Appendix H-10

VISUAL IMPACT STUDY

VISUAL SPECIALIST EIA REPORT INPUTS:

Scoping and Environmental Impact Assessment (EIA) processes for the proposed development of Impumelelo Wind Energy Facility (WEF) and associated infrastructure, near Secunda, Province of Mpumalanga.

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Executive Summary

Impumelelo Wind RF (Pty) Ltd (hereafter referred to as" Impumelelo") is proposing to develop the Impumelelo WEF, near Secunda in Mpumalanga Province.

The proposed WEF 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 these projects. The competent authority for this EIA is the national Department of Forestry, Fisheries and Environment (DFFE). Grid connection infrastructure for the WEF will be subject to a separate Basic Assessment Process, which is currently being undertaken in parallel to this EIA process.

This Visual Impact Assessment (VIA) is being undertaken as part of the EIA process.

The VIA has determined that the study area has a predominantly rural / pastoral visual character and as such, a WEF development would alter the visual character and contrast with the typical land use and/or pattern and form of human elements present across much of the broader study area. The level of contrast will however be reduced by the presence of mining activity and electrical and road infrastructure within the study area.

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. An important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs. No formal protected areas, leisure-based tourism activities or ***sensitive*** receptor locations were identified in the study area, thus confirming the low level of visual sensitivity.

The desktop assessment did however identify multiple farmsteads within the study area that could be considered to be receptors, although not all of them would be sensitive to the proposed development. These farmsteads are however regarded as *potentially* sensitive visual receptors as elements of the proposed development could potentially alter natural or semi-natural vistas experienced from these locations. At this stage however, local sentiments towards the proposed development are not known.

A total of 97 potentially sensitive receptors were identified within 10 km of the proposed Impumelelo WEF project area, although twenty-three (23) of these receptors were found to be either outside the viewshed for the WEF or more than 10kms from the nearest turbine placement. None of the remaining receptors are considered sensitive. Only one (1) potentially sensitive receptor (VR55) is expected to experience high levels of visual impact. This receptor, along with VR33, VR51 and VR 56, is located within the Impumelelo WEF project area and as such the respective land-owners are not expected to perceive the proposed development in a negative light

Fifty-one (51) receptor locations are expected to experience moderate levels of impact as a result of the Impumelelo WEF development, while the remaining twenty-two (22) would only experience low levels of visual impact.

None of the roads in the study area are regarded as visually sensitive.

A preliminary assessment of overall impacts revealed that impacts associated with all the proposed Impumelelo WEF are of **low** significance during both construction and decommissioning phases. During operation however, visual impacts from the WEF would be of **moderate** significance with relatively few mitigation measures available to reduce the visual impact.

Considering the presence of existing mining activity, the Sasol fuel plant and proposals for other renewable energy facilities in the broader area, 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. Considering this, cumulative impacts have been rated as **moderate**.

A comparative assessment of site alternatives for the on-site Substation / BESS 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 either of the site alternatives and both alternatives were found to be **Favourable**.

From a visual perspective therefore, the proposed Impumelelo WEF project is deemed acceptable, and the Environmental Authorisation (EA) should be granted. SLR Consulting 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.

Contents

List of Figures

List of Tables

Appendices:

List of Abbreviations

BA	Basic Assessment
DBAR	Draft Basic Assessment Report
DEIAR	Draft Environmental Impact Assessment Report
DFFE	Department of Forestry, Fisheries and Environment
DM	District Municipality
DSR	Draft Scoping Report
DEM	Digital Elevation 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
SANBI	South African National Biodiversity Institute
VIA	Visual Impact Assessment
VR	Visual Receptor
WEF	Wind Energy Facility

Glossary

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 study area or visual assessment zone is assumed to encompass a zone of 5 km from the outer boundary of the proposed Wind Energy Facility application site.
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 be in conformity 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.

This report serves as the Visual Specialist Scoping Report input that was prepared as part of the Scoping and Environmental Impact Assessment (S&EIA) for the for the proposed development of a 200 MW Impumelelo Wind Energy Facility (WEF) and associated infrastructure, near Secunda in Mpumalanga Province.

1. Introduction

1.1 Scope, Purpose and Objectives of this Specialist Report

Impumelelo Wind RF (Pty) Ltd (hereafter referred to as" Impumelelo") is proposing to develop the Impumelelo WEF, near Secunda in Mpumalanga Province. The proposed WEF 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 these projects. The competent authority for this EIA is the national Department of Forestry, Fisheries and Environment (DFFE).

Grid connection infrastructure for the proposed WEF will be subject to a separate Environmental Authorization (EA) Process, which is currently being undertaken in parallel to this EIA process.

This Visual Impact Assessment (VIA) is being undertaken as part of the EIA process.

Prior to commencing with the Visual Specialist Assessment in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on the Visual Theme (Government Notice 320, dated 20 March 2020), a site sensitivity verification was undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

The aim of this report is to present the findings of the visual specialist assessment to provide specialist inputs to the Draft Environmental Impact Report (DEIR) for the Impumelelo WEF. The assessment will identify potential visual issues associated with the development of the proposed Impumelelo WEF and determine the potential extent of visual impacts. This involves characterising the visual environment of the area and identifying areas of potential visual sensitivity that may be subject to visual impacts. This visual assessment focuses on the potential sensitive visual receptor locations and provides an assessment of the magnitude and significance of the visual impacts associated with the proposed development.

1.2 Details of Specialist

This specialist assessment was undertaken by Kerry Schwartz of SLR Consulting, 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 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.

A *Curriculum Vitae* is included in Appendix A and a signed specialist statement of independence is included in **Appendix B** of this specialist assessment.

Visual Specialist	SLR Consulting – Kerry Schwartz
Contact Details	klschwartz@slrconsulting.com
Qualifications	BA (Geography), University of Leeds 1982

Visual Specialist	SLR Consulting – Kerry Schwartz
VIA Expertise	• VIAs (EIAs) for the proposed Koup 1 and Koup 2 WEFs and associated Grid Connection Infrastructure, near Beaufort West, Western Cape Province. • 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

1.3 Assessment methodology

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

1.4 Terms of Reference

Specific requirements for the Visual Impact Assessment (VIA) are however outlined below.

- Comply with the Assessment Protocols that were published on 20 March 2020, in Government Gazette 43110, GN 320. This specifically includes Part A, which provides the Site Sensitivity Verification Requirements where a Specialist Assessment is required but no Specific Assessment Protocol has been prescribed.
- Provide a Site Sensitivity Verification Report based on the requirements documented in the Assessment Protocols published on 20 March 2020, in Government Gazette 43110, GN 320.
- Compile a Visual Impact Assessment in compliance with Appendix 6 of the 2014 NEMA EIA Regulations (as amended). The Specialist Assessment must also be in adherence to any additional relevant legislation and guidelines that may be deemed necessary.
- Provide inputs to the Draft Scoping Report to include a description of the affected environment and environmental sensitivities, key legislation, key issues to be addressed during the EIA Phase, high level assessment of impacts, and confirmation of scope of work for the EIA Phase.
- The specialist must undertake a site visit to identify the level of sensitivity assigned to the project area on the Screening Tool, and to verify and confirm this sensitivity and land-use, as well as to comply with the requirements of Part A of the Assessment Protocols published on 20 March 2020, in Government Gazette 43110, GN 320.
- Determination, description and mapping of the baseline environmental condition and sensitivity of the study area. Specify setbacks or buffers and provide clear reasons for these recommendations.
- Provide sensitivities in KMZ or similar GIS format.
- Provide review input on the preferred infrastructure layout following the sensitivity analysis and layout identification.
- The report must describe the visual character of the local area. Any significant visual features or visual disturbances should be identified and mapped, as well as any sensitive visual receptors within the proposed project area or within viewsheds of the project.
- Visual character and visual absorption capacity should be described.
- Viewsheds for the proposed development should be calculated, defined and presented, and the varying sensitivities of these viewsheds must be highlighted.
- Mapping of visual sensitivity of the site will require consideration of visual receptors outside the site, and sensitivity to development on the site for potentially affected visual receptors of “very high” sensitivity.
- Assessment to be based on a site visit and a photographic survey of the surrounding region from which the landscape and visual baselines can be prepared. The assessment must also consider the maps generated by the National Screening Tool.
- Identify and assess the potential direct, indirect and cumulative impacts of the proposed development on the receiving environment from a visual perspective. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project.
- Identify any protocols, legal and permit requirements that are relevant to this project and the implications thereof.
- Provide recommendations with regards to potential monitoring programmes.
- Determine mitigation and/or management measures which could be implemented to as far as possible reduce the effect of negative impacts and enhance the effect of positive impacts. Also identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This must be included in the EMPr.

- Incorporate and address all review comments made by the Project Team (CSIR and Project Applicant) during the various revisions of the specialist report.
- Incorporate and address all issues and concerns raised by Stakeholders, Competent Authority, I&APs and the public during the Public Participation Process (where relevant and applicable).

2. Approach and Methodology

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

- 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 National Geospatial Information (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 a site visit.

- Identification of sensitive and potentially sensitive receptor locations

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

- Fieldwork and photographic review

A two (2) day site visit was undertaken between the 25th and 26th of January 2022 (mid summer).The aim of the site visit was to:

  - verify the landscape characteristics identified via desktop means;
  - conduct a photographic survey of the proposed study area;
  - verify 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
  - assist with the assessment and rating of receptor impacts.

- Impact Assessment

A rating matrix (Appendix D) was used to objectively evaluate the significance of the potential visual impacts associated with the Impumelelo WEF project, both before and after implementing mitigation measures. Mitigation measures were identified (where possible) in an attempt to minimise the potential visual impact of the proposed development. The rating matrix is based on several different factors including geographical extent, probability, reversibility, irreplaceable loss of resources, duration, extent and consequence in order to assign a level of significance to the potential visual impact of the project.

A separate rating matrix was used to assess the visual impact of the proposed WEF project on the visual receptor locations (both sensitive and potentially sensitive), as identified. This matrix is based on three 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.

2.1 Information Sources

The main sources of information which were utilised for the VIA are listed in Error! Reference source not found. below:

Table 1: Sources of Information

Data / Information	Source	Date	Type	Description
Elevation data	NGI	2011	Spatial	5m contour national coverage - prone to inaccuracies.
1: 50 000 Topographical Maps	NGI	Various	Spatial	Topographical map series used as background.
Land Cover Data	DFFE (GEOTERRAIMAGE)	2020	Spatial	2020 South African National Land-Cover Dataset.
Vegetation Classification	SANBI	2018	Spatial	SANBI Veg Map based on vegetation Rutherford & Mucina classification 2012.
Satellite Imagery	Google Earth	2022	Spatial	Google Earth Imagery.
South African National Protected Areas Database (SAPAD)	DFFE	2021, Q1	Spatial	Spatial delineation of protected areas in South Africa. Updated quarterly.
National Protected Areas Expansion Strategy (NPAES)	SANBI	2008	Spatial	Spatial delineation of protected areas in South Africa.
The National web-based Environmental Screening Tool.	DFFE	2020	Report & spatial	High level identification of areas of environmental sensitivities.
SA REEA	DFFE	2022, Q2	Spatial	SA Renewable Energy EIA Application Database (REEA)

2.2 Assumptions, Knowledge Gaps and Limitations

Assumptions, knowledge gaps and limitations relevant to this study are outlined below:

- It should be noted that this report is presented in the format / template provided by the Environmental Assessment Practitioner (EAP), the CSIR – Environmental Management Services, at the inception of the project. Although a new EAP (WSP Group Africa (Pty) Ltd) has taken over the management of this process in the interim, it has been decided to retain the original CSIR report template so as to avoid any confusion.
- This visual study has been undertaken based on the project description provided by the Developer and the EAP at the inception of the project.
- Given the nature of the receiving environment and the height of the proposed wind turbines, the study area or visual assessment zone is assumed to encompass an area of 10km from the proposed WEF – i.e., an area of 10km from the boundary of the WEF application site. The application of the 10km limit on the visual assessment zone relates to the fact that visual impacts decrease exponentially over distance. Thus, although the WEF may still be visible beyond 10km, 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.
- 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 between the 25th and 26th of January 2022. 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, several 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 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 a reasonably accurate indicative assessment of the degree of visual impact likely to be experienced at each receptor location as a result of the proposed 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.
- 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.
- Receptors that were assumed to be farmsteads were still regarded as being potentially sensitive to the visual impacts associated with the proposed development and were thus assessed as part of the VIA.
- Based on the project description provided by Impumelelo, all analysis for this VIA is based on a worst-case scenario where turbine heights are assumed to be 300 m at the blade tip. Substation, Battery Energy Storage (BESS) facilities and office building heights are assumed to be less than 25m in height.
- Due to the varying scales and sources of information; maps may have minor inaccuracies. Terrain data for this area, derived from the NGI's 5 m Contour Database, 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 analysis did 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) 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 WEF 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 WEFs and as such, general measures to mitigate the impact of additional light sources on the ambiance of the nightscape have been provided.
- This study includes a broad assessment of the potential cumulative impacts of other renewable energy developments on the existing landscape character and on the identified sensitive receptors. Cumulative impacts will be examined in more detail in the EIA phase VIA report.
- Photomontages included in this report have been provided merely as indicative illustrations and should not be seen as an accurate representation of the proposed Impumelelo turbine layout.
- Photomontages have not been compiled for all sensitive and potentially sensitive receptor locations. Instead a range of locations was selected for modelling purposes to provide an indication of how views could potentially be transformed from different locations within the study area. It should be noted that the photomontages are specific to each location, and that even sites in close proximity to one another may be affected in different ways by the proposed WEF development.
- The photomontages represent a visual environment that assumes that all vegetation cleared during construction will be restored to its current state after the construction phase. This is however an improbable scenario as some vegetation cover may be permanently removed which may reduce the accuracy of the models generated.
- At the time the VIA was undertaken the proposed project was still in the planning stage and as such the turbine layout, as provided by the client, may change. In addition, infrastructure associated with the WEF has not been included in the models.
- It should be noted that the site visit was undertaken in late January 2022, during mid-summer, which is characterised by higher levels of rainfall and increased vegetation cover. In these conditions, slightly reduced levels of visual impact will be experienced from receptor locations in the surrounding area.
- In clear weather conditions, wind turbines would present a greater contrast with the surrounding environment than they would on an overcast day. The field investigation was conducted during clear to partly cloudy weather conditions.

2.3 Consultation Processes Undertaken

At this stage, no specific consultation has been undertaken in respect of this VIA. However, continuous consultation with Interested and Affected Parties (I&APs) during the public participation process for the EIA will be used (where available) to help establish how the proposed development will be perceived by the various identified receptors and the degree to which the impact will be regarded as negative. Although I&APs have not yet provided any formal feedback in this regard, the report will be updated to include relevant information as and when it becomes available.

3. Description of Project Aspects relevant to the Visual Impact Assessment

In this section, the typical visual issues related to the establishment of WEFs and associated infrastructure 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) in conjunction with local experience to describe the generic impacts associated with WEFs.

3.1 Wind Farm Components

A full project description for the proposed Impumelelo WEF has been provided in the Draft EIA Report (DEIR). However, a list of the key components that have visual implications is provided below. Although the associated on-site infrastructure has been included here, the visual impact of associated infrastructure is generally far less significant than the visual impact associated with wind turbines. The infrastructure would however intensify the visual prominence of the proposed development if located on ridge tops or flat sites in natural settings where there is limited tall, wooded vegetation present to conceal the impact.

The proposed Impumelelo WEF and associated infrastructure include the following components:

- Up to 28 wind turbine generators (WTGs) with a maximum capacity of up to 200MW.
- Turbines with a hub height of up to 200m and a rotor diameter of up to 200m (**Figure 1**).
- Hardstand areas of approximately 1 500m^2 per turbine.
- Medium voltage cabling connecting the turbines will be laid underground, except where a technical assessment suggests that overhead lines are required, within the facility connecting the turbines to the onsite substation.
- Internal roads with a width of between 5m and 6m providing access to each turbine, the BESS, on-site substation (SS), step-down substation and laydown area. The roads will accommodate cable trenches and stormwater channels (as required) and will include turning circle/bypass areas of up to 20m at some sections during the construction phase. As such, the roads and cables will be positioned within a 20m wide corridor. Existing roads will be upgraded wherever possible, although new roads will be constructed where necessary.
- Temporary laydown or staging area of approximately 22 000m^2.
- Construction camp laydown/ area of approximately 5 000m^2.
- Independent Power Producer (IPP) site substation and battery energy storage system (BESS), with a total footprint of 6.5 hectares (ha).
- Operation and maintenance buildings will be located in close proximity to the on-site substation and will include:
    - Operation building;
    - Workshop, and
    - Stores
- Other infrastructure will include a temporary batching plant and galvanised steel fencing up to 3m high.

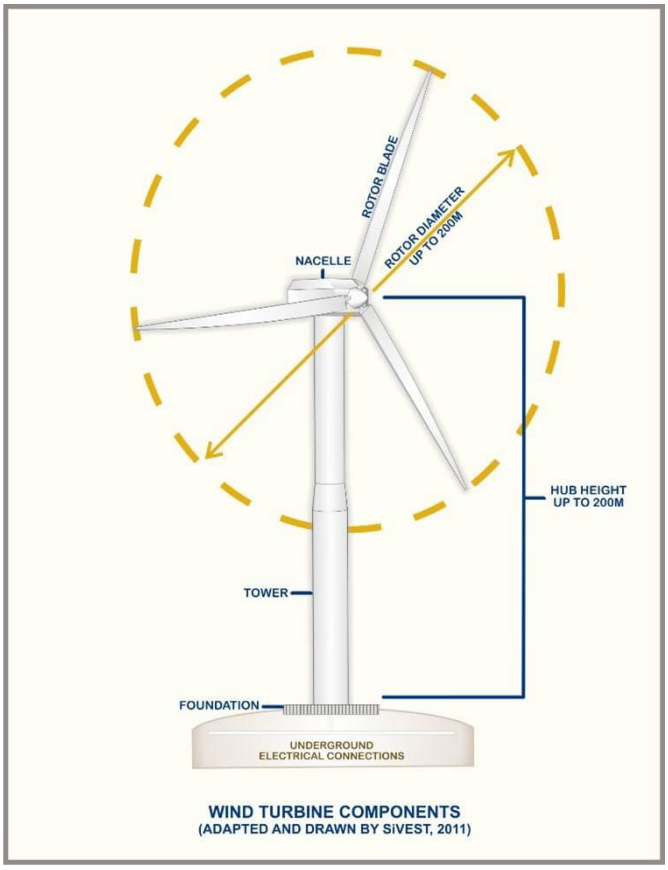


Figure 1: Typical components of a wind turbine

3.1.1 Construction Period

The construction period is expected to span ± 36 months.

3.2 Visual Implications

3.2.1 Wind Turbines

As stated above the proposed WEF consists of up to 28 wind turbines and associated on-site infrastructure with a total generation capacity of up to 200MW. The wind turbines will have a hub height of up to 200m and a rotor diameter of up to 200m. The height of the turbines and their location on gently undulating terrain would result in the development typically being visible over a large area (**Figure 2**).

Figure 2: Wind turbines at Loeriesfontein 2 WEF in the Northern Cape Province.

Internationally, studies have demonstrated that there is a direct correlation between the number of turbines and the degree of objection to a wind farm, with less opposition being encountered when fewer turbines are proposed (Devine-Wright, 2005). Certain objectors to wind farms also mention the "sky space" occupied by the rotors of a turbine, this being the area in which the rotors would rotate.

The visual prominence of wind turbines would be exacerbated within natural settings, in areas of flat terrain or if located on ridge tops. Given the height of the turbines, even dense stands of wooded vegetation are only likely to offer partial visual screening.

3.2.2 Shadow Flicker

Shadow flicker may occur when the sun is low on the horizon and shines through the rotating blades of a wind turbine, resulting in a moving shadow. The rotating blades repeatedly cast a shadow which will be perceived as a "flicker" and this flicker-effect can potentially impact on residents located near the wind turbines.

The effect of shadow flicker is however only likely to be experienced by people situated directly within the shadow cast by the blade of the wind turbine. As such, shadow flicker is only expected to have an impact on and cause health risks to people residing in houses located relatively close to a wind turbine and at a specific orientation, particularly in areas where there is little screening present. Shadow flicker may also be experienced by and impact on motorists if a wind turbine is located in close proximity to an existing road.

The impact of shadow flicker can be effectively mitigated by choosing the correct site and layout for the wind turbines, taking into consideration the orientation of the turbines relative to the nearby houses and the latitude of the site. Hence appropriate development restriction zones around residences and along main roads will reduce the adverse effects of shadow flicker, while tall structures and trees will also obstruct shadows and prevent the effect of shadow flicker from impacting on surrounding residents.

3.2.3 Motion-based visual intrusion

An important component of the visual impacts associated with wind turbines is the movement of the rotors. Labelled as motion-based visual intrusion, this refers to the tendency of the viewer to focus on discordant,

moving features when scanning the landscape. Evidence from surveys of public attitudes towards wind farms however suggest that the viewing of moving blades is not necessarily perceived negatively (Bishop and Miller, 2006).

3.2.4 Associated On-Site Infrastructure

The proposed on-site infrastructural elements are not expected to be associated with significant visual impacts when compared to visual impact associated with the wind turbines. Substations however are generally large, highly visible structures which are relatively industrial in character. In addition, BESS facilities, at a maximum height of 10 m, could potentially be highly visible from receptors in the surrounding area. Substation and BESS facilities are not features of the natural environment, but are representative of human (anthropogenic) alteration, and as such could potentially be perceived to be incongruous when placed in largely natural landscapes. In this instance, the substation and BESS are intended to serve the proposed WEF project and as such, these structures are likely to be perceived as part of the greater WEF facility. Thus, the visual impact of the substation and BESS will be relatively minor when compared to the visual impact associated with the development as a whole. The infrastructure would, however, increase the visual "clutter" of the proposed development 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.

Surface clearance for cable trenches, access roads and laydown areas 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 4.1.9**).

4. Baseline Environmental Description

4.1 General Description

4.1.1 Site Locality

The proposed Impumelelo WEF is located in the Dipaleseng local Municipality in Mpumalanga Province, approximately 35 km south-west of Secunda and 11 km north-east of Greylingstad. (**Map 1 in Appendix F**).

As shown in **Map 2 in Appendix F**, the proposed WEF will be constructed on the following farm portions:

- Portions Number 6 and 25 of the Farm 522 Hartbeesfontein
- Portions Number 2,4,5 and 9 of the Farm 543 Platkop
- Portions Number 0,7 and 8 of the Farm 544 Mahemsfontein

The Impumelelo WEF project area as shown in has a total combined area of approximately 2800 hectares (ha), although the buildable area in only approximately 680 ha, subject to finalization based on technical and environmental requirements.

Scoping and EIA phase layouts are shown in **Maps 3A and 3B in Appendix F**

4.1.2 Topography

The broader area surrounding the proposed Impumelelo WEF is characterized by a mix of flat to undulating plains with low hills and intersected by shallow river valleys (**Figure 3**)**.** Areas of slightly higher elevation occur along the north and south-eastern boundary of the study area. Slopes across the study area are relatively gentle to low, with steeper slopes being largely associated with the more incised river valleys of the Grootspruit and the hilly terrain near Greyslingstad (**Figure 4)**.

Figure 3: View south-west from the northern boundary of the Impumelelo WEF study area showing typically undulating terrain

Figure 4: View of hills in the south-eastern sector of the study area, near Greylingstad.

The topography and slope of the study area are respectively illustrated in **Map 4 and Map 5 in Appendix F**.

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 position of the viewer within the landscape will influence the types of vistas typically present. Viewers located within a more incised valley for example would have limited vistas, whereas much wider vistas would be experienced by viewers on higher-lying ridge tops or slopes. 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.

Bearing in mind that wind turbines are very large structures (potentially up to 200m in height including the rotor blades with a diameter of 200m), these could be visible from a considerable area around the site. Although localised topographic variations may limit views of wind turbines from some areas within the study area, there would be very little topographic shielding across the remainder of the study area to lessen the visual impact of the turbines from any locally occurring receptor locations.

The high degree of visibility was confirmed by way of a preliminary visibility analysis for the EIA phase turbine layout proposals as provided by Impumelelo. A worst-case scenario was assumed when undertaking the analysis, in which the proposed turbines were assigned a maximum height 300 m (maximum height at blade tip). The resulting viewshed indicates that, although some areas along the south-western boundary of the study area are outside the viewshed for the WEF, blade tips of wind turbines positioned on the application site would be visible from most parts of the study area.

Detailed topographic data was not available for the broader study area and as such the visibility analysis does not consider any localised topographic variations which may constrain views. Additionally, the visibility analysis is based entirely on topography and does not consider 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.

4.1.3 Vegetation

According to Mucina and Rutherford (2006), the study area is dominated by the Soweto Highveld Grassland vegetation type (**Figure 9**) which is characterised by short to medium-high dense, tufted grassland (**Figure 10**).

Figure 5: Grassland visible in the northern sector of the study area.

Much of the natural vegetation cover has however been removed or transformed by cultivation as well as tall exotic trees scattered in clusters across the study area, along roads (**Figure 6**) and around farmsteads (**Figure 7**).

Figure 6: Tall trees planted along roads

Figure 7: Example of trees planted around farmsteads

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 in the area may restrict views from these receptor locations.

4.1.4 Land Use

According to the South African National Land Cover dataset (Geoterraimage 2020), much of the visual assessment area is classified as "Cultivated Land" interspersed with significant areas of "Grassland". Tracts of forested land and numerous water bodies are scattered throughout the study area (**Map 8 in Appendix F**).

Commercial agriculture is the dominant activity in the study area, with the main focus being maize cultivation (**Figure 8**) with some limited livestock and game farming. There are multiple farm portions in the study area, resulting in a relatively moderate density of rural settlement with many scattered farmsteads in evidence. Built form in much of the study area comprises farmsteads, ancillary farm buildings and workers' dwellings, gravel access roads, power and telephone lines and fences.

Figure 8:Cultivated land to the south of the Impumelelo WEF project area.

High levels of human influence are however visible to the north-east of the WEF project area where the Impumelelo Mine has resulted in significant transformation in the landscape (**Figure 9**). In addition, the small town of Greylingstad is partially in the WEF study area, resulting in a significant degree of transformation on the south-western boundary of the study area. High voltage power lines (Error! Reference source not found.), contribute further to the overall transformation of the landscape in this area, with two sets of 400kV lines bisecting the study area in a west-east direction.

Figure 9: View of Impumelelo Mine to the north of the Impumelelo WEF project area.

Figure 10: High voltage power lines traversing the southern sector of the Impumelelo WEF project area.

Other evidence of significant human influence in the area includes road, rail and telecommunications.

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 Impumelelo WEF development 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.

Moderate levels of human transformation and visual degradation are however evident in close proximity to the proposed WEF where mining activity dominates the landscape. Urban development associated with the town of Greylingstad has transformed the landscape in the south-west while 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 these sectors of the study area, thus reducing the level of contrast of the proposed development.

4.1.5 Visual Character

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 presence of Impumelelo Mine close to the proposed WEF, in conjunction with urban and infrastructural development has resulted in a high degree of visual degradation in sectors of the study area. The more transformed character of the landscape is an important factor in this context, as the introduction of the proposed WEF 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.

In light of this, it is important to assess whether the introduction of a WEF 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 by mining, urban and infrastructural development.

4.1.6 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 mining and infrastructural development in the vicinity of the proposed Impumelelo WEF.

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

4.1.7 Sensitive Visual Receptor Locations

A sensitive visual receptor location is defined as a location from where receptors would potentially be impacted by a proposed development. Adverse impacts often arise where a new development is seen as an intrusion that 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, depending 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 / 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 I&APs, as raised during the public participation process conducted as part of the Environmental Assessment study.

As the visibility of the development would diminish exponentially over distance, receptors that are closer to the WEF would experience greater adverse visual impacts than those located further away. Visual impacts resulting from wind turbines would be greatest within a 1km to 2km radius, and although turbines may still be visible beyond 10km, the degree of visual impact would diminish considerably at this distance (**Figure** 11).

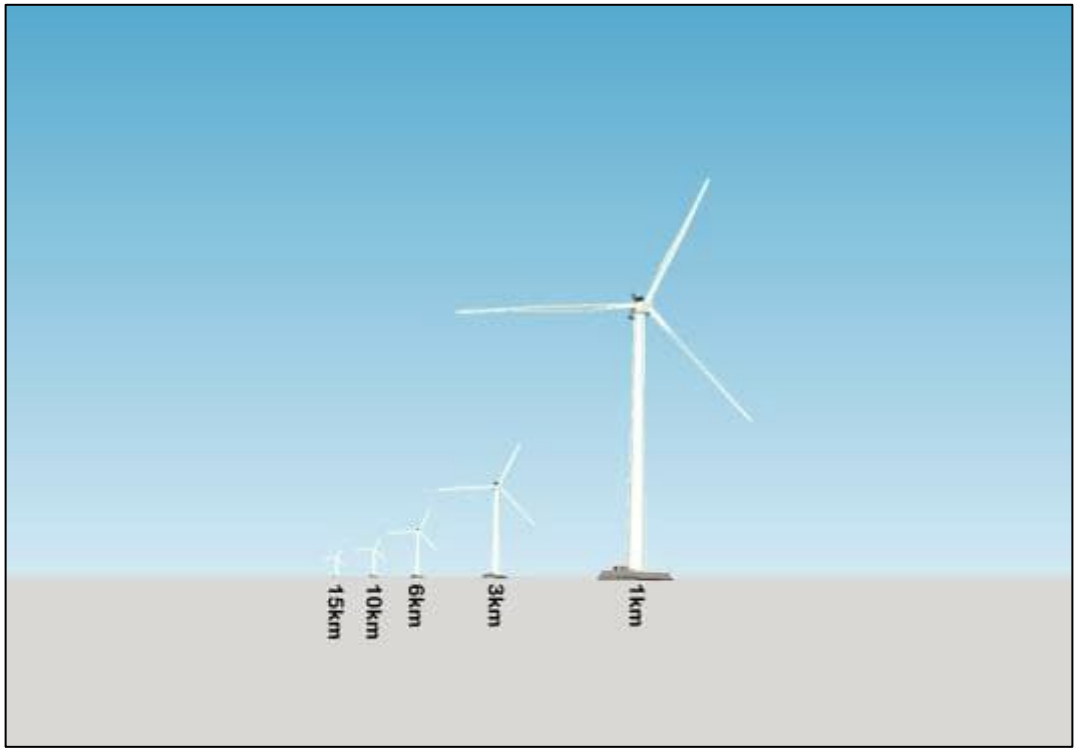


Figure 11: Conceptual representation of the diminishing visibility of a wind turbine over distance.

At this stage of the process, zones of visual impact for the proposed WEF have been delineated according to distance from the nearest turbine position as per the EIA Phase WEF layout provided by the proponent. Based on the height and scale of the project, the distance intervals chosen for these zones of visual impact are as follows:

- ≤2km (high impact zone)
- 2.1km – 6km (moderate impact zone)
- 6.1km – 10 km (low impact zone)

The degree of visual impact experienced will vary from one receptor location 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 development. These may be positive (a symbol of progression toward a less polluted future) or negative (foreign objects degrading the natural landscape); and
- Degree to which the viewer will accept a change in the typical character of the surrounding area.

Preliminary desktop assessment did not identify any formal protected areas or leisure-based tourism activities in the study area for the proposed Impumelelo WEF. The desktop assessment did however identify multiple farmsteads and residences within the study area. While these homesteads and residences could be considered to be receptors, not all of them would be sensitive to the proposed development and given the number of farmsteads, it was not possible to confirm the presence of receptors at all the identified locations. Notwithstanding these limitations, 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. ***None of these receptor locations were found to be sensitive.***

Although most of the receptor locations are believed to be farmsteads, they are regarded as ***potentially*** sensitive visual receptors as the proposed development could potentially alter natural or semi-natural vistas experienced from these locations. At this stage however, local sentiments towards the proposed development are not known.

It was noted that residential areas within the town Greylingstad are located within the Impumelelo WEF study area. While these could be considered as receptors, they are not considered to be sensitive due to their location within built-up, transformed areas.

In many cases, roads along which people travel, are regarded as sensitive receptors. The primary thoroughfare in the study area is the R547 Main Road which traverses the eastern sector of the study area linking to the R50 arterial route north of the study area to the R23 arterial route to the south. However, the R547 and several other minor thoroughfares in the study area are primarily used as local access roads and do not form part of any scenic tourist routes. These roads are not specifically valued or utilised for their scenic or tourism potential and are therefore not regarded as visually sensitive.

The potentially sensitive visual receptor locations identified within the study area for the Impumelelo WEF are indicated in **Map 9 in Appendix G**.

4.1.8 Receptor Impact Rating

In order to assess the impact of the proposed WEF 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.

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 2 km of the proposed WEF development area. Beyond 10km, the impact of a WEF facility diminishes considerably, as the development would appear to merge with the elements on the horizon.

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, a series of low hills or a mine dump located between a receptor location and an object could completely shield the object from the receptor. As such, where views of the proposed development are completely screened, the receptor has been assigned an overriding negligible impact rating, as the development would not impose any impact on the receptor.

The visual contrast of a development refers to the degree to which the proposed WEF 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 visual receptors within a specific context. A development that is incongruent with the surrounding area could have a significant visual impact on visual receptors as it may change the visual character of the landscape.

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 main roads;
  - areas within 500m of railway infrastructure;
  - areas within 150m of cultivated land, commercial forest plantations and urban smallholdings.
- **Low** –
  - areas within 500m of urban / industrial / built-up areas;
  - areas within 500m of mines / quarries etc;

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

Table 2: Rating Scores

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

An explanation of the matrix is provided in **Table 3** below.

Table 3: Visual assessment matrix used to rate the impact of the proposed development on potentially sensitive receptors

VISUAL FACTOR	VISUAL IMPACT RATING			
	HIGH	**MODERATE**	**LOW**	**OVERRIDING FACTOR: NEGLIGIBLE**
Distance of receptor away from proposed development	<= 2km **Score 3**	2.1km - 6 km **Score 2**	6.1 km - 10 km **Score 1**	>10 km
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 landform), 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 landform), typical land use and/or human elements (infrastructural form) **Score 2**	**Corresponds** with the pattern and form of the natural landscape elements (vegetation and landform), typical land use and/or human elements (infrastructural form) **Score 1**	

The assessment of receptor impacts conducted during the Scoping Phase of the project was refined based on the EIA phase turbine layout provided by Impumelelo. This refined receptor impact rating for the Impumelelo WEF Project is provided in **Appendix C** while **Table 4** below presents a summary of the overall visual impact of the proposed WEF on each of the potentially sensitive visual receptor locations identified within 10kms of the Impumelelo WEF project area.

Table 4: Summary receptor impact rating for Impumelelo WEF

OVERALL IMPACT RATING	NUMBER OF SENSITIVE RECEPTORS	NUMBER OF POTENTIALLY SENSITIVE RECEPTORS
HIGH	0	1
MODERATE	0	51
LOW	0	22
TOTAL INCLUDED IN ASSESSMENT	**0**	**74**
>10KMS FROM NEAREST TURBINE	*0*	*17*
OUTSIDE VIEWSHED	*0*	*6*
TOTAL EXCLUDED FROM ASSESSMENT	**0**	**23**

The table above shows that a total of 97 receptors were identified within 10kms of the proposed Impumelelo WEF project area, twenty-three (23) of which are either outside the viewshed for the project or more than 10kms from the nearest wind turbine. None of the remaining receptors are considered sensitive. As previously mentioned, most of the locations identified are assumed to be farmsteads and although these residences could be considered to be receptors, given the degree of transformation in the landscape, not all of them would be sensitive to the proposed development

Only one (1) potentially sensitive receptor (VR55) is expected to experience high levels of visual impact. This receptor, along with VR33, VR51 and VR 56, is located within the Impumelelo WEF project area and as such the respective land-owners are not expected to perceive the proposed development in a negative light

Fifty-one (51) receptor locations are expected to experience moderate levels of impact as a result of the Impumelelo WEF development, while the remaining twenty-two (22) would only experience low levels of visual impact.

4.1.9 Photomontages

Photomontages (visual simulations) have been compiled to provide an indication of how the proposed Impumelelo WEF development would appear from selected view points within the visual assessment area. These viewpoints are shown in **Map 11 in Appendix F**. Photomontages for these locations were compiled by superimposing a 3 Dimensional model of the Impumelelo WEF turbine layout onto photographs taken during the site visit.

Limitations associated with this exercise are outlined below.

- Access to areas off the main roads was restricted and as such, only a limited number of suitable view points were photographed.
- Photomontages are specific to each location, and even sites in close proximity to one another may be affected in different ways by the proposed WEF development.

- The photomontages represent a visual environment that assumes that all vegetation cleared during construction will be restored to its current state after the construction phase. This is however an improbable scenario as some vegetation cover may be permanently removed which may reduce the accuracy of the models generated.
- Infrastructure associated with the WEF has not been included in the models.
- These photomontages have been provided merely as indicative illustrations and should not be seen as an accurate representation of the proposed Impumelelo WEF turbine layout.

However, the resulting photomontages presented below are still considered relevant as they illustrate how views from each selected viewpoint could potentially be transformed by the proposed WEF development if the wind turbines are erected within the project area as proposed.

Viewpoint IW1

This viewpoint is located on the in the Impumelelo WEF project area, on a secondary road, approximately 800mm from the nearest turbine placement **in the view** and is thus in a zone of high visual impact.

Figure 12: View north-east from Viewpoint IW1 Pre-Construction

Figure 13: View north-east from Viewpoint IW1 Post-Construction

Viewpoint IW2

This viewpoint is located on the western boundary of the Impumelelo WEF project area, on a secondary road, approximately 850m from the nearest turbine placement **in the view** and is thus in a zone of high visual impact.

Figure 14: View east-north-east from Viewpoint IW2 Pre-Construction

Figure 15: View east-north-east from Viewpoint IW2 Post-Construction

Viewpoint IW3

This viewpoint is located on south-west of the **Impumelelo** WEF project area, on a secondary road, approximately 4.5 km from the nearest turbine placement **in the view** and is thus in a zone of moderate visual impact.

Figure 16: View north-north-east from Viewpoint IW3 Pre-Construction

Figure 17: View north-north-east from Viewpoint IW3 Post-Construction

4.1.10 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.

The town of Greylingstad, located approximately 11 km south-west of the Impumelelo WEF project area is the main source of light within the study area. The town is expected to have a significant impact on the night scene in the south-eastern sector of the study area. Another prominent light source within the study area at night is the security lighting at the Impumelelo Mine to the north- east of the Impumelelo WEF project area.

Other light sources in the broader area would largely emanate from the many farmsteads dotted across the study area, and also from vehicles travelling along the local access 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 WEF 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 presence of a 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.

4.1.11 Existing and Proposed Renewable Energy Developments

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

- existing mining / quarrying activities, and
- other existing / proposed renewable energy facilities within a 55km radius.

Existing mining and industrial activity has already resulted in large scale visual impacts, especially to the north-east of the Impumelelo WEF where Impumelelo Mine has significantly altered the sense of place and visual character in the study area. Across the broader region, urban development and mining and industrial activity, including the Sasol Secunda synthetic fuel plant and Grootvlei Power Station further contribute to the transformed visual character of the landscape.

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. The South African Renewable Energy EIA Application Database from DFFE (REEA_OR_2022_Q2) records only two approved renewable energy project within 55kms of the Impumelelo project area. One of these is a 75MW Solar Photovoltaic (PV) facility located on several portions of the Farm Grootvlei No 453 IR, some 28 km south-east of the Impumelelo WEF project area, in close proximity to Grootvlei Power Station and well-established mining developments. The second project is the Tutuka 65.9MW Solar and associated infrastructure project this being a Solar Photovoltaic

(PV) facility located at the Tutuka Power Station, some 47km south east of the Impumelelo WEF project area;

Considering the distance of these projects from the Impumelelo WEF Project Area, it is not anticipated that this development will result in any significant cumulative impacts affecting the landscape or the visual receptors within the visual assessment zone for the Impumelelo WEF.

However, it is known that the Impumelelo WEF project forms part of a larger Renewable Energy cluster of projects proposed in the greater Secunda area. This complex, including wind (Impumelelo and Mukondeleli WEFs) and solar facilities (Vhuvhili SEF) as well as associated grid connection infrastructure, will affect much of the landscape to the south and south-west of Secunda.

From a visual perspective, the concentration of renewable energy facilities in close proximity to existing mining and industrial development as proposed will further change the visual character of the broader 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 impacts on the landscape.

4.2 Project Specific Description

As the focus of the VIA is largely on the potential impacts of the proposed development on the landscape and the receptors ***in the surrounding area***, the baseline information for the Impumelelo WEF project area is much the same as that for the broader area. The topography within the project areas will however influence the level of visibility of the proposed development and the prevalent land cover will determine the level of contrast that will be associated with the proposed development. Accordingly, project specific baseline information has only been examined in respect of topography / visibility and land use / land cover.

4.2.1 Topography

The project area for Impumelelo WEF is characterised by plateaus at slightly higher elevations intersected by shallow river valleys. Although some of the Wind turbines will be located on higher elevations, it is not anticipated that there will be significant impact on the skyline. In addition, topographic variations in the surrounding area are sufficient to limit views of the turbines from some parts of the study area, although across the remainder of the study area there would be little topographic shielding to reduce the visibility of the from many of the locally occurring receptor locations.

4.2.2 Land Use

The project area is largely characterised by cultivated land interspersed with significant areas of grassland. The wind turbine development area is mostly located on cultivated land in the central sections of the site and as such, the proposed development would alter the visual character and contrast significantly with the typical land use present across the development site.

4.3 Identification of Environmental Sensitivities

4.3.1 Sensitivities identified by the National Web-Based Environmental Screening Tool

In assessing the visual sensitivity of the proposed Impumelelo WEF project area, consideration was given to the Landscape and Flicker Themes of the National Environmental Screening Tool. The Landscape Theme of the National Environmental Screening Tool identifies areas of very high sensitivity in respect WEF development in the Impumelelo WEF project area (Figure 18). According to the

Screening Tool, the project area is associated with “mountain tops and high ridges” and this factor has resulted in areas of “Very High” landscape sensitivity in the central and north-western sectors of the site.

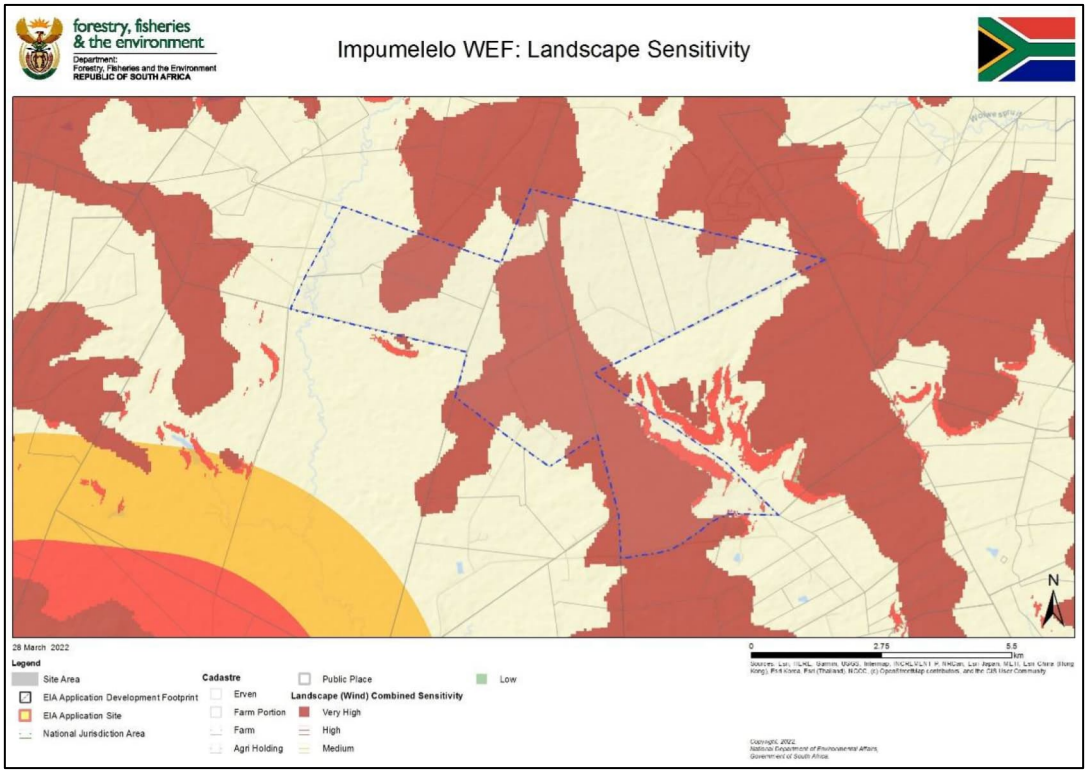


Figure 18: Relative Landscape Sensitivity within the Impumelelo WEF project area (March 2022)

The flicker theme demarcates areas (1 km buffers) of sensitivity around identified receptors in the area (**Figure 19**). Under this theme, potential flicker receptors have been identified on the site, or within 1 km of the site boundary. Buffers demarcated around these receptors have been assigned a “very high” sensitivity rating.

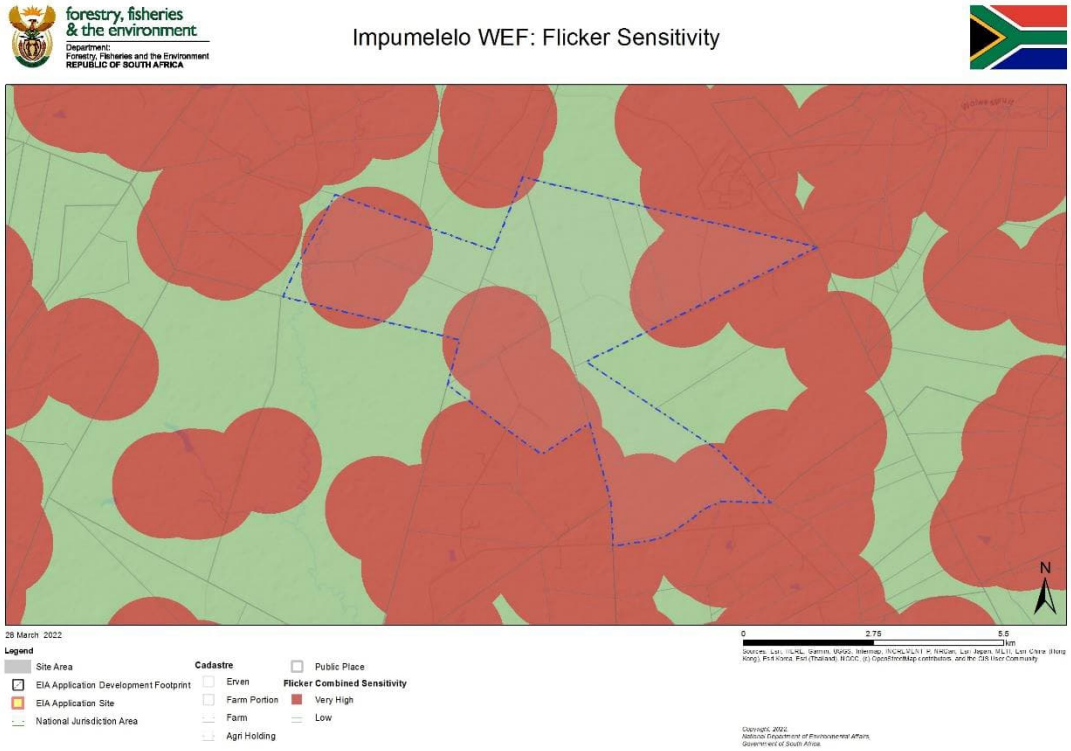


Figure 19: Flicker Sensitivity within the Impumelelo WEF site (March 2022)

The Screening Tool is however a very high level, desktop study and as such the results of the study must be viewed against the findings of the field investigation as well as factors affecting visual impacts such as:

- the presence of visual receptors;
- the distance of those receptors from the proposed development;
- the likely visibility of the development from the receptor locations; and
- the degree of landscape transformation and / or degradation already present.

4.3.2 Outcome of the Specialist 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 receiving environment, a matrix has been developed 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 5), 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 WEF 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 5: 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 pastoral with some areas of scenic value, although some areas are significantly transformed.										
Presence of sensitive visual receptors	No sensitive receptors have been identified in the study area, although *potentially* sensitive receptors are present.										
Aesthetic sense of place / visual character	Visual character is a typical rural / pastoral landscape, although significantly transformed by urban / industrial development and mining activity.										
Irreplaceability / uniqueness / scarcity value	Few areas of scenic value were found within the study area.										
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	No tourism/leisure-based facilities were found in the area										
International / regional / local status of the environment	Study area is typical of rural / pastoral landscapes, although significantly transformed by urban / industrial development and mining activity.										
**Scenic quality under threat / at risk of change	Introduction of a WEF will alter the visual character and sense of place, 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 32, 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 4.1.7** of this report. However, no formal protected areas, leisure-based tourism activities or sensitive receptor locations were identified in the study area.

During the Scoping Phase of the EIA process, all project specialists were requested to indicate environmentally sensitive areas within the WEF project area. The aim of this exercise was to demarcate any areas that should be precluded from the wind turbines development footprint. From a visual perspective, sensitive areas would be those where the establishment of wind turbines would result in the greatest probability of visual impacts on potentially sensitive visual receptors. The results of the exercise undertaken in respect of the proposed Impumelelo WEF are provided below and the identified areas of sensitivity in relation to the Scoping and EIA phase layouts are shown in are shown in **Maps 10A** and **10B in Appendix F**.

Using GIS-based visibility analysis, it was possible to determine that the tip of at least one turbine blade (I.e., at a maximum height of 300m) would be visible from many of the identified potentially sensitive receptors in the study area and as such, no areas on the site are significantly more visible than the remainder of the site. However, the visual prominence of a tall structure such as a wind turbine would be exacerbated if located on higher ridges or relatively higher-lying plateaus on the site. As such, it is recommended that wind turbines should preferably not be located on the highest ridges within the WEF development area. However, while these ridges could be seen as areas of potentially high visual sensitivity, the study area as a whole is rated as having a low to moderate visual sensitivity, and as such, the sensitivity rating would be reduced to “Medium-High”. Hence the ridges are **not considered to be “no go areas”**, but rather should be viewed as zones where turbine placement would be least preferred.

From a visual perspective, another concern aspect is the direct visual impact of the turbines on any farmsteads or receptors located on the application site. Accordingly, a 500m zone of potential visual sensitivity has been delineated around the existing residences on the application site and also around any receptors located within 500m of the site boundary. In addition, it is recommended that a 300m visual sensitivity zone is applied on either side of the district roads which traverse the WEF project area.

Limiting the development of wind turbines in these areas will reduce visual impacts and prevent significantly adverse impacts of flicker on the local residents and on passing motorists, although the full extent of these impacts can only be determined by way of a Flicker Impact Assessment. At this stage however, **the visual sensitivity zones are not considered “no go” areas**, but rather should be viewed as zones where development should preferably be limited. It should be stressed that these zones apply to turbine development only. The visual impacts resulting from the associated on-site infrastructure are considered to have far less significance when viewed in the context of the WEF as a whole and as such the associated on-site infrastructure has been excluded from the sensitivity analysis.

4.3.3 Sensitivity Analysis Summary Statement

Although the Screening Tool identifies significant areas of very high landscape and flicker sensitivity within the Impumelelo WEF project area, the site sensitivity verification exercise conducted in respect of this VIA (**Appendix C**) did not indicate the presence of mountaintops, *high* ridges or any significantly steep slopes. This assessment, confirmed by the field investigation, showed the presence of low ridges and plateaus in

a largely undulating landscape. The sensitivity analysis above has recognised these ridges and identified the higher ridges as zones where development would be least preferred.

The presence of receptors, either on the Impumelelo WEF application site, or within 1km of the site boundary, was confirmed by the site sensitivity verification exercise. However, an assessment of receptor locations using Google Earth showed that there were no receptors present at some of the locations identified by the National Screening Tool. The remaining (confirmed) receptors were factored into the sensitivity analysis, together with a 500m buffer.

5. Alternative Development Footprints

From a visual perspective, there are no fatal flaws associated with the EIA Phase WEF development footprint. However, lower lying ridges would be considered less visually sensitive, and thus would be considered more favourable.

6. Issues, Risks and Impacts

6.1 Identification of Potential Impacts/Risks

Potential visual issues / impacts identified during the EIA Phase VIA resulting from the proposed Impumelelo WEF, together with possible mitigation measures are outlined below.

6.1.1 Construction Phase: Potential Impact 1

- Potential alteration of the visual character and sense of place resulting from construction activities.
- Potential visual impacts of construction affecting receptors in the study area, including:
    - visual intrusion resulting from large construction vehicles and equipment;
    - visual effect of construction laydown areas and material stockpiles;
    - impacts of increased dust emissions from construction activities and related traffic;
    - visual scarring of the landscape as a result of site clearance and earthworks; and
    - visual pollution resulting from littering on the construction site.

6.1.2 Operational Phase: Potential Impact 2:

- Potential alteration of the visual character and sense of place;
- Potential visual impacts affecting receptors in the study area, including:
    - visual intrusion resulting from the presence of wind turbines, particularly in more natural undisturbed settings;
    - visual clutter caused by substation and other associated infrastructure on-site;
    - impacts of increased dust emissions from maintenance vehicles accessing the site via gravel roads; and
    - visual scarring of the landscape as a result of site clearance and earthworks.
- Potential visual effect on surrounding farmsteads; and
- Potential alteration of the night time visual environment as a result of operational and security lighting as well as navigational lighting on top of the wind turbines.

6.1.3 Decommissioning Phase: Impact 3

Potential visual impacts of decommissioning affecting receptors in the study area, including:

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

6.1.4 Cumulative Impacts: Impact 4

- Combined visual impacts from mining, 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, infrastructural and renewable energy development in the broader area could potentially exacerbate visual impacts on visual receptors.

7. Impact Assessment

7.1 Potential Impacts during the Construction Phase

Potential visual impacts identified during the Construction Phase of the project are listed below.

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

Table 6 below presents the detailed impact ratings associated with the construction of the Impumelelo WEF and associated infrastructure, together with the recommended mitigation measures.

Table 6: Direct Visual Impacts during Construction

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**						

7.2 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.
- Inform receptors within 1km of the WEF development area of the construction programme and schedules.
- Maintain a neat construction site by removing rubble, litter and waste materials regularly.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- 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.

7.3 Potential Impacts during the Operational Phase

7.3.1 Impact 2

Potential visual impacts identified during the Operational Phase of the project are listed below.

- The wind turbines may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings.
- The proposed WEF 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 nighttime visual environment will be altered as a result of operational and security lighting at the proposed WEF.

Table 7 below presents the detailed impact ratings associated with the operation of the Impumelelo WEF, together with the recommended mitigation measures.

Table 7: Direct Visual Impacts during Operation

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 development may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. ▪ The proposed WEF and associated infrastructure will alter the visual character of the surrounding area and expose potentially sensitive visual receptor locations to visual impacts. ▪ Shadow flicker 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 WEF.	Operation	Negative	Moderate	3	3	3	4	4	**52**	**N3**	3	3	3	4	4	**52**	**N3**
					Significance	**N3- Moderate**							**N3 - Moderate**						

7.4 Operational Phase Mitigation Measures

- Turbine colours should adhere to CAA requirements and any relevant mitigation measures recommended by the avifauna specialist. Bright colours and logos on the turbines should be kept to a minimum.
- Inoperative turbines should be repaired promptly, as they are considered more visually appealing when the blades are rotating (or at work) (Vissering, 2011).
- If turbines need to be replaced for any reason, they should be replaced with turbines of similar height and scale to lessen the visual impact.
- 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 (whilst adhering to relevant 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 relevant 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.
- Where possible, the operation and maintenance buildings should be consolidated to reduce visual clutter.
- Non-reflective surfaces should be used where possible.

7.5 Potential Impacts during the Decommissioning Phase

7.5.1 Impact 3

Potential visual impacts identified during the Decommissioning Phase of the project are listed below.

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

Error! Reference source not found. below presents the detailed impact ratings associated with the decommissioning of the Impumelelo WEF, together with the recommended mitigation measures.

Table 8: Direct Visual Impacts during Decommissioning

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. ▪ Decommissioned infrastructure left on the site may be visually intrusive.	Decommissioning	Negative	Moderate	3	2	3	4	3	**40**	**N3**	2	2	3	2	2	**18**	**N2**
					Significance	**N3- Moderate**							**N2 - Low**						

7.6 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.

7.7 Cumulative Impacts

7.7.1 Impact 4

Potential cumulative visual impacts identified of the project are listed below.

- Additional renewable energy and associated grid connection 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 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 nighttime visual environment could be altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area.

Table 9 below presents the detailed impact ratings associated with potential cumulative impacts resulting from the construction, operation and decommissioning of the Impumelelo WEF, together with the recommended mitigation measures.

Table 9: Cumulative Impacts

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	4	3	3	4	4	**56**	**N3**	4	3	3	4	4	**56**	**N3**
					Significance	**N3- Moderate**							**N3 - Moderate**						

7.8 Cumulative Impact Mitigation Measures

- Implementation of the mitigation measures as recommended above.

7.9 No-Go Impacts

Nature of the impact

The 'No Go' alternative is essentially the option of not developing the Impumelelo WEF project. The area would thus retain its visual character and sense of place and no visual impacts would be experienced by any locally occurring receptors.

Significance of impact without mitigation measures

Not applicable.

Significance of impact with mitigation measures

Not applicable.

8. Scoping Level Impact Assessment Summary

A scoping level impact assessment summary is provided in **Table 10** below.

Table 10: Overall Impact Significance (Post Mitigation)

Phase	**Overall Impact Significance**
Construction	Low (4)
Operational	Moderate (3)
Decommissioning	Low (4)
Nature of Impact	**Overall Impact Significance**
Cumulative - Construction	Moderate (3)
Cumulative - Operational	Moderate (3)
Cumulative - Decommissioning	Low (4)

9. Comparative Assessment of Alternatives

Two (2) substation / BESS site alternatives (Option 1 and Option 2) have been put forward for the EIA phase of the assessment process. The alternatives are shown on **Maps 3A and 3B in Appendix F**.

A comparative assessment of these alternatives has been undertaken 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 Table 11below.

Table 11: 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

A detailed comparative assessment table is provided in **Appendix G**. In summary however, no fatal flaws were identified for either of the proposed site alternatives for the substation / BESS for Impumelelo WEF and both alternatives were found to be favourable.

10. Legislative and Permit Requirements

Key legal requirements pertaining to the proposed 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). As part of the EIA process, the need for a VIA to be undertaken has been identified in order to assess the visual impact of the proposed Impumelelo WEF.

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 GN R 320 (20 March 2020 and Appendix 6 of 2014 NEMA EIA Regulations (as amended).

11. Conclusion

A visual study was conducted to assess the magnitude and significance of the potential visual impacts associated with the development of the proposed Impumelelo WEF near Secunda in Mpumalanga Province. The VIA has determined that the study area has a predominantly rural / pastoral visual character and as such, a WEF development would alter the visual character and contrast with the typical land use and/or pattern and form of human elements present across much of the broader study area. The level of contrast will however be reduced by the presence of mining activity and electrical and road infrastructure within the study area.

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. An important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs. No formal protected areas, leisure-based tourism activities or ***sensitive*** receptor locations were identified in the study area, thus confirming the low level of visual sensitivity.

The desktop assessment did however identify multiple farmsteads and residences within the study area that could be considered to be receptors, although not all of them would be sensitive to the proposed development. These farmsteads are however regarded as potentially sensitive visual receptors as elements of the proposed development could potentially alter natural or semi-natural vistas experienced from these locations. At this stage however, local sentiments towards the proposed development are not known.

A total of 97 potentially sensitive receptors were identified within 10 km of the proposed Impumelelo WEF project area, although twenty-three (23) of these receptors were found to be either outside the viewshed for the WEF or more than 10kms from the nearest turbine placement. None of the remaining receptors are considered sensitive. Only one (1) potentially sensitive receptor (VR55) is expected to experience high levels of visual impact. This receptor, along with VR33, VR51 and VR 56, is located within the Impumelelo WEF project area and as such the respective land-owners are not expected to perceive the proposed development in a negative light

Fifty-one (51) receptor locations are expected to experience moderate levels of impact as a result of the Impumelelo WEF development, while the remaining twenty-two (22) would only experience low levels of visual impact.

None of the roads in the study area are regarded as visually sensitive.

A preliminary assessment of overall impacts revealed that impacts associated with all the proposed Impumelelo WEF are of **low** significance during both construction and decommissioning phases. During operation however, visual impacts from the WEF would be of **moderate** significance with relatively few mitigation measures available to reduce the visual impact.

Considering the presence of existing mining activity, the Sasol fuel plant and proposals for other renewable energy facilities in the broader area, 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. Considering this, cumulative impacts have been rated as **moderate**.

A comparative assessment of site alternatives for the on-site Substation / BESS 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 either of the site alternatives and both alternatives were found to be **Favourable**.

From a visual perspective therefore, the proposed Impumelelo WEF project is deemed acceptable, and the Environmental Authorisation (EA) should be granted. SLR Consulting 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.

11.1 Visual Impact Statement

It is SLR Consulting's opinion that the potential visual impacts associated with the proposed Impumelelo WEF are negative and of moderate significance. Given the absence of sensitive receptors and the level of human transformation and landscape degradation in areas near the proposed Impumelelo WEF, the project is deemed acceptable from a visual perspective and the EA should be granted. SLR Consulting 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.

12. References

Barthwal, R. 2002. Environmental Impact Assessment. New Age International Publishes, New Delhi.

Breedlove, G., 2002. A systematic for the South African Cultural Landscapes with a view to implementation. Thesis – University of Pretoria.

Bishop, I.D. and Miller, D.R. (2007) Visual Assessment of Offshore Wind Turbines: The Influence of Distance, Contrast, Movement and Social Variables. Renewable Energy, 32, 814-831.

Ecotricity Website: http://www.ecotricity.co.uk.

Google Earth, 2022

DFFE, National Environmental Screening Tool 2022

Mucina L., and Rutherford M.C., (eds) 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

National Environmental Management Act, 1998 (Act No. 107 of 1998), (NEMA)

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.

South African National Land-Cover Dataset, © GEOTERRAIMAGE - 2020

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.

UNESCO. 2005. Operational Guidelines for the Implementation of the World Heritage Convention. UNESCO World Heritage Centre. Paris

Appendix A - Specialist Expertise

- Please add 2-3-page CV that includes specialist details, and relevant expertise that the specialist has to compile this specialist report.

Appendix B - Specialist Statement of Independence

Note from the CSIR: Specialists to please include a signed and commissioned copy of the specialist declaration form. CSIR to provide Specialist declaration forms.

Appendix C: EIA Phase Receptor Impact Rating Table

Receptor Location	Distance to nearest Turbine			Screening		Contrast		OVERALL IMPACT RATING	
	KMs	Rating		Rating		Rating		Rating	
INCLUDED IN ASSESSMENT									
VR1 - Farmstead	9.0	Low	1	Low	1	Mod	2	LOW	4
VR2 - Farmstead	8.8	Low	1	Low	1	Mod	2	LOW	4
VR3 - Farmstead	8.3	Low	1	Low	1	Mod	2	LOW	4
VR5 - Farmstead	5.5	Mod	2	High	3	Mod	2	MODERATE	7
VR6 - Farmstead	7.1	Low	1	Low	1	Mod	2	LOW	4
VR7 - Farmstead	4.5	Mod	2	Low	1	Mod	2	MODERATE	5
VR8 - Farmstead	6.0	Mod	2	Mod	2	Mod	2	MODERATE	6
VR9 - Farmstead	4.8	Mod	2	Mod	2	Mod	2	MODERATE	6
VR10 - Farmstead	4.7	Mod	2	Low	1	Mod	2	MODERATE	5
VR11 - Farmstead	2.5	Mod	2	Mod	2	Mod	2	MODERATE	6
VR12 - Farmstead	4.6	Mod	2	Mod	2	Mod	2	MODERATE	6
VR15 - Farmstead	10.0	Low	1	Low	1	Mod	2	LOW	4
VR16 - Farmstead	9.9	Low	1	Mod	2	Mod	2	MODERATE	5
VR17 - Farmstead	8.0	Low	1	Mod	2	Mod	2	MODERATE	5
VR18 - Farmstead	8.3	Low	1	Mod	2	Mod	2	MODERATE	5
VR19 - Farmstead	8.3	Low	1	Mod	2	Mod	2	MODERATE	5
VR21 - Farmstead	8.2	Low	1	Low	1	Mod	2	LOW	4
VR22 - Farmstead	6.0	Mod	2	Low	1	Mod	2	MODERATE	5
VR23 - Farmstead	10.0	Low	1	Low	1	Mod	2	LOW	4
VR24 - Farmstead	8.0	Low	1	Low	1	Mod	2	LOW	4
VR25 - Farmstead	9.1	Low	1	Mod	2	Mod	2	MODERATE	5
VR27 - Farmstead	8.2	Low	1	Low	1	Mod	2	LOW	4
VR28 - Farmstead	4.3	Mod	2	Low	1	Mod	2	MODERATE	5
VR29 - Farmstead	4.1	Mod	2	Low	1	Mod	2	MODERATE	5
VR30 - Farmstead	2.4	Mod	2	Low	1	High	3	MODERATE	6
VR31 - Farmstead	2.4	Mod	2	Mod	2	Mod	2	MODERATE	6
VR32 - Farmstead	2.0	Mod	2	Mod	2	Mod	2	MODERATE	6
*VR33 - Farmstead^*	*0.7*	*High*	*3*	*Mod*	*2*	*Mod*	*2*	*MODERATE*	*7*
VR36 - Farmstead	6.5	Low	1	Mod	2	Mod	2	MODERATE	5
VR38 - Farmstead	8.4	Low	1	Low	1	High	3	MODERATE	5

VR39 - Farmstead	7.6	Low	1	Mod	2	Mod	2	MODERATE	5
VR40 - Farmstead	6.5	Low	1	Low	1	Mod	2	LOW	4
VR41 - Farmstead	4.7	Mod	2	Mod	2	Mod	2	MODERATE	6
VR42 - Farmstead	*7.4*	*Low*	*1*	*Low*	*1*	*Mod*	*2*	*LOW*	*4*
VR47 - Farmstead	4.3	Mod	2	Low	1	Mod	2	MODERATE	5
VR48 - Farmstead	7.5	Low	1	Low	1	Mod	2	LOW	4
VR49 - Farmstead	9.0	Low	1	Low	1	Mod	2	LOW	4
VR50 - Farmstead	7.6	Low	1	Mod	2	High	3	MODERATE	6
*VR51 - Farmstead^*	*0.9*	*High*	*3*	*Mod*	*2*	*Mod*	*2*	*MODERATE*	*7*
VR52 - Farmstead	1.1	High	3	Mod	2	Mod	2	MODERATE	7
VR53 - Farmstead	2.5	Mod	2	Low	1	Mod	2	MODERATE	5
VR54 - Farmstead	3.1	Mod	2	Low	1	Mod	2	MODERATE	5
*VR55 - Farmstead^*	*0.4*	*High*	*3*	*High*	*3*	*Mod*	*2*	*HIGH*	*8*
*VR56 - Farmstead^*	*1.1*	*High*	*3*	*Low*	*1*	*Mod*	*2*	*MODERATE*	*6*
VR62 - Farmstead	7.7	Low	1	High	3	Mod	2	MODERATE	6
VR64 - Farmstead	6.2	Low	1	Low	1	Mod	2	LOW	4
VR65 - Farmstead	6.7	Low	1	Mod	2	Mod	2	MODERATE	5
VR66 - Farmstead	3.0	Mod	2	Mod	2	Mod	2	MODERATE	6
VR67 - Farmstead	3.8	Mod	2	Low	1	Mod	2	MODERATE	5
VR68 - Farmstead	4.3	Mod	2	Mod	2	Mod	2	MODERATE	6
VR69 - Farmstead	6.1	Low	1	Low	1	Mod	2	LOW	4
VR70 - Farmstead	1.8	High	3	Low	1	Mod	2	MODERATE	6
VR71 - Farmstead	2.7	Mod	2	Low	1	Mod	2	MODERATE	5
VR72 - Farmstead	3.7	Mod	2	Mod	2	Mod	2	MODERATE	6
VR73 - Farmstead	5.9	Mod	2	Low	1	Mod	2	MODERATE	5
VR74 - Farmstead	5.1	Mod	2	Low	1	Mod	2	MODERATE	5
VR75 - Farmstead	4.2	Mod	2	Low	1	Mod	2	MODERATE	5
VR76 - Farmstead	0.9	High	3	Mod	2	Mod	2	MODERATE	7
VR77 - Farmstead	1.5	High	3	Mod	2	Mod	2	MODERATE	7
VR78 - Farmstead	2.0	High	3	Mod	2	Mod	2	MODERATE	7
VR79 - Farmstead	4.1	Mod	2	Mod	2	Mod	2	MODERATE	6
VR80 - Farmstead	4.1	Mod	2	Low	1	Mod	2	MODERATE	5
VR81 - Farmstead	3.8	Mod	2	Mod	2	Mod	2	MODERATE	6
VR82 - Farmstead	5.7	Mod	2	Low	1	Mod	2	MODERATE	5
VR83 - Farmstead	6.5	Low	1	Mod	2	Mod	2	MODERATE	5
VR84 - Farmstead	7.0	Low	1	Low	1	Mod	2	LOW	4
VR85 - Farmstead	8.4	Low	1	Mod	2	Mod	2	MODERATE	5

VR86 - Farmstead	8.6	Low	1	Low	1	Mod	2	LOW	4
VR87 - Farmstead	10.0	Low	1	Low	1	Mod	2	LOW	4
VR88 - Farmstead	8.2	Low	1	Low	1	Mod	2	LOW	4
VR89 - Farmstead	9.8	Low	1	Low	1	Mod	2	LOW	4
VR90 - Farmstead	6.5	Low	1	Low	1	Mod	2	LOW	4
VR91 - Farmstead	8.6	Low	1	Low	1	Mod	2	LOW	4
VR92 - Farmstead	6.7	Low	1	Mod	2	Mod	2	MODERATE	5
EXCLUDED FROM ASSESSMENT									
*VR13 - Farmstead**	*11.3*	*NIL*							
*VR14 - Farmstead**	*11.1*	*NIL*							
*VR20 - Farmstead**	*10.4*	*NIL*							
*VR34 - Farmstead**	*10.5*	*NIL*							
*VR35 - Farmstead**	*10.6*	*NIL*							
*VR43 - Farmstead**	*10.4*	*NIL*							
*VR44 - Farmstead**	*10.4*	*NIL*							
*VR57 - Farmstead**	*11.0*	*NIL*							
*VR58 - Farmstead**	*10.3*	*NIL*							
*VR59 - Farmstead**	*10.4*	*NIL*							
*VR60 - Farmstead**	*10.9*	*NIL*							
*VR63 - Farmstead**	*10.8*	*NIL*							
*VR93 - Farmstead**	*10.6*	*NIL*							
*VR94 - Farmstead**	*11.3*	*NIL*							
*VR95 - Farmstead**	*10.4*	*NIL*							
*VR96 - Farmstead**	*10.6*	*NIL*							
*VR97 - Farmstead**	*11.0*	*NIL*							
VR4 - Farmstead#	*7.8*	*NIL*							
VR26 - Farmstead#	*10.3*	*NIL*							
VR37 - Farmstead#	*9.9*	*NIL*							
VR45 - Farmstead#	*9.5*	*NIL*							
VR46 - Farmstead#	*8.9*	*NIL*							
VR61 - Farmstead#	*11.0*	*NIL*							

** Receptor is more than 10kms from the nearest wind turbine*

 # Receptor is outside the viewshed for the wind turbines

^ Receptor is inside the Impumelelo WEF project area

Appendix D - Site Sensitivity Verification

Prior to commencing with the specialist assessment in accordance with Appendix 6 of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014, a site sensitivity verification was undertaken in order to confirm the current land use and environmental sensitivity of the proposed Impumelelo WEF project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool). This site sensitivity verification was undertaken in adherence to the gazetted Environmental Assessment Protocols, specifically with 'Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed' (GG 43110 / GNR 320, 20 March 2020),

The details of the site sensitivity verification are noted below:

Date of Site Visit	25 – 26 January 2022
Specialist Name	Assessment undertaken by Kerry Schwartz Field investigation undertaken by Stephan Jacobs and Gugu
Professional Registration Number	South African Geomatics Council – GTc GISc 1187
Specialist Affiliation / Company	SLR Consulting

1. Site Sensitivity Verification

A site sensitivity verification has been conducted in support of the Visual Impact Assessment (VIA) for the Impumelelo WEF near Secunda in Mpumalanga Province. The verification exercise is based on a desktop-level assessment supported by field-based observation and involved an assessment of factors as outlined below.

1.1 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 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 analysis were then checked against the findings of the site visit.

1.2 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 by way of a desktop assessment as well as field-based investigation. Google Earth imagery (2022) was used to identify potential receptors within the study area and where possible, these receptor locations were then checked against the findings of the field investigation.

1.3 Fieldwork and photographic review

A two (2) day site visit was undertaken between the 25th and the 26th of January 2022 (mid-summer). 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).

1.4 Sources of Information

The main sources of information utilized for this site sensitivity verification exercise included:

- Elevation data (5m contours) 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 (2020);
- Vegetation classification data extracted from the South African National Biodiversity Institute's (SANBI's) VEGMAP 2018 dataset;
- Google Earth Satellite imagery 2022;
- South African Renewable Energy EIA Application Database from Department of Environmental Affairs (incremental release Quarter 2 2021);
- The National Web-Based Environmental Screening Tool, Department of Forestry, Fisheries and Environment (DFFE);

2. Outcome of Site Sensitivity Verification

The assessment has shown that the study area has a predominantly rural / pastoral visual character and as such, a WEF development would alter the visual character and contrast with the typical land use and/or pattern and form of human elements present across much of the broader study area. The level of contrast will however be reduced by the presence of mining activity and electrical and road infrastructure within the study area.

.

A broad-scale assessment of landscape sensitivity, based on the physical characteristics of the study area, economic activities and land use that predominates, determined that the area would have a low visual sensitivity. No formal protected areas, leisure-based tourism activities or ***sensitive*** receptor locations were identified in the study area, thus confirming the low level of visual sensitivity.

A site sensitivity assessment was undertaken to inform the site layout for the WEF with the aim of indicating any areas within the proposed WEF project area which should be precluded from the development footprint. From a visual perspective, sensitive areas would be areas where the establishment of wind turbines would result in the greatest probability of visual impacts on potentially sensitive visual receptors.

Using GIS-based visibility analysis, it was possible to determine that the tip of at least one turbine blade (I.e., at a maximum height of 300m) would be visible from many of the identified potentially sensitive receptors in the study area and as such, no areas on the site are significantly more visible than the remainder of the site. However, the visual prominence of a tall structure such as a wind turbine would be exacerbated if located on higher ridges or relatively higher-lying plateaus on the site. As such, it is recommended that wind turbines should preferably not be located on the highest ridges within the WEF development area. While these ridges could be seen as areas of potentially high visual sensitivity, the study area as a whole is rated as having a low to moderate visual sensitivity, and as such, the sensitivity rating would be reduced to "Medium-High". Hence the ridges are **not considered to be "no go areas"**, but rather should be viewed as zones where turbine placement would be least preferred.

In determining visual sensitivity, consideration must be given to the direct visual impact of the turbines on any farmsteads or receptors located on the application site. Accordingly, a 500m zone of potential visual sensitivity has been delineated around the existing residences on the application site and also around any

receptors located within 500m of the site boundary. In addition, it is recommended that a 300m visual sensitivity zone is applied on either side of the district roads which traverse the WEF project area.

Limiting the development of turbines in these areas will reduce visual impacts and prevent significantly adverse impacts of glint and glare on the local residents and on passing motorists, although the full extent of these impacts can only be determined by way of a Flicker Impact Assessment. At this stage however**, the visual sensitivity zones are not considered "no go" areas**, but rather should be viewed as zones where development should be limited. It should be stressed that these zones apply to wind turbines development only. The visual impacts resulting from the associated on-site infrastructure are considered to have far less significance when viewed in the context of the WEF as a whole and as such the associated on-site infrastructure has been excluded from the sensitivity analysis.

The areas identified as visually sensitive toWEF development are shown in Error! Reference source not found.**.**

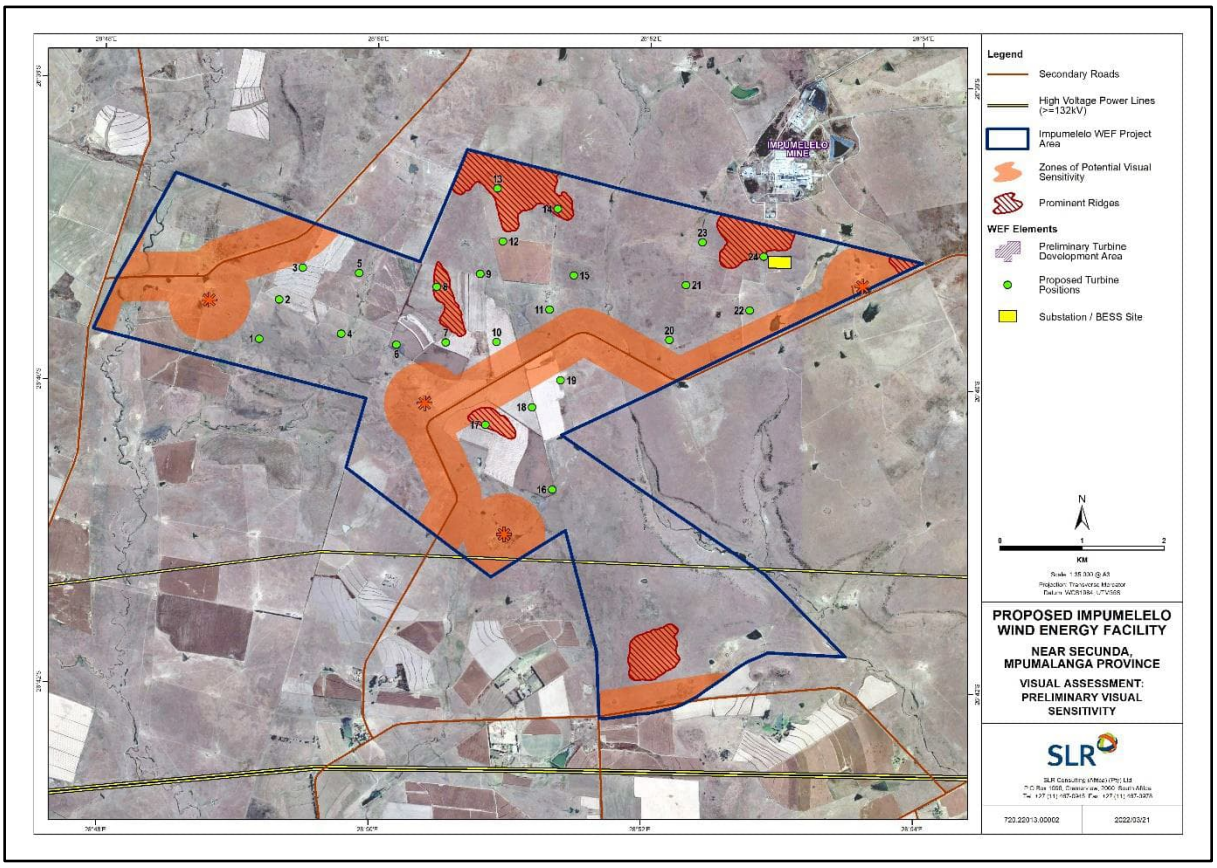


Figure 1: Areas of Potential Visual Sensitivity in the Impumelelo WEF Project Area

3. National Environmental Screening Tool

In assessing the visual sensitivity of the proposed Impumelelo WEF project area, consideration was given to the Landscape and Flicker Themes of the National Environmental Screening Tool. The Landscape Theme of the National Environmental Screening Tool identifies areas of very high sensitivity in respect WEF development in the Impumelelo WEF project area (**Figure 2**). According to the Screening Tool, the project area is associated with "mountain tops and high ridges" and this factor has resulted in areas of "Very High" landscape sensitivity in the central and north-western sectors of the site.

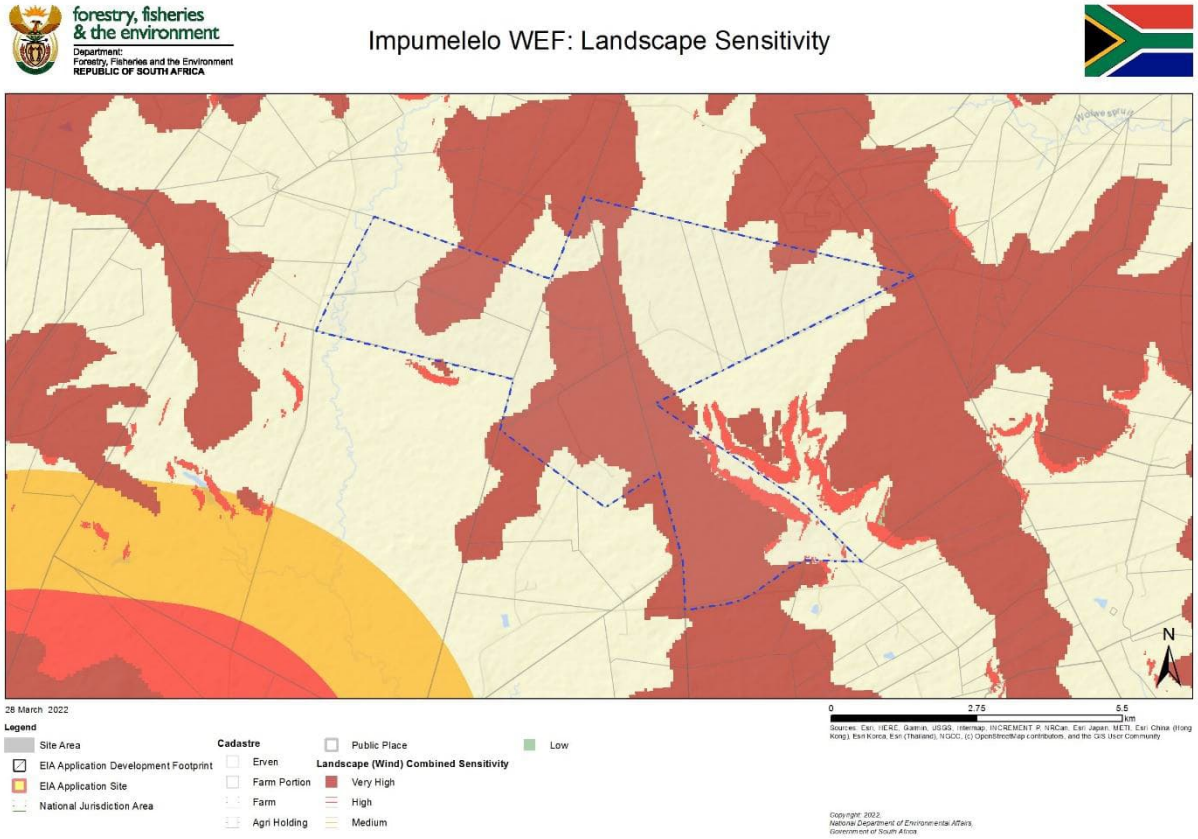


Figure 2: Impumelelo Relative Landscape Sensitivity (March 2022)

The flicker theme demarcates areas (1 km buffers) of sensitivity around identified receptors in the area (**Figure** 19**3**). Under this theme, potential flicker receptors have been identified on the site, or within 1 km of the site boundary. Buffers demarcated around these receptors have been assigned a "very high" sensitivity rating.

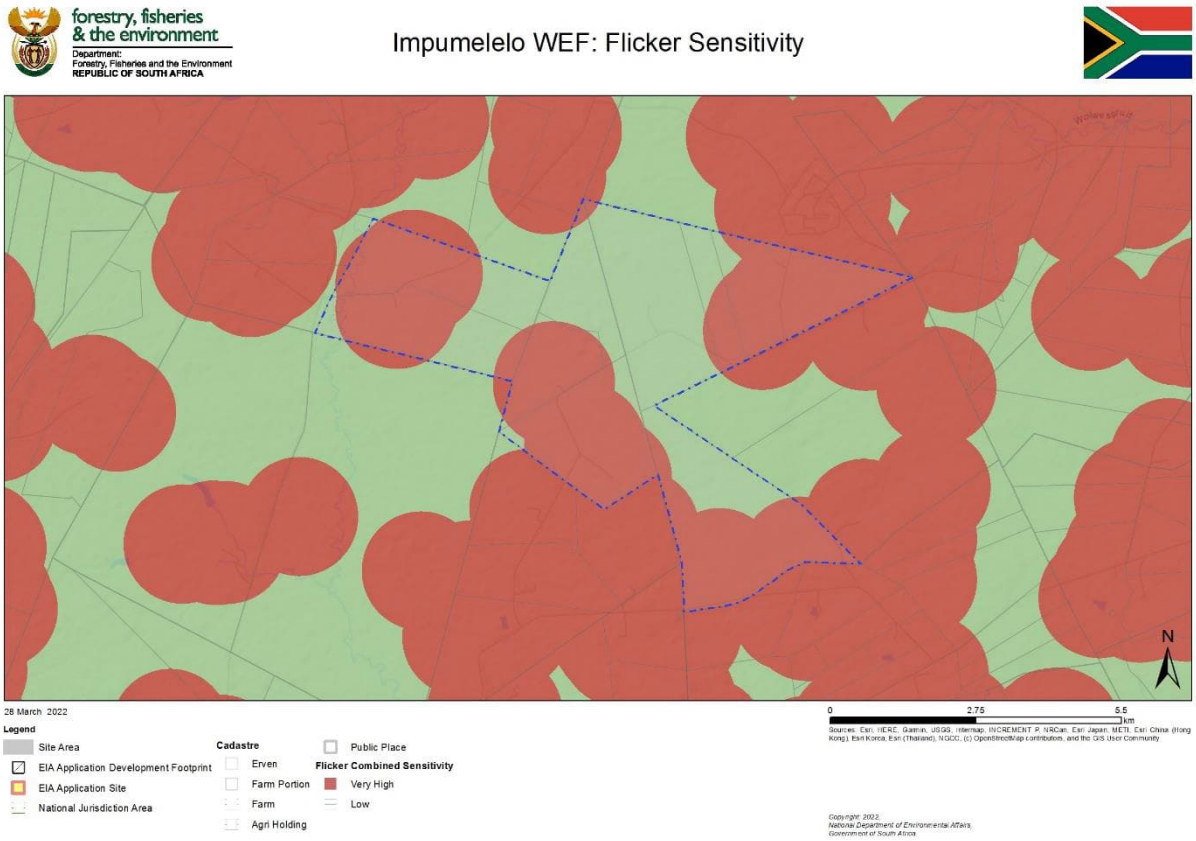


Figure 3: Impumelelo Flicker Sensitivity (March 2022)

The Screening Tool is however a very high level, desktop study and as such the results of the study must be viewed against the findings of the field investigation as well as factors affecting visual impacts such as:

- the presence of visual receptors;
- the distance of those receptors from the proposed development;
- the likely visibility of the development from the receptor locations; and
- the degree of landscape transformation and / or degradation already present.

4. Sensitivity Analysis Summary

Although the Screening Tool identifies significant areas of very high landscape and flicker sensitivity within the Impumelelo WEF project area, the site sensitivity verification exercise did not indicate the presence of mountaintops, *high* ridges or any significantly steep slopes. This assessment, confirmed by the field investigation, showed the presence of low ridges and plateaus in a largely undulating landscape. The sensitivity analysis above has recognised these ridges and identified the higher ridges as zones where development would be least preferred.

The presence of receptors, either on the Impumelelo WEF application site, or within 1km of the site boundary, was confirmed by the site sensitivity verification exercise. However, an assessment of receptor locations using Google Earth showed that there were no receptors present at some of the locations identified by the National Screening Tool. The remaining (confirmed) receptors were factored into the sensitivity analysis, together with a 500m buffer.

5. Conclusion

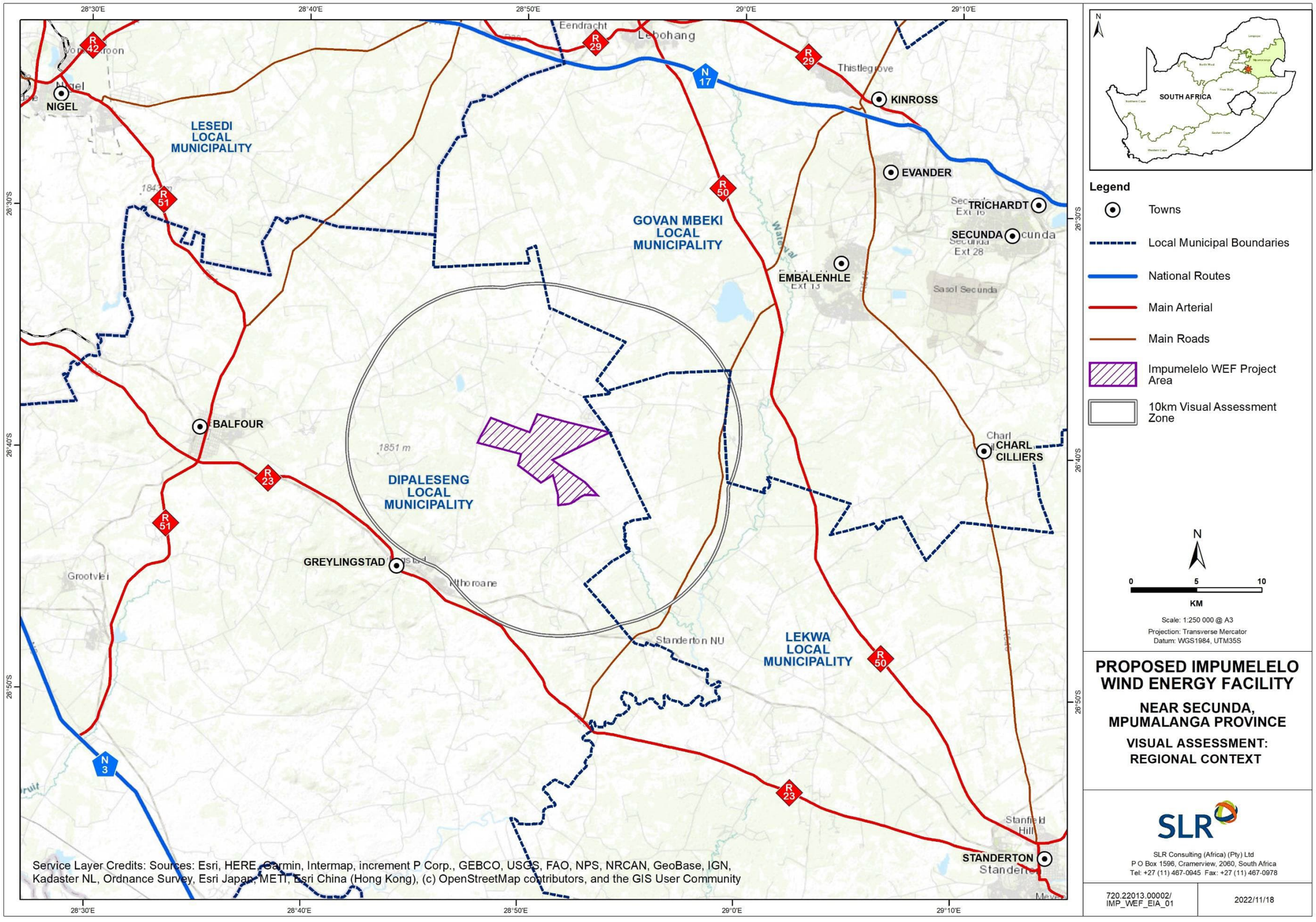
A site sensitivity verification has been conducted in support of the Visual Impact Assessment (VIA) for the Impumelelo WEF near Secunda in Mpumalanga Province. This verification has been based on a desktop-level assessment supported by field-based observation.

As outlined above, the sensitivities identified have been further assessed in relation to the sensitivities identified in terms of the Landscape Theme of the National Environmental Screening Tool and the areas identified as visually sensitive during the course of the specialist VIA and associated field work have been verified.

Appendix E: Impact Assessment Methodology

Appendix F: Maps

MAP 1: Regional Context



Legend

- Towns
- Local Municipal Boundaries
- National Routes
- Main Arterial
- Main Roads
- Impumelelo WEF Project Area
- 10km Visual Assessment Zone

N

0 5 10

KM

Scale: 1:250 000 @ A3

Projection: Transverse Mercator

Datum: WGS1984, UTM35S

PROPOSED IMPUMELELO WIND ENERGY FACILITY

NEAR SECUNDA, MPUMALANGA PROVINCE

VISUAL ASSESSMENT: REGIONAL CONTEXT

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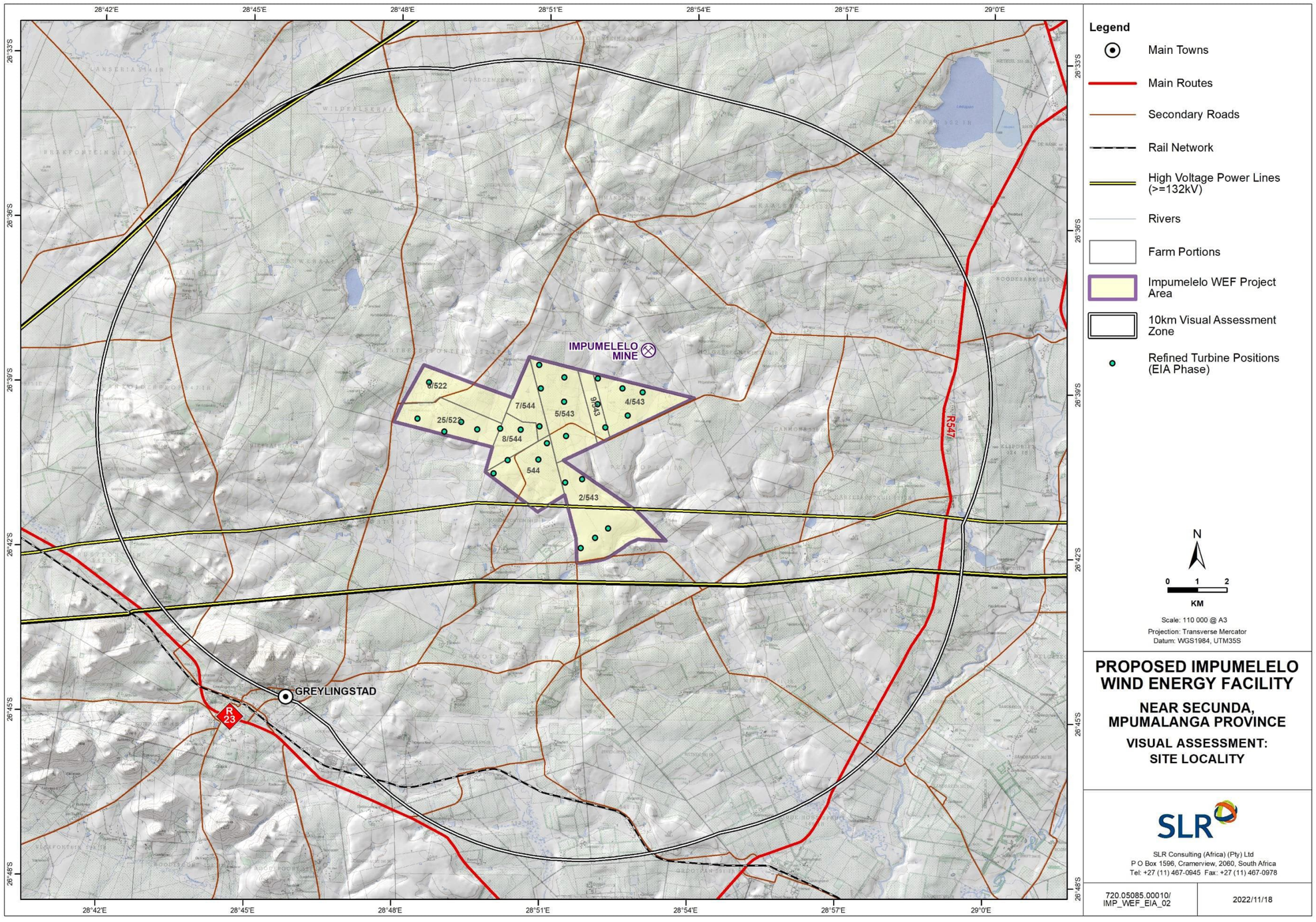
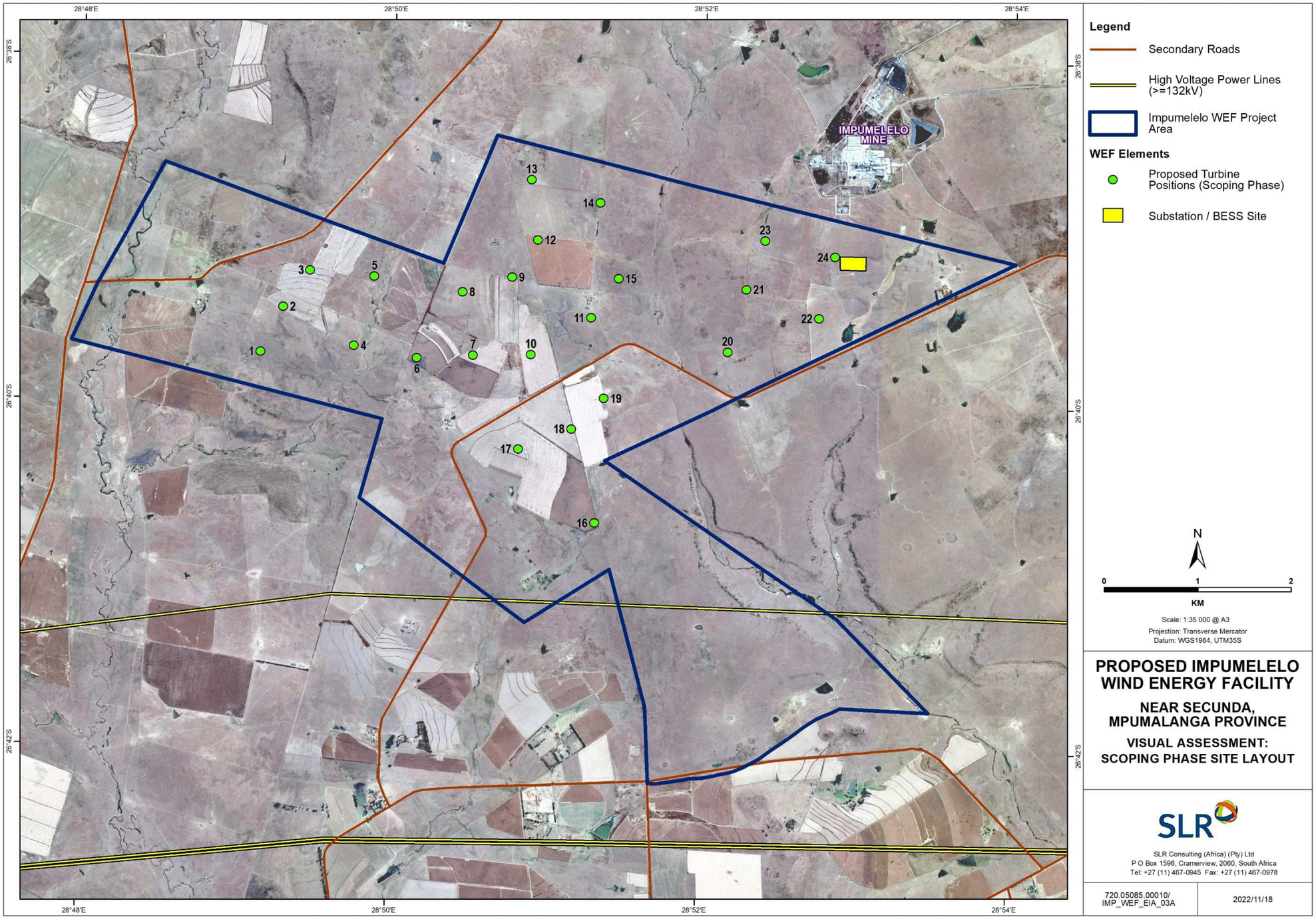
MAP 2: Site Locality



MAP 3A: Scoping Phase Site Layout



Legend

- Secondary Roads
- High Voltage Power Lines (>=132kV)
- Impumelelo WEF Project Area

WEF Elements

- Proposed Turbine Positions (Scoping Phase)
- Substation / BESS Site

N

0 1 2

KM

Scale: 1:35 000 @ A3
Projection: Transverse Mercator
Datum: WGS1984, UTM35S

PROPOSED IMPUMELELO WIND ENERGY FACILITY

NEAR SECUNDA, MPUMALANGA PROVINCE

VISUAL ASSESSMENT: SCOPING PHASE SITE LAYOUT

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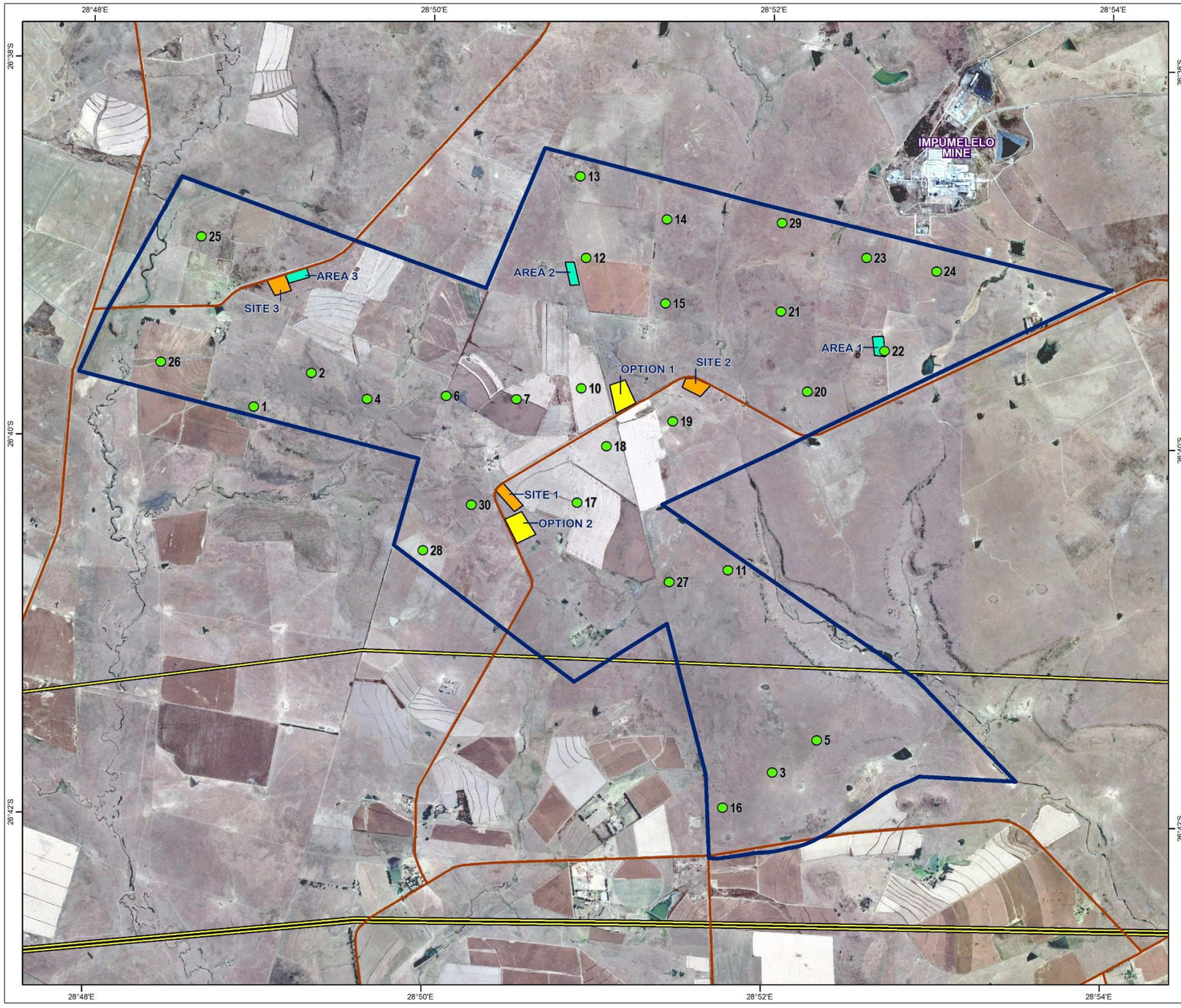
MAP 3B: EIA Phase Site Layout



Legend

- Secondary Roads
- High Voltage Power Lines (>=132kV)
- Impumelelo WEF Project Area

WEF Elements

- Refined Turbine Positions (EIA Phase)
- Substation / BESS Site Alternatives
- Construction Camp / Batching Plants
- Temporary Laydown Areas

N

0 1 2

KM

Scale: 1:35 000 @ A3
Projection: Transverse Mercator
Datum: WGS1984, UTM35S

PROPOSED IMPUMELELO WIND ENERGY FACILITY

NEAR SECUNDA, MPUMALANGA PROVINCE

VISUAL ASSESSMENT: EIA PHASE SITE LAYOUT

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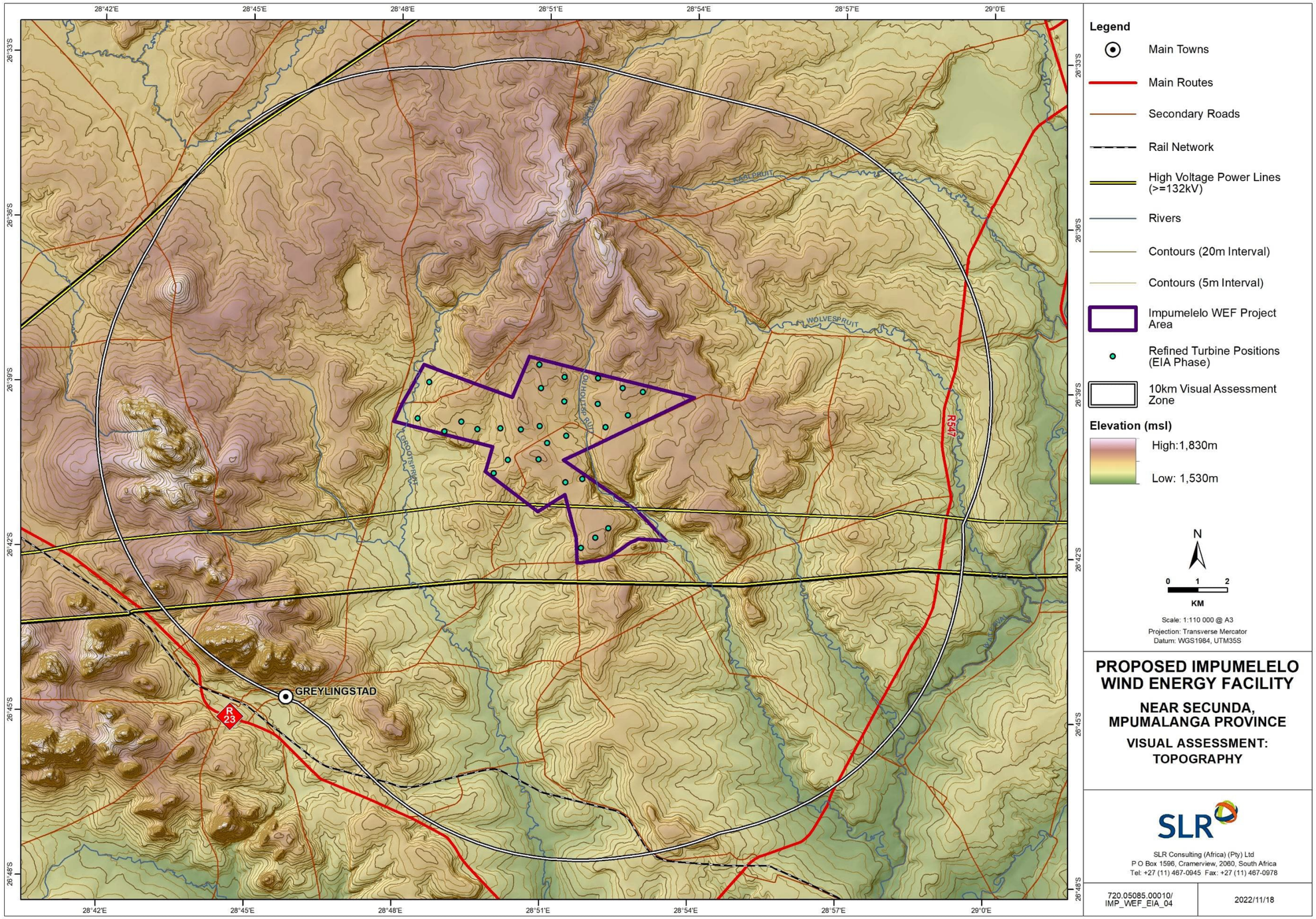
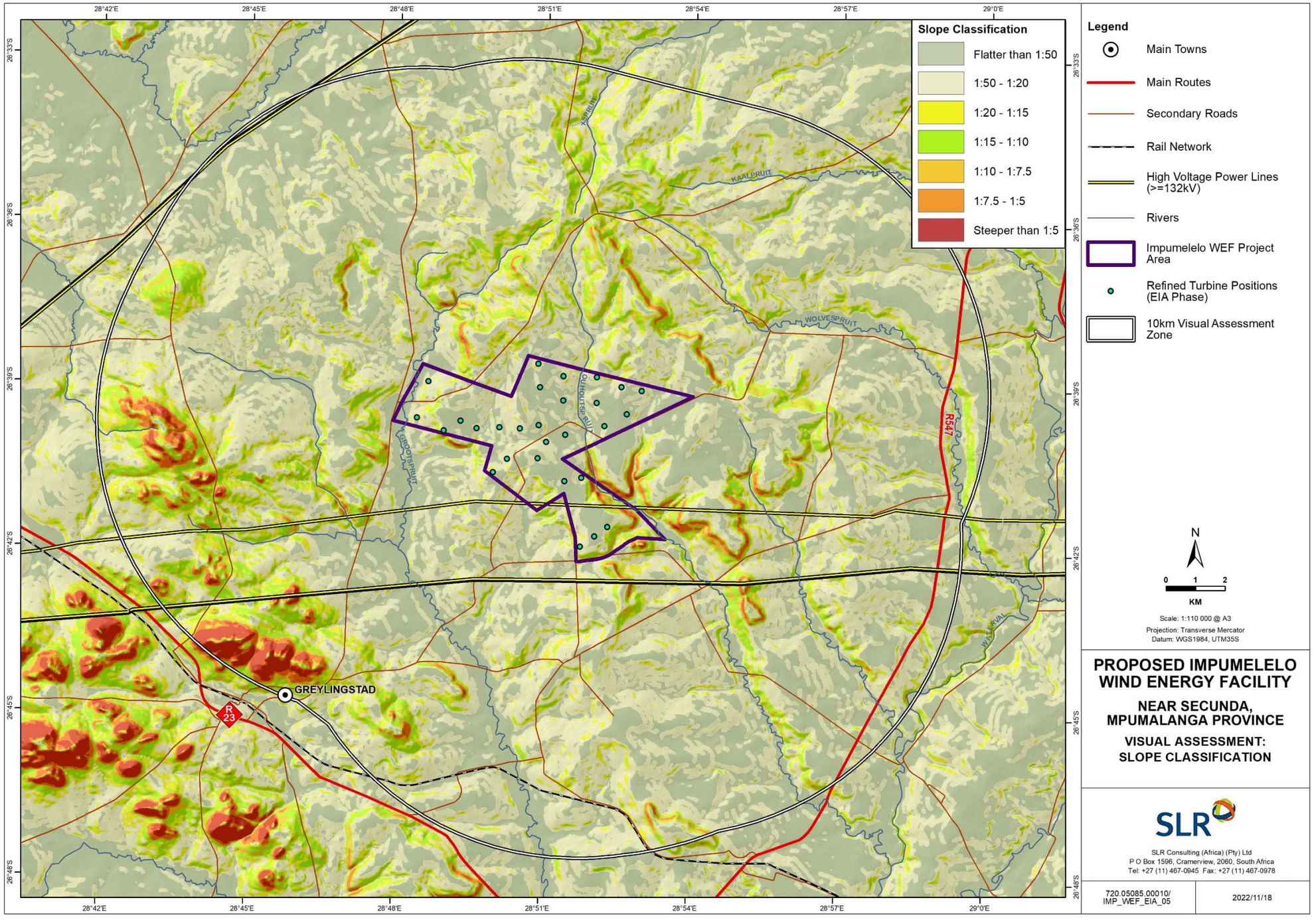
MAP 4: Topography



MAP 5: Slope Classification



Scale: 1:110 000 @ A3
Projection: Transverse Mercator
Datum: WGS1984, UTM35S

PROPOSED IMPUMELELO WIND ENERGY FACILITY

NEAR SECUNDA, MPUMALANGA PROVINCE

VISUAL ASSESSMENT: SLOPE CLASSIFICATION

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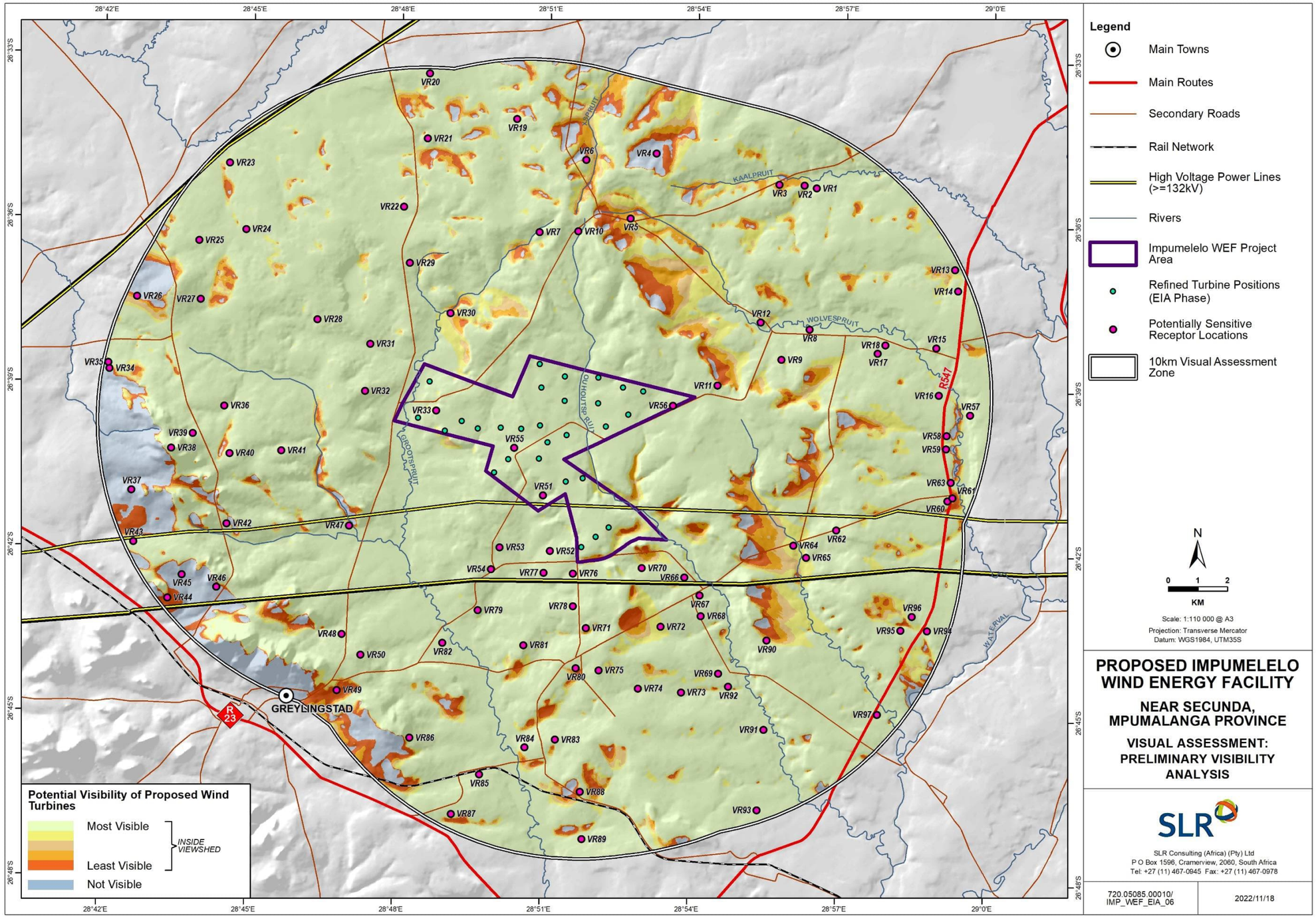
MAP 6: Potential Visibility of Wind Turbines



PROPOSED IMPUMELELO WIND ENERGY FACILITY

NEAR SECUNDA, MPUMALANGA PROVINCE

VISUAL ASSESSMENT: PRELIMINARY VISIBILITY ANALYSIS

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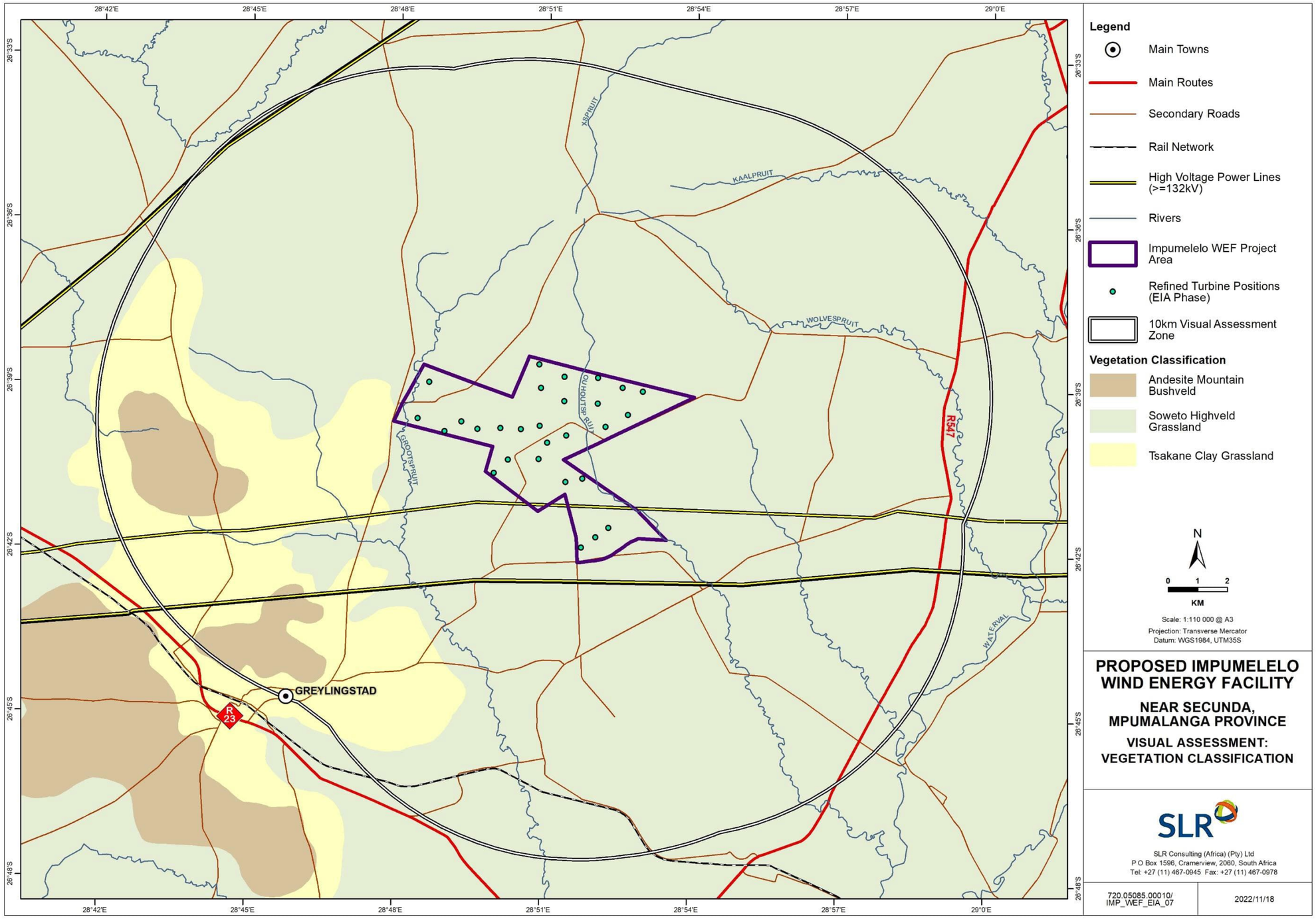
MAP 7: Vegetation Classification



PROPOSED IMPUMELELO WIND ENERGY FACILITY

NEAR SECUNDA, MPUMALANGA PROVINCE

VISUAL ASSESSMENT: VEGETATION CLASSIFICATION

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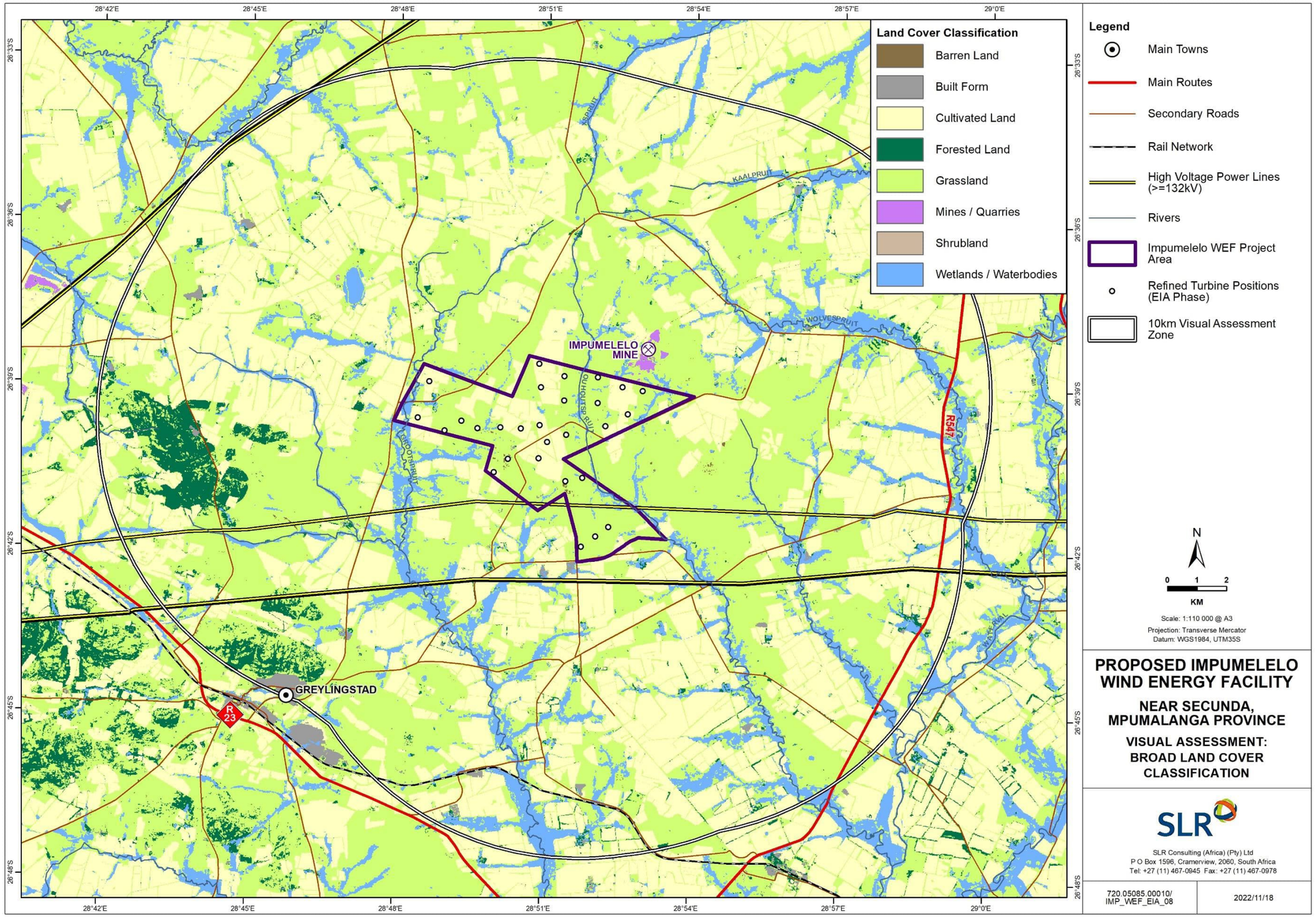
720.05085.00010/ IMP_WEF_EIA_07	2022/11/18

MAP 8: Land Cover Classification



Scale: 1:110 000 @ A3
Projection: Transverse Mercator
Datum: WGS1984, UTM35S

PROPOSED IMPUMELELO WIND ENERGY FACILITY

NEAR SECUNDA, MPUMALANGA PROVINCE

VISUAL ASSESSMENT: BROAD LAND COVER CLASSIFICATION

SLR Consulting (Africa) (Pty) Ltd
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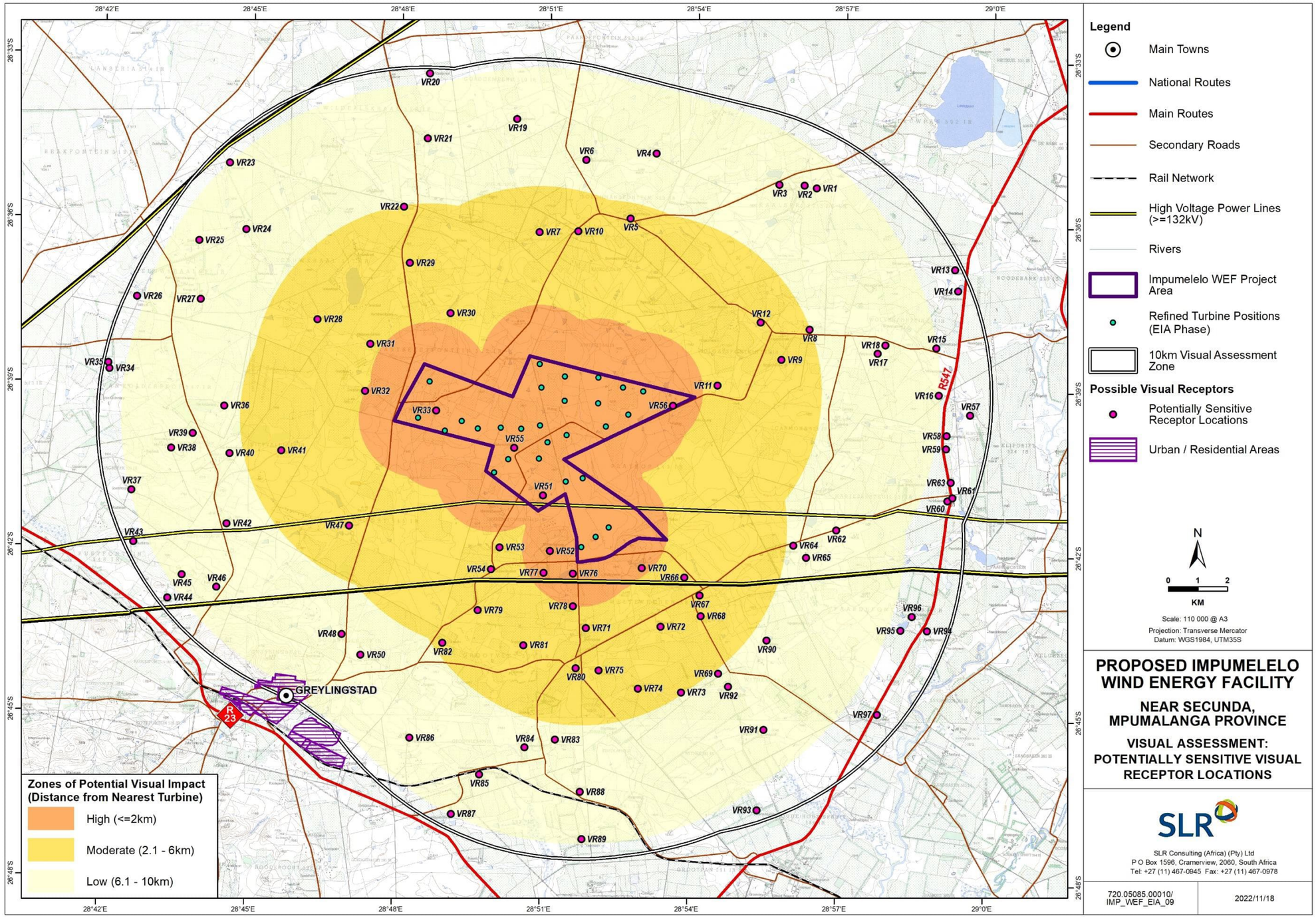
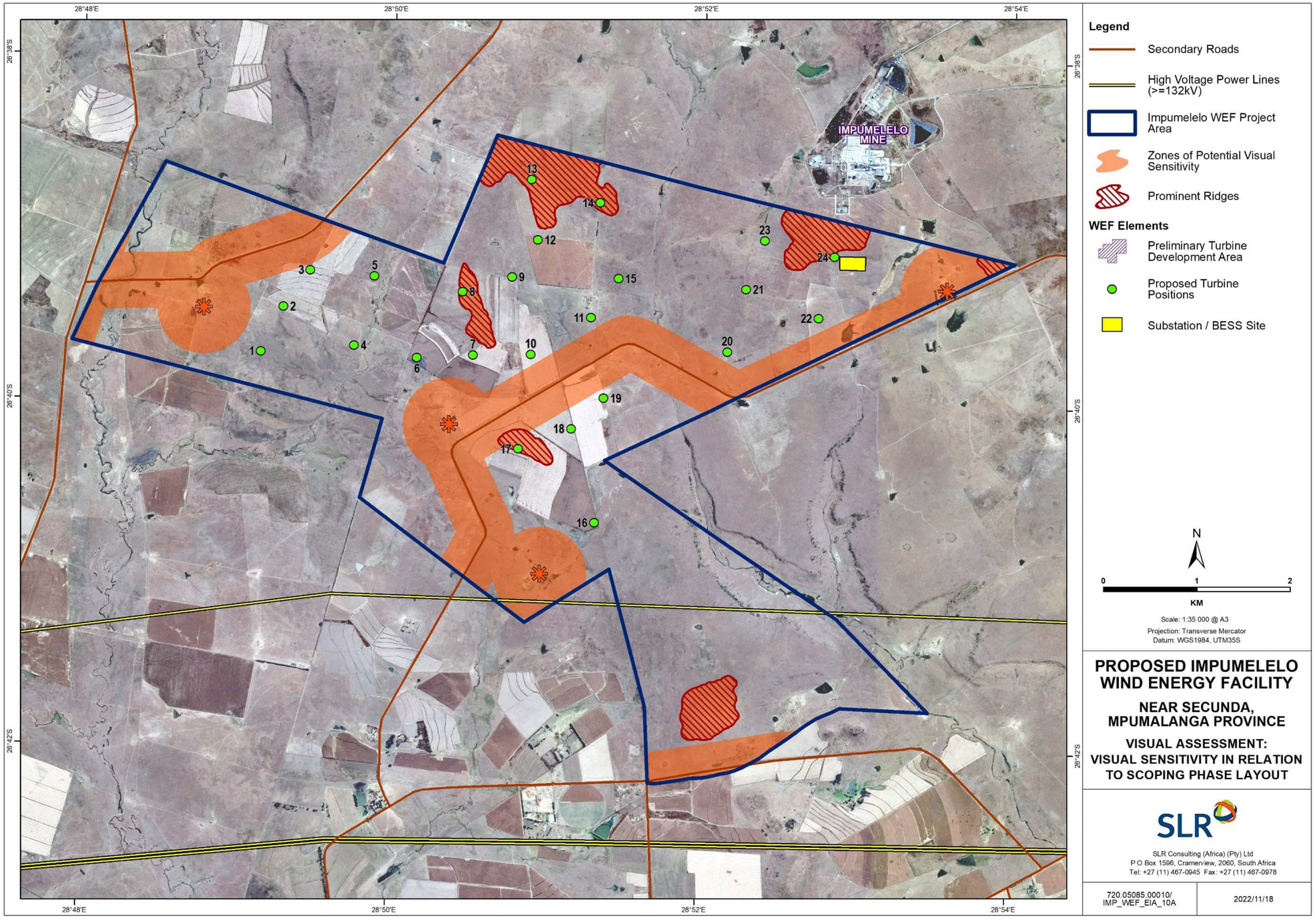
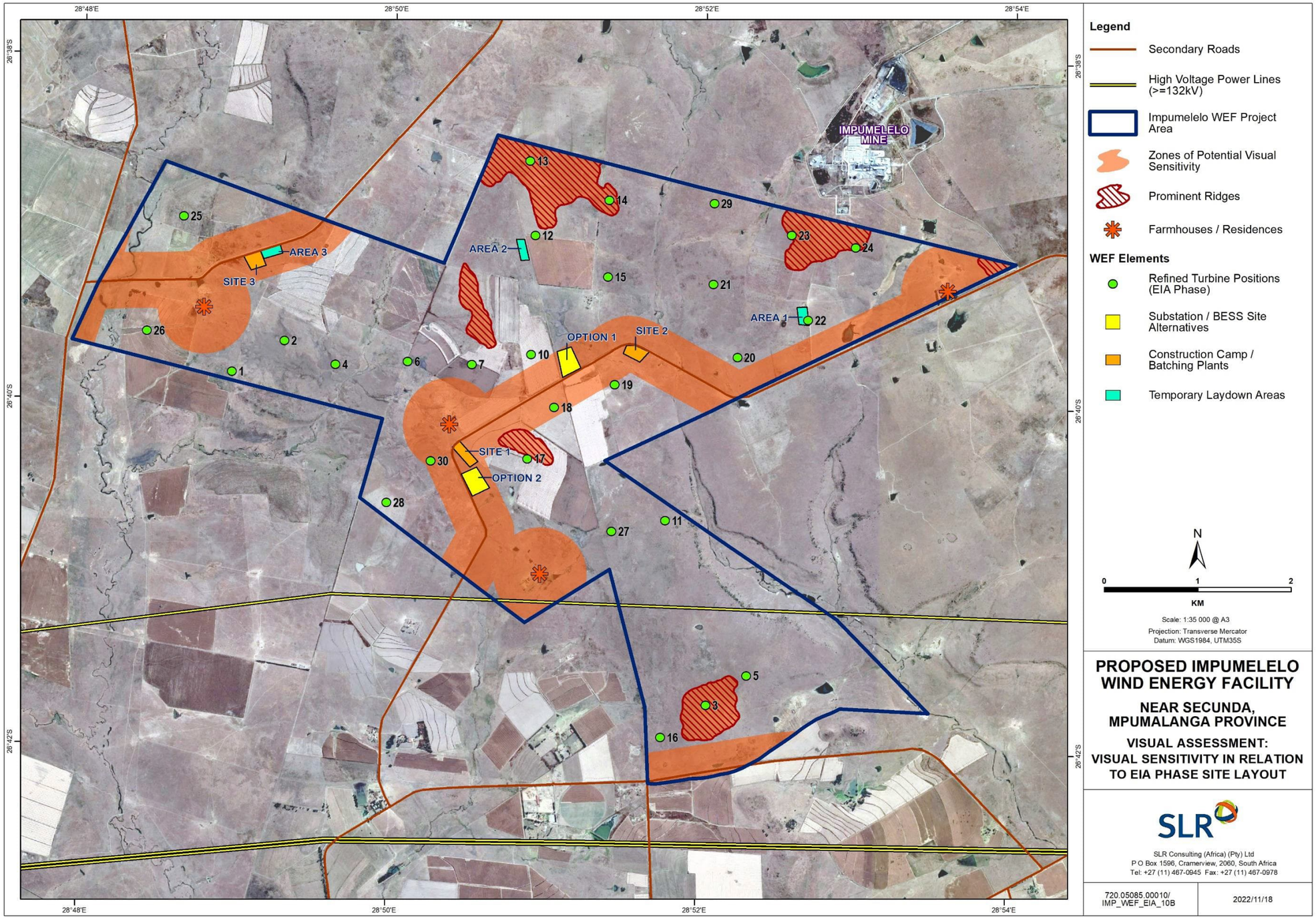
MAP 9: Potentially Sensitive Receptor Locations



MAP 10A: Visual Sensitivity in relation to Scoping Phase Layout



MAP 10B: Visual Sensitivity in relation to EIA Phase Layout



PROPOSED IMPUMELELO WIND ENERGY FACILITY

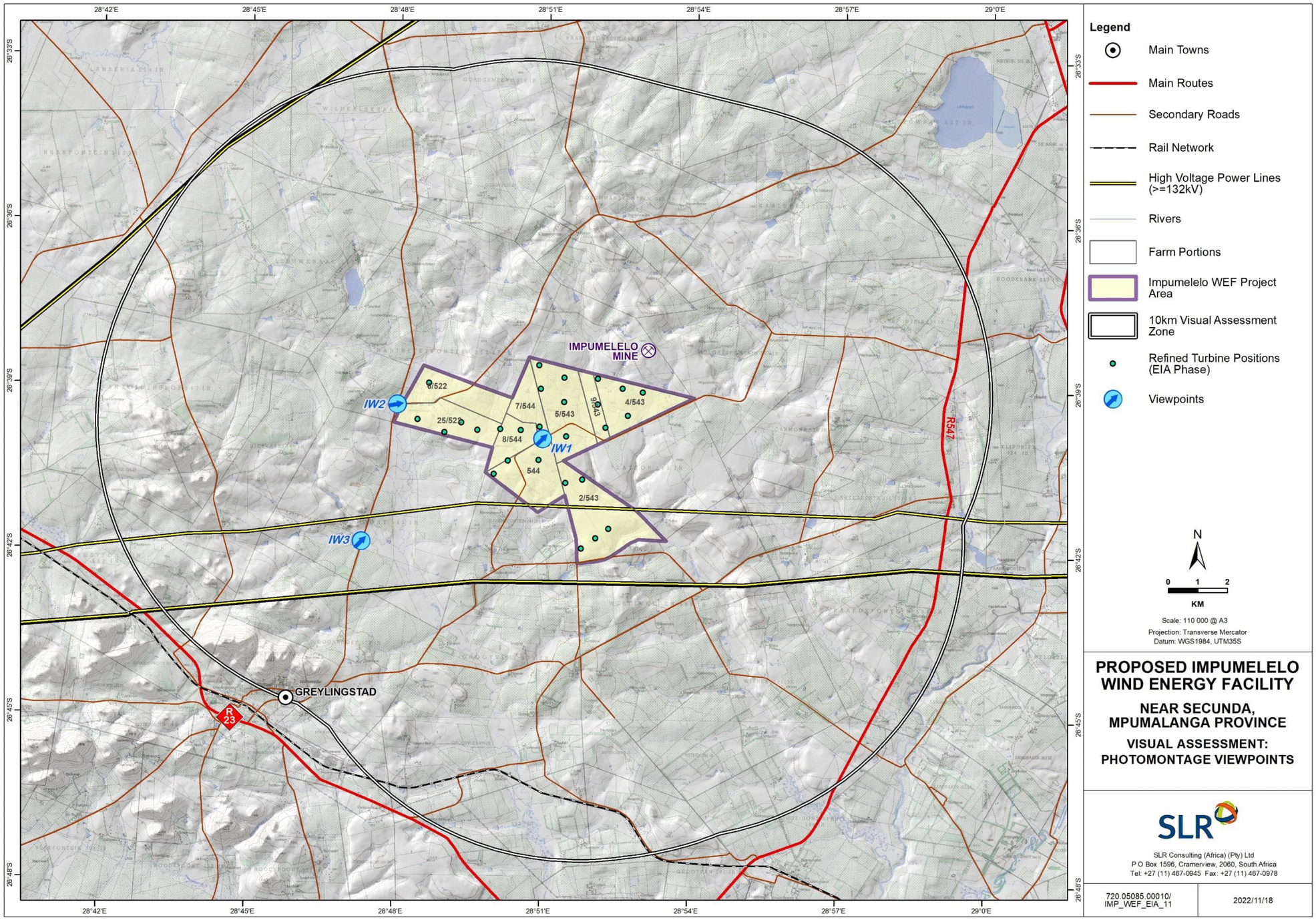
NEAR SECUNDA, MPUMALANGA PROVINCE

VISUAL ASSESSMENT: VISUAL SENSITIVITY IN RELATION TO EIA PHASE SITE LAYOUT

SLR Consulting (Africa) (Pty) Ltd
P O Box 1596, Cramerview, 2060, South Africa
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

720.05085.00010/ IMP_WEF_EIA_10B	2022/11/18

MAP 11: Photomontage Viewpoints



PROPOSED IMPUMELELO WIND ENERGY FACILITY

NEAR SECUNDA, MPUMALANGA PROVINCE

VISUAL ASSESSMENT: PHOTOMONTAGE VIEWPOINTS

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Appendix G: Comparative Assessment of Alternatives – Impumelelo

Alternative	Preference	Reasons (incl. potential issues)
SUBSTATION AND BESS SITE		
Option 1	Favourable	▪ Option 1 is located on slightly elevated terrain and as such would only be partially exposed on the skyline. ▪ There are no sensitive receptors within 5km of this alternative. ▪ The closest potentially sensitive receptor to this alternative is approximately 1.3 km away, this being VR55. The visual impacts from Option 1 affecting this receptor are therefore rated as moderate. As this receptor is located within the Impumeleo WEF project area however, it is assumed that residents at this location would have a vested interest in the WEF and would therefore not perceive the proposed development in a negative light. ▪ The remaining receptors are all more than 2 km away and would only be subjected to low or negligible levels of impact. ▪ Option 1 is located adjacent to an existing District Road 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 slightly elevated terrain and as such would only be partially exposed on the skyline. ▪ There are no sensitive receptors within 5km of this alternative. ▪ The closest potentially sensitive receptors to this alternative are approximately 530m and 1km away, these being VR55 and VR51. The visual impacts from Option 2 affecting these receptors is therefore rated as moderate. As these receptors are located within the Impumelelo WEF project area however, it is assumed that residents at these locations would have a vested interest in the WEF and would therefore not perceive the proposed development in a negative light. ▪ The remaining receptors are all more than 2 km away and would only be subjected to low or negligible levels of impact. ▪ Option 2 is located adjacent to an existing District Road 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.