrestrial ecology (fauna) and Species of Special Concern (SSC).
- Consider seasonal changes and long-term trends, such as due to climate change;
- Identify any SSC or protected species on site and clearly map with a high degree of certainty the exact no-go zones with a high level of confidence;
- Map the sensitive ecological features within the proposed project area, showing any 'no-go' areas (i.e. 'very high' sensitivity). Specify set-backs or buffers and provide clear reasons for these recommendations. Also map the extent of disturbance and transformation of the site;
- Identify and assess the potential impacts of the project on the terrestrial environment and provide mitigation measures to include in the environmental management plan; and
- The assessment should be based on existing information, national and provincial databases, SANBI mapping, professional experience and field work conducted.

Soils and Agricultural Potential

- Describe the existing environment in terms of soils, geology, land-use and agricultural potential. Significant soils and agricultural features or disturbances should be identified, as well as sensitive features and receptors within the project area. The description must include surrounding agricultural land uses and activities, to convey the local agricultural context;
- Describe and map soil types (soil forms), soil characteristics (soil depth, soil colour, limiting factors, and clay content of the top and sub soil layers), and degradation and erodibility of soils etc. to the extent necessary to inform this assessment;

- Varying sensitivities of the soils and agricultural potential must be mapped and highlighted;
- The assessment is to be based on existing information, and professional experience and field work conducted by the specialist, as considered necessary and in accordance with relevant legislated requirements;
- Identify and assess the potential impacts of the proposed development on loss of agricultural land, soils and agriculture, including impacts of associated infrastructure, such as the buildings, fencing etc. and provide relevant mitigation measures to include in the environmental management plan;
- Identify any protocols, legal and permit requirements relating to soil and agricultural potential impacts that are relevant to this project and the implications thereof;
- Map sensitivity of the site and clearly show no-go areas i.e. existing irrigated fields/ cultivated lands; and
- The report needs to fulfil the terms of reference for an agricultural study as set out in the National Department of Agriculture's document, Regulations for the evaluation and review of applications pertaining to renewable energy on agricultural land, dated September 2011, with an appropriate level of detail for the agricultural suitability and soil variation on site (which may therefore be less than the standardised level of detail stipulated in the above regulations).

Avifauna (Birds)

- Describe the affected environment from an avifaunal perspective, including consideration of the surrounding habitats and avifaunal features (e.g. Ramsar sites, Critical Bird Areas, wetlands, migration routes, feeding, roosting & nesting areas, etc.);
- Describe and map bird habitats on the site, based on on-site monitoring, desk-top review, collation of available information, studies in the local area and previous experience;
- Map the sensitivity of the site in terms of avifaunal features such as habitat use, roosting, feeding and nesting / breeding; and
- Identify and assess the potential impacts of the proposed development on avifauna. Provide sufficient mitigation measures to include in the environmental management plan.

Geotechnical

- Comprehensive desktop geotechnical report detailing the geological, hydrogeological and geotechnical conditions is required.
- A literature review should be undertaken as part of the desktop investigation in which topographic and geological maps must be reviewed.
- Consideration must be given, but not limited to, the following at desktop level.
    - The influence of topography on site suitability of the PV Plant and 132kV power line.
    - Any envisaged geological and geotechnical influences and the competency of foundations for the construction of the PV plant and 132kV power line.
    - Tectonic influences on overall stability, namely the presence of faulting, lineaments and preferred discontinuity orientations.
- As part of the literature review, any available previous investigations and reports should be reviewed and critical geotechnical conclusions presented in the desktop report.

Heritage

- Describe and map the heritage features of the site and surrounding area. This is to be based on desk-top reviews, fieldwork, available databases, and findings from other heritage studies in the area, where relevant. Include reference to the grade of heritage feature and any heritage status the feature may have been awarded;
- Assess the impacts and provide mitigation measures to include in the environmental management plan;
- Map heritage sensitivity for the site. Clearly show any "no-go" areas in terms of heritage (i.e. "very high" sensitivity) and provide recommended buffers or set-back distances;
- Identify and assess potential impacts from the project on the full scope of heritage features, including archaeology, palaeontology and the cultural-historical landscape, as required by heritage legislation;
- Liaise with the relevant authority in order to obtain a final comment in terms of section 38 pf the National Heritage Resources Act, 1999 (Act No. 25 of 1999), including Regulations issued thereunder, as necessary; and
- Load the relevant documents on the South African Heritage Resources Information System (SAHRIS) to obtain a comment from SAHRA.

Social

- Describe the social assessment context of the Leeudoringstad and Kgakala areas, focusing on aspects that are potentially affected by a substation project, and taking into consideration the current situation as well as the trends, the local planning (IDPs and SDFs), other developments in the area. The study should look more broadly than the individual land parcels on which the proposed project will developed, as most, if not all, of the anticipated social impacts may be experienced in the urban areas nearest to the proposed development;
- Apply a variety of appropriate options for sourcing information, such as review of analogous studies, available databases and social indicators, and use of interviews with key affected parties such as local communities, local landowners & government officials (local and regional) etc.;
- The social study does not lend itself to providing a spatially based sensitivity map. Therefore, instead, the study could provide a simplified schematic mapping of the links between the project actions (i.e. interventions) and the receiving social environment (i.e. the socio-ecological system), which may occur at a local, provincial or national scale, and showing how these links can be optimized to enhance benefits and minimize negative impacts;
- Consider social issues such as potential in-migration of job seekers, opportunities offered by training and skills development, cumulative effects with other projects in the local area implications for local planning and resource use;
- Provide recommendations to enhance the socio-economic benefits of the proposed development and to avoid (or minimise) the potential negative impacts;
- Identify and assess potential social benefits and costs as a result of the proposed development, for all stages of the project, and including the estimated direct employment opportunities; and
- Evaluate the implications of the project on the local socio-economic context.

Surface Water / Aquatic Ecology

- Compile a Surface Water / Aquatic Ecology Compliance Statement according to the protocol for the assessment and reporting of environmental impacts on aquatic biodiversity on a site identified as being of "low sensitivity" for aquatic biodiversity, gazetted on 20 March 2020

(Sections 24(5)(A) and (H) and 44 of NEMA, 1998) (https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Aquatic_Biodiversity_Assessment.pdf);

- The Surface Water / Aquatic Biodiversity Compliance Statement, must verify:
- That the site is of "low" sensitivity for aquatic biodiversity; and

- Whether or not the proposed development will have an impact on the aquatic features.
- The Surface Water / Aquatic Biodiversity Compliance Statement, must contain, as a minimum, the following information:
  - Contact details and curriculum vitae of the specialist including SACNASP registration number and field of expertise;
  - A signed statement of independence by the specialist;
  - Baseline profile description of biodiversity and ecosystems, including the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;
  - Methodology used to verify the sensitivities of the aquatic biodiversity features on the national web based environmental screening tool;
  - Methodology used to undertake the Initial Site Sensitivity Verification and preparation of the Compliance Statement, including equipment and modelling used, where relevant;
  - Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;
  - A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations; and
  - Any conditions to which the statement is subjected.
- Where the information gathered from the Initial Site Sensitivity Verification differs from that identified as having a "low" aquatic biodiversity sensitivity by the national web based environmental screening tool and it is found to be of a "very high" sensitivity, the following will be required:
  - Describe the aquatic ecology features of the project area, with focus on features that are potentially impacted by the proposed project. The description should include the major habitat forms within the study site, giving due consideration to freshwater ecosystems, drainage lines and wetlands;
  - Consider seasonal changes and long-term trends, such as due to climate change as far as possible;
  - Identify any Species of Special Concern or protected species on site relevant to the aquatic environment;
  - Map the sensitive ecological features within the proposed project area, showing any 'no-go' areas (i.e. 'very high' sensitivity) with a very high confidence and accuracy. Specify set-backs or buffers and provide clear reasons for these recommendations. Also map the extent of disturbance and transformation of the site;
  - Identify and delineate wetlands that may occur on the site, using the relevant and latest protocols established by DWAF;
  - Determine if a Water Use License (WUL) or General Authorisation (GA) is required and if so, determine the requirements thereof by undertaking the appropriate DWS risk assessment.

- Verify the datasets of watercourses against a digital terrain model (or slope / contour data) to ensure that the watercourses are mapped in the correct places based on topography;
- Identify and assess the potential impacts of the project (including all access roads) on the aquatic environment;
- Provide mitigation measures to include in the environmental management plan; and
- The assessment should be based on existing information, national and provincial databases, SANBI mapping, professional experience and field work conducted.

Visual

- Describe the visual character of the local area. Any significant visual features or visual disturbances should be identified and mapped, as well as any sensitive visual receptors within the proposed project area or within viewsheds of the proposed development;
- Visual character and visual absorption capacity should be described;
- Viewsheds for various elements of the proposed development should be calculated, defined and presented, and the varying sensitivities of these viewsheds must be highlighted;
- Mapping of visual sensitivity of the site will require consideration of visual receptors outside the site, and sensitivity to development on the site for potentially affected visual receptors of 'very high' sensitivity;
- Assessment to be based on findings of the site visit, visual modelling, and a photographic survey of the surrounding region from which the landscape and visual baselines can be prepared;
- Identify and assess potential impacts from the project on the receiving environment. All impacts should be considered under varying conditions as appropriate to the study i.e. day, night, clear weather, cloudy weather etc. Provide mitigation measures to include in the EMPr;
- Maps depicting viewsheds / line of sight across the site should be generated and included in the reports. These maps should indicate current viewsheds / visual landscape / obstructions as well as expected visual impacts during the construction, operational and decommissioning phases of the proposed development;
- Provide specific mitigation on light management and
- Provide photomontages from accessible locations.

PROPOSED DEVELOPMENT OF THE 9.9MW WILDEBEESTKUIL 2 SOLAR PHOTOVOLTAIC (PV) PLANT, 132kV POWER LINE AND ASSOCIATED INFRASTRUCTURE NEAR LEEUDORINGSTAD IN THE NORTH WEST PROVINCE, MAQUASSI HILLS LOCAL MUNICIPALITY IN THE DR KENNETH KAUNDA DISTRICT MUNICIPALITY

TERMS OF REFERENCE (ToR) FOR SPECIALIST STUDIES

1 INTRODUCTION

The purpose of the Terms of Reference (ToR) is to provide the specialist team with a consistent approach to the specialist studies that are required as part of the Basic Assessment (BA) process being conducted in respect of the proposed solar photovoltaic (PV) plant and associated power line development. This will enable comparison of environmental impacts, efficient review, and collation of the specialist studies into the BA report, in accordance with the latest requirements of the EIA Regulations, 2014 (as amended).

2 PROCESS

In terms of the Environmental Impact Assessment (EIA) Regulations, which were published on 04 December 2014 and amended on 07 April 2017 [promulgated in Government Gazette 40772 and Government Notice (GN) R326, R327, R325 and R324 on 7 April 2017], various aspects of the proposed development are considered listed activities under GNR 327 and GNR 324 (this project is considered a BA process due to energy capacity thresholds of under 20MW and vegetation clearance thresholds of under 20ha), which may have an impact on the environment and therefore require authorisation from the provincial competent authority, namely the North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT), prior to the commencement of such activities.

3 PROJECT DESCRIPTION

3.1 Project history

The original BA process for the proposed Wildebeestkuil PV Generation (Pty) Ltd (hereafter referred to as "Wildebeestkuil PV Generation") solar photovoltaic (PV) plant was initiated in August 2016. All specialist studies were undertaken and subsequently all site sensitivities were identified. The specialist studies and draft basic assessment reports (DBARs) were completed and released for 30-day public review. The BA was however put out on hold prior to submitting the final basic assessment reports (FBARs) to the Department of Environmental Affairs (DEA). In February 2017, the proposed capacity and layout of the solar PV plant was amended, and a new connection point and associated power line corridors were assessed. However, the project was put on hold prior to submitting the application forms to the DEA or commencing with the legislated public participation process. In August of 2020, Wildebeestkuil PV Generation proposed an additional 9.9MW PV plant on the Wildebeestkuil site (now referred to as the Wildebeestkuil 1 Solar PV Plant & 132kV Power Line and Wildebeestkuil 2 Solar PV Plant & 132kV Power Line) outside of all site sensitivities that were identified in 2016, and as such specialist studies have been commissioned to assess and verify the now two (2) solar PV plants and 132kV power lines under the new Gazetted specialist protocols[1].

3.2 Project location

Wildebeestkuil PV Generation is proposing to construct a solar PV plant, 132kV power line and associated infrastructure approximately 4km east of the town of Leeudoringstad in the Maquassi Hills Local Municipality, which falls within the Dr Kenneth Kaunda District Municipality in the North West Province of South Africa (hereafter referred to as the "proposed development") (Department Ref No.: To be Allocated). The proposed development will have a total maximum generation capacity of up to approximately 9.9 megawatt (MW) and will be referred to as the Wildebeestkuil 2 Solar PV Plant and 132kV Power Line. SiVEST Environmental Division (hereafter referred to as "SiVEST") has subsequently been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the BA process for the proposed construction of the Wildebeestkuil 2 Solar PV Plant, 132kV power line and associated infrastructure. The overall objective of the solar PV plants and power lines is to generate electricity (by capturing solar energy) to feed into the national electricity grid and "wheel" the power to customers based on a power purchase agreement. Additionally, an agreement is in place to sell the energy to PowerX, who hold a National Energy Regulator of South Africa (NERSA)-issued

[1] GOVERNMENT GAZETTE No. 43110, PROCEDURES FOR THE ASSESSMENT AND MINIMUM CRITERIA FOR REPORTING ON IDENTIFIED ENVIRONMENTAL THEMES IN TERMS OF SECTIONS 24(5)(a) AND (h) AND 44 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998, WHEN APPLYING FOR ENVIRONMENTAL AUTHORISATION, 20 MARCH 2020.

In terms of sections 24(5)(a), (h) and 44 of the National Environmental Management Act, 1998, prescribe general requirements for undertaking site sensitivity verification and for protocols for the assessment and minimum report content requirements of environmental impacts for environmental themes for activities requiring environmental authorisation, as contained in the Schedule hereto. When the requirements of a protocol apply, the requirements of Appendix 6 of the Environmental Impact Assessment Regulations, as amended, (EIA Regulations), promulgated under sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), are replaced by these requirements. Each protocol applies exclusively to the environmental theme identified within its scope. Multiple themes may apply to a single application for environmental authorisation, and assessments for these themes must be undertaken in accordance with the relevant protocol, or where no specific protocol has been prescribed, in accordance with the requirements of the EIA Regulations.

electricity trading license which allows them to purchase energy generated from clean and renewable resources and sell it to its customers.

The proposed solar PV plant will be located on the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59; and
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59.

The combined extent of the above-mentioned properties is approximately 115.5 hectares (ha). The proposed solar PV plant and associated infrastructure assessed as part of this BA will however only occupy a portion of the above-mentioned properties.

The power line corridor alternatives associated with each proposed solar PV plant which were assessed as part of the respective BA processes traverse the following properties:

- Portion 13 of the Farm Wildebeestkuil No. 59;
- Portion 14 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 5 of the Farm Wildebeestkuil No. 59;
- Remainder of Portion 7 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 29 of the Farm Leeuwbosch No. 44;
- Remainder of Portion 22 of the Farm Wildebeestkuil No. 59;
- Portion 35 of the Farm Leeuwbosch No. 44;
- Portion 36 of the Farm Leeuwbosch No. 44;
- Portion 37 of the Farm Leeuwbosch No. 44; and
- Portion 38 of the Farm Leeuwbosch No. 44.

The proposed development is located directly west of the Harvard Substation, where the current supply of electricity for the local areas and businesses is extracted from.

3.3 Solar PV Plant Components

The key components to be constructed are listed below:

- Solar PV field (arrays) comprising multiple PV modules.
- PV panel mountings. PV panels will be single axis tracking mounting, and the modules will be either crystalline silicon or thin film technology.
- Each PV module will be approximately 2.5m long and 1.2m wide and mounted on supporting structures above ground. The final design details will become available during the detailed design phase of the proposed development, prior to the start of construction.
- The foundations will most likely be either concrete or rammed piles. The final foundation design will be determined at the detailed design phase of the proposed development.

In addition, related infrastructure required are:

- Underground cabling (≈0.8m × 0.6 wide)
- Permanent Guard House (≈876m²)
- Temporary building zone (≈2994m²)
- Switching Substation (≈2000m²)

- Internal gravel roads (≈3.5m width)
- Upgrade to existing roads; and
- Site fencing (≈2.1m high)

In addition to the above, the electricity generated by the proposed solar PV plant will be fed into the national electricity grid via a 132kV power line, which will connect to the Leeudoringstad Solar Plant Substation (part of a separate BA process)[2]. The proposed 132kV power line will consist of a series of towers anticipated to be located approximately 200m to 250m apart at this stage. The type of power line towers will be determined during the final design stages of the proposed development, prior to construction commencing. The height will vary based on the terrain, but will ensure minimum overhead line (OHL) line clearances with buildings and surrounding infrastructure. The exact location of the towers will be determined during the final design stages of the proposed development.

For the purpose of this BA, corridors between approximately 60m and 150m wide were assessed for the proposed power line corridor route alternatives (see **Section 4** below). This is to allow for flexibility to route the power lines within the assessed corridors. As such, the selected preferred power lines will be routed within the assessed corridors. The final servitudes will be routed within the power line corridors, and it expected that the servitude swill not exceed 32m.

Once fully developed, the intention is to generate electricity (by capturing solar energy) to feed into the national electricity grid and “wheel” the power to customers based on a power purchase agreement. Additionally, an agreement is in place to sell the energy to PowerX, who hold a NERSA-issued electricity trading license which allows them to purchase energy generated from clean and renewable resources and sell it to its customers.

The construction phase will be between 12 and 24 months and the operational lifespan will be approximately 20 years, depending on the length of the power purchase agreement with the relevant off taker.

4 BA ALTERNATIVES

4.1 Location alternatives

No site alternatives for the proposed developments are being considered as the placement of solar PV installations and power lines is dependent on several factors, all of which are favourable at the proposed site location. This included land availability and topography, environmental sensitivities, distance to the national grid, solar resource site accessibility and current land use.

4.2 Technology alternatives

No other activity / technology alternatives are being considered. Renewable energy development in South Africa is highly desirable from a social, environmental and development point of view. Based on the flat terrain, the climatic conditions and current land use being agricultural, it was determined that the proposed site would be best-suited for a solar PV plant and associated power line, instead of any

[2] Proposed Leeudoringstad Solar Plant Substation part of separate BA process and will be authorised under a separate EA.

other type of renewable energy technology. It is generally preferred to install wind energy facilities (WEFs) on elevated ground. In addition, concentrated solar power (CSP) installations are not feasible because they have a high water requirement and the project site is located in a relatively arid area. There is also not enough rainfall in the area to justify a hydro-electric plant. Therefore, the only feasible technology alternative on this site is solar PV with associated power line, and as such this is the only technology alternative being considered.

4.3 Layout alternatives

No design or layout alternatives for the PV development area, Switching Substation, Guard house and Temporary Building Zone (and all other associated infrastructure) are being considered or assessed as part of the current BA process. Design and layout alternatives were considered and assessed as part of a previous BA process that was never completed, and as such the PV development area, Switching Substation, Guard house and Temporary Building Zone (and all other associated infrastructure) have been placed to avoid site sensitivities identified as part of a previous BA process as well as the current BA process. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layout being proposed as part of the current project. The results of the updated specialist assessments have informed the layout being proposed as part of the current BA process. The proposed layout has therefore been informed by the identified environmental sensitive and/or “no-go” areas.

Three (3) power line corridor route alternatives for the proposed 132kV power line were however identified and assessed by the respective specialists as part of the current BA process. These alternatives essentially provide for different power line route alignments contained within an assessment corridor. The power line corridor route alternatives were informed by the identified environmental sensitive and/or “no-go” areas. The various power line corridor alternatives are described in **Section 5.10** below.

4.4 The operational aspects of the activity

No operational alternatives were assessed in the BA, as none are available for solar PV installations and power lines.

4.5 ‘No-go’ alternative

The “no-go” alternative is the option of not fulfilling the proposed project. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report. Implementing the “no-go” option would entail no development.

The “no-go” option is a feasible option; however, this would prevent the Wildebeestkuil 2 Solar PV Plant & 132kV Power Line from contributing to the environmental, social and economic benefits associated with the development of the renewables sector.

5 SPECIALIST REPORT REQUIREMENTS

The specialist assessments should include the following sections:

5.1 Project Description

The specialist report must include the project description as provided above.

5.2 Terms of Reference (ToR)

The specialist report must include an explanation of the Terms of Reference (ToR) applicable to the specialist study. In addition, a table must be provided at the beginning of the specialist report listing the requirements for specialist reports in accordance with Appendix 6 of the EIA Regulations, 2014 (as amended) and cross referencing these requirements with the relevant sections in the report. An MS Word version of this table will be provided by SiVEST.

5.3 Legal Requirements and Guidelines

The specialist report must include a thorough overview of all applicable best practice guidelines, relevant legislation and authority requirements.

5.4 Methodology

The report must include a description of the methodology applied in carrying out the specialist assessment.

5.5 Specialist Findings / Identification of Impacts

The report must present the findings of the specialist studies and explain the implications of these findings for the proposed development (e.g. permits, licenses etc.). This section of the report should also identify any sensitive and/or 'no-go' areas on the development site which should be avoided.

The reports should be accompanied with spatial datasets (shapefiles, KML) and accompanying text documents if required.

5.6 Impact Rating Methodology

The impacts of the proposed solar PV plant and 132kV power line (during the Construction, Operation and Decommissioning phases) are to be assessed and rated according to the methodology developed by SiVEST. Specialists will be required to make use of the impact rating matrix provided (in Excel format) for this purpose. Please note that the significance of Cumulative Impacts should also be rated in this section. Both the methodology and the rating matrix will be provided by SiVEST.

Please be advised that this section must include mitigation measures aimed at minimising the impact of the proposed development.

5.7 Input to The Environmental Management Program (EMPr)

The report must include a description of the key monitoring recommendations for each applicable mitigation measure identified for each phase of the proposed development for inclusion in the Environmental Management Program (EMPr) or Environmental Authorisation (EA).

Please make use the Impact Rating Table (in Excel format) provided for each of the phases (i.e. Design, Construction, Operation and Decommissioning).

5.8 Cumulative Impact Assessment

Cumulative impact assessments must be undertaken for the proposed solar PV plant in order to determine the cumulative impact that will materialise should other Renewable Energy Facilities (REFs) and large-scale industrial developments be constructed within 50km of the proposed development.

The cumulative impact assessment must contain the following:

- A cumulative environmental impact statement noting whether the overall impact is acceptable; and
- A review of the specialist reports undertaken for other REFs and an indication of how the recommendations, mitigation measures and conclusion of the studies have been considered.

In order to assist the specialists in this regard, SiVEST will provide the following documentation / data:

- A summary table listing all REFs identified within 50km of the proposed solar PV plant;
- A map showing the location of the identified REFs;
- KML files; and
- Relevant EIA / BA reports that could be obtained.

The list of renewable energy facilities that must be assessed as part of the cumulative impact will be provided.

5.9 “No-Go” Alternative

Consideration must be given to the “no-go” option in the BA process. The “no-go” option assumes that the site remains in its current state, i.e. there is no construction of a Solar PV Plant, 132kV power line and associated infrastructure in the proposed project area and the status quo would proceed.

5.10 Comparative Assessment of Alternatives

As mentioned, layout alternatives, which subsequently informed the area for the potential erection of PV panels for the proposed solar PV plant, were identified and comparatively assessed as part of the BA process undertaken in 2016. Specialist studies were originally undertaken in 2016 and all current layouts and/or positions being proposed were selected based on the environmental sensitivities identified as part of these studies in 2016. All specialist studies which were undertaken in 2016 were however updated in 2020 (including ground-truthing, where required) to focus on the impacts of the layout being proposed as part of the current project. The results of the updated specialist assessments have informed the layout being proposed as part of the current BA process.

As the positions of the proposed PV development area, Switching Substation, Guard house and Temporary Building Zone (as well as all other associated infrastructure) have already been determined taking the identified environmental sensitive and/or "no-go" areas into consideration, the specialist is to update the comparative assessment as per the latest table provided by SiVEST.

Three (3) power line corridor route alternatives for the proposed 132kV power line were however identified and assessed by the respective specialists as part of the current BA process. These alternatives essentially provide for different power line route alignments contained within an assessment corridor. The power line corridor route alternatives were informed by the identified environmental sensitive and/or "no-go" areas. The various power line corridor route alternatives are described below.

1) Power Line Corridor Option 1:

This involves an overhead power line which will run north of the R502, from the switching substation located within the Wildebeestkuil 2 Solar PV Plant application site (namely Portion 14 of the Farm Wildebeestkuil No. 59) to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation, depending on the alternative chosen as "preferred" for the Leeudoringstad Solar Plant Substation site[3]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil 2 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

2) Power Line Corridor Option 2A:

This involves an overhead power line which will run south of the R502, from the switching substation located within the Wildebeestkuil 2 Solar PV Plant application site (namely Portion 14 of the Farm Wildebeestkuil No. 59) to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation, depending on the alternative chosen as "preferred" for the Leeudoringstad Solar Plant Substation site[3]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil 2 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

3) Power Line Corridor Option 2B:

This involves an underground power line which will run south of the R502, from the switching substation located within the Wildebeestkuil 2 Solar PV Plant application site (namely Portion 14 of the Farm Wildebeestkuil No. 59) to either Option 1 or Option 2 of the Leeudoringstad Solar Plant Substation, depending on the alternative chosen as "preferred" for the Leeudoringstad Solar Plant Substation site[3]. The Leeudoringstad Solar Plant Substation site alternatives are situated approximately 2km to the north-east of the Wildebeestkuil 2 Solar PV Plant application site, within Portion 37 of the Farm Leeuwbosch No. 44.

The specialist is therefore also to undertake comparative assessment for the above-mentioned power line corridor alternatives as per the table provided by SiVEST.

[3] 132kV power line corridor route associated with solar PV plant intrinsically linked to Leeudoringstad Solar Plant Substation site (part of separate on-going BA process). Leeudoringstad Solar Plant Substation site chosen as "preferred" by respective specialists as part of that separate BA process therefore informed connection point for power line corridor being proposed as part of this BA application.

Key

PREFERRED	The alternative will result in a low impact / reduce the impact / result in a positive impact
FAVOURABLE	The impact will be relatively insignificant
LEAST PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

Alternative	**Preference**	**Reasons (incl. potential issues)**
Power Line Corridor Route Alternative		
Option 1		
Option 2A		
Option 2B		

5.11 Conclusion / Impact Statement

The conclusion section of the specialist reports must include an **Impact Statement**, indicating whether any fatal flaws have been identified and ultimately whether the proposed development can be authorised or not (i.e. whether EA should be granted / issued or not).

5.12 Executive Summary

Specialists must provide an Executive Summary which summarises the findings of their report to allow for easy inclusion in the BA reports.

6 DELIVERABLES

All specialists will need to submit the following deliverables:

- 1 x Draft Specialist Report for inclusion in DBAR no later than 07 September 2020 and updated version based on EAP and applicant review no later than 11 September 2020;
- 1 x Final Specialist Report for inclusion in FBAR (should updates and/or revisions be required);
- A copy of the Specialist Declaration of Interest (DoI) form, containing original signatures. This form will be provided to the specialists. ***Please note that the undertaking / affirmation under oath section of the report must be signed by a Commissioner of Oaths***; and
- All data relating to the studies, such as shape files, photos and maps (see **Section 7** below).

7 GENERAL SUBMISSION REQUIREMENTS

Please ensure that your specialist report includes the following:

- A detailed description of the study's methodology; indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisations;

- Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the correct season and providing that as a limitation will not be allowed;
- All specialist studies must be final, and provide detailed / practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA;
- Should a specialist recommend specific mitigation measures, these must be clearly indicated;
- Regarding cumulative impacts:
    - Clearly defined cumulative impacts and where possible the size of the identified impact must be quantified and indicated, i.e. hectares of cumulatively transformed land.
    - A detailed process flow to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.
    - Identified cumulative impacts associated with the proposed development must be rated with the significance rating methodology used in the process.
    - The significance rating must also inform the need and desirability of the proposed development.
    - A cumulative impact environmental statement on whether the proposed development must proceed.
- The report must in line with the DEA Screening Tool Specialist Theme Protocols (As gazetted 20 March 2020) if they apply. If they do not, the report must be written in accordance with Appendix 6 of the EIA Regulations, 2014 (as amended);
- A table at the beginning of your report cross referencing how the requirements for specialist according to Appendix 6 of the EIA Regulations, 2014 (as amended) has been adhered to. An MS Word version will be provided;
- A thorough overview of all applicable legislation, policies, guidelines. etc.;
- Identification of sensitive and/or “no-go” areas to be avoided;
- Please note that the Department considers a “no-go” area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure is allowed in the “no-go” areas;
- Should the specialist definition of “no-go” area differ from the Departments definition; this must be clearly indicated. The specialist must also indicate the “no-go” area's buffer if applicable;
- Recommend mitigation measures in order to minimise the impact of the proposed development;
- Provide implications of specialist findings for the proposed development (e.g. permits, licenses etc.);
- Specify if any further assessment will be required;
- Include an Impact Statement, concluding whether any fatal flaws have been identified and ultimately whether the proposed development can be authorised or not (i.e. whether EA should be granted / issued or not); and
- A copy of the Specialist Declaration of Interest (DoI) form, containing original signatures, must be appended to all Draft and Final Reports. This form will be provided to the specialists. ***Please note that the undertaking / affirmation under oath section of the report must be signed by a Commissioner of Oaths.***

8 DEADLINES AND REPORT SUBMISSION

- Draft Specialist Report for inclusion in DBAR no later than 07 September 2020 and updated version based on EAP and applicant review no later than 11 September 2020.
- Any changes arising based on stakeholder engagement no later than 16 October 2020

9 REPORT / DATA FORMATS

- All specialist reports must be provided in MS Word format;
- Where maps have been inserted into the report, SiVEST will require a separate map set in PDF format for inclusion in our submission;
- Where figures and/or photos have been inserted into the report, SiVEST will require the original graphic in .jpg format for inclusion in our submission; and
- ***Delineated areas of sensitivity must be provided in either ESRI shape file format or Google Earth KML format. Sensitivity classes must be included in the attribute tables with a clear indication of which areas are "No-Go" areas.***

10 SPECIALIST SPECIFIC ISSUES

Terrestrial Ecology

- Describe the terrestrial ecology features of the project area, with focus on features that are potentially impacted by the proposed project. The description should include the major habitat forms within the study site, giving due consideration to terrestrial ecology (flora), terrestrial ecology (fauna) and Species of Special Concern (SSC).
- Consider seasonal changes and long-term trends, such as due to climate change;
- Identify any SSC or protected species on site and clearly map with a high degree of certainty the exact no-go zones with a high level of confidence;
- Map the sensitive ecological features within the proposed project area, showing any 'no-go' areas (i.e. 'very high' sensitivity). Specify set-backs or buffers and provide clear reasons for these recommendations. Also map the extent of disturbance and transformation of the site;
- Identify and assess the potential impacts of the project on the terrestrial environment and provide mitigation measures to include in the environmental management plan; and
- The assessment should be based on existing information, national and provincial databases, SANBI mapping, professional experience and field work conducted.

Soils and Agricultural Potential

- Describe the existing environment in terms of soils, geology, land-use and agricultural potential. Significant soils and agricultural features or disturbances should be identified, as well as sensitive features and receptors within the project area. The description must include surrounding agricultural land uses and activities, to convey the local agricultural context;
- Describe and map soil types (soil forms), soil characteristics (soil depth, soil colour, limiting factors, and clay content of the top and sub soil layers), and degradation and erodibility of soils etc. to the extent necessary to inform this assessment;

- Varying sensitivities of the soils and agricultural potential must be mapped and highlighted;
- The assessment is to be based on existing information, and professional experience and field work conducted by the specialist, as considered necessary and in accordance with relevant legislated requirements;
- Identify and assess the potential impacts of the proposed development on loss of agricultural land, soils and agriculture, including impacts of associated infrastructure, such as the buildings, fencing etc. and provide relevant mitigation measures to include in the environmental management plan;
- Identify any protocols, legal and permit requirements relating to soil and agricultural potential impacts that are relevant to this project and the implications thereof;
- Map sensitivity of the site and clearly show no-go areas i.e. existing irrigated fields/ cultivated lands; and
- The report needs to fulfil the terms of reference for an agricultural study as set out in the National Department of Agriculture's document, Regulations for the evaluation and review of applications pertaining to renewable energy on agricultural land, dated September 2011, with an appropriate level of detail for the agricultural suitability and soil variation on site (which may therefore be less than the standardised level of detail stipulated in the above regulations).

Avifauna (Birds)

- Describe the affected environment from an avifaunal perspective, including consideration of the surrounding habitats and avifaunal features (e.g. Ramsar sites, Critical Bird Areas, wetlands, migration routes, feeding, roosting & nesting areas, etc.);
- Describe and map bird habitats on the site, based on on-site monitoring, desk-top review, collation of available information, studies in the local area and previous experience;
- Map the sensitivity of the site in terms of avifaunal features such as habitat use, roosting, feeding and nesting / breeding; and
- Identify and assess the potential impacts of the proposed development on avifauna. Provide sufficient mitigation measures to include in the environmental management plan.

Geotechnical

- Comprehensive desktop geotechnical report detailing the geological, hydrogeological and geotechnical conditions is required.
- A literature review should be undertaken as part of the desktop investigation in which topographic and geological maps must be reviewed.
- Consideration must be given, but not limited to, the following at desktop level.
    - The influence of topography on site suitability of the PV Plant and 132kV power line.
    - Any envisaged geological and geotechnical influences and the competency of foundations for the construction of the PV plant and 132kV power line.
    - Tectonic influences on overall stability, namely the presence of faulting, lineaments and preferred discontinuity orientations.
- As part of the literature review, any available previous investigations and reports should be reviewed and critical geotechnical conclusions presented in the desktop report.

Heritage

- Describe and map the heritage features of the site and surrounding area. This is to be based on desk-top reviews, fieldwork, available databases, and findings from other heritage studies in the area, where relevant. Include reference to the grade of heritage feature and any heritage status the feature may have been awarded;
- Assess the impacts and provide mitigation measures to include in the environmental management plan;
- Map heritage sensitivity for the site. Clearly show any "no-go" areas in terms of heritage (i.e. "very high" sensitivity) and provide recommended buffers or set-back distances;
- Identify and assess potential impacts from the project on the full scope of heritage features, including archaeology, palaeontology and the cultural-historical landscape, as required by heritage legislation;
- Liaise with the relevant authority in order to obtain a final comment in terms of section 38 pf the National Heritage Resources Act, 1999 (Act No. 25 of 1999), including Regulations issued thereunder, as necessary; and
- Load the relevant documents on the South African Heritage Resources Information System (SAHRIS) to obtain a comment from SAHRA.

Social

- Describe the social assessment context of the Leeudoringstad and Kgakala areas, focusing on aspects that are potentially affected by a substation project, and taking into consideration the current situation as well as the trends, the local planning (IDPs and SDFs), other developments in the area. The study should look more broadly than the individual land parcels on which the proposed project will developed, as most, if not all, of the anticipated social impacts may be experienced in the urban areas nearest to the proposed development;
- Apply a variety of appropriate options for sourcing information, such as review of analogous studies, available databases and social indicators, and use of interviews with key affected parties such as local communities, local landowners & government officials (local and regional) etc.;
- The social study does not lend itself to providing a spatially based sensitivity map. Therefore, instead, the study could provide a simplified schematic mapping of the links between the project actions (i.e. interventions) and the receiving social environment (i.e. the socio-ecological system), which may occur at a local, provincial or national scale, and showing how these links can be optimized to enhance benefits and minimize negative impacts;
- Consider social issues such as potential in-migration of job seekers, opportunities offered by training and skills development, cumulative effects with other projects in the local area implications for local planning and resource use;
- Provide recommendations to enhance the socio-economic benefits of the proposed development and to avoid (or minimise) the potential negative impacts;
- Identify and assess potential social benefits and costs as a result of the proposed development, for all stages of the project, and including the estimated direct employment opportunities; and
- Evaluate the implications of the project on the local socio-economic context.

Surface Water / Aquatic Ecology

- Compile a Surface Water / Aquatic Ecology Compliance Statement according to the protocol for the assessment and reporting of environmental impacts on aquatic biodiversity on a site

identified as being of “low sensitivity” for aquatic biodiversity, gazetted on 20 March 2020 (Sections 24(5)(A) and (H) and 44 of NEMA, 1998) (https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Aquatic_Biodiversity_Assessment.pdf);

  - The Surface Water / Aquatic Biodiversity Compliance Statement, must verify:
  - That the site is of “low” sensitivity for aquatic biodiversity; and

- Whether or not the proposed development will have an impact on the aquatic features.
- The Surface Water / Aquatic Biodiversity Compliance Statement, must contain, as a minimum, the following information:
  - Contact details and curriculum vitae of the specialist including SACNASP registration number and field of expertise;
  - A signed statement of independence by the specialist;
  - Baseline profile description of biodiversity and ecosystems, including the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;
  - Methodology used to verify the sensitivities of the aquatic biodiversity features on the national web based environmental screening tool;
  - Methodology used to undertake the Initial Site Sensitivity Verification and preparation of the Compliance Statement, including equipment and modelling used, where relevant;
  - Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;
  - A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations; and
  - Any conditions to which the statement is subjected.
- Where the information gathered from the Initial Site Sensitivity Verification differs from that identified as having a “low” aquatic biodiversity sensitivity by the national web based environmental screening tool and it is found to be of a “very high” sensitivity, the following will be required:
  - Describe the aquatic ecology features of the project area, with focus on features that are potentially impacted by the proposed project. The description should include the major habitat forms within the study site, giving due consideration to freshwater ecosystems, drainage lines and wetlands;
  - Consider seasonal changes and long-term trends, such as due to climate change as far as possible;
  - Identify any Species of Special Concern or protected species on site relevant to the aquatic environment;
  - Map the sensitive ecological features within the proposed project area, showing any ‘no-go’ areas (i.e. ‘very high’ sensitivity) with a very high confidence and accuracy. Specify set-backs or buffers and provide clear reasons for these recommendations. Also map the extent of disturbance and transformation of the site;
  - Identify and delineate wetlands that may occur on the site, using the relevant and latest protocols established by DWAF;
  - Determine if a Water Use License (WUL) or General Authorisation (GA) is required and if so, determine the requirements thereof by undertaking the appropriate DWS risk assessment.

- Verify the datasets of watercourses against a digital terrain model (or slope / contour data) to ensure that the watercourses are mapped in the correct places based on topography;
- Identify and assess the potential impacts of the project (including all access roads) on the aquatic environment;
- Provide mitigation measures to include in the environmental management plan; and
- The assessment should be based on existing information, national and provincial databases, SANBI mapping, professional experience and field work conducted.

Visual

- Describe the visual character of the local area. Any significant visual features or visual disturbances should be identified and mapped, as well as any sensitive visual receptors within the proposed project area or within viewsheds of the proposed development;
- Visual character and visual absorption capacity should be described;
- Viewsheds for various elements of the proposed development should be calculated, defined and presented, and the varying sensitivities of these viewsheds must be highlighted;
- Mapping of visual sensitivity of the site will require consideration of visual receptors outside the site, and sensitivity to development on the site for potentially affected visual receptors of 'very high' sensitivity;
- Assessment to be based on findings of the site visit, visual modelling, and a photographic survey of the surrounding region from which the landscape and visual baselines can be prepared;
- Identify and assess potential impacts from the project on the receiving environment. All impacts should be considered under varying conditions as appropriate to the study i.e. day, night, clear weather, cloudy weather etc. Provide mitigation measures to include in the EMPr;
- Maps depicting viewsheds / line of sight across the site should be generated and included in the reports. These maps should indicate current viewsheds / visual landscape / obstructions as well as expected visual impacts during the construction, operational and decommissioning phases of the proposed development;
- Provide specific mitigation on light management and
- Provide photomontages from accessible locations.

Appendix B

SPECIALIST EXPERTISE

CURRICULUM VITAE

Name	Kerry Lianne Schwartz
Profession	GIS Specialist
Name of Firm	SiVEST SA (Pty) Ltd
Present Appointment	Senior GIS Consultant: Environmental Division
Years with Firm	32 Years
Date of Birth	21 October 1960
ID No.	6010210231083
Nationality	South African

Professional Qualifications

BA (Geography), University of Leeds 1982

Membership to Professional Societies

South African Geomatics Council – GTc GISc 1187

Employment Record

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1994 – Present	SiVEST SA (Pty) Ltd - Environmental Division: GIS/Database Specialist.
1988 - 1994	SiVEST (formerly Scott Wilson Kirkpatrick): Town Planning Technician.
1984 – 1988	Development and Services Board, Pietermaritzburg: Town Planning Technician.

Language Proficiency

LANGUAGE	SPEAK	READ	WRITE
English	Fluent	Fluent	Fluent

Key Experience

Kerry is a GIS specialist with more than 20 years' experience in the application of GIS technology in various environmental, regional planning and infrastructural projects undertaken by SiVEST.

Kerry's GIS skills have been extensively utilised in projects throughout South Africa in other Southern African Countries. These projects have involved a range of GIS work, including:

- Design, compilation and management of a spatial databases in support of projects.
- Collection, collation and integration of data from a variety of sources for use on specific projects.
- Manipulation and interpretation of both spatial and alphanumeric data to provide meaningful inputs for a variety of projects.
- Production of thematic maps and graphics.
- Spatial analysis and 3D modelling.

Kerry further specialises in visual impact assessments (VIAs) and landscape assessments.

Projects Experience

STRATEGIC PLANNING PROJECTS

Provision of database, analysis and GIS mapping support for the following:

- Database development for socio-economic and health indicators arising from Social Impact Assessments conducted for the Lesotho Highlands Development Association – Lesotho.
- Development Plan for the adjacent towns of Kasane and Kazungula - Ministry of Local Government, Land and Housing (Botswana).
- Development Plan for the rural village of Hukuntsi - Ministry of Local Government, Land and Housing (Botswana).
- Integrated Development Plans for various District and Local Municipalities including:
  - Nquthu Local Municipality (KwaZulu-Natal)
  - Newcastle Local Municipality (KwaZulu-Natal)
  - Amajuba District Municipality (KwaZulu-Natal)
  - Jozini Local Municipality (KwaZulu-Natal)
  - Umhlabuyalingana Local Municipality (KwaZulu-Natal)
- uMhlathuze Rural Development Initiative – uMhlathuze Local Municipality (KwaZulu-Natal).
- Rural roads identification – uMhlathuze Local Municipality (KwaZulu-Natal).
- Mapungubwe Tourism Initiative – Development Bank (Limpopo Province).
- Northern Cape Tourism Master Plan – Department of Economic Affairs and Tourism (Northern Cape Province).
- Spatial Development Framework for Gert Sibande District Municipality (Mpumalanga) in conjunction with more detailed spatial development frameworks for the 7 Local Municipalities in the District, namely:
  - Albert Luthuli Local Municipality
  - Msukaligwa Local Municipality
  - Mkhondo Local Municpality
  - Pixley Ka Seme Local Municipality
  - Dipaleseng Local Municipality
  - Govan Mbeki Local Municipality
  - Lekwa Local Municipality
- Land Use Management Plans/Systems (LUMS) for various Local Municipalities including:
  - Nkandla Local Municipality (KwaZulu-Natal)
  - Hlabisa Local Municipality (KwaZulu-Natal)
  - uPhongolo Local Municipality (KwaZulu-Natal)
  - uMshwathi Local Municipality
- Spatial Development Framework for uMhlathuze Local Municipality (KwaZulu-Natal).
- Spatial Development Framework for Greater Clarens – Maloti-Drakensberg Transfrontier Park (Free State).
- Land use study for the Johannesburg Inner City Summit and Charter – City of Johannesburg (Gauteng).
- Port of Richards Bay Due Diligence Investigation – Transnet
- Jozini Sustainable Development Plan – Jozini Local Municipality (KwaZulu-Natal)
- Spatial Development Framework for Umhlabuyalingana Local Municipality (KwaZulu-Natal)

BUILT INFRASTRUCTURE

- EIA and EMP for a 9km railway line and water pipeline for manganese mine – Kalagadi Manganese (Northern Cape Province).
- EIA and EMP for 5x 440kV Transmission Lines between Thyspunt (proposed nuclear power station site) and several substations in the Port Elizabeth area – Eskom (Eastern Cape Province).
- Initial Scoping for the proposed 750km multi petroleum products pipeline from Durban to Gauteng/Mpumalanga – Transnet Pipelines.
- Detailed EIA for multi petroleum products pipeline from Kendall Waltloo, and from Jameson Park to Langlaagte Tanks farms –Transnet Pipelines.
- Environmental Management Plan for copper and cobalt mine (Democratic Republic of Congo).
- EIA and Agricultural Feasibility study for Miwani Sugar Mill (Kenya).
- EIAs for Concentrated Solar and Photovoltaic power plants and associated infrastructure (Northern Cape, Free State, Limpopo and North West Province).
- EIAs for Wind Farms and associated infrastructure (Northern Cape and Western Cape).
- Basic Assessments for 132kV Distribution Lines (Free State, KwaZulu-Natal, Mpumalanga and North West Province).
- Environmental Assessment for the proposed Moloto Development Corridor (Limpopo).
- Environmental Advisory Services for the Gauteng Rapid Rail Extensions Feasibility Project.
- Environmental Screening for the Strategic Logistics and Industrial Corridor Plan for Strategic Infrastructure Project 2, Durban-Free State-Gauteng Development Region.

STATE OF THE ENVIRONMENT REPORTING

- 2008 State of the Environment Report for City of Johannesburg.
- Biodiversity Assessment – City of Johannesburg.

STRATEGIC ENVIRONMENTAL ASSESSMENTS AND ENVIRONMENTAL MANAGEMENT FRAMEWORKS

- SEA for Greater Clarens – Maloti-Drakensberg Transfrontier Park (Free State).
- SEA for the Marula Region of the Kruger National Park, SANParks.
- SEA for Thanda Private Game Reserve (KwaZulu-Natal).
- SEA for KwaDukuza Local Municipality (KwaZulu-Natal).
- EMF for proposed Renishaw Estate (KwaZulu-Natal).
- EMF for Mogale City Local Municipality, Mogale City Local Municipality (Gauteng).
- SEA for Molemole Local Municipality, Capricorn District Municipality (Limpopo).
- SEA for Blouberg Local Municipality, Capricorn District Municipality (Limpopo).
- SEA for the Bishopstowe study area in the Msunduzi Local Municipality (KwaZulu-Natal).

WETLAND STUDIES

- Rehabilitation Planning for the Upper Klip River and Klipspruit Catchments, City of Johannesburg (Gauteng).
- Wetland assessments for various Concentrated Solar and Photovoltaic power plants and associated infrastructure (Limpopo, Northern Cape, North West Province and Western Cape).
- Wetland assessments for Wind Farms and associated infrastructure (Northern Cape and Western Cape).

- Wetland assessments for various 132kV Distribution Lines (Free State, KwaZulu-Natal, Mpumalanga and North West Province).

VISUAL IMPACT ASSESSMENTS

- VIA for the Thyspunt Transmission Lines Integration Project (Eatern Cape).
- VIA s for various Solar Power Plants and associated grid connection infrastructure (Northern Cape, Free State, Limpopo and North West Province) the most recent project being:
  - Mooi Plaats, Wonderheuvel and Paarde Valley Solar PV facilities near Nouport (Northern Cape).
- VIAs for various Wind Farms and associated grid connection infrastructure (Northern Cape and Western Cape), the most recent projects including:
  - Graskoppies, Hartebeest Leegte, Ithemba and !Xha Boom Wind Farms near Loeriesfontein (Northern Cape);
  - Kuruman 1 and 2 WEFs near Kuruman (Northern Cape);
  - San Kraal and Phezukomoya WEFs near Noupoort (Northern Cape);
  - Paulputs WEF near Pofadder (Northern Cape)
  - Kudusberg WEF near Matjiesfontein (Western Cape);
  - Tooverberg WEF, near Touws River (Western Cape);
  - Rondekop WEF, near Sutherland (Northern Cape).
- VIAs for various 132kV Distribution Lines (Free State, KwaZulu-Natal, Mpumalanga and North West Province).
- VIA for the proposed Rorqual Estate Development near Park Rynie on the South-Coast of KwaZulu-Natal Province.
- VIA for the proposed Assagay Valley Mixed Use Development (KwaZulu-Natal).
- VIA for the proposed Kassier Road North Mixed Use Development (KwaZulu-Natal).
- VIA for the proposed Tinley Manor South Banks Development (KwaZulu-Natal).
- VIA for the proposed Tinley Manor South Banks Beach Enhancement Solution, (KwaZulu-Natal).
- VIAs for the proposed Mlonzi Hotel and Golf Estate Development (Eastern Cape Province).
- Visual sensitivity mapping exercise for the proposed Mogale's Gate Lodge Expansion (Gauteng).
- Analysis phase visual assessment for the proposed Renishaw Estate Environmental Management Framework in the Scottburgh Area (KwaZulu-Natal).
- Landscape Character Assessment for Mogale City Environmental Management Framework (Gauteng).

Appendix C

SPECIALIST DECLARATION

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

Proposed Construction of Two Solar Photovoltaic (PV) Energy Facilities near Leeudoringstad, North West Province (Wildebeestkuil PV1 and Wildebeestkuil PV2)

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:	SiVEST SA (Pty) Ltd			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	2	Percentage Procurement recognition	110
Specialist name:	Kerry Schwartz			
Specialist Qualifications:	BA			
Professional affiliation/registration:	SAGC (GISc Technician)			
Physical address:	51 Wessels Road, Rivonia			
Postal address:	PO Box 2921, Rivonia			
Postal code:	2128	Cell:	0824695850	
Telephone:	011 798 0632	Fax:	011 803 7272	
E-mail:	Kerrys@sivest.co.za			

2. DECLARATION BY THE SPECIALIST

I, Kerry Schwartz, 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.

K Schwartz

Signature of the Specialist

SiVEST

Name of Company:

14 September 2020

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

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

K Schwartz

Signature of the Specialist

SiVEST

Name of Company

14 September 2020

Date

Jacqueline Chantel Jackson
COMMISSIONER OF OATHS

Signature of the Commissioner of Oaths

Divisional Controller
Ref. 9/1/8/2 (R/O) KZN PMB - 08/02/2019

Date: 14/09/2020 Place: PMB
Business Address: VCC Estate, 170 Peter Brown Drive, PMB

Appendix D

SITE SENSITIVITY VERIFICATION REPORT

WILDEBEESTKUIL PV GENERATION (PTY) LTD

PROPOSED CONSTRUCTION OF TWO SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITIES NEAR LEEUDORINGSTAD, NORTH WEST PROVINCE

Site Sensitivity Verification Report

DEDECT Reference: *(***To be provided***)*
Report Prepared by: SiVEST
Issue Date: 14 September 2020
Version No.: 1

SITE SENSITIVITY VERIFICATION
(IN TERMS OF PART A OF THE ASSESSMENT PROTOCOLS PUBLISHED IN GN 320 ON 20 MARCH 2020

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1. INTRODUCTION

The original BA process for the proposed Wildebeestkuil Solar Photovoltaic (PV) plant and associated 132kV power line was initiated in August 2016. All specialist studies were undertaken and subsequently all site sensitivities were identified. The BA was however put out on hold prior to submitting the final basic assessment report (FBAR) to the Department of Environmental Affairs (DEA). In the interim, the proponent, Wildebeestkuil PV Generation (Pty) Ltd (hereafter referred to as Wildebeest PV Generation) has revised their development proposals to accommodate two (2) separate Solar Photovoltaic (PV) Energy facilities (SPEFs), including grid connection infrastructure, each with a capacity of up to 9.9MW, on three adjacent farm portions near Leeudoringstad, North West Province. The proposed PV Facilities will require Environmental Authorisation (EA) and as such, each project is the subject of a separate Basic Assessment (BA) in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended. A visual impact assessment (VIA) is being undertaken by SiVEST SA (PTY) Ltd as part of the required BA processes. The aim of this VIA is to revise and update the VIA report previously compiled.

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 has been undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

2. SITE SENSITIVITY VERIFICATION

The site sensitivity verification exercise conducted in support of the Visual Impact Assessment (VIA) for the proposed Wildebeestkuil PV1 and Wildebeestkuil PV2 SPEFs has been based on a desktop-level assessment supported by field-based observation. This verification involved an assessment of factors as outlined below.

2.1 Physical landscape characteristics

Physical landscape characteristics such as topography, vegetation and land use are important factors influencing the visual character and visual sensitivity of the study area. Baseline information about the physical characteristics of the study area was initially sourced from spatial databases provided by NGI, the South African National Biodiversity Institute (SANBI) and the South African National Land Cover Dataset (Geoterraimage – 2014). The characteristics identified via desktop means were later verified during the site visit.

2.2 Identification of sensitive receptors

Due to the extent of the study area and the potentially large number of receptor locations, the identification of visual receptors was undertaken via desktop means only, using Google Earth imagery.

2.3 Fieldwork and photographic review

Fieldwork was originally undertaken in October 2016 (early summer) as part of a visual assessment undertaken for preliminary solar PV development proposals on the Wildebeestkuil application site. Given the time that has elapsed since the original fieldwork was undertaken, a second site visit was undertaken, involving a two (2) day site visit between the 12th and 13th of August 2020 (late winter).

The purpose of the site visits was to:

- verify the landscape characteristics identified via desktop means;
- conduct a photographic survey of the study area;
- identify any additional visually sensitive receptor locations within the study area; and
- inform the impact rating assessment of visually sensitive receptor locations (where possible).

3. OUTCOME OF SITE SENSITIVITY VERIFICATION

Visual sensitivity of the broader area surrounding the proposed Wildebeestkuil PV1 and Wildebeestkuil PV2 SPEF application site was found to be low, largely due to the to the presence of degraded land and anthropogenic elements such as the town of Leeudoringstad, Kgakala Township, R502 and R504 regional roads, high voltage power lines, Leeubos TR 132kV Traction Substation and the existing railway line, which would likely reduce the scenic quality of the area.

In addition, no formal protected areas were identified in the study area and although a significant number of potentially sensitive receptors were identified, most of these appear to be existing farmsteads. These farmsteads are regarded as potentially sensitive visual receptors because they are located within a mostly rural setting and the proposed development will likely alter natural vistas experienced from these locations, although the residents' sentiments toward the proposed development are unknown.

As a result of the relatively flat terrain and the lack of screening vegetation, PV arrays placed on the site are expected to be at least partially visible from most of the potentially sensitive receptors and as such, no areas on the site were deemed to be significantly more sensitive than the remainder of the site.

4. NATIONAL ENVIRONMENTAL SCREENING TOOL

In assessing the visual sensitivity of the proposed Wildebeestkuil PV1 and Wildebeestkuil PV2 application site, consideration was given to the Landscape Theme of the National Environmental Screening Tool. Under this theme, the tool identifies areas of "**High**" and "**Medium"** sensitivity in respect of solar PV development on the application site. The identification of areas of "High" landscape sensitivity in this instance is related to the proximity of the site to Kgakala Township to the north-west and the Leeudoringspruit to the south of the application site. **Figure *1*** below is an extract from the Screening Tool Report generated for the Wildebeestkuil PV1 and PV2 application site.

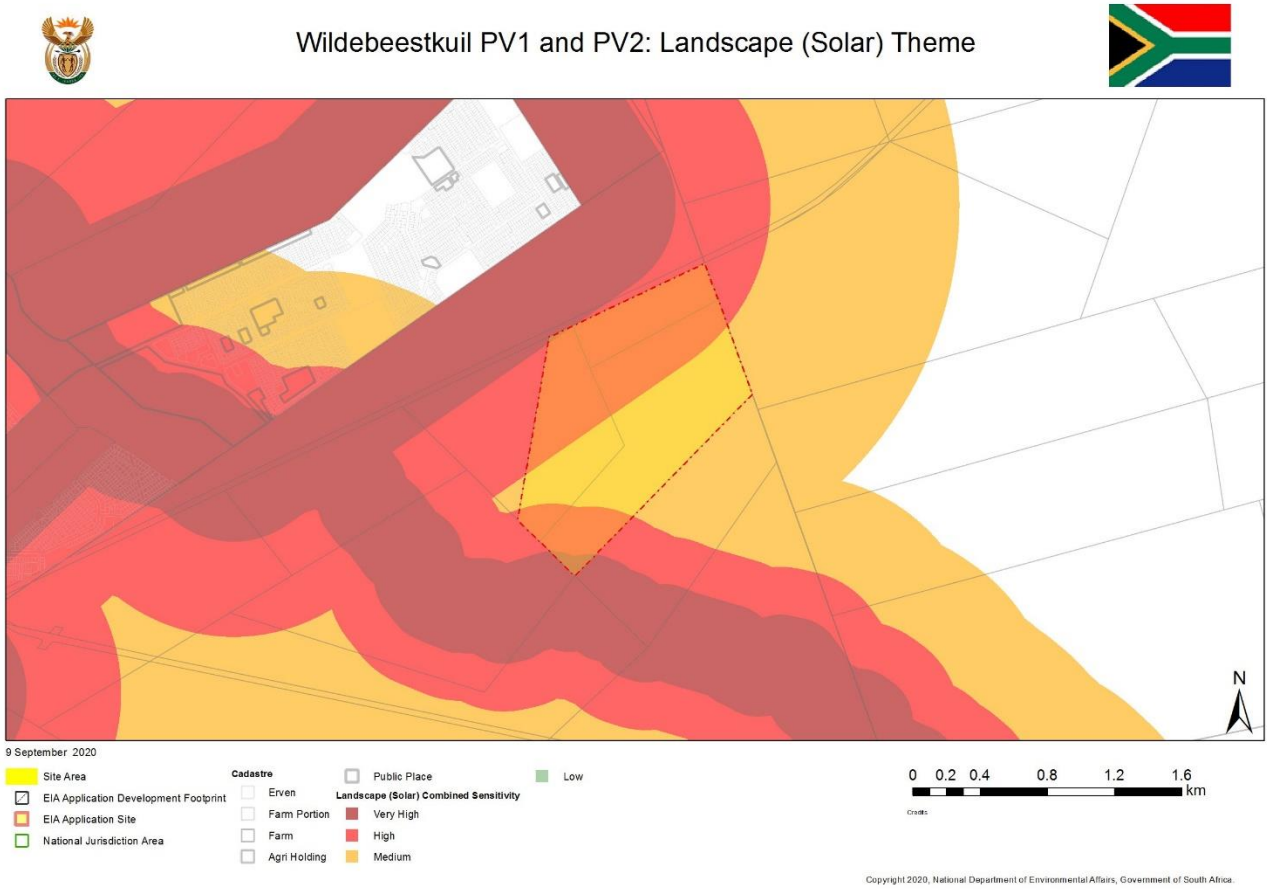

Figure 1: Relative Landscape Sensitivity for the Wildebeestkuil PV1 and Wildebeestkuil PV2 application site

The National Environmental Screening Tool does not identify any landscape sensitivities in respect of the proposed power line.

It should be noted that the Screening Tool is a very high level, desktop study and as such the results of the study in respect of landscape sensitivity must be viewed against the findings of the field investigation as well as factors affecting visual impact, such as:

- the presence of visual receptors;

- the distance of those receptors from the proposed development; and
- the likely visibility of the development from the receptor locations.

The VIA has found that, although there is a relatively high concentration of receptors in the Kgakala, Township, these receptors are not expected to be sensitive to the visual impact of the proposed development due to the existing visual degradation within these areas. Urban development and electricity infrastructure have significantly altered the visual character in this sector of the study area and general degradation of the landscape has been exacerbated by significant amounts of litter in the township and the surrounding area (**Figure 2**). Accordingly, the verification did not suggest any significant level of landscape sensitivity in this area.

Figure 2: Typical landscape in Kgakala Township

In addition, the site investigation did not confirm any landscape sensitivity associated with the Leeudoringspruit. In fact, views towards the watercourse from the R502 main road show significant degradation largely due to litter (**Figure 3**).

Figure 3: Views towards the Leeudoringspruit showing visual degradation due to litter

5. CONCLUSION

The site sensitivity verification exercise conducted in support of the Visual Impact Assessment (VIA) for the proposed Wildebeestkuil PV1 and Wildebeestkuil PV2 SPEFs has been based on a desktop-level assessment supported by field-based observation. In assessing the visual sensitivity of the proposed Wildebeestkuil PV1 and Wildebeestkuil PV2 application site, consideration was given to the Landscape Theme of the National Environmental Screening Tool, and as outlined above, the findings of the sensitivity assessment undertaken in the VIA have been verified.

Appendix D

IMPACT RATING METHODOLOGY

1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) METHODOLOGY

The Environmental Impact Assessment (EIA) Methodology assists in evaluating the overall effect of a proposed activity on the environment. Determining of the significance of an environmental impact on an environmental parameter is determined through a systematic analysis.

1.1 Determination of Significance of Impacts

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale (i.e. site, local, national or global), whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in **Table 1**.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

1.2 Impact Rating System

The impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the various project stages, as follows:

- Planning;
- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

The significance of Cumulative Impacts should also be rated (As per the Excel Spreadsheet Template).

1.2.1 Rating System Used to Classify Impacts

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the possible mitigation of the impact. Impacts have been consolidated into one (1) rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

Table 1: Rating of impacts criteria

ENVIRONMENTAL PARAMETER		
A brief description of the environmental aspect likely to be affected by the proposed activity (e.g. Surface Water).		
ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity (e.g. oil spill in surface water).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY (R)		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES (L)		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION (D)		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		

1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact (i.e. whether the impact has the ability to alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE (S)		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula: **Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.**		

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

The table below is to be represented in the Impact Assessment section of the report. The excel spreadsheet template can be used to complete the Impact Assessment.

Table 2: Rating of impacts template and example

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
Vegetation and protected plant species	Vegetation clearing for access roads, turbines and their service areas and other infrastructure will impact on vegetation and protected plant species.	2	4	2	2	3	3	39	-	Medium	**Outline/explain the mitigation measures to be undertaken to ameliorate the impacts that are likely to arise from the proposed activity. These measures will be detailed in the EMPr.**	2	4	2	1	3	2	24	-	Low

Operational Phase																				
Fauna	Fauna will be negatively affected by the operation of the wind farm due to the human disturbance, the presence of vehicles on the site and possibly by noise generated by the wind turbines as well.	2	3	2	1	4	3	36	-	Medium	**Outline/explain the mitigation measures to be undertaken to ameliorate the impacts that are likely to arise from the proposed activity. These measures will be detailed in the EMPr.**	2	2	2	1	4	2	22	-	Low
Decommissioning Phase																				
Fauna	Fauna will be negatively affected by the decommissioning of the wind farm due to the human disturbance, the presence and operation of vehicles and heavy machinery on the site and the noise generated.	2	3	2	1	2	3	30	-	Medium	**Outline/explain the mitigation measures to be undertaken to ameliorate the impacts that are likely to arise from the proposed activity. These measures will be detailed in the EMPr.**	2	2	2	1	2	2	18	-	Low

Cumulative																				
Broad-scale ecological processes	Transformation and presence of the facility will contribute to cumulative habitat loss and impacts on broad-scale ecological processes such as fragmentation.	2	4	2	2	3	2	26	-	Medium	**Outline/explain the mitigation measures to be undertaken to ameliorate the impacts that are likely to arise from the proposed activity. These measures will be detailed in the EMPr.**	2	3	2	1	3	2	22	-	Low