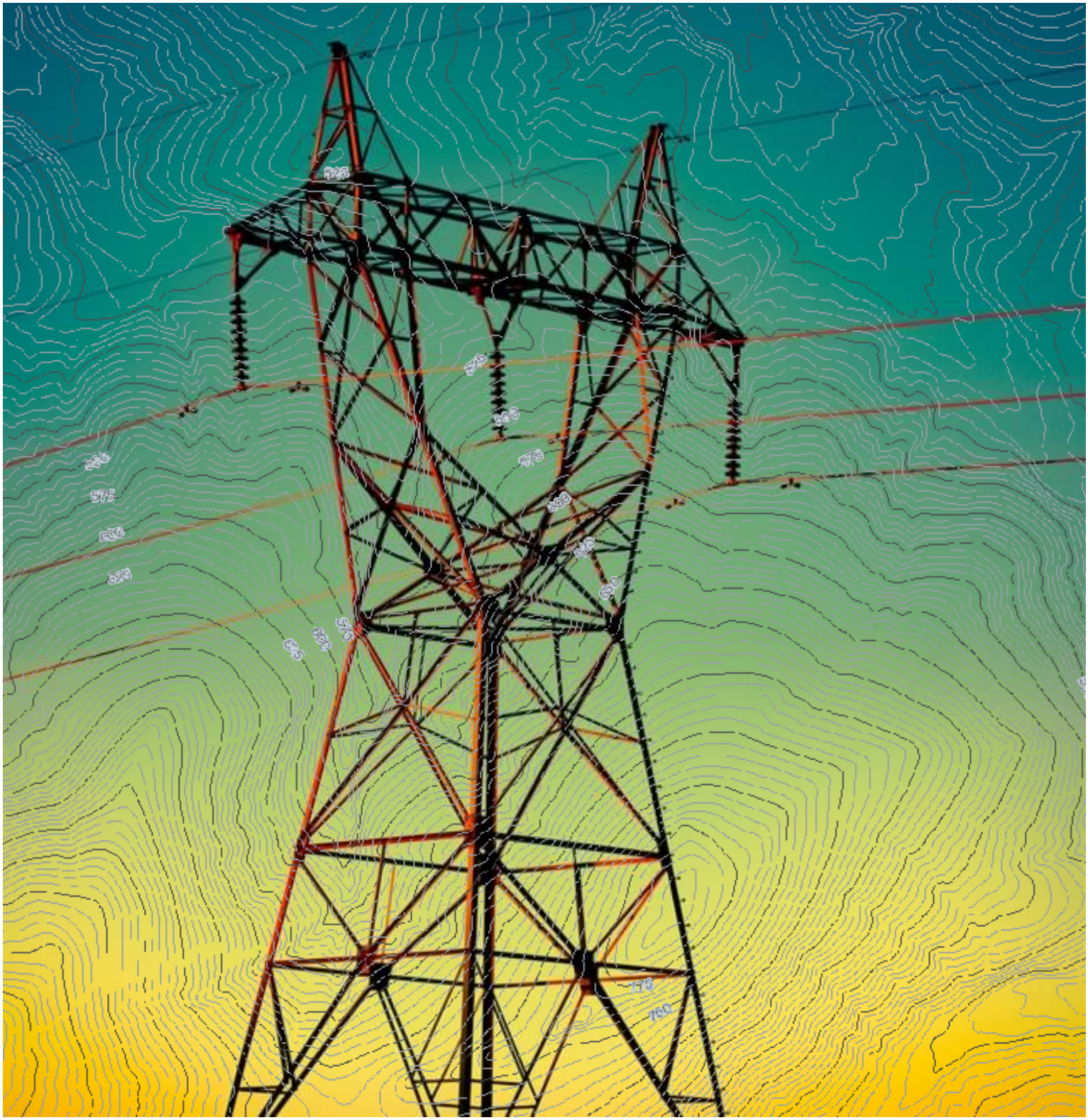


August 2021

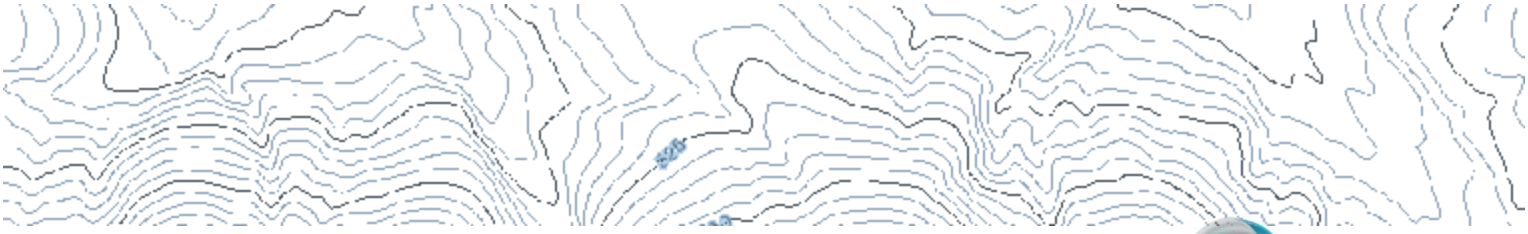
Phala
ENVIRONMENTAL
CONSULTANTS

Visual Impact Assessment

The Proposed Power Line as part of the Sonvanger Solar Power Plant near Theunissen, Free State Province

PROJECT DETAILS

Project title:	**Visual Impact Assessment -** The Proposed Power Line as part of the Sonvanger Solar Power Plant near Theunissen, Free State Province.
Prepared by:	Marélie Botha Phala Environmental Consultants 30 Fouche Street Steynsrus 9515 Tel: +2782 493 5166 Email: phala.env@gmail.com
Prepared for:	**Sonvanger Solar Power Plant (RF) (Pty) Ltd. & Pele Green Energy (Pty) Ltd.** 3 Centex Close Brooklyn Place Eastgate Kramerville Sandton 2196 Tel: (011) 262 0515 Email: info@pelegreenenergy.com
Report date:	August 2021



When used as reference this report should be cited as: Phala Environmental (2021). Visual Impact Assessment: The Proposed Power Line as part of the Sonvanger Solar Power Plant near Theunissen, Free State Province.

EXECUTIVE SUMMARY

PROJECT BACKGROUND

An EIA for the Sonvanger Photovoltaic Solar Power Plant was conducted in 2014 (DEA Ref: 14/12/16/3/3/2/672) and received Environmental Authorisation in 2015. To enable the connection of the Sonvanger Solar Power Plant to the national grid network, Pele Green Energy (Pty) Ltd. is proposing the development of a 132kV single-circuit power line from the Sonvanger Photovoltaic Solar Power Plant to the existing Oryx-Joel 132kV Line and will connect via a loop-in loop-out connection.

The proposed project is intended to form part of the Department of Mineral Resources and Energy's (DMREs) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme. The REIPPP Programme aims to secure 14 725 Megawatts (MW) of new generation capacity from renewable energy sources, while simultaneously diversifying South Africa's electricity mix. According to the 2021 State of the Nation Address, Government will soon be initiating the procurement of an additional 11 800 MW of power from renewable energy, natural gas, battery storage and coal in line with the Integrated Resource Plan 2019 and fulfilling their commitments under the United Nations Framework Convention on Climate Change and its Paris Agreement which include the reduction of greenhouse gas emissions. Eskom, our largest greenhouse gas emitter, has committed in principle to net zero emission by 2050 and to increase its renewable capacity.

The proposed Power Line as Part of the Sonvanger Solar Power Plant (SPP) requires Environmental Authorisation (EA) from the National Department of Forestry, Fisheries and the Environment (DFFE) in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA), and the 2017 Environmental Impact Assessment (EIA) Regulations (GNR 326). A 'Basic Assessment (BA) process' is required as described in Regulation 19 – 20.

The Visual Impact Assessment (VIA) Report has been prepared by Phala Environmental on behalf of Environamics and is intended to provide input into the 'Basic Assessment Report (BAR)' to be submitted to DFFE.

PROJECT DESCRIPTION

The purpose of the proposed PV energy facility, of which the power line is an essential component, will be to evacuate the generated power into the Eskom Holdings SOC Ltd (Eskom) electricity grid. If successful, Pele Green Energy (Pty) Ltd and the Sonvanger SPP will be remunerated on a per kilowatt hour generated basis by Eskom in terms of a 20-year Power Purchase Agreement. Pele Green Energy (Pty) Ltd. will be required to apply for a generation license from the National Energy Regulator of South Africa (NERSA). Depending on the economic conditions following the lapse of this period, the facility can either be decommissioned or the power purchase agreement may be renegotiated and extended.

The scope of the assessment includes a 132kV single-circuit evacuation power line from the site to the existing Oryx-Joel 132kV Line and will connect via a loop-in loop-out connection, which is approximately 22 kilometres long and the placement of the power line will be assessed within a 200m wide corridor.

The construction phase for an entire SPP and associated infrastructure similar to the Sonvanger SPP, which includes the power line, will extend over a period of 12-18 months. The anticipated capital expenditure value of the proposed Sonvanger SPP on completion will be approximately R1.5 Billion.

APPROACH TO THE STUDY

The Impact assessment took into account the nature, scale and duration of impacts on the visual receptors whether such impacts are positive or negative. Each impact was assessed according to the visual receptors, which were determined by using the ZTV, and the following project phases:

- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact were detailed. A brief discussion of the impact and the rationale behind the assessment was included. The rating system is applied to the potential impacts on the receiving visual receptors and includes an objective evaluation of the mitigation of the impact.

The ZTV reflects the visibility rating in term of proximity of viewers to the power line. The distances were calculated using satellite imagery, but the impact magnitude was determined by using previous experiences, assumptions and opinions, it is therefore theoretical. The ZTV maps will give a clearer understanding of areas susceptible to line of sight which means, an imaginary line from the eye to a perceived object, in this case the power line. The ZTV assessment **did not consider existing screening such as buildings and vegetation cover but rather the terrain's above mean sea level (AMSL) which indicates line of sight**. The receptors which were identified were subject to an impact assessment.

SUMMARY OF KEY FINDINGS

Referring to the assessment score of this VIA report review, the significance of the visual impact will be a "Negative Low Impact". The only receptors likely to be impacted by the proposed development are the nearby property owners and on nearby roads. A summary of the potential impacts identified for the detailed design and construction, and operation phase are presented in Table A and Table B.

Table A: Summary of potential visual impacts identified for the design and construction phase.

Impact	Significance Without Mitigation	Significance With Mitigation
Construction impacts	(28) Low Negative	(13) Negative Low

Table B: Summary of potential visual impacts identified for the operation phase.

Impact	Significance Without Mitigation	Significance With Mitigation
Potential visual impacts on sensitive visual receptors located within a 5km radius of the SPP	(39) Medium Negative	(39) Medium Negative
Potential visual impacts on sensitive visual receptors in the region (5-10km)	(28) Low Negative	(28) Low Negative
Visual and sense of place impacts	(26) Low Negative	(26) Low Negative

KEY FINDINGS

The construction and operational phase of the proposed Sonvanger power line, may have a visual impact on the study area, especially within (but not restricted to) a 5 - 10km radius of the proposed power line. The visual impact will differ amongst places, depending on the distance of the power line.

The proposed development is located in a close proximity to other existing Eskom power infrastructure. The potential for cumulative impacts to occur as a result of the projects is therefore likely.

Due to the height of the power line (32m), no viable mitigation measures can be implemented to eliminate the visual impact of the power line, but the possible visual impacts can be reduced. A number of mitigation measures have however been proposed regardless of whether or not mitigation measures will reduce the significance of the of the anticipated impacts, they are considered good practice and should be implemented and maintained throughout the construction, operational and decommissioning phases of the project.

In terms of possible landscape degradation, the landscape does not appear to have any specific protection or importance. No buffer areas or areas to be avoided are applicable for this development.

CONCLUSION

It is believed that renewable energy resources are essential to the environmental well- being of the country and planet (WESSA, 2012). Aesthetic issues are subjective, and some people find solar farms and their associated infrastructure pleasant and optimistic while others may find it visually invasive; it is mostly perceived as symbols of energy independence; and local prosperity. The visual impact is also dependant on the land use of an area and the sensitivity thereof in terms of visual impact, such as protected areas, parks and other tourism related activities.

Taking into account all positive factors of such a development including economic factors, social factors and sustainability factors, especially in an arid country, and the industrialised and degraded landscape, the visual impact of this proposed development will be insignificant and is suggested that the development commence, from a visual impact point of view. **PLEASE NOTE** that the details of the power line should be submitted with the South African Civil Aviation Authority (SACAA).

It is therefore Phala Environmental's recommendation that the project be approved.

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LIST OF ACRONYMS

AMSL	above mean sea level
AC	Alternating Current
BAR	Basic Assessment Report
B-BBEE	Broad-Based Black Economic Empowerment
BEE	Black Economic Empowerment
CLO	Community Liaison Officer
CSP	Concentrated Solar Power
DC	Direct Current
DEA	Department of Environmental Affairs (National)
DEAT	Department of Environmental Affairs and Tourism
DFFE	Department Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
DM	District Municipality
EA	Environmental Authorisation
ECA	Environment Conservation Act (No. 73 of 1989)
ECO	Environmental Control Officer
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPC	Engineering, Procurement and Construction
FMP	Fire Management Plan
ha	Hectares
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEP	Integrated Energy Plan

IFC	International Finance Corporation
IPP	Independent Power Producer
IRP	Integrated Resource Plan
IUCN	International Union for Conservation of Nature
GIS	Geographic Information System
km	Kilometre
kV	Kilovolt
LED	Local Economic Development
LM	Local Municipality
MW	Megawatt
NDP	National Development Plan
NEPCO	National Electrical Power Company
NEMA	National Environmental Management Act (No. 107 of 1998)
O&M	Operations and Maintenance
OHS	Occupational Health and Safety
PSDF	Provincial Spatial Development Framework
PV	Photovoltaic
RE	Renewable Energy
REDZ	Renewable Energy Development Zone
REIPPP	Renewable Energy Independent Power Producer Procurement Programme
SDF	Spatial Development Framework
SPP	Solar Power Plant
ToR	Terms of Reference
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VIA	Visual Impact Assessment
ZTV	Zone of Theoretical Visibility

1. INTRODUCTION

1.1. Project Background

An EIA for the Sonvanger Photovoltaic Solar Power Plant was conducted in 2014 (DEA Ref: 14/12/16/3/3/2/672) and received Environmental Authorisation in 2015. To enable the connection of the Sonvanger Solar Power Plant to the national grid network, Pele Green Energy (Pty) Ltd. is proposing the development of a 132kV single-circuit power line from the Sonvanger Photovoltaic Solar Power Plant to the existing Oryx-Joel 132kV Line and will connect via a loop-in loop-out connection.

The proposed project is intended to form part of the Department of Mineral Resources and Energy's (DMREs) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme. The REIPPP Programme aims to secure 14 725 Megawatts (MW) of new generation capacity from renewable energy sources, while simultaneously diversifying South Africa's electricity mix. According to the 2021 State of the Nation Address, Government will soon be initiating the procurement of an additional 11 800 MW of power from renewable energy, natural gas, battery storage and coal in line with the Integrated Resource Plan 2019 and fulfilling their commitments under the United Nations Framework Convention on Climate Change and its Paris Agreement which include the reduction of greenhouse gas emissions. Eskom, our largest greenhouse gas emitter, has committed in principle to net zero emission by 2050 and to increase its renewable capacity.

The proposed Power Line as Part of the Sonvanger Solar Power Plant (SPP) requires Environmental Authorisation (EA) from the National Department of Forestry, Fisheries and the Environment (DFFE) in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA), and the 2017 Environmental Impact Assessment (EIA) Regulations (GNR 326). A 'Basic Assessment (BA) process' is required as described in Regulation 19 – 20.

The Visual Impact Assessment (VIA) Report has been prepared by Phala Environmental on behalf of Environamics and is intended to provide input into the 'Basic Assessment Report (BAR)' to be submitted to DFFE.

1.2. Project Description

The purpose of the proposed PV energy facility, of which the power line is an essential component, will be to evacuate the generated power into the Eskom Holdings SOC Ltd (Eskom) electricity grid. If successful, Pele Green Energy (Pty) Ltd and the Sonvanger SPP will be remunerated on a per kilowatt hour generated basis by Eskom in terms of a 20-year Power Purchase Agreement. Pele Green Energy (Pty) Ltd. will be required to apply for a generation license from the National Energy Regulator of South Africa (NERSA). Depending on the economic conditions following the lapse of this period, the facility can either be decommissioned or the power purchase agreement may be renegotiated and extended.

The scope of the assessment includes a 132kV single-circuit evacuation power line from the site to the existing Oryx-Joel 132kV Line and will connect via a loop-in loop-out connection, which is approximately 22 kilometers long and the placement of the power line will be assessed within a 200m wide corridor.

Based on a review of previous similar projects and the basic project information received for the purpose of this VIA, the scope of work and basic infrastructure that are inclusive of any ancillary

activities and that can be associated with the proposed power line as part of the Sonvanger SPP would include:

- The connection to the grid and electrical reticulation network:

Connecting the array to the electrical grid requires transformation of the voltage from 480V to 33kV to 132kV. The normal components and dimensions of a distribution rated electrical substation will be required. Output voltage from the inverter is 480V and this is fed into step up transformers to 132kV. An onsite substation will be required on the site to step the voltage up to 132kV, after which the power will be evacuated into the national grid. Whilst Pele Green Energy (Pty) Ltd. and the Sonvanger SPP has not yet received a cost estimate letter from Eskom, it is expected that generation from the facility will tie in with the Oryx-Joel 132kV Line and will connect via a loop-in loop-out connection.

- 132kV transmission line:

An 22km, 132kV transmission line with concrete foundations and steel tower structures (i.e., pylons). The line will consist of either self-supporting suspension structures or guyed monopoles and a maximum height of 32 m. The span lengths are estimated to range between 200 m and 300 m. The servitude for the 132 kV power line will be 40 m wide. Associated electrical infrastructure at the Oryx-Joel will be constructed in order to ensure that the power line is capable of receiving the additional electricity that is generated by the proposed Sonvanger SPP. This infrastructure includes, but is not limited to, feeders, Busbars, transformer bays and extension to the platform at the Eskom Capital Substation. The proposed power line was assessed within a 200m wide corridor.

- Roads:

For power line maintenance existing service and access roads will be utilised as much as possible for maintenance purposes. Where no existing access is present, due to the low traffic anticipated, access will be provided in the form of jeep tracks, as opposed to formalised roads.

1.3. Consideration of Alternatives

The DEAT 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, location, activity, and design alternatives. It is, however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the developer and EAP, which in some instances culminates in a single preferred project proposal. An initial site assessment was conducted by the developer on the proposed power line route, which included the following farms: Afrikander Oord No. 80 (Portions 0 & 2), Ebenhaeser No. 401 (Portions 0, 1, 2 and 3), Erfbloem No. 12 (Portions 0, 4, 5 and 6), Excelsior No. 147 (Portions 1, 2 and 3), Geodemoed No. 143 (Portions 0, 2 and 3), Grottkau No. 410 (Portions 0, 3 and 5), Karreebooms Vallei (Portions 0, 2, 5, 6, 7 and 8), Leeuwbult No. 52 (Portions 0 and 3), Leeuwvlei No. 115 (Portions 0, 1, 2 and 3), Mamre No. 566 (Portions 0, 1, 2 and 3), Masilo No. 597 (Portions 0 and 12), Mooi Hoek No. 297 (Portions 0, 1, 4 and 5), Silesia No. 409 (Portions 0, 2 and 3), Smaldeel No. 262 (Portions 0, 1, 2, 8, 20, 21, 22, 23), Spes Bona No. 290 (Portions 0 and 2), Theunissen No. 252 (Portions 0 and 2), Vergelegen No. 85 (Portions 1, 4, 5 and 7), and the route was found favourable. These factors were then taken into consideration and avoided as far as possible.

The following alternatives were considered in relation to the proposed activity:

- No-go alternative

There will be negative implications for the proposed Sonvanger SPP, as there will be no dedicated and fundamental electrical infrastructure to allow the proposed SPP to connect to the Oryx-Joel 132kV line and the national grid. This could possibly result in non-realisation of the benefits, such as economic spin offs, and electricity generation associated with the proposed Sonvanger SPP. This could also result in additional costs and expenditure, as well as additional timeframes required, due to the potential re-design of the proposed Sonvanger SPP to align with an alternative substation within the region. Using an alternative substation within the region (dependent on capacity requirements) could result in longer power lines and associated service roads, which could, in turn, cause additional negative impacts to the surrounding environment. If re-design is not financially and technically feasible, then the proposed Sonvanger SPP will not be able to be constructed as it will not have fundamental infrastructure to link it to the national grid. If the proposed Sonvanger SPP cannot be constructed as a result of the no-go of the proposed Sonvanger Power Line Project, this could, in turn, result in the following implications:

- The landowners of the various farm portions on which the proposed infrastructure will be constructed will not be able to derive benefits from the implementation of an additional land-use;
- No additional power will be generated or supplied through means of renewable energy resources by this project at this location;
- There will be no contributions and assistance to the government in achieving its proposed renewable energy target of 17 800 MW by 2030;
- No additional power will be provided via the Eskom grid, with approximately 90% coal based power generation with associated high levels of CO2 emissions and water consumption;
- Electricity generation will remain constant (i.e. no additional renewable energy generation will occur on the proposed site) and the local economy will not be diversified;
- Local communities will continue their dependence on agriculture production and government subsidies. The local municipality's vulnerability to economic downturns will increase because of limited access to capital;
- The positive socio-economic impacts likely to result from the project such as increased local spending, skills transfer and education/training of local communities, and the creation of local employment opportunities will not be realised; and
- The local economic benefits associated with the REIPPPP will not be realised, and socio-economic contribution payments into the local community trust will not be realised.

The following benefits could also occur if the 'no-go' alternative is implemented:

- There will be no development of electrical infrastructure that is associated with SEFs at the proposed location;
- The agricultural land use will remain only;
- No threatened vegetation will be removed or disturbed during the development of the electrical infrastructure;
- No potential impact to avifauna present in the area;
- No change to the current landscape will occur; and
- No additional water uses and waste generation during the construction phase.

- Location alternatives

It is important to note that the location of the proposed power line and service road is motivated by the location of the proposed Sonvanger SPP and its proximity to the Oryx-Joel 132kV connection line. The determination of the development footprint was determined through a desktop screening assessment of the site and consultation with the relevant landowner identifying possible areas that should not be proposed for the development.

As discussed previously, the overall aim of this proposed project is to provide the necessary electrical infrastructure to ensure that the proposed Sonvanger SPP is equipped and enabled to transmit the generated electricity (from the Sonvanger SPP) to the Capital substation. In turn, the best routing of the proposed transmission line from the proposed SPP site to the substation was based on economic feasibility (shortest route between the two points), as well as environmental sensitivities, and the willingness of landowners to provide consent for the construction of the proposed electrical grid infrastructure on their land. The proposed power line was assessed within a 200m wide corridor in order to ensure that any development constraints or environmental sensitivities can be avoided in the final siting and location of the proposed power line, that may arise because of the BA proses.

- Technical alternatives: Power lines

It is expected that generation from the facility will tie in with the Oryx-Joel 132kV connection line. The preferred power line route is located northeast of the Sonvanger SPP. It is proposed that from this on-site substation, one 132kV, single-circuit power line will be constructed to connect the project to the Oryx-Joel 132kV line, located approximately 22kilometres northeast of the site. The proposed 132kV overhead transmission line route is the only preferred alternative for the applicant at this stage.

- Design and layout alternatives

The power line will be assessed within a 200m wide corridor. Design alternatives will be considered throughout the planning and design phase and specialist studies are expected to inform the final route for the proposed power line as ensure that any development constraints or environmental sensitivities can be avoided.

- Technology alternatives

The technology that is proposed for the construction and operation of the proposed Transmission Line and electrical infrastructure will be guided by national standards and best practice. The technology options and operational aspects are also governed by Eskom's requirements and building specifications. This therefore limits the amount of variability in terms of the technology and operational processes. The type of technology used will relate to the infrastructure being installed and constructed, such as the type of conductors, pylon structures and design, use of Bird Flight Diverters, and building structures for the on-site substation.

1.4. EIA Regulations

The EIA Regulations No. 982, 983, 984 and 985 (as amended in 2017) promulgated in terms of Section 24(5) and 44 of the National Environmental Management Act, (107 of 1998) determine that an EIA process should be followed for certain listed activities, which might have a detrimental impact on the environment. According to Regulation No. 326 the purpose of the Regulations is: *"…to regulate the procedure and criteria as contemplated in Chapter 5 of the Act relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental*

authorisations for the commencement of activities, subjected to environmental impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto".

The EIA Regulations No. 327 outline the activities for which EIA should apply. The following activities with special reference to the proposed activity are listed in the EIA Regulations:

Table 1.1: Listed activities

Relevant notice:	**Activity No (s)**	**Description of each listed activity as per project description**:
GNR. 327 (as amended in 2017)	Activity 11(ii)	• *"The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."* • Activity 11(i) is triggered since the proposed photovoltaic solar facility will transmit and distribute electricity of 132 kilovolts outside an urban area.

1.5. Terms of Reference

The Terms of Reference (ToR) as provided and agreed upon with Environamics include the following:

Specialists in their field of expertise will consider baseline data and identify and assess impacts according to predefined rating scales. Specialists will also suggest optional or essential ways in which to mitigate negative impacts and enhance positive impacts. Further, specialists will, where possible, take into consideration the cumulative effects associated with this and other projects, which are either developed or in the process of being developed in the local area. The results of these specialist studies will be integrated into the BA for comments and final submissions to all Interested and Affected Parties (I&APs) and DFFE. The Terms of Reference (ToR) or general requirements proposed for the inputs are listed below:

<u>General Requirements:</u>

Specialists' reports must comply with Appendix 6 of GNR982 published under sections 24(5), and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and whereby the following are to be included:

- The details of the specialist who prepared the report and the expertise of that specialist to compile a specialist report including a curriculum vitae.
- A declaration that the specialist is independent in a form as may be specified by the competent authority.
- An indication of the scope of, and the purpose for which, the report was prepared.
- The date and season of the site investigation and the relevance of the season to the outcome of the assessment.

- A description of the methodology adopted in preparing the report or carrying out the specialised process; the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure.
- An identification of any areas to be avoided, including buffers.
- A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers.
- A description of any assumptions made and any uncertainties or gaps in knowledge.
- A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment.
- Any mitigation measures for inclusion in the EMPr;
- Any conditions for inclusion in the environmental authorisation.
- Any monitoring requirements for inclusion in the EMPr or environmental authorisation.
- A reasoned opinion as to whether the proposed activity or portions thereof should be authorised, and if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan.
- A description of any consultation process that was undertaken during the course of preparing the specialist report.
- A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and
- Any other information requested by the competent authority.

In addition to the above, specialists are expected to:

- Review the BA, with specific reference to the Comments and Response Report to familiarize with all relevant issues or concerns relevant to their field of expertise.
- In addition to the impacts listed in the BA, identify any issue or aspect that needs to be assessed and provide expert opinion on any issue in their field of expertise that they deem necessary in order to avoid potential detrimental impacts.
- Assess the degree and extent of all identified impacts (including cumulative impacts) that the preferred project activity and its proposed alternatives, including that of the no-go alternative, may have.
- Identify and list all legislation and permit requirements that are relevant to the development proposal in context of the study.
- Reference all sources of information and literature consulted; and
- Include an executive summary to the report.

The terms of reference for this Visual Impact Assessment (VIA) requires providing the following:

- Conduct a desktop review of available information that can support and inform the specialist study;
- Describe the receiving environment and the visual absorption for the proposed project;
- Conduct a field survey to determine the actual or practical extent of potential visibility of the proposed development;
- Conduct a photographic survey of the landscape surrounding the development;
- Identify issues and potential visual impacts for the proposed project, to be considered in combination with any additional relevant issues that may be raised through the public consultation process;
- Identify possible cumulative impacts related to the visual aspects for the proposed project;
- Assess the potential impacts, both positive and negative, associated with the proposed project for the construction, operation and decommissioning phases;
- Identify management actions to avoid or reduce negative visual impacts; and to enhance positive benefits of the project; and
- Use mapping and photo-montage techniques as appropriate.

1.6. Project Team and Experience

The project team will consist of Marélie Botha.

Marélie Botha graduated with an Honours degree in 2012 from the North West University in the field of Environmental Sciences specialising in Geography and Environmental Management and has since been involved in over 50 Environmental Impact Assessments (EIA), with most of the projects being on Renewable Energy projects where she also accumulated the necessary skills to conduct visual and social impact assessments.

2. METHODOLOGY

A site inspection was conducted on 29 July 2021, most of the visual receptors were determined by using ZTV and geographical imagery before the site inspection.

2.1. Purpose of the Study

To determine the purpose of the study, one would first have to understand what a visual impact is: Visual impacts occur when changes in the landscape are noticeable to viewers looking at the landscape from their homes or from parks and conservation areas, highways and travel routes, and important cultural features and historic sites.

Visual impacts therefore relate to the changes that arise in the composition of views as a result of:

- Changes to the landscape;
- People’s response to that changes; and
- the overall negative effect with respect to the scenic beauty of that landscape, which can be subjective.

Visual impact is therefore measured as the change or contrast to the existing visual environment and the extent to which that change compromises (negative impact) or enhances (positive impact) or maintains the visual quality of the landscape.

Visual impacts can be seen as an issue because it reduces the public's enjoyment and appreciation of the landscape and impair the character or quality of such a place as well as the aesthetic quality of the landscape if it is considered to be a national resource.

VIAs addresses the importance of the inherent aesthetics of the landscape, the public value of viewing that landscape, and the contrast or change in the landscape derived from the physical presence of a proposed project. For instance, Sensitive Geographical Areas can be classified as sensitive properties that are evaluated for the potential for adverse visual impacts, based on the current land use or enjoyment of the view. The sensitivity of a certain geographical area is the degree to which a particular area can accommodate change. An example of a sensitive geographical area would be when scenic quality was influential in its being. In other words, a geographical area is not sensitive to visual impact if visual aspects of its feeling and setting are not part of what makes it eligible.

A project therefore has a significant visual impact in a certain geographical area when the proximity of the proposed project impairs aesthetic features or attributes of that area in a substantially visual way such that features, or attributes are considered important contributing elements to the value of the resource.

The purpose and objectives of this VIA report is to:

- give the reader an overview of the aesthetics of the landscape.
- determine the visual receptors present within the study area.
- determine the receptors likely to be sensitive to the proposed development.
- determine the extent and significance of the visual impact.

The scope of the assessment includes the proposed development area and its associated structures and infrastructure.

2.2. Approach to the Study

The approach to the study followed various guidelines for visual impact assessments that are available. This assessment will be undertaken in accordance with:

- South African Provincial Government (Western Cape Province) – Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (2005);
- United States of America, Texas Department of Transportation - Standard Operating Procedure for Visual Impact Assessments (2012);
- The Landscape Institute with the Institute of Environmental Management and Assessment – Guidelines for Landscape and Visual Impact Assessments, Second Edition (2002); and
- World Bank Group - Environmental, Health, and Safety Guidelines for Wind Energy (2015).

Together these documents provide a comprehensive basis and data base for the level of approach of a visual impact assessment.

2.3. Baseline Assessment – Significance Rating

Impact assessment must take account of the nature, scale and duration of impacts on the visual receptors whether such impacts are positive or negative. Each impact is also assessed according to the visual receptors, which were determined by using the ZTV, and the following project phases:

- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving visual receptors and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact, Table 2.1 below, will be utilised as the baseline impact assessment for each visual receptor and phases of the project.

Table 2.1: Impact Significance Rating

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		

This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible, rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		

1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity. The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description

6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

2.4. Visibility rating in terms of proximity by using the Zone of Theoretical Visibility (ZTV) model

The ZTV reflects the visibility rating in term of proximity of viewers to the power line. The distances were calculated using satellite imagery, but the impact magnitude was determined by using previous experiences, assumptions and opinions, it is therefore theoretical. The ZTV maps will give a clearer understanding of areas susceptible to line of sight which means, an imaginary line from the eye to a perceived object, in this case the power line. The ZTV assessment **did not take into account existing screening such as buildings and vegetation cover but rather the terrain's above mean sea level (AMSL) which indicates line of sight**. The receptors which were identified were subject to an impact assessment. The following table was utilised to determine the ZTV Visibility Rating in terms of proximity:

Table 2.2: ZTV Visibility Rating in terms of proximity

Radius	**Visibility rating in terms of proximity**
0-5km	Very High

5-10km	Medium
10-15km	Medium-Low
15-20km	Low

2.5. Assumptions and Limitations

2.5.1. Spatial Data Accuracy

Spatial data used for visibility analysis originate from various sources and scales. Inaccuracy and errors are therefore inevitable. Where relevant, these are highlighted in the report. Every effort was made to minimize their effect.

2.5.2. View Shed Analysis

A view shed is the geographical area that is visible from a location. It includes all surrounding points that are in line-of-sight with that location and excludes points that are beyond the horizon or obstructed by terrain and other features. The initial determination of the view sheds on maps does not take into account the potential screening effect of vegetation and buildings.

2.5.3. Viewer Subjectivity

It is believed that renewable energy resources are essential to the environmental well- being of the country and planet (WESSA, 2012). Aesthetic issues are subjective, and some people find wind & solar farms, power line infrastructure and masts pleasant and optimistic while others may find it visually invasive; it is mostly perceived as symbols of energy independence; and local prosperity. Some tourism officials predict that solar farms will enhance tourism, while some solar farms have themselves become tourist attractions, with several around the world having visitor. Other tourists might find the SPPs intrusive and spoil their views of the natural environment.

3. PROJECT LOCATION AND DESCRIPTION

The power line as part of the Sonvanger SPP is located on Afrikander Oord No. 80 (Portions 0 & 2), Ebenhaeser No. 401 (Portions 0, 1, 2 and 3), Erfbloem No. 12 (Portions 0, 4, 5 and 6), Excelsior No. 147 (Portions 1, 2 and 3), Geodemoed No. 143 (Portions 0, 2 and 3), Grottkau No. 410 (Portions 0, 3 and 5), Karreebooms Vallei No. 258 (Portions 0, 2, 5, 6, 7 and 8), Leeuwbult No. 52 (Portions 0 and 3), Leeuwvlei No. 115 (Portions 0, 1, 2 and 3), Mamre No. 566 (Portions 0, 1, 2 and 3), Masilo No. 597 (Portions 0 and 12), Mooi Hoek No. 297 (Portions 0, 1, 4 and 5), Silesia No. 409 (Portions 0, 2 and 3), Smaldeel No. 262 (Portions 0, 1, 2, 8, 20, 21, 22, 23), Spes Bona No. 290 (Portions 0 and 2), Theunissen No. 252 (Portions 0 and 2), Vergelegen No. 85 (Portions 1, 4, 5 and 7), Registration Division Theunissen, within the Masilonyana and the Matjhabeng LMs of the Lejweleputswa DM in the Free State Province. The grid connection corridor is approximately 22km adjacent and northeast of the town of Theunissen.

Table 3.1: General Site Information

Description of affected farm portions	- Remaining Extent of the farm Afrikander Oord No. 80 - Portion 2 of the farm Afrikander Oord No. 80 - Remaining Extent of the farm Ebenhaeser No. 401 - Portion 1 of the farm Ebenhaeser No. 401 - Portion 2 of the farm Ebenhaeser No. 401 - Portion 3 of the farm Ebenhaeser No. 401 - Remaining Extent of the farm Erfbloem No. 12 - Portion 4 of the farm Erfbloem No. 12 - Portion 5 of the farm Erfbloem No. 12 - Portion 6 of the farm Erfbloem No. 12 - Portion 1 of the farm Excelsior No. 147 - Portion 2 of the farm Excelsior No. 147 - Portion 3 of the farm Excelsior No. 147 - Remaining Extent of the farm Geodemoed No. 143 - Portion 2 of the farm Geodemoed No. 143 - Portion 3 of the farm Geodemoed No. 143 - Remaining Extent of the farm Grottkau No. 410 - Portion 3 of the farm Grottkau No. 410 - Portion 5 of the farm Grottkau No. 410 - Remaining Extent of the farm Karreebooms Vallei No. 258 - Portion 2 of the farm Karreebooms Vallei No. 258 - Portion 5 of the farm Karreebooms Vallei No. 258 - Portion 6 of the farm Karreebooms Vallei No. 258 - Portion 7 of the farm Karreebooms Vallei No. 258 - Portion 8 of the farm Karreebooms Vallei No. 258 - Remaining Extent of the farm Leeuwbult No. 52 - Portion 3 of the farm Leeuwbult No. 52 - Remaining Extent of the farm Leeuwvlei No. 115 - Portion 1 of the farm Leeuwvlei No. 115 - Portion 2 of the farm Leeuwvlei No. 115 - Portion 3 of the farm Leeuwvlei No. 115 - Remaining Extent of the farm Mamre No. 566 - Portion 1 of the farm Mamre No. 566 - Portion 2 of the farm Mamre No. 566 - Portion 3 of the farm Mamre No. 566 - Remaining Extent of the farm Masilo No. 597 - Portion 12 of the farm Masilo No. 597 - Remaining Extent of the farm Mooi Hoek No. 297 - Portion 1 of the farm Mooi Hoek No. 297 - Portion 4 of the farm Mooi Hoek No. 297 - Portion 5 of the farm Mooi Hoek No. 297 - Remaining Extent of the farm Silesia No. 409 - Portion 2 of the farm Silesia No. 409 - Portion 3 of the farm Silesia No. 409 - Remaining Extent of the farm Smaldeel No. 262 - Portion 1 of the farm Smaldeel No. 262

	- Portion 2 of the farm Smaldeel No. 262 - Portion 8 of the farm Smaldeel No. 262 - Portion 20 of the farm Smaldeel No. 262 - Portion 21 of the farm Smaldeel No. 262 - Portion 22 of the farm Smaldeel No. 262 - Portion 23 of the farm Smaldeel No. 262 - Remaining Extent of the farm Spes Bona No. 290 - Portion 2 of the farm Spes Bona No. 290 - The Remaining Extent of the farm Theunissen No. 252 - Portion 2 of the farm Theunissen No. 252 - Portion 1 of the farm Vergelegen No. 85 - Portion 4 of the farm Vergelegen No. 85 - Portion 5 of the farm Vergelegen No. 85 - Portion 7 of the farm Vergelegen No. 85
District Municipality	Xhariep DM
Local Municipality	Masilonyana and Matjhabeng LMs
Nearest Town(s)	The town of Theunissen is located adjacent to a portion of the power line route.
Structure Height	Power lines ~32m
Power Line Length	Approximately 8km
Corridor width	200m

3.1. Project Site

The power line as part of the Sonvanger SPP is located on Afrikander Oord No. 80 (Portions 0 & 2), Ebenhaeser No. 401 (Portions 0, 1, 2 and 3), Erfbloem No. 12 (Portions 0, 4, 5 and 6), Excelsior No. 147 (Portions 1, 2 and 3), Geodemoed No. 143 (Portions 0, 2 and 3), Grottkau No. 410 (Portions 0, 3 and 5), Karreebooms Vallei No. 258 (Portions 0, 2, 5, 6, 7 and 8), Leeuwbult No. 52 (Portions 0 and 3), Leeuwvlei No. 115 (Portions 0, 1, 2 and 3), Mamre No. 566 (Portions 0, 1, 2 and 3), Masilo No. 597 (Portions 0 and 12), Mooi Hoek No. 297 (Portions 0, 1, 4 and 5), Silesia No. 409 (Portions 0, 2 and 3), Smaldeel No. 262 (Portions 0, 1, 2, 8, 20, 21, 22, 23), Spes Bona No. 290 (Portions 0 and 2), Theunissen No. 252 (Portions 0 and 2), Vergelegen No. 85 (Portions 1, 4, 5 and 7), Registration Division Theunissen, within the Masilonyana and the Matjhabeng LMs of the Lejweleputswa DM in the Free State Province. The grid connection corridor is approximately 22km adjacent and northeast of the town of Theunissen.

The R30 runs adjacent to the proposed power line, the power line also crosses the S494, S478, R708 and R30 roads, as well as a non-perennial stream, agricultural fields and a wetland system. The surrounding properties are characterised by agriculture, urban developments (Theunissen and Masilo and mining.

A site inspection of the proposed power line route was conducted on 29 July 2021, refer to the locality map and key features below:

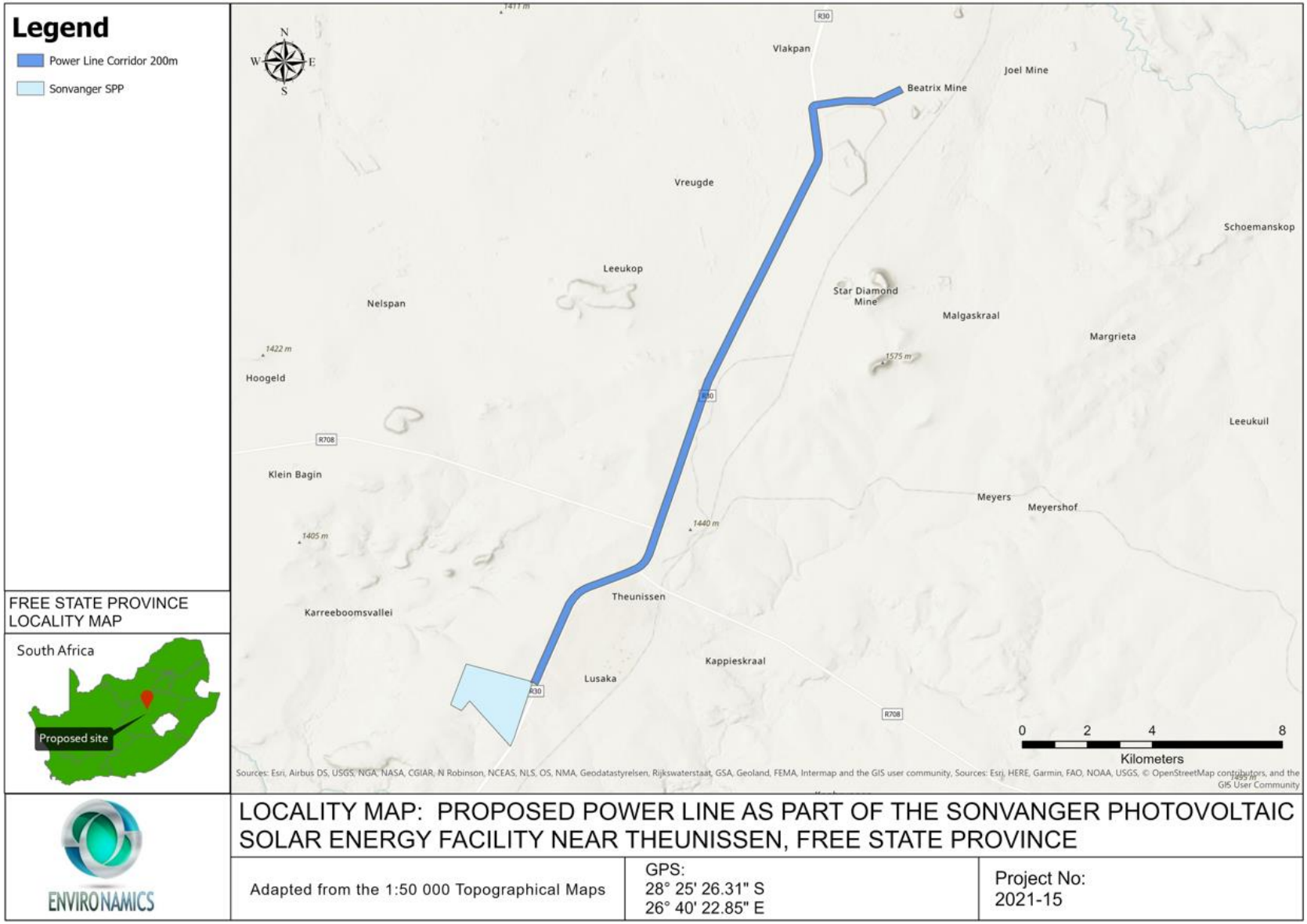

Figure 3.1: Locality map for the proposed Sonvanger Power Line near Theunissen, Free State Province.

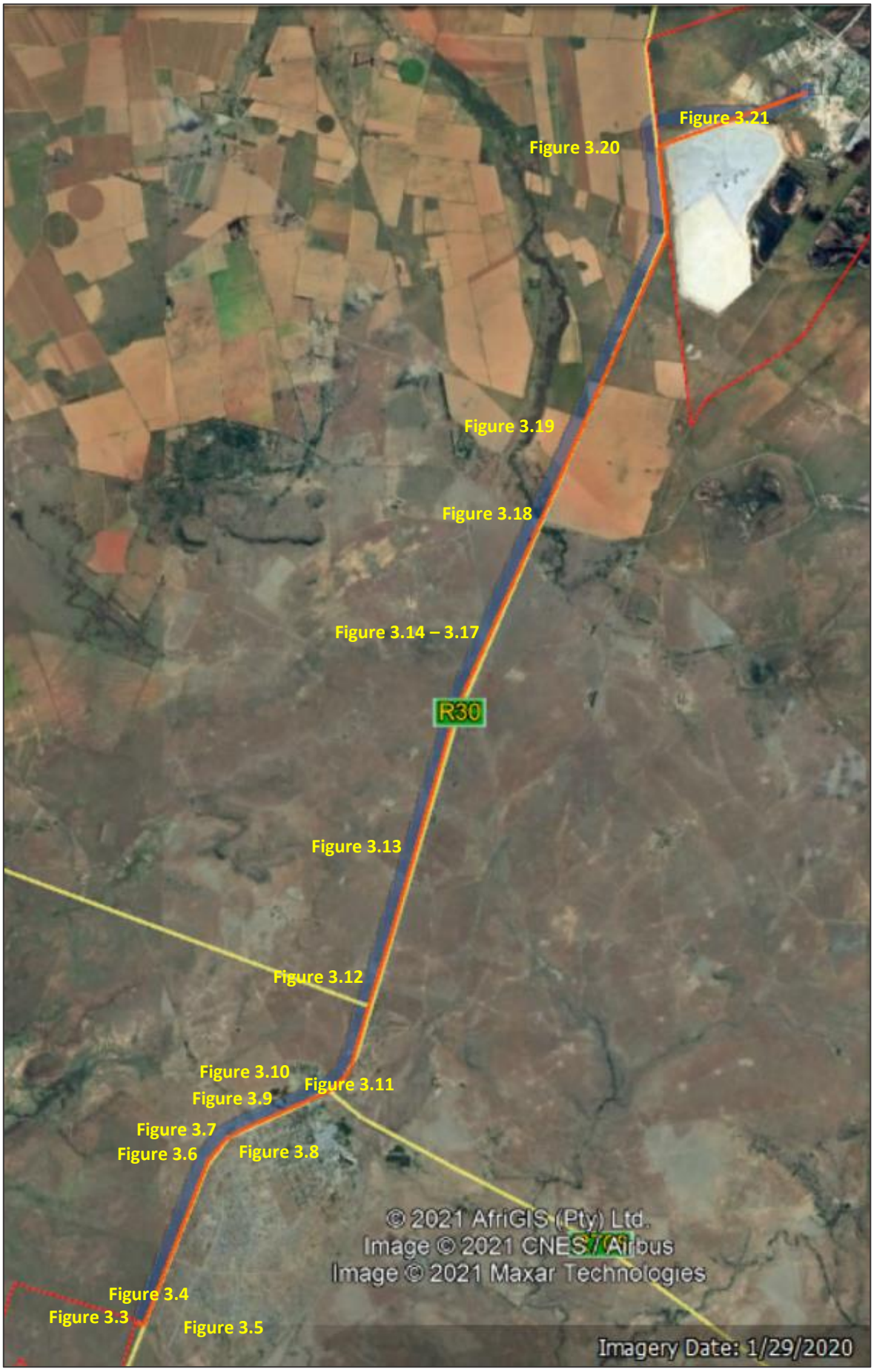

Figure 3.2: Location of key features along the proposed power line route.

Figure 3.3: Beginning of the proposed power line route from the proposed Sonvanger SPP in a north-eastern direction.

Figure 3.4: View of the R30 and a portion of power line corridor taken towards the north.

Figure 3.5: Masilo informal settlement located on the opposite side of the R30, in full view of the proposed power line and SPP.

Figure 3.6: Waste disposal site located within corridor. Water tower visible on the horizon.

Figure 3.7: Cemetery located within the power line corridor.

Figure 3.8: Power Line crossing the S494. The S494 conncts to the R30. A filling station is visible on the opposite side of the road.

Figure 3.9: A degraded wetland system is located within the 200m power line corridor.

Figure 3.10: A degraded wetland system is located within the 200m power line corridor. Theunissen Combined School is visible from the proposed power line route.

Figure 3.11: Power Line will cross over Bree Street.

Figure 3.12: Power Line will cross over the R708.

Figure 3.13: The power line will pass underneath existing power line infrastructure.

Figure 3.14: Approximate centre of the proposed power line route, taken towards the north.

Figure 3.15: Approximate centre of the proposed power line route, taken towards the north west.

Figure 3.16: Approximate centre of the proposed power line route, taken towards the west.

Figure 3.17: Approximate centre of the proposed power line route, taken towards the south west.

Figure 3.18: The proposed power line will cross over a storm water channel and the S478.

Figure 3.19: The proposed power line will have to be placed within existing agricultural fields for approximately 5,25km.

Figure 3.20: Farmstead located at the R30 crossing of the proposed power line.

Figure 3.21: R30 crossing of the proposed power line. Existing power line infrastructure and the Beatrix Mine Sibanye-Stillwater is visible in the background.

4. EXISTING LANDSCAPE

It is possible that landscape change due to the proposed development could impact the character of an important landscape area.

Importance can be derived from specific features that can relate to urban or rural settings. They might include key natural, historic or culturally significant elements. Importance might also relate to landscapes that are uncommon or under threat from development.

Generally, the most significant natural areas are afforded a degree of legal protection such as National Parks and Reserves; however, they might also have local significance and not be protected.

This section describes the types of landscape that may be impacted, indicating the likely degree of sensitivity and describes how the landscape areas are likely to be impacted.

4.1. Landscape Character

Landscape character is a composite of a number of influencing factors including:

- Landform and drainage.
- Nature and density of development.
- Vegetation patterns.

4.1.1. Landform and Drainage

The proposed power line route drains towards the south.

The site is located in an area with a medium significance in elevation, meaning that the site is not located on a mountain or at the foot of a mountain, but has some significant difference in elevation. The preferred power line route is located at an above mean sea level (amsl) of approximately 1457m at the highest elevation and at an amsl of 1388m at the lowest elevation. Refer to Figures 4.2 to 4.5 for elevation profiles of the site. Elevation profiles were taken over a 5km buffer from the site from all 8 wind directions. Figure 4.6 indicates the elevation profile of the entire power line route.

The landform and drainage described above is unlikely to limit visibility, especially towards the west and south west. The proposed development will be visible to the town of Theunissen. Areas within 5km from the proposed development might have a clear view without taking existing screening into account.

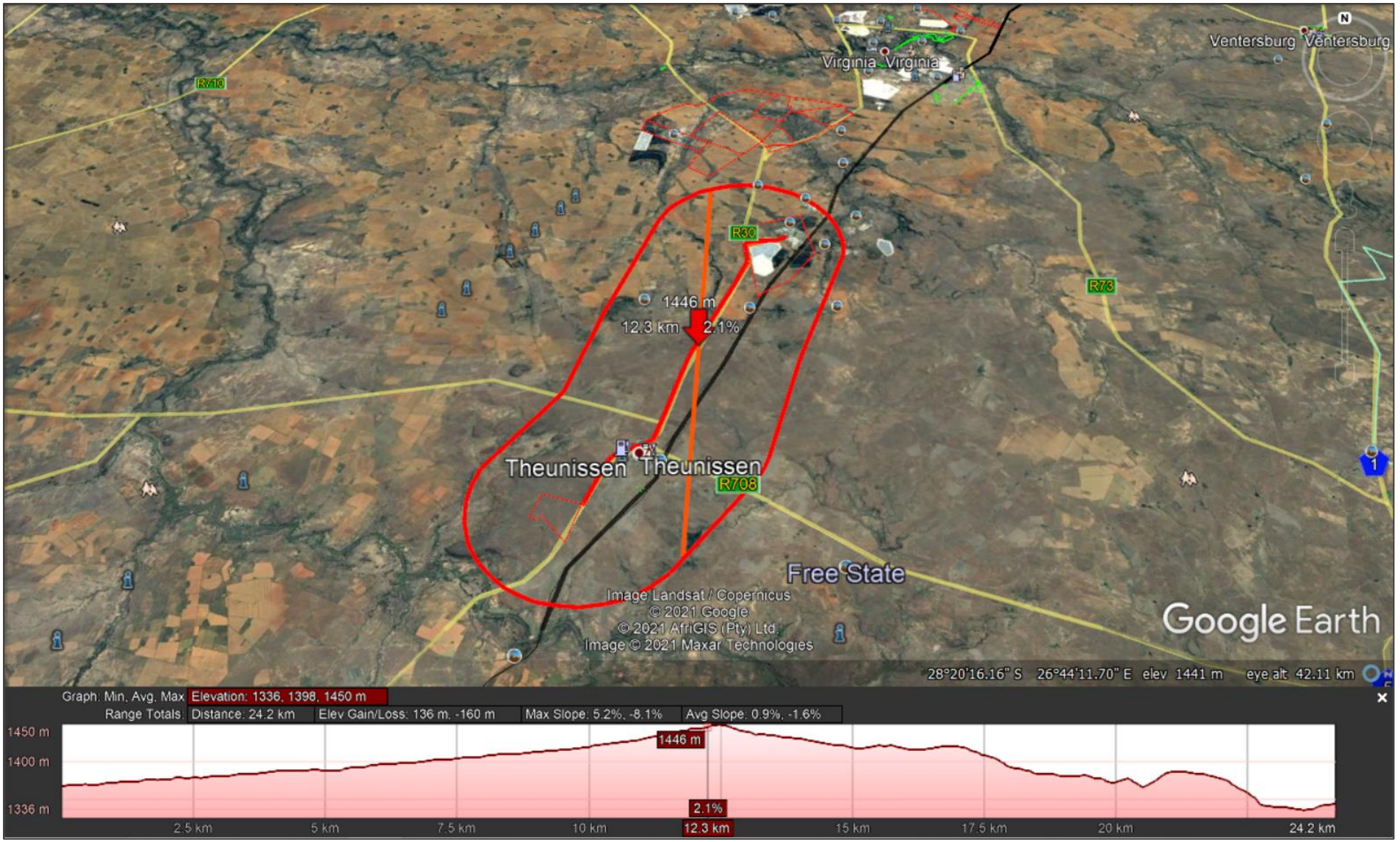

Figure 4.1: Elevation Transect of the power line taken from north to south.

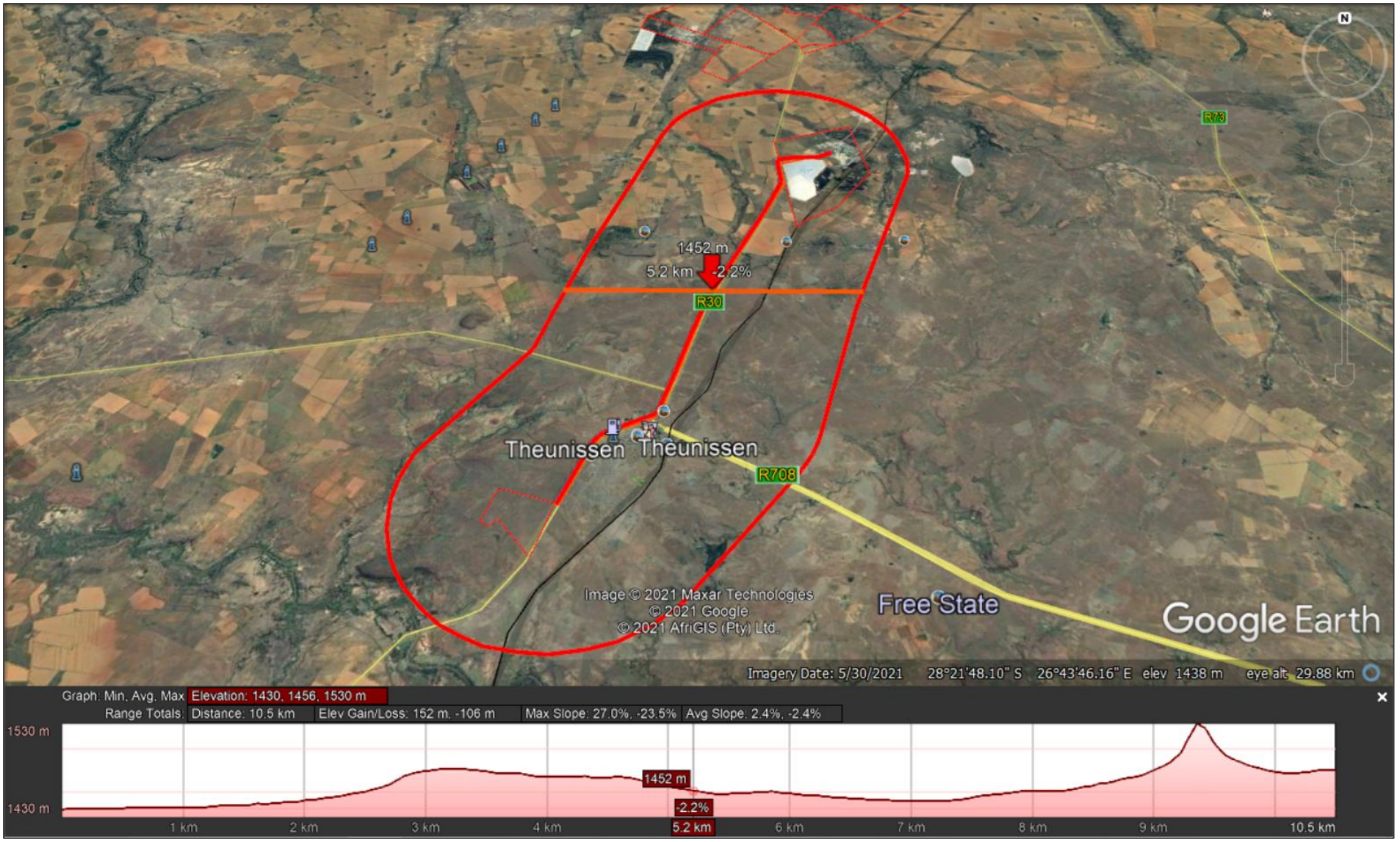

Figure 4.2: Elevation Transect of the power line taken from west to east.

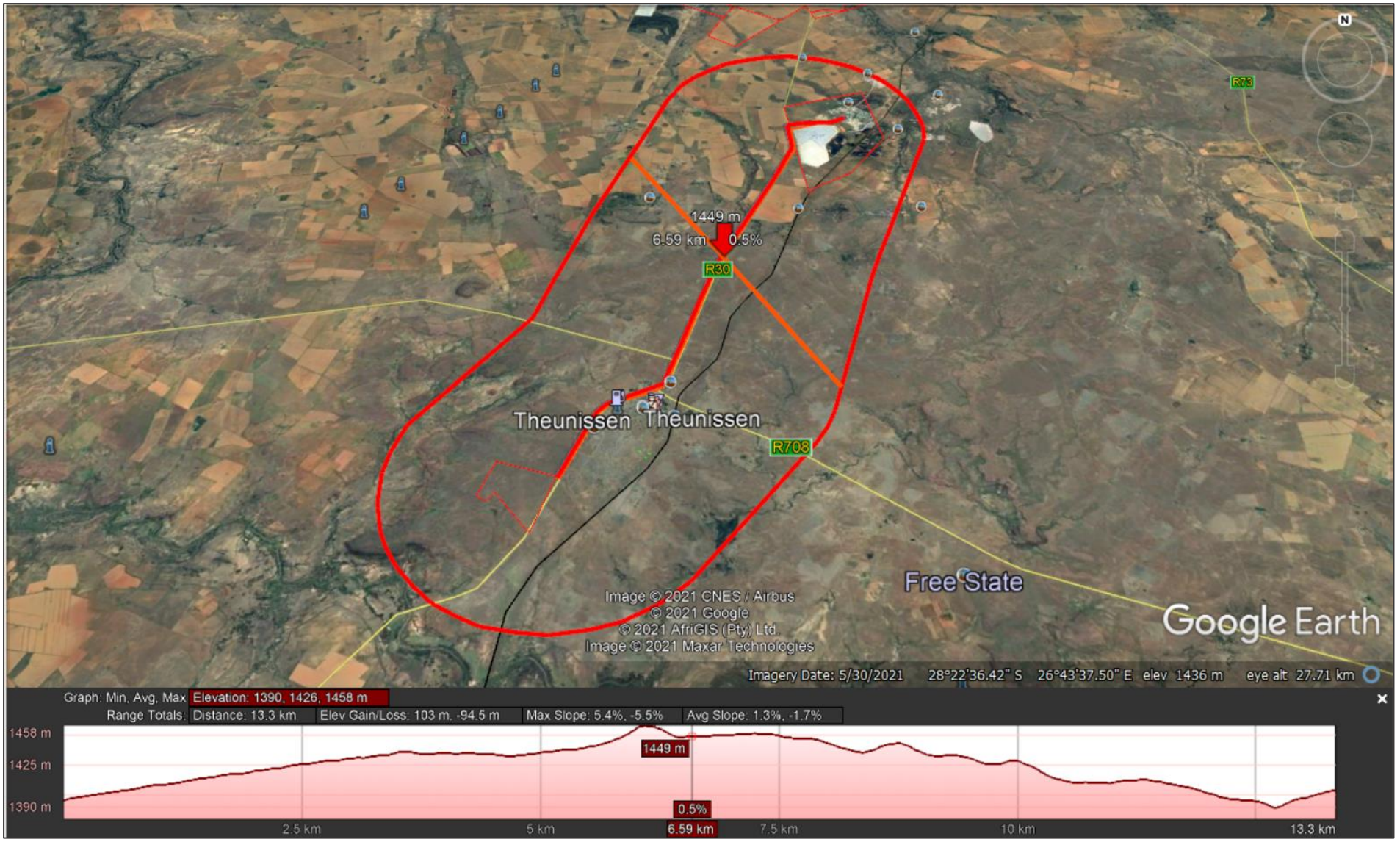

Figure 4.3: Elevation Transect of the power line taken from north west to south east.

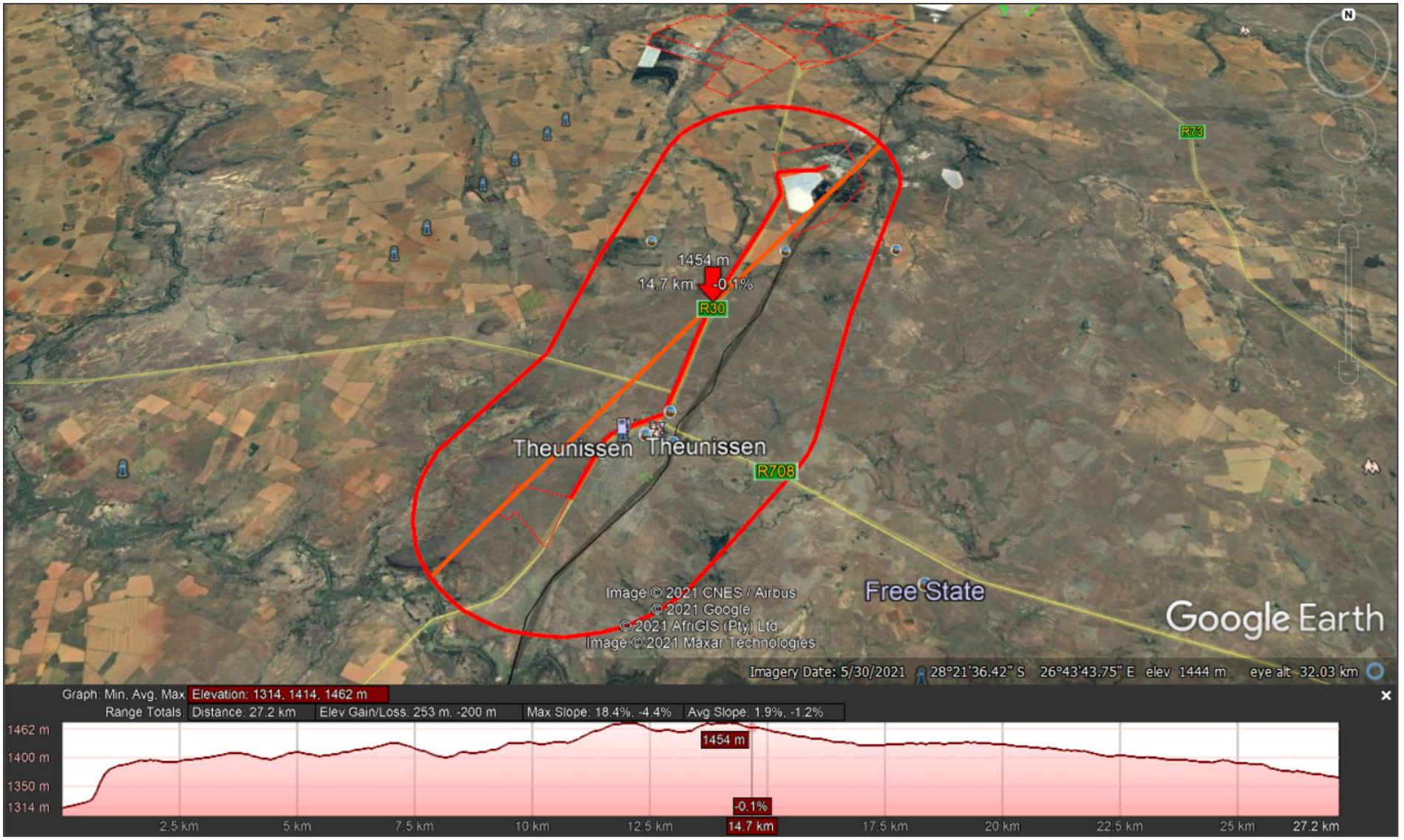

Figure 4.4: Elevation Transect of the power line taken from north east to south west.

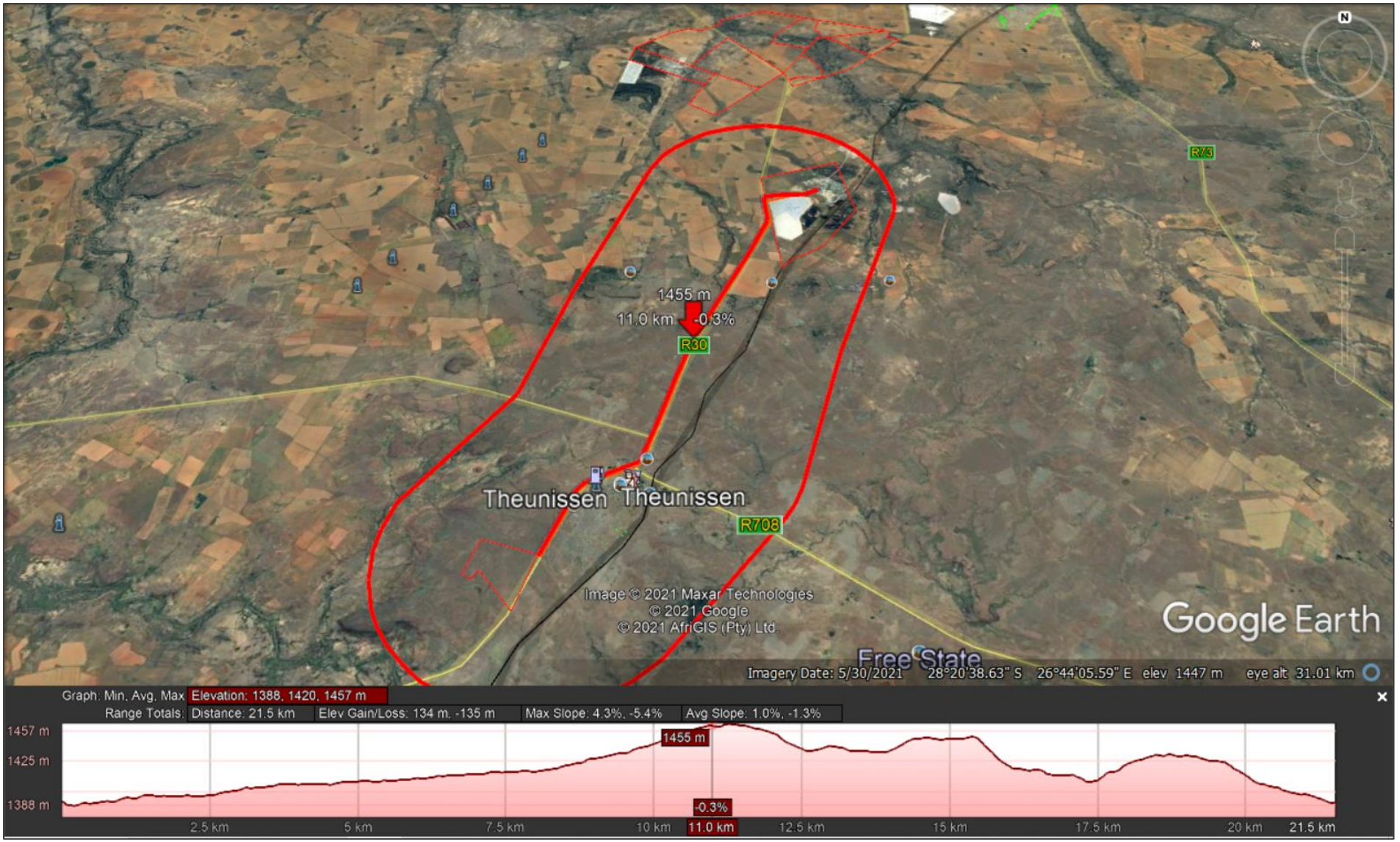

Figure 4.5: Elevation Transect of the power line route

4.1.2. Vegetation Patterns

In terms of vegetation type the proposed power line route falls within the Central Free State Grassland type, which is described by Mucina and Rutherford (2006) as 'Vulnerable'. However the vegetation type has not been included in the list of threatened ecosystems published on 9 December 2011 (Notice 34809 of 2011). Central Free State Grassland vegetation covers the Free State Province and marginally into the Gauteng Province. The region is characterised by undulating plains supporting short grassland, in natural conditions dominated by *Themeda triandra* while *Eragrostis curvula and E. chloromelas* become dominant in degraded habitats. Dwarf karoo bushes establish in severely degraded clayey bottomlands. Overgrazed and trampled low-lying areas with heavy clayey soils are prone to *Acacia karroo* encroachments.

4.1.3. Nature and Density of the Development

Development within the study area can be divided into the following types:

Table 4.1: Nature and density of the development.

	1Km	5km	10km	15km	20km
Industrial Development	- Existing power line infrastructures - Beatrix Mine Sibanye Stillwater	- Existing power line infrastructure - Beatrix mine - Beatrix Mine Substation	- Existing power line infrastructure - Sibanye Gold Beatrix 4 - Joel Mine	- Old Oryx Mine - Existing power line infrastructures	- Tera4 Plant - Existing power line infrastructures
Urban Development	- Masilo Informal Settlement - Theunissen - Farmsteads	- Farmsteads	- Farmsteads	- Farmsteads	- Kitty - Meloding - Virginia - Meloding
Agricultural Development	- Crop Farming - Livestock farming - Farming infrastructure	- Crop Farming - Livestock farming - Farming infrastructure	- Crop Farming - Livestock farming - Farming infrastructure	- Crop Farming - Livestock farming - Farming infrastructure	- Crop Farming - Livestock farming - Farming infrastructure
Service Development	- R30 - Bree Street - R708 - S478 - S494 - S1622 - Storm water channel - Railway line	- Railway line - Sewerage works - R30 - R708 - S478 - S494 - S1622	- R730 - R30 - R708 - Railway line - Small gravel Roads	- R730 - R30 - R708 - Railway line - Small Gravel Roads	- R730 - R30 - R708 - R73 - Railway line - Small Gravel Roads
Tourism Development	- Theunissen Golf Club		- Goldfields Game Ranch - The Wedding Barn - Vetrivier - Doringr River	- Vetrivier - Erfenis Dam - Doring River	- Sand River - Erfenis dam

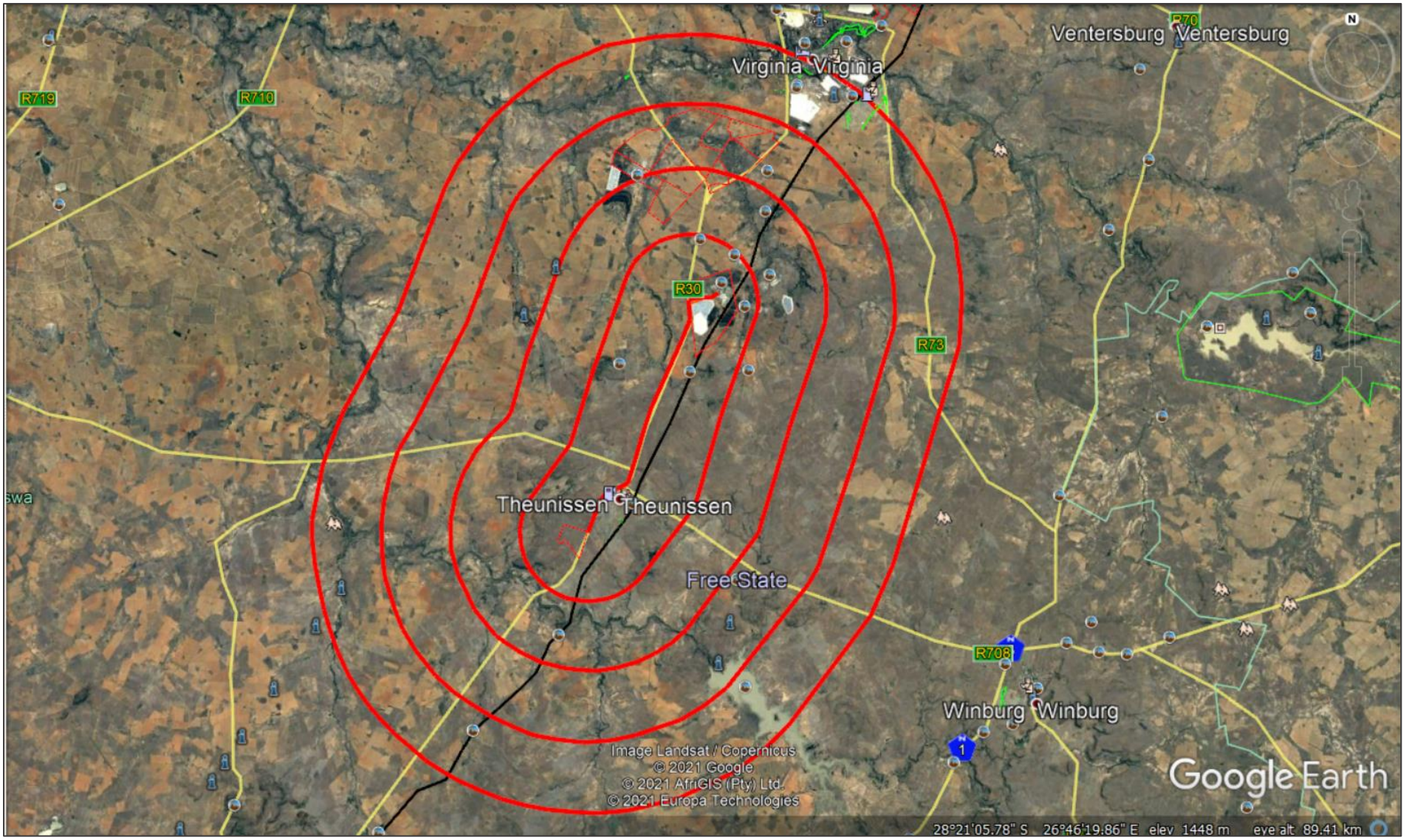

Figure 4.6: Possible visual receptors within 1-20km of the proposed power line.

5. VISUEL RECEPTORS

Please note that the power line forms part of the site's assessment due to it only being a connection point and short line distance.

Visual Receptors can be defined as: "Individuals, groups or communities who are subject to the visual influence of a particular project".

5.1. Identified Visual Receptors

This section is intended to highlight possible Receptors within the landscape which due to use could be sensitive to landscape change. They include:

- **Area Receptors** which include the towns of:
  - Theunissen
  - Virginia.
  - Kitty.
  - Meloding.
  - Merriespruit.
  - Erfenis Dam.
  - Masilo.
- **Linear Receptors** which include:
  - R30
  - Bree Street
  - R708
  - S478
  - S494
  - S1622
  - R730
  - R73
  - Small Gravel Roads
  - Storm water channel
  - Railway line
  - Doring River.
  - Sand River.
  - Vet River
  - Eskom Power Line Infrastructure.
- **Point Receptors** which include:
  - Farmsteads.
  - Agricultural developments.
  - Theunissen Golf Club.
  - Sewerage works.
  - Goldfields Game Ranch
  - The Wedding Barn
  - Beatrix Mine Sibanye Stillwater
  - Beatrix mine

- Beatrix Mine Substation
- Sibanye Gold Beatrix 4
- Joel Mine
- Old Oryx Mine
- Tera4 Plant

Refer to **Figure 6.1: Zone of Theoretical Visibility (ZTV). This map indicates all areas that are in direct line of site of the proposed power line development up to a distance of 20km.

5.2. Impacts on airports and aerodromes

5.2.1. Objects affecting airspace and applicable legislation

Any communications structure, building or other structure, whether temporary or permanent, which has the potential to endanger aviation in navigable airspace, or has the potential to interfere with the operation of navigation or surveillance systems or Instrument Landing Systems, including meteorological systems for aeronautical purposes, is considered an obstacle and shall be submitted to the Commissioner for Civil Aviation for evaluation (refer to SA-CAR Part 139.01.33).

As navigable airspace is any airspace where "heavier than air" craft can operate, it means that any obstacle, anywhere, needs to be evaluated.

The main reason is to control or prevent structures that could have a serious effect on aviation safety, especially in the vicinity of an aerodrome. It also follows that the knowledge of where obstacles are, will add to aviation safety.

Power lines

Power lines, overhead wires and cables are considered as obstacles and the detail shall be communicated to the Commissioner at an early planning stage.

The Commissioner shall require the route of the power line, the co-ordinates (latitude and longitude in degree, minute, seconds and tenth of seconds format) of turning points in the line, the maximum height of the structures above ground level and the name of the power line. The Commissioner shall evaluate the route and require those sections of the line (if any), which is considered a danger to aviation to be marked or rerouted.

Power lines shall be marked when crossing a river, valley or major highway with marker spheres of a diameter of not less than 60 cm. The spheres shall be of one colour and displayed alternately orange/red and white or a colour that is in sharp contrast to the background as seen from an airborne perspective. The spacing between the spheres and between the spheres and the supporting towers shall not exceed 30m. On lines with multiple cables, the spheres shall be fitted to the highest cable.

The marker spheres shall be visible from at least 1000m from an airborne perspective and 300m from the ground.

Where power lines cross a river or valley, the co-ordinates (latitude and longitude in degree, minute, seconds and tenth of seconds format) and the height of the line above the valley or river, shall be communicated to the Commissioner for publication in the appropriate media.

The Commissioner may require that supporting towers be marked and lighted.

Cranes

Where cranes are erected, prior permission shall be obtained from the Commissioner. The co-ordinates (latitude and longitude in degree, minute, seconds and tenth of seconds format), the ground elevation of the site above mean sea level, the height of the crane, the dimensions of the jib as well as the erecting date and duration of the project must be communicated to the Commissioner for evaluation and publication in the relevant media.

The Commissioner shall specify markings, if required.

When markings are required, the crane shall be painted in a conspicuous colour which in a sharp contrast to the background from an airborne perspective. Illumination shall clearly define the shape of the crane and the extremities of the structure shall be illuminated by medium intensity Type B flashing red light (20 – 60 flashes per minute), of 2000 candela (±25 %) intensity.

Variations on Markings

Written, motivated request for the variation of any of the requirements for the marking of structures may be addressed to the Commissioner.

Specifications on markings

Specification on the lighting and painting of structures can be found in International Civil Aviation Organization's Annex 14 chapter 6 and the specifics in Annex 14 APPENDIX 1. COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS AND PANELS. (https://www.flashtechnology.com/wp-content/uploads/2017/09/ICAO-Annex-14-Chapter-6-2013.pdf).

Figure 5.1: Stringing of power line infrastructure in South Africa.

6. ZONE OF THEORETICAL VISIBILITY MODEL

Visual Receptors can be defined as: "Individuals, groups or communities who are subject to the visual influence of a particular project."

A Zone of Theoretical Visibility (ZTV) is a Geographic Information System (GIS)-generated tool to identify the likely (or theoretical) extent of visibility of a development. The tool used in this model does not take existing screening in account but only the above mean sea level of the landscape.

Table 6.1: ZTV Assumptions

Radius	Impact Magnitude
0-5km	Very High - High
5-10km	Medium-High
10-15km	Medium-Low
15-20km	Low

6.1. ZTV Rating

Table 6.2 below reflects the visibility rating in terms of proximity on viewers of the Power Line. The distances were calculated according to experience, assumptions and opinion. The ZTV map will give a clearer understanding of areas susceptible to line of sight for the Power Line.

Table 6.2: ZTV Visibility Rating in terms of Proximity to the Power Line.

Radius	Visual Receptors	Visibility rating in terms of proximity
0-5km	- Masilo Informal Settlement. - Theunissen. - Existing Power Line Infrastructure. - Railway line. - Agricultural Developments. - Farmsteads. - Theunissen golf club. - R30 - Bree Street - R708 - S478 - S494 - S1622. - Beatrix Mine Sibanye Stillwater. - Beatrix Mine. - Beatrix Mine Substation.	Very High
5-10km	- R30. - Agricultural Developments. - R708. - Existing Power Line Infrastructure. - Sibanye Gold Beatrix 4. - Joel Mine. - Vet River.	High
10-15km	- Erfenis Dam. - Vet River. - R30.	Medium
15-20km	- Agricultural Developments. - Existing Power Line Infrastructure. - R30.	low
20-25km	-	Very Low

The ZTV assessment did not take into account existing screening such as buildings and vegetation cover but rather the terrain's above mean sea level (AMSL) which indicates line of sight. The main visual receptors in the area are agricultural developments, with very few urban developments in the form of farmsteads, impacted by the proposed development.

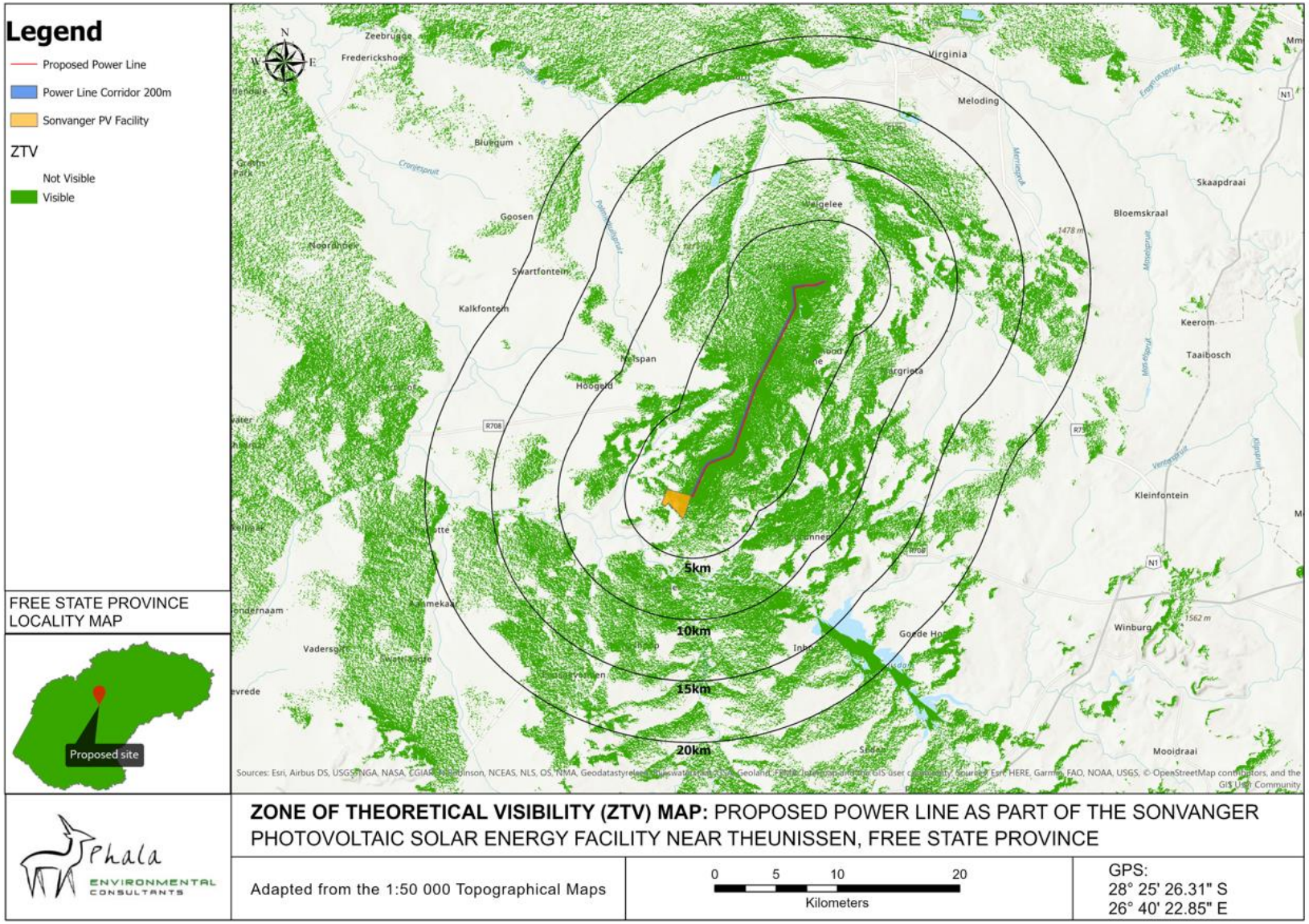

Figure 6.1: Zone of Theoretical Visibility (ZTV) for the Power Line.

7. VISUAL IMPACT ASSESSMENT

This section provides a detailed description and assessment of the potential visual impacts that were identified during the EIA process for the detailed design and construction, operation, and decommissioning phases of Sonvanger Power Line.

7.1. Design and Construction Phase

The design and construction phase of the proposed Sonvanger SPP and Power Line are expected to take approximately 12 to 18 months to complete. It is anticipated that the following activities would be included and would form part of the detailed design and construction phase. It is important to note that the power line will not exist alone, nor will the SPP be able to exist alone, therefore the activities below include the SPP and the activities relevant to the power line, are highlighted:

- **Pre-planning:** Several post-authorisation factors are expected to influence the final design of the facility and could result in small-scale modifications of the positioning of the PV array and / or associated infrastructure. The construction process is dynamic and unforeseen changes to the project specifications may occur. The final facility design is required to be approved by DFFE prior to any construction activities commencing on-site. Should any substantive changes or deviations from the original scope or layout of the project reflected in the BA process occur, DFFE would need to be notified thereof, and where applicable additional approval may need to be obtained.
- **Conduct surveys**: Prior to initiating construction, several surveys will be required. These include, but are not limited to confirmation of the micro-siting footprint (i.e., confirming the precise location of the PV panels, substation, and the plant's associated infrastructure), and a geotechnical survey, as well as any other surveys that may be required.
- **Procurement and employment**: At the peak of construction the project is likely to create up to 800 employment opportunities. These employment opportunities will be temporary, and will last for a period of approximately 12 to 18 months (i.e., the length of construction). Employment opportunities generated during the construction phase will include low skilled, semi-skilled, and skilled opportunities. Solar PV projects make use of large numbers of unskilled and semi-skilled labour so there will be good opportunity to use local labour. The injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area. Most of the labour force is expected to be sourced from the surrounding towns. No labourers will be accommodated on-site during the construction period.
- **Establishment of an access road to the site:** Access to the facility will be obtained via the R48 and access to the proposed power line route will be obtained from the S1159, R48 and P70. An internal site road network will also be required to provide access to the solar field and associated infrastructure. The access and internal roads will be constructed within a 25-meter corridor. The final layout will be determined following the identification of site related sensitivities.

- **Undertake site preparation:** Site preparation activities will include clearance of vegetation. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and / or spread on site.
- **Transport of components and equipment to site:** The national, regional, secondary and proposed internal access roads will be used to transport all components and equipment required during the construction phase of the solar facility. Some of the components (i.e., substation transformer) may be defined as abnormal loads in terms of the National Road Traffic Act (No. 93 of 1996) (NRTO) by virtue of the dimensional limitations. Typical civil engineering construction equipment will need to be brought to the site (e.g., excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the mounting of the PV support structures, construction of the substation and site preparation.
- **Establishment of laydown areas on site:** Laydown and storage areas will be required for typical construction equipment. Once the required equipment has been transported to site, a dedicated equipment construction camp and laydown area will need to be established adjacent to the workshop area. The equipment construction camp serves to confine activities and storage of equipment to one designated area to limit potential impacts associated with this phase of development. The laydown area will be used for the assembly of the PV panels and the general placement / storage of construction equipment.
- **Erect PV arrays and construct substation and invertors:** The construction phase involves installation of the PV solar panels and structural and electrical infrastructure required for the operation of the facility. In addition, preparation of the soil and improvement of the access roads is likely to continue for most of the construction phase. For array installations, vertical support posts are driven into the ground. The posts will hold the support structures (tables) on which the PV modules would be mounted. Trenches are dug for the underground AC and DC cabling and the foundations of the inverter enclosures and transformers are prepared if necessary. Underground cables and overhead circuits connect the Power Conversion Stations (PCS) to the on-site AC electrical infrastructure and ultimately the solar facility's onsite substation. The construction of the substation will require a survey of the site, site clearing and levelling and construction of access road(s) (where applicable), construction of a level terrace and foundations, assembly, erection, installation and connection of equipment, and rehabilitation of any disturbed areas, and protection of erosion sensitive areas.
- **Establishment of ancillary infrastructure:** Ancillary infrastructure will include workshop, storage and laydown areas, gatehouse and security complex, as well as a temporary contractor's equipment camp. The establishment of the ancillary infrastructure and support buildings will require the clearing of vegetation and levelling of the development site, and the excavation of foundations prior to construction. Laydown areas for building materials and equipment associated with these buildings will also be required.
- **Construction of the power line:** A power line is constructed by surveying the power line route, constructing foundations for the towers, installing the towers, stringing the conductors, and finally rehabilitating disturbed areas and protecting erosion sensitive areas.

- **Undertake site rehabilitation:** Once construction is completed and all construction equipment has been removed, the site will be rehabilitated where practical and reasonable. In addition, on full commissioning of the solar facility, any access points which are not required during operation must be closed and rehabilitated accordingly.

The majority of visual impacts associated with the project are anticipated to occur during the operational phase of development. Impacts during the construction phase of the power line are typical of the type of visual impacts generally associated with construction activities. Impacts associated with the design and construction phase of a project are usually of a short duration and temporary in nature, but could have long-term effects on the surrounding visual environment if not planned or managed appropriately. It is therefore necessary that the design phase be conducted in such a manner so as not to result in permanent impacts associated with the ill placement of project components or associated infrastructure.

7.1.1. Construction Phase Impacts Associated with the Sonvanger Power Line

7.1.1.1. Construction Impacts

Impacts during the construction phase of the project mainly relate to construction activities, dust generation and there may be a notable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and landowners in the area.

Table 7.1: Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed Sonvanger Power Line

Nature of Impact	**Visual impact of construction activities on sensitive visual receptors in close proximity to the Power Line.**							
	Geographical Extent	**Probability**	**Duration**	**Magnitude**	**Reversibility**	**Irreplaceable Loss of Resources**	**Cumulative Effect**	**SIGNIFICANCE**
Pre-Mitigation	Local (2)	Definite (4)	Short term (1)	Medium (2)	Partly Reversable (2)	No loss of resources (1)	Low (2)	(28) Low Negative
Post-Mitigation	Local (2)	Probable (3)	Short term (1)	Low (1)	Partly Reversable (2)	No loss of resources (1)	Low (2)	(13) Low Negative
Can the impact be mitigated?	Yes							
Mitigation:	Planning - Retain and maintain natural vegetation immediately adjacent to the development footprint. Construction - Ensure that vegetation is not unnecessarily removed during the construction phase. - Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) where possible. - Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. - Ensure that rubble, litter, etc. are appropriately stored (if it can't be removed daily) and then disposed of regularly at a licenced waste site. - Reduce and control dust during construction by utilising dust suppression measures. - Reduce construction activities between 07:00 and 18:00, where possible, in order to reduce the impacts of construction lighting.							

	- Rehabilitate all disturbed areas immediately after the completion of construction work and maintain good housekeeping.
No-Go Alternative:	The current status quo is maintained due to no impact.
Cumulative Impacts:	The construction of the Sonvanger SPP facility and the 132kV evacuation line may increase the cumulative visual impact together with existing electricity infrastructure, to people using the road adjacent to site. Dust will be the main factor to take into account.
Residual Impacts:	None, if rehabilitation is carried out as specified.

7.2. Operational Phase

The Sonvanger SPP (which will include the power line) is anticipated to operate for a minimum of 20 years. While the power line is largely self-sufficient, monitoring and periodic maintenance activities will be required. Key elements of the Operation and Management (O&M) Plan include monitoring and reporting the performance of the power line and conducting preventative and corrective maintenance.

The potential positive and negative visual impacts which could arise as a result of the operation of the proposed project (which include the SPP) include the following:

7.2.1. Operational Phase Impacts Associated with the Sonvanger Power Line

7.2.1.1. Potential visual impacts on sensitive visual receptors located within a 5km radius of the SPP

The Sonvanger Power Line (~7,4km in length) is expected to have a relative impact on visual receptors located within a 5km radius of the proposed project. These most sensitive of these visual receptors are road users on the R30 and R708, as well as agricultural developments in the area. The power line was assessed within a 200m wide corridor.

Due to the height of the Power Lines and extent of the project, no viable mitigation measures can be implemented to eliminate the visual impact of the power line. Numerous other power lines and substations are present in the area surrounding the proposed power line.

Table 7.2: Visual impacts of observers in close proximity to the proposed power line.

Nature of Impact	**Visual impact on observers travelling along the roads and residents at homesteads within a 5km radius of the power line.**							
	Geographical Extent	**Probability**	**Duration**	**Magnitude**	**Reversibility**	**Irreplaceable Loss of Resources**	**Cumulative Effect**	**SIGNIFICANCE**
Pre-Mitigation	Local (2)	Probable (3)	Long term (3)	High (3)	Partly Reversable (2)	No loss of resources (1)	Low (2)	(39) Medium Negative
Post-Mitigation	Local (2)	Probable (3)	Long term (3)	High (3)	Partly Reversable (2)	No loss of resources (1)	Low (2)	(39) Medium Negative
Can the impact be mitigated?	No, but best practice measures can be implemented.							
Mitigation:	Planning - Retain/re-establish and maintain natural vegetation under the power line. Operations - Maintain general appearance of the power line corridor.							
No-Go Alternative:	The current status quo is maintained due to no impact.							
Cumulative Impacts:	The construction of the Sonvanger SPP facility and the 132kV evacuation line may increase the cumulative visual impact together with existing electricity infrastructure, to people using the road adjacent to site. Dust will be the main factor to take into account.							
Residual Impacts:	The visual impact will be removed after decommissioning of the site, if the SPP is not decommissioned after 20 years – the visual impact will of the power line will remain as well.							

7.2.1.2. Potential visual impacts on sensitive visual receptors in the region (5-10km)

The Sonvanger Power Line (~22km in length) is expected to have a low visual impact on observers located between 5-10km from the proposed power line. There are a number of agricultural developments located in the area. The power line was assessed within a 200m wide corridor.

Due to the height of the Power Lines and extent of the project, no viable mitigation measures can be implemented to eliminate the visual impact of the power line. Numerous other power lines and mines are present in the area surrounding the SPP.

Table 7.3: Visual impact of the proposed power line within the region.

Nature of Impact	**Visual impact on observers travelling along the roads and residents at homesteads within a 5-10km radius of the power line.**							
	Geographical Extent	**Probability**	**Duration**	**Magnitude**	**Reversibility**	**Irreplaceable Loss of Resources**	**Cumulative Effect**	**SIGNIFICANCE**
Pre-Mitigation	Local (2)	Possible (2)	Long term (3)	Medium (2)	Partly Reversable (2)	No loss of resources (1)	Low (2)	(28) Low Negative
Post-Mitigation	Local (2)	Possible (2)	Long term (3)	Medium (2)	Partly Reversable (2)	No loss of resources (1)	Low (2)	(28) Low Negative
Can the impact be mitigated?	No, but best practice measures can be implemented.							
Mitigation:	Planning - Retain/re-establish and maintain natural vegetation under the power line. Operations - Maintain general appearance of the power line corridor.							
No-Go Alternative:	The current status quo is maintained due to no impact.							
Cumulative Impacts:	The construction of the Sonvanger SPP facility and the 132kV evacuation line may increase the cumulative visual impact together with existing electricity infrastructure, to people using the road adjacent to site. Dust will be the main factor to take into account.							
Residual Impacts:	The visual impact will be removed after decommissioning of the site, if the SPP is not decommissioned after 20 years – the visual impact will of the power line will remain as well.							

7.2.1.3. Visual and sense of place impacts

An area's sense of place is created through the interaction of various characteristics of the environment, including atmosphere, visual resources, aesthetics, climate, lifestyle, culture, and heritage. An area's sense of place is however subjective and largely dependent on the demographics of the population residing within the area and their perceptions regarding trade-offs. For example, while some individuals may prefer not to see any form of infrastructure development, others may have an interest in large-scale infrastructure, or engineering projects, and the operation of such facilities, and consider the impact to be less significant. Such a scenario may especially be true given that the project comprises a Renewable Energy project and could therefore be seen as benefitting the local environment, when compared to non-renewable energy generation projects.

An impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light. The visual impacts associated with the impact on sense of place relate to the change in the landscape character and visual impact of Sonvanger Power Line. The area surrounding the power line route is degraded and characterised by agricultural developments and mines. Considering this, it can be anticipated that the visual and sense of place impacts associated with the operation of the facility will be of low significance.

Table 7.4: Visual impact and impacts on sense of place

Nature of Impact	**Visual impacts and sense of place impacts associated with the operation phase of the Sonvanger Power Line.**							
	Geographical Extent	**Probability**	**Duration**	**Magnitude**	**Reversibility**	**Irreplaceable Loss of Resources**	**Cumulative Effect**	**SIGNIFICANCE**
Pre-Mitigation	Local (2)	Possible (2)	Long term (3)	Medium (2)	Reversable (1)	Significant loss of resources (3)	Low (2)	(26) Low Negative
Post-Mitigation	Local (2)	Possible (2)	Long term (3)	Medium (2)	Reversable (1)	Significant loss of resources (3)	Low (2)	(26) Low Negative
Can the impact be mitigated?	No, but best practice measures can be implemented, and subjectivity can be influenced.							
Mitigation:	- It is believed that renewable energy resources are essential to the environmental well- being of the country and planet (WESSA, 2012). Aesthetic issues are subjective, and some people find solar farms and their associated infrastructure pleasant and optimistic while others may find it visually invasive; it is mostly perceived as symbols of energy independence; and local prosperity.							

	- The subjectivity towards the project in its entirety can be influenced by creating a "Green Energy" awareness campaign, educating the local community and potentially tourists on the benefits of renewable energy. This can be achieved by also hosting an 'open day' where the local community can have the opportunity to view the completed project which may enlist a sense of pride in the renewable energy project in their area. - Implement good housekeeping measures.
No-Go Alternative:	The current status quo is maintained due to no impact.
Cumulative Impacts:	Potential impact on the current sense of place in the area due to other electricity infrastructure in the area.
Residual Impacts:	The visual impact of the Sonvanger SPP and power line will remain if the facility is not decommissioned and dismantled after the end of its operational life.

7.3. Decommissioning Phase

The decommissioning phase of the project will result in the same visual impacts experienced during the construction phase of the project. However, in the case of the Sonvanger Power Line (which includes the Sonvanger SPP) it is anticipated that the proposed facility will be refurbished and upgraded to prolong its life. No decommissioning of the facility is proposed.

7.4. Assessment of Alternatives

No alternative routes have been identified for assessment, but a 200m wide corridor has been assessed as part of the power line route to make provision for any sensitive features that might be encountered and have to be avoided. The final location of the proposed power line route will be informed by technical considerations and inputs from the relevant specialist studies (including the VIA) being undertaken as part of the EIA process.

7.5. Assessment of Impacts for the No-Go Alternative

The "no-go" alternative is the option of not constructing the Sonvanger Power Line (which in turn includes the Sonvanger SPP). The implementation of Sonvanger Power Line (and Sonvanger SPP) is expected to result in a number of negative visual impacts, but if the power line and SPP is not constructed the following positive impacts will be lost:

- Potential direct and indirect employment opportunities.
- Potential economic multiplier effect.
- Development of non-polluting, renewable energy infrastructure.

8. MITIGATION MEASURES

The primary visual impact, which is associated with the power line route and infrastructure is not mitigatable to the point where the visual impact can be eliminated, but it can be reduced by implementing best practice measures. The functionality of the power line cannot be changed to reduce the possible visual impact, but the following measures can be put in place to enhance the possible visual impact:

- It is recommended that vegetation cover (i.e., either natural or cultivated) located within the power line servitude, be maintained, during both the construction and operational phases of the power line and to only disturb areas where the pylons will be located.
- Existing roads should be utilised wherever possible. New roads should be planned to take due cognisance of the topography to limit cut and fill requirements. The construction/upgrade of roads should be undertaken properly, with adequate drainage structures in place to minimise the risk of erosion.

The following mitigation and monitoring requirements are recommended to ensure the visual impact of the proposed development is limited:

8.1. Mitigation Measures during the Construction and Decommissioning Phases

- An Environmental Control Officer should be appointed during the construction and decommissioning phase to oversee environmental compliance.
- Ensure that vegetation is not unnecessarily cleared or removed during the construction period.
- Reduce the construction period through careful logistical planning and productive implementation of resources.
- Plan the placement of lay-down areas and potential temporary construction camps in order to minimise vegetation clearing (i.e., in already disturbed areas) where possible.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- Implement good housekeeping through the removal of rubble, litter and construction material, if it is not removed daily to a registered landfill site, then it should be stored appropriately until removal can take place.
- Dust suppression should be implemented during construction especially near roads where dust may cause reduced visibility. Due to a scarcity of water in the region, contractors should source alternative ways to implement dust suppression. One such way could be the use of fine gravel stone on roads with heavy traffic.
- Restrict construction activities to daylight hours in order to negate or reduce the visual impact associated with lighting.
- Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of construction works.

8.2. Mitigation Measures during the Operational Phase

- Maintenance of the power line.
- Roads must be maintained to eliminate erosion and suppress dust.
- Rehabilitated areas must be monitored for rehabilitation failure and remedial action must then be implemented as and when required.
- Where sensitive visual receptors are likely to be affected (e.g., residents of homesteads in close proximity to the power line), it is recommended that the developer enter into negotiations with property owners regarding the potential screening of visual impacts at the receptor site. This may entail the planting of vegetation or trees. Visual screening has been found to be most effective when placed at the receptor itself, which will block the view towards the power line.
- Due to the height of the Power Line, no viable mitigation measures can be implemented to eliminate the visual impact of the power line, but the subjectivity towards the project in its entirety can be influenced by creating a “Green Energy” awareness campaign, educating the local community and potentially tourists on the benefits of renewable energy.

8.3. Monitoring Requirements

The following monitoring requirements are recommended to be included as conditions in the Environmental Authorisation to ensure the visual impact of the proposed development is limited:

- The ECO and ELO should monitor the amount of litter on site during construction on a daily basis to ensure litter prevention.
- The ECO and ELO should monitor housekeeping during construction to ensure neat and tidy laydown areas.
- The ECO and ELO should monitor the amount of dust seen up to 20km from site during construction. Dust suppression should be implemented on a daily basis.
- The ECO and ELO should ensure and monitor all rehabilitation after construction for at least the first 6 months to ensure all vegetation is established in a proper and healthy way. This will also depend on the amount of rainfall and season after construction which might shorten the monitoring requirement.
- Any other monitoring requirements set out by the EA, EMP and SACAA.

9. KEY FINDINGS AND CONCLUSION

Referring to the assessment score of this VIA report review, the significance of the visual impact will be a "Negative Low Impact". The only receptors likely to be impacted by the proposed development are the nearby property owners and on nearby roads. A summary of the potential impacts identified for the detailed design and construction, and operation phase are presented in Table 9.1 and Table 9.2. A summary of the potential cumulative visual impacts identified for the project is provided in Table 9.3.

Table 9.1: Summary of potential visual impacts identified for the design and construction phase.

Impact	Significance Without Mitigation	Significance With Mitigation
Construction impacts	(28) Low Negative	(13) Negative Low

Table 9.2: Summary of potential visual impacts identified for the operation phase.

Impact	Significance Without Mitigation	Significance With Mitigation
Potential visual impacts on sensitive visual receptors located within a 5km radius of the SPP	(39) Medium Negative	(39) Medium Negative
Potential visual impacts on sensitive visual receptors in the region (5-10km)	(28) Low Negative	(28) Low Negative
Visual and sense of place impacts	(26) Low Negative	(26) Low Negative

9.1. Key Findings

The construction and operational phase of the proposed Sonvanger power line, may have a visual impact on the study area, especially within (but not restricted to) a 5 - 10km radius of the proposed power line. The visual impact will differ amongst places, depending on the distance of the power line.

The proposed development is located in a close proximity to other existing Eskom power infrastructure. The potential for cumulative impacts to occur as a result of the projects is therefore likely.

Due to the height of the power line (32m), no viable mitigation measures can be implemented to eliminate the visual impact of the power line, but the possible visual impacts can be reduced. A number of mitigation measures have however been proposed regardless of whether or not mitigation measures will reduce the significance of the of the anticipated impacts, they are considered good practice and should be implemented and maintained throughout the construction, operational and decommissioning phases of the project.

In terms of possible landscape degradation, the landscape does not appear to have any specific protection or importance. No buffer areas or areas to be avoided are applicable for this development.

9.2. Conclusion

It is believed that renewable energy resources are essential to the environmental well- being of the country and planet (WESSA, 2012). Aesthetic issues are subjective, and some people find solar farms and their associated infrastructure pleasant and optimistic while others may find it visually invasive; it is mostly perceived as symbols of energy independence; and local prosperity. The visual impact is also dependant on the land use of an area and the sensitivity thereof in terms of visual impact, such as protected areas, parks and other tourism related activities.

Taking into account all positive factors of such a development including economic factors, social factors and sustainability factors, especially in an arid country, the visual impact of this proposed development will be insignificant and is suggested that the development commence, from a visual impact point of view. **PLEASE NOTE** that the details of the power line should be submitted with the South African Civil Aviation Authority (SACAA).

It is therefore Phala Environmental's recommendation that the project be approved.

10. REFERENCES

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