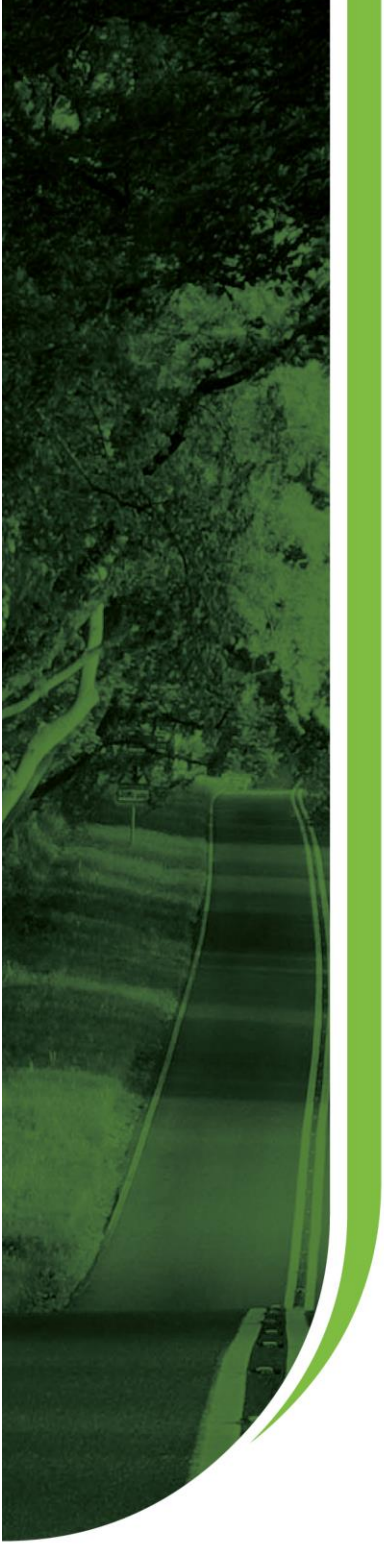

# PROPOSED DEVELOPMENT OF THE PRIESKA POWER RESERVE, PRIESKA, NORTHERN CAPE PROVINCE

## Visual Impact Assessment

## Focus: Wind Turbines

June 2022

**Prepared for:**

ZERO EMISSION ENERGY CENEC

**Prepared by:**

Mr Christoff du Plessis
christoff@enviroworks.co.za

# QUALITY AND REVISION RECORD

## 1.1 QUALITY APPROVAL

| | Capacity | Name | Signature | Date |
|---|---|---|---|---|
| Author | Visual Specialist | Christoff du Plessis |  | 29/06/2022 |
| Reviewer | Quality Check Officer | Elbi Bredenkamp |  | 29/06/2022 |

This report has been prepared in accordance with Enviroworks Quality Management System.

## 1.2 REVISION RECORD

| Revision Number | Objective | Change | Date |
|---|---|---|---|
| Version 1 | Determine the Visual Impact of the Proposed Wind Turbines of the Prieska Power Reserve on the surrounding area of Prieska, Northern Cape. | - | 29/06/2022 |

## 1.3 DISCLAIMER

*Even though every care is taken to ensure the accuracy of this report, visual impact assessment studies are limited in scope, time and budget. Discussions are to some extent made on reasonable and informed assumptions built on bona fide information sources, as well as deductive reasoning. Since visual impact studies deal with dynamic natural systems additional information may come to light at a later stage during the impact assessment phase. The author does not accept responsibility for conclusions made in good faith based on own databases or on the information provided. Although the author exercised due care and diligence in rendering services and preparing documents, he accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the authors and by the use of this document. This report should therefore be viewed and acted upon with these limitations in mind."*

# 2 EXECUTIVE SUMMARY

Enviroworks has been appointed by CENEC to compile the Visual Impact Assessment (VIA) for the proposed Prieska Power Reserve Industrial Hub Phase 1 in order to determine the Visual Impact of the proposed facility. This VIA Report was compiled in accordance with the Guidelines for involving a Visual and Aesthetic Specialist in the EIA process (DEA&DP, 2005). This Guideline was developed by the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) to be implemented as best practise.

## 2.1 PROJECT DESCRIPTION

CENEC is a planning, managing, contracting and financing facilitator for Solar Plants; however, they have also expanded their operations into wind energy. An opportunity arose for CENEC when access was gained to leasable land approximately ten kilometres (10 km) southeast of Prieska in the Northern Cape Province. The proposed development entails the following:

1. **Electricity Provision**

Given the size of production planned (Solar: 1760 MW and Wind: 400 MW) and being adjacent to a high capacity Line, this production of electricity will justify establishment on its own.

2. **Green Hydrogen and Green Ammonia**

The weak point of solar energy is the night time. The latest battery technology will be employed for storage; however, an additional logistical advantage is gained by using a hybrid model whereby the wind will be used during the night (at two hundred metres above ground level the wind seldom ceases) and the solar during the day-time, which is all backed up by batteries as well as a wheeling deal with Eskom.

3. **Possible Downstream Industries:**

- **Zero Carbon Smelter:**

A certain class of smelter releases no carbon dioxide. The beauty of this technology is that it releases only oxygen. In addition, it does away with a number of the waste creating and expensive processes associated with conventional smelters. The limitation is that it could work only with manganese oxide and ferro-oxide. However, both these are available from the Postmasburg-Kathu region, adding value to minerals that previously would have been exported abroad, leaving South African industries to buy steel back at inflated process.

- **Next Generation Protein:**

Given food shortages across Africa and other parts of the world, a new way of looking at food is emerging. Following on the artificial production of some vitamins for almost a century, many other nutritional elements would follow and since 2015 many industrial laboratories in the food industry are investigating new means of artificially producing proteins. It is planned to locate such a plant in the hub of the Karoo Power Reserve. It also has an interesting subsection that is equally innovative:

- **Carbon Sequestration Plant:**

High concentrations of carbon dioxide, the main cause of global warming, now be captured mechanically from the atmosphere into filters. These filters are removed and heated in sealed chambers to release the carbon dioxide that will then be concentrated for a variety of industrial uses, but also for the artificial protein production.

During Phase 1, the chemical plant will produce eighty thousand tons (80 000 t) of hydrogen per year. It will receive one hundred and eighty Mega Watt (180 MW) from three (3) different solar PV plants and one hundred and thirty-two Mega Watt (132 MW) from the wind turbines on the south-eastern mountain tops.

## 2.2 SITE ALTERNATIVES

The proposed development will be situated on the following farms Prieskas Poort No. 51, Karabee No. 50 and T Keikams Poort No. 71, Prieska, Northern Cape Province. The proposed site constitutes of natural terrain.

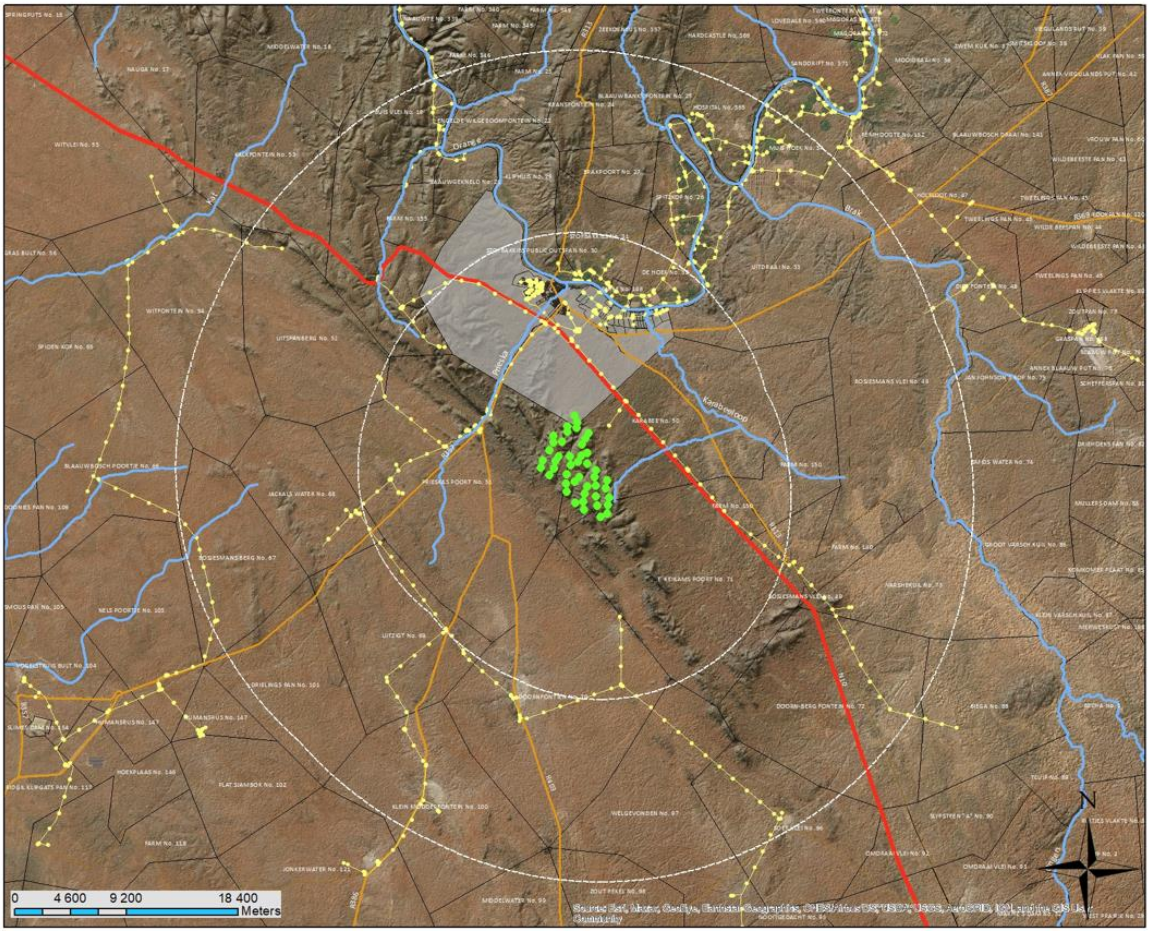


**Figure 1: Locality of the Proposed Development.**

The Client provided only one (1) possible location where the development can take place. According to specifications in the Northern Cape Provincial Spatial Development Framework (2012/2018)(NCPSDF), this land portion is favourable for many additional reasons that will strengthen the planned application form a policy perspective. The points mentioned below are referenced to the maps, obtained from the NCPSDF. This locality is situated in an area that:

- Does not contain sensitive biodiversity and national resources;
- Does not contain important heritage resources;
- Only allows for a low level of agriculture and agriculture processing;
- Is strategically important to the energy sector: solar corridor;
- Provides sufficient supporting provincial infrastructure and service base;
- Is a strategically important Economic Sector: Industrial Development Zone; and,
- Economic and Social Governance.

In addition, the same document rates the settlement investment profile of Prieska as transitional, which means it is, in terms of both development and need, relatively inactive. It is evident that the project not only has merits in its own right, it is also compliant to existing provincial planning and that this project may breathe new life into a community that seems half-forgotten.

## 2.3 DESIGN ALTERNATIVES

One design alternatives are proposed, as detailed below.

### Alternative 1: Construction of Two Hundred Meter (200 m) Wind Turbines - Preferred option

Only one (1) design alternative has been provided for the design of the wind turbines. Figure 2 below provides a visual impression of how the proposed development can possibly look within the surrounding landscape.


**Figure 2: Visual Impression of a Tree Mast**

## 2.4 CONCLUSION AND RECOMMENDATIONS

The proposed development will be highly visible within the short distance zone due to the short distance between the observer and the proposed development. Given the design of the proposed wind turbines it offers a low compatibility with the surrounding landscape. The VAC of the study area is considered to be low within the short distance zone as the proposed development will be placed on top of a low mountain coupled with the scares vegetation cover which predominantly consist of low thicket. The wind tubines, solar farm and the 132 kV Powerline will be visible within the short distance zone. The highest visual impact will occur from National Route Ten (N10) situated three point eight kilometres (3.8 km) towards the northeast, the R357 situated four and a half kilometres (4.5 km) towards the northwest and the R386 situated four point two kilometres (4.2 km) towards the west of the proposed development; however, the visual impact will be temporary from these vantage points due to the fact that observers will only traverse through the study area.

The proposed development will have a high visual impact when observed from the Blockhouse situated within the Koppie Nature Reserve. The blockhouse is the only heritage important structure that will be negatively influenced by the proposed development; however, it must be noted that there are some eight thousand (8 000) blockhouses across South Africa. Furthermore, the blockhouse in question has been vandalised and proof can clearly be seen. The Wind Turbines were predominantly used to determine the visual impact of the proposed development as it is roughly one hundred and fifty metres (150 m) taller than any of the other infrastructure. The relative visibility of the turbines, seen from the Koppie is more or less equal to the silos situated within the foreground. The landscape surrounding Prieska is not considered to be of high scenic nor cultural value as the town owns it origin to the Orange River and the surrounding farms. The proposed development will be an injection to the Local Economy of Prieska and as such the overall moderate visual impact will be acceptable.

**Construction Phase:**

- Access roads are to be kept clean;
- Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. Roofs should be grey and non-reflective;
- Construction camps as well as development areas should be screened with netting;
- Lights within the construction camp should face directly down (angle of 90˚);
- Vegetation clearance should be limited to the development footprint only;
- Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact;
- All areas disturbed by construction activities must be subject to landscaping and rehabilitation;
- All spoil and waste will be disposed to a registered waste site and certificates of disposal provided;
- The project must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;
- Signage, if essential, should be discrete and confined to entrance gates. No corporate or advertising signage should be permitted.
- Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; and,

- Mitigation of visual impacts associated with the construction phase would entail proper planning, management and rehabilitation of the construction site. Mitigation measures include the following:
    - Reduce the time of construction through careful planning of logistics and ensure the productive implementation of resources;
    - Limit disturbance of the environment to the development footprint; and,
    - Limit construction activities to business hours (07:00 – 17:00).

**Operation Phase:**

- Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare;
- Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact;
- Mitigation to minimise lighting impacts include the following:
    - Shielding the sources of light by physical barriers (walls, vegetation or structures itself);
    - Limit mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights);
    - Make use of downward directional lighting fixtures;
    - Make use of minimum lumen or wattage in lights;
    - The navigation light at the top of the mast must be shielded to prevent disturbance to adjacent landowners; and,
    - Use motion sensors to activate lighting ensuring light is available when needed.
- Rehabilitation and Post-closure measures:
    - All above-ground structures should be removed, safely disposed of or possibly recycled for use elsewhere; and,
    - The affected area should be regarded to pre-development topographic conditions, unless the area is required for new specific uses.

# 3 DECLARATION OF THE SPECIALIST

I, **Christoff du Plessis**, **ID 911126 5012 084**, declare that I:

- am an Environmental Specialist at Enviroworks;
- act as an independent Specialist Consultant in the field of Visual Impacts;
- am assigned as Specialist Consultant by CENEC for this proposed project;
- I do not have or will not have any financial interest in the undertaking of the activity other than remuneration for work as stipulated in the terms of reference;
- remuneration for services by the proponent in relation to this proposal is not linked to approval by decision-making Authorities responsible for permitting this proposal;
- the consultancy has no interest in secondary or downstream developments as a result of the Authorisation of this project.
- have no and will not engage in conflicting interests in the undertaking of the Activity;
- undertake to disclose to the Client and the Competent Authority any material, information that have or may have the potential to influence the decision of the Competent Authority required in terms of the Environmental Impact Assessment Regulations 2017; and,
- will provide the Client and Competent Authority with access to all information at my disposal, regarding this project, whether favourable or not.

Christoff du Plessis
christoff@enviroworks.co.za

# 4 SPECIALIST CV AND DETAILS

| | |
|---|---|
| **Business name of Specialist:** | Enviroworks |
| **Specialist Name:** | Christoff du Plessis |
| **Physical address:** | 57 Outeniquasboch Wildlife Estate, Hartenbos, 6520 |
| **Postal address:** | Suite 116, Private Bag X01, Brandhof |
| **Postal code:** | 9324 |
| **Telephone:** | 051 436 0793 |
| **E-mail:** | christoff@enviroworks.co.za |
| **Fax:** | 086 601 7507 |

# Christoff du Plessis

**Relevant Qualifications**

Baccalaureus Scientiae (B.Sc) in Environmental Geography: University of the Free State (2014)

**Work Experience**

**January 2015 – Present:** Environmental Specialist at Enviroworks

**Key Specialist Experience**

**Visual Impact Assessment (VIA):**

- Phalaborwa Wildlife Activity Hub, Kruger National Park, Limpopo Province (SANParks).
- 4.9ha Sand Mine on Portion 5 of the Farm Doornekraal No. 830, Western Cape Province (Greenmined).
- Proposed development of the Harvard Powerline, Bloemfontein, Free State Province (Centlec).
- Proposed development of the 35 m Buffeljagsrivier Monopole Mast, Buffeljagsrivier, Western Cape Province (Coast to Coast Towers).
- Proposed development of the 25 m Robertson Monopole Mast, Robertson, Western Cape Province (Coast to Coast Towers).
- Proposed development of the Klein Mooimaak Rest Camp Facility, West Coast National Park (SANParks).
- Proposed development of a Sand Mine near Malmesbury, Western Cape Province (Greenmined).
- Proposed upgrade of the R27 Gate and Geelbek Restaurant, West Coast National Park, Western Cape Province (SANParks).
- Proposed development of the 25 m Roodekrans Monopole Mast, Krugersdorp, Gauteng Province (Coast to Coast Towers).
- Proposed development of a 25 m Monopole Mast on Portion 25 of the Farm Klein Bottelary No. 17, Brackenfell, Western Cape Province (Coast to Coast Towers).

- Proposed development of a Landfill Site on Portion 3 of the Farm Katbosch No. 93, Sasolburg, Free State Province (Metsimaholo Landfill).
- Proposed development of numerous visitor information centres at Schroda and Mapungubwe Hill, Mapungubwe National Park, Limpopo Province (SANParks).
- Proposed development of a 35 m Monopole Mast on Portion 13 of the Farm Van Aries Kraal No. 455, Grabouw, Western Cape Province (Coast to Coast Towers).
- Proposed development of a 25 m Monopole Mast on Erf 532, Gansbaai, Western Cape Province (Coast to Coast Towers).
- Proposed development of a 35 m Lattice Mast on Portion 7 of the Farm Jagersvlakte No. 292, Grabouw, Western Cape Province (Warren Petterson Planning).
- Proposed development of a 35 m Lattice Mast on Erf 532, Stanford, Western Cape Province (Warren Petterson Planning).
- Proposed development of a 15 m Lattice Mast on Portion 4 of the Farm No. 53, Genadendal, Western Cape Province (Warren Petterson Planning).
- Proposed development of a 25 m Monopole Mast on Portion 8 of the Farm Delta No. 1003, Groot Drakenstein, Western Cape Province (Coast to Coast Towers).
- Proposed development of a 30 m Tree Mast on Portion 87 of the Farm Langverwacht No. 241, Kuils River, Western Cape Province (Warren Petterson Planning).
- Proposed development of a 20 m Tree Mast on Erf 679, Gouda, Western Cape Province (Atlas Towers).
- Proposed development of an IPP 400kV Power Line from Grommis to Aggeneys, Northern Cape Province (Eskom).
- Proposed development of a 30 m Lattice Mast on Erf 2819, Caledon, Western Cape Province (Atlas Towers).
- Proposed development of a 54 m Lattice Mast on Portion 7 of the Farm Haane Kuil No. 335, Beaufort West, Western Cape Province (Star Towers).
- Proposed development of a 25 m Monopole Mast on Erf 1035, Caledon, Western Cape Province (Atlas Towers).
- Proposed development of a 25 m Tree Mast on Erf 47, Birkenhead, Western Cape Province (Atlas Towers).
- Proposed development of a 25 m Monopole Mast on Erf 1201, Van Dyks Bay, Western Cape Province (Atlas Towers).
- Proposed development of a 20 m Tree Mast on Erf 1671, Melkbosstrand, Western Cape Province (Atlas Towers).
- Proposed development of a 15 m Tree Mast on Erf 740, Klein Brak River, Western Cape Province (Atlas Towers).
- Proposed Upgrades to the Alpha 1 Recreational Lounge, Robben Island, Western Cape Province (Robben Island Museum).
- Proposed development of a 25 m Tree Mast on Erf 969, Picaltsdorp, Western Cape Province (Atlas Towers).

- Proposed development of a 25 m Tree Mast on Erf 20601, George, Western Cape Province (Atlas Towers).
- Proposed development of a 25 m Monopole Mast on Erf 571, Dellville Park, Western Cape Province (Atlas Towers).
- Proposed development of a 15 m Tree Mast on Portion 113 of the Farm Ruygte Vally No. 205, Sedgefield, Western Cape Province (Atlas Towers).
- Proposed development of a 15 m Dome Mast on Erf 8281, Mossel Bay, Western Cape Province (Atlas Towers).
- Proposed development of a 35 m Tree Mast on Portion 42 of the Farm Harkerville No. 428, Plettenberg Bay, Western Cape Province (Atlas Towers).
- Proposed development of a 25 m Monopole Mast on the Remaining Extent of the Farm No. 790, Philippi, Western Cape Province (Atlas Towers).
- Proposed development of a 15 m Tree Mast on Portion 3 of the Farm No. 452, Grabouw, Western Cape Province (Atlas Towers).
- Proposed development of a 15 m Tree Mast on the Remainder of Erf 3331, Vredenburg, Western Cape Province (Atlas Towers).
- Proposed development of a 40 m Lattice Mast on Portion 24 of the Farm Olyven Boomen No. 83, Malan Valley, Western Cape Province (Atlas Towers).
- Proposed development of a 25 m Tree Mast on Erf 2, Villiersdorp, Western Cape Province (Atlas Towers).
- Proposed development of the Lendlovu Lodge, Addo Elephant Park, Eastern Cape Province (SANParks).
- Proposed development of a 25 m Tree Mast on Erf 270, Franschhoek, Western Cape Province (Galaxy Palms).
- Proposed development of a 25 m Lattice Mast on Erf 9, Nuwerus, Western Cape Province (Atlas Towers).

**Wetland Delineation Studies:**

- Wetlands Delineation study for the development of 13 borrow pits along National Road 8, Ladybrand, Free State Province (SANRAL).
- Wetland Delineation study for the development of a 12.5ha cemetery on Erf 4233, Western Cape Province (Theewaterskloof Local Municipality).
- Wetland Delineation study for the proposed development of an Agri-Hub near Cederville, Eastern Cape Province (Femplan).
- Wetland Delineation study for the proposed development of an Agri-Hub near Lambasi, Eastern Cape Province (Femplan).
- Wetland Delineation study for the proposed development of the Blue Hills Curro Castle, Midrand, Gauteng Province (Curro Holdings).

**Stormwater Management Plans:**

- Stormwater Management Plan for the Agri-World Recycling Plant, Swellendam, Western Cape Province (Agri-World Recycling Plant).
- Stormwater Management Plan for the Klaasvoogds Granite Mine, Springbok, Northern Cape Province (Greenmined Environmental).
- Stormwater Management Plan for the Moreson Poultry Project, Brandfort, Free State Province (Moreson Poultry).
- Stormwater Management Plan for the Sintier Poultry Project, Bronkhorstspruit, Gauteng Province (Sintier Poultry).
- Stormwater Management Plan for the maintenance and extending of a canal near Karatera, Western Cape Province (Eden Municipality).
- Stormwater Management Plan for Layer Hen Houses on the Remaining Extent of Portion 1 of the Farm Elandsfontein No. 21, Moloti City, North West Province (Bramakama Poultry).

# 5 ABBREVIATIONS

| | | |
|---|---|---|
| **CBA** | - | Critical Biodiversity Area |
| **DEA** | - | Department of Environmental Affairs |
| **DEA&DP** | - | Department of Environmental Affairs & Development Planning |
| **DEM** | - | Digital Elevation Model |
| **DTM** | - | Digital Terrain Model |
| **EIA** | - | Environmental Impact Assessment |
| **ESA** | - | Ecological Support Area |
| **GIS** | - | Geographical Information System |
| **Km** | - | Kilometre |
| **LTE** | - | Latest Cellular Technology |
| **M** | - | Metre |
| **MAP** | - | Mean Annual Precipitation |
| **MAT** | - | Mean Annual Temperature |
| **RF** | - | Radio Frequency |
| **USGS** | - | United States Geological Survey |
| **UTM** | - | Universal Transverse Mercator |
| **VAC** | - | Visual Absorption Capacity |
| **VIA** | - | Visual Impact Assessment |

# 6 REQUIREMENTS OF A SPECIALIST REPORT

Appendix 6 of Government Notice Regulation 326 of 7 April 2017 outlines the basic requirements of a Specialist Report. Please refer to Table 3 below of all requirements.

**Table 1: Requirements of a Specialist Report as set out in GN R. 326 of 07 April 2017.**

| REQUIREMENTS | YES/NO |
|---|---|
| A Specialist report prepared in terms of these Regulations must contain –<br>a. Details of –<br>i. The Specialist who prepared the report; and,<br>ii. The expertise of that Specialist to compile a specialist report including a curriculum vitae; | Yes |
| b. A declaration that the Specialist is independent in a form as may be specified by the Competent Authority; | Yes |
| c. An indication of the scope of, and the purpose for which, the report was prepared;<br>i. An indication of the quality and age of base data used for the Specialist Report;<br>ii. A description of existing impacts on site, cumulative impacts of the proposed development and levels of acceptable change; | Yes |
| d. The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment; | Yes |
| e. A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used; | Yes |
| f. Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives; | Yes |
| g. An identification of any areas to be avoided, including buffers; | Yes |
| h. A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers; | Yes |
| i. A description of any assumptions made and any uncertainties or gaps in knowledge; | Yes |
| j. A description of the findings and potential implications of such findings on the impact of the proposed activity or activities; | Yes |
| k. Any mitigation measures for inclusion in the EMP'r | Yes |
| l. Any conditions for inclusion in the Environmental Authorisation; | Yes |
| m. Any monitoring requirements for inclusion in the EMP'r or Environmental Authorisation; | Yes |
| n. A reasoned opinion –<br>i. Whether the proposed activity, activities or portions thereof should be authorised;<br>ii. If the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMP'r, and where applicable, the closure plan; | Yes |
| o. A description of any consultation process that was undertaken during the course of preparing the specialist report; | N/A |
| p. A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and, | N/A |
| q. Any other information requested by the Competent Authority. | Yes |

# 7 VISUAL IMPACT EVALUATION CRITERIA CHECKLIST

As per the Provincial Government of the Western Cape Guideline for involving Visual and Aesthetic Specialists in the EIA Process (DEA&DP, 2005), a high-quality visual assessment should include the following criteria:

**Table 2: Requirements of a Visual Impact Assessment.**

| REQUIREMENTS | YES/NO |
|---|---|
| Meet the minimum requirements for a visual assessment; | Yes |
| Is appropriate to the nature and scale of the proposed development; | Yes |
| Provides a full description of the environment and the project; | Yes |
| Considers the project within its wider context; | Yes |
| Provides a clear methodology using accepted conventions for visual assessment; | Yes |
| All sources of information and references are given; | Yes |
| Graphics, including maps and visual simulations, are clear; | Yes |
| Include both quantitative and qualitative criteria; | Yes |
| Cumulative visual impacts have been considered; | Yes |
| An evaluation of alternatives has been made; | Yes |
| An explanation of significance ratings, related to bench-marks, is given; | Yes |
| Recommendations for visual mitigation are sensible and practical; | Yes |
| Recommendations for monitoring programmes have been outlined; | Yes |
| The best practical environmental option has been considered; | Yes |
| All the visual issues raised in the scoping have been addressed; | Yes |
| A clear summary of mitigation measures, including essential and optional measures, is given. | Yes |

**Contents**

# 8 STUDY APPROACH

## 8.1 Methodology

The study was undertaken using Geographical Information System (GIS) software as a tool to generate a viewshed analyses and to apply relevant spatial criteria to the proposed development. A detailed Digital Elevation Model (DEM) for the study area (S30E22, S30E23, S31E22 & S31E23) was obtained from the National Aeronautic Space Administration (NASA). The methodology utilised to identify issues to the visual impact include the following activities:

- The creation of a detailed digital terrain model of the potentially affected environment;
- The identification of sensitive environments upon which the proposed Prieska Power Reserve could have a potential impact on; and,
- The creation of a viewshed analyses of the cluster of turbines of the Prieska Power Reserve in order to determine the visual exposure and the topography's potential to absorb the potential visual impact. The viewshed analysis takes into account the dimension of the proposed wind turbines and was calculated at a height of two hundred meters (200 m).

This Report (Visual Impact Assessment) sets out to identify and quantify the possible visual impacts related to the proposed Prieska Power Reserve, as well as offer potential mitigation measures where required. The following methodology has been adopted for the assessment of the Visual Impact Assessment:

- **Determine the Potential Visual Exposure**
  The visibility or visual exposure of any structure or activity is the point of departure for the VIA. It stands to reason that if the proposed infrastructure was not visible, no impact will occur. Viewshed analyses of the proposed structures indicate the potential visibility.
- **Determine Visual Distance/Observer Proximity to the facility**
  In order to refine the visual exposure of the proposed Prieska Power Reserve on surrounding areas/receptors, the principle of reduced impact over distance is applied in order to determine the core area of visual influence for the structures.
  Proximity radii for the proposed facility are created in order to indicate the scale and viewing distance of the structures and to determine the prominence of the structures in relation to their environment.
  The visual distance theory and the observer's proximity to the Prieska Power Reserve are closely related, and especially relevant, when considered from areas with a high viewer incidence and a predominantly negative visual perception of the proposed infrastructure.
- **Determine Viewer Incidence/Viewer Perception**
  The number of observers and their perception of a structure determine the concept of visual impact. If there are no observers, then there would be no visual impact. If the visual perception of the structure is favourable to all observers, the visual impact would be positive.
  It is therefore necessary to identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed infrastructure. It would be impossible not to generalise the viewer incidence and sensitivity to some degree, as there are many variables when trying

to determine the perception of the observer; regularity of sighting, cultural background, state of mind, and purpose of sighting which would create a myriad of options.

- **Determine the Visual Absorption Capacity of the Natural Vegetation**

  This is defined as the capacity of the receiving environment to absorb the potential visual impact of the proposed development. The VAC is primarily a function of the vegetation, and will be high if the vegetation is tall, dense and continuous. Conversely, low growing sparse and patchy vegetation will have a low VAC.

  The VAC will also be high where the environment can readily absorb the structure in terms of texture, colour, form and light/shade characteristics of the structure. On the other hand, the VAC for a structure contrasting markedly with one or more of the characteristics of the environment will be low. The VAC generally increases with distance, where discernible detail in visual characteristics of both environment and structure decreases.

  The Digital Terrain Model utilised in the calculation of the visual exposure of the proposed Prieska Power Reserve does not incorporate the potential VAC of the natural vegetation of the region. It is therefore necessary to determine the VAC by means of the interpretation of the vegetation cover, supplemented with field observation.

- **Determine the Visual Impact Index**

  The results of the above analyses are merged in order to determine where the areas of likely visual impact would occur. These areas are further analysed in terms of the previously mentioned issues (related to the visual impact) and in order to judge the magnitude of each impact.

- **Determine the Impact Significance**

  The potential visual impacts identified and described are quantified in their respective geographical locations in order to determine the significance of the anticipated impact. Significance is determined as a function of the extent, duration, magnitude and probability.

## 8.2 Projections

Projected coordinate systems are defined by ArcGIS Resource Centre (The developers) as "*a flat, two dimensional surface. Unlike a geographical coordinate system, a projected coordinate system has constant lengths, angles, and areas across the two dimensions. A projected coordinate system is always based on a geographic coordinate system that is based on a sphere or spheroid".* Projected Coordinates systems are world based and thus the larger the area the larger the distortion. To minimise the distortion the Universal Transverse Mercator (UTM) coordinate reference system divides the Earth into 60 equal zones that are all 6 degrees wide in longitude from East to West. Prieska is situated within the thirty fourth degree (34˚) UTM Zone, thus the WGS84/UTM S34 (32734) was used as projection.

# 9 ASSUMPTIONS AND LIMITATIONS

- Information is assumed to be the latest available information.
- Visual impact studies and assessments depend, to some extent, on subjective judgements. The subjectivity, of the analysis relates to the value driven nature of VIA. However, to deal with subjectivity, the methodology of this VIA is explained and rating categories clearly defined.
- It is assumed that site alternatives have been investigated by CENEC and the most suitable recommended by their acquisition Specialists.

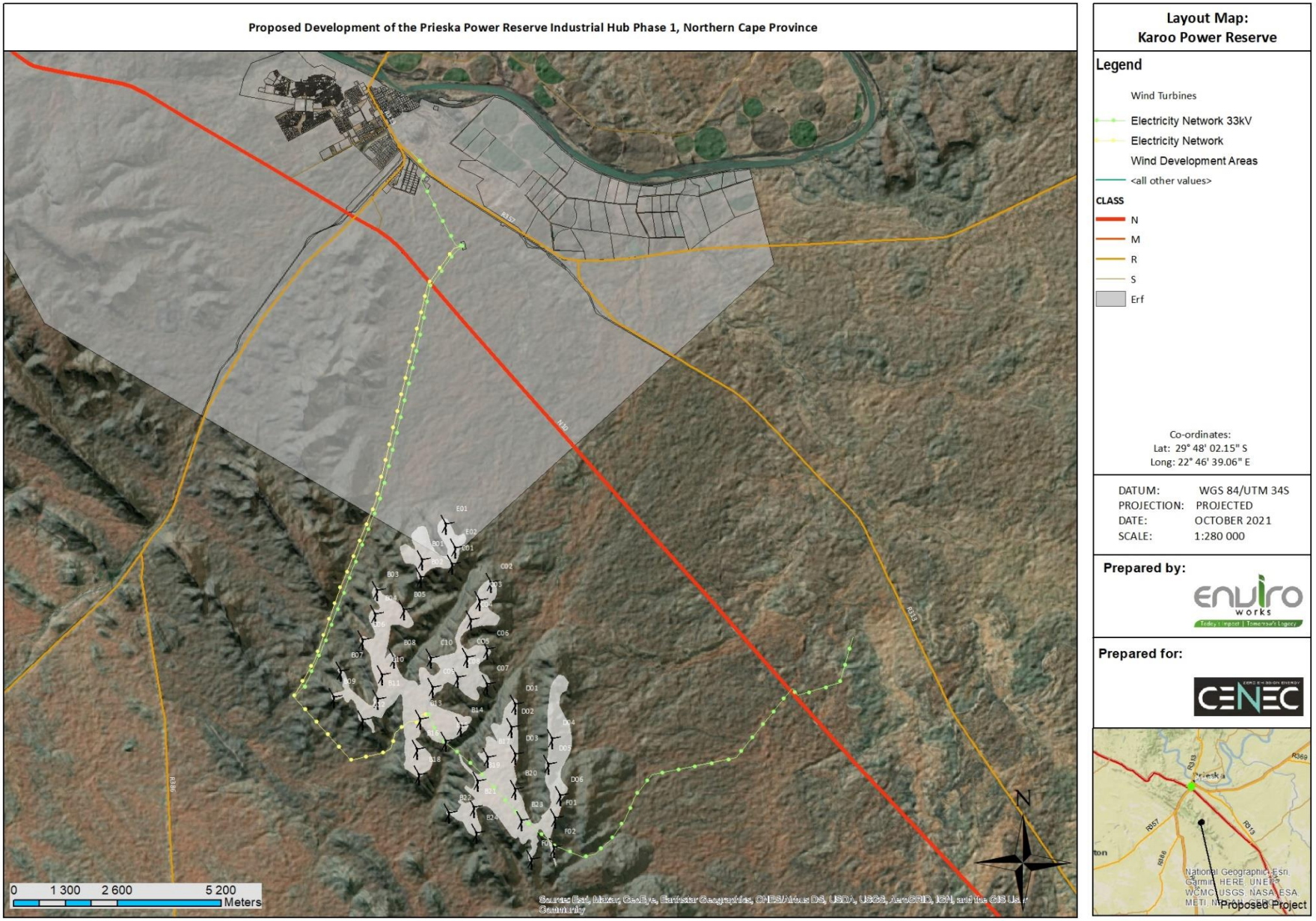


**Figure 3: Layout Map of the Proposed Development.**

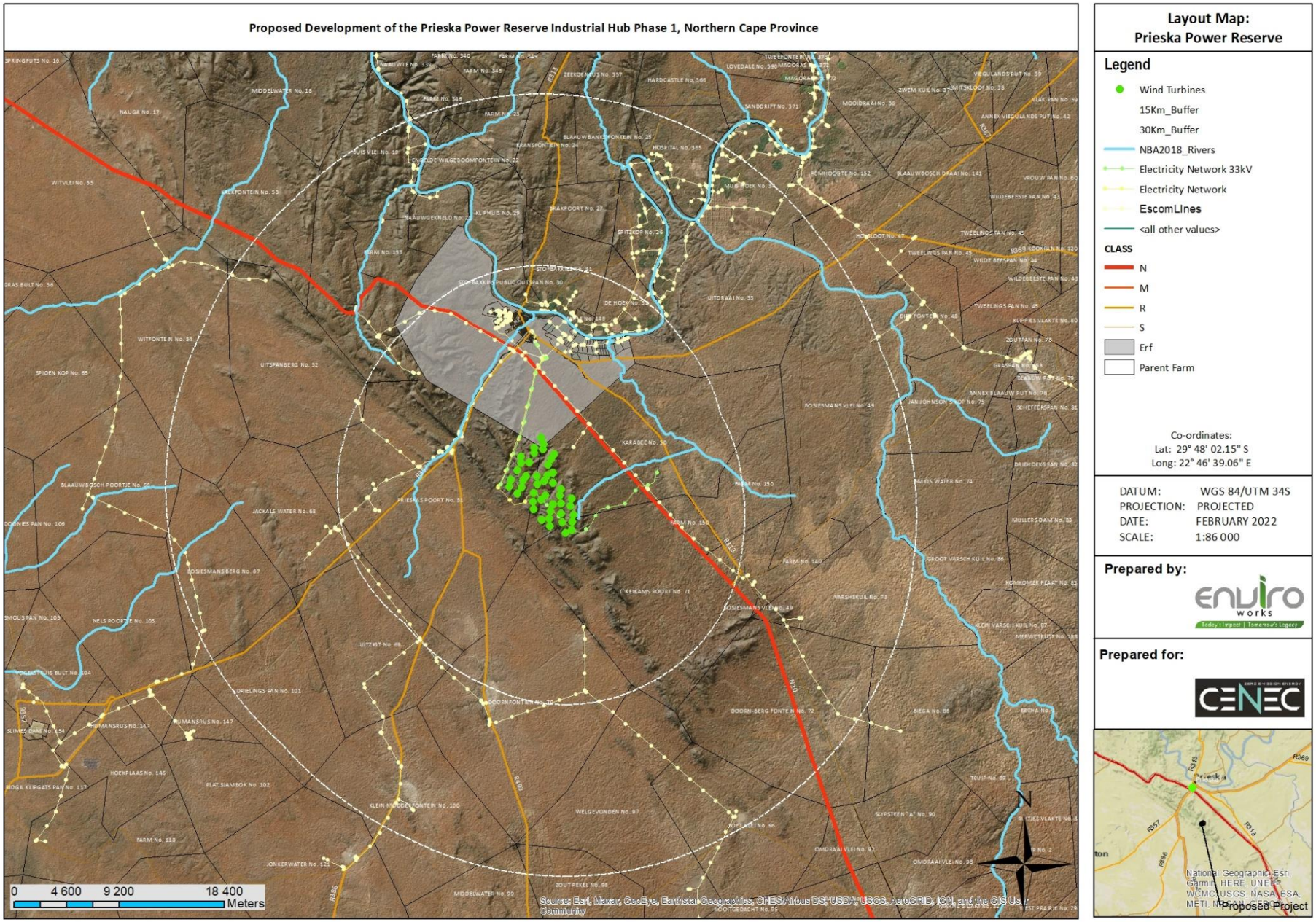


**Figure 4: Locality Map of the Proposed Prieska Power Reserve, Northern Cape Province.**

# 10 SCOPE OF WORK

The determination of the potential visual impacts is undertaken in terms of nature, extent, duration, magnitude, probability and significance of the construction and operation phases of the proposed project. The study area for the visual assessment encompasses a geographical area of 130 km$^2$ (extent of the maps) and includes a thirty kilometres (30 km) buffer zone from the proposed Prieska Power Reserve. The study area constitutes of local tourist attractions, residential areas, agricultural activities and natural environments. The proposed development will be situated ten kilometres (10 km) towards the south of the town of Prieska.

Anticipated issues related to the potential visual impact of the proposed Prieska Power Reserve include the following:

- The visibility of the facility to, and potential visual impact on, observers travelling along National Route Ten (N10), R357, R386, R403, Loots Boulevard and internal roads within the town of Prieska;
- The visibility of the facility to, and potential visual impacts on tourists visiting tourist attraction near Prieska (Die Bos Nature Reserve, Fort, Green Valley Nuts, Hiking Trails, Khoisan Rock Art, Memorial Garden, Prieska Museum, Ria Huysamen Aloe Garden, Schumann Rock Collection, Restaurants and numerous bed and breakfasts in the surrounding area)(Experience the Northern Cape, 2021);
- The visibility of the facility to, and potential visual impact on observers residing within Prieska and on the surrounding farms;
- The visual absorption capacity of natural or planted vegetation as well as man-made topographical features;
- Potential visual impacts associated with the construction- and operational phase; and,
- The potential to mitigate visual impacts.

It is anticipated that the issues listed above may constitute a visual impact at a local scale.

# 11 THE AFFECTED ENVIRONMENT

The proposed Prieska Power Reserve will be situated on the following farms:

- Portion 3 of the Farm Karabee No. 50; *Jan-se-Plaas;*
- Portion 9 of the Farm Karabee No. 50; *Stoffelshoek*;
- Portion 2 of the Farm Prieska's Poort No. 51; *Prieska's Poort*;
- Portion 11 of the Farm Prieska's Poort No. 51; *Prieska's Poort*;
- Remaining Extent of Portion 4 of the Farm Karabee No. 50; *Wonderpan*;
- Remaining Extent of Portion 8 of the Farm Karabee No. 50; *Wonderpan*;
- Portion 5 of the Farm Karabee No. 50; *Grashoek*;
- Remaining Extent of Portion 12 of the Farm T'Keikans Poort No. 71; *Pienaar Boerdery*; and
- Remaining Extent of Erf 1, Prieska, *Municipal Land/Townlands.*

The study area constitutes of urban residential areas, agricultural activities and recreational activities (Die Bos Nature Reserve, Fort, Green Valley Nuts, Hiking Trails, Khoisan Rock Art, Memorial Garden, Prieska Museum, Ria Huysamen Aloe Garden, Schumann Rock Collection, Restaurants and numerous bed and breakfasts in the surrounding area).

## 11.1 Topography, Vegetation and Hydrology

### *11.1.1 Vegetation*

The study area is described by Mucina & Rutherford, 2006, as hills and low mountains, slightly irregular plains but with some rugged terrain (e.g. downstream of the Augrabies Falls) with sparse vegetation dominated by shrubs and dwarf shrubs, with annuals conspicuous, especially in spring, and perennial grasses and herbs. Groups of widely scattered low trees such as *Aloe dichotoma* var. *dichotoma* and *Acacia mellifera* subsp. *detinens* occur on slopes of koppies and on sandy soils of foot slopes respectively.

### *11.1.2 Geology*

The region has a complicate geology: banded iron formation and amphibolites of the Asbestos Hills Subgroup are Vaalian and the carbonates and cherts of the Campbell Group are of the same era. Metamorphic rocks of the Mokolian Erathem include quartzites and gneisses of the Korannaland Supergroup as well as the Riemvasmaak gneiss. Metamorphosed clastic sediments of the Uitdraai Formation are also Mokolian. The remaining half of the area is composed of many other stratigraphies, metamorphosed sediments and outcrops of the ultrametamorphic rocks of the Namaqualand Metamorphic Complex. The soils are shallow and skeletal (dominant soil forms are Mispah and Glenrosa), typical mainly of Ib and Ic land types, and to a lesser extent also of Fb land type (Mucina & Rutherford, 2006).

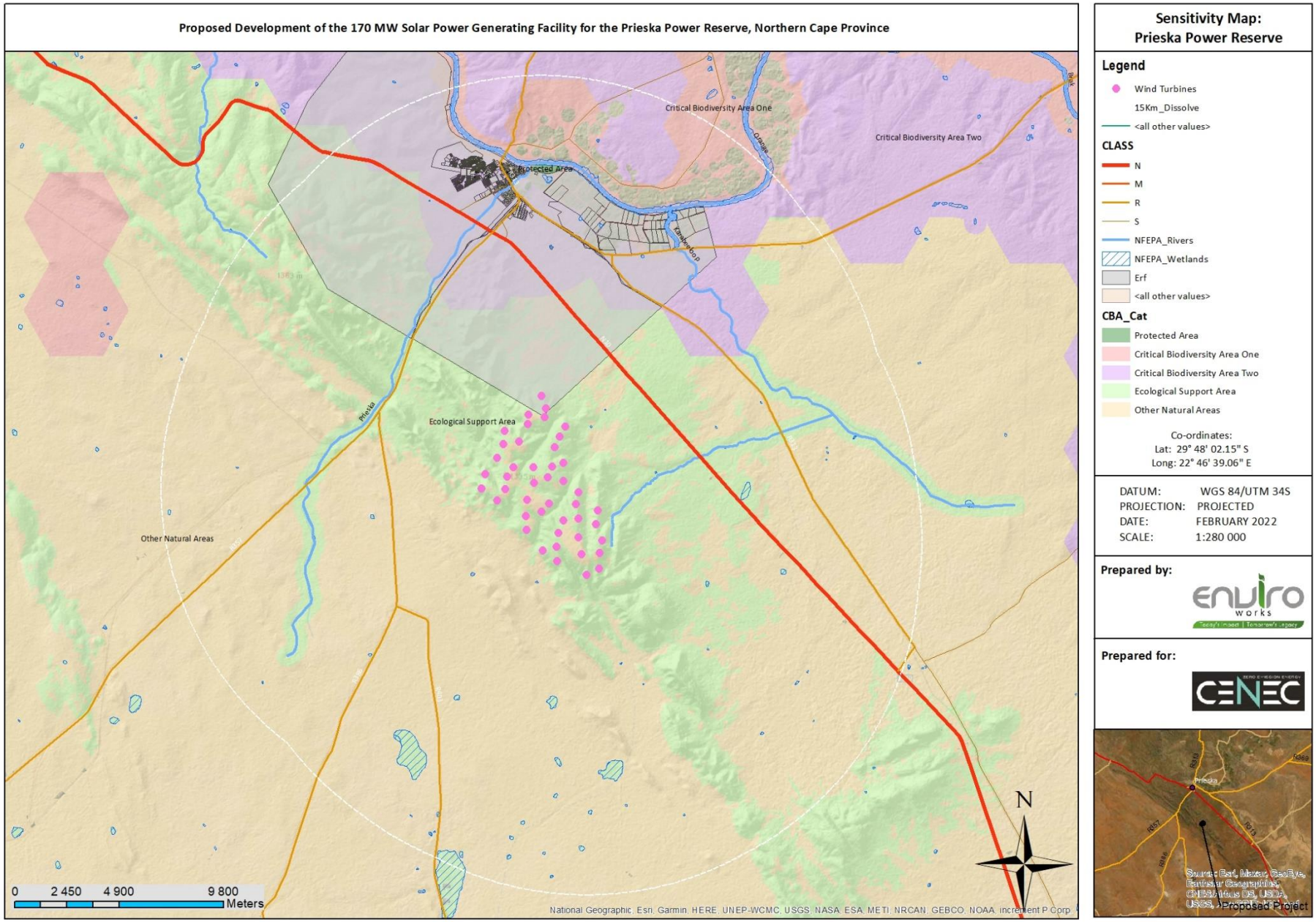


**Figure 5: Sensitivity Map of the Study Area.**

### *11.1.3 Climate*

The proposed project will be situated within the Lower Gariep Broken Veld bio-region. The Mean Annual Precipitation (MAP) of the study area is one hundred and fifty-five millimeters (155 mm) occurring predominantly between the months of February and April (Mucina & Rutherford, 2006). The Mean Annual Temperature (MAT) recorded for the study area is eighteen degrees Celsius (18˚ C) with summer temperatures averaging at twenty-one degrees Celsius (31˚ C).

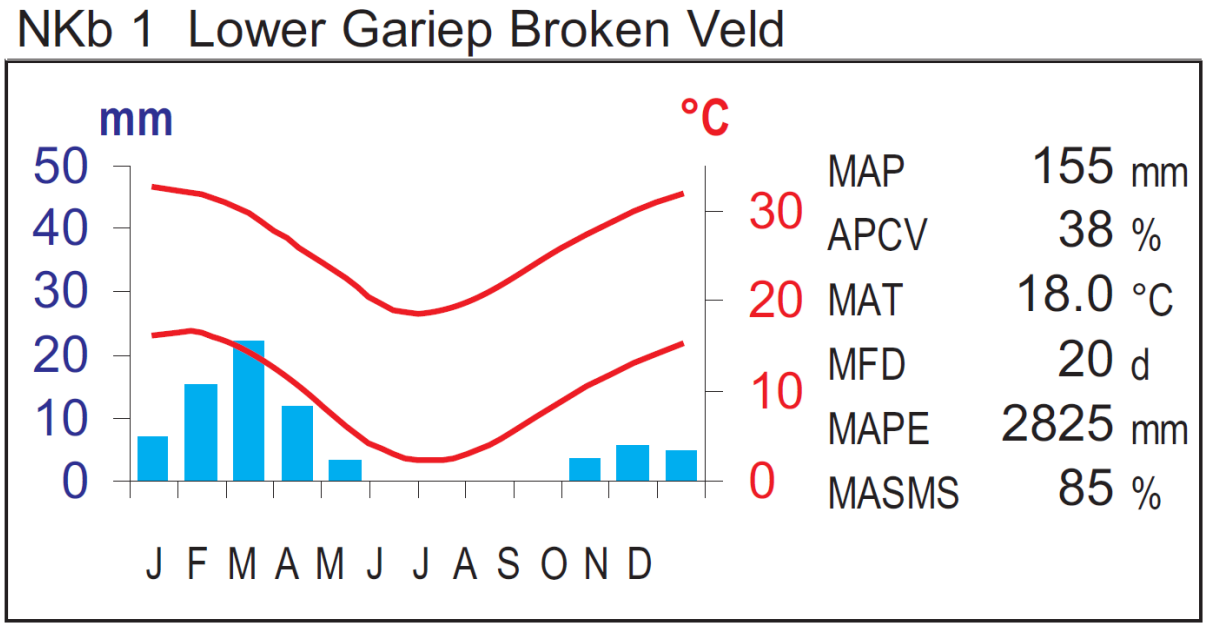


**Figure 6: Climate Diagram for the Lower Gariep Broken Veld.**

## 12 RELEVANT LEGISLATION AND GUIDELINES

The following legislation and guidelines have been considered in the preparation of this report:

- This Visual Impact Assessment was undertaken in accordance with the Guidelines for Involving Visual and Aesthetic Specialists in EIA Processes, as issued by the Department of Environmental Affairs and Development Planning (DEA&DP).
- The Environmental Impact Assessment Regulation as outlined in Government Notice Regulation 326 of 7 April 2017.

## 13 DEVELOPMENT CATEGORY

As per the Guidelines for Involving Visual and Aesthetic Specialists in EIA Processes, the development categories are as follow:

**Table 3: Development Categories.**

| | |
|---|---|
| **Category 1** | Items listed in this category include:<br>➢ Nature reserves;<br>➢ Nature related recreation;<br>➢ Camping;<br>➢ Picnicking; and,<br>➢ Trails and minimal visitor facilities. |
| **Category 2** | Items listed in this category include:<br>➢ Low-key recreation/resort/residential type developments; |

| | |
|---|---|
| | ➢ Small scale agriculture/nurseries/narrow roads; and,<br>➢ Small scale infrastructure |
| **Category 3** | Items listed in this category include:<br>➢ Low density residential/resort type development;<br>➢ Golf or polo estates; and,<br>➢ Low to medium-scale infrastructure. |
| **Category 4** | These include:<br>➢ Medium density residential development;<br>➢ Sport facilities;<br>➢ Small-scale commercial facilities/office parks;<br>➢ One-stop petrol stations;<br>➢ Light industry;<br>➢ Medium scale infrastructure. |
| **Category 5** | These include:<br>➢ High density township/residential developments;<br>➢ Retail and office complexes;<br>➢ Industrial facilities;<br>➢ Refineries;<br>➢ Treatment plants;<br>➢ Power stations;<br>➢ Wind energy farms;<br>➢ Powerlines;<br>➢ Freeways;<br>➢ Toll roads;<br>➢ Large scale infrastructure generally;<br>➢ Large scale development of agriculture land and commercial tree plantations;<br>➢ Quarrying and mining activities with related processing plants. |

Derived from Table 5, the proposed project falls within Category 5 (Wind Energy Farms and Powerlines). From the aforementioned, Table 6 was compiled in order to determine the Visual Impact of any proposed development.

**Table 4: Expected Visual Impact of the Proposed Development.**

| **Type of Environment** | **Type of Development** | | | | |
|---|---|---|---|---|---|
| | **Category 1** | **Category 2** | **Category 3** | **Category 4** | **Category 5** |
| Protected/wild areas of international or regional significance. | Moderate visual impact expected | High visual impact expected | High visual impact expected | Very high visual impact expected | Very high visual impact expected |

| | | | | | |
|---|---|---|---|---|---|
| Areas or routes of high scenic, cultural, historical significance. | Minimal visual impact expected. | Moderate visual impact expected | High visual impact expected | High visual impact expected | Very high visual impact expected |
| Areas or routes of medium scenic, cultural or historical significance. | Little or no visual impact expected | Minimal visual impact expected. | Moderate visual impact expected | High visual impact expected | High visual impact expected |
| Areas or routes of low scenic, cultural or historical significance/disturbed. | Little or no visual impact expected | Little or no visual impact expected | Minimal visual impact expected. | Moderate visual impact expected | High visual impact expected |
| Disturbed or degraded sites/run-down urban areas/wasteland. | Little or no visual impact expected | Little or no visual impact expected | Little or no visual impact expected | Minimal visual impact expected. | Moderate visual impact expected |

From the table above, it is anticipated that the proposed Prieska Power Reserve will have a high visual impact on the surrounding areas. Prieska is considered to have areas or routes of moderate scenic, cultural and historical significance due to the proclaimed buildings within town and its surrounds. The aim of this report will be to determine the accurracy of Table 6, the visual impact of the proposed development and the level of compatibility thereof with the surrounding landscape.

# 14 DESCRIPTION OF THE RECEIVING ENVIRONMENT

Landscape character is defined by the U.K Institute of Environmental Management and Assessment (IEMA) as the "*distinct and recognizable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, land form, soil, vegetation, land use and human settlement*" (GLVIA, 2002). According to DEA&DP Guideline Section 9.2, information describing the current state of the affected environment, as well as trends in the area, is required for visual input into the EIA process. The receiving environment was determined using the 2013-2014 South African National Land-Cover data as provided by the National Department of Environmental Affairs (DEA) and field observation conducted on 12 August 2021.

## 14.1 Sense of Place

The term sense of place captures the identity of places we recognize. It embraces natural and cultural features, the distinctive sights, sounds and experiences to the people residing in or nearby that place. Places with a strong sense of place have a clear identity and character that is recognisable by inhabitants and visitors alike.

Sense of place differs from place attachment by considering the social geographical context of place bonds and the sensing of place, such as aesthetic and a feeling of dwelling. 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 town of Prieska dates to 1878 when the town received Municipal Status; however, it consisted of only of a church and a few townhouses of the local farmers. Like most towns of the Northern Cape it is situated adjacent

to the Orange River and at the foot of the Doringberg. The town did not serve any strategic purpose; however, it did serve as an economic hub for the surrounding farmers, a purpose it fulfils to this day.

It must be noted that the town played a minor role in both the Anglo Boer War and First World War. In 1900 the little-known revolt by the Cape Afrikaners took place in and around Prieska and some skirmishes with the British troops resulted. Today evidence of its participation during these wars are still evident throughout the town (Gaigher, 2012).

The railway line that connects South Africa to Namibia was constructed hastily in 1914 and owes its existence to the outbreak of the first World War. The railway line stretched from Prieska in the Northern Cape to Karasburg in Namibia and predominantly served as a military railway line. The railway line provided logistical support to General Louis Botha's troops in his 1915 invasion of what was then German South West Africa (Ball, 2016).

Blockhouses were constructed throughout South Africa during the Anglo Boer War which occurred from 1899-1902. These were constructed by the British Forces as a means to protect strategic railway lines and bridges; however, as the war progressed these were used to limit the movement of Republican commandos. Some eight thousand (8000) blockhouses were constructed during the course of the war; however, most were dismantled once the war came to an end. The blockhouse in Prieska is one (1) that survived to this day in silent testimony of a bitter and foolish war (Frescura, 2015).

The following tourist attractions can be visited when in Prieska:

- Die Bos Nature Reserve;
- Prieska Fort;
- Green Valley Nuts;
- Hiking Trails;
- Khoisan Rock Art;
- Memorial Garden
- Prieska Museum;
- Ria Huysamen Aloe Garden;
- Schumann Rock Collection; and,
- Wonderdraai.

**Figure 7: The Prieska Blockhouse.**

**Figure 8: Dutch Reformed Church situated within the CBD of Prieska.**


**Figure 9: Memorial graveyard situated towards the southeast of Prieska.**

**Figure 10: Old Church in Victoria Road; however, no records thereof could be obtained.**

Given the heritage of Prieska a moderate Visual Impact is expected.

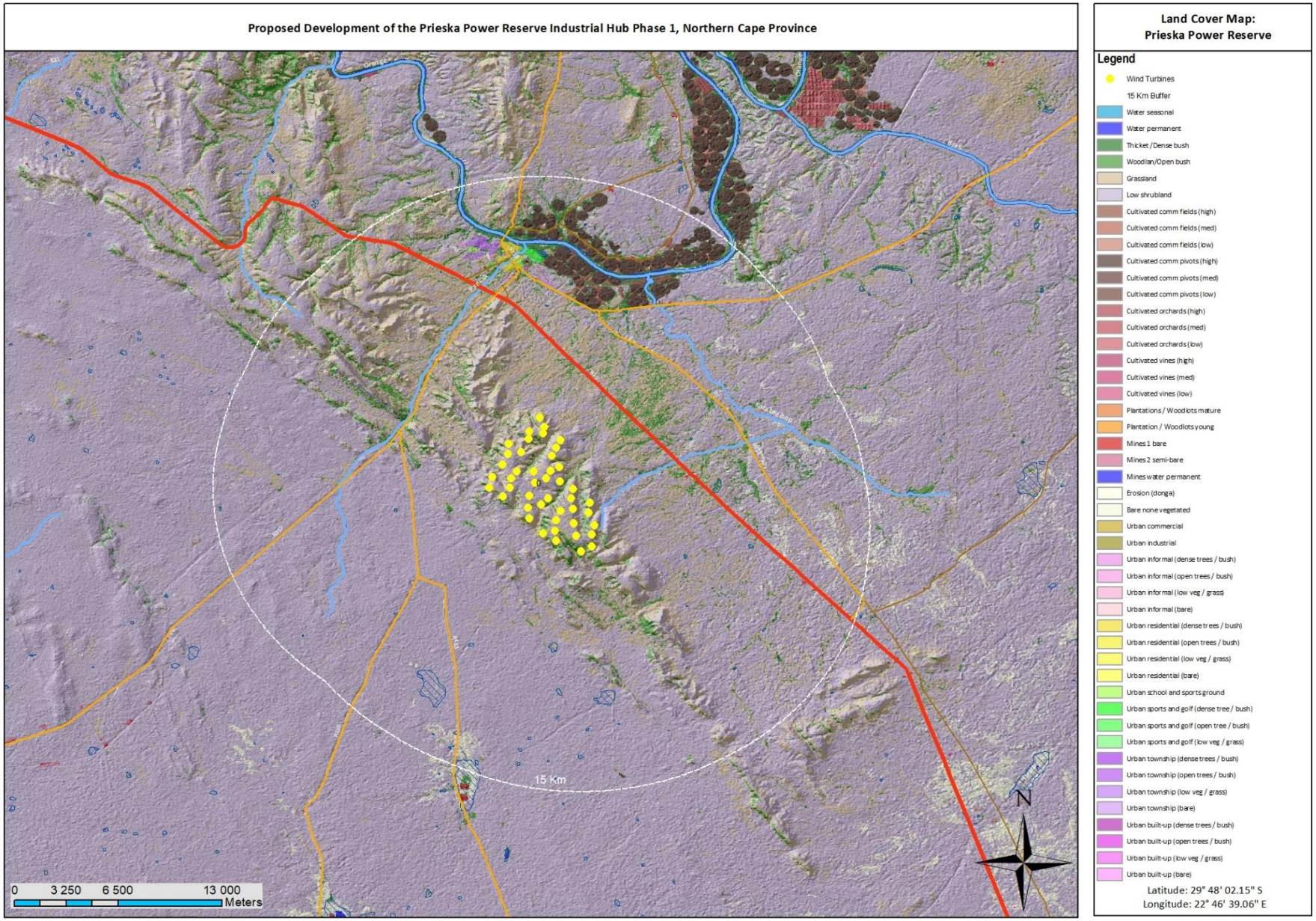


**Figure 11: Land Cover Map of the Area.**

# 15 RESULTS

## 15.1 Potential Visual Exposure (Preferred Mast Position)

The combined result of the viewshed analysis for the proposed Prieska Power Reserve is displayed on the map below (Figure 16). The visibility analysis was undertaken at the height of the Wind Turbines measuring in at two hundred metres (200 m), in order to simulate the view from the development and to indicate prominence of the structures within the landscape. Furthermore; Figure 12 indicates proximity radii from the proposed Prieska Power Reserve as a reference to determine the Visual Absorption Capacity. It must be noted that the Digital Terrain Model (DTM) utilised from the viewshed analysis does not include the effect of vegetation cover and built structures. These features may influence the visual exposure to some degree.

## 15.2 Prieska Power Reserve Preferred Mast Position

### *15.2.1 0-5 km (short distance)*

The proposed development will be highly visible within the short distance zone due to the short distance between the observer and the proposed development. Given the design of the proposed wind turbines it offers a low compatibility with the surrounding landscape. The VAC of the study area is considered to be low within the short distance zone as the proposed development will be placed on top of a low mountain coupled with the scares vegetation cover which predominantly consist of low thicket. The wind tubines, solar farm and the 132 kV Powerline will be visible within the short distance zone. The highest visual impact will occur from National Route Ten (N10) situated three point eight kilometres (3.8 km) towards the northeast, the R357 situated four and a half kilometres (4.5 km) towards the northwest and the R386 situated four point two kilometres (4.2 km) towards the west of the proposed development; however, the visual impact will be temporary from these vantage points due to the fact that observers will only traverse through the study area. Numerous farmsteads were observed within the short distance zone which are situated at kilometre four and a half (km 4.5) towards the northwest, kilometre one point eight (km 1.8) towards the northeast and kilometre one point seven (km 1.7) towards the south. The visual impact will be permanent to the residence of these farmsteads. No visual sensitive areas were observed within the short distance zone.

### *15.2.2 5-10 km (short to medium distance)*

The highest visual impact within the short to medium distance zone will occur from the town of Prieska situated eight point three kilometres towards the north of the proposed development. The proposed development will be clearly visible from the outskirts of the town; however, given the built-up environment of the Central Business District (CBD) a visual impact is only expected from certain elevated vantage points within town. The proposed development will have a high visual impact from the Prieska Blockhouse situated within the Koppie Nature Reserve; however, from the Dutch Reformed Church the visual impact will be low. Other points of interest within the short to medium distance zone include the Boer War Memorial Ground from where the visual impact will be moderate and an old Church in Victoria Street (assumed to be Catholic). The powerline will be visible from town; however, given the already developed infrastructure within the area the visual impact is considered low as viewer perception has already been established. Two holding dams will be situated within the short to medium distance zone; however, no visual impact is expected as it blends in with the agricultural sense of place of the environment. It must be noted that the visual impact will remain high from the major roads within the short to distance zone given the low VAC of the study area.

### *15.2.3 10-20 km (medium to long distance)*

The visual impact will decrease from high to moderate within the medium to long distance zone due to the increase of distance between the proposed development and the observer. The powerline will be difficult to identify over this distance; however, the silhouette of the wind turbines will still be identifiable from this area. It must be nted that the wind turbines will blend in with the backdrop of sky to some degree which increases the VAC from none to low. The proposed development will be visible from all major roads as discussed under Section 16; however, from these vantage points the visual impact is considered to be temporary as motorists will only traverse through the area. Numerous farmsteads are situated within the medium to long distance zone; however, the visual impact will not effect them to the same degree as would be experience when situated within the short distance zone.

### *15.2.4 Greater than 20 km (long distance)*

The overall visual impact of the proposed development within the long distance zone is expected to be low to none depending on the vantage point. Towards the northwest the visual impact will be restricted to kilometer ten point two (km 10.2), towards the southeast to kilometre twenty-one point two (km 21.2), towards the southwest to kilometre twenty-three point seven (km 23.7), towards the north east to kilometre twenty-three point two (km 23.2) and to kilometre eighteen and a half (km 18.5) towards the north. The visual absorption capacity is considered to be moderate within the long distance zone as it is predominantly affected by the undulating topography of the study area coupled with the distance between the proposed development and the observer.

### *15.2.5 Conclusion*

The proposed development will be highly visible within the short distance zone due to the short distance between the observer and the proposed development. Given the design of the proposed wind turbines it offers a low compatibility with the surrounding landscape. The VAC of the study area is considered to be low within the short distance zone as the proposed development will be placed on top of a low mountain coupled with the scares vegetation cover which predominantly consist of low thicket. The wind tubines, solar farm and the 132 kV Powerline will be visible within the short distance zone. The highest visual impact will occur from National Route Ten (N10) situated three point eight kilometres (3.8 km) towards the northeast, the R357 situated four and a half kilometres (4.5 km) towards the northwest and the R386 situated four point two kilometres (4.2 km) towards the west of the proposed development; however, the visual impact will be temporary from these vantage points due to the fact that observers will only traverse through the study area.

The proposed development will have a high visual impact when observed from the Blockhouse situated within the Koppie Nature Reserve. The blockhouse is the only heritage important structure that will be negatively influenced by the proposed development; however, it must be noted that there are some eight thousand (8 000) blockhouses across South Africa. Furthermore, the blockhouse in question has been vandalised and proof can clearly be seen. The Wind Turbines were predominantly used to determine the visual impact of the proposed development as it is roughly one hundred and fifty metres (150 m) taller than any of the other infrastructure. The relative visibility of the turbines, seen from the Koppie is more or less equal to the silos situated within the foreground. The landscape surrounding Prieska is not considered to be of high scenic nor cultural value as the

town owns it origin to the Orange River and the surrounding farms. The proposed development will be an injection to the Local Economy of Prieska and as such the overall moderate visual impact will be acceptable.

## 15.3 Elevation of the Area

Section 15.3 and Section 16 must be read in conjunction with Section 15.2. The graphs illustrated below provide a visual reference of the capability of the landscape to absorb the visual impact associated with the proposed Prieska Power Reserve. The graphs have been compiled within a twenty kilometer (20 km) radius in the eight major wind directions from the proposed development.

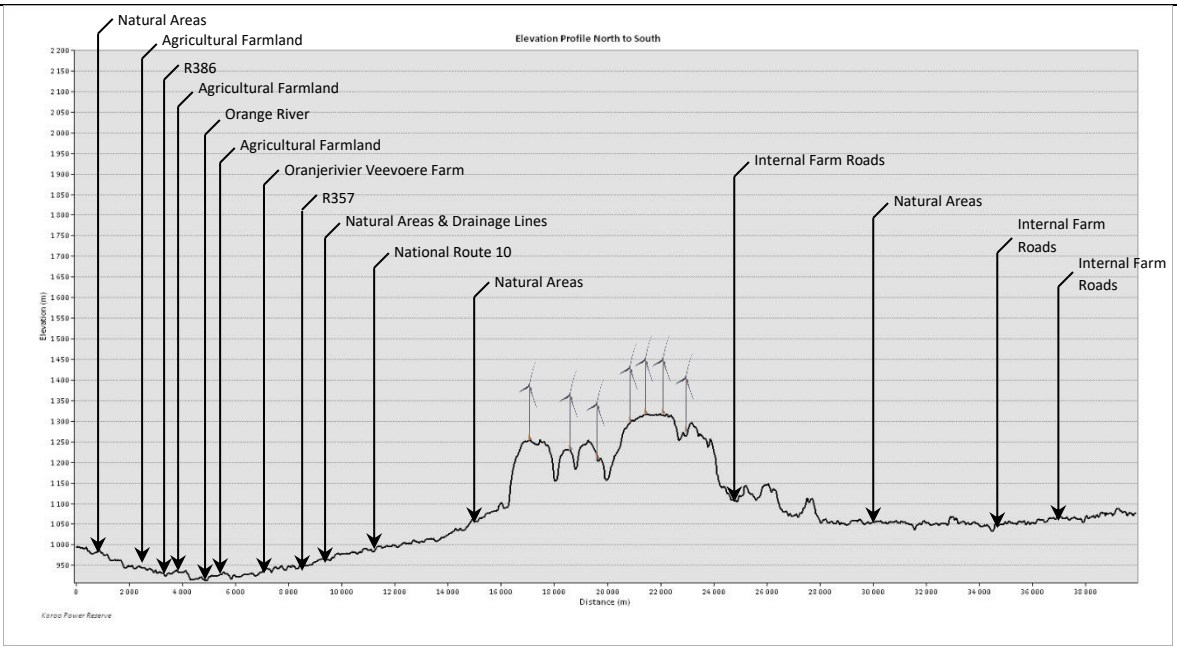


**Figure 12: Elevation Profile from North to South of the study area.**

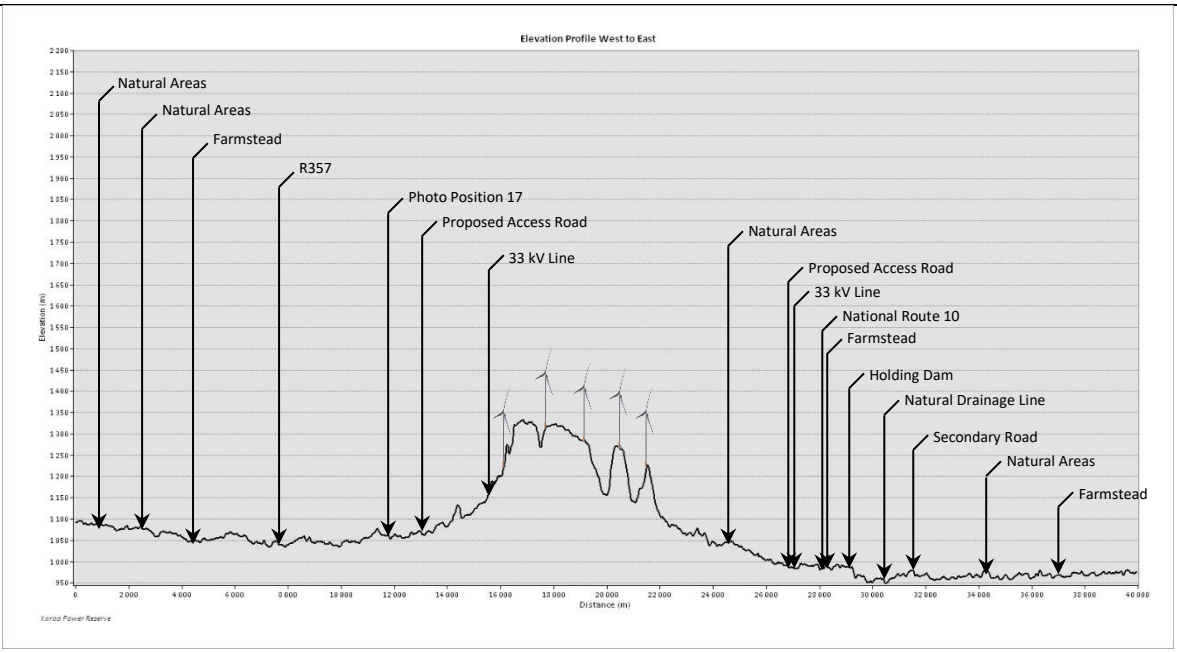


**Figure 13: Elevation Profile from West to East of the study area.**

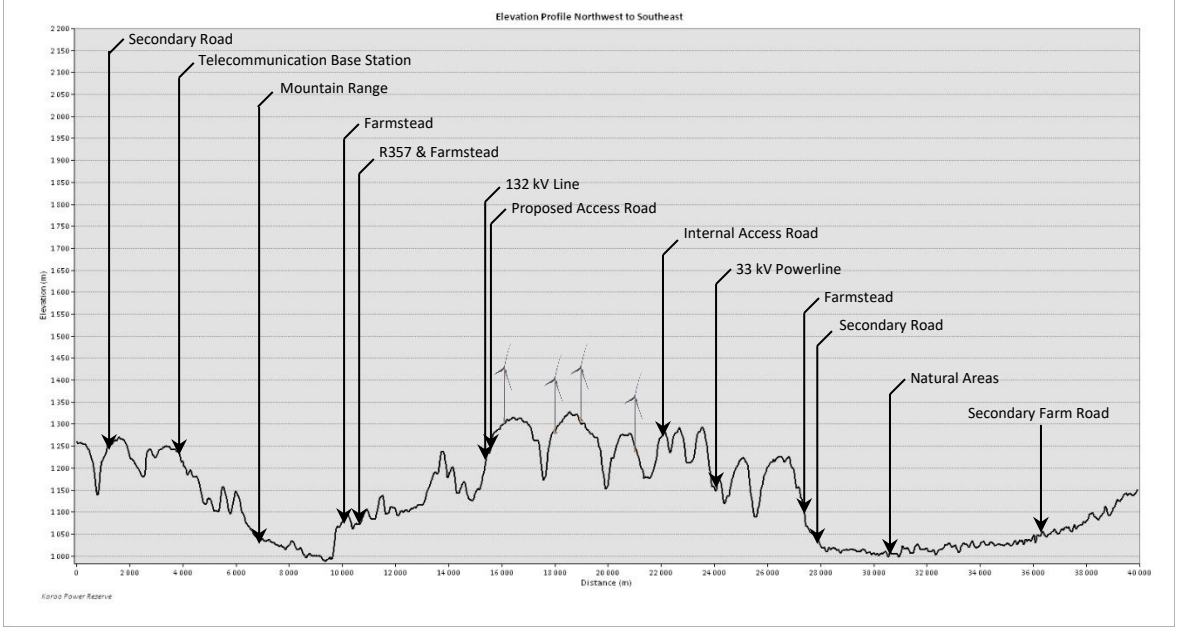


**Figure 14: Elevation Profile from Northwest to Southeast of the study area.**

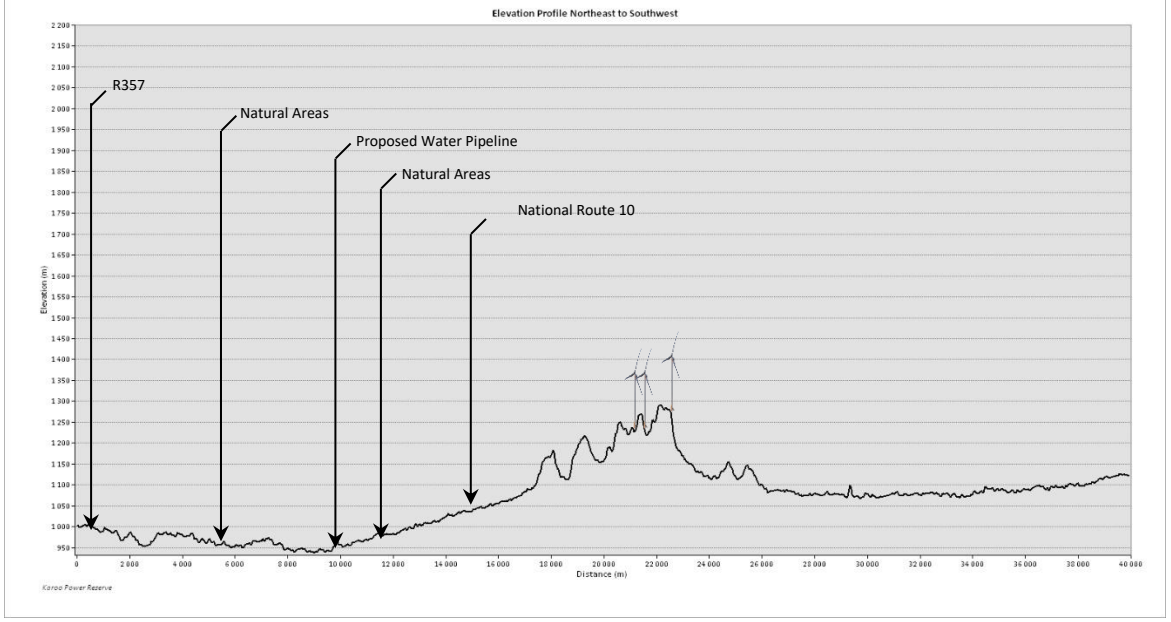


**Figure 15: Elevation Profile from Northeast to Southwest of the study area.**

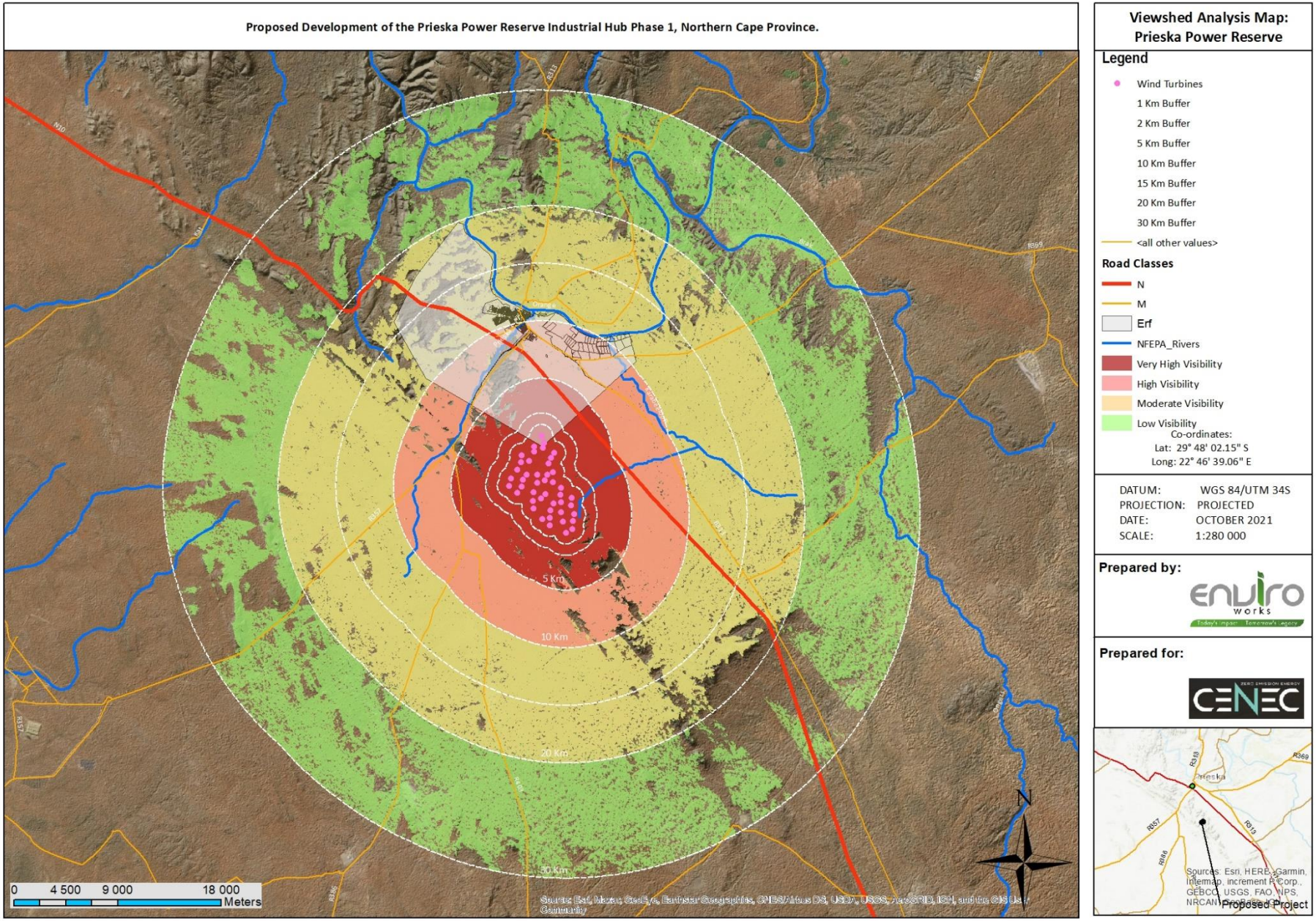


**Figure 16: Viewshed Analysis of the proposed Prieska Power Reserve.**

# 16 VISUAL ABSORPTION CAPACITY

The following section provides a description of the viewshed analysis via photographic evidence taken at a height of one point eight metres (1.8 m). This will enable the reader to understand the Visual Absorption Capacity (VAC) of the area and provide a visual reference. The Visual Absorption Capacity of the surrounding area is considered to be low within thirty kilometers (30 km) of the Prieska Power Reserve due to the built-up environment, sparse vegetation cover and the undulating topography of the study area.


**Figure 17: Photo Position 1 situated towards the northeast of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Moderate Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Moderate Visual Impact |
| Photo Position 1 was taken twenty-two kilometres (22 km) towards the northeast of the proposed development along the R386. The proposed development will have a moderate visual impact from this vantage point due to its low landscape compatibility and low VAC of the study area; however, the distance between the observer and the development reduces the impact to some degree. The visual impact from this vantage point will be temporary as motorists will only traverse through the area. | |


**Figure 18: Photo Position 2 situated towards the north of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Moderate Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Moderate Visual Impact |

Photo 2 was taken along the R386 situated eighteen kilometres (18 km) towards the north of the Proposed Development. The proposed development will be visible from this vantage point; however, visibility will be influenced by the distance between the observer and the proposed development. Although the visual impact will be temporary it will still be moderate as the landscape has a low VAC.


**Figure 19: Photo Position 3 situated towards the north of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Moderate Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Moderate Visual Impact |

Figure 19 is situated sixteen point two kilometres (16.2 km) towards the north of the proposed development and was taken adjacent to a farmstead along the R386. The proposed development will have a moderate and permanent impact from this vantage point. The visual impact will be permanent due to the residence and farmworkers that will reside within this area. It must be noted that the visual impact will be restricted to some degree due to the distance between the proposed development and the observer.


**Figure 20: Photo Position 4 situated towards the northwest of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | No Visual Exposure |
| Visual Absorption Capacity | High VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | No Visual Impact |

Figure 20 was taken sixteen point two kilometres (16.2 km) towards the northwest of the proposed development adjacent to the Orange River. No visual impact will occur from this vantage point due to the dense vegetation cover as evident within the foreground. It must be noted that should the trees be removed the visual impact will be moderate.


**Figure 21: Photo Position 5 situated towards the northwest of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Low Visual Exposure |
| Visual Absorption Capacity | Moderate VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Low Visual Impact |

Photo Position 5 was taken fifteen point three kilometres (15.3 km) towards the north of the proposed development adjacent to the entrance of the Prieska Golf Club. The visual impact from this vantage point will be low due to the moderate VAC of the study area. The moderate VAC is a result of the scattered vegetation cover as evident within the foreground and the built-up environment in the background. Depending on the position of the observer some of the turbines might be visible and thus the reason for the Low Visual Impact. It must be noted that the visual impact will be temporary from the golf club as observers will only reside within the area for a set period of time.


**Figure 22: Photo Position 6 situated towards the north of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | No Visual Exposure |
| Visual Absorption Capacity | High VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | No Visual Impact |

Figure 22 was taken fifteen point four kilometres (15.4 km) towards the north of the proposed development. The proposed development will not be visible from this vantage point due to the dense vegetation cover as evident within the foreground. Figure 22 was taken from chalets situated on the riverbank of the Orange River.


**Figure 23: Photo Position 7 situated towards the north of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Low Visual Exposure |
| Visual Absorption Capacity | High VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Low Visual Impact |

Figure 23 was taken from the Dutch Reformed Church situated fifteen point two kilometres (15.2 km) towards the north of the proposed development. From this vantage point the visual impact will be low as only parts of the turbines will be visible. The visual impact is predominantly influenced by the built-up environment as evident within the foreground. The visual impact will be permanent from this vantage point due to the numerous observers residing within the immediate vicinity.


**Figure 24: Photo Position 8 situated towards the north of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | No Visual Exposure |
| Visual Absorption Capacity | High VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | No Visual Impact |

Figure 24 is situated fifteen kilometres (15 km) towards the north of the proposed development and was taken adjacent to what seems to be an old catholic church (Please refer to Figure 10). The proposed development will not be visible from this vantage point due to the built-up environment as evident within the foreground. The built-up environment thus results in a high VAC of the immediate study area.


**Figure 25: Photo Position 9 situated towards the east of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | High Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | High Visual Impact |

Photo Position 9 is situated fourteen kilometres (14 km) towards the north of the proposed development and was taken from the Old Blockhouse situated within the Koppie Nature Reserve. Given the elevated observer point the VAC is only influenced by the distance between the proposed development and the observer. Given the historical significance of the blockhouse a high visual impact is assigned as the proposed development will be clearly visible (Please refer to the visual impression).


**Figure 26: Photo Position 10 situated towards the north of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Moderate Visual Exposure |
| Visual Absorption Capacity | Moderate VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Low Visual Impact |

Figure 26 was taken fourteen kilometres (14 km) towards the north of the proposed development from the Prieska Graveyard. Some of the graves date back as far as the Anglo Boer War (1899 – 1902). The visual impact will be low given the moderate vegetation cover as evident within the foreground restricting the visual impact to some degree. The visual impact will be temporary as observers will only reside within the area for a set period of time. Although the graveyard has some historic significance no important figure was buried here.


**Figure 27: Photo Position 11 situated towards the northeast of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Moderate Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Moderate Visual Impact |

Figure 27 was taken twelve point nine kilometres (12.9 km) towards the northeast of the proposed development along the R357 adjacent to the Prieska Airfield. The proposed development will be visible from this vantage point; however, a moderate visual impact is assigned due to the thickets evident within the foreground coupled with the distance between the observer and the proposed development which results in a Low VAC. It must be noted that the top of the turbines will be visible; however, the visual impact will be temporary as motorists will only traverse through the area.


**Figure 28: Photo Position 12 situated towards the northeast of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Moderate Visual Exposure |
| Visual Absorption Capacity | Moderate VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Moderate Visual Impact |

Figure 28 was taken eleven point seven kilometres (11.7 km) towards the northeast of the proposed development along the R357. The proposed development will be visible from the R357; however, a moderate visual impact is assigned as observers will only traverse through the area. It must be noted that the VAC of the study area is influenced by the thickets as evident within the foreground and the undulating topography of the study area as can be seen in the background. The turbines will blend in with the backdrop of sky to some degree restricting the visual impact of the proposed development.


**Figure 29: Photo Position 13 situated towards the northeast of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | High Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Moderate Visual Impact |

Figure 29 was taken sixteen point six kilometres (16.6 km) towards the northeast of the proposed development along the R357. The proposed development will be visible from this vantage point; however, a moderate visual impact is assigned due to the distance between the observer and the proposed development; coupled with the limited observers that will traverse through the area. Furthermore, the turbines will blend in with the backdrop of sky to some degree which in turn lowers the visual impact.


**Figure 30: Photo Position 14 situated towards the northeast of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | High Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Low Visual Impact |

Figure 30 was taken twenty-four point eight kilometres (24.8 km) towards the northeast of the proposed development along the R357. Beyond Figure 30 no visual impact will occur towards the northeast as it is the highest point within this wind direction. The visual impact will be low from this vantage point due to the distance between the proposed development and the observer; however, the visual impact will be temporary as motorists will only traverse through the area. From this vantage point the turbines will be visible; however, not as discreet as within the ten kilometre (10 km) radius.


**Figure 31: Photo Position 15 situated towards the northwest of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Moderate Visual Exposure |
| Visual Absorption Capacity | Moderate VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Low Visual Impact |

Figure 31 was taken thirteen kilometres (13 km) towards the northwest of the proposed development along the R357 at the intersection with National Route Ten (N10). From this vantage point the visual impact will be low as only the top of some of the turbines will be visible. The visual impact is predominantly restricted by the undulating topography of the study area as illustrated within the background resulting in a moderate VAC. Although dense thickets can be seen within the foreground they will not contribute to the VAC. The visual impact; however, will be temporary as motorists will only traverse through the area.


**Figure 32: Photo Position 16 situated towards the northwest of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Moderate Visual Exposure |
| Visual Absorption Capacity | Moderate VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Low Visual Impact |

Figure 32 was taken ten point eight kilometres (10.8 km) towards the northwest of the proposed development along the R357 enroute to Copperton. The top section of some of the towers will be visible from this vantage point; however, a low visual impact is assigned due to the moderate VAC of the study area. The VAC of the study area is predominantly influenced by the undulating topography of the study as can be observed within the foreground. Furthermore, the low visual impact is assigned as the proposed development will not be situated within the direct line of sight of motorists.


**Figure 33: Photo Position 17 situated towards the west of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | High Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | High Compatibility |
| Visibility | Moderate Visual Impact |

Figure 33 was taken eight point one kilometres (8.1 km) towards the west of the proposed development along the access road. The proposed development will be highly visible from this vantage point; however, the road is not frequently used and as such a moderate visual impact is assigned. Given the short distance between the proposed development and the observer the study area offers very little in terms of the VAC.

**Figure 34: Photo Position 18 situated towards the southwest of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | No Visual Exposure |
| Visual Absorption Capacity | High VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | No Visual Impact |

Figure 34 was taken twenty-two point seven kilometres (22.7 km) towards the southwest of the proposed development along the R357. No visual impact will occur from this vantage point due to the high VAC of the study area. The high VAC is influenced by the undulating topography of the study area as evident within the background.


**Figure 35: Photo Position 19 situated towards the northwest of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | High Visual Exposure |
| Visual Absorption Capacity | Moderate VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Moderate Visual Impact |

Figure 35 was taken thirteen and a half kilometres (13.5 km) towards the northwest of the proposed development along National Route Ten (N10). From this vantage point the proposed development will have a high visual exposure due to the low VAC of the study area. Furthermore, a moderate visual impact is assign as the proposed development will be situated within the direct line of sight of motorists; however, the visual impact will be temporary as observers will only traverse through the study area.


**Figure 36: Photo Position 20 situated towards the northwest of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | High Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Moderate Visual Impact |

Figure 36 was taken fifteen kilometres (15 km) towards the northwest of the proposed development along National Route Ten (N10). The proposed development will be moderately visible from this vantage point as limited observers are expected within this region. Furthermore, the undulating topography of the study area as evident within the background will limit the visual exposure to some degree; however, the top of the turbines will still be visible. It must be noted that beyond Figure 36 no visual impact will occur as illustrated by Figure 16 (Viewshed Analysis).


**Figure 37: Photo Position 21 situated towards the northeast of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | High Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | High Visual Impact |

Figure 37 was taken six point two kilometres (6.2 km) towards the northeast of the proposed development along National Route Ten (N10). The Visual Impact from Photo Position 21 is expected to be high due to the high visual exposure of the development coupled with the low VAC of the study area. The low VAC is assigned due to the sparse vegetation cover coupled with the short distance between the proposed development and the observer. Given that the photograph was taken from National Route Ten (N10) the visual impact will be temporary as motorists will only traverse through the area.


**Figure 38: Photo Position 22 situated towards the northeast of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | High Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | High Visual Impact |

Figure 38 was taken six kilometres (6 km) towards the northeast of the proposed development along National Route Ten (N10). The proposed development will have a high visual impact from this vantage point due to the short distance between the observer and the proposed development. The proposed infrastructure will be clearly distinguishable and as such the high visual impact. The visual impact is; however, expected to be temporary as motorists will only traverse through the area.


**Figure 39: Photo Position 23 situated towards the southeast of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Moderate Visual Exposure |
| Visual Absorption Capacity | Moderate VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Moderate Visual Impact |

Figure 39 was taken nine point six kilometres (9.6 km) towards the southeast of the proposed development along National Route Ten (N10). The proposed development will have a moderate visual impact from this vantage point as the VAC restricts the visual exposure to some degree. The VAC is predominantly influenced by the undulating topography of the study area. Given the distance between the proposed development and the obsever the turbines will blend in the backdrop of sky to some degree.


**Figure 40: Photo Position 24 situated towards the southeast of the Proposed Development.**

| | |
|---|---|
| Visual Exposure of the Area | Moderate Visual Exposure |
| Visual Absorption Capacity | Low VAC |
| Landscape Integrity | Low Compatibility |
| Visibility | Moderate Visual Impact |

Figure 40 was taken seventeen point eight kilometres (17.8 km) towards the southeast of the proposed development along National Route Ten (N10). The proposed development will be moderately visible from this vantage point due to the distance between the proposed development and the observer. The VAC does not influence the visual exposure from this vantage point. It must be noted that the visual impact will be permanent from this vantage point as a farmstead is situated directly adjacent to it.

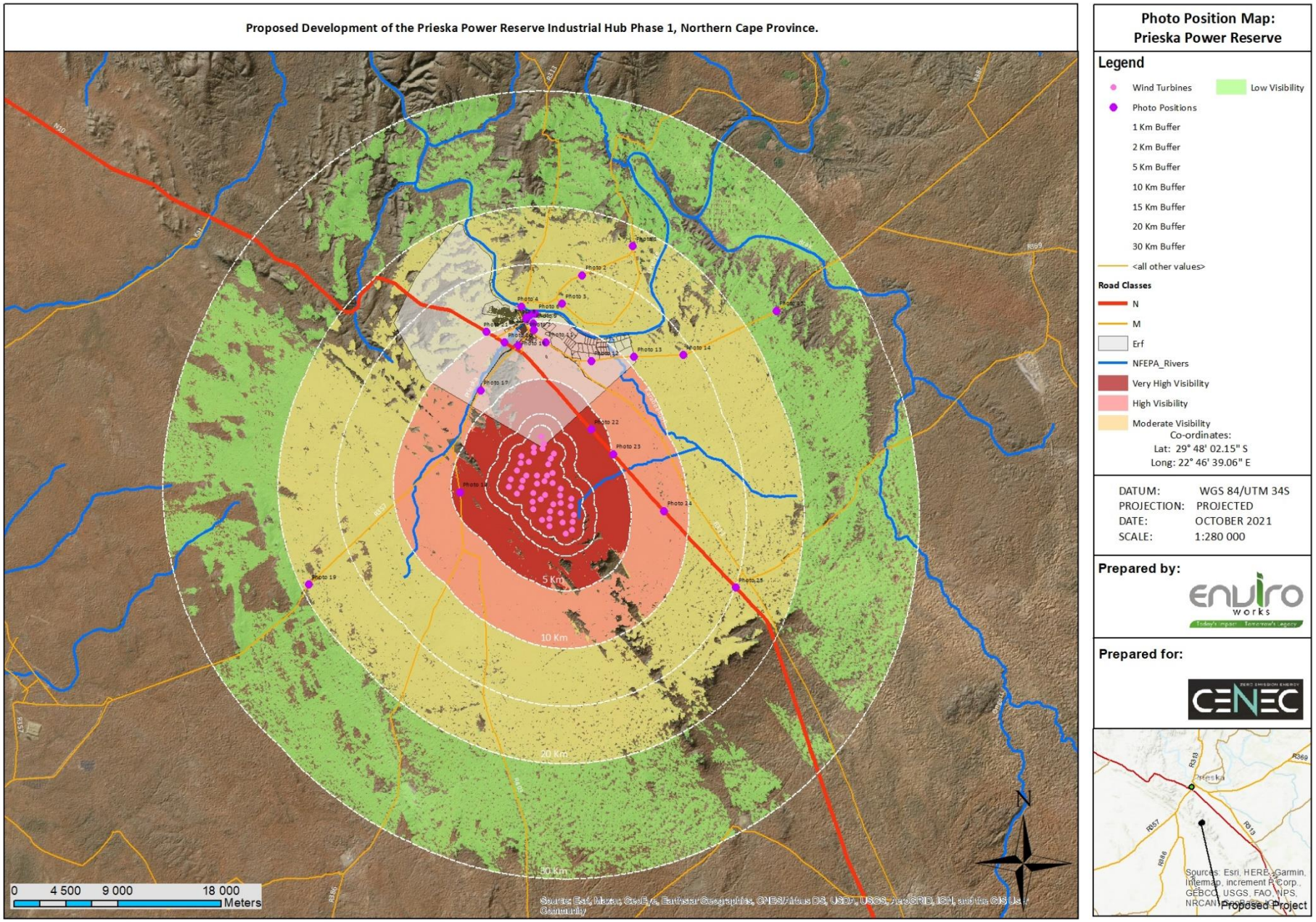


**Figure 41: Locations from where the photos have been taken.**

# 17 VISUAL IMPACT ASSESSMENT: IMPACT RATING METHODOLOGY

The previous section outlines all areas visible from the Prieska Power Reserve (viewshed analysis). This section will attempt to quantify these potential visual impacts in their respective geographical locations and in terms of the identified issues related to the visual impact. The methodology for the assessment of potential visual impacts states the nature of the potential visual impact (e.g. the visual impact on individuals who travel along the National Route Ten (N10), R357, R386, R403, Loots Boulevard and internal roads within the town of Prieska as well as those residing within and visiting the project extent) and includes a table quantifying the potential significance of visual impact according to the following criteria:

- Duration of the impact (time scale);
- Extent of the impact (spatial scale);
- Magnitude (or nature) of negative or positive impacts;
- Probability of the impact occurring;
- Cumulative Impacts; and the,
- Degree to which the impact can be mitigated.

The scales to be used to assess these variables and to define the rating categories are tabulated in the tables below.

**Table 5: Evaluation components, ranking scales and descriptions (criteria).**

| Evaluation component | Ranking scale and description (criteria) |
|---|---|
| **DURATION** | **5 – Permanent:** Where time will not mitigate the visual impact.<br>**4 - Long term**: Impact might occur for the lifespan of the project.<br>**3 - Medium term**: Impact might occur for the duration for screening vegetation to mature.<br>**2 - Short term**: Impact might occur for the duration of the construction phase.<br>**1 - Immediate** |
| **EXTENT**<br>(or spatial scale / influence of impact) | **5 - International**: Affecting areas across International Boundaries.<br>**4 - National**: Affecting large parts of the country.<br>**3 - Regional**: Affecting a larger metropolitan or regional area.<br>**2 - Local**: Limited to the immediate surroundings.<br>**1 - Site-specific**: Extending only as far as the activity.<br>**0 - None** |
| **INTENSITY**<br>Magnitude of the impact on views, scenic or cultural resources | **5 - Definite** where scenic and cultural resources are definitely affected.<br>**4 - High** where scenic and cultural resources are significantly affected.<br>**3 - Moderate** where visual and scenic resources are affected to a limited extent.<br>**2 - Low** where visual and scenic resources are not affected.<br>**1 - Very low** the proposed development will not be visible. |
| **PROBABILITY** (of occurrence) | **5 - Definite**: Where time will not mitigate the visual impact.<br>**4 – Long Term Probability**: Lifespan of the project.<br>**3 - Medium probability**: Duration for screening vegetation to mature.<br>**2 - Low probability**: Screening vegetation matured and development has a high Landscape Compatibility.<br>**1 – Short Term**: Duration of the construction phase. |

| Evaluation component | Ranking scale and description (criteria) |
|---|---|
| **CUMULATIVE** impacts | **High**: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.<br>**Medium**: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern.<br>**Low**: The activity is localised and might have a negligible cumulative impact.<br>**None**: No cumulative impact on the environment. |

Once the evaluation components have been ranked for each potential impact, the significance of each potential impact will be assessed (or calculated) using the following formula:

**SP** (Significance Points) = (**Duration** + **Extent** + **Intensity**) x **Probability**

The maximum value is 75 significance points (SP). The unmitigated and mitigated scenarios for each potential environmental impact should be rated as per the table below.

**Table 6: Definition of significance ratings (positive and negative).**

| Significance Points | Environmental Significance | Description |
|---|---|---|
| **60 – 75** | **Very High (VH)** | An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options. |
| **45 – 59** | **High (H)** | An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options. |
| **30 – 44** | **Medium-high (MH)** | If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked. |
| **15 – 29** | **Medium (M)** | If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project. |
| **0 – 14** | **Low (L)** | An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation. |
| **+** | **Positive impact (+)** | A positive impact is likely to result in a positive consequence/effect and is likely to contribute to positive decisions about whether or not to proceed with the project. |

# 18 VISUAL IMPACT ASSESSMENT

The primary visual impacts of the proposed Prieska Power Reserve are further assessed as follow:

## 18.1 Potential visual impact on sensitive visual receptors, located within a 10 km radii of the Prieska Power Reserve.

The Operational Phase of the Prieska Power Reserve could have a high visual impact (significance rating= 18) on observers within a five kilometer (5 km) radius.

**Table 7: Impact Ratings of the Construction Phase within a 10 km radius.**

| Planning, design and construction phase | Design Alternative 1 | | No-Go Alternative |
|---|---|---|---|
| | Before Mitigation | After Mitigation | |
| **POTENTIAL VISUAL IMPACTS:** | | | |
| **Nature of impact:** Impact on the sense of place for surrounding users. | **Activity:** The movement of construction vehicles, machinery and personnel on site shall result in a visual impact on surrounding users. Furthermore to this, the storage of materials and excavation shall result in disturbance and an unsightly character. | | No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken. |
| **Duration:** | 2 | 2 | - |
| **Extent:** | 2 | 1 | - |
| **Intensity:** | 2 | 2 | - |
| **Probability:** | 1 | 1 | - |
| **Total SP:** | 6 | 5 | - |
| **Significance rating:** | Low (L) | Low (L) | - |
| **Cumulative impact:** | - | - | - |
| **Proposed Mitigation:** | • Access roads are to be kept clean;<br>• Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. Roofs should be grey and non-reflective;<br>• Construction camps as well as development areas should be screened with netting;<br>• Lights within the construction camp should face directly down (angle of 90˚);<br>• Vegetation clearance should be limited to the development footprint only;<br>• Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact;<br>• All areas disturbed by construction activities must be subject to landscaping and rehabilitation;<br>• All spoil and waste will be disposed to a registered waste site and certificates of disposal provided;<br>• The project must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;<br>• Signage, if essential, should be discrete and confined to entrance gates. No corporate or advertising signage should be permitted. | | N/A |

| Planning, design and construction phase | Design Alternative 1 | | No-Go Alternative |
|---|---|---|---|
| | Before Mitigation | After Mitigation | |
| | • Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; and,<br>• Mitigation of visual impacts associated with the construction phase would entail proper planning, management and rehabilitation of the construction site. Mitigation measures include the following:<br>  • Reduce the time of construction through careful planning of logistics and ensure the productive implementation of resources;<br>  • Limit disturbance of the environment to the development footprint; and,<br>  • Limit construction activities to business hours (07:00 – 17:00). | | |

**Table 8: Impact Ratings of the Operational Phase within a 5 km radius.**

| Operational Phase | Design Alternative 1 | No-Go Alternative |
|---|---|---|
| **POTENTIAL VISUAL IMPACTS:** | | |
| **Nature of impact:** Impact on the sense of place for surrounding users. | **Activity:** The development of the Prieska Power Reserve can cause a visual intrusion to observers within a five-kilometre (5 km) radius from the proposed development. | No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken. |
| **Duration:** | 5 | 5 |
| **Extent:** | 3 | 0 |
| **Intensity:** | 4 | 0 |
| **Probability:** | 4 | 5 |
| **Total SP:** | 48 | 25 |
| **Significance rating:** | High (H) | P (+) |
| **Cumulative impact:** | - | - |
| **Proposed Mitigation:** | • Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare;<br>• Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact; | N/A |

| Operational Phase | Design Alternative 1 | No-Go Alternative |
|---|---|---|
| | • Mitigation to minimise lighting impacts include the following:<br>  • Shielding the sources of light by physical barriers (walls, vegetation or structures itself);<br>  • Limit mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights);<br>  • Make use of downward directional lighting fixtures;<br>  • Make use of minimum lumen or wattage in lights;<br>  • The navigation light at the top of the mast must be shielded to prevent disturbance to adjacent landowners; and,<br>  • Use motion sensors to activate lighting ensuring light is available when needed.<br>• Rehabilitation and Post-closure measures:<br>  • All above-ground structures should be removed, safely disposed of or possibly recycled for use elsewhere; and,<br>  • The affected area should be regarded to pre-development topographic conditions, unless the area is required for new specific uses. | |

**Table 9: Impact Ratings of the Operational Phase within a 10 km radius.**

| Operational Phase | Design Alternative 1 | No-Go Alternative |
|---|---|---|
| **POTENTIAL VISUAL IMPACTS:** | | |
| **Nature of impact:** Impact on the sense of place for surrounding users. | **Activity:** The development of the Prieska Power Reserve can cause a visual intrusion to observers within a ten-kilometre (10 km) radius from the proposed development. | No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken. |
| **Duration:** | 5 | 5 |
| **Extent:** | 3 | 0 |
| **Intensity:** | 3 | 0 |
| **Probability:** | 4 | 5 |
| **Total SP:** | 44 | 25 |

| Operational Phase | Design Alternative 1 | No-Go Alternative |
|---|---|---|
| **Significance rating:** | Moderate-High (MH) | P (+) |
| **Cumulative impact:** | - | - |
| **Proposed Mitigation:** | • Please refer to Mitigation Measures listed above. | N/A |

**Table 10: Impact Ratings of the Operational Phase within a 20 km radius.**

| Operational Phase | Design Alternative 1 | No-Go Alternative |
|---|---|---|
| **POTENTIAL VISUAL IMPACTS:** | | |
| **Nature of impact:** Impact on the sense of place for surrounding users. | **Activity:** The development of the Prieska Power Reserve can cause a visual intrusion to observers within a twenty-kilometre (20 km) radius from the proposed development. | No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken. |
| **Duration:** | 4 | 5 |
| **Extent:** | 3 | 0 |
| **Intensity:** | 3 | 0 |
| **Probability:** | 40 | 5 |
| **Total SP:** | 14 | 25 |
| **Significance rating:** | Moderate-High | P (+) |
| **Cumulative impact:** | - | - |
| **Proposed Mitigation:** | • Please refer to Mitigation Measures listed above. | N/A |

**Table 11: Impact Ratings of the Operational Phase within a 30 km radius.**

| Operational Phase | Design Alternative 1 | No-Go Alternative |
|---|---|---|
| **POTENTIAL VISUAL IMPACTS:** | | |
| **Nature of impact:** Impact on the sense of place for surrounding users. | **Activity:** The development of the Prieska Power Reserve can cause a visual intrusion to observers within a thirty-kilometre (30 km) radius from the proposed development. | No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken. |
| **Duration:** | 4 | 5 |
| **Extent:** | 3 | 0 |
| **Intensity:** | 2 | 0 |

| Operational Phase | Design Alternative 1 | No-Go Alternative |
|---|---|---|
| **Probability:** | 2 | 5 |
| **Total SP:** | 18 | 25 |
| **Significance rating:** | Moderate | P (+) |
| **Cumulative impact:** | - | - |
| **Proposed Mitigation:** | Please refer to Mitigation Measures listed above. | N/A |

# 19 CONCLUSION AND RECOMMENDATIONS

The proposed development will be highly visible within the short distance zone due to the short distance between the observer and the proposed development. Given the design of the proposed wind turbines it offers a low compatibility with the surrounding landscape. The VAC of the study area is considered to be low within the short distance zone as the proposed development will be placed on top of a low mountain coupled with the scares vegetation cover which predominantly consist of low thicket. The wind tubines, solar farm and the 132 kV Powerline will be visible within the short distance zone. The highest visual impact will occur from National Route Ten (N10) situated three point eight kilometres (3.8 km) towards the northeast, the R357 situated four and a half kilometres (4.5 km) towards the northwest and the R386 situated four point two kilometres (4.2 km) towards the west of the proposed development; however, the visual impact will be temporary from these vantage points due to the fact that observers will only traverse through the study area.

The proposed development will have a high visual impact when observed from the Blockhouse situated within the Koppie Nature Reserve. The blockhouse is the only heritage important structure that will be negatively influenced by the proposed development; however, it must be noted that there are some eight thousand (8 000) blockhouses across South Africa. Furthermore, the blockhouse in question has been vandalised and proof can clearly be seen. The Wind Turbines were predominantly used to determine the visual impact of the proposed development as it is roughly one hundred and fifty metres (150 m) taller than any of the other infrastructure. The relative visibility of the turbines, seen from the Koppie is more or less equal to the silos situated within the foreground. The landscape surrounding Prieska is not considered to be of high scenic nor cultural value as the town owns it origin to the Orange River and the surrounding farms. The proposed development will be an injection to the Local Economy of Prieska and as such the overall moderate visual impact will be acceptable.

**Construction Phase:**

- Access roads are to be kept clean;
- Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. Roofs should be grey and non-reflective;
- Construction camps as well as development areas should be screened with netting;
- Lights within the construction camp should face directly down (angle of 90˚);
- Vegetation clearance should be limited to the development footprint only;
- Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact;
- All areas disturbed by construction activities must be subject to landscaping and rehabilitation;
- All spoil and waste will be disposed to a registered waste site and certificates of disposal provided;
- The project must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;
- Signage, if essential, should be discrete and confined to entrance gates. No corporate or advertising signage should be permitted.
- Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; and,

- Mitigation of visual impacts associated with the construction phase would entail proper planning, management and rehabilitation of the construction site. Mitigation measures include the following:
    - Reduce the time of construction through careful planning of logistics and ensure the productive implementation of resources;
    - Limit disturbance of the environment to the development footprint; and,
    - Limit construction activities to business hours (07:00 – 17:00).

**Operation Phase:**

- Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare;
- Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact;
- Mitigation to minimise lighting impacts include the following:
    - Shielding the sources of light by physical barriers (walls, vegetation or structures itself);
    - Limit mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights);
    - Make use of downward directional lighting fixtures;
    - Make use of minimum lumen or wattage in lights;
    - The navigation light at the top of the mast must be shielded to prevent disturbance to adjacent landowners; and,
    - Use motion sensors to activate lighting ensuring light is available when needed.
- Rehabilitation and Post-closure measures:
    - All above-ground structures should be removed, safely disposed of or possibly recycled for use elsewhere; and,
- The affected area should be regarded to pre-development topographic conditions, unless the area is required for new specific uses.

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