CAMDEN I SOLAR (RF) PTY LTD

Proposed Construction of the Camden I Solar Energy Facility and Associated Grid Connection Infrastructure near Ermelo, Mpumalanga Province

Visual Impact Assessment Report – EIA Phase

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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**
(a) details of the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a *curriculum vitae*;	**Section 1.2.** **Appendix B**
(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** Error! Reference source not found. **Appendix A**
(cA) an indication of the quality and age of base data used for the specialist report;	**Section** Error! Reference source not found.. **Section** Error! Reference source not found..
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	**Section 6.** **Section 8.**
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	**Section 1.4** **Section** Error! Reference source not found..
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	**Section** Error! Reference source not found.. **Appendix C**
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	**Section 6.**
(g) an identification of any areas to be avoided, including buffers;	**Section** Error! Reference source not found.. **Section** Error! Reference source not found..
(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** Error! Reference source not found..
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	**Section** Error! Reference source not found..
(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** Error! Reference source not found. **Section** Error! Reference source not found.

(k) any mitigation measures for inclusion in the EMPr;	**Section** Error! Reference source not found.**.**
(l) any conditions for inclusion in the environmental authorisation;	No specific conditions relating to the visual environment need to be included in the environmental authorisation (EA)
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	**Section** Error! Reference source not found.
(n) a reasoned opinion— i. whether the proposed activity, activities or portions thereof should be authorised; 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 or Environmental Authorization, and where applicable, the closure plan;	**Section 12.1**
(o) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	No feedback has yet been received from the public participation process regarding the visual environment
(p) any other information requested by the competent authority	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**

CAMDEN I SOLAR RF (PTY) LTD

PROPOSED CONSTRUCTION OF THE CAMDEN 1 SOLAR ENERGY FACILITY NEAR ERMELO, MPUMALANGA PROVINCE

VISUAL IMPACT ASSESSMENT REPORT – EIA PHASE

Executive Summary

Camden I Solar RF (Pty) Ltd (hereafter referred to as "Camden I Solar") is proposing to construct an up to 100MW Camden 1 Solar Energy Facility (SEF) and associated grid connection infrastructure near Ermelo in Mpumalanga Province. The proposed SEF and grid connection projects are two of the eight projects comprising the proposed Camden Renewable Energy Complex, located south-east of Ermelo in Mpumalanga Province. The projects are located within the Msukaligwa Local Municipality, in the Gert Sibande District Municipality. The proposed SEF development will be subject to a full Environmental Impact Assessment (EIA) process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) as amended and EIA Regulations, 2014 (as amended). Accordingly, an EIA process as contemplated in terms of the EIA Regulations (2014, as amended) is being undertaken in respect of the proposed SEF project. The competent authority for this EIA is the national Department of Forestry, Fisheries and Environment (DFFE). Grid connection infrastructure for the SEF will be subject to a separate Environmental Authorisation Process, which is currently being undertaken in parallel to the facility EIA process. This Visual Impact Assessment (VIA) is being undertaken as part of the EIA processes.

This combined VIA has determined that the study area has a somewhat mixed visual character, transitioning from the heavily transformed urban / industrial landscape associated with Camden Power Station, Camden residential area and Mooiplaats Colliery in the north / north-east to a more rural / pastoral character across the remainder of the study area. Hence, although a solar PV facility and power line development would alter the visual character and contrast with this rural / pastoral character, the location of the proposed SEF and associated grid connection infrastructure in close proximity to Camden Power Station and the associated power lines, mining activity and rail infrastructure will significantly reduce the level of contrast.

A broad-scale assessment of visual 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.

One formal protected area (Langcarel Private Nature Reserve) was identified within the study area, although the area is entirely managed for commercial agriculture with no conservation

activities present and no evidence of public access to the site. Any landscape value or visual appeal has therefore been reduced. The area is not typically valued for its tourism significance and relatively few leisure-based tourism facilities (lodges/accommodation facilities) were identified inside the study area. This factor in conjunction with the high levels of transformation in the north and north-east have reduced the overall visual sensitivity of the broader area.

Solar Energy Facility: Receptor Identification

A total of fifteen (15) potentially sensitive receptors were identified in the study area. Only one (1) of the identified receptor locations was found to be sensitive (SR3), this being a residence whose occupants have previously expressed some concern about elements of the proposed Camden Renewable Energy Complex. This receptor was however found to be outside the viewshed for the Camden 1 SEF project. The remaining fourteen (14) receptor locations, are all believed to be farmsteads that are regarded as *potentially* sensitive visual receptors as the proposed development will likely alter natural or semi-natural vistas experienced from these locations. Nine of these farmsteads are not expected to experience any visual impacts as a result of the proposed development as they are either outside the viewshed for the proposed PV arrays, or located more than 5km from the proposed PV arrays.

One of the remaining receptors (VR15) would experience high levels of visual impact, largely as a result of proximity to the proposed PV arrays. Impacts are however likely to be reduced by the presence of trees along sections of the District Road D260. In addition, this receptor is located within the Camden I WEF project area and it has been confirmed by the Proponent that the relevant land owners are in support of the overall Camden Renewable Energy Complex project. As such, they are not expected to perceive the proposed development in a negative light and this would reduce the level of visual impact experienced at this location. Four potentially sensitive receptor locations are expected to experience moderate levels of impact as a result of the SEF development, while one receptor only will experience low levels of visual impact.

Electrical Grid Infrastructure corridor: Receptor Identification

A total of fourteen (14) receptors were identified within 5 km of the nearest corridor alternative, none of which are considered sensitive. All of the receptors identified are assumed to be farmsteads which could be considered to be receptors. However, given the degree of transformation in the landscape, and the fact that much of the proposed route alignment is relatively close to existing high voltage power lines, it is not anticipated that all of these receptors would be sensitive to the proposed development.

Ten (10) of the identified receptors were found to be outside the viewshed for the proposed power lines and were excluded from the assessment. The remaining four (4) receptor locations are expected to experience moderate levels of impact as a result of the Camden I SEF grid connection infrastructure. Three of these receptors are however located in the project area for the Camden I WEF and as the relevant land owners are known to support the proposed development, they are not expected to perceive the proposed power lines in a negative light.

A preliminary assessment of overall impacts revealed that impacts associated with all the proposed Camden I SEF and associated grid connection infrastructure (post mitigation) are of low significance during both construction and decommissioning phases. During operation however, visual impacts (post mitigation) from the Camden I SEF would be of moderate significance with relatively few mitigation measures available to reduce the visual impact. Visual impacts associated with the Camden SEF I Grid Connection project during operation would be of low significance.

Considering the presence of existing and proposed mining activity and electrical generation and distribution infrastructure, the introduction of new renewable energy facilities in the area will result in further change in the visual character of the area and alteration of the inherent sense of place, extending 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 recommended mitigation measures. In light of this, cumulative impacts have been rated as moderate.

A comparative assessment of site alternatives for the on-site SEF infrastructure and also for the grid connection alternatives was undertaken in order to determine which of the alternatives would be preferred from a visual perspective. No fatal flaws were identified in respect of any of the alternatives for the proposed on-site substation / BESS facilities and temporary construction camp / cement batching plant and all alternatives were found to be favourable.

No fatal flaws were identified for either of the substation alternatives or any of the grid connection infrastructure alternatives. No preference was determined for either of the substation site alternatives and both alternatives were found to be favourable. Power Line Corridor Options 1 and 2 were identified as the Preferred Alternatives, while Power Line Corridor Options 3 and 4 were found to be favourable.

From a visual perspective therefore, the proposed Camden 1 SEF and associated grid connection project is deemed acceptable and the respective Environmental Authorisations (EAs) should be granted. For both applications, SiVEST is of the opinion that the visual impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

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VISUAL IMPACT ASSESSMENT REPORT – EIA PHASE

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GLOSSARY OF TERMS

ABBREVIATIONS

BA	Basic Assessment
BESS	Battery Energy Storage System
DBAR	Draft Basic Assessment Report
DEIAR	Draft Environmental Impact Assessment Report
DFFE	Department of Forestry, Fisheries and Environment
DM	District Municipality
DMRE	Department of Mineral Resources and Energy
DSR	Draft Scoping Report
DTM	Digital Terrain Model
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
FEIAR	Final Environmental Impact Assessment Report
FSR	Final Scoping Report
GIS	Geographic Information System
I&AP	Interested and/or Affected Party
IPP	Independent Power Producer
LM	Local Municipality
kV	Kilovolt
MW	Megawatt
NGI	National Geo-Spatial Information
REF	Renewable Energy Facility
REIPPP	Renewable Energy Independent Power Producer Programme
SACAA	South African Civil Aviation Authority
SANBI	South African National Biodiversity Institute
SEF	Solar Energy Facility
VIA	Visual Impact Assessment
VR	Visual Receptor
WEF	Wind Energy Facility

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.

Sky Space: The area in which the turbine rotors would rotate.

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

Study area / Visual Assessment Zone: The area with a zone of 10km from the outer boundary of the proposed WEF application site, and 5km from the proposed grid connection 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 development would be congruent with the surrounding environment. It is based on whether or not the development 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 development 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 development 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.

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1 INTRODUCTION

Camden I Solar RF (Pty) Ltd (hereafter referred to as "Camden I Solar") is proposing to construct the up to 100MW Camden I Solar Energy Facility (SEF) and associated grid connection infrastructure near Ermelo in Mpumalanga Province. The proposed SEF and grid connection projects are two of the eight projects comprising the proposed Camden Renewable Energy Complex. The proposed SEF development will be subject to a full Environmental Impact Assessment (EIA) process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) as amended and EIA Regulations, 2014 (as amended). Accordingly, an EIA process as contemplated in terms of the EIA Regulations (2014, as amended) is being undertaken in respect of the proposed SEF project. The competent authority for this EIA is the national Department of Forestry, Fisheries and Environment (DFFE).

Grid connection infrastructure for the SEF is subject to a separate EIA Process, which is currently being undertaken in parallel to this EIA process.

Specialist studies have been commissioned to assess and verify the proposed development under the new Gazetted specialist protocols[1].

1.1 Scope and Objectives

This combined Visual Impact Assessment (VIA) is being undertaken as part of the respective EIA and BA processes. The aim of the VIA is to identify potential visual issues associated with the development of the proposed SEF and associated infrastructure, as well as to determine the potential extent of visual impacts. This will be achieved by determining the character of the visual environment and identifying areas of potential visual sensitivity that may be subject to visual impacts. The 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 SEF and the associated infrastructure.

[1] Formally gazetted on 20 March 2020 (GN No. 320)

1.2 Specialist Credentials

This VIA was undertaken by Kerry Schwartz, a GIS specialist with more than 20 years' experience in the application of GIS technology in various environmental, regional planning and infrastructural projects. Kerry's GIS and spatial analysis skills have been extensively utilised in projects throughout South Africa and in other Southern African countries. Kerry has also undertaken many VIAs in recent years and the relevant VIA project experience is listed in the table below.

A Curriculum Vitae and a signed specialist statement of independence are included in Appendix- A of this specialist assessment.

Table 1: Relevant Project Experience

Environmental Practitioner	Kerry Schwartz (for and on behalf of SiVEST SA)
Contact Details	klschwartz@slrconsulting.com
Qualifications	BA (Geography), University of Leeds 1982
Expertise to carry out the Visual Impact Assessment.	**Visual Impact Assessments:** ▪ VIA (EIA) for the proposed Oya Energy Facility near Matjiesfontein, Western Cape Province; ▪ VIA (BA) for the proposed construction of 132kV power lines to serve the authorised Loeriesfontein 3 PV Solar Energy Facility near Loeriesfontein, Northern Cape Province; ▪ VIA (BA) for the proposed construction of the Oya 132kV power line near Matjiesfontein, Northern and Western Cape Provinces; ▪ VIAs (BA) for the proposed Gromis WEF and associated Grid Connection Infrastructure, near Komaggas, Northern Cape Province. ▪ VIAs (BA) for the proposed Komas WEF and associated Grid Connection Infrastructure, near Komaggas, Northern 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 (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)

1.3 Assessment Methodology

This VIA is based on a combination of desktop-level assessment supported by field-based observation.

1.3.1 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 – 2020). The characteristics identified via desktop means were later verified during the site visit.

1.3.2 Identification of sensitive receptors

Visual receptor locations and routes that are sensitive and/or potentially sensitive to the visual intrusion of the proposed development were identified and assessed in order to determine the impact of the proposed development on these receptor locations.

1.3.3 Fieldwork and photographic review

A two (2) day site visit was undertaken between the 17th and the 18th of September 2019 (late winter). The purpose of the site visit was to:

- verify the landscape characteristics identified via desktop means;
- conduct a photographic survey of the study area;
- verify, where possible, the sensitivity of visual receptor locations identified via desktop means;
- eliminate receptor locations that are unlikely to be influenced by the proposed development;
- identify any additional visually sensitive receptor locations within the study area; and
- inform the impact rating assessment of visually sensitive receptor locations (where possible).

1.3.4 Visual / Landscape Sensitivity

GIS technology was used to identify any specific areas of potential visual sensitivity within the Camden I SEF development site and also within the power line assessment corridors. These would be areas where the placement of PV arrays or the establishment of a new power line will result in the greatest probability of visual impacts on potentially sensitive visual receptors.

In addition, the National Environmental Screening Tool[2] was examined to determine any relative landscape sensitivity in respect of the proposed development.

1.3.5 Impact Assessment

A rating matrix was used to provide an objective evaluation of the significance of the visual impacts associated with the proposed development, both before and after implementing mitigation measures. Mitigation measures were identified (where possible) in an attempt to minimise the visual impact of the proposed development. The rating matrix considers a number of 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 project.

A separate rating matrix was used to assess the visual impact of the proposed development on each visual receptor location (both sensitive and potentially sensitive), as identified. This matrix

[2] https://screening. environment.gov.za/screeningtool/

is based on three (3) parameters, namely the distance of an identified visual receptor from the proposed development, the presence of screening factors and the degree to which the proposed development would contrast with the surrounding environment.

1.3.6 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 development 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 EIA phase report will be updated to include relevant information as and when it becomes available.

1.4 Sources of Information

The main sources of information utilised for this VIA included:

- Project description for the proposed development provided by the Proponent;
- Elevation data from 25m Digital Elevation model (DEM) from the National Geo-Spatial Information (NGI);
- 1:50 000 topographical maps of South Africa from the NGI;
- Land cover and land use data extracted from the 2020 South African National Land-Cover Dataset provided by GEOTERRAIMAGE;
- Vegetation classification data extracted from the South African National Biodiversity Institute's (SANBI's) VEGMAP 2018 dataset;
- Google Earth Satellite imagery 2021;
- South African Renewable Energy EIA Application Database from DFFE (incremental release Quarter 3 2021);
- South African Protected Areas Database from DFFE (incremental release Quarter 2 2021);
- The National Web-Based Environmental Screening Tool, Department of Forestry, Fisheries and Environment (DFFE);

2 ASSUMPTIONS AND LIMITATIONS

- Given the nature of the receiving environment and the height of the proposed photovoltaic (PV) panels and on-site infrastructure elements, the study area or visual assessment zone is assumed to encompass an area of 5km from the proposed SEF project area– i.e. an area of 5km from the boundary Portion 1 of the Farm Welgelegen No 322. This limit on the visual assessment zone relates to the fact that visual impacts decrease exponentially over distance. Thus although the SEF may theoretically 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.
- In assessing the potential visual impacts of the proposed 132kV power line, the visual assessment zone is assumed to encompass a zone of 5km from the outer boundary of the power line assessment corridors.
- The identification of visual receptors involved a combination of desktop assessment as well as field-based observation. Initially Google Earth imagery was used to identify potential receptors within the study area. Where possible, these receptor locations were verified and assessed during a site visit which was undertaken in mid-September 2019. Due to the extent of the study area however and the number of receptors that could potentially be sensitive to the proposed development, it was not possible to visit or verify every potentially sensitive visual receptor location. As such, a number of broad assumptions have been made in terms of the likely sensitivity of the receptors to the proposed development.
- It should be noted that not all receptor locations would necessarily perceive the proposed development 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 development. Thus, the presence of a receptor in an area potentially affected by the proposed development does not necessarily mean that any visual impact will be experienced.
- The potential visual impact at each sensitive visual receptor location was assessed 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 an indicative assessment of the degree of visual impact likely to be experienced at each receptor location as a result of the proposed development. 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.
- As stated, the exact status of all the receptors could not be verified during the field investigation and as such the receptor impact rating was largely undertaken via desktop means. Where details of the levels of leisure / tourism activities on different sectors of

the relevant farms are not known, the impact rating matrix for these receptors is based on the assumed location of the main accommodation complex on each property.

- Based on the updated project description provided by the proponent, all analysis for this VIA is based on a worst-case scenario where PV panel heights are assumed to be 10m. On-site substations, Battery Energy Storage (BESS) facilities and office building heights are assumed to be less than 25m in height.
- Visual analysis in respect of the power lines is based on a worst-case scenario where power line tower heights are assumed to be 35 m.
- Due to the varying scales and sources of information; maps may have minor inaccuracies. Terrain data for this area, derived from the National Geo-Spatial Information (NGI)'s 25m Digital Elevation Model (DEM), is fairly coarse and somewhat inconsistent and as such, localised topographic variations in the landscape may not be reflected on the DEM used to generate the viewshed(s) and visibility analysis conducted in respect of the proposed development.
- In addition, the viewshed / visibility analysis does not take into account any existing vegetation cover or built infrastructure which may screen views of the proposed development. This analysis should therefore be seen as a conceptual representation or a worst-case scenario.
- 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 Draft EIA Report (DEIR) or Draft Basic Assessment Report (DBAR) will however be incorporated into further drafts of this report, 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 SEF 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 SEFs and as such, general measures to mitigate the impact of additional light sources on the ambiance of the nightscape have been provided.
- At the time of undertaking the visual study no *detailed* information was available regarding the design and layout of services and infrastructure associated with the proposed development. The potential visual impact of the *typical* infrastructure associated with a SEF has therefore been assessed.
- In the light of the fact that the renewable energy industry is still relatively new in South Africa, this report draws on international literature and web material to describe the generic impacts associated with SEFs.
- At the time of writing this report, the proposed PV layout was still in the preliminary design phase and as such, no visualisation modelling was undertaken for the proposed development. This can however be provided should the Public Participation process identify the need for this exercise.
- This study includes an assessment of the potential cumulative impacts of other renewable energy and infrastructural / mining 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, assumptions have been made as to the likely impacts of these developments.

- It should be noted that the fieldwork for this study was undertaken in mid-September 2019, during late winter which is characterised by low levels of rainfall and reduced vegetation cover. In these conditions, increased levels of visual impact will be experienced from receptor locations in the surrounding area.
- The overall weather conditions in the study area have certain visual implications and are expected to affect the visual impact of the proposed development to some degree. In clear weather conditions, the PV panels would present a greater contrast with the surrounding environment than they would on an overcast day. Although the field investigation was conducted during clear weather conditions however, localised pollution in the study area results in relatively hazy skies which would reduce the visibility of the PV panels.

3 TECHNICAL DESCRIPTION

3.1 Project Location

3.1.1 SEF

The proposed SEF is located approximately 16km south-east of Ermelo in Mpumalanga Province (**Figure 1**) and is within the Msukaligwa Local Municipality, in the Gert Sibande District Municipality.

Based on the current conceptual layout, the SEF project is located on Portion 1 of the Farm Welgelegen No 322 which is some 695 hectares (ha) in extent (**Figure 2**).

A smaller buildable area (approximately 285 ha) has however been identified as a result of a preliminary suitability assessment undertaken by the proponent and this area is likely to be further refined with the exclusion of sensitive areas determined through various specialist studies being conducted as part of the EIA process.

3.1.2 Grid Connection

It is proposed that a 132kV overhead power line will connect the Camden I SEF on-site substation to Camden Power Station via the proposed Camden Collector substation (which in turn will connect to the Camden Power Station).

Based on the current proposed power line route alignment, the grid assessment corridors will traverse the following farm portions:

- Portion 1 of Welgelegen Farm No. 322; and

- Portion 2 of Welgelegen Farm No. 322;

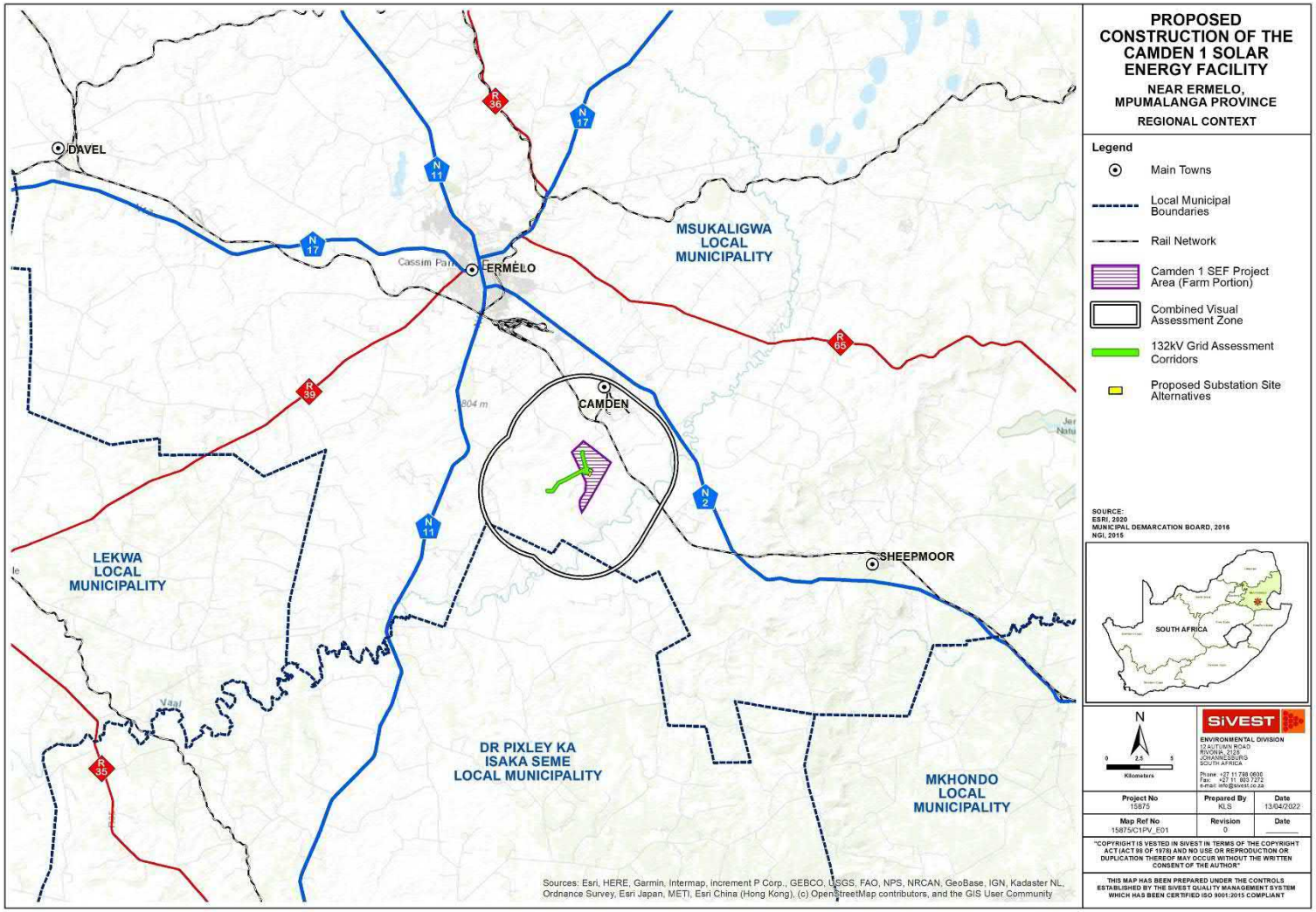


Figure 1: Camden I SEF and Grid Connection Infrastructure in the Regional Context

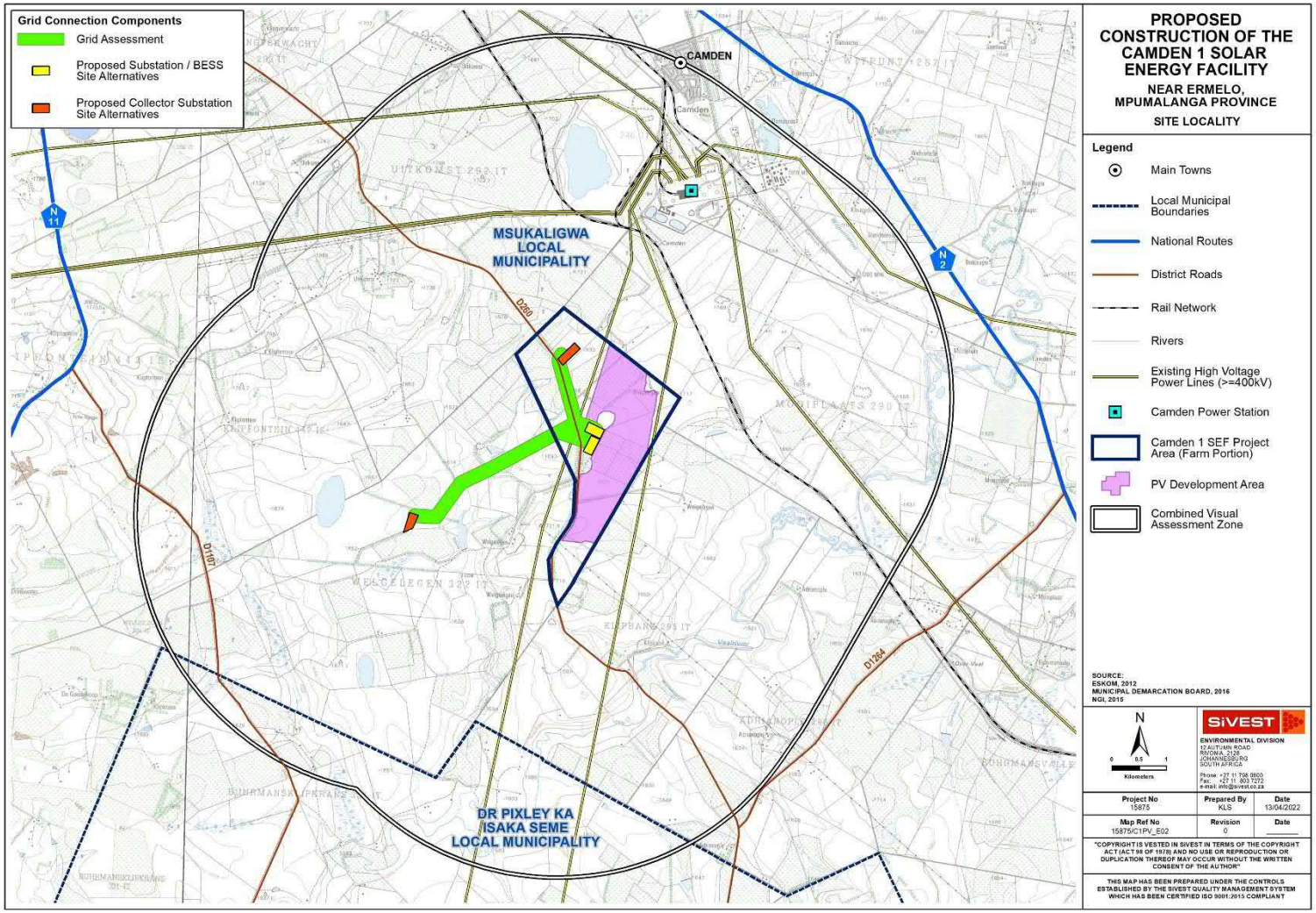


Figure 2: Camden I SEF and Grid connection Infrastructure Site Locality

3.2 Project Technical Details

3.2.1 SEF Components

It is anticipated that the proposed Camden I SEF will have a capacity of up to 100MW. The overall objective of the development is to generate electricity by capturing solar energy to feed into the National Grid by way of 132kV and 400kV overhead power lines (OHP) connecting to the nearby Camden Power Station, via a collector substation which in turn is connected to the Camden I SEF IPP on-site substation (of up to 132kV). In summary, the proposed Camden I SEF will include the following components:

The SEF will consist of the following:

- **Solar Photovoltaic (PV) arrays:**
  - At this stage, it is anticipated that the proposed Solar PV energy facility will include PV fields (arrays) comprising multiple PV modules. The PV modules are arranged in rows and columns, some of which may require levelling of the terrain and associated slope stabilisation measures.
  - PV panels (**Figure 3**) will have a maximum height of 5 m, and could be mounted on fixed tilt, single axis tracking or dual axis tracking mounting structures or Bifacial Solar Modules with a maximum combined height of up to 10m. Where desirable and feasible, Agri-Voltaic principles could be considered in the final design. ;

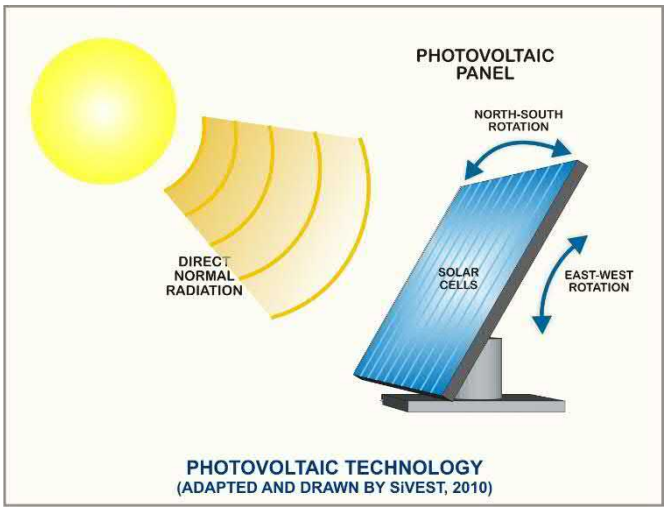


Figure 3: Typical components of a solar PV panel

- **On-Site Infrastructure**
  - One (1) new Independent Power Producer (IPP) on-site substation, occupying an area of approximately 1.5 ha. The substation will consist of a high voltage substation yard to allow for multiple (up to) 132kV feeder bays and transformers, control building, telecommunication infrastructure, access roads, and other substation components as required.
  - A Battery Energy Storage System (BESS) will be located next to the onsite substation, occupying an area of approximately 6.5ha. The BESS storage capacity will be up to

100MW/400MWh with up to four hours of storage. It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies will be considered as the preferred battery technology. The main components of the BESS include the batteries, power conversion system and transformer which will all be stored in various rows of containers;

- Medium voltage cabling linking the solar PV arrays to the on-site substation complexes will be laid underground where feasible.
- Internal roads with a width of between 4m and 5m, increasing to 6m on bends, will provide access to the PV arrays. Where required for turning circle/bypass areas, access or internal roads may be up to 20m to allow for larger component transport. The total length of internal road envisaged is ~8km.
- One (1) construction camp and temporary laydown / staging area with a combined area of 25 000m^2.
- Operation and Maintenance (O&M) buildings, workshop and stores with a combined footprint of approximately 500m^2 to be located in close proximity to the substation site.
- A temporary cement batching plant occupying a footprint of approximately 0.5 ha. The site will also accommodate a cement silo of up to 20m in height.

3.2.2 Grid Connection Infrastructure

The electricity generated by the proposed Camden I SEF will be fed into the national grid by way of (up to 132kV) overhead power lines (OHPs), connecting to the nearby Camden Power Station. The OHL towers will be up to 35 m in height and it is assumed that these towers will be located approximately 200m to 250m apart.

Power line corridors of 250 m are being assessed to allow flexibility when determining the final route alignment. The required servitude width is however much less than 250m and will be positioned within the assessed corridor.

The proposed grid connection infrastructure to serve the Camden I WEF will include the following components:

- One (1) new 33/132kV on-site substation, occupying an area of up to approximately 1.5 ha in extent. The onsite grid connection substation will consist of a high voltage substation yard to allow for multiple (up to) 132kV feeder bays and transformers, control building, telecommunication infrastructure, access roads, etc. The proposed substation will be a step-up substation and will include an Eskom portion and an IPP portion, hence the substation has been included in both the EIA for the SEF and in the BA for the grid infrastructure to allow for handover to Eskom. The applicant will remain in control of the low voltage components (i.e. 33kV components) of the substation, while the high voltage components (i.e. 132kV components) of this substation will likely be ceded to Eskom shortly after the completion of construction; and
- New 132kV overhead power lines, either single or double circuit, connecting the on-site substation to the nearby proposed Camden Collector substation, which in turn will connect to the Camden Power Station.

3.2.3 EIA Layout Alternatives

Design and layout alternatives for the proposed SEF are being considered and assessed as part of the EIA. These include two site alternatives for the Substation / BESS and for the construction camp /temporary laydown area / cement batching plant. (**Figure 4**).

3.2.4 BA Alternatives

Two substation alternatives with four associated route alternatives are being assessed for the proposed Camden I SEF grid connection (**Figure 5**).

- Power Line Corridor Option 1 is approximately 1.7 km in length (depending on the exact route options), linking substation Option 1 to Camden Collector Substation Option 2.
- Power Line Corridor Option 2 is approximately 1.7 km in length (depending on the exact route options), linking substation Option 2 to Camden Collector Substation Option 2.
- Power Line Corridor Option 3 is approximately 3.9 km in length (depending on the exact route options), linking substation Option 2 to Camden Collector Substation Option 1.
- Power Line Corridor Option 4 is approximately 3.8 km in length (depending on the exact route options), linking substation Option 1 to Camden Collector Substation Option 1.

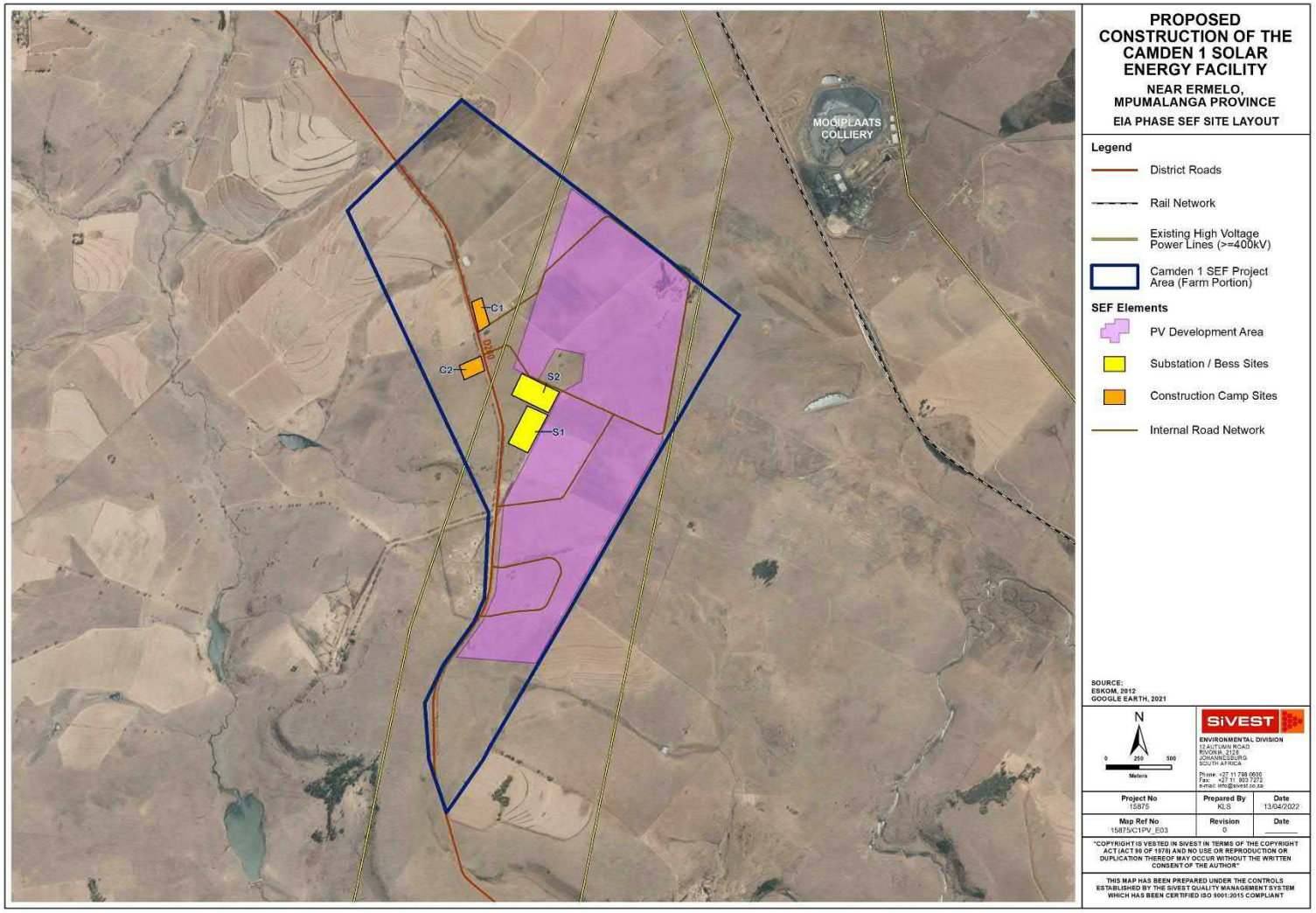


Figure 4: Preliminary Camden I SEF layout, including alternatives

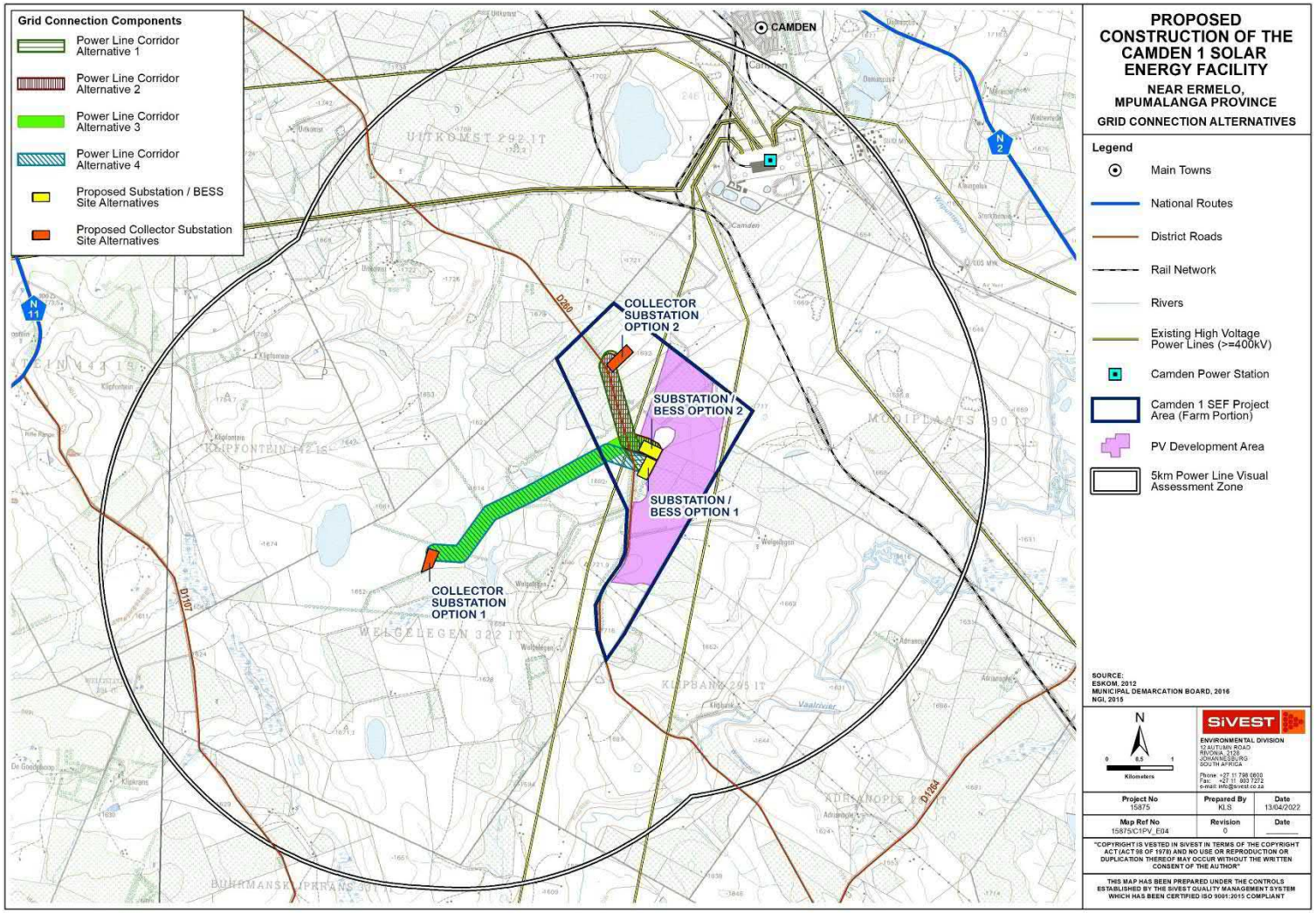


Figure 5: Grid Connection Alternatives

4 LEGAL REQUIREMENTS AND GUIDELINES

Key legal requirements pertaining to the proposed SEF development are outlined below.

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), (NEMA) and the EIA Regulations 2014 (as amended), the proposed development includes listed activities which require a full Environmental Impact Assessment (EIA) or a Basic Assessment (BA) to be undertaken. As part of the EIA and BA processes, the need for a VIA to be undertaken has been identified in order to assess the visual impact of the proposed WEF and grid connection infrastructure.

There is currently no legislation within South Africa that explicitly pertains to the assessment of visual impacts, however in addition to 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)

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.

Accordingly, this specialist visual assessment has been undertaken in compliance with Appendix 6 of 2014 NEMA EIA Regulations (as amended).

5 FACTORS INFLUENCING VISUAL IMPACT

The degree of visibility of an object informs the level and intensity of the visual impact, but other factors also influence the nature of the visual impact. The landscape and aesthetic context of the environment in which the object is placed, as well as the perception of the viewer are also important factors

5.1 Visual environment

Solar PV facilities and electrical infrastructure 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 are practised that are dependent on the enjoyment of, or exposure to, the scenic or aesthetic character of the area. Residents and visitors to these areas could perceive the development to be highly incongruous in this context and may regard the development as an unwelcome intrusion which degrades the natural character and scenic beauty of the area, and which could potentially even compromise the practising of tourism activities in the area. In this instance however, significant

transformation in parts of the study area has resulted in considerable degradation of the scenic quality of the landscape.

The presence of other anthropogenic features associated with 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 a solar PV facility and associated grid connection infrastructure into this setting may be considered to be less visually intrusive than if there was no existing built infrastructure visible.

5.2 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. The viewer's perception 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 and the associated grid connection infrastructure to be a negative visual impact as this type of development is often associated with employment creation, social up-liftment and the general growth and progression of an area, and could even have positive connotations.

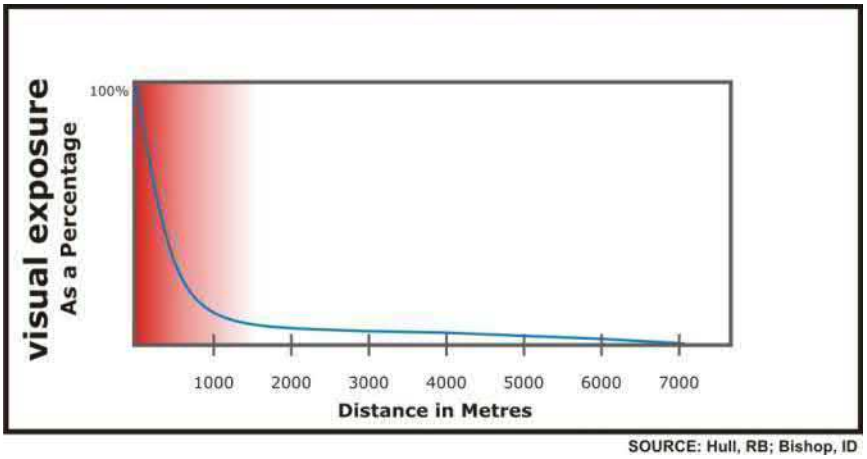
5.3 Type of visual receptor

Visual impacts can be experienced by different types of receptors, including people living or working, or driving along roads within the viewshed of the proposed development. The receptor type in turn affects the nature of the typical 'view', with views being permanent in the case of a residence or other place 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.

5.4 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 6)**.



SOURCE: Hull, RB; Bishop, ID

Figure 6: Conceptual representation of diminishing visual exposure over distance

6 VISUAL CHARACTER AND SENSITIVITY OF THE STUDY AREA

Defining the visual character of an area is an important part of assessing visual impacts as this establishes the visual baseline or existing visual environment in which the development would be constructed. The visual impact of a development is measured by establishing the degree to which the development would contrast with, or conform to, the visual character of the surrounding area. The inherent sensitivity of the area to visual impacts or visual sensitivity is thereafter determined, based on the visual character, the economic importance of the scenic quality of the area, inherent cultural value of the area and the presence of visual receptors.

Physical and land use related characteristics, as outlined below, are important factors contributing to the visual character of an area.

6.1 Physical and Land Use Characteristics

6.1.1 Topography

The proposed Camden I SEF development and associated grid connection infrastructure is located in an area largely characterised by a mix of undulating plains (**Figure** 7) and greater relief in the form of higher lying plateaus intersected by river valleys (**Figure 8**). Slopes across the study area are relatively gentle to moderate, with steeper slopes being largely associated with the more incised river valleys. The main water course in the study area is the Vaal River in the south-eastern portion of the study area.

Flat to gently undulating terrain prevails across much of the SEF project area (**Figure 9**).

Maps showing the topography and slopes within and in the immediate vicinity of the combined assessment area are provided in **Figure 10** and **Figure 11.**

Figure 7: View south-east from the D260 District Road in the north-western of the study area showing undulating terrain.

Figure 8: Areas of greater relief along the Vaal River to the south of the Camden I SEF project area.

Figure 9: View south-east across the Camden I SEF project area from the D260 District Road showing flat to gently undulating terrain and Eskom overhead powerline.

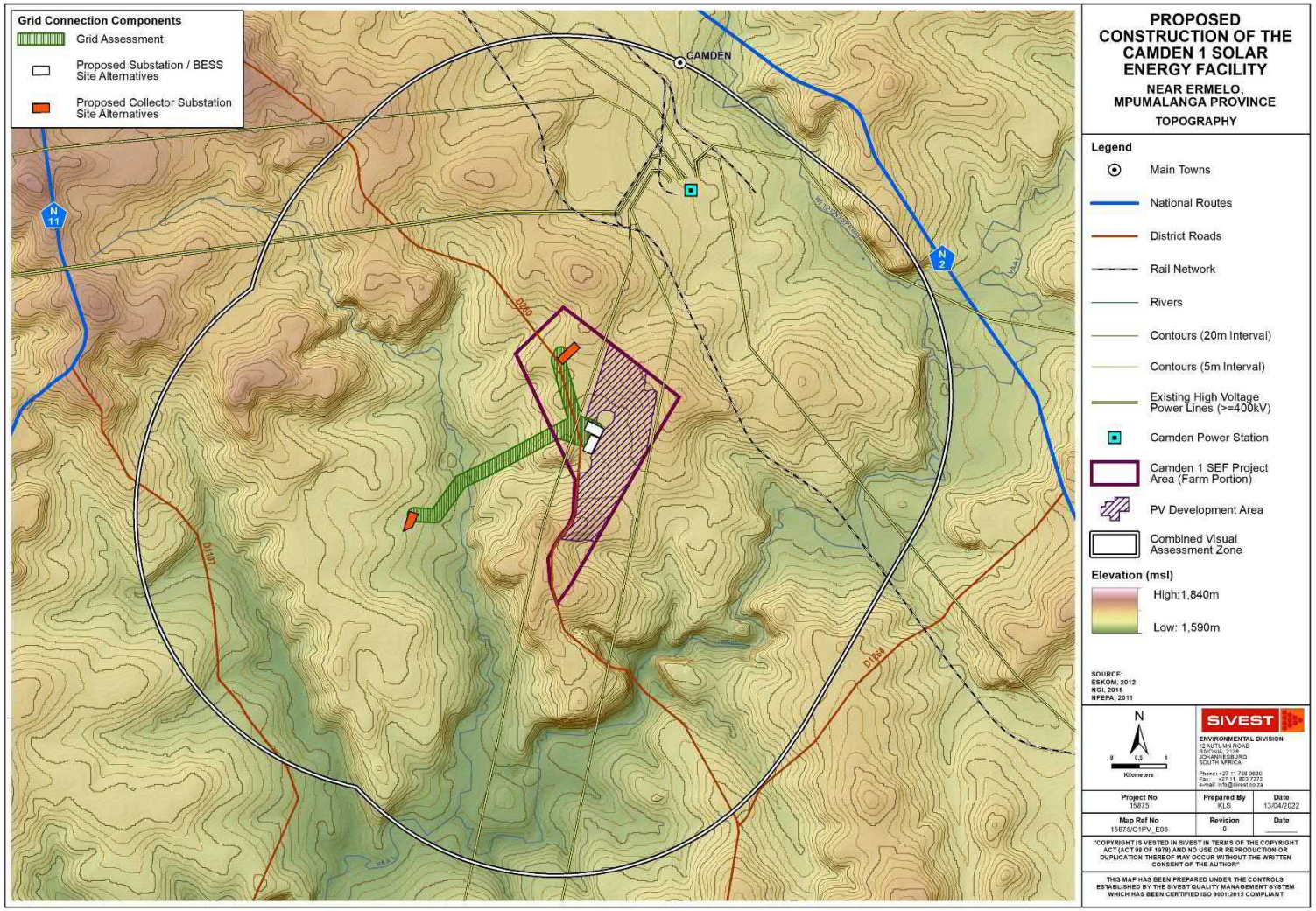


Figure 10: Topography of the study area

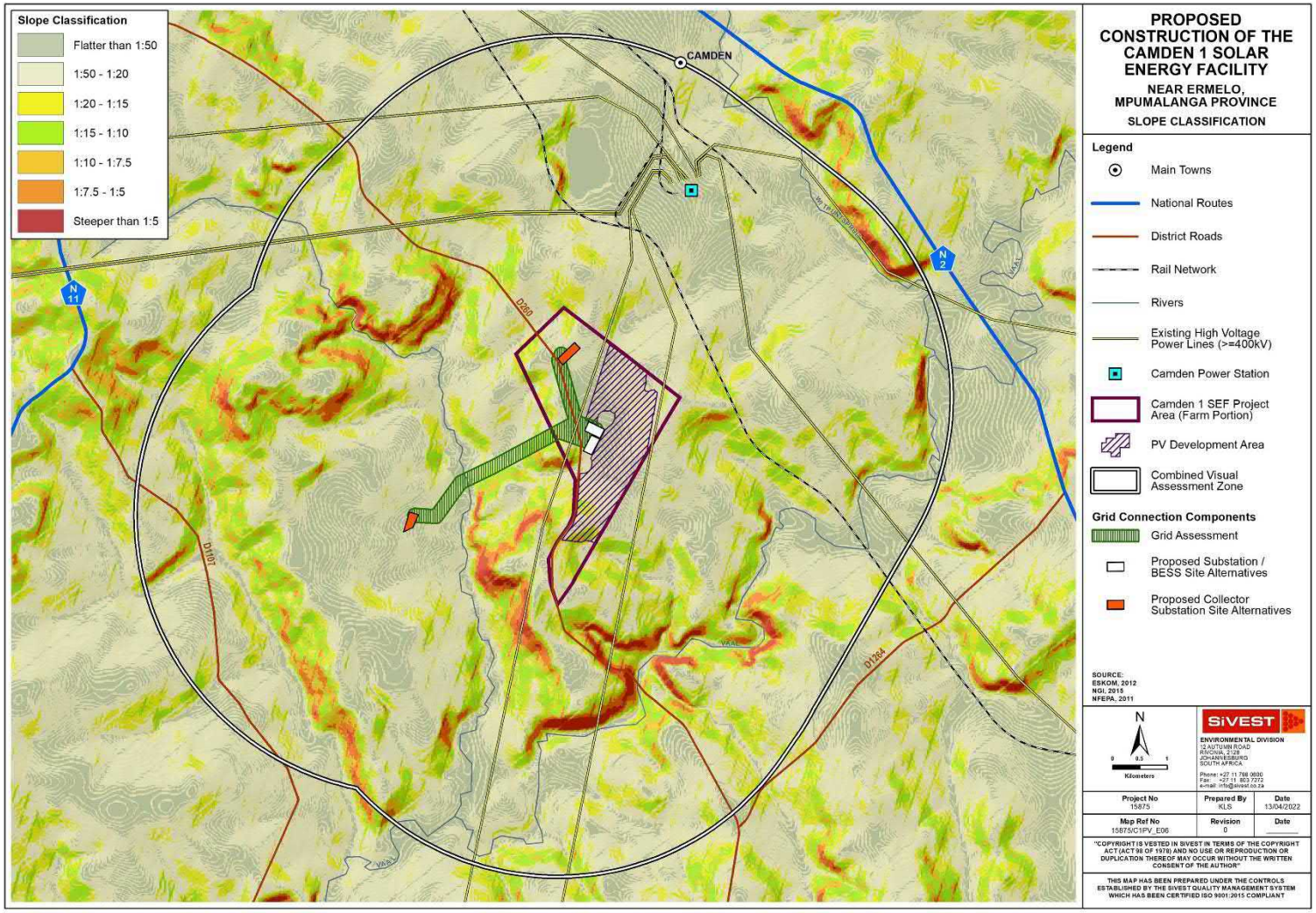


Figure 11: Slope classification

Visual Implications

The nature of the topography and the position of the viewer within the landscape are strong factors influencing the types of vistas typically present. Wider vistas will typically be experienced from higher-lying areas or hilltops and as such the view will be directly dependent on whether the viewer is within a valley bottom or in an area of higher elevation. Importantly in the context of this study, the same is true of objects placed at different elevations and within different landscape settings. Objects placed on high-elevation slopes or ridge tops would be highly visible, while those placed in valleys or enclosed plateaus would be far less visible.

The PV arrays will not however be located on high elevation slopes or on ridgelines and as such there will be minimal impact on the skyline. Localised topographic variations may limit views of the PV arrays from some parts of the study area, but across the remainder of the study area there would be little topographic shielding to reduce the visibility of the steel structures of the proposed on-site substation from many of the locally occurring receptor locations.

GIS technology was used to undertake a preliminary visibility analysis for the proposed PV arrays based on the project information provided by the Proponent. A worst-case scenario was assumed when undertaking the analysis, in which the proposed PV panels were assigned a maximum height of 10 m. The resulting viewshed, as shown in **Figure 12**. indicates that the PV arrays would not be visible, or only partially visible from many parts of the study area. Areas of high visibility are largely contained within the project area and several of the identified receptor locations are outside the viewshed for the PV arrays.

Power line towers and the steel structures of the proposed substation, at a maximum height of 35m, are likely to be visible from many of the locally-occurring receptor locations. In addition, sections of the proposed power line could impact on the skyline, particularly where they traverse ridges or areas of relatively higher elevation. A preliminary visibility analysis was undertaken for the proposed power line routes and substation sites, based on points at 250 m intervals along the centre line of the corridor alternatives, and assuming a tower height of 35 m. The resulting viewshed as per Error! Reference source not found. below indicates that elements of the proposed grid connection infrastructure would be highly visible from areas to the north and west of the assessment corridors, although much of the remainder of the study area is outside the viewshed for the power lines.

However, the visibility analysis is based entirely on topography and does not does not consider any existing vegetation cover or built infrastructure which may screen views of the proposed development. Detailed topographic data was not available for the broader study area and as such the visibility analysis does not take into account any localised topographic variations which may constrain views. This analysis should therefore be seen as a conceptual representation or a worst-case scenario.

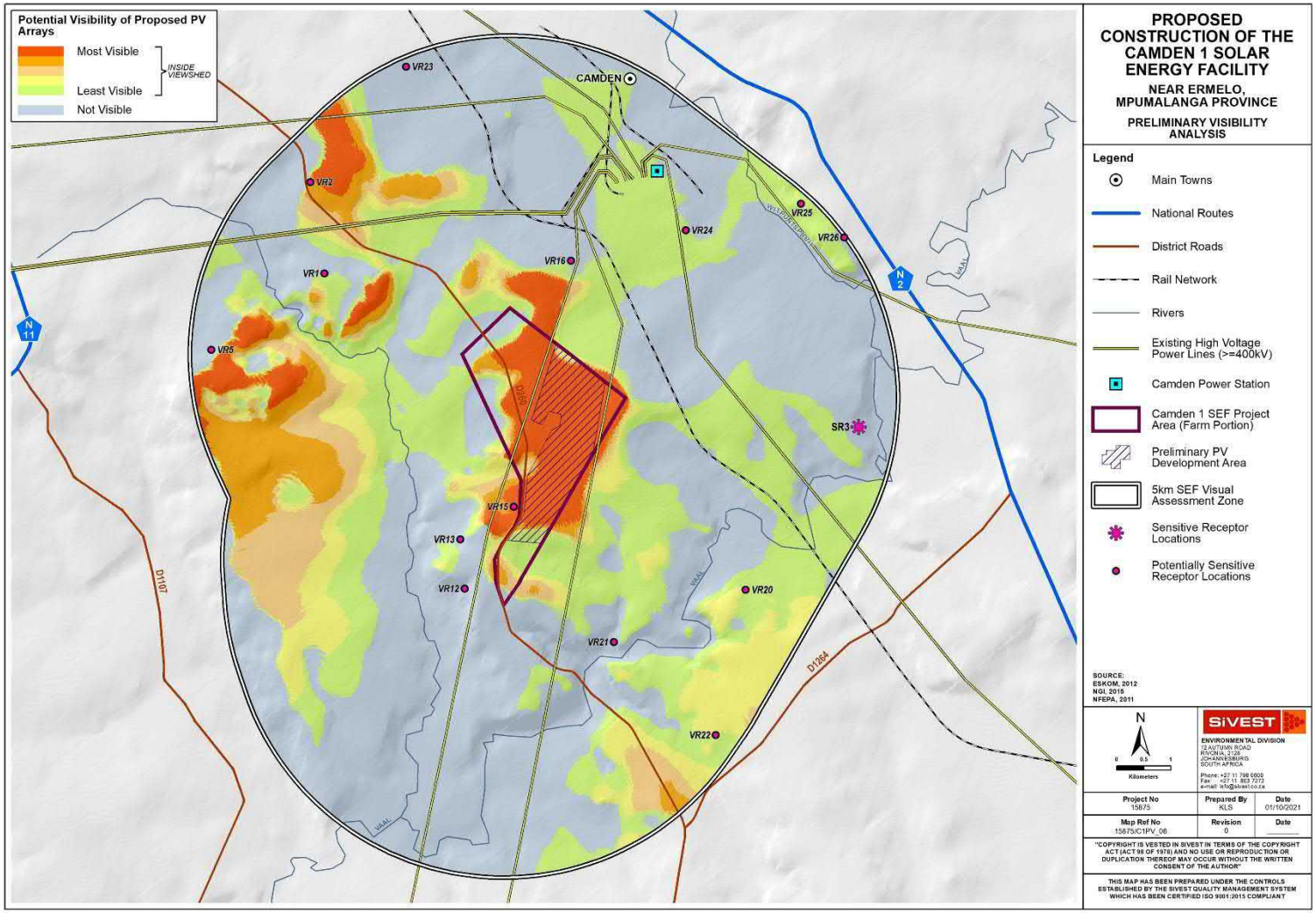


Figure 12: Potential visibility of PV arrays

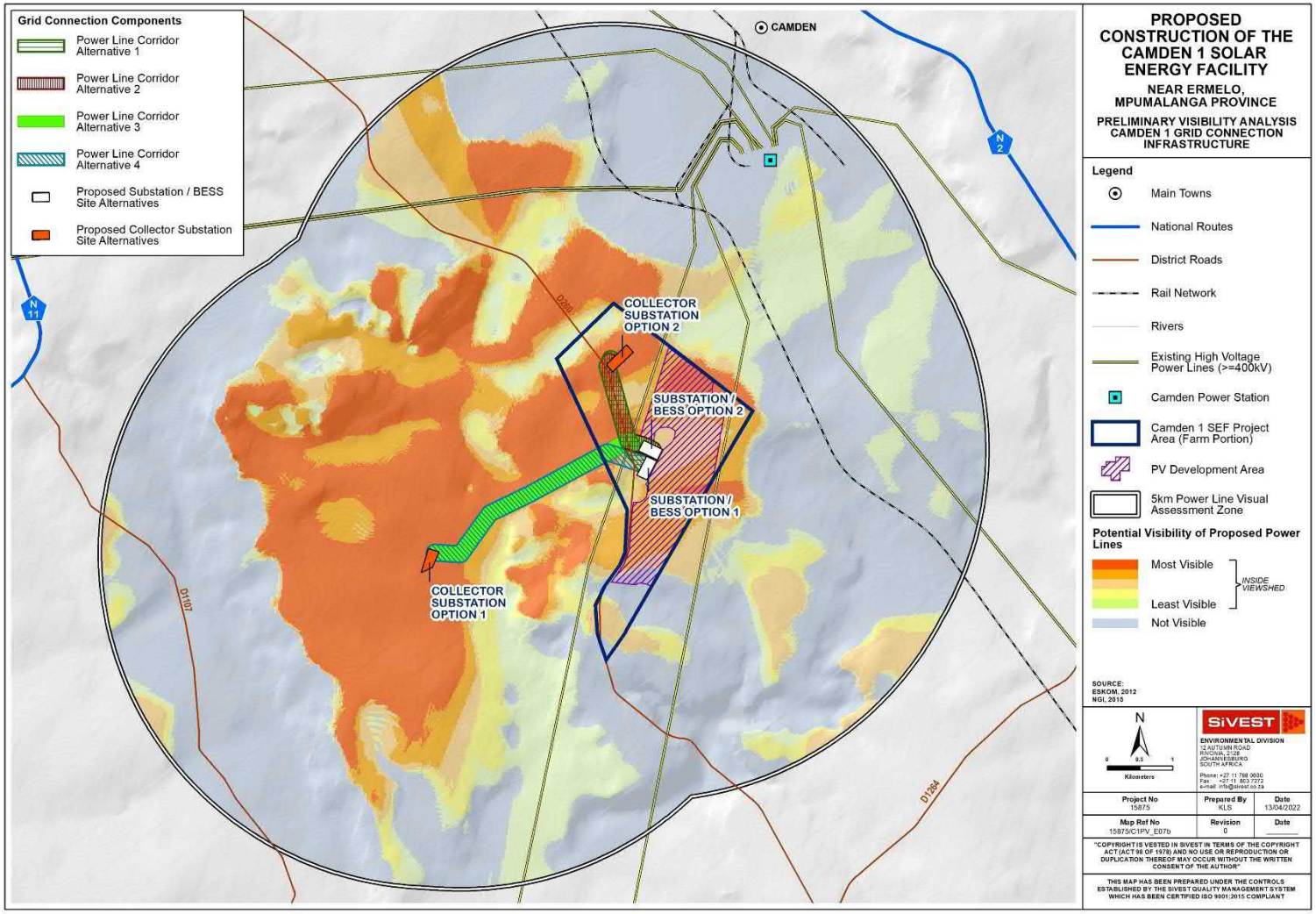


Figure 13: Potential visibility of Camden I SEF power lines

6.1.2 Vegetation

According to Mucina and Rutherford (2006), the study area is largely dominated by two vegetation types, namely the Amersfoort Highveld Clay Grassland and the Eastern Highveld Grassland vegetation types (**Figure 14**). Amersfoort Highveld Clay Grassland in the north-western section of the study area (**Figure 15)** is associated with undulating grassland plains, largely dominated by a dense *Themeda triandra* sward, often forming a short lawn as a result of grazing. The Eastern Highveld Grassland, in much of the remainder of the study area is characterised by a short dense grassland with scattered rocky outcrops where some woody species occur.

Much of the natural vegetation cover has however been partly removed or transformed by cultivation as well as the presence of tall exotic trees scattered in clusters across the study area and around farmsteads **(Figure 16**). In addition, a tall windrow of invasive trees lines both sides of the D260 District Road passing the proposed Solar PV Facility footprint, thus screening views of the development from this road.

Visual Implications

Although the proposed development will contrast significantly with the predominant vegetative cover in the area, scattered trees and shrubs will provide some degree of screening thus potentially reducing impacts experienced by the potentially sensitive receptors in the area. In addition, tall trees planted around farmhouses and along roads in the area may restrict views from these receptor locations.

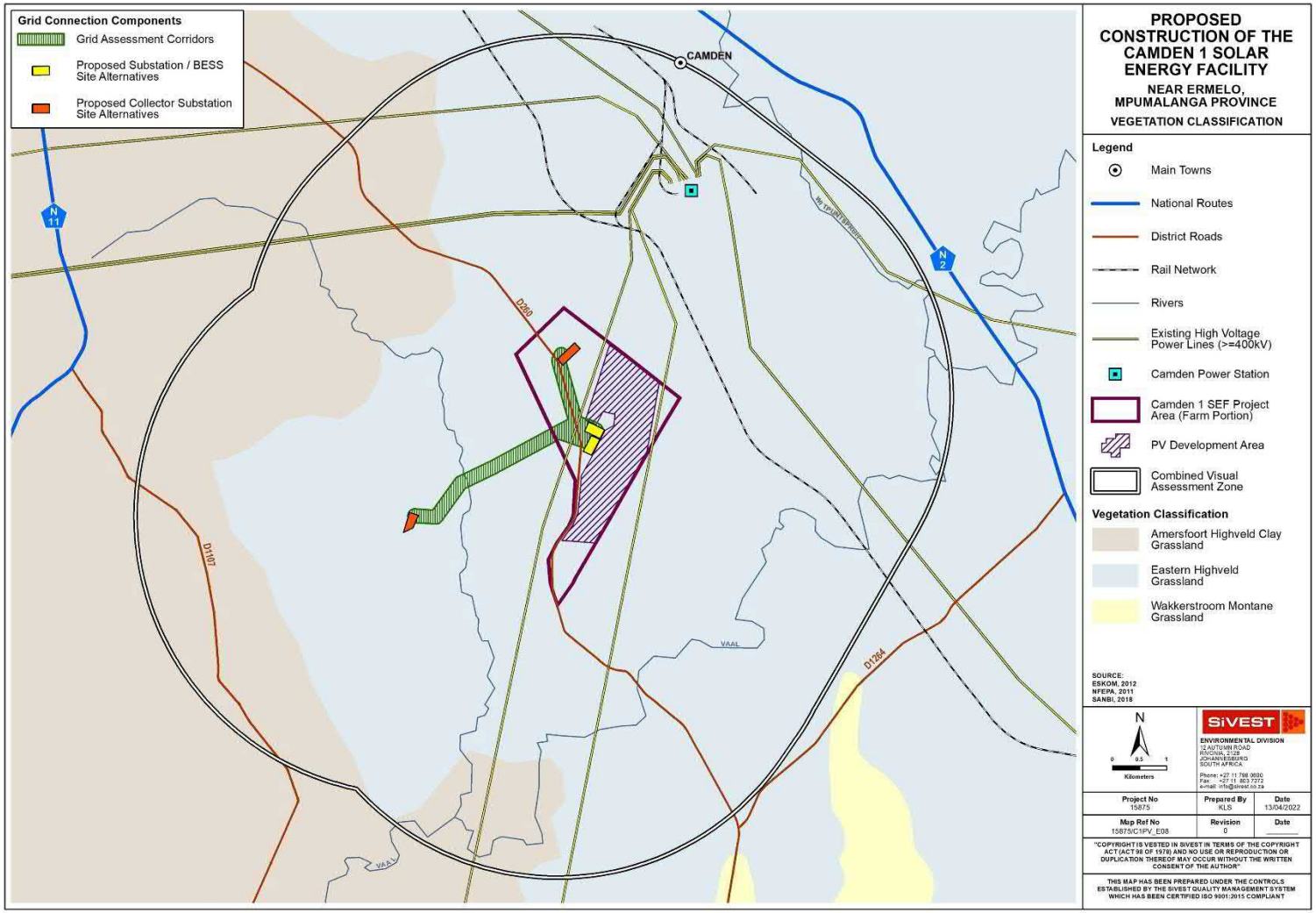


Figure 14: Vegetation Classification in the Study Area

Figure 15: Grasslands in the northern sector of the study area.

Figure 16: Clusters of trees scattered across the study area.

6.1.3 Land Use

According to the South African National Land Cover dataset (Geoterraimage 2020), much of the visual assessment area is classified as “Grassland” interspersed with significant areas of “Cultivation”. Small tracts of forested land and numerous water bodies are scattered throughout the study area (**Figure 17**).

Commercial agriculture is the dominant activity in the study area, with the main focus being maize cultivation (**Figure 18**) and livestock grazing (**Figure 19**). Although there are several farm portions in the study area, the density of rural settlement is relatively low, and farmsteads are scattered across the study area. Built form in much of the study area comprises farmsteads, ancillary farm buildings and workers’ dwellings (**Figure 20**), gravel access roads, telephone lines, fences and windmills.

High levels of human influence are however visible in the northern sector of the study area caused by the presence of Camden Power Station (**Figure 21**) and the adjacent Camden residential area and associated high voltage power lines (**Figure 22**). Mooiplaats Colliery, located north-east of the Camden 1 SEF project area also forms a distinctive anthropogenic feature in the otherwise pastoral landscape.

Other evidence of significant human influence includes road, rail, telecommunications and high voltage electricity infrastructure (**Figure 23**).

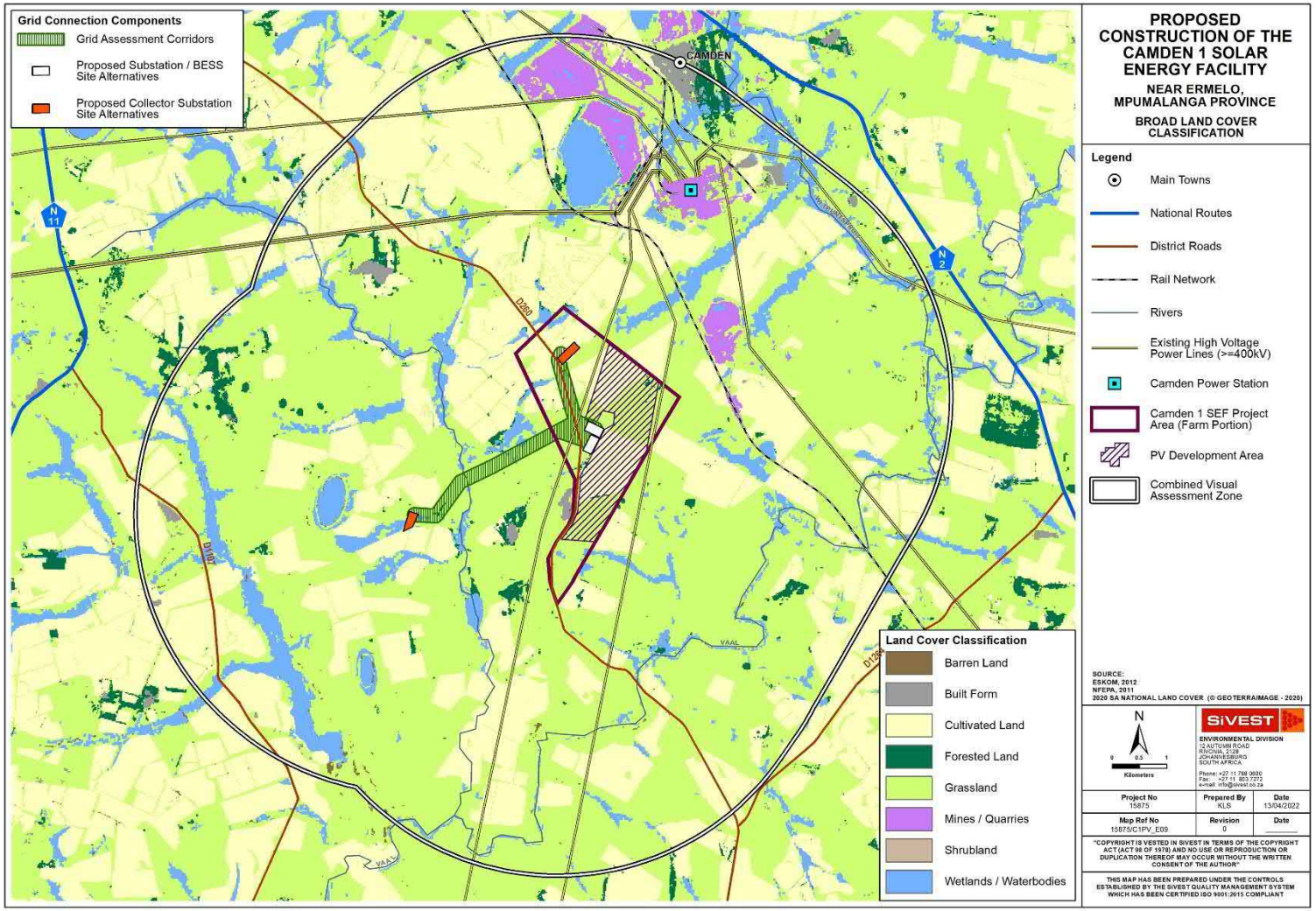


Figure 17: Land Cover Classification

Figure 18: Maize cultivation south-east of the Camden 1 SEF project area.

Figure 19: Livestock grazing is common in the study area.

Figure 20: Farm workers dwellings and associated farm infrastructure in the study area.

Figure 21: View of Camden Power Station to the west of the N2 national route.

Figure 22: High voltage power lines feeding into Camden Power Station.

Figure 23: Rail infrastructure and power lines to the south-east of the Camden 1 SEF project area.

Visual Implications

The predominance of cultivated land in conjunction with the remaining natural grassland cover across much of the study area would give the viewer the general impression of a largely rural / pastoral setting. Thus, the proposed Camden 1 SEF development and associated grid connection 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 development site and across much of the study area.

High levels of human transformation and visual degradation are however evident in the north and north-east where Camden Power Station and associated residential and infrastructural development as well as mining activity dominate the landscape. In addition, roads, railways and power lines have further degraded the visual character of the study area to some degree. This transformation has already altered the visual character across much of the north-eastern sector of the study area, thus reducing the level of contrast of the proposed development.

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

6.2 Visual Character and Cultural Value

The physical and land use-related characteristics of the study area as described above 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 including buildings, roads and other objects such as telephone 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.

The predominant land use in the area (maize cultivation) has significantly transformed the natural landscape across much of the study area. In addition, the landscape becomes progressively more transformed towards the north-eastern boundary of the study area where Camden Power Station and mining activities have resulted in a high degree of visual degradation. The more industrial character of the landscape is an important factor in this context, as the introduction of the proposed SEF and associated grid connection infrastructure would result in less visual contrast where other anthropogenic elements are already present, especially where the scale of those elements is similar to that of the proposed development.

The scenic quality of the landscape is also an important factor that contributes to the visual character or inherent sense of place. Visual appeal is often associated with unique natural features or distinct variations in form. As such, the pastoral landscape and rolling hills in parts of the study area are important features that could increase the visual appeal and visual interest in the area.

Cultural landscapes are becoming increasingly important concepts in terms of the preservation and management of rural and urban settings across the world. The concept of ‘cultural landscape’ is a way of looking at a place that focuses on the relationship between human activity and the biophysical environment (Breedlove, 2002). In this instance, the rural / pastoral landscape represents how the environment has shaped 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 towns, such as Ermelo, engulfed by an otherwise rural / pastoral environment, form an integral part of the wider landscape.

In light of this, it is important to assess whether the introduction of a solar PV facility and associated grid connection infrastructure into the study area would be a degrading factor in the context of the prevailing character of the cultural landscape. Broadly speaking, visual impacts on the cultural landscape in the area around the proposed development would be reduced by the fact that the visual character in much of the area has been significantly transformed and degraded mining and infrastructural development.

6.3 Visual Sensitivity Analysis and Verification

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 or nature-based 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 (**Table 2**), 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 SEF or a power line 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 2: Environmental factors used to define visual sensitivity of the study area

FACTORS	DESCRIPTION	RATING									
		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 sensitive visual receptors	Relatively few sensitive receptors have been identified in the study area.										
Aesthetic sense of place / visual character	Visual character is a typical rural / pastoral 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 a typical rural / pastoral 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	Relatively few tourism/leisure based facilities in the area										
International / regional / local status of the environment	Study area is a typical rural/pastoral landscape										
**Scenic quality under threat / at risk of change	Introduction of a SEF and associated infrastructure will alter the visual character and sense of place. In addition, the development of other renewable energy facilities in the broader area as planned will introduce an increasingly industrial character, giving rise to significant cumulative impacts										

**Any rating above '5' for this specific aspect will trigger the need to undertake an assessment of cumulative visual 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 39, which according to the scale above, would result in the area being rated as having a low visual sensitivity. 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 and this has been factored into the sensitivity rating above. The presence of visual receptors is examined in more detail in **Section 8** of this report.

The rating has also taken into account the Langcarel Private Nature Reserve identified in the South African Protected Areas Database (incremental release Quarter 2 2021). Field investigation found no outward indication of the presence of a nature reserve in this area and much of the land within the demarcated reserve is utilised for commercial cultivation, while the land parcels involved are all managed for agricultural purposes (commercial farming). The reserve boundaries include the farm property that forms the Camden I SEF project area and it is known that the land owners support the proposed development. Accordingly, visual sensitivities normally associated with nature reserves will be reduced in this instance.

During the initial stages of the EIA, a site sensitivity assessment was undertaken to inform the site layout for the SEF and the power line route alignments. The aim of this exercise was to indicate any areas of the application site or grid assessment corridors which should be precluded from the development footprint. From a visual perspective, sensitive areas would be areas where the establishment of establishment of PV panels, power lines, substations or other associated infrastructure would result in the greatest probability of visual impacts on sensitive or potentially sensitive visual receptors.

6.3.1 SEF Site Sensitivity

Using GIS-based visibility analysis, it was possible to determine which sectors of the SEF application site would be visible to the highest numbers of receptors in the study area. However, this analysis found that no areas on the site are *significantly* more visible than the remainder of the site. In addition, due to the relatively low number of receptors in the area, and the fact that some of these receptors lie outside the viewshed for the PV arrays, very few areas on the site were found to be visible to more than two (2) receptors. As such, in terms of visibility, no areas on the site were found to be particularly sensitive.

In determining visual sensitivity, consideration must be given to the direct visual impact of the PV arrays on any farmsteads or receptors located in, or within 500m of, the project area. Only one farmstead is located within 500m of the Camden I SEF project area and as such a 500m

zone of ***potential*** visual sensitivity has been delineated around this receptor. However, this farmstead is located within the Camden I WEF project area and it is known that the relevant owners / occupants support the overall Camden Renewable Energy Complex project. As such, they are not expected to perceive the proposed development in a negative light and this would reduce the level of sensitivity potentially associated with the proposed SEF.

In addition, consideration must be given to the possible adverse effects of glint and glare on passing motorists. Accordingly, a 300m zone of ***potential*** visual sensitivity has been identified on either side of the D260 district road which traverses the SEF project area. It should be noted however that possible visual impacts on road users would be significantly reduced in this instance by the presence of trees planted alongside stretches of the D260 district road providing some measure of visual screening. The full extent of these impacts can however only be determined by way of a Glint and Glare Impact Assessment.

In light of the above, the zones of potential visual sensitivity are ***not*** considered "no go" areas, but rather should be viewed as zones where development should, where possible, be limited and / mitigated. It should be stressed that these zones apply to PV array development only and not the remainder of the infrastructure detailed in this report.

The visual impacts resulting from the associated on-site infrastructure are considered to have far less significance when viewed in the context of the SEF as a whole and as such the associated on-site infrastructure has been excluded from the sensitivity analysis.

The areas identified as ***potentially*** visually sensitive to SEF development are shown in **Figure** 24**Error! Reference source not found.** below.

6.3.2 Power Line Route Sensitivity

GIS-based visibility analysis in respect of the Camden I SEF power line route alignments determined that no sections of the route alignment are *significantly* more visible than any other. As such, in terms of visibility, no sections of the route alignment were found to be more sensitive than others.

In considering the possible visual impact of the power line or substations on any nearby farmsteads or receptors, investigation determined that there are no farmsteads within 500m of the assessment corridors. Accordingly, no areas of visual sensitivity were identified in relation to any of the corridor alternatives.

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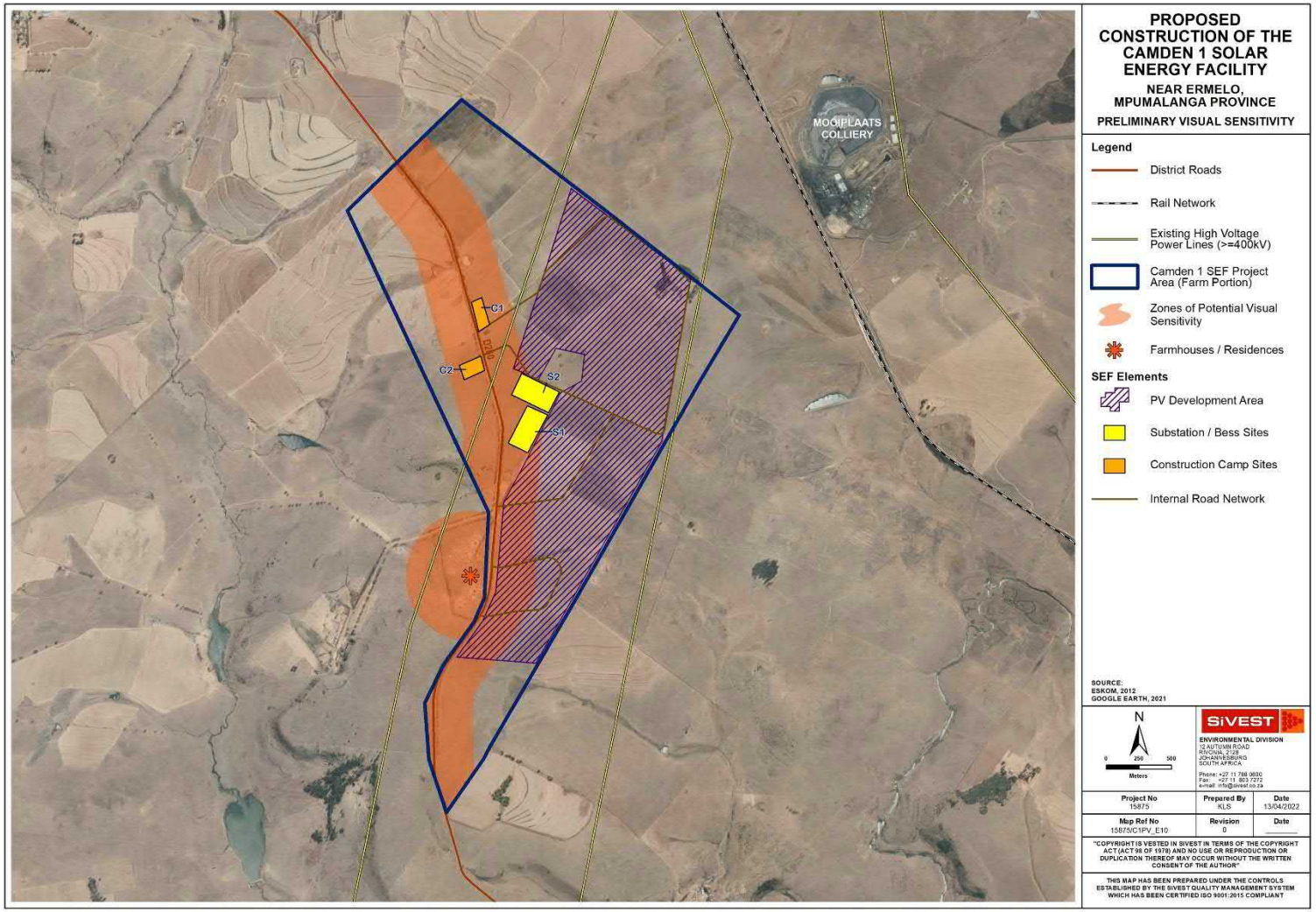

Figure 24: Potential visual sensitivity zones of the Camden I SEF Site

6.3.3 Sensitivities identified by the National Screening Tool: SEF

In assessing visual sensitivity of the proposed SEF, consideration was given to the Landscape Theme of the National Environmental Screening Tool. Under the Landscape Theme, as shown in **Figure 25** below, the tool identifies the entire Camden I SEF project area as “Very High” sensitivity in respect of SEF development. According to the Screening Tool, this rating is associated with the presence of a demarcated protected area (Langcarel Private Nature Reserve) as well as natural features such as mountain tops, high ridges and steep slopes

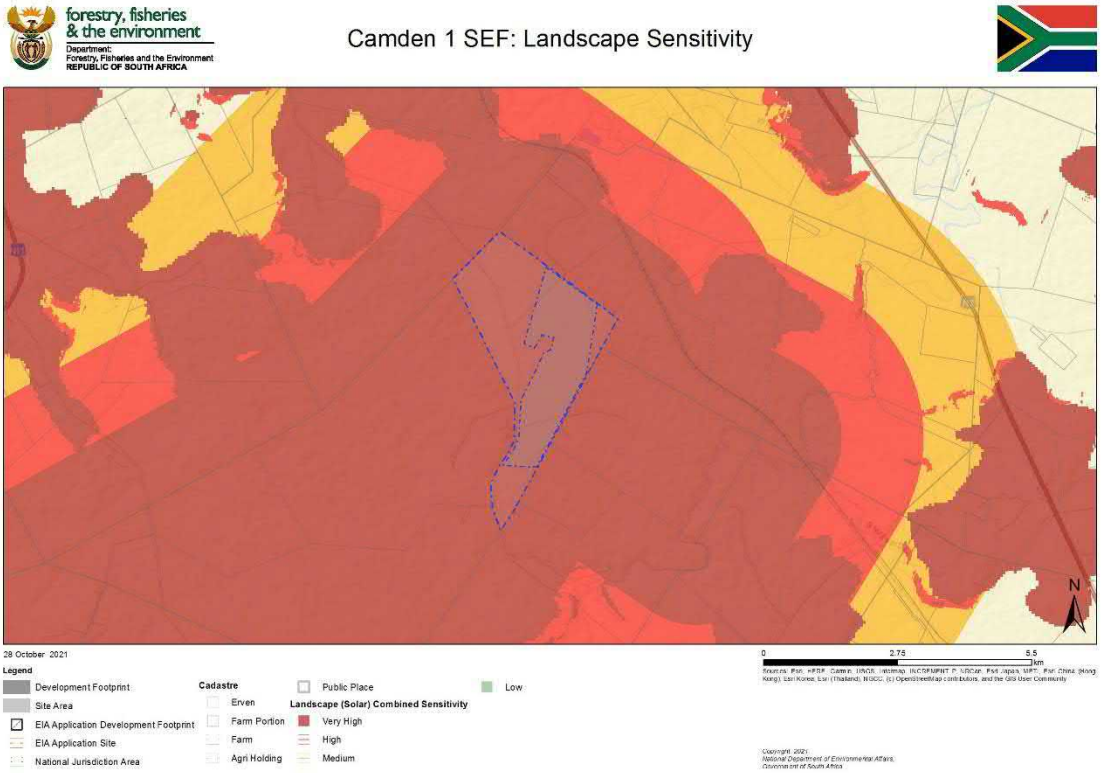

Figure 25: Relative Landscape Sensitivity (October 2021)

The Screening Tool provides a very high level, desktop assessment 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 development; and
- the likely visibility of the development from the receptor locations.

6.3.4 Sensitivity Analysis Summary for SEF Development

Although the Screening Tool identifies significant areas of very high landscape sensitivity, the site sensitivity verification exercise conducted in respect of this VIA found little evidence to support this sensitivity rating. The sensitivity rating for this site is heavily influenced by the

Langcarel Private Nature Reserve which is identified in the South African Protected Areas Database. As stated however, the area is entirely managed for commercial agriculture with no conservation activities present and no evidence of public access to the site. Any landscape value or visual appeal has therefore been reduced. Accordingly, the site is not subject to the usual visual / landscape sensitivity associated with nature reserves.

In addition, the desktop topographic assessment of the area did not indicate the presence of mountaintops, *high* ridges or any significantly steep slopes. This assessment, confirmed by the field investigation, indicated that the site is largely characterised by flat to gently undulating terrain and as such, no areas of landscape sensitivity were identified on the site.

6.3.5 Sensitivities identified by the National Screening Tool: Power Line Route Alternatives

The National Environmental Screening Tool does not identify any landscape sensitivities in respect of the proposed grid connection infrastructure.

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 undulating topography in the study area and the areas of cultivation and grassland would reduce the visual absorption capacity, this would be offset to some degree by the presence of Camden Power Station, mining and infrastructural development in the vicinity of the proposed Camden I SEF and associated grid connection infrastructure. In addition, the presence of a tall invasive alien trees lining both sides of the district road nearest the proposed Solar PV facility provides a measure of visual shielding and therefore increases absorption capacity in the immediate vicinity of the Camden I SEF and associated grid connection infrastructure.

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

7 TYPICAL VISUAL IMPACTS ASSOCIATED WITH WIND ENERGY FACILITES

In this section, the typical visual issues related to the establishment of solar PV facilities 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 SEFs and associated grid connection infrastructure.

7.1 Solar Energy Facilities

The solar power component of the proposed energy generation facility 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 10m high. The height of these objects will make them visible, especially in the context of a relatively flat landscape.

More importantly, the concentration of these panels will make them highly visible, 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 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 energy facility, particularly in natural locations where little transformation has taken place **Figure 26** below is an example of a visually prominent PV facility.

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

7.2 Associated On-Site Infrastructure

The infrastructure associated with the proposed Camden I SEF will include the following:

- A new IPP on-site substation;
- Medium voltage (33kV) cables, buried underground wherever technically feasible;
- A Battery Energy Storage System (BESS) located next to the onsite substation, comprising batteries, power conversion system and transformer which will all be stored in various rows of containers;
- Internal roads;
- A construction laydown / staging area;
- Conservancy tanks and portable toilets as necessary.
- Operation and Maintenance (O&M) buildings;
- A temporary cement batching plant.

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. Conversely, the presence of other anthropogenic objects associated with the built environment, including other substations, power lines or even agricultural infrastructure, may result in the visual environment being considered to be 'degraded' and thus the introduction of a substation into this setting may be less of a visual impact than if there was no existing built infrastructure visible. In this instance, the substation is intended to serve the proposed Camden I SEF project and as such, is likely to be perceived as part of the greater SEF development. Thus, the visual impact of the substation will be relatively minor when compared to the visual impact associated with the SEF development as a whole.

Surface clearance for cable trenches, access roads, laydown areas and other on-site infrastructure may result in the increased visual prominence of these features, thus increasing the level of contrast with the surrounding landscape. Buildings, BESS containers 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 0**).

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

7.3 Grid Connection Infrastructure

Grid connection infrastructure for this project includes overhead 132kV power lines linking the on-site substation to proposed Camden Collector Substation, which in turn connects to Camden Power Station.

Power line towers are by their nature very large objects and thus highly visible. It is understood that the maximum tower height envisaged for the proposed power line is expected to be 35 m (approximately equivalent in height to an ten storey building). Although a tower structure would be less visible than a building, the height of the structure means that the tower 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 power lines are not features of the natural environment, they could be perceived to be highly incongruous in the context of a largely natural landscape. The height and linear nature of the power line 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 line. In a largely natural, bushy setting, vegetation clearance will cause fragmentation of the natural vegetation cover, thus making the power line more visible and drawing the viewer's attention to the servitude.

In this instance, the proposed grid connection infrastructure is close to the existing 400kV power line network feeding into Camden Power Station and as such the level of incongruity associated with the additional infrastructure will be reduce. In addition, the grid connection infrastructure is intended to serve the proposed SEF and as such, will only be built if this project is developed. The power lines and substations are therefore likely to be perceived as part of the greater SEF development and the visual impact will be relatively minor when compared to the visual impact associated with the development as a whole.

8 SENSITIVE VISUAL RECEPTORS

A sensitive visual receptor location is defined as a location 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 development may be visible, but the receptor may not necessarily be adversely affected by any visual intrusion associated with the development. 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 homesteads / 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 EIA and BA studies.

As the visibility of the development would diminish exponentially over distance (refer to **section 5.4** above), receptor locations which are closer to the SEF or power line 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 landscape character of the surrounding area.

8.1 Receptor Identification

Preliminary desktop assessment of the study area identified nineteen (19) potentially sensitive visual receptor locations within the combined study area for the Camden I SEF and associated grid connection infrastructure, most of which appear to be existing farmsteads. Although the findings of the desktop assessment were largely confirmed during the field investigation, it was not possible to confirm the presence of receptors at all the identified locations due to access restrictions. Notwithstanding this limitation, all the identified receptor locations were assessed as part of the VIA as they are still regarded as being potentially sensitive to the visual impacts associated with the proposed development.

Only one (1) of the identified receptor locations was found to be sensitive (SR3), this being a residence whose occupants have previously expressed some concern about elements of the proposed Camden Renewable Energy Complex. This receptor was however found to be **outside the viewshed** for the Camden 1 SEF project, and more than 5km from the nearest power line assessment corridor.

The remaining receptor locations are all farmsteads that are regarded as *potentially* sensitive visual receptors as the proposed development will likely alter natural or semi-natural vistas experienced from these locations. Where such receptors are located within the adjoining project area for the Camden I WEF, it has been assumed that the relevant land owners are involved in the overall Camden Renewable Energy Complex project. As such, these land owners are not expected to perceive the proposed development in a negative light and this would reduce the level of visual impact

It was noted that the residential area of Camden is partially located within the Camden I SEF study area. While the residences in this area could be considered to be receptors, they are not expected to be sensitive due to their location within built-up, heavily transformed areas.

In many cases, roads along which people travel, are regarded as sensitive receptors. The primary thoroughfare in the study area is the D260 district road which traverses the study area in a north-south direction. This road, in conjunction with the minor roads in the area, is primarily used as a local access road and does not form part of any scenic tourist routes. As such, the road is not specifically valued or utilised for its scenic or tourism potential and is therefore not regarded as visually sensitive.

As previously stated, the South African Protected Areas Database identifies the Langcarel Private Nature Reserve within the Camden I SEF study area. The area is however entirely managed for commercial agriculture with no conservation activities present, and therefore any visual appeal has been reduced. Accordingly, the reserve is not considered to be a sensitive receptor. Furthermore, the reserve includes the farm property that forms the Camden I SEF project area and it is known that the land owners support the proposed SEF development and associated grid connection infrastructure.

The identified potentially sensitive visual receptor locations for the proposed SEF and grid connection are indicated in **Figure 27**and Figure 28 respectively.

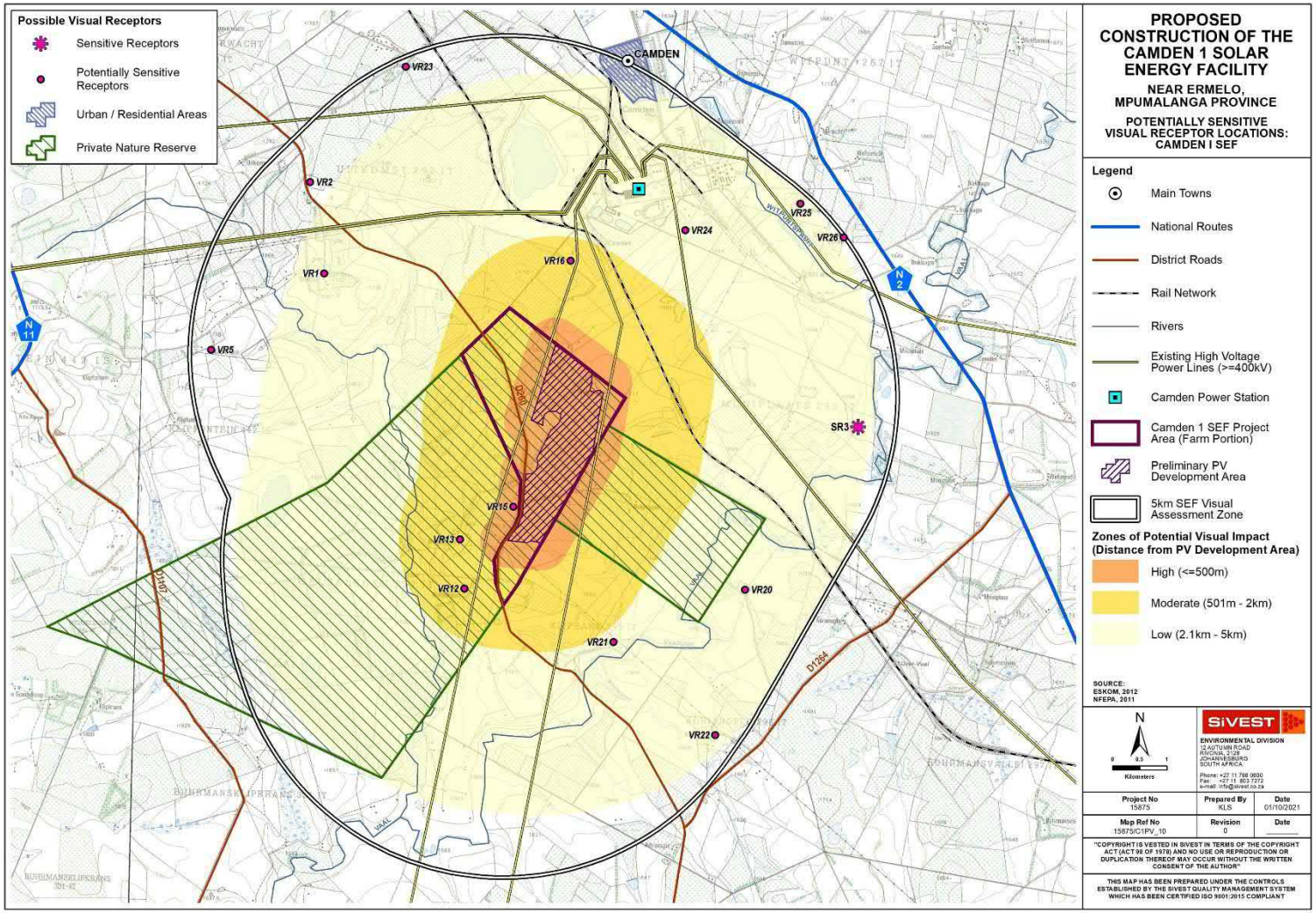

Figure 27: Sensitive receptor locations within 5km of the Camden I SEF site

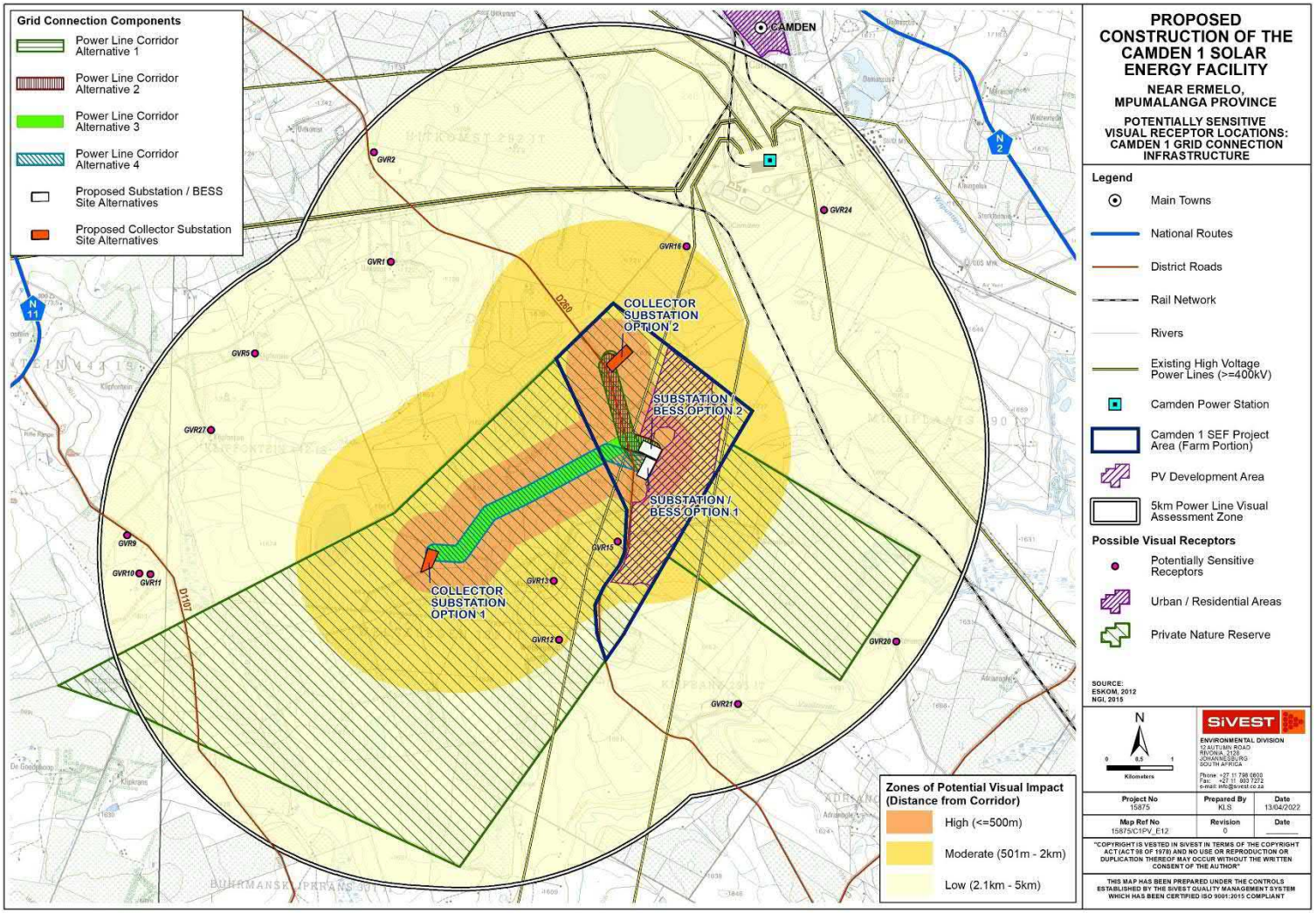

Figure 28: Potentially sensitive receptor locations within 5kms of the nearest power line corridor

8.2 Receptor Impact Rating

In order to assess the impact of the proposed facilities 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 the factors listed below:

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

These are considered to be the most important factors when assessing the visual impact of a proposed development 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, distance of the viewer / receptor location from the development 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 proposed solar PV arrays. The visual impact of a solar PV facility beyond 5km would be negligible as the development would appear to merge with the elements on the horizon. Any visual receptor locations beyond these distance limits have therefore not been assessed as they fall outside the study area and would not be visually influenced by the proposed development.

At this stage of the process, zones of visual impact for the proposed SEF have been delineated according to distance from the PV development area. Based on the height and scale of the solar PV project, the distance intervals chosen for the zones of visual impact, as shown in **Figure 27**, are as follows:

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

Zones of visual impact for the proposed power lines have been delineated according to distance from the combined power line assessment corridors. Based on the likely height of the power

line towers, the distance intervals chosen for the zones of visual impact, as shown in **Figure** 28 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. A tall windrow of invasive trees line both sides of the D260 District Road passing the proposed Solar PV Facility and associated grid connection footprint.

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 development on receptors within a specific context. A development that is incongruent with the surrounding area could change the visual character of the landscape and have a significant visual impact on sensitive receptors.

In order to determine the likely visual compatibility of the proposed development, the study area was classified into the following zones of visual contrast:

- **High –** undeveloped / natural / rural areas.
- **Moderate –**
    - areas within 500m of existing power lines (>=88kV);
    - areas within 500m of railway infrastructure;
    - cultivated areas and smallholdings.
- **Low –**
    - areas within 500m of urban / built-up areas;
    - areas within 500m of quarries / mines etc;
    - areas within 500m of Camden Power Station;

These zones are depicted in **Figure 29** below.

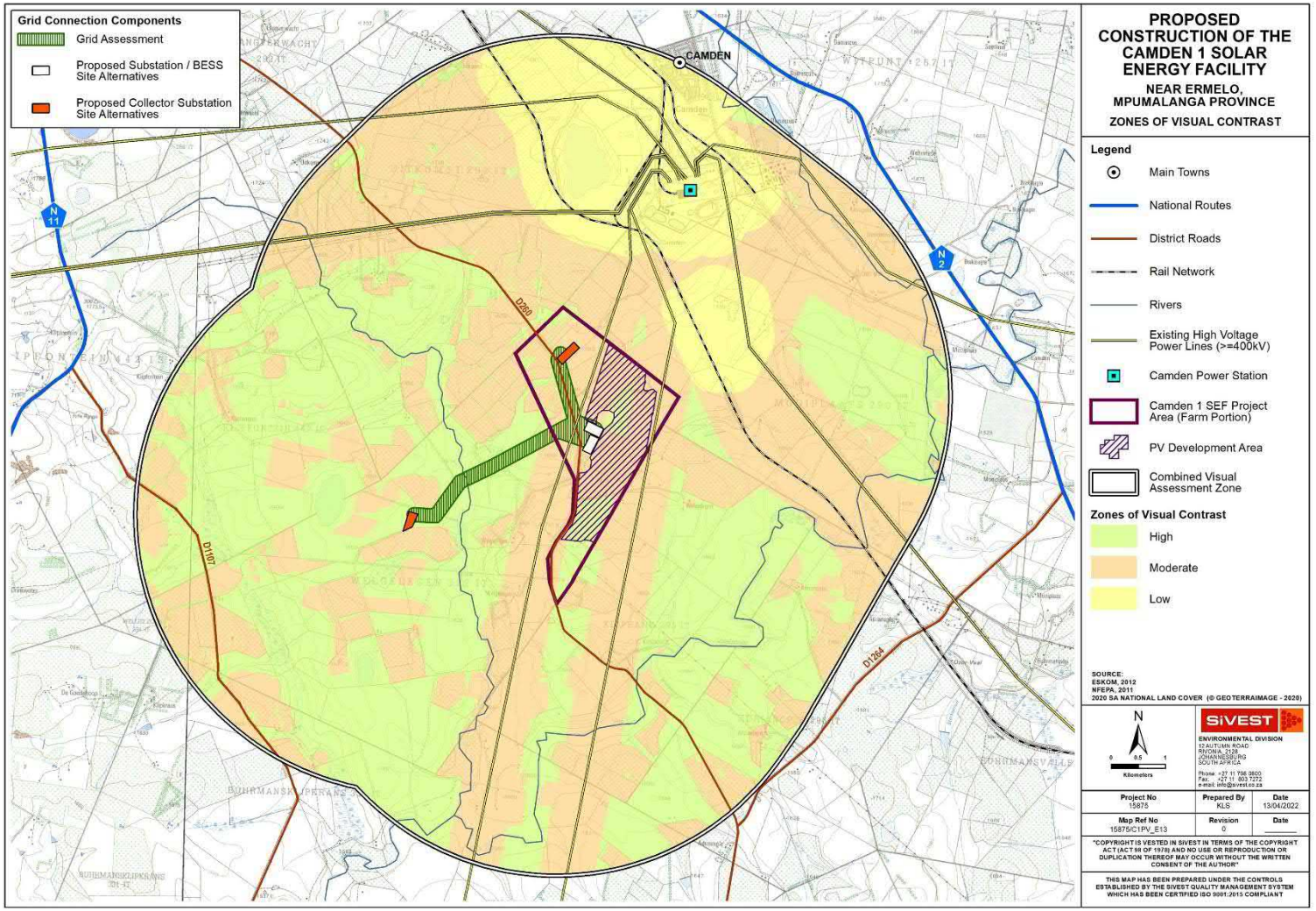

Figure 29: Zones of Visual Contrast

8.2.4 Impact Rating Matrix

The receptor impact rating matrix returns a score which in turn determines the visual impact rating assigned to each receptor location (**Error! Reference source not found.**) below.

Table 3: 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 **Table 4** below.

Table 4: Visual assessment matrix used to rate the impact of the proposed development on potentially sensitive receptors

	VISUAL IMPACT RATING			
VISUAL FACTOR	**HIGH**	**MODERATE**	**LOW**	**<u>OVERRIDING FACTOR</u>: 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 5 below presents a summary of the overall visual impact of the proposed Camden I SEF on each of the potentially sensitive visual receptor locations identified within 5kms of the boundary of the Camden I SEF project area.

Table 5: Receptor impact rating for the proposed Camden1 SEF Project

Receptor Location	Distance to PV Array		Screening		Contrast		OVERALL IMPACT RATING	
	KMs	Rating	Rating		Rating		Rating	
*SR3 - Homestead on Ptn 2 of Mooiplaats No 290 **	*NIL*							
*VR1 - Farmstead **	*NIL*							
VR2 - Farmstead #	*NIL*							
VR5 - Farmstead #	*NIL*							
*VR12 - Farmstead **	*NIL*							
*VR13 - Farmstead **	*NIL*							
VR15 - Farmstead	0.2	High	3	High	3	Mod	2	HIGH	8
*VR16 - Farmstead **	*NIL*							
VR20 - Farmstead	3.7	Low	1	Low	1	High	3	MODERATE	5
*VR21 - Farmstead **	*NIL*							
VR22 - Farmstead	4.8	Low	1	Mod	2	High	3	MODERATE	6
VR23 - Farmstead #	*NIL*							
VR24 - Farmstead	3.1	Low	1	Mod	2	Low	1	LOW	4
VR25 - Farmstead	4.8	Low	1	Mod	2	Mod	2	MODERATE	5
VR26 - Farmstead #	*NIL*							

** Receptor is outside the preliminary viewshed and as such the overall impact rating is **"NIL"***
*# Receptor is more than 5km from the PV array and as such the overall impact rating is **"NIL"***

The table above shows that six of the identified receptors are outside the viewshed for the PV arrays, including the only sensitive receptor (SR3) in the study area. In addition, four receptors are more than 5km from the proposed PV arrays and as such are not expected to experience any visual impacts as a result of the proposed development.

One of the remaining receptors (VR15) would experience high levels of visual impact, largely as a result of proximity to the proposed PV arrays. As this receptor is located within the Camden I WEF project area, it has been assumed that the relevant land owners are involved in the overall Camden Renewable Energy Complex project. In addition, this receptor receives a high degree of screening due to the district road being lined on either side by tall alien invasive trees and thereby shielding the receptor from the proposed solar PV site As such, they are not expected to perceive the proposed development in a negative light and this would reduce the level of visual impact.

Four of the remaining receptor locations are expected to experience moderate levels of impact as a result of the SEF development, while one receptor will only experience low levels of visual impact.

Error! Reference source not found. below presents a summary of the overall visual impact of the proposed 132kV power line on each of the potentially sensitive visual receptor locations identified within 5kms of the boundary of the nearest assessment corridor.

Table 6: Receptor Impact rating for the proposed 132kV Power Line

Receptor Location	Distance to Nearest Corridor Alternative		Screening		Contrast		OVERALL IMPACT RATING	
	KMs	Rating	Rating		Rating		Rating	
*VR1 - Farmstead**	*3.5*	*NIL*						
VR2 - Farmstead	4.7	Low	1	Mod	2	Mod	2	MODERATE	5
*VR5 - Farmstead**	*4.0*	*NIL*						
*VR9 - Farmstead**	*4.6*	*NIL*						
*VR10 - Farmstead**	*4.4*	*NIL*						
*VR11 - Farmstead**	*4.2*	*NIL*						
*VR12 - Farmstead**	*1.9*	*NIL*						
VR13 - Farmstead	1.2	Mod	2	Low	1	Mod	2	MODERATE	5
VR15 - Farmstead	1.1	Mod	2	Mod	2	Mod	2	MODERATE	6
*VR16 - Farmstead**	*2.0*	*NIL*						
VR20 - Farmstead	4.6	Low	1	Low	1	High	3	MODERATE	5
*VR21 – Farmstead**	*3.8*	*NIL*						
*VR24 – Farmstead**	*3.9*	*NIL*						
*VR27 – Farmstead**	*3.8*	*NIL*						

** Receptor is outside the preliminary viewshed and as such the overall impact rating is **"NIL"***

The table above shows that a total of fourteen (14) receptors were identified within 5 km of the nearest corridor alternative, none of which are considered sensitive. All of the receptors identified are assumed to be farmsteads which could be considered to be receptors. However, given the degree of transformation in the landscape, and the fact that much of the proposed route alignment is relatively close to existing high voltage power lines, it is not anticipated that all of these receptors would be sensitive to the proposed development.

Ten (10) of the identified receptors were found to be outside the viewshed for the proposed power lines and were excluded from the assessment. The remaining four (4) receptor locations are expected to experience moderate levels of impact as a result of the Camden I SEF grid connection infrastructure. Three of these receptors are however located in the project area for

the Camden I WEF and as the relevant land owners are known to support the proposed development, they are not expected to perceive the proposed power lines in a negative light.

Although the Langcarel Private Nature Reserve is within the Camden I SEF study area, it has not been included in the impact rating matrix due to the fact that the area is entirely managed for commercial agriculture with no conservation activities present or planned, and there is no evidence of any public access to this reserve. As such, this site is not considered visually sensitive.

As stated above, none of the roads in the area are considered to be visually sensitive (refer Section 8.1).

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 wind farm at night.

Camden Power Station and the adjacent Camden residential area, as well as Mooiplaats Colliery to the north of the Camden I SEF project area are the main sources of light within the study area. These elements are expected to have a significant impact on the night scene in the northern sector of the study area.

Other light sources in the broader area would largely emanate from the farmsteads dotted across the study area, and also from vehicles travelling along the district roads.

Overall, the visual character of the night environment within the study area is considered to be moderately ‘polluted’ and will therefore not be regarded as pristine. While the operational and security lighting required for the proposed SEF project is likely to intrude on the nightscape and create some glare, the impact of the additional lighting is expected to be reduced by the significant amount of light already present within the surrounding area at night. However, farmsteads located in areas characterised by lower levels of disturbance / transformation would be moderately sensitive to the impact of additional lighting.

Power lines and associated towers or pylons are not generally lit up at night and, thus light spill associated with the proposed grid connection infrastructure is only likely to emanate from the proposed on-site substation. Lighting from this facility is therefore expected to intrude on the nightscape to some degree. It should however be noted that the grid connection infrastructure will only be constructed if the proposed SEF is developed and thus the lighting impacts from the proposed substation would be subsumed by the glare and contrast of the lights associated

with the SEF. As such, the grid connection infrastructure is not expected to result in significant lighting impacts.

8.4 Cumulative Impacts

Although it is important to assess the visual impacts of the proposed Camden I SEF and associated grid connection specifically, it is equally important to assess the cumulative visual impact that could materialise as a result of this development. Cumulative impacts occur where existing or planned developments, in conjunction with the proposed development, result in significant incremental changes in the broader study area. In this instance, such developments would include:

- existing and proposed mining / quarrying activities,
- electrical infrastructure including Camden Power Station and associated power lines; and
- proposed renewable energy facilities comprising the Camden Renewable Energy Complex (Wind, Solar, Hydrogen/Ammonia and associated grid connection infrastructure).

Existing mining / quarrying and electrical infrastructure have already resulted in large scale visual impacts, mostly along the N2 national route, extending south-eastwards from Ermelo to Camden Power Station. These developments have significantly altered the sense of place and visual character in the broader region.

Renewable energy facilities have the potential to cause large-scale visual impacts, and although the level of transformation already present in the landscape will reduce the contrast and overall visual impact of the new development, the incremental change in the landscape will be increased and the visual impacts on surrounding visual receptors would be exacerbated. Although the South African Renewable Energy EIA Application Database from DFFE does not record any existing or proposed renewable projects within 35kms of the Camden 1 SEF project area, a cumulative assessment must include all elements of the proposed Camden Renewable Energy Complex. This complex, including wind, solar and green hydrogen energy facilities as well as associated grid connection infrastructure, will affect a large portion of the study area.

From a visual perspective, the concentration of renewable energy facilities as proposed will further change the visual character of the area and alter the inherent sense of place, extending 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 recommended mitigation measures. In addition, it is possible that these developments in close proximity to each other could be seen as one large Renewable Energy Facility (REF) rather than several separate developments. Although this will not necessarily reduce impacts on the visual character of the area, it could potentially reduce the cumulative visual impacts on the landscape.

8.5 Identification of Potential Impacts

Potential visual issues / impacts resulting from the proposed **Camden I SEF** and associated grid connection infrastructure are outlined below. More detailed descriptions of these impacts are provided in Section **Error! Reference source not found.**.

8.5.1 Construction Phase: WEF and Grid Connection Infrastructure

Nature of the impact

- Potential visual intrusion resulting from large construction vehicles and equipment;
- Potential visual effect of construction laydown areas and material stockpiles.
- Potential impacts of increased dust emissions from construction activities and related traffic;
- Potential visual scarring of the landscape as a result of site clearance and earthworks; and
- Potential visual pollution resulting from littering on the construction site.

Significance of impact

The significance of visual impacts associated with the SEF during construction is expected to be **Moderate**, but will be reduced to **Low** with the implementation of mitigation measures.

The significance of visual impacts associated with the grid connection infrastructure during construction is expected to be **Low**, but will be further reduced with the implementation of mitigation measures.

8.5.2 Operational Phase: WEF and Grid Connection Infrastructure

Nature of the impact

- Potential alteration of the visual character of the area;
- Potential visual intrusion resulting from PV arrays or grid connection infrastructure;
- Potential visual clutter caused by substation and other associated infrastructure on-site.
- Potential visual effect on surrounding farmsteads; and
- Potential glint and glare impacts resulting from PV arrays on passing motorists and nearby receptors; and
- Potential visual impact on the night time visual environment.

Significance of impact

The significance of visual impacts associated with the SEF during operation is expected to be Moderate, and although mitigation measures will result in some minor reduction of visual impacts, the degree of significance will remain **Moderate.**

The significance of visual impacts associated with the grid connection infrastructure during operation are expected to be **Low**, but will be further reduced with the implementation of mitigation measures.

8.5.3 Decommissioning Phase: WEF and Grid Connection Infrastructure

Nature of the impact

- Potential visual intrusion resulting from vehicles and equipment involved in the decommissioning process;
- Potential impacts of increased dust emissions from decommissioning activities and related traffic;
- Potential visual scarring of the landscape as a result of decommissioning activities; and
- Potential visual intrusion of any remaining infrastructure on the site.

Significance of impact

The significance of visual impacts associated with the SEF during decommissioning is expected to be **Moderate**, but will be reduced to **Low** with the implementation of mitigation measures.

The significance of visual impacts associated with the grid connection infrastructure during decommissioning is expected to be **Low**, but will be further reduced with the implementation of mitigation measures.

8.5.4 Cumulative Impacts

Nature of the impact

- Combined visual impacts from mining, industrial, infrastructural and renewable energy development in the broader area could potentially alter the sense of place and visual character of the area; and
- Combined visual impacts from mining, industrial, infrastructural and renewable energy development in the broader area could potentially exacerbate visual impacts on visual receptors.

Significance of impact

The significance of cumulative visual impacts are potentially **High**, but could be reduced to **Moderate** with the implementation of mitigation measures.

9 OVERALL VISUAL IMPACT RATING

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. The tables below present the impact matrix for visual impacts associated with the proposed construction and operation of the Camden I SEF and the associated grid connection infrastructure. Preliminary mitigation measures have been determined based on best practice and literature reviews.

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

9.1 Camden I SEF

9.1.1 Construction Phase Impact Rating

Table 7: Impact Rating for Camden I SEF during the construction phase

CONSTRUCTION PHASE: DIRECT IMPACTS																		
Impact number	**Aspect**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**						
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**	**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**
Impact 1:	Visual impacts	▪ Large construction vehicles, equipment and construction material stockpiles 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. ▪ 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. ▪ 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 resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment. ▪ Potential visual pollution resulting from littering on the construction site.	Construction	Negative	Moderate	3	2	3	4	3	**40**	**N3**	2	2	3	2	2	**18**	**N2**
					Significance	**N3- Moderate**							**N2 - Low**						

9.1.2 Construction Phase Mitigation Measures

- Carefully plan to mimimise the construction period and avoid construction delays.
- Where possible, restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- Maintain a neat construction site by removing rubble, litter and waste materials regularly.
- Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.
- 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.

9.1.3 Operational Phase Impact Rating

Table 8: Impact Rating for Camden I SEF during the operational phase

OPERATION PHASE: DIRECT IMPACTS																		
Impact number	**Aspect**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**						
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**	**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**
Impact 1:	Visual impacts	▪ 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. ▪ Glint and glare from PV arrays may impact nearby receptors. ▪ 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.	Operation	Negative	Moderate	3	3	3	4	4	**52**	**N3**	3	3	3	4	4	**52**	**N3**
					Significance	**N3- Moderate**							**N3 - Moderate**						

9.1.4 Operational Phase Mitigation Measures

- 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 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 (as far as possible).
- Lighting fixtures should make use of minimum lumen or wattage (whilst adhering to relevant safety standards).
- Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used (whilst adhering to relevant safety standards).
- If economically and technically feasible, make use of motion detectors on security lighting.

9.1.5 Decommissioning Phase Impact Rating

Table 9: Impact Rating for Camden I SEF during the decommissioning phase

DECOMMISSIONING PHASE: DIRECT IMPACTS																		
Impact number	**Aspect**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**					
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**	**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**
Impact 1:	Visual impacts	▪ 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 construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual 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.	Decommissioning	Negative	Moderate	3	2	3	4	3	**40**	**N3**	2	2	3	2	2	**18**	**N2**
					Significance	**N3- Moderate**							**N2 - Low**						

9.1.6 Decommissioning Phase Mitigation Measures

- 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.
- Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.
- 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, in compliance with the regulatory requirements at the time of decommissioning.

9.1.7 Cumulative Impact Rating

Table 10: Cumulative Impact Rating for Camden I SEF

CUMULATIVE IMPACTS																		
Impact number	**Aspect**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**						
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**	**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**
Impact 1:	Visual 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.	All stages	Negative	Moderate	5	3	3	5	4	**64**	**N4**	4	3	3	4	4	**56**	**N3**
					Significance	**N4- High**							**N3 - Moderate**						

9.1.8 Cumulative Impact Mitigation Measures

- Carefully plan to minimise the construction period and avoid construction delays.
- Position laydown areas and related storage/stockpile areas in unobtrusive positions in the landscape, where possible.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- aWhere possible, the operation and maintenance buildings should be consolidated to reduce visual clutter.
- As far as possible, limit the number of maintenance vehicles 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.
- Lighting fixtures should make use of minimum lumen or wattage whilst adhering to safety standards.
- 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 required to maintain safety standards.

9.2 Camden I Grid Connection Infrastructure

9.2.1 Construction Phase Impact Rating

Table 11: Impact Rating for Camden I SEF 132kV Grid Connection Infrastructure during the construction phase

CONSTRUCTION PHASE: DIRECT IMPACTS																		
Impact number	**Aspect**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**						
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**	**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**
Impact 1:	Visual impacts	▪ Large construction vehicles, equipment and construction material stockpiles 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. ▪ 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. ▪ 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 resulting in visual scarring of the landscape and increasing the level of visual contrast with the surrounding environment. ▪ Potential visual pollution resulting from littering on the construction site.	Construction	Negative	Moderate	3	2	3	2	2	**30**	**N2**	2	2	3	2	2	**18**	**N2**
					Significance	**N2- Low**							**N2 - Low**						

9.2.2 Construction Phase Mitigation Measures

- Carefully plan to minimise the construction period and avoid construction delays.
- Vegetation clearing should take place in a phased manner.
- Make use of existing gravel access roads where possible.
- Limit the number of vehicles and trucks travelling to and from the proposed sites, 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.
- Maintain a neat construction site by removing litter, rubble and waste materials regularly.

9.2.3 Operational Phase Impact Rating

Table 12: Impact Rating for Camden I SEF 132kV Grid Connection Infrastructure during the operational phase

OPERATIONAL PHASE: DIRECT IMPACTS																		
Impact number	**Aspect**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**						
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**	**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**
Impact 1:	Visual impacts	▪ The proposed power line and substation could alter the visual character of the surrounding area and expose sensitive visual receptor locations to visual impacts. ▪ The proposed development 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 could be altered as a result of operational and security lighting at the proposed substation.	Operation	Negative	Moderate	2	3	3	4	2	**24**	**N2**	2	3	3	4	2	**24**	**N2**
					Significance	**N2- Low**							**N2 - Low**						

9.2.4 Operational Phase Mitigation Measures

- Where possible, limit the number of maintenance vehicles using access roads.
- 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 the substation site whilst adhering to safety standards.
- Light fittings for security at night should reflect the light toward the ground and prevent light spill.
- Lighting fixtures should make use of minimum lumen or wattage whilst adhering to safety standards.
- 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 buildings on the substation site should not be illuminated at night unless required to adhere to safety standards and should be painted in natural tones that fit with the surrounding environment.
- Non-reflective surfaces should be used where possible.

9.2.5 Decommissioning Phase Impact Rating

Table 13: : Impact Rating for Camden I SEF 132kV Grid Connection Infrastructure during the decommissioning phase

DECOMMISSIONING PHASE: DIRECT IMPACTS																		
Impact number	**Aspect**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**					
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**	**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**
Impact 1:	Visual impacts	▪ 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 construction would expose bare soil resulting in visual scarring of the landscape and increasing the level of visual 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.	Decommissioning	Negative	Moderate	3	2	3	2	2	**30**	**N2**	2	2	3	2	2	**18**	**N2**
					Significance	**N2- Low**							**N2 - Low**						

9.2.6 Decommissioning Phase Mitigation Measures

- 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.
- Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.
- 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, in compliance with the regulatory requirements at the time of decommissioning.

9.2.7 Cumulative Impact Rating

Table 14: Cumulative Impact Rating for Camden I WEF 132kV Grid Connection Infrastructure

CUMULATIVE IMPACTS																		
Impact number	**Aspect**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**						
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**	**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**
Impact 1:	Visual impacts	▪ Additional renewable energy and associated infrastructure 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 and associated infrastructure 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.	All stages	Negative	Moderate	5	3	3	5	4	**64**	**N4**	4	3	3	4	4	**56**	**N3**
					Significance	**N4- High**							**N3 - Moderate**						

9.2.8 Cumulative Impact Mitigation Measures

- Where possible, limit the number of maintenance vehicles using access roads.
- Non-reflective surfaces should be utilised where possible.
- Where possible, limit the amount of security and operational lighting present at the on-site substation.
- Light fittings for security at night should reflect the light toward the ground and prevent light spill.

10 COMPARATIVE ASSESSMENT OF ALTERNATIVES

A comparative assessment has been undertaken in respect of the design and layout alternatives put forward for the EIA phase of the Camden I SEF and associated grid connection infrastructure. The aim of the comparative assessment is to determine which of the alternatives would be preferred from a visual perspective. Preference ratings for each alternative have been 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 increases the visibility).

The alternatives are rated as preferred; favourable, least-preferred or no-preference described in **Error! Reference source not found.** below.

Table 15: Description of preference ratings applied to alternatives

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

Detailed comparative assessment tables for each sub-project are provided in **Appendix D**. Summaries of the findings are however provided below.

10.1 Camden I SEF: Infrastructure Alternatives

The EIA Phase design and layout proposals for Camden I SEF include two site alternatives each for the Substation / BESS and the construction camp / batching (**Figure 4**).

No fatal flaws were identified for any of the proposed site alternatives for the substation / BESS or and construction camps for Camden SEF. A summary of the preference ratings for each infrastructural element is provided below.

- Substation / BESS: No preference was determined for any of the site alternatives and both alternatives were found to be favourable.
- Temporary Construction Camp / Cement Batching Plant: No preference was determined for any of the site alternatives and both alternatives were found to be favourable.

10.2 Camden I SEF: 132kV Grid Connection Alternatives

Two substation alternatives with four associated route alternatives are being assessed for the proposed Camden I SEF 132kV Grid Connection (**Figure 5)**:

No fatal flaws were identified for either of the proposed substation site alternatives or any of the proposed grid connection alternatives. A summary of the preference ratings for each infrastructural element is provided below.

- Substation: No preference was determined for either of the site alternatives and both alternatives were found to be favourable.
- Grid Connection Corridors: Corridor Options 1 and 2 (leading to the preferred Collector Substation site) are the preferred options while Corridor Options 3 and 4 were all found to be favourable.

10.3 No-Go Alternative

The 'no-go' alternative is the option of not undertaking the proposed project. Hence, if the 'no-go' option is implemented, there would be no development. The area would thus retain its visual character and sense of place and no visual impacts would be experienced by any locally occurring receptors.

11 REVISED SEF LAYOUT

Subsequent to the completion of all specialist studies, the Proponent has refined the proposed Camden I SEF layout in line with the recommendations of the various specialists. The refined layout as shown in **Figure 4** has been assessed from a visual perspective and it has been concluded that these amendments do not change the findings of this VIA.

12 CONCLUSION

A combined visual study was conducted to assess the magnitude and significance of the potential visual impacts associated with the development of the proposed Camden I SEF and associated grid connection infrastructure near Ermelo in Mpumalanga Province. The VIA has demonstrated that the study area has a somewhat mixed visual character, transitioning from the heavily transformed urban / peri-urban landscape associated with Camden Power Station, Camden residential area and Mooiplaats Colliery in the north / north-east to a more rural / pastoral character across the remainder of the study area. Hence, although a solar PV and power line development would alter the visual character and contrast with this rural / pastoral character, the location of the proposed SEF and grid connection infrastructure in relatively close proximity to Camden Power Station and the associated power lines, mining activity and rail infrastructure will significantly reduce the level of contrast.

A broad-scale assessment of visual 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.

One formal protected area (Langcarel Private Nature Reserve) was identified within the study area, although the area is entirely managed for commercial agriculture with no conservation activities present and no evidence of public access to the site. Any landscape value or visual appeal has therefore been reduced. The area is not typically valued for its tourism significance and relatively few leisure-based tourism facilities (lodges/accommodation facilities) were identified inside the study area. This factor in conjunction with the high levels of transformation in the north and north-east have reduced the overall visual sensitivity of the broader area.

Solar Energy Facility: Receptor Identification

A total of fifteen (15) potentially sensitive receptors were identified in the study area. Only one (1) of the identified receptor locations was found to be sensitive (SR3), this being a residence whose occupants have previously expressed some concern about elements of the proposed Camden Renewable Energy Complex. This receptor was however found to be outside the viewshed for the Camden 1 SEF project.

The remaining fourteen (14) receptor locations, are all believed to be farmsteads that are regarded as *potentially* sensitive visual receptors as the proposed development will likely alter natural or semi-natural vistas experienced from these locations. Nine of these farmsteads are not expected to experience any visual impacts as a result of the proposed development as they are either outside the viewshed for the proposed PV arrays, or located more than 5km from the proposed PV arrays.

One of the remaining receptors (VR15) would experience high levels of visual impact, largely as a result of proximity to the proposed PV arrays. Impacts are however likely to be reduced by the presence of trees along sections of the District Road D260. In addition, this receptor is located within the Camden I WEF project area and it has been confirmed by the Proponent that the relevant land owners are in support of the overall Camden Renewable Energy Complex project. As such, they are not expected to perceive the proposed development in a negative light and this would reduce the level of visual impact experienced at this location. Four potentially sensitive receptor locations are expected to experience moderate levels of impact as a result of the SEF development, while one receptor only will experience low levels of visual impact.

Electrical Grid Infrastructure corridor: Receptor Identification

A total of fourteen (14) receptors were identified within 5 km of the nearest corridor alternative, none of which are considered sensitive. All of the receptors identified are assumed to be farmsteads which could be considered to be receptors. However, given the degree of transformation in the landscape, and the fact that much of the proposed route alignment is

relatively close to existing high voltage power lines, it is not anticipated that all of these receptors would be sensitive to the proposed development.

Ten (10) of the identified receptors were found to be outside the viewshed for the proposed power lines and were excluded from the assessment. The remaining four (4) receptor locations are expected to experience moderate levels of impact as a result of the Camden I SEF grid connection infrastructure. Three of these receptors are however located in the project area for the Camden I WEF and as the relevant land owners are known to support the proposed development, they are not expected to perceive the proposed power lines in a negative light.

A preliminary assessment of overall impacts revealed that impacts associated with all the proposed Camden I SEF and associated grid connection infrastructure (post mitigation) are of low significance during both construction and decommissioning phases. During operation however, visual impacts (post mitigation) from the Camden I SEF would be of moderate significance with relatively few mitigation measures available to reduce the visual impact. Visual impacts associated with the Camden SEF I Grid Connection project during operation would be of low significance.

Considering the presence of existing and proposed mining activity and electrical generation and distribution infrastructure, the introduction of new renewable energy facilities in the area will result in further change in the visual character of the area and alteration of the inherent sense of place, extending 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 recommended mitigation measures. In light of this, cumulative impacts have been rated as moderate.

A comparative assessment of site alternatives for the on-site SEF infrastructure and also for the grid connection alternatives was undertaken in order to determine which of the alternatives would be preferred from a visual perspective. No fatal flaws were identified in respect of any of the alternatives for the proposed on-site substation / BESS facilities and temporary construction camp / cement batching plant and all alternatives were found to be favourable.

No fatal flaws were identified for either of the substation alternatives or any of the grid connection infrastructure alternatives. No preference was determined for either of the substation site alternatives and both alternatives were found to be favourable. Power Line Corridor Options 1 and 2 were identified as the Preferred Alternatives, while Power Line Corridor Options 3 and 4 were found to be favourable.

12.1 Visual Impact Statement

It is SiVEST's opinion that the potential visual impacts associated with the proposed Camden I SEF and the associated grid connection infrastructure are negative and of low to moderate significance. Given the relatively low number of potentially sensitive receptors and the significant level of human transformation and landscape degradation in areas near the

proposed development, the project is deemed acceptable from a visual perspective and the respective Environmental Authorisations (EAs) should be granted. For both applications, SiVEST is of the opinion that the impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

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- Oberholzer, B. 2005. Guideline for involving visual & aesthetic specialists in EIA processes: *Edition 1.* CSIR Report No ENV-S-C 2005 053 F. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.
- Vissering, J., Sinclair, M., Margolis, A. 2011. State Clean Energy Program Guide: A Visual Impact Assessment Process for Wind Energy Projects. Clean Energy State Alliance.
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Contact Person: Kerry Schwartz
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Email: klschwartz@slrconsulting.com

Appendix A

SPECIALIST CV AND DECLARATION

CURRICULUM VITAE

Kerry Lianne Schwartz

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

`

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 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 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 for various projects, including renewable energy facilities, power lines and mixed use developments.

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 Plans for the adjacent towns of Kasane and Kazungula and for the rural village of Hukuntsi in Botswana.
- Integrated Development Plans for various District and Local Municipalities in KwaZulu-Natal Province.
- Rural Development Initiative and Rural Roads Identification for uMhlathuze Local Municipality (KwaZulu-Natal).
- Tourism Initiatives and Master Plans for areas such as the Mapungubwe Cultural Landscape (Limpopo Province) and the Northern Cape Province.
- Spatial Development Frameworks for various Local and District Municipalities in KwaZulu-Natal and Mpumalanga and Free State Provinces.
- Land Use Management Plans/Systems (LUMS) for various Local Municipalities in KwaZulu-Natal.
- Land use study for the Johannesburg Inner City Summit and Charter.
- Port of Richards Bay Due Diligence Investigation.

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).

VISUAL IMPACT ASSESSMENTS

- VIAs 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).
  - Oya Energy Facility, near Touws River (Western Cape).
- VIAs for various Wind Farms and associated grid connection infrastructure (Northern Cape and Western Cape), the most recent projects including:
  - 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).
  - Gromis and Komas WEFs, near Kleinzee (Northerrn 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.
- VIAs for the proposed Assagay Valley and 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).

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

Camden Renewable Energy Complex, which consists of eight subprojects as follows:

- Camden I Wind Energy Facility (up to 210MW)
- Camden I Wind Grid Connection (up to 132kV);
- Camden Grid Connection and Collector substation (up to 400kV);
- Camden I Solar (up to 100MW)
- Camden I Solar Grid Connection (up to 132kV);
- Camden II Wind Energy Facility (up to 210MW)
- Camden II Wind Energy Facility up to 132kV Grid Connection; and
- Camden Green Hydrogen and Ammonia Facility, including grid connection infrastructure

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:	12 Autumn St, Rivonia			
Postal address:	PO Box 2921, Rivonia			
Postal code:	2128	Cell:	082 469 5850	
Telephone:	011 798 0632	Fax:	011 798 0632	
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 SA (Pty) Ltd

Name of Company:

25 November 2021

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.

KSchwartz

Signature of the Specialist

SiVEST SA (Pty) Ltd

Name of Company

25 November 2021

Date

Hlengiwe Innocentia Ntuli
COMMISSIONER OF OATHS

Signature of the Commissioner of Oaths

Signature:

PPP Administrator
RO-02/11/2020 ZA-GT-10/11/2020

25 NOVEMBER 2021

Date

Date 25/11/2021 **Place** Rivonia
Business Address: 12 Autumn Street, Rivonia 2128

10.4 The Specialist

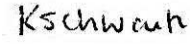
Note: Duplicate this section where there is more than one specialist.

I **Kerry Schwartz**, as the appointed specialist hereby declare/affirm the correctness of the information provided as part of the application, and that I:

- in terms of the general requirement to be independent (tick which is applicable):

X	other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
	am not independent, but another EAP that is independent and meets the general requirements set out in Regulation 13 has been appointed to review my work (Note: a declaration by the review specialist must be submitted);

- have expertise in conducting specialist work as required, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- will ensure compliance with the EIA Regulations 2014;
- 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 application;
- will take into account, to the extent possible, the matters listed in regulation **18** of the regulations when preparing the application and any report, plan or document relating to the application;
- will disclose to the proponent or applicant, registered interested and affected parties 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 or the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority (unless access to that information is protected by law, in which case I will indicate that such protected information exists and is only provided to the competent authority);
- declare that all the particulars furnished by me in this form are true and correct;
- am aware that it is an offence in terms of Regulation 48 to provide incorrect or misleading information and that a person convicted of such an offence is liable to the penalties as contemplated in section 49B(2) of the National Environmental Management Act, 1998 (Act 107 of 1998).



Signature of the specialist

SiVEST SA (Pty) Ltd
Name of company

25 November 2021
Date

Appendix B

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

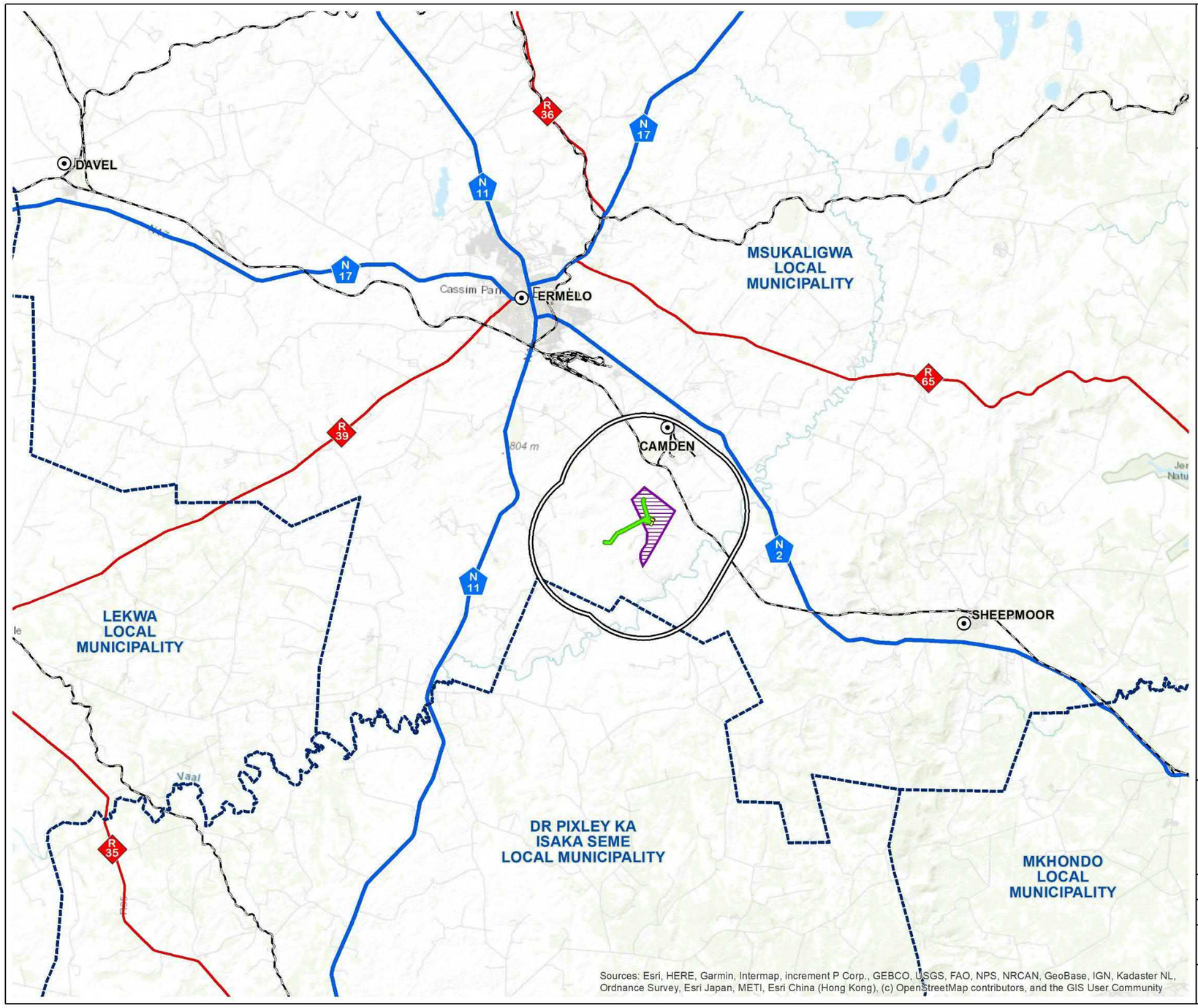
Operational Phase																				
Fauna	Fauna will be negatively affected by the operation of the wind farm due to the human disturbance, the presence of vehicles on the site and possibly by noise generated by the wind turbines as well.	2	3	2	1	4	3	36	-	Medium	**Outline/explain the mitigation measures 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

Appendix C

Maps

MAP 1: Regional Context



PROPOSED CONSTRUCTION OF THE CAMDEN 1 SOLAR ENERGY FACILITY

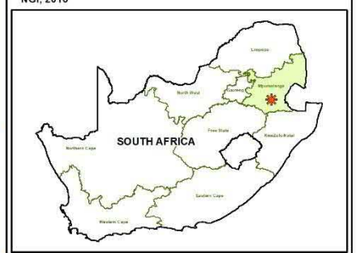
NEAR ERMELO, MPUMALANGA PROVINCE

REGIONAL CONTEXT

Legend

- Main Towns
- Local Municipal Boundaries
- Rail Network
- Camden 1 SEF Project Area (Farm Portion)
- Combined Visual Assessment Zone
- 132kV Grid Assessment Corridors
- Proposed Substation Site Alternatives

SOURCE:
ESRI, 2020
MUNICIPAL DEMARCATION BOARD, 2016
NGI, 2015



N

0 2.5 5
Kilometers

SiVEST
ENVIRONMENTAL DIVISION
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Phone: +27 11 798 0600
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Project No	Prepared By	Date
15875	KLS	13/04/2022
Map Ref No	**Revision**	**Date**
15875/C1PV_E01	0	

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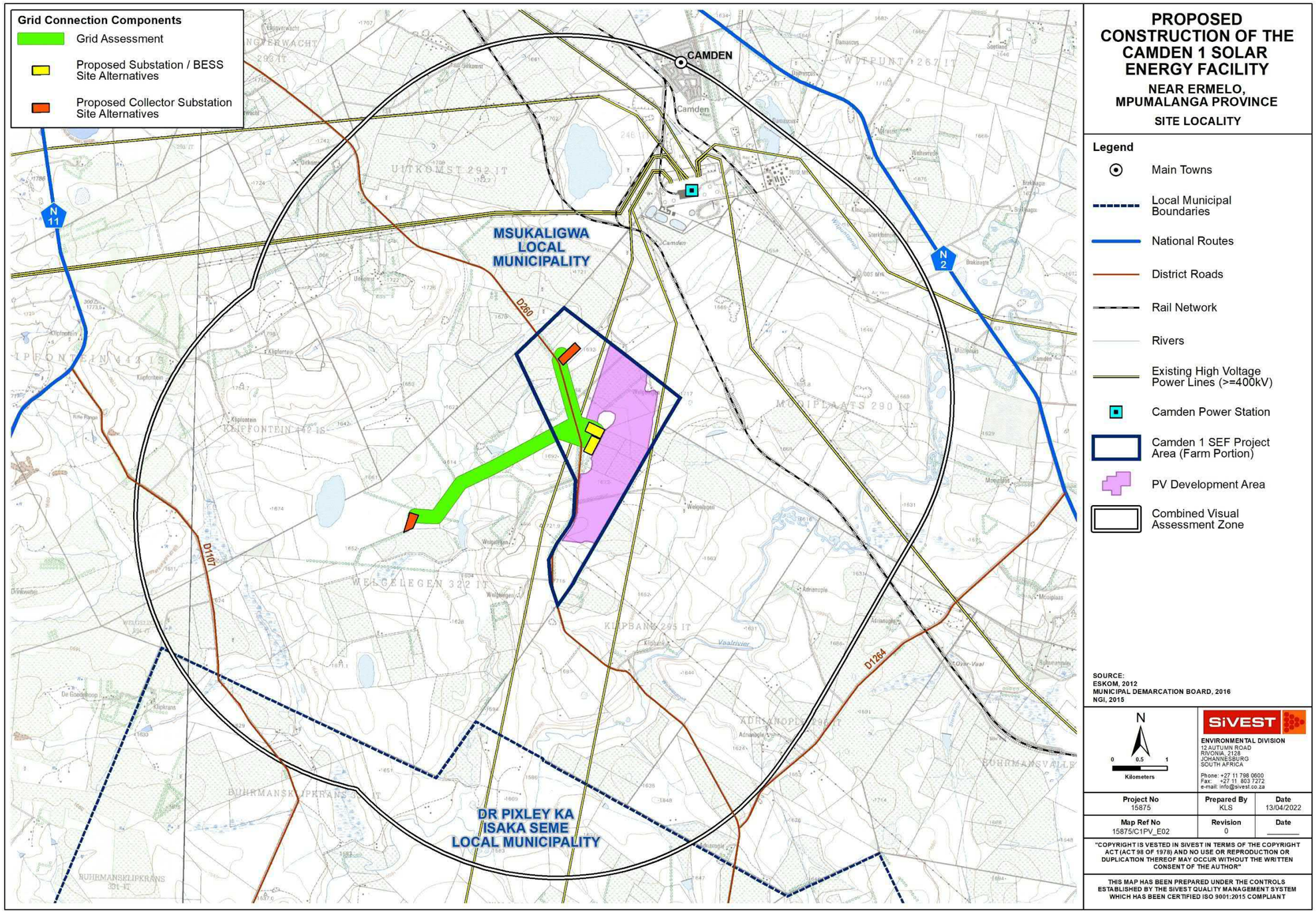
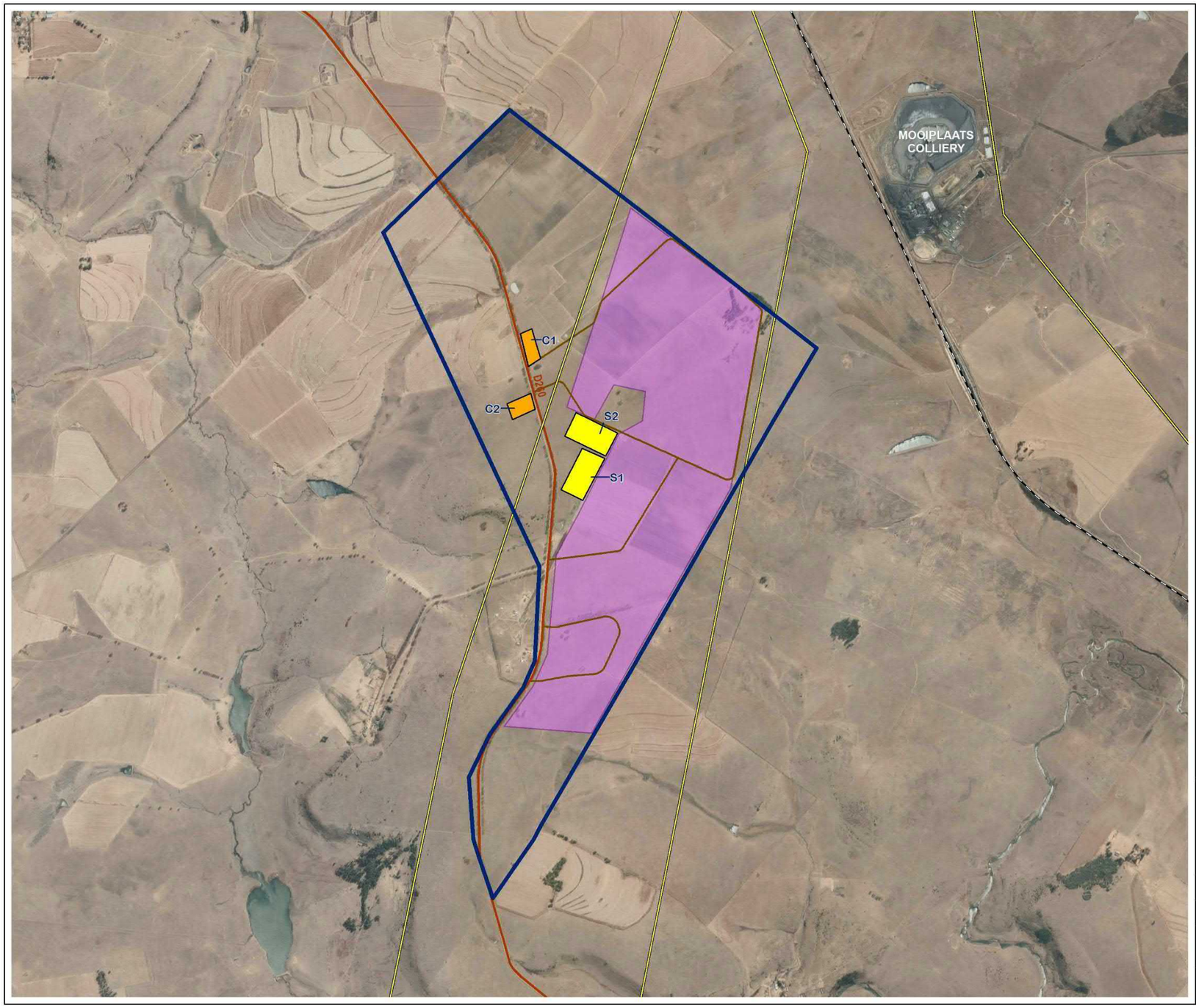
THIS MAP HAS BEEN PREPARED UNDER THE CONTROLS ESTABLISHED BY THE SIVEST QUALITY MANAGEMENT SYSTEM WHICH HAS BEEN CERTIFIED ISO 9001:2015 COMPLIANT

MAP 2: Site Locality



MAP 3: Preliminary Site Layout



PROPOSED CONSTRUCTION OF THE CAMDEN 1 SOLAR ENERGY FACILITY

NEAR ERMELO, MPUMALANGA PROVINCE

EIA PHASE SEF SITE LAYOUT

Legend

- District Roads
- Rail Network
- Existing High Voltage Power Lines (>=400kV)
- Camden 1 SEF Project Area (Farm Portion)

SEF Elements

- PV Development Area
- Substation / Bess Sites
- Construction Camp Sites
- Internal Road Network

SOURCE:
ESKOM, 2012
GOOGLE EARTH, 2021

N

0 250 500

Meters

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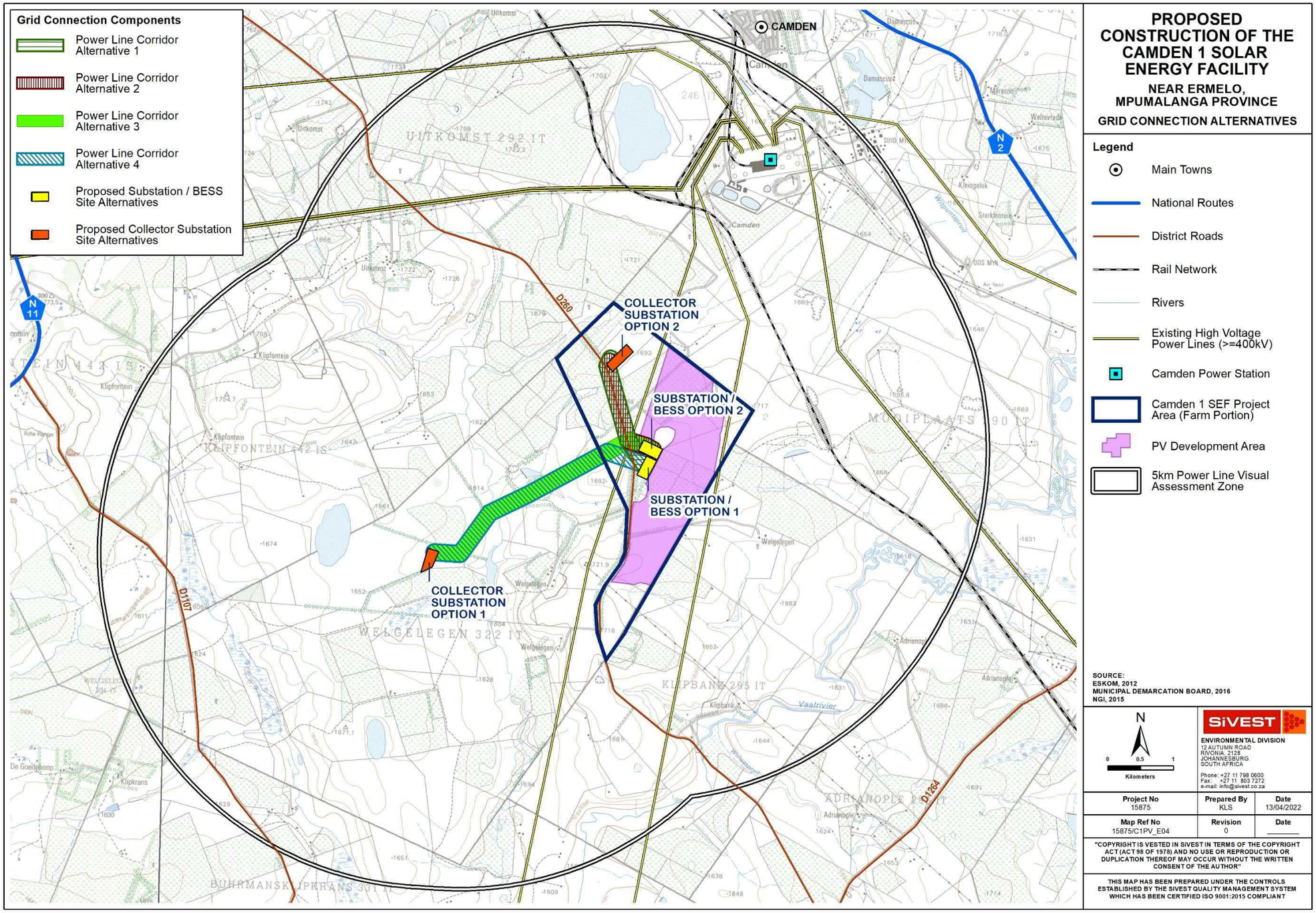
MAP 4: Grid Connection Alternatives



PROPOSED CONSTRUCTION OF THE CAMDEN 1 SOLAR ENERGY FACILITY

NEAR ERMELO, MPUMALANGA PROVINCE

GRID CONNECTION ALTERNATIVES

Legend

- Main Towns
- National Routes
- District Roads
- Rail Network
- Rivers
- Existing High Voltage Power Lines (>=400kV)
- Camden Power Station
- Camden 1 SEF Project Area (Farm Portion)
- PV Development Area
- 5km Power Line Visual Assessment Zone

SOURCE:
ESKOM, 2012
MUNICIPAL DEMARCATION BOARD, 2016
NGI, 2015

N

0 0.5 1

Kilometers

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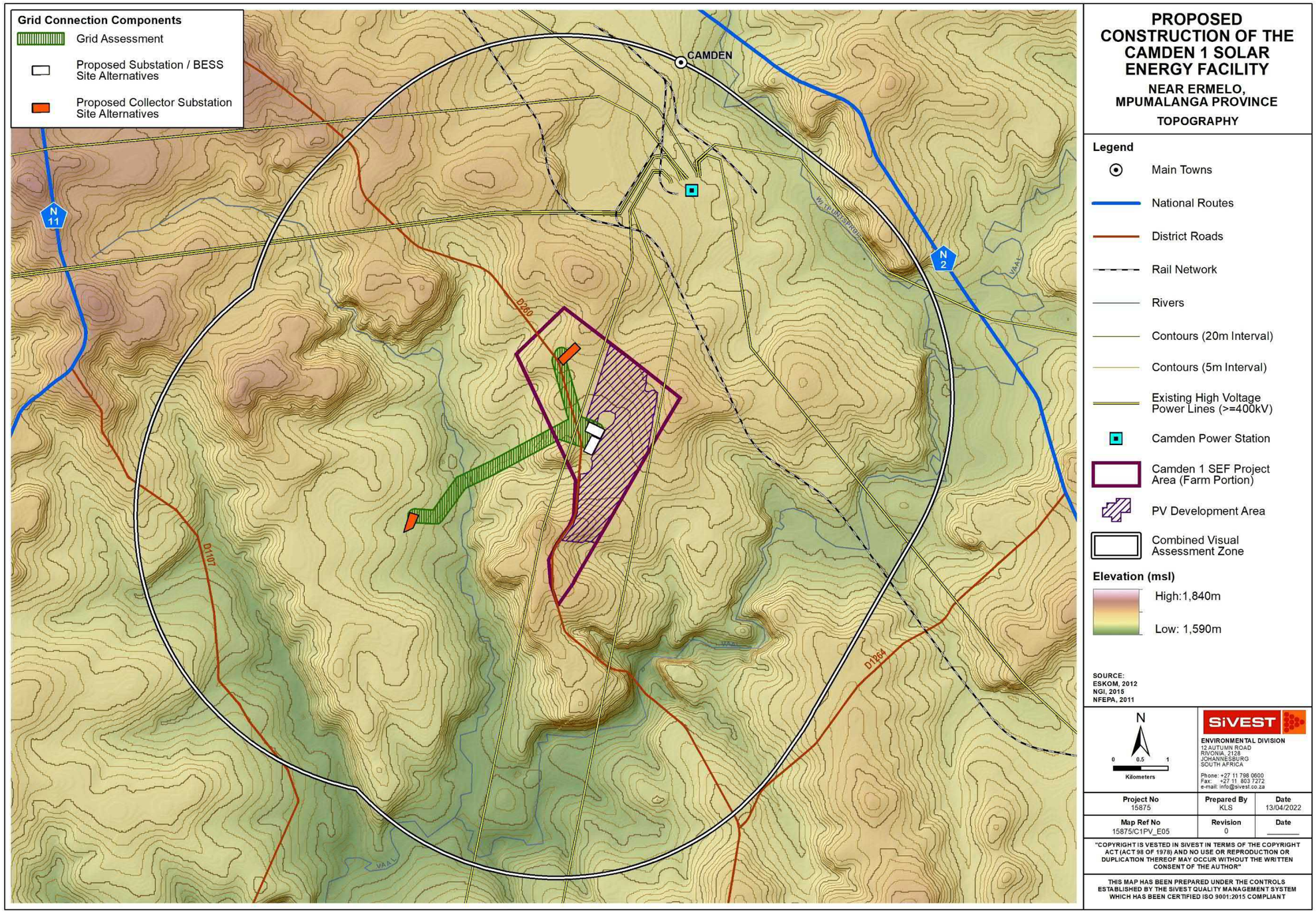
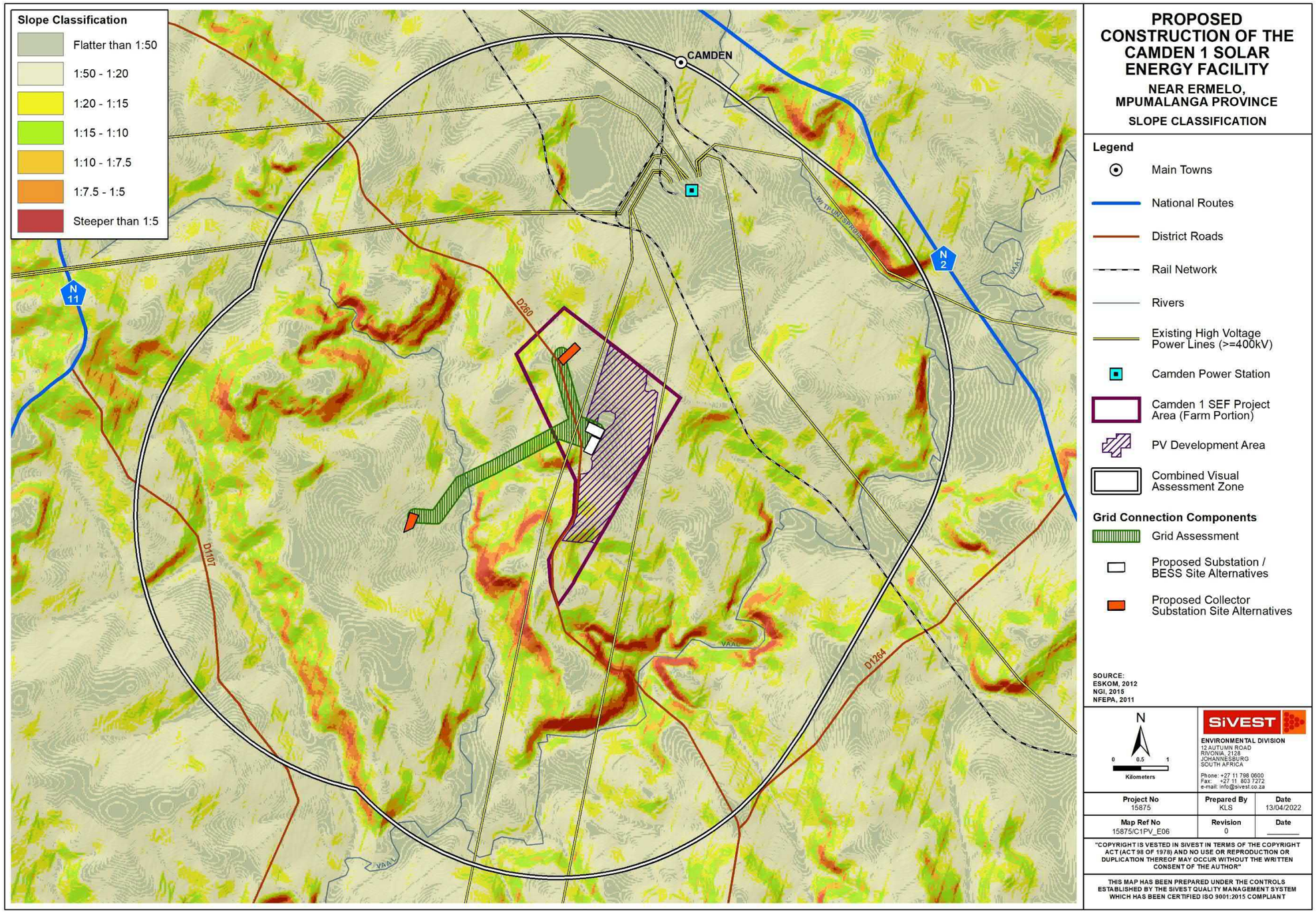
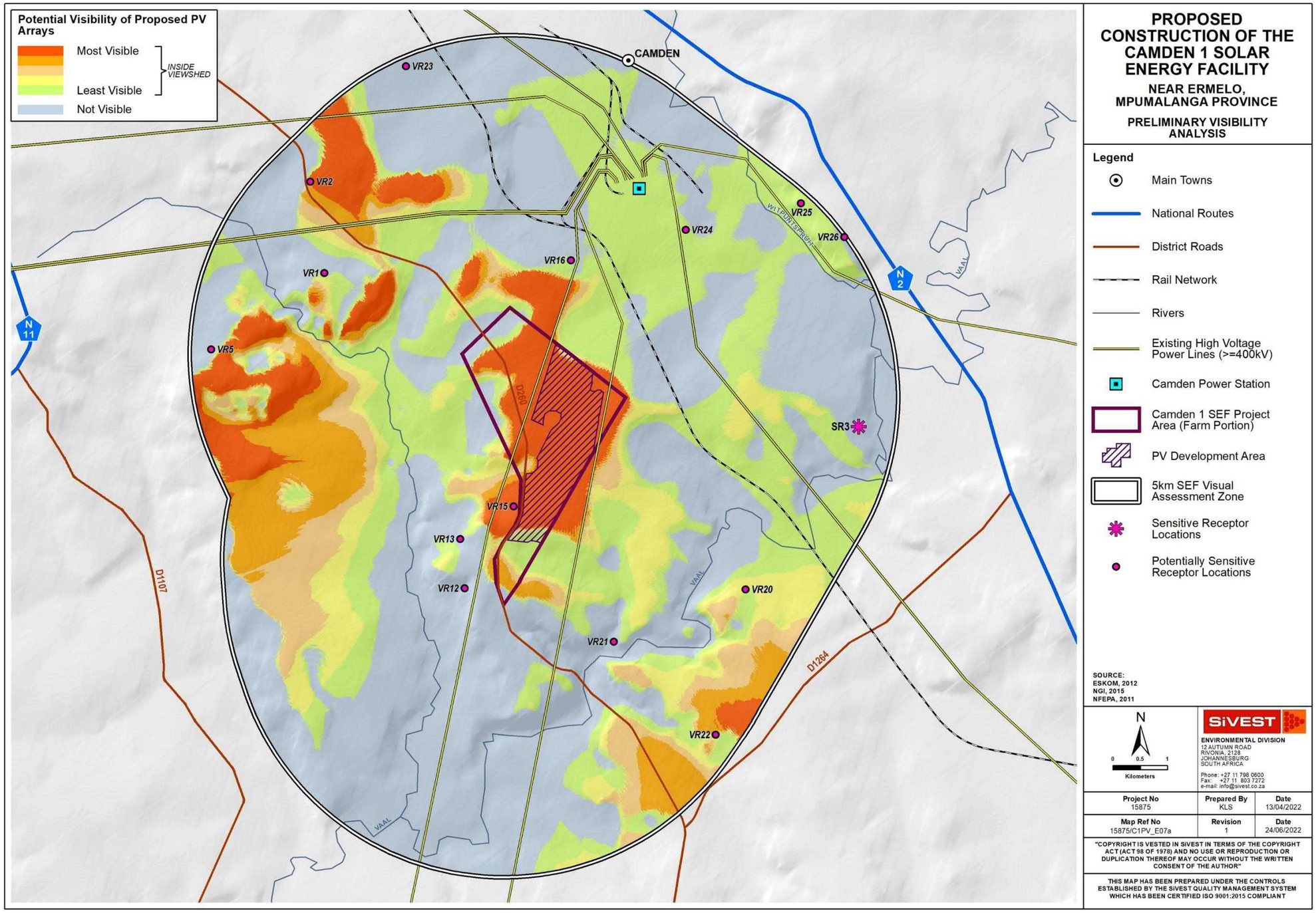
MAP 5: Topography



MAP 6: Slope Classification



MAP 7a: Potential Visibility of PV Panels



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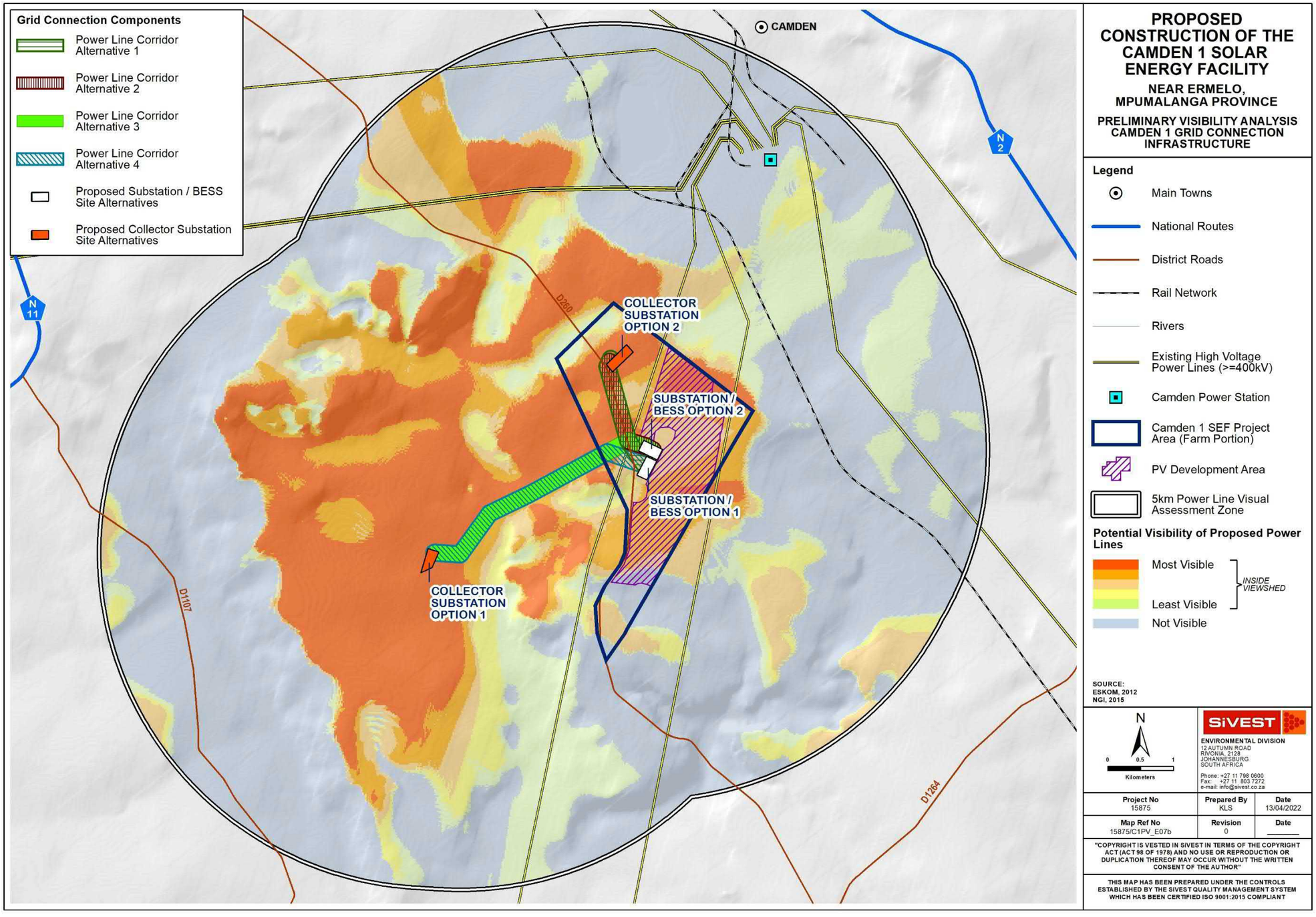
MAP 7b: Potential Visibility of Power Lines



PROPOSED CONSTRUCTION OF THE CAMDEN 1 SOLAR ENERGY FACILITY

NEAR ERMELO, MPUMALANGA PROVINCE

PRELIMINARY VISIBILITY ANALYSIS CAMDEN 1 GRID CONNECTION INFRASTRUCTURE

Legend

- Main Towns
- National Routes
- District Roads
- Rail Network
- Rivers
- Existing High Voltage Power Lines (>=400kV)
- Camden Power Station
- Camden 1 SEF Project Area (Farm Portion)
- PV Development Area
- 5km Power Line Visual Assessment Zone

Potential Visibility of Proposed Power Lines

- Most Visible
- Least Visible
- Not Visible

INSIDE VIEWSHED

SOURCE:
ESKOM, 2012
NGI, 2015

N

0 0.5 1

Kilometers

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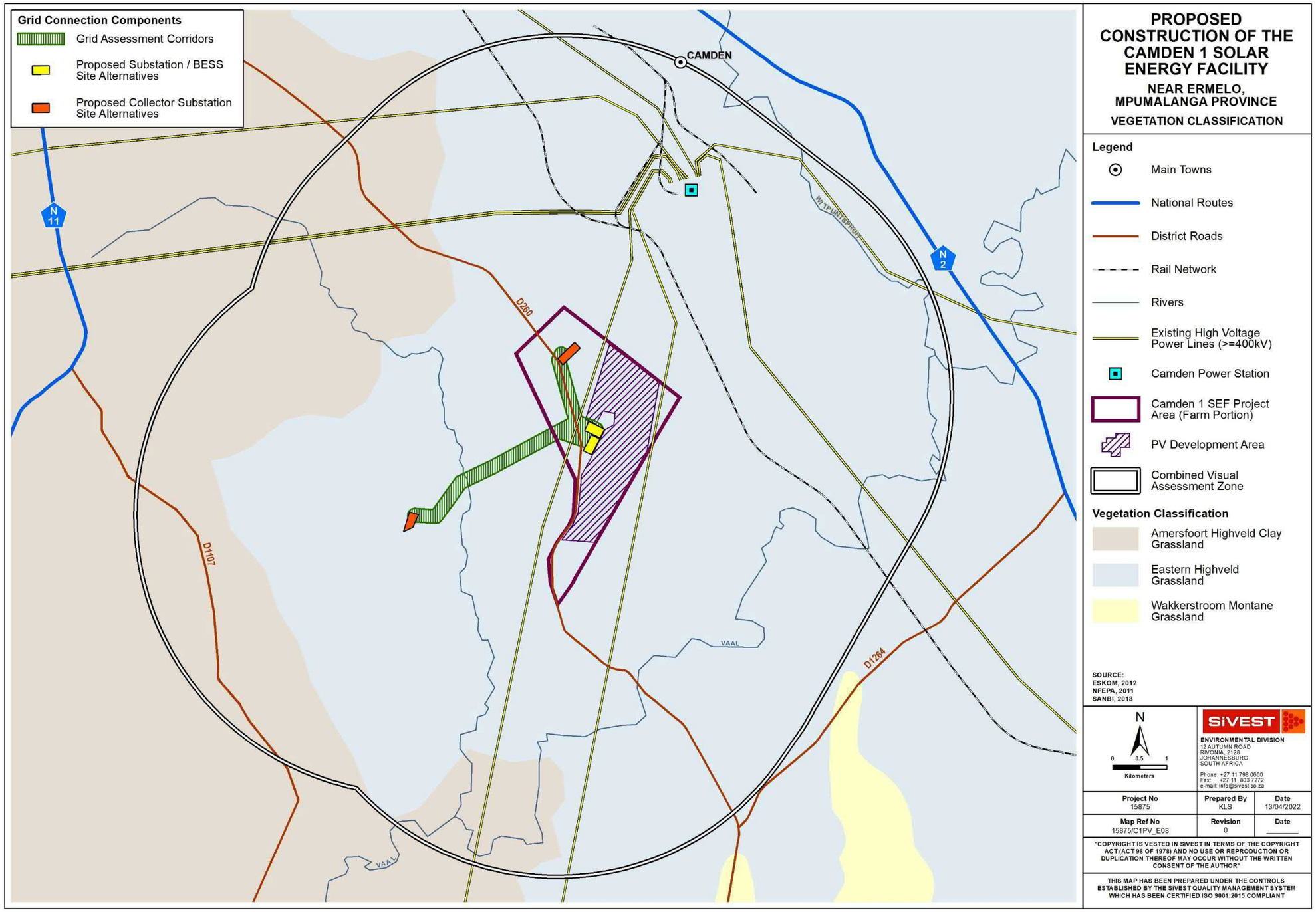
MAP 8: Vegetation Classification



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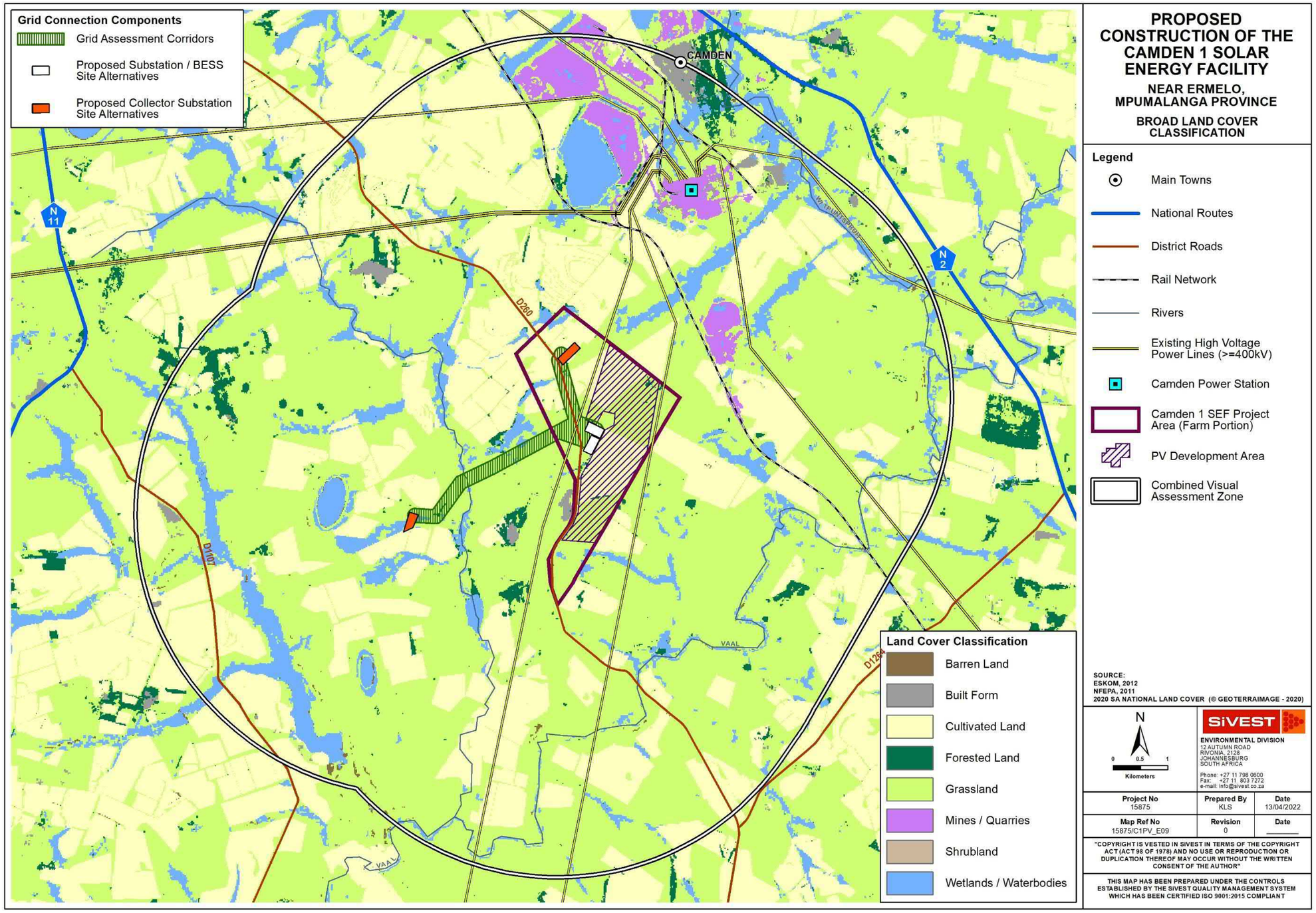
MAP 9: Land Cover Classification



PROPOSED CONSTRUCTION OF THE CAMDEN 1 SOLAR ENERGY FACILITY

NEAR ERMELO, MPUMALANGA PROVINCE

BROAD LAND COVER CLASSIFICATION

Legend

- Main Towns
- National Routes
- District Roads
- Rail Network
- Rivers
- Existing High Voltage Power Lines (>=400kV)
- Camden Power Station
- Camden 1 SEF Project Area (Farm Portion)
- PV Development Area
- Combined Visual Assessment Zone

SOURCE:
ESKOM, 2012
NFEPA, 2011
2020 SA NATIONAL LAND COVER (® GEOTERRAIMAGE - 2020)

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0 0.5 1
Kilometers

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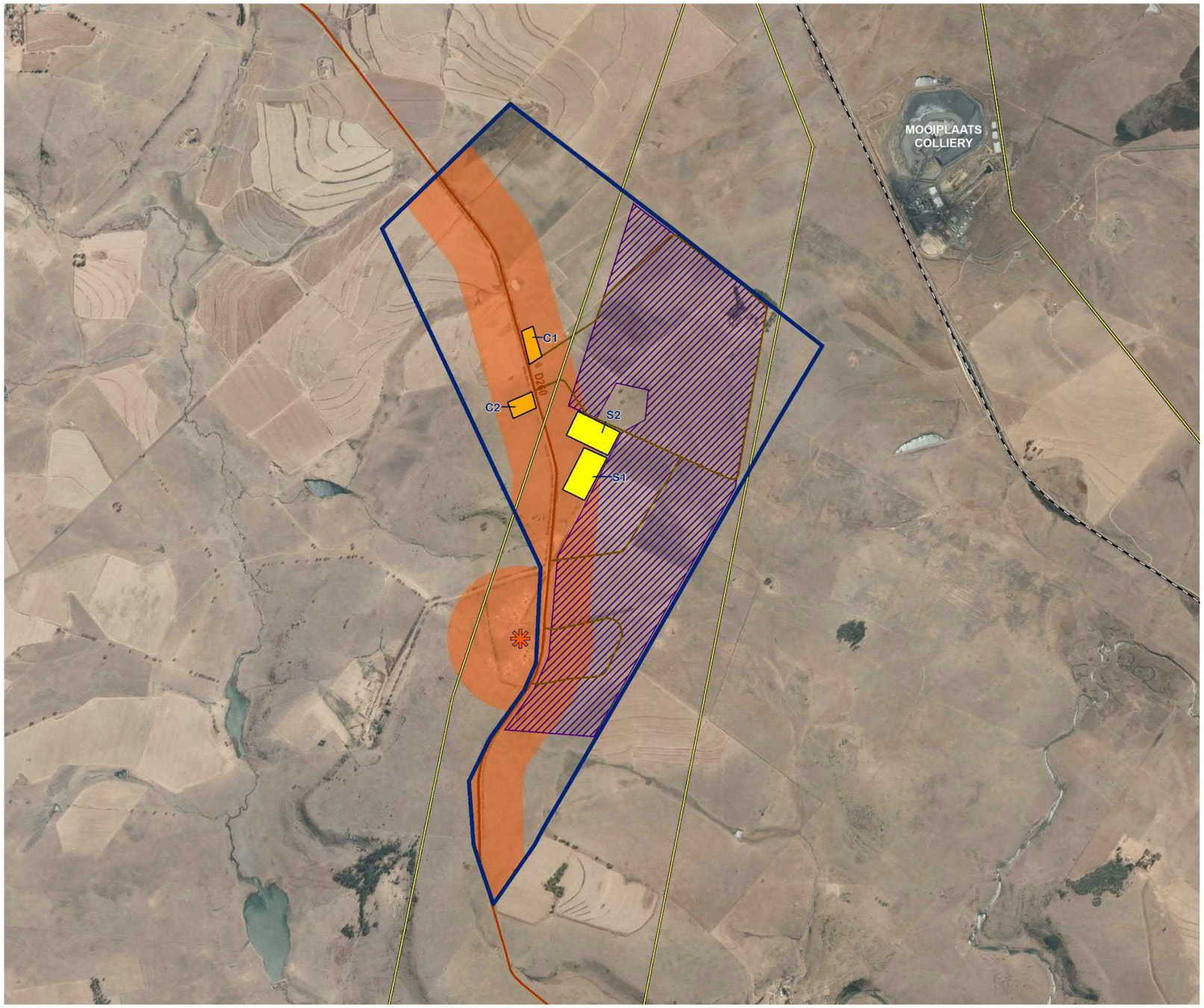
MAP 10: Visual Sensitivity on the Camden 1 PV Site



PROPOSED CONSTRUCTION OF THE CAMDEN 1 SOLAR ENERGY FACILITY

NEAR ERMELO, MPUMALANGA PROVINCE

PRELIMINARY VISUAL SENSITIVITY

Legend

- District Roads
- Rail Network
- Existing High Voltage Power Lines (>=400kV)
- Camden 1 SEF Project Area (Farm Portion)
- Zones of Potential Visual Sensitivity
- Farmhouses / Residences

SEF Elements

- PV Development Area
- Substation / Bess Sites
- Construction Camp Sites
- Internal Road Network

SOURCE:
ESKOM, 2012
GOOGLE EARTH, 2021

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0 250 500

Meters

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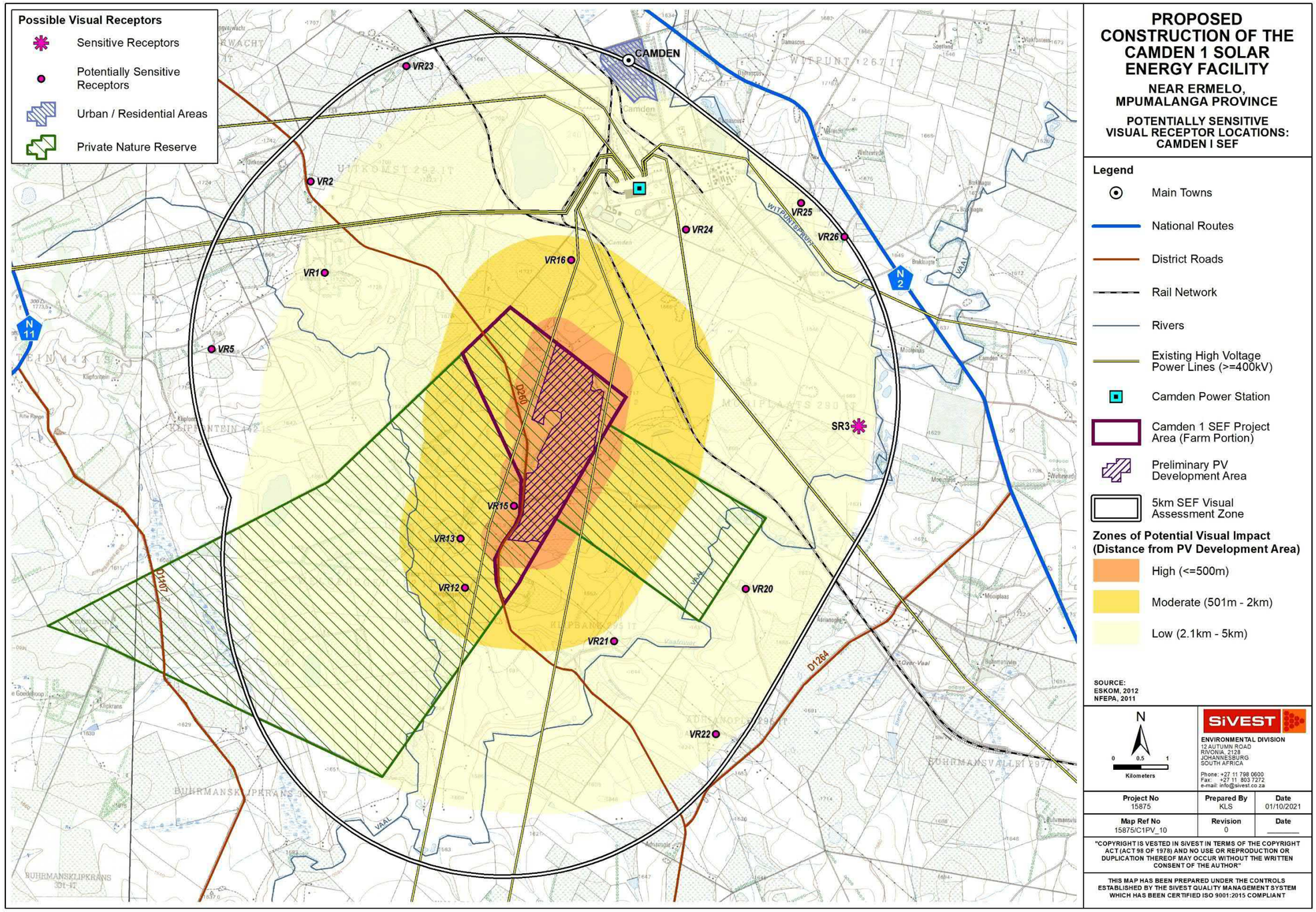
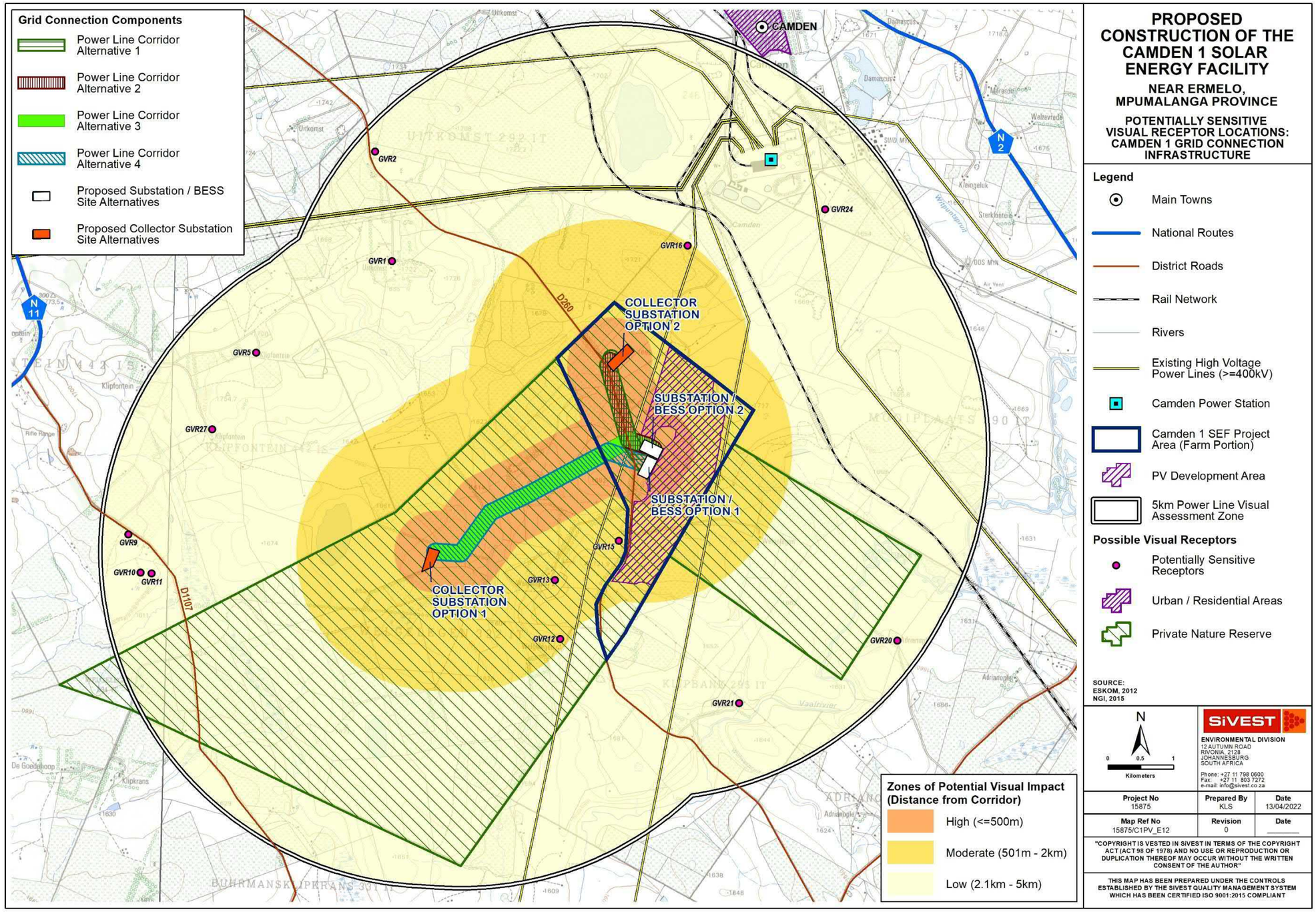
MAP 11: Potentially Sensitive Receptor Locations – Camden I SEF



MAP 12: Potentially Sensitive Receptor Locations – Camden I SEF Grid Connection



PROPOSED CONSTRUCTION OF THE CAMDEN 1 SOLAR ENERGY FACILITY

NEAR ERMELO, MPUMALANGA PROVINCE

POTENTIALLY SENSITIVE VISUAL RECEPTOR LOCATIONS: CAMDEN 1 GRID CONNECTION INFRASTRUCTURE

Legend

- Main Towns
- National Routes
- District Roads
- Rail Network
- Rivers
- Existing High Voltage Power Lines (>=400kV)
- Camden Power Station
- Camden 1 SEF Project Area (Farm Portion)
- PV Development Area
- 5km Power Line Visual Assessment Zone

Possible Visual Receptors

- Potentially Sensitive Receptors
- Urban / Residential Areas
- Private Nature Reserve

SOURCE:
ESKOM, 2012
NGI, 2015

N

0 0.5 1
Kilometers

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MAP 13: Zones of Visual Contrast

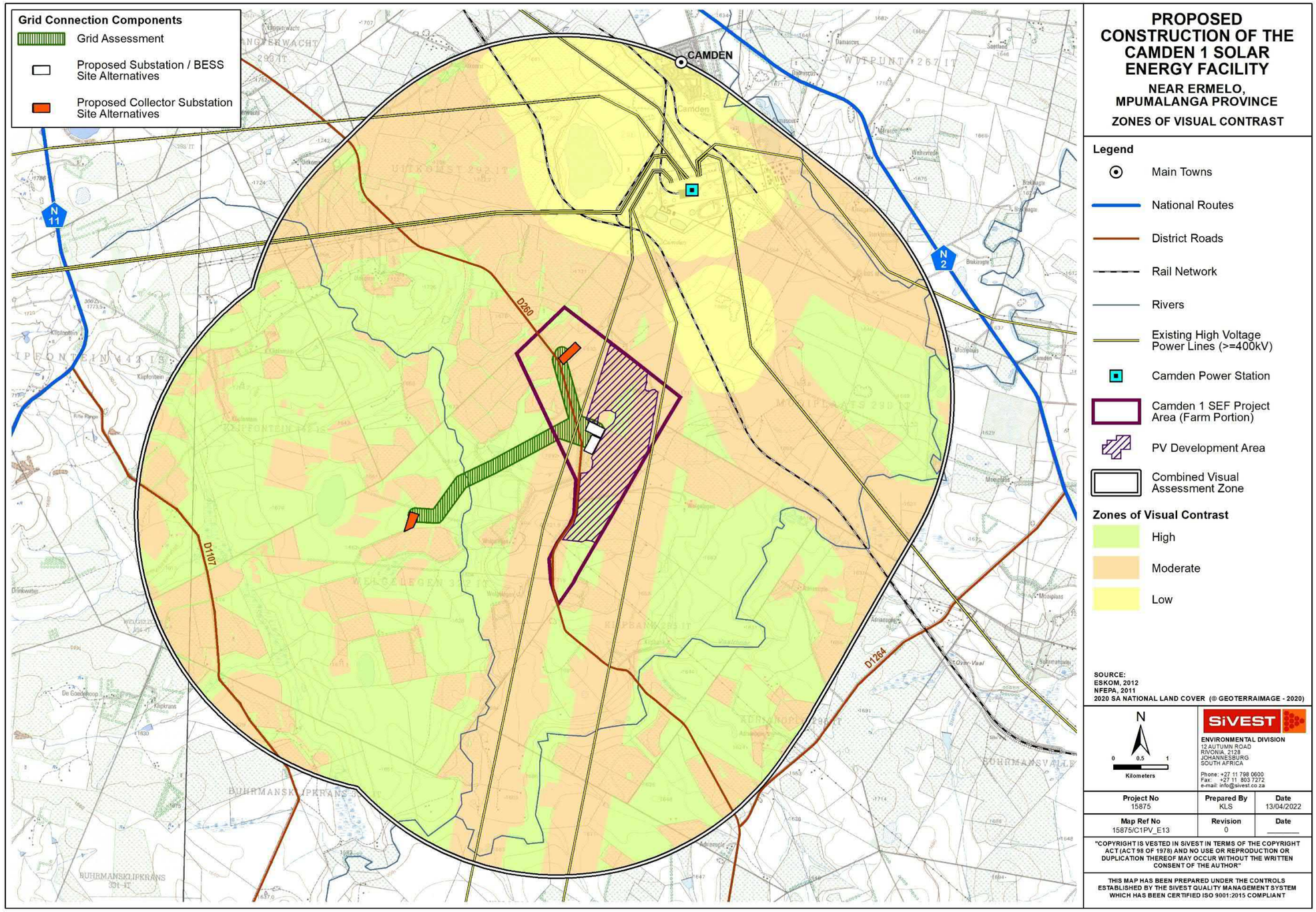

Table 1: Comparative Assessment of Alternatives – Camden I SEF On-Site Infrastructure

Alternative	Preference	Reasons (incl. potential issues)
SUBSTATION AND BESS SITE		
Option 1	Favourable	▪ Option 1 is located on relatively flat terrain and would only be moderately exposed on the skyline. ▪ There are no sensitive receptors within 5km of this alternative. ▪ The closest potentially sensitive receptor to this alternative is approximately 1 km away, this being VR15. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. However, impacts are likely to be reduced due to the fact that this receptor is located on the Camden I WEF development site and it is known that residents at this location support the WEF development. Hence these residents would not perceive the proposed development in a negative light. In addition, the proximity of this receptor to the existing transmission lines would reduce the level of impact experienced. The remaining receptors are all more than 2 km away and would only be subjected to low or negligible levels of impact. ▪ This Option is located in relatively close proximity to high voltage power lines and to District Road D260 and this factor would reduce the level of contrast, thus reducing the visual impact of this site alternative. ▪ In light of the above, there are no fatal flaws associated with Option 1 and, this alternative is considered **favourable** from a visual perspective.
Option 2	Favourable	▪ Option 2 is located on relatively flat terrain and would only be moderately exposed on the skyline. ▪ There are no sensitive receptors within 5km of this alternative. ▪ The closest potentially sensitive receptor to this alternative is approximately 1.4 km away, this being VR15. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. However, impacts are likely to be reduced due to the fact that this receptor is located on the Camden I WEF development site and it is known that residents at this location support the WEF development. Hence these residents would not perceive the proposed development in a negative light. In addition, the proximity of this receptor to the existing transmission lines would reduce the level of impact experienced. The remaining receptors are all more than 2 km away and would only be subjected to low or negligible levels of impact. ▪ This Option is located in relatively close proximity to high voltage power lines and to District Road D260 and this factor would reduce the level of contrast, thus reducing the visual impact of this site alternative. ▪ In light of the above, there are no fatal flaws associated with Option 2 and this alternative is considered **favourable** from a visual perspective..
TEMPORARY CONSTRUCTION CAMP / CEMENT BATCHING PLANT		
Option 1	Favourable	▪ Option 1 is located on relatively flat terrain and would only be moderately exposed on the skyline.

Alternative	Preference	Reasons (incl. potential issues)
		▪ There are no sensitive receptors within 5km of this alternative. ▪ The closest potentially sensitive receptor to this alternative is approximately 1.9 km away, this being VR15. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. However, impacts are likely to be reduced due to the fact that this receptor is located on the Camden I WEF development site and it is known that residents at this location support the WEF development. Hence these residents would not perceive the proposed development in a negative light. In addition, the proximity of this receptor to the existing transmission lines would reduce the level of impact experienced. The remaining receptors are all more than 2 km away and would only be subjected to low or negligible levels of impact. ▪ This Option is located in relatively close proximity to high voltage power lines and is adjacent to District Road D260 and this factor would reduce the level of contrast, thus reducing the visual impact of this site alternative. ▪ In light of the above, there are no fatal flaws associated with Option 1 and this alternative is considered **Favourable** from a visual perspective.
Option 2	Favourable	▪ Option 1 is located on relatively flat terrain and would only be moderately exposed on the skyline. ▪ There are no sensitive receptors within 5km of this alternative. ▪ The closest potentially sensitive receptor to this alternative is approximately 1.5 km away, this being VR15. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. However, impacts are likely to be reduced due to the fact that this receptor is located on the Camden I WEF development site and it is known that residents at this location support the WEF development. Hence these residents would not perceive the proposed development in a negative light. In addition, the proximity of this receptor to the existing transmission lines would reduce the level of impact experienced. The remaining receptors are all more than 2 km away and would only be subjected to low or negligible levels of impact. ▪ This Option is located in relatively close proximity to high voltage power lines and is adjacent to District Road D260 and this factor would reduce the level of contrast, thus reducing the visual impact of this site alternative. ▪ In light of the above, there are no fatal flaws associated with Option 1 and this alternative is considered **Favourable** from a visual perspective.

Table 2: Comparative Assessment of Alternatives – Camden I SEF 1323kV Grid Connection Infrastructure

Alternative	Preference	Reasons (incl. potential issues)
CAMDEN I GRID		
Power Line Corridor Option 1	Preferred	▪ Corridor Option 1 is approximately 1.7 km in length, linking substation Option 1 to Camden Collector Substation Option 2 ▪ This route alignment does not traverse any ridges and as such will only be marginally exposed on the skyline. ▪ The closest potentially sensitive receptor to this alternative is approximately 1 km away, this being VR15. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. However, impacts are likely to be reduced due to the fact that this receptor is located on the Camden I WEF development site and it is known that residents at this location support the WEF development. Hence these residents would not perceive the proposed development in a negative light. In addition, the proximity of this receptor to the existing transmission lines would reduce the level of impact experienced. The remaining receptors are all more than 2 km away and would only be subjected to low or negligible levels of impact. ▪ There are no fatal flaws associated with Option 1 and considering the shorter length of the power line, this alternative is expected to result in less visual impact and as such is **Preferred** from a visual perspective.
Power Line Corridor Option 2	Preferred	▪ Corridor Option 2 is 1.6 km in length, linking substation Option 2 to Camden Collector Substation Option 2. ▪ This route alignment does not traverse any ridges and as such will only be marginally exposed on the skyline. ▪ The closest potentially sensitive receptor to this alternative is approximately 1.4 km away, this being VR15. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. However, impacts are likely to be reduced due to the fact that this receptor is located on the Camden I WEF development site and it is known that residents at this location support the WEF development. Hence these residents would not perceive the proposed development in a negative light. In addition, the proximity of this receptor to the existing transmission lines would reduce the level of impact experienced. The remaining receptors are all more than 2 km away and would only be subjected to low or negligible levels of impact. ▪ There are no fatal flaws associated with Option 2 and considering the shorter length of the power line, this alternative is expected to result in less visual impact and as such is **Preferred** from a visual perspective.
Power Line Corridor Option 3	Favourable	▪ Corridor Option 3 is 3.9km in length, linking substation Option 2 to Camden Collector Substation Option 1. ▪ This route alignment does not traverse any ridges and as such will only be marginally exposed on the skyline. ▪ The closest potentially sensitive receptors to this alternative are approximately 1.2 and 1.4 km away, these being VR13 and VR15

Alternative	Preference	Reasons (incl. potential issues)
		respectively. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. However, impacts are likely to be reduced due to the fact that these receptors are located on the Camden I WEF development site and it is known that residents at this location support the WEF development. Hence these residents would not perceive the proposed development in a negative light. In addition, the proximity of these receptors to the existing transmission lines would reduce the level of impact experienced. The remaining receptors are all more than 1.8 km away and would only be subjected to moderate or low levels of impact. ▪ There are no fatal flaws associated with Option 3 and this alternative is considered **Favourable** from a visual perspective.
Power Line Corridor Option 4	Favourable	▪ Corridor Option 4 is only 3.8 km in length, linking substation Option 1 to Camden Collector Substation Option 1. ▪ This route alignment does not traverse any ridges and as such will only be marginally exposed on the skyline. ▪ The closest potentially sensitive receptors to this alternative are approximately 1.2 and 1.4 km away, these being VR13 and VR15 respectively. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. However, impacts are likely to be reduced due to the fact that these receptors are located on the Camden I WEF development site and it is known that residents at this location support the WEF development. Hence these residents would not perceive the proposed development in a negative light. In addition, the proximity of these receptors to the existing transmission lines would reduce the level of impact experienced. The remaining receptors are all more than 1.8 km away and would only be subjected to moderate or low levels of impact. ▪ There are no fatal flaws associated with Option 4 and this alternative is considered **Favourable** from a visual perspective.