



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

VISUAL IMPACT ASSESSMENT OF PROPOSED POFADDER WIND ENERGY FACILITY 1 (PTY) LTD

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
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1. SPECIALIST INFORMATION

Specialist Company Name: B-BBEE	Contribution level (Indicate 1 to 8 or non-compliant)			4	Percentage Procurement recognition	0
Specialist name:	Stephen Stead					
Specialist Qualifications:	BA Honours Geography					
Professional affiliation/registration:	Association of Professional Heritage Practitioners					
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2. DECLARATION BY THE SPECIALIST

I, Stephen Stead, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



 Signature of the Specialist

Director VRM Africa cc

 Name of Company:

18-2-2022

 Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

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



Signature of the Specialist

Director VRM Africa cc

Name of Company

Date



Signature of the Commissioner of Oaths

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18-2-2022

Date

Details of Specialist, Declaration and Undertaking Under Oath



Pofadder Wind Energy Facility 1 (Pty) Ltd

Proposed Commercial Wind Energy Facility (WEF)



Visual Impact Assessment: Scoping Phase

DEA Reference: *(or applicable)*

Report Prepared by: VRM Africa cc

Issue Date: 14 March 2022

Version No.: V2

POFADDER WIND ENERGY FACILITY 1 (PTY) LTD

PROPOSED COMMERCIAL WIND ENERGY FACILITY

VISUAL IMPACT ASSESSMENT

EXECUTIVE SUMMARY

The rural setting and settlement pattern of this arid landscape has aesthetic value as a dryland cultural landscape and care should be taken to ensure that the proposed wind farm adds to the value of this cultural landscape, without resulting in landscape modifications that are unduly visually intrusive or result in long term degradation of local landscape features. Wind farms have the potential to complement a rural settlement landscape and all efforts should be set in place to ensure that this does take place.

To ensure that Visual Resource Management Objectives are met, a full Level 4 VIA is required. This assessment must incorporate photomontages to inform the adjacent landowners of the nature of the landscape change and make an informed decision on the suitability of the landscape change such that surrounding eco-tourism activities that align with the significant biodiversity of the area, can be effectively accommodated. Further information requirements have been listed for inclusion in the final visual impact assessment in the conclusion.

The above visual and landscape findings are subject to further detail provided in the EIA by various specialist studies, namely the Botanical and Social. As such the findings could be amended to accommodate more informed studies of these specialist fields. Preliminary findings of the scoping report include (amongst others):

- Medium levels of scenic quality from natural landscape setting.
- A likely extensive Zone of Visual Influence into surrounding rural arid landscapes that do not include significant landscape resources or unique landforms.
- Remote locality with limited receptors but with potential for on site receptors including farm worker dwellings to be located within 1km distance from wind turbines with possible flicker impacts due to the large size of the turbines.
- The DFFE Screening does highlight raised ground on the site that would be utilised for turbine placement. The site visit found that the low ridgeline is not a significant feature, and the placement of the turbines on this landform is unlikely to generate further visual intrusion. There are sections of the access road that are routed on steep slopes (likely higher than 1 in 4m). These locations have been flagged in the scoping report for review in the final design. The turbines are located off the crest of the low ridgeline, and as such, care needs to be undertaken to address the cut and fills if the turbines are located within 1 in 10m slopes. These areas would need to be identified in the impact assessment phase, with the full cut/fill areas identified in the plan drawings.

- In principle support for the study area for wind farming with large sized turbines due to the Medium Exposure to limited receptors, and Medium ratings for Scenic Quality and no significant landscape resources located within the project Zone of Visual Influence.

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

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	Section of Report
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	SPECIALIST INFORMATION
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	DFFE DoI
c) an indication of the scope of, and the purpose for which, the report was prepared;	Scope and Objectives
(cA) an indication of the quality and age of base data used for the specialist report;	SPECIALIST INFORMATION
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Description of the receiving environment
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	NA
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Assessment Methodology
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;	Landscape Context
g) an identification of any areas to be avoided, including buffers;	Classes I and II are the most valued and have been identified as potential landscape impact areas.
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;	Figure 16
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Assumptions and Limitations

j) a description of the findings and potential implications of such findings on the impact of the proposed activity, (including identified alternatives on the environment) or activities;	
k) any mitigation measures for inclusion in the EMPr;	
l) any conditions for inclusion in the environmental authorisation;	
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	
n) a reasoned opinion- <ul style="list-style-type: none"> i. (as to) whether the proposed activity, activities or portions thereof should be authorised; <ul style="list-style-type: none"> (iA) regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan; 	<i>Pending Impacts</i>
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	
q) any other information requested by the competent authority.	
2) Where a government notice <i>gazetted</i> by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	



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Postal address:	P.O Box 7233 Blanco					
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Telephone:			Fax:			
E-mail:	steve@vrma.co.za					

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Director VRM Africa cc

 Name of Company:

18-2-2022

 Date

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Signature of the Specialist

Director VRM Africa cc

Name of Company

Date



Signature of the Commissioner of Oaths

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COMMISSIONER OF OATHS
SARIS VAN EDE
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Date

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POFADDER WIND ENERGY FACILITY 1 (PTY) LTD

PROPOSED COMMERCIAL WIND ENERGY FACILITY

VISUAL IMPACT ASSESSMENT

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- Appendix D: Specialist Information: Professional Registration Certificate and Curriculum Vitae
- Appendix E: VRM Checklists and Terminology

Glossary of Terms

Technical Terms	Definition (Oberholzer, 2005)
Degree of Contrast	The measure in terms of the form, line, colour and texture of the existing landscape in relation to the proposed landscape modification in relation to the defined visual resource management objectives.
Visual intrusion	Issues are concerns related to the proposed development, generally phrased as questions, taking the form of “what will the impact of some activity be on some element of the visual, aesthetic or scenic environment”.
Receptors	Individuals, groups or communities who would be subject to the visual influence of a particular project.
Sense of place	The unique quality or character of a place, whether natural, rural or urban.
Scenic corridor	A linear geographic area that contains scenic resources, usually, but not necessarily, defined by a route.
Viewshed	The outer boundary defining a view catchment area, usually along crests and ridgelines. Similar to a watershed. This reflects the area, or the extent thereof, where the landscape modification would probably be seen.
Visual Absorption Capacity	The potential of the landscape to conceal the proposed project.

Technical Term	Definition (USDI., 2004)
Key Observation Point	Receptors refer to the people located in the most critical locations, or key observation points, surrounding the landscape modification, who make consistent use of the views associated with the site where the landscape modifications are proposed. KOPs can either be a single point of view that an observer/evaluator uses to rate an area or panorama, or a linear view along a roadway, trail, or river corridor.
Visual Resource Management	A map-based landscape and visual impact assessment method development by the Bureau of Land Management (USA).
Zone of Visual Influence	The ZVI is defined as ‘the area within which a proposed development may have an influence or effect on visual amenity.’

List of Abbreviations

<i>APHP</i>	Association of Professional Heritage Practitioners
<i>BLM</i>	Bureau of Land Management (United States)
<i>BPEO</i>	Best Practicable Environmental Option
<i>CALP</i>	Collaborative for Advanced Landscape Planning
<i>DEM</i>	Digital Elevation Model
<i>DoC</i>	Degree of Contrast
<i>EIA</i>	Environmental Impact Assessment
<i>EMPr</i>	<i>Environmental Management Plan</i>
<i>GIS</i>	Geographic Information System
<i>GPS</i>	Global Positioning System
<i>IDP</i>	Integrated Development Plan

<i>IEMA</i>	Institute of Environmental Management and Assessment (United Kingdom)
<i>KOP</i>	Key Observation Point
<i>LVIA</i>	Landscape and Visual Impact Assessment
<i>MAMSL</i>	Metres above mean sea level
<i>NELPAG</i>	New England Light Pollution Advisory Group
<i>SDF</i>	Spatial Development Framework
<i>SEA</i>	Strategic Environmental Assessment
<i>VAC</i>	Visual Absorption Capacity
<i>VIA</i>	Visual Impact Assessment
<i>VRM</i>	Visual Resource Management
<i>VRMA</i>	Visual Resource Management Africa
<i>ZVI</i>	Zone of Visual Influence

POFADDER WIND ENERGY FACILITY 1 (PTY) LTD

PROPOSED COMMERCIAL WIND ENERGY FACILITY

VISUAL IMPACT ASSESSMENT

1. INTRODUCTION

Visual Resource Management Africa CC (VRMA) was appointed by Atlantic Renewable Energy Partners (Pty) Ltd (AEP) to undertake a **Visual Impact Assessment** for the proposed Pofadder Wind Energy Facility 1 VIA on behalf of Pofadder Wind Energy 1 (Pty) Ltd. The proposed development site is located in the Northern Cape Province, within the Kai !Garib Local Municipality and the Z F Mgcawu District Municipality in the Northern Cape Province (as mapped in Figure 2). Pofadder Wind Energy 1 (Pty) Ltd. proposes to construct three windfarms and associated infrastructure on a site located 25km southeast of the small town of Pofadder and 162km west of large town of Upington in the Northern Cape Province of South Africa.

1.1 Scope and Objectives

This visual scoping report will focus on the Pofadder Wind Energy Facility 1, which includes the application for 30 wind turbines with a combined contracted capacity of up to 200MW. As this is a scoping report, a site visit was not undertaken but will be implemented prior to impact assessment.

1.2 Terms of Reference

The scope of this study is to cover the entire proposed project area. The terms of reference for the study are as follows:


- Collate and analyse all available secondary data relevant to the affected proposed project area. This includes a site visit of the full site extent, as well as of areas where potential impacts may occur beyond the site boundaries.
- Consider all cumulative effects in all impact reports.
- Specific attention is to be given to the following:
 - Quantifying and assessing existing scenic resources/visual characteristics on, and around, the proposed site.
 - Evaluation and classification of the landscape in terms of sensitivity to a changing land use.
 - Determining viewsheds, view corridors and important viewpoints to assess the visual impacts of the proposed project.
 - Determining visual issues, including those identified in the public participation process.
 - Reviewing the legal framework that may have implications for visual/scenic resources.
 - Assessing the significance of potential visual impacts resulting from the proposed project for the construction, operation, and decommissioning phases of the proposed project.
 - Assessing the potential cumulative impacts associated with the visual impact.

- Identifying possible mitigation measures to reduce negative visual impacts for inclusion into the proposed project design, including input into the Environmental and Social Management Plan (ESMP).

1.3 Specialist Credentials

Full Specialist CV and list of VRM Africa’s completed projects can be seen in Appendix C.

Table 1. Specialist declaration of independence.

<p>All intellectual property rights and copyright associated with VRM Africa’s services are reserved, and project deliverables, including electronic copies of reports, maps, data, shape files and photographs, may not be modified or incorporated into subsequent reports in any form, or by any means, without the written consent of the author. Reference must be made to this report, should the results, recommendations or conclusions in this report be used in subsequent documentation. Any comments on the draft copy of the Visual Impact Assessment (VIA) must be put in writing. Any recommendations, statements or conclusions drawn from, or based upon, this report, must make reference to it.</p> <p>This document was completed by Silver Solutions 887 cc trading as VRM Africa, a Visual Impact Study and Mapping organisation located in George, South Africa. VRM Africa cc was appointed as an independent professional visual impact practitioner to facilitate this VIA. I, Stephen Stead, hereby declare that VRM Africa, an independent consulting firm, has no interest or personal gains in this project whatsoever, except receiving fair payment for rendering an independent professional service.</p>  <p>Stephen Stead <i>APHP accredited VIA Specialist</i></p>

Contributors to this study are summarised in the table below.

Table 2: Authors and Contributors to this Report.

Aspect	Person	Organisation / Company	Qualifications
Landscape and Visual Assessment (author of this report)	Stephen Stead B.A (Hons) Human Geography, 1991 (UKZN, Pietermaritzburg)	VRMA	<ul style="list-style-type: none"> Accredited with the Association of Professional Heritage Practitioners and 16 years of experience in visual assessments including renewable energy, powerlines, roads, dams across southern Africa. Registered with the Association of Professional Heritage Practitioners since 2014.

1.4 Assessment Methodology Outline

The process that VRM Africa follows when undertaking a VIA is based on the United States Bureau of Land Management 's (BLM) Visual Resource Management method (USDI., 2004). This mapping and GIS-based method of assessing landscape modifications allows for increased objectivity and consistency by using standard assessment criteria.

The following approach was used in understanding the landscape processes and informing the magnitude of the impacts of the proposed landscape modification. The table below lists a number of standardised procedures recommended as a component of best international practice.

Table 3: Methodology Summary Table

Action	Description
Site Survey	The identification of existing scenic resources and sensitive receptors in and around the study area to understand the context of the proposed development within its surroundings to ensure that the intactness of the landscape and the prevailing sense of place are taken into consideration.
Project Description	Provide a description of the expected project, and the components that will make up the landscape modification.
Reviewing the Legal Framework	The legal, policy and planning framework may have implications for visual aspects of the proposed development. The heritage legislation tends to be pertinent in relation to natural and cultural landscapes, while Strategic Environmental Assessments (SEAs) for renewable energy provide a guideline at the regional scale.
Determining the Zone of Visual Influence	This includes mapping of viewsheds and view corridors in relation to the proposed project elements, in order to assess the zone of visual influence of the proposed project. Based on the topography of the landscape as represented by a Digital Elevation Model, an approximate area is defined which provides an expected area where the landscape modification has the potential to influence landscapes (or landscape processes) or receptor viewpoints.
Identifying Visual Issues and Visual Resources	Visual issues are identified during the public participation process, which is being carried out by others. The visual, social or heritage specialists may also identify visual issues. The significance and proposed mitigation of the visual issues are addressed as part of the visual assessment.
Assessing Potential Visual Impacts	An assessment is made of the significance of potential visual impacts resulting from the proposed project for the construction, operational and

Action	Description
	decommissioning phases of the project. The rating of visual significance is based on the methodology provided by the Environmental Assessment Practitioner (EAP).
Formulating Mitigation Measures	Possible mitigation measures are identified to avoid or minimise negative visual impacts of the proposed project. The intention is that these would be included in the project design, the Environmental Management programme (EMPr) and the authorisation conditions.

The process that VRMA followed when determining landscape significance is based on the United States Bureau of Land Management's (BLM) Visual Resource Management method (USDI., 2004). This mapping and Geographic Information System (GIS) based method of assessing landscape modifications allows for increased objectivity and consistency by using standard assessment criteria. The following key factors determine the suitability of landscape change:

- “Different levels of scenic values require different levels of management. For example, management of an area with high scenic value might be focused on preserving the existing character of the landscape, and management of an area with little scenic value might allow for major modifications to the landscape. Determining how an area should be managed first requires an assessment of the area’s scenic values”.
- “Assessing scenic values and determining visual impacts can be a subjective process. Objectivity and consistency can be greatly increased by using the basic design elements of form, line, colour, and texture, which have often been used to describe and evaluate landscapes, to also describe proposed projects. Projects that repeat these design elements are usually in harmony with their surroundings; those that don’t create contrast. By adjusting project designs so the elements are repeated, visual impacts can be minimized” (USDI., 2004).

The assessment comprises two main sections: firstly, the **Baseline Stage** to identify the visual resources and key observation locations within the project zone of visual influence; and secondly, the **Assessment Stage** which determines the visual impacts and significance of the proposed landscape modifications.

1.5 Baseline Analysis Stage

In terms of VRM methodology, landscape character is derived from a combination of **scenic quality**, **receptor sensitivity** to landscape change and **distance** from the proposed landscape change. The objective of the analysis is to compile a mapped inventory of the visual resources found in the receiving landscape, and to derive a mapped Visual Resource sensitivity layer from which to evaluate the suitability of the landscape change.

1.5.1 Scenic Quality

The scenic quality is determined making use of the VRM Scenic Quality Checklist (refer to Annexure D). The checklist identifies seven scenic quality criteria which are rated with 1 (low) to 5 (high) scale. The scores are totalled and assigned an A (High), B (Moderate) or C (low) based on the following split:

A= scenic quality rating of ≥ 19 .

B = rating of 12 – 18,

C= rating of ≤ 11

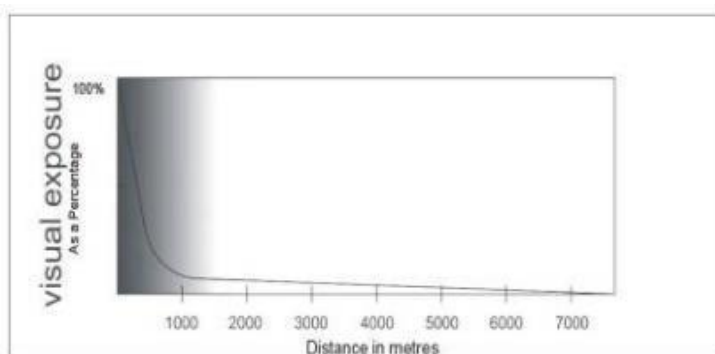
The seven scenic quality criteria are defined below:

- **Land Form:** Topography becomes more of a factor as it becomes steeper, or more severely sculptured.
- **Vegetation:** Primary consideration given to the variety of patterns, forms, and textures created by plant life.
- **Water:** That ingredient which adds movement or serenity to a scene. The degree to which water dominates the scene is the primary consideration.
- **Colour:** The overall colour(s) of the basic components of the landscape (e.g., soil, rock, vegetation, etc.) are considered as they appear during seasons or periods of high use.
- **Scarcity:** This factor provides an opportunity to give added importance to one, or all, of the scenic features that appear to be relatively unique or rare within one physiographic region.
- **Adjacent Land Use:** Degree to which scenery and distance enhance, or start to influence, the overall impression of the scenery within the rating unit.
- **Cultural Modifications:** Cultural modifications should be considered and may detract from the scenery or complement or improve the scenic quality of an area.

1.5.2 Receptor Exposure

The area where a landscape modification starts to influence the landscape character is termed the Zone of Visual Influence (ZVI) and is defined by the U.K. Institute of Environmental Management and Assessment's (IEMA) 'Guidelines for Landscape and Visual Impact Assessment' as 'the area within which a proposed development may have an influence or effect on visual amenity (of the surrounding areas).' The ZVI is strongly influenced by distance or how Exposed the receptor is to the proposed landscape change. The inverse relationship of distance and visual impact is well recognised in visual analysis literature (Hull, R.B. and Bishop, I.E., 1988). According to Hull and Bishop, exposure, or visual impact, tends to diminish exponentially with distance. The areas where most landscape modifications would be visible are located within 2km from the site of the landscape modification. Thus, the potential visual impact of an object diminishes at an exponential rate as the distance between the observer and the object increases due to atmospheric conditions prevalent at a location, which causes the air to appear greyer, thereby diminishing detail. For example, viewed from 1000m from a landscape modification, the impact would be 25% of the impact as viewed from 500m from a landscape modification. At 2000m it would be 10% of the impact at 500m. The relationship is indicated in the following graph generated by Hull and Bishop.

Table 4. Hull and Bishop graphic depicting reducing visibility over distance.



The Visual and Aesthetic Guidelines generated by the Western Cape DEA&DP also refer to Visual Exposure Criteria (Oberholzer, B., 2005)

- **High** :Dominant or clearly noticeable (<2km)

- **Moderate** :Recognisable to the viewer (2 – 6km)
- **Low** :Minimally visible areas in the landscape (>6km)

In order to determine the level of exposure to receptors, the VRM methodology also takes distance from a landscape modification into consideration in terms of understanding visual resource. Three distance categories are defined by the Bureau of Land Management (United States Department of Interior): (USA Bureau of Land Management, 2004). The distance zones that are utilised in the assessment are:

1. **Foreground / Middle ground**, up to approximately 6km, which is where there is potential for the sense of place to change;
2. **Background areas**, from 6km to 24km, where there is some potential for change in the sense of place, but where change would only occur in the case of very large landscape modifications; and
3. **Seldom seen areas**, which fall within the Foreground / Middle ground area but, as a result of no receptors, are not viewed or are seldom viewed.

1.5.3 Receptor Sensitivity

Receptor Sensitivity levels are a measure of public concern for scenic quality and assessed making use of the Sensitivity Checklist in Annexure D. Receptor sensitivity to landscape change is determined by rating the following factors in terms of Low to High:

- **Type of Users:** Visual sensitivity will vary with the type of users, e.g. recreational sightseers may be highly sensitive to any changes in visual quality, whereas workers who pass through the area on a regular basis may not be as sensitive to change.
- **Amount of Use:** Areas seen or used by large numbers of people are potentially more sensitive.
- **Public Interest:** The visual quality of an area may be of concern to local, or regional, groups. Indicators of this concern are usually expressed via public controversy created in response to proposed activities.
- **Adjacent Land Uses:** The interrelationship with land uses in adjacent lands. For example, an area within the viewshed of a residential area may be very sensitive, whereas an area surrounded by commercially developed lands may not be as visually sensitive.
- **Special Areas:** Management objectives for special areas such as Natural Areas, Wilderness Areas or Wilderness Study Areas, Wild and Scenic Rivers, Scenic Areas, Scenic Roads or Trails, and Critical Biodiversity Areas frequently require special consideration for the protection of their visual values.
- **Other Factors:** Consider any other information such as research or studies that include indicators of visual sensitivity.

1.5.4 Visual Resource Management Classes

These findings are then submitted to a VRM Matrix below. The VRM Classes are not prescriptive and are used as a guideline to determine the carrying capacity of a visually preferred landscape as a basis for assessing the suitability of the landscape change associated with the proposed project.

Table 5: VRM Class Matrix Table

		VISUAL SENSITIVITY LEVELS								
		High			Medium			Low		
SCENIC QUALITY	A (High)	II	II	II	II	II	II	II	II	II
	B (Medium)	II	III	III/ IV *	III	IV	IV	IV	IV	IV
	C (Low)	III	IV	IV	IV	IV	IV	IV	IV	IV
DISTANCE ZONES		Fore/middle ground	Background	Seldom seen	Fore/middle ground	Background	Seldom seen	Fore/middle ground	Background	Seldom seen

* If adjacent areas are **Class III** or lower, assign **Class III**, if higher, assign **Class IV**

The visual objectives of each of the classes are listed below:

- The Class I objective is to preserve the existing character of the landscape, the level of change to the characteristic landscape should be very low and must not attract attention. Class I is assigned when a decision is made to maintain a natural landscape.
- The Class II objective is to retain the existing character of the landscape and the level of change to the characteristic landscape should be low. The proposed development may be seen but should not attract the attention of the casual observer, and should repeat the basic elements of form, line, colour and texture found in the predominant natural features of the characteristic landscape.
- The Class III objective is to partially retain the existing character of the landscape, where the level of change to the characteristic landscape should be moderate. The proposed development may attract attention, but should not dominate the view of the casual observer, and changes should repeat the basic elements found in the predominant natural features of the characteristic landscape; and
- The Class IV objective is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the landscape can be high, and the proposed development may dominate the view and be the major focus of the viewer's (s') attention without significantly degrading the local landscape character.

1.5.5 Key Observation Points

During the Baseline Inventory Stage, Key Observation Points (KOPs) are identified. KOPs are defined by the Bureau of Land Management as the people (receptors) located in strategic locations surrounding the property that make consistent use of the views associated with the site where the landscape modifications are proposed. These locations are important in terms of the VRM methodology, which requires that the Degree of Contrast (DoC) that the proposed landscape modifications will make to the existing landscape be measured from these most critical locations, or receptors, surrounding the property. To define the KOPs, potential receptor locations were identified in the viewshed analysis, and screened, based on the following criteria:

- Angle of observation.
- Number of viewers.

- Length of time the project is in view.
- Relative project size.
- Season of use.
- Critical viewpoints, e.g., views from communities, road crossings; and
- Distance from property.

1.6 Assessment and Impact Stage

The analysis stage involves determining whether the potential visual impacts from proposed surface-disturbing activities or developments will meet the management objectives established for the area, or whether design adjustments will be required. This requires a contrast rating to assess the expected DoC the proposed landscape modifications would generate within the receiving landscape in order to define the Magnitude of the impact.

1.6.1 Contrast Rating

The contrast rating is undertaken to determine if the VRM Class Objectives are met. The suitability of landscape modification is assessed by comparing and contrasting existing receiving landscape to the expected contrast that the proposed landscape change will generate. This is done by evaluating the level of change to the existing landscape by assessing the line, colour, texture and form, in relation to the visual objectives defined for the area.

The following criteria are utilised in defining the DoC:

- **None:** The element contrast is not visible or perceived.
- **Weak:** The element contrast can be seen but does not attract attention.
- **Moderate:** The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- **Strong:** The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

As an example, in a Class I area, the visual objective is to preserve the existing character of the landscape, and the resultant contrast to the existing landscape should not be notable to the casual observer and cannot attract attention. In a Class IV area example, the objective is to provide for proposed landscape activities that allow for major modifications of the existing character of the landscape. Based on whether the VRM objectives are met, mitigations, if required, are defined to avoid, reduce or mitigate the proposed landscape modifications so that the visual impact does not detract from the surrounding landscape sense of place.

Based on the findings of the contrast rating, the Magnitude of the Landscape and Visual Impact Assessment is determined.

1.6.2 Photomontages

As a component in this contrast rating process, visual representation, such as photo montages are vital in large-scale modifications, as this serves to inform Interested & Affected Parties and decision-making authorities of the nature and extent of the impact associated with the proposed project/development. There is an ethical obligation in this process, as visualisation can be misleading if not undertaken ethically. In terms of adhering to standards for ethical representation of landscape modifications, VRMA subscribes to the Proposed Interim Code of Ethics for Landscape Visualisation developed by the Collaborative for Advanced Landscape Planning (CALP) (Sheppard, 2000). This code states that professional presenters of realistic landscape visualisations are responsible for

promoting full understanding of proposed landscape changes, providing an honest and neutral visual representation of the expected landscape, by seeking to avoid bias in responses and demonstrating the legitimacy of the visualisation process. Presenters of landscape visualisations should adhere to the principles of:

- Access to Information
- Accuracy
- Legitimacy
- Representativeness
- Visual Clarity and Interest

The Code of Ethical Conduct states that the presenter should:

- Demonstrate an appropriate level of qualification and experience.
- Use visualisation tools and media that are appropriate to the purpose.
- Choose the appropriate level of realism.
- Identify, collect and document supporting visual data available for, or used in, the visualisation process.
- Conduct an on-site visual analysis to determine important issues and views.
- Seek community input on viewpoints and landscape issues to address in the visualisations.
- Provide the viewer with a reasonable choice of viewpoints, view directions, view angles, viewing conditions and timeframes appropriate to the area being visualised.
- Estimate and disclose the expected degree of uncertainty, indicating areas and possible visual consequences of the uncertainties.
- Use more than one appropriate presentation mode and means of access for the affected public.
- Present important non-visual information at the same time as the visual presentation, using a neutral delivery.
- Avoid the use, or the appearance of, 'sales' techniques or special effects.
- Avoid seeking a particular response from the audience.
- Provide information describing how the visualisation process was conducted and how key decisions were taken (Sheppard, 2000).

1.7 Impact Methodology

SiVest has provided a standardised Environment Impact Assessment (EIA) Methodology to assisting the evaluation of the overall effects of the proposed activity on the environment, determining significance through a systemic analysis. Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale (i.e. site, local, national or global), whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. For further details of the EIA methodology, refer to Appendix C.

2 ASSUMPTIONS AND LIMITATIONS

- Digital Elevation Models (DEM) and viewsheds were generated using a 30-metre SRTM elevation data provided by NASA Earthdata (<https://earthdata.nasa.gov/>, n.d.). Although every effort to maintain accuracy was undertaken, as a result of the DEM being generated from satellite imagery and not being a true representation of the earth's surface, the viewshed mapping is approximate and may not represent an exact visibility incidence. Thus, specific

features identified from the DEM and derived contours (such as peaks and conical hills) would need to be verified once a detailed survey of the project area took place.

- The use of open-source satellite imagery was utilised for base maps in the report.
- Some of the mapping in this document was created using Bing Maps, Open-Source Map, ArcGIS Online and Google Earth Satellite imagery.
- The project deliverables, including electronic copies of reports, maps, data, shape files and photographs are based on the author's professional knowledge, as well as available information.
- VRM Africa reserves the right to modify aspects of the project deliverables if and when new/additional information may become available from research or further work in the applicable field of practice or pertaining to this study.

3 PROJECT LOCALITY

The applicant, Pofadder Wind Energy Facility 1 (Pty) Ltd, is proposing the development of a commercial Wind Energy Facility (WEF) and associated infrastructure on a site located approximately 20km South East of Pofadder within in the Northern Cape Province as mapped in Figure 1 below.

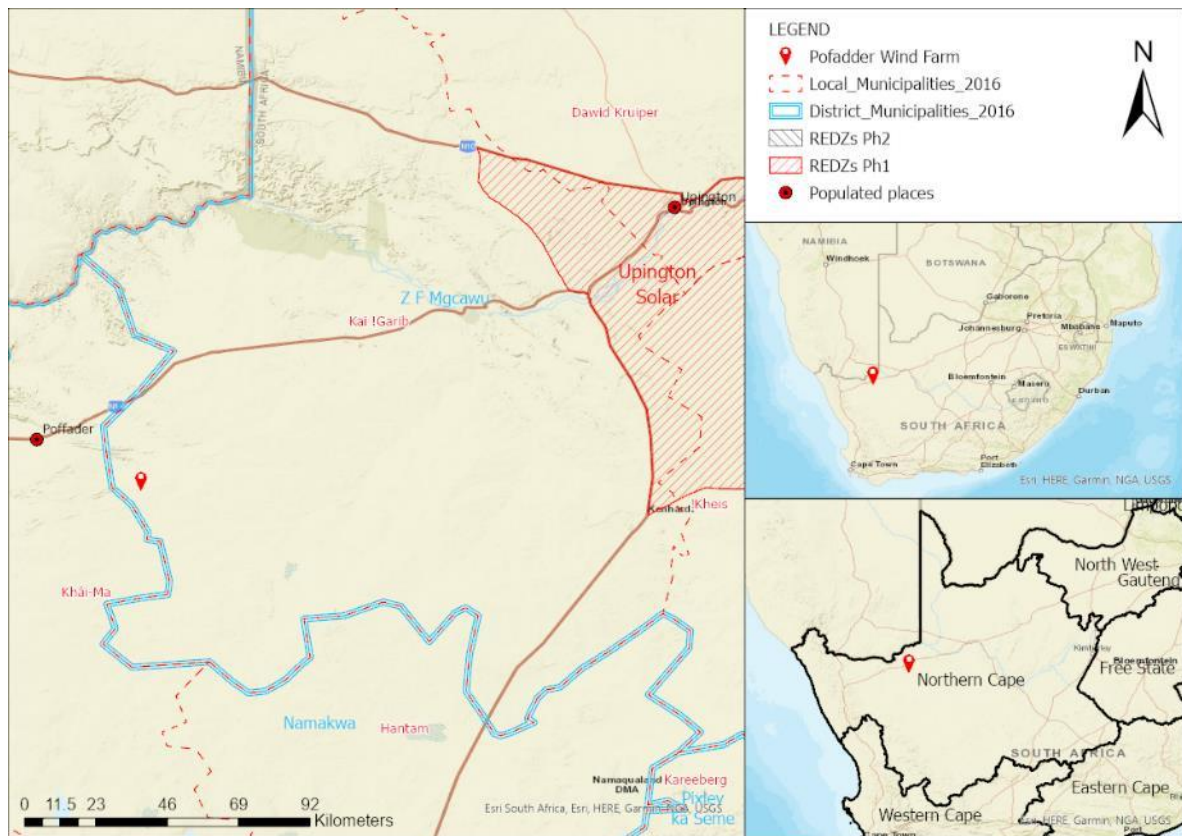


Figure 1. Project locality map.

A preferred project site with an extent of approx. 3000ha has been identified as a technically suitable area for the development of the Pofadder WEF 1, which will comprise of up to 30 turbines with a combined contracted capacity of up to 200MW. The project site is located on the following properties:

- The Farm Ganna-Poort 202;
- The Farm Lovedale 201; and

- Portion 3 of the Farm Sand Gat 150.

Two additional WEF's are concurrently being considered on the properties and are assessed by way of separate impact assessment processes contained in the 2014 Environmental Impact Assessment Regulations (GN No. R982, as amended) for listed activities contained Listing Notices 1, 2 and 3 (GN R983, R984 and R985, as amended). These projects are known as Pofadder Wind Energy Facility 2 and Pofadder Wind Energy Facility 3. VRM Africa is undertaking the VIA's for all three proposed wind farms.

4 LEGAL REQUIREMENT AND GUIDELINES

In order to comply with the Visual Resource Management requirements, it is necessary to relate the proposed landscape modification in terms of international best practice in understanding landscapes and landscape processes. The proposed project also needs to be evaluated in terms of 'policy fit'. This requires a review of National and Regional policy and planning for the area to ensure that the scale, density and nature of activities or developments are harmonious and in keeping with the planned sense of place and character of the area.

4.1 International and National Good Practice

For cultural landscapes, the following documentation provides good practice guidelines, specifically:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA), Second Edition.
- International Finance Corporation (IFC).
- World Bank Group.
- Millennium Ecosystem Assessment (MEA).
- United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Convention (WHC).

4.1.1 Guidelines for Landscape and Visual Impact Assessment, Second Edition

The Landscape Institute and the Institute of Environmental Management and Assessment (United Kingdom) have compiled a book outlining best practice in landscape and visual impact assessment. This has become a key guideline for LVIA in the United Kingdom. "The principal aim of the guideline is to encourage high standards for the scope and context of landscape and visual impact assessments, based on the collegiate opinion and practice of the members of the Landscape Institute and the Institute of Environmental Management and Assessment. The guidelines also seek to establish certain principles and will help to achieve consistency, credibility and effectiveness in landscape and visual impact assessment, when carried out as part of an EIA" (The Landscape Institute, 2003);

In the introduction, the guideline states that 'Landscape encompasses the whole of our external environment, whether within village, towns, cities or in the countryside. The nature and pattern of buildings, streets, open spaces and trees – and their interrelationships within the built environment – are an equally important part of our landscape heritage" (The Landscape Institute, 2003) (Pg. 9). The guideline identifies the following reasons why landscape is important in both urban and rural contexts, in that it is:

- An essential part of our natural resource base.
- A reservoir of archaeological and historical evidence.
- An environment for plants and animals (including humans);

- A resource that evokes sensual, cultural and spiritual responses and contributes to our urban and rural quality of life; and
- Valuable recreation resources (The Landscape Institute, 2003).

4.1.2 International Finance Corporation (IFC)

The IFC Performance Standards (IFC, 2012) do not explicitly cover visual impacts or assessment thereof. Under IFC PS 6, ecosystem services are organized into four categories, with the third category related to cultural services which are defined as “the non-material benefits people obtain from ecosystems” and “may include natural areas that are sacred sites and areas of importance for recreation and aesthetic enjoyment” (IFC, 2012).

However, the IFC Environmental Health and Safety Guidelines for Electric Power Transmission and Distribution (IFC, 2007) specifically identifies the risks posed by power transmission and distribution projects to create visual impacts to residential communities. It recommends mitigation measures to be implemented to minimise visual impact. These should include the siting of powerlines and the design of substations with due consideration to landscape views and important environmental and community features. Prioritising the location of high-voltage transmission and distribution lines in less populated areas, where possible, is promoted.

IFC PS 8 recognises the importance of cultural heritage for current and future generations and aims to ensure that projects protect cultural heritage. The reports define Cultural Heritage as “(i) tangible forms of cultural heritage, such as tangible moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values; (ii) unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls” (IFC, 2012). The IFC PS 8 defines Critical Heritage as “one or both of the following types of cultural heritage: (i) the internationally recognized heritage of communities who use or have used within living memory the cultural heritage for long-standing cultural purposes; or (ii) legally protected cultural heritage areas, including those proposed by host governments for such designation” (IFC, 2012).

Legally protected cultural heritage areas are identified as important in the IFC PS 8 report. This is for “the protection and conservation of cultural heritage, and additional measures are needed for any projects that would be permitted under the applicable national law in these areas”. The report states that “in circumstances where a proposed project is located within a legally protected area or a legally defined buffer zone, the client, in addition to the requirements for critical cultural heritage, will meet the following requirements:

- Comply with defined national or local cultural heritage regulations or the protected area management plans.
- Consult the protected area sponsors and managers, local communities and other key stakeholders on the proposed project; and
- Implement additional programs, as appropriate, to promote and enhance the conservation aims of the protected area” (IFC, 2012).

4.1.3 World Bank Group

In terms of specific reference to wind farming best practice, the World Bank Group, which is associated with the IFC, generated a guideline for Wind Energy in 2015. The report titled Environmental, Health and Safety Guidelines for Wind Energy makes the following recommendations for Landscape, Seascape and Visual Impacts:

Landscape, Seascape and Visual Impacts

- Depending on the location, a wind energy facility may have an impact on viewsapes, especially if visible from or located near residential areas or tourism sites. Visual impacts associated with wind energy projects typically concern the installed and operational turbines themselves (e.g., colour, height, and number of turbines).
- Impacts may also arise in relation to operational wind facilities' interaction with the character of the surrounding landscape and/or seascape. Impacts on Legally Protected and Internationally Recognized. Areas of importance to biodiversity and cultural heritage features are also a consideration. Preparing zone of visual influence maps and preparing wire-frame images and photomontages from key viewpoints is recommended to inform both the assessment and the consultation processes.
- Avoidance and minimization measures to address landscape, seascape, and visual impacts are largely associated with the siting and layout of wind turbines and associated infrastructure, such as meteorological towers, onshore access tracks, and substations.
- Consideration should be given to turbine layout, size, and scale in relation to the surrounding landscape and seascape character and surrounding visual receptors (e.g., residential properties, users of recreational areas/routes).
- Consideration should also be given to the proximity of turbines to settlements, residential areas, and other visual receptors to minimize visual impacts and impacts on residential amenity, where possible. All relevant viewing angles should be considered when considering turbine locations, including viewpoints from nearby settlements.
- Other factors can be considered in relation to minimizing visual impacts:
 - Incorporate community input into wind energy facility layout and siting.
 - Maintain a uniform size and design of turbines (e.g., type of turbine and tower, as well as height).
 - Adhere to country-specific standards for marking turbines, including aviation/navigational and environmental requirements (see Community Health and Safety section below), where available.
 - Minimize presence of ancillary structures on the site by minimizing site infrastructure, including the number of roads, as well as by burying collector system power lines, avoiding stockpiling of excavated material or construction debris, and removing inoperative turbines.
 - Erosion measures should be implemented and cleared land should be promptly re-vegetated with local seed stock of native species. (World Bank Group, 2015)

4.1.4 Millennium Ecosystem Assessment

In the Ecosystems and Human Well-being document compiled by the Millennium Ecosystem Assessment in 2005, Ecosystems are defined as being “essential for human well-being through their provisioning, regulating, cultural, and supporting services. Evidence in recent decades of escalating human impacts on ecological systems worldwide raises concerns about the consequences of ecosystem changes for human well-being”. (Millennium Ecosystem Assessment, 2005)

The Millennium Ecosystem Assessment defined the following non-material benefits that can be obtained from ecosystems:

- Inspiration: Ecosystems provide a rich source of inspiration for art, folklore, national symbols, architecture, and advertising.
- Aesthetic values: Many people find beauty or aesthetic value in various aspects of ecosystems, as reflected in the support for parks, scenic drives, and the selection of housing locations.
- Sense of place: Many people value the “sense of place” that is associated with recognised features of their environment, including aspects of the ecosystem.

- Cultural heritage values: Many societies place high value on the maintenance of either historically important landscapes (“cultural landscapes”) or culturally significant species; and
- Recreation and ecotourism: People often choose where to spend their leisure time based in part on the characteristics of the natural or cultivated landscapes in a particular area. (Millennium Ecosystem Assessment, 2005)

The Millennium Ecosystem Assessment Ecosystems and Human Well-being: Synthesis report indicates that there has been a “rapid decline in sacred groves and species” in relation to spiritual and religious values, and aesthetic values have seen a “decline in quantity and quality of natural lands”. (Millennium Ecosystem Assessment, 2005)

4.2 National and Regional Legislation and Policies

In order to comply with the Visual Resource Management requirements, it is necessary to clarify which National and Regional planning policies govern the proposed development area to ensure that the scale, density and nature of activities or developments are harmonious and in keeping with the sense of place and character of the area.

The following guidelines and policies were identified for this project:

- DEA&DP Visual and Aesthetic Guidelines.
- REDZ status.
- Regional and Local Municipality Planning and Guidelines.

The map below indicates the administrative locality of the proposed development area.

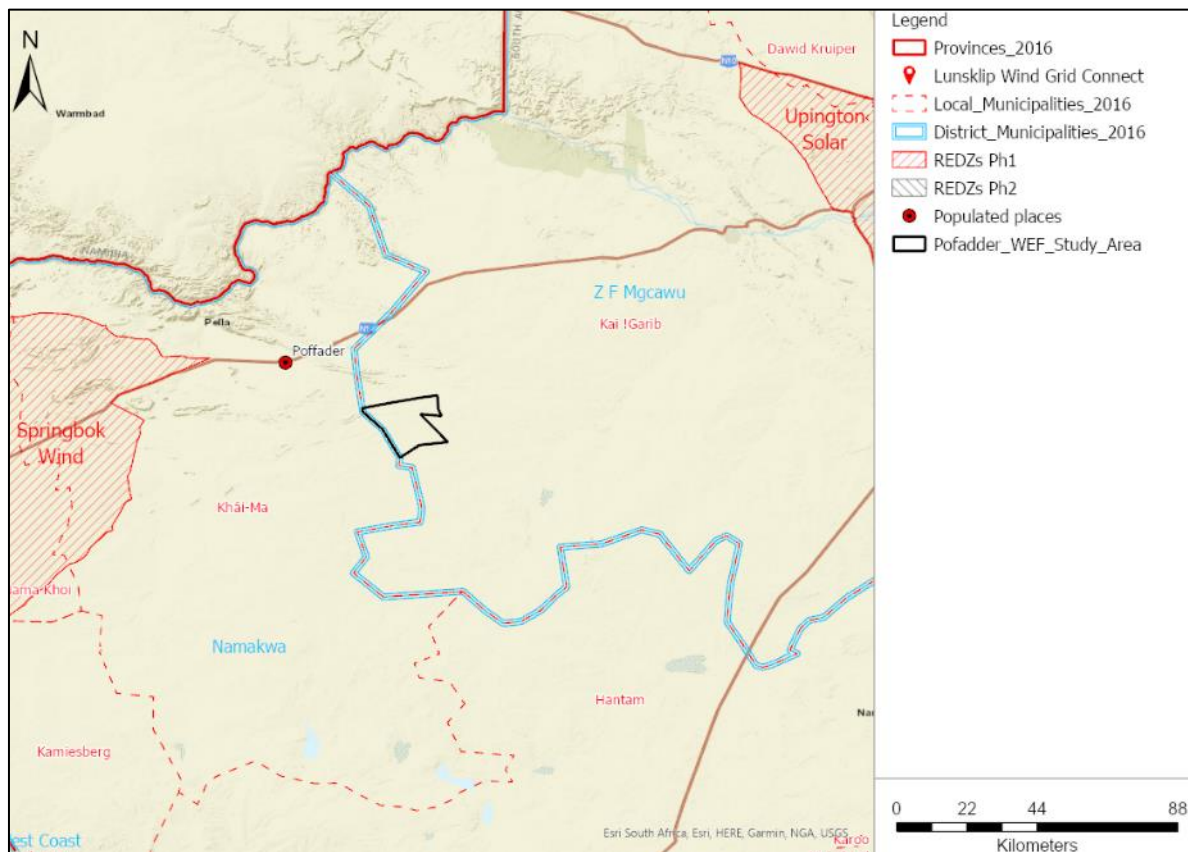


Figure 2. District and Local Governance Planning Map.

4.2.1 DEA&DP Visual and Aesthetic Guidelines

Although not located within the Western Cape, reference to the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for involving visual and aesthetic specialists in Environmental Impact Assessment (EIA) processes is provided in terms of southern African best practice in Visual Impact Assessment. The report compiled by Oberholzer states that the Best Practicable Environmental Option (BPEO) should address the following:

- Ensure that the scale, density and nature of activities or developments are harmonious and in keeping with the sense of place and character of the area. The BPEO must also ensure that development must be located to prevent structures from being a visual intrusion (i.e., to retain open views and vistas).
- Long term protection of important scenic resources and heritage sites.
- Minimisation of visual intrusion in scenic areas.
- Retention of wilderness or special areas intact as far as possible.
- Responsiveness to the area's uniqueness, or sense of place.” (Oberholzer B. , 2005)

Mapping of Visual and Landscape Sensitivity Criteria

Based on the DEA&DP Visual and Aesthetic Guidelines (see Section 4.1.4 DEA&DP Visual and Aesthetic Guidelines) the following broad brush sensitivity buffers are proposed to protect visual resources should they be identified in the landscape / project Zone of Visual Influence.

Table 6: General Guide for Mapping of Visual Buffers for Wind Farms Table.

Landscape features/criteria	Best practice setbacks	Comments
Project area boundary (internal)		Buffer usually 1 to 1.5 times height of the proposed turbines.
Prominent topographic Features	500 m	Peaks, ridgelines and scarp edges.
Steep slopes	>1:4 and >1:10	Generally, avoid slopes >1:10
Perennial rivers, large dams, wetland features	Perennial rivers: 250 – 500 m.	Buffers also subject to specialist freshwater assessment.
Minor streams (ecological corridors have visual landscape value)	-	Min. 50m (subject to freshwater Assessment).
Minor roads	250 m	
Provincial / arterial roads	1 km	
Scenic routes and passes	1 to 3 km	
Nature reserves / protected areas	3 to 5 km	(subject to viewshed)
Private nature reserves/ game farms/ guest farms/ resorts (tourism value)	2 to 5 km	(subject to viewshed)
Farmsteads	1 km	
Towns / settlements	2 to 4 km	Subject to Social and Sound Specialist findings / subject to size of turbine
Cultural landscapes / heritage sites	500 m (subject to viewshed).	Subject to Heritage Specialist findings

* Derived from general recommendations from the DEA&DP Visual and Aesthetic Guidelines (Oberholzer B. , 2005)

4.2.2 Renewable Energy Development Zone Status

The study does not fall within a REDZ area.

4.2.3 Local and Regional Planning.

As indicated in the Figure 2 administrative map on the following page, the property falls within the ZF Mgcawu District Municipality. A review of the local and regional planning found that while tourism is supported due to the unique landscape of this arid region, there is also support for renewable energy development due to the benefits from economic growth and employment. The finding for policy fit relevant to landscape and visual impact is Medium to High +VE. Care would need to be taken to ensure that local tourism activities using landscape resources are not impacted by the proposed wind farm landscape change. The following tables list key regional and local planning that has relevance to the project pertaining to landscape-based tourism, and energy projects.

Table 7: Governance administrative table

Theme	Name
REDZ	No
Province	Northern Cape
District Municipality	ZF Mgcawu District Municipality
Local Municipality	Kai !Garib Local Municipality

Table 8: ZF Mgcawu District Municipality Integrated Development Plan (Namakwa District Municipality)

Theme	Requirements	Page
Economic Development	<ul style="list-style-type: none"> Sustainability – the promotion of economic and social development through the sustainable management and utilisation of natural resources and the maintenance of the productive value of the physical environment; Promoting the growth, diversification and transformation of the provincial economy 	26/27
	<ul style="list-style-type: none"> Provincial government must position itself as an enabler of economic growth. Since it cannot bring about increased economic growth and development alone, collaboration with the private sector, the donor community and the relevant national level institutions is essential. 	30
Natural Resources	Identify biodiversity offsets to reach conservation targets for industries Integrate the new CBA map into the municipal Environmental Management Framework and Spatial Development Framework and strengthen enforcement regarding prohibition of development in these areas	204
Energy	Produce sufficient energy to support industry at competitive prices, ensuring access for poor households, while reducing carbon emissions per unit of power by about one-third	16
Tourism	Key components of tourism include the need for a tourist-attraction (e.g. eco-scenery, cultural, heritage), good transport routes, safety and, in many instances, high-quality restaurants and hotels	24

Table 9: Kai !Garib Local Municipality Integrated Development Plan Revised 2021 (Kai !Garib Local Municipality)

Theme	Requirements	Page
Economy	Economic diversification is therefore required, and promising opportunity lies in the field of power generation using the area’s natural resources, renewable energy sources such as sun, wind and water	80
	The Green Economy has much to offer in terms of job creation, infrastructure development and general economic development	109
Renewable Energy	<ul style="list-style-type: none"> • Renewable and Gas Energy Business Incubator • Opportunities: Land available for renewable energy plants 	78/79
Tourism	Tourism Development plan: The development of eco-tourism packages, a Kokerboom tourism route, Game Reserve, Agro-Tourism	66

5 TECHNICAL DESCRIPTION

The Pofadder WEF 1 development is proposed to accommodate the following infrastructure, which will enable the wind farm to supply a contracted capacity of up to 200MW:

- Up to 30 wind turbines with a maximum hub height of up to 200m;
- A transformer at the base of each turbine;
- Concrete turbine foundations and turbine hardstands;
- Temporary laydown areas which will accommodate the boom erection, storage and assembly area;
- Cabling between the turbines, to be laid underground where practical;
- An on-site substation of up to 1.25ha in extent to facilitate the connection between the wind farm and the electricity grid;
- An internal overhead 132kV power line, with a servitude of 32m, to connect the wind farm to the collector substation (to be assessed in a separate Basic Assessment Report);
- Access roads to the site and between project components inclusive of stormwater infrastructure. A 12 m road corridor may be temporary impacted during construction and rehabilitated to 6m wide after construction.
- A total road network of about 50 km.
- A temporary concrete batching plant; and
- Operation and Maintenance buildings including a gate house, security building, control centre, offices, warehouses, a workshop and visitors centre.

In order to evacuate the energy generated by the WEF’s to supplement the national grid, Pofadder Grid (Pty) Ltd is proposing two grid connection alternatives which will be assessed in a separate Integrated Grid BAR.

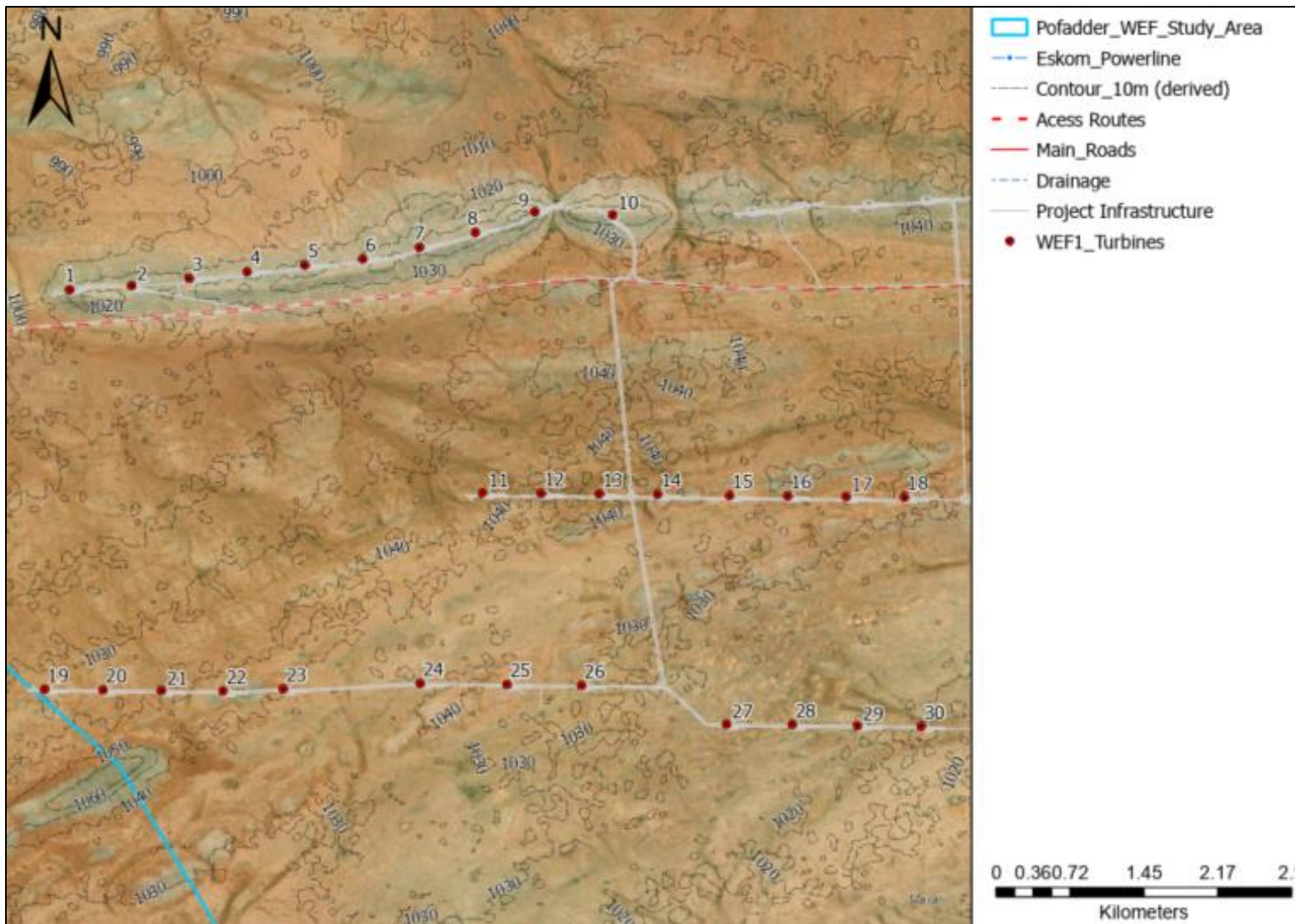


Figure 3. Proposed wind turbine and infrastructure layout for WEF 1.

6 DESCRIPTION OF THE RECEIVING ENVIRONMENT

Landscape character is defined by the U.K. Institute of Environmental Management and Assessment (IEMA) as the 'distinct and recognisable 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, landform, soils, vegetation, land use and human settlement'. It creates the specific sense of place or essential character and 'spirit of the place' (IEMA, 2002). This section of the VIA identified the main landscape features that define the landscape character, as well as the key receptors that make use of the visual resources created by the landscape.

6.1 Site Investigation

A field survey is still to be undertaken to inform the landscape and visual impact assessment. During the site visit, photographs are to be taken from each viewpoint, and the view direction and GPS location captured. The main land use will be documented as well as the nature of the dominant landscape in the vista. To represent views of the proposed landscape modification by means of photomontages for assessment purposes, panoramic photographs will also be taken from key viewpoints. The following information was captured:

Table 10. Site Investigation Information Description Table.

Attribute	Description
ID	Unique ID assigned numerically for inclusion in the ArcGIS Pro GPS platform.
Name	Name of the landscape or visual issues being recorded.
Direction	Direction of the photograph taken of the issue.
Comment	Description of the landscape or visual issues with motivation.
Photograph	Photograph in the recorded direction.
Lat	GPS locality for latitude
Long	GPS locality for longitude

The above information formed the basis for the Site Sensitivity Verification statement that is located in **Appendix A**.

The above data collect during the site survey is located in **Appendix B**.

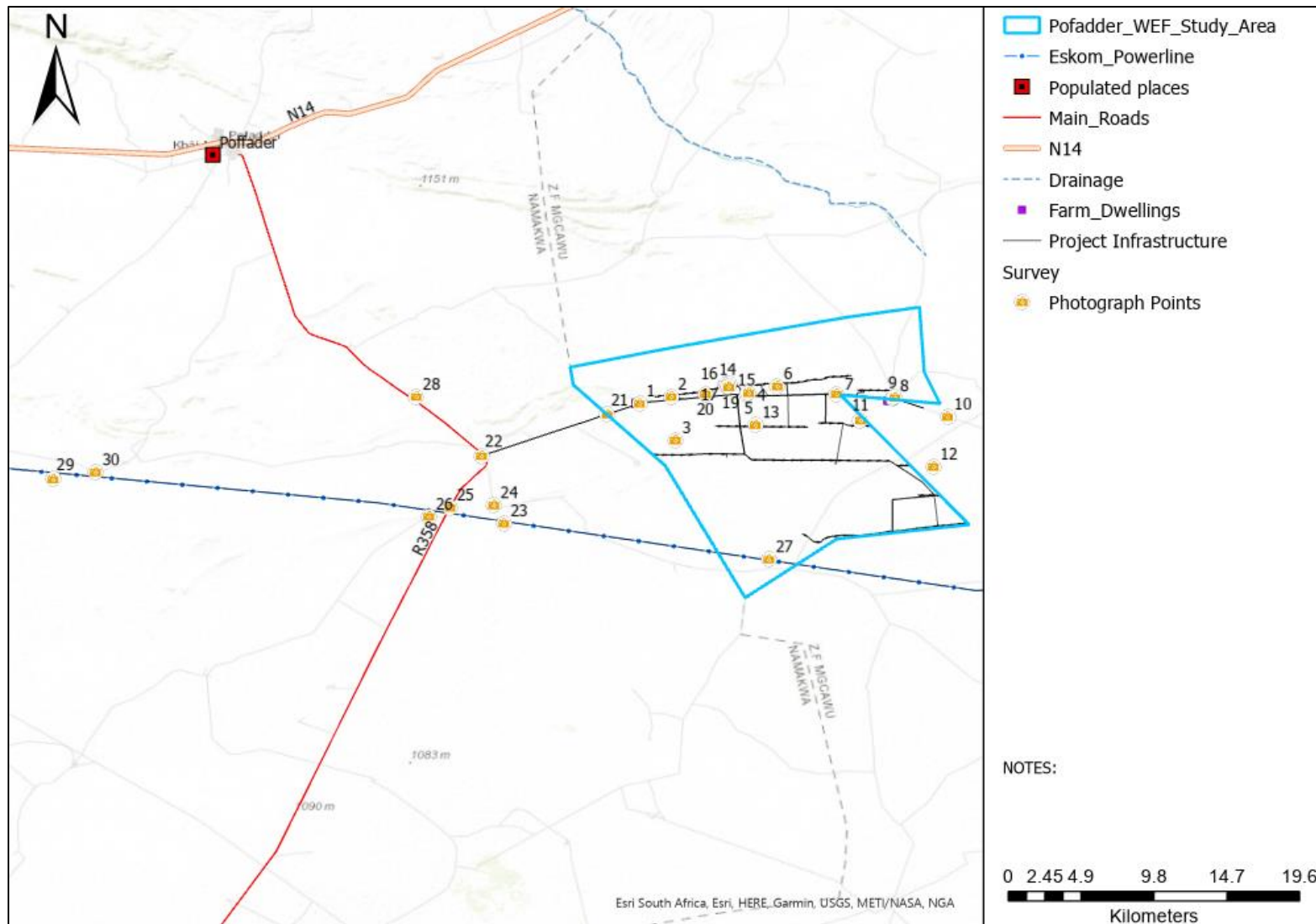


Figure 4. Survey points covered during the field study exercise.

6.2 Landscape Context

6.2.1 Regional Locality

The proposed wind farm is located in the Northern Cape Province, in an arid region climate that lies 50km from the Namibian southern border that is formed by the Orange River. As the area is located within an arid climate zone, it is thus sparsely populated with small agricultural towns sustaining low intensity farming of sheep and goats. The nearest settlement is the small town of Pofadder, located 24km northwest of the site.

6.2.2 Infrastructure and Road Access

The main road located within the region is the N14 National Highway which runs from Upington to Springbok and is located 20km to the north of the site. A minor district road is located 7.2km to the west (R358), as well as a minor farm access road routing through the proposed development area (east to west). These roads are for farming access and are gravel, usually unsuited for tourist related traffic.

In terms of other Renewable Energy projects located within the project ZVI, the figure below depicts the two other wind farm developments which are proposed in the region. Approximately 30km to the west are two Mainstream Wind Farm (Namies and Poortjies), with the Paulputs Wind Farm located 36km to the north. Neither of these wind farm developments will fall within the project ZVI and while authorised, construction has not commenced.

Located in the southern portion of the study area is an Eskom 400kV Arries/Aggeneis power line. Within the 2km distance from the power line, the landscape character is likely to be strongly defined as a power line corridor with a higher VAC level.



Figure 5: Photograph of the N14 National Road northbound just before Aggeneys town.



Figure 6: Photograph of the typical gravel road located to the west of the study area.

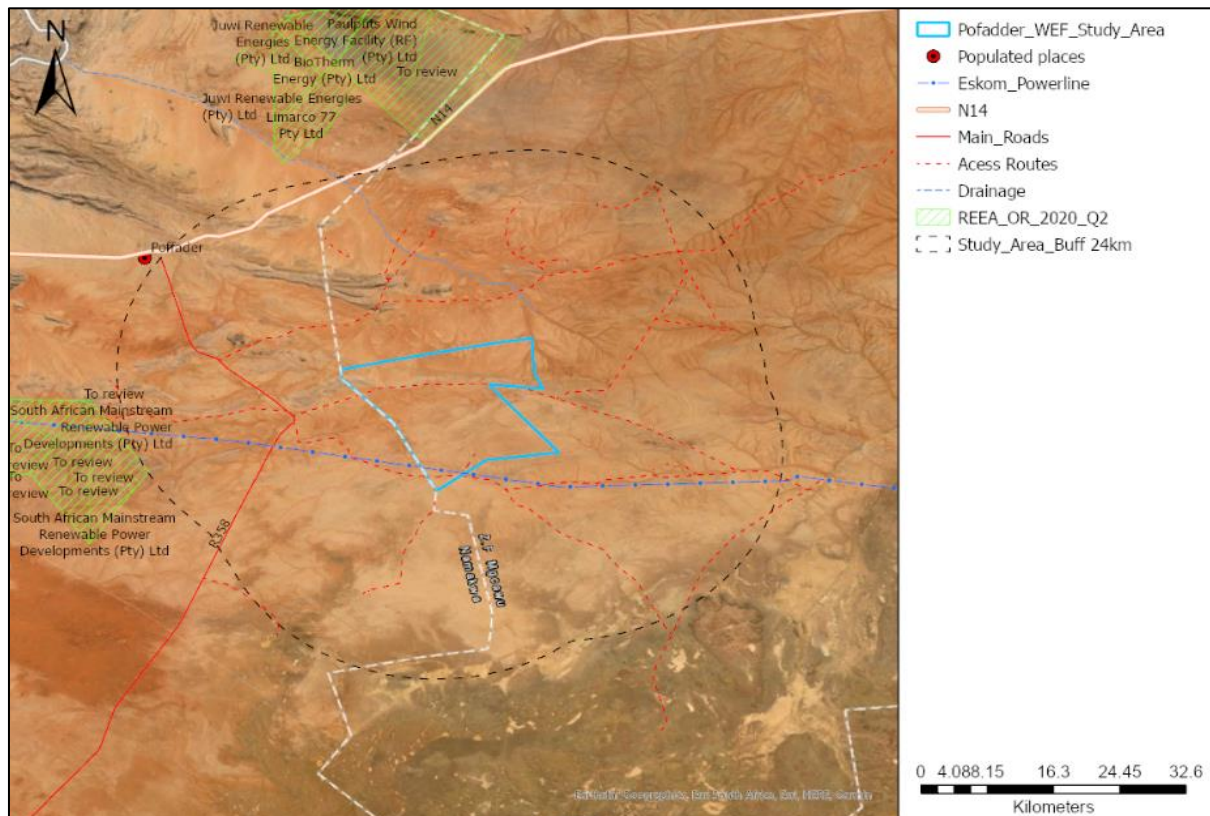


Figure 7. Major infrastructure and DEA renewable energy map.

6.2.3 Landuse

Land use is a crucial factor in determining landscape character, especially regarding the Visual Absorption Capacity (VAC) of the landscapes. Oberholzer defines VAC as the potential of the landscape to conceal the proposed project (Oberholzer, 2005). General land uses of the area are described making use of ArcGIS World Satellite Imagery.

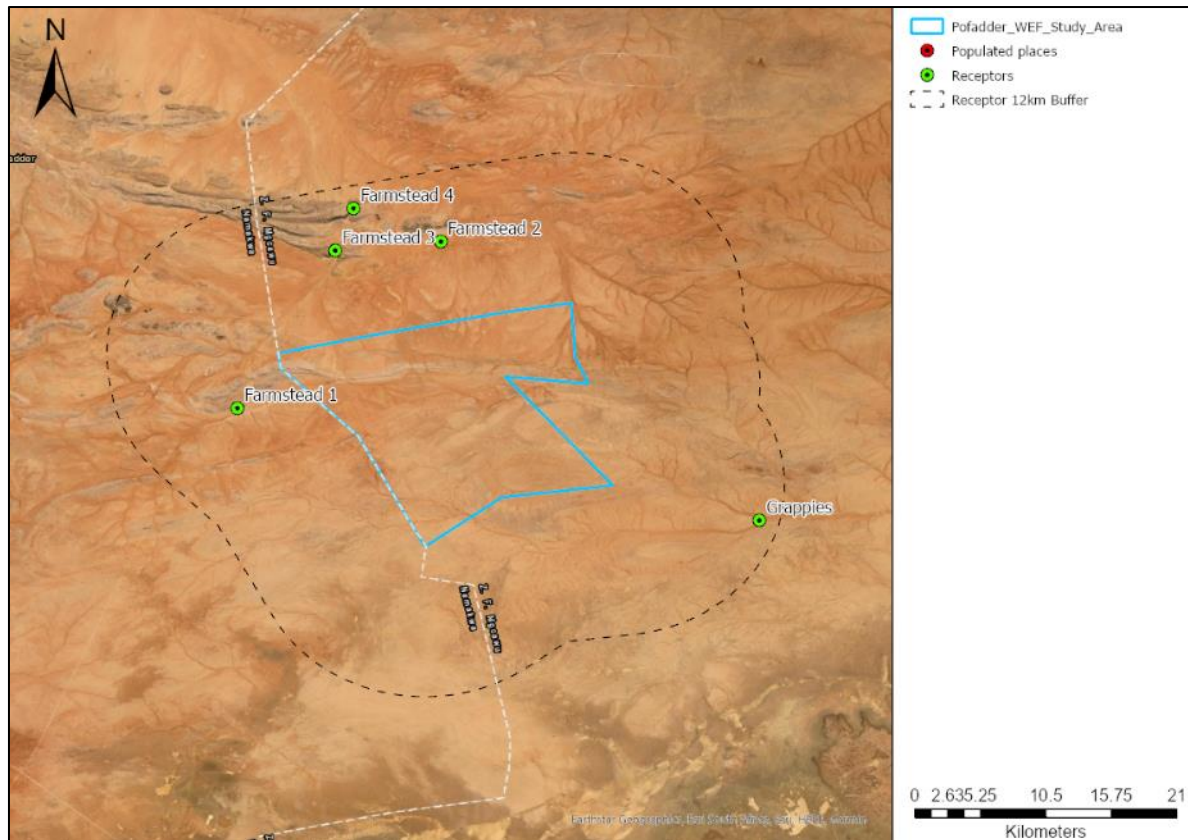


Figure 8. ESRI Open Source satellite imagery underlay to the study area depicting an uniform arid environment within the 12km buffer around the footprint.

The current land use of the proposed properties is an arid agricultural area with sheep and goat farming carried out in this very dry environment. Due to the limited stock carrying capacity, the farms are large in size. Man-made modifications associated with the farming are related to those typical of the low intensity sheep farming but do include some isolated farmsteads. These features are small in scale in the landscape and do not detract from the sense of place.

6.2.4 Conservation

A regional mapping exercise was undertaken to identify conservation protection areas. The desktop survey found that no protected or conservation related activities are located within the project ZVI. Should the Scoping Phase identify eco-tourism related activities associated with conservation projects, these would need to be included in the assessment as Key Observation Points if they are located within the project ZVI.

6.2.5 Vegetation

According to the South African National Biodiversity Institute (SANBI) 2012 Vegetation Map of South Africa, Lesotho and Swaziland (South African National Biodiversity Institute, 2012) the vegetation biome is described as Nama-Karoo.

The Nama-Karoo Biome “occurs on the central plateau of the western half of South Africa, at altitudes between 500 and 2000m, with most of the biome falling between 1000m and 1400m. It is the second-largest biome in the region”. The SANBI Plantzafrica website indicates that the vegetation distribution of this biome is determined primarily by rainfall where “rain falls in summer and varies between 100 and 520mm per year. This also determines the predominant soil type - over 80% of the area is covered by a lime-rich, weakly developed soil over rock. Although less than 5% of rain reaches the

rivers, the high erodibility of soils poses a major problem where overgrazing occurs. The dominant vegetation is a grassy, dwarf shrubland. Grasses tend to be more common in depressions and on sandy soils, and less abundant on clayey soils” (Plantzafrica, n.d.). As indicated in the map below, the two vegetation types characterising this biome are Bushmanland Basin Shrubland and Bushmanland Arid Grassland. The majority of the site is covered by the latter. The other biome that falls within the project area is the Succulent Karoo Biome with the vegetation type described as Bushmanland Inselberg Shrubland. As indicated by the name, this vegetation is found on the rocky outcrops that characterise the northern portions of the study area.

Visual screening from vegetation in both these biomes, is likely to be very limited and would not restrict the proposed project Zone of Visual Influence (ZVI). The use of vegetation as a potential project mitigation screening is limited, as the high temperatures and low rainfall of the area would not be conducive to tree screening growth. The growth of trees would also create contrast, as the trees would look un-characteristic in the Nama-Karoo and Desert cultural landscapes.



Figure 9: Photograph typical of the area taken to the northwest of Aggeneys showing the inselbergs and the Bushmanland Arid Grasslands on the flat plains.

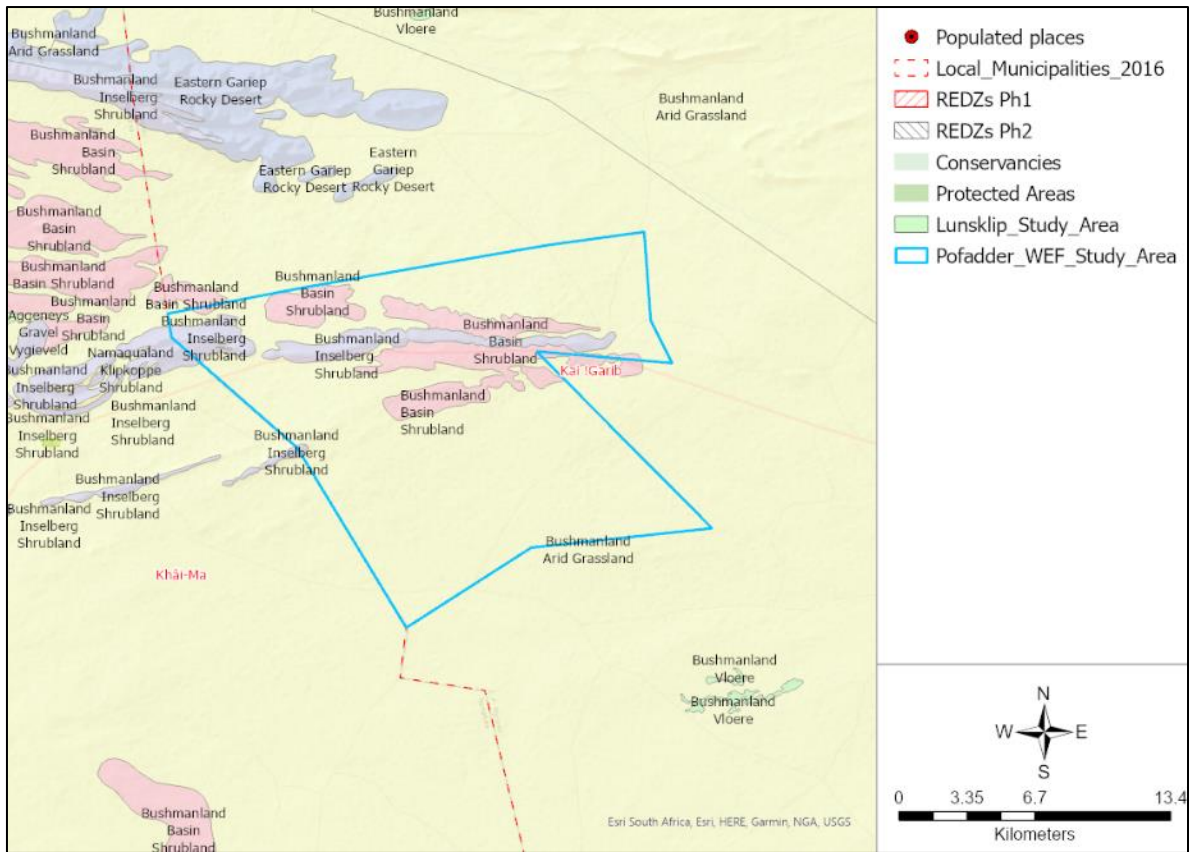
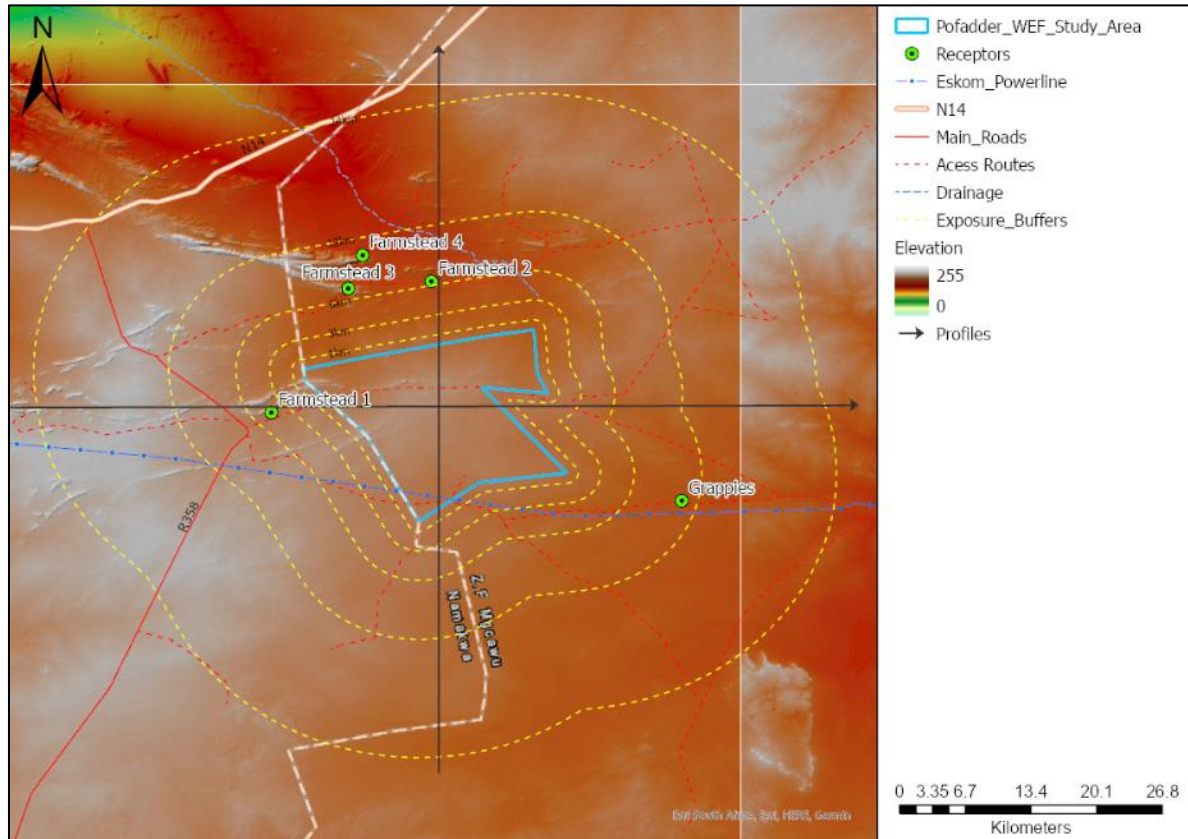


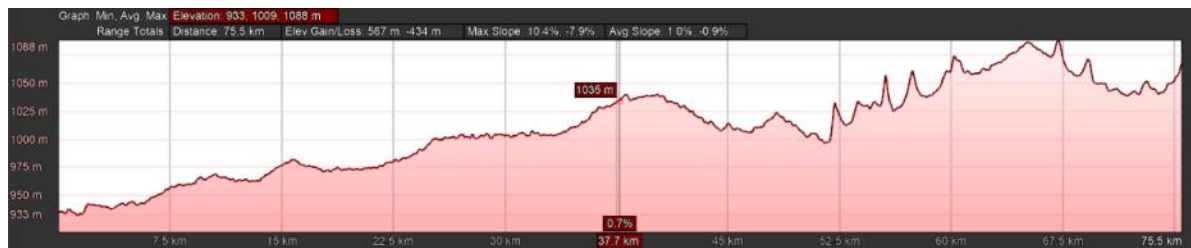
Figure 10: Vegetation Type Map

6.2.6 Regional Topography

Regional and local topography has the potential to strongly influence landscape character, as well as the extent of the Zone of Visual Influence. In order to better understand these aspects of the study, a Digital Elevation Model was generated making use of the NASA STRM digital elevation model.



East to West Profile



North to South Profile



Figure 11. Regional terrain model depicting distance buffers around the study area and the profile line locality generated from Google Earth.

Due to the relatively flat nature of the terrain, the zone of visual influence is likely to be widespread, but with slight undulation creating some visual screening in the background areas. The east to west profile depicts the site as having relative prominence, with low ground of 933m in the east rising to a high of 1058m in the west. Across the 75km length, the total change in elevation is 155m, emphasising the flat nature of the terrain. The north to south profile also reflects a flat terrain, with more undulation to the north. The low drainage point is to the north at 900mamsl, with the project area located on the region high point of 1038m. Due to the flat terrain, topographic screening is likely to be limited given the height of the turbines.

6.2.7 Site Topography

As slopes have a strong influence on landscape character and can also result in large cut and fills from the development of linear features such as roads, and platforms, a slope analysis was undertaken for the study area making use of ArcGIS Open Source terrain data.

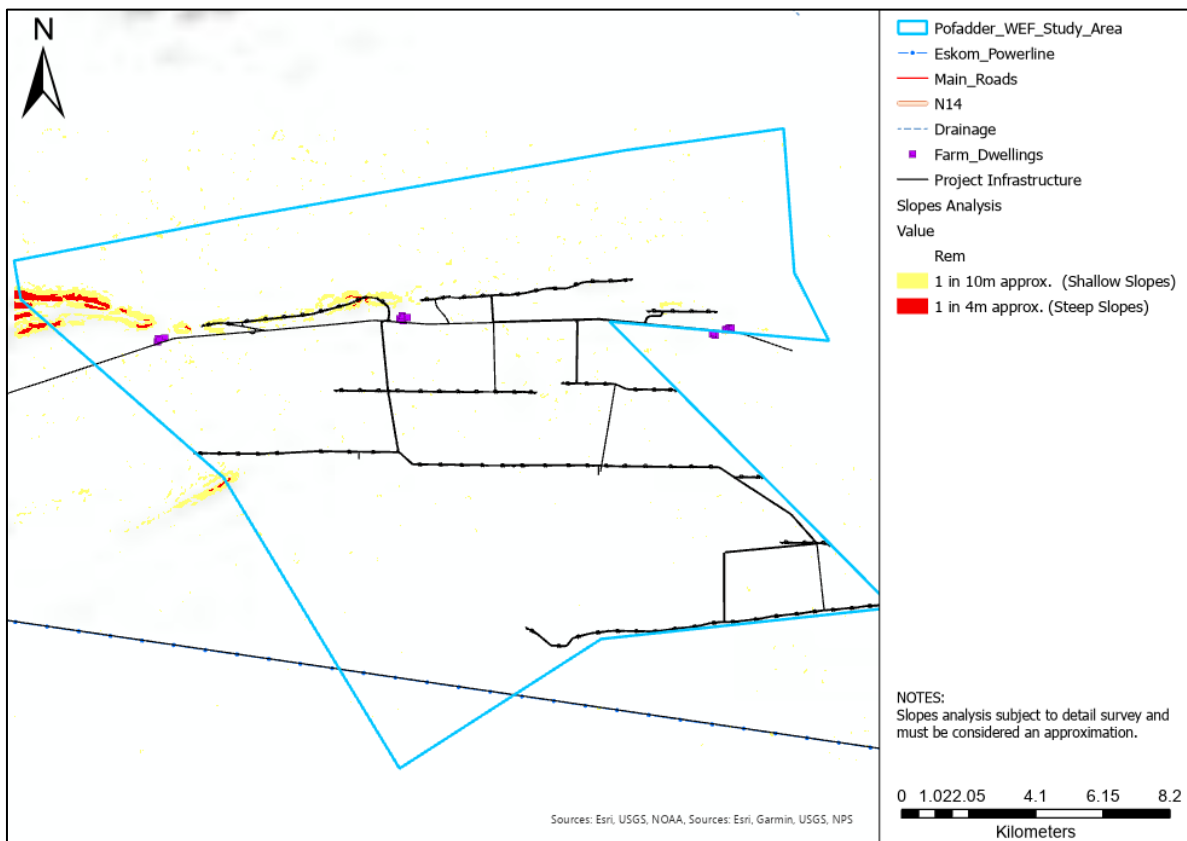


Figure 12. Approximate steeper slopes (1 in 10m) mapping where landscape scarring or erosion could take place that needs to be confirmed with detail design.

Making use of the slopes analysis functioning in ArcGIS Pro, approximate steep slopes were generated for Steep Slopes (1 in 4m), Shallow Slopes (1 in 10m.), and flatter terrain areas remaining. could increase risk of visual scarring. Although not depicted in the mapping above, the low ridgeline does extend across the study area to the west. As this is a landform of interest, the steep and shallow slopes that comprise the low ridgeline should be incorporated as a Physiographic Rating Unit for landscape assessment. It must also be noted that as the shallow ridgeline is approximately 20m in height, it is not a significant landform, but does add to the local scenic quality.

6.3 Project Zone of Visual Influence

The visible extent, or viewshed, is “the outer boundary defining a view catchment area, usually along crests and ridgelines” (Oberholzer B. , 2005). In order to define the extent of the possible influence of the proposed project, a viewshed analysis was undertaken from the proposed site at a specified height above ground level as indicated in the Table 11 below, making use of open-source NASA ASTER Digital Elevation Model data (NASA, 2009). The extent of the viewshed analysis was restricted to a defined distance that represents the approximate zone of visual influence (ZVI) of the proposed activities, which takes the scale, and size of the proposed projects into consideration in relation to the natural visual absorption capacity of the receiving environment. The maps are informative only as visibility tends to diminish exponentially with distance, which is well recognised in visual analysis literature (Hull & Bishop, 1988).

6.3.1 Viewshed Analysis

A viewshed analysis was undertaken for the site making use of NASA SRTM 30m Digital Elevation Model data (NASA, 2009). The offset height reflects the height value representing the project height (worst case scenario) of the respective project component. The Capped Extent refers to the limitation placed on the viewshed taking into consideration the expected distance when the proposed landscape change would not be clearly noticeable.

Table 11: Proposed Project Heights Table

Project Component	Offset Height (m)	Capped extent
Turbines Hub (lights at night)	200m	30km
Blade Top Height (movement)	300m	30km

As can be seen in the approximate viewshed depicted in Figure 13, the extent to the zone of visual influence is likely to be widespread across the region. This is due to the large height of the turbines that are positioned on a local high point in the landscape, surrounded by terrain at a relatively uniform elevation. For these reasons, the viewshed is rated as Regional and Extent High as the landscape will extent across a wide landscape area. The Zone of Visual Influence, however, is likely to be localised in extent with clearer visibility of the wind turbines contained with the 12km distance area. Due to the topography that does include some undulating and hill features, there will be localised pockets where limited views of the turbines will take place. Within the 6km distance zone, the visual impacts are probable with Medium to High Exposure. Outside of this distance zone, visual impacts are possible, but unlikely to be experienced as dominating in the Medium to Low Visual Exposure areas beyond 12km.

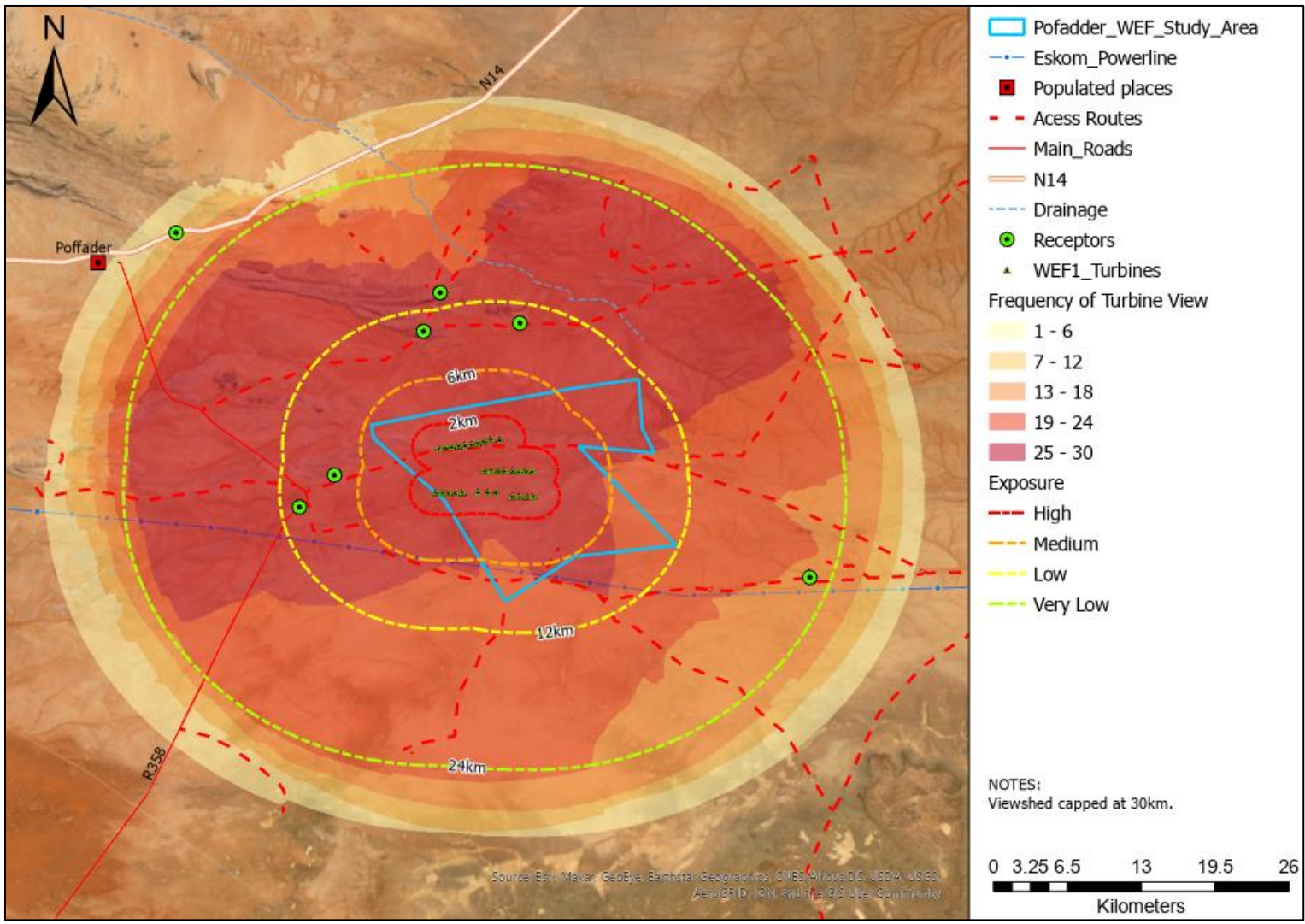


Figure 13. Expected WEF1 project viewshed and exposure generated from 300m height above ground from turbine points.

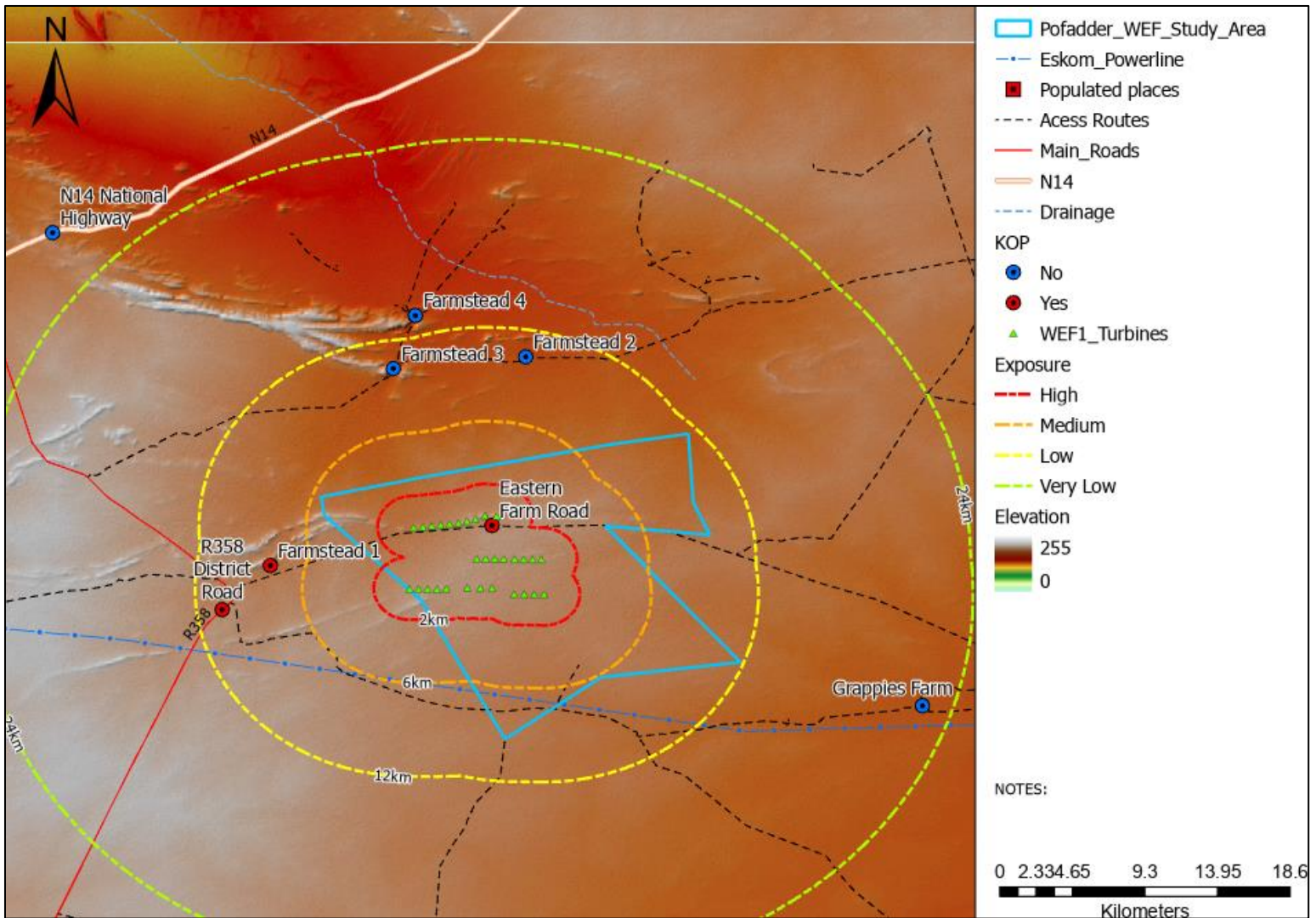


Figure 14: WEF1 preliminary Receptor and KOP locality map.

6.4 Receptors and Key Observation Points

As defined in the methodology, KOPs are defined by the Bureau of Land Management as the people (receptors) located in strategic locations surrounding the property that make consistent use of the views associated with the site where the landscape modifications are proposed. The following table lists the receptors identified within the ZVI and motivates if they have significance and should be defined as KOP for further evaluation in the impact assessment phase. The receptors located within the ZVI and KOPs view lines are mapped on the previous page in Figure 14.

Table 12: Receptor and KOP Motivation Table.

Name	Exposure	Distance	KOP	POINT_X	POINT_Y	Motivation
Farmstead 1	Medium	8.3km	Yes	19.57031	-29.301	Medium Exposure with clear views of the proposed wind farm. Although this dwelling appears un-occupied, it could be used as a dwelling in the future.
Farmstead 2	Medium	10.2km	No	19.71729	-29.1808	Medium Exposure with clear views of the proposed wind farm.
Farmstead 3	Low	10.3km	No	19.64113	-29.1875	Low Exposure.
Farmstead 4	Low	13.3km	No	19.65377	-29.157	Low Exposure.
R358 District Road	Medium	10.5km	Yes	19.54258	-29.3263	Regional access route.
N14 National Highway	Very Low	27.5km	No	19.44507	-29.1094	Important scenic view corridor but with very Low Exposure
Kenhardt Farm Road	High	Less than 1km	Yes	19.84722	-29.2979	High Exposure to road users (very low traffic frequency)
Grappies Farm	Low	22km	No	19.94558	-29.3816	Low Exposure.

6.5 Physiographic Rating Units

The Physiographic Rating Units are the areas within the proposed development area that reflect specific physical and graphic elements that define a particular landscape character. These unique landscapes within the project development areas are rated to assess the scenic quality and receptor sensitivity to landscape change, which is then used to define a Visual Resource Management Class for each of the site's unique landscape/s. The exception is Class I, which is determined based on national and international policy / best practice and landscape significance and as such are not rated for scenic quality and receptor sensitivity to landscape change. The table below lists the Physiographic Rating Units/ unique landscapes that were defined, with motivation in the right column and mapped in in Figure 15 on the following page. Based on the SANBI mapping and the site visit to define key landscape features, the following broad-brush vegetation were tabled.

Table 13: Physiographic Landscape Rating Units.

Landscapes	Motivation
Nama-Karoo with Bushmanland grasslands	Flat terrain with no significant man-made changes to the Nama-Karoo shrubland vegetation.
Farm access road buffer 250m	In terms of meeting best practice as the recommendations derived from the DEA&DP Visual and Aesthetic Guidelines.
Internal dwelling 1km buffer (Cultural settlements)	
Boundary internal 800m buffer	
Low ridgeline with moderate slopes	The low ridgelines to the northwest of the site with medium significance as a landform element that does add to the scenic quality but at a local level.
1 in 4m steep slopes adjacent to the small 'poort' landform not suitable for development	Steep slopes and the small ridgelines they comprise are a key natural feature in the landscape. These areas are also subject to scarring from road and erosion. These areas should be considered as Class I (No-go)
Drainage lines and washes (not assessed)	Drainage lines and significant surface water hydrology areas are protected by law in South Africa. Areas defined as having significance would need to be classified as Class I (No-go). <i>These area are not mapped as are defined by the relevant specialist.</i>
Steep sided rocky outcrops	Located to the northwest of the study area is a ridgeline landform defined by moderate high, steep slopes and some rocky outcropping.

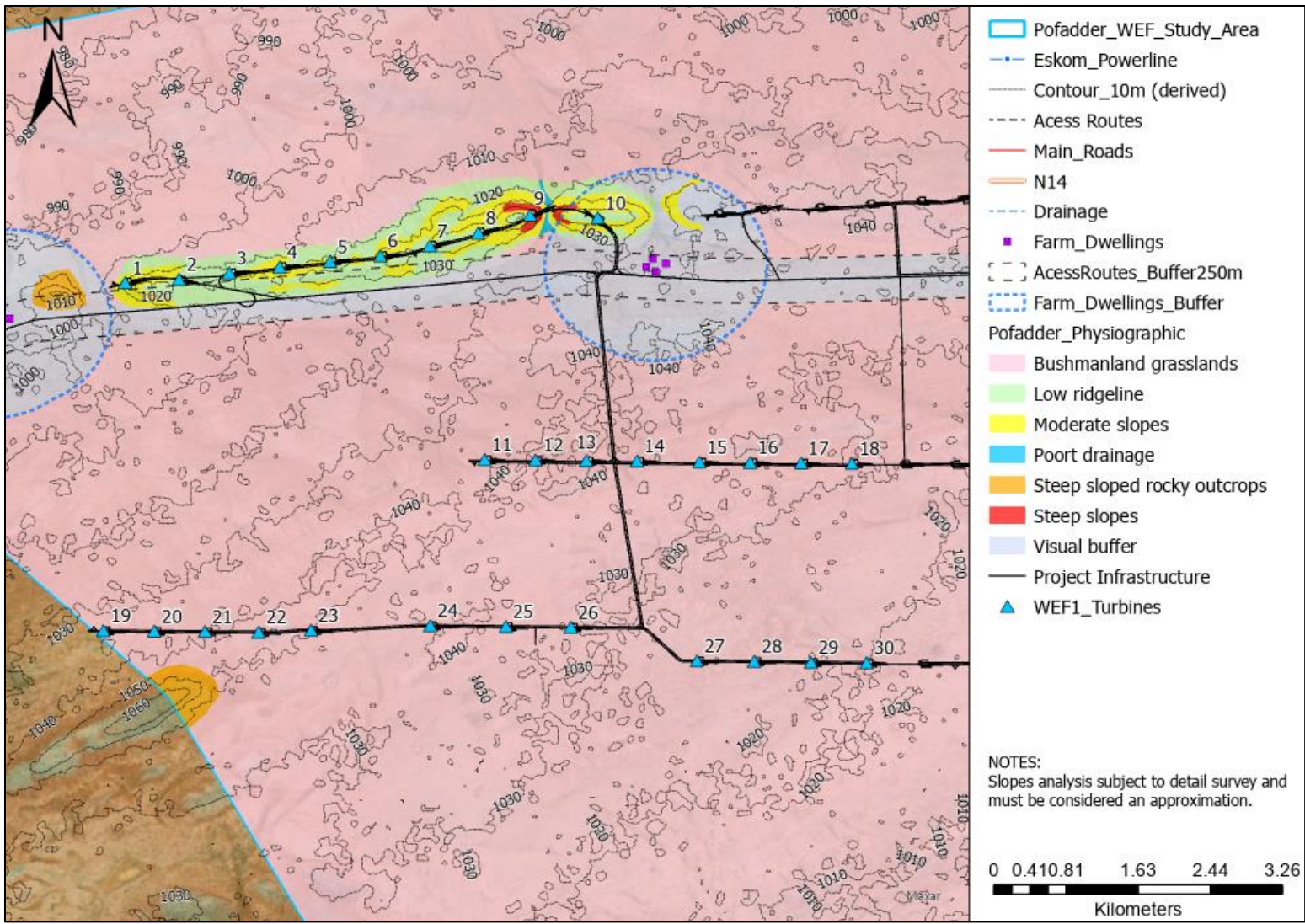


Figure 15: WEF1 Site Satellite Image Map depicting uniform terrain and vegetation.

Table 14: Scenic Quality and Receptor Sensitivity Rating.

Landscape Rating Units	Scenic Quality									Receptor Sensitivity						VRM	
	A= scenic quality rating of ≥19; B = rating of 12 – 18, C= rating of ≤11									H = High; M = Medium; L = Low							
Attribute	Landform	Vegetation	Water	Colour	Scarcity	Adjacent Landscape	Cultural Modifications	Sum	Rating	Type of Users	Amount of Use	Public Interest	Adjacent Land Uses	Special Areas	Rating	Inventory Class	Management Class
Ecologically sensitive areas Hydrologically sensitive areas Heritage sensitive areas Steep sided rocky outcrops 1 in 4 slopes	(Class I is not rated)															I	I
Nama-karoo / Bushmanland grassland	1	2	0	2	1	3	2	11	C	L	L	L	H	L	L	IV	III
Low Ridgeline, Visual Buffer (Cultural Settlements and road buffer) *Property buffer pending I&AP Comments	3	2	0	2	1	3	2	13	B	M	L	L	L	M	M	III	II

Red colour indicates change in rating from Visual Inventory to Visual Resource Management Classes motivated in the following section.

The **Scenic Quality** scores are totalled and assigned an A (High scenic quality), B (Moderate scenic quality) or C (Low scenic quality) category based on the following split: A= scenic quality rating of ≥19; B = rating of 12 – 18, C= rating of ≤11 (USDI., 2004).

Receptor Sensitivity levels are a measure of public concern for scenic quality. Receptor sensitivity to landscape change is determined by rating the key factors relating to the perception of landscape change in terms of Low to High.

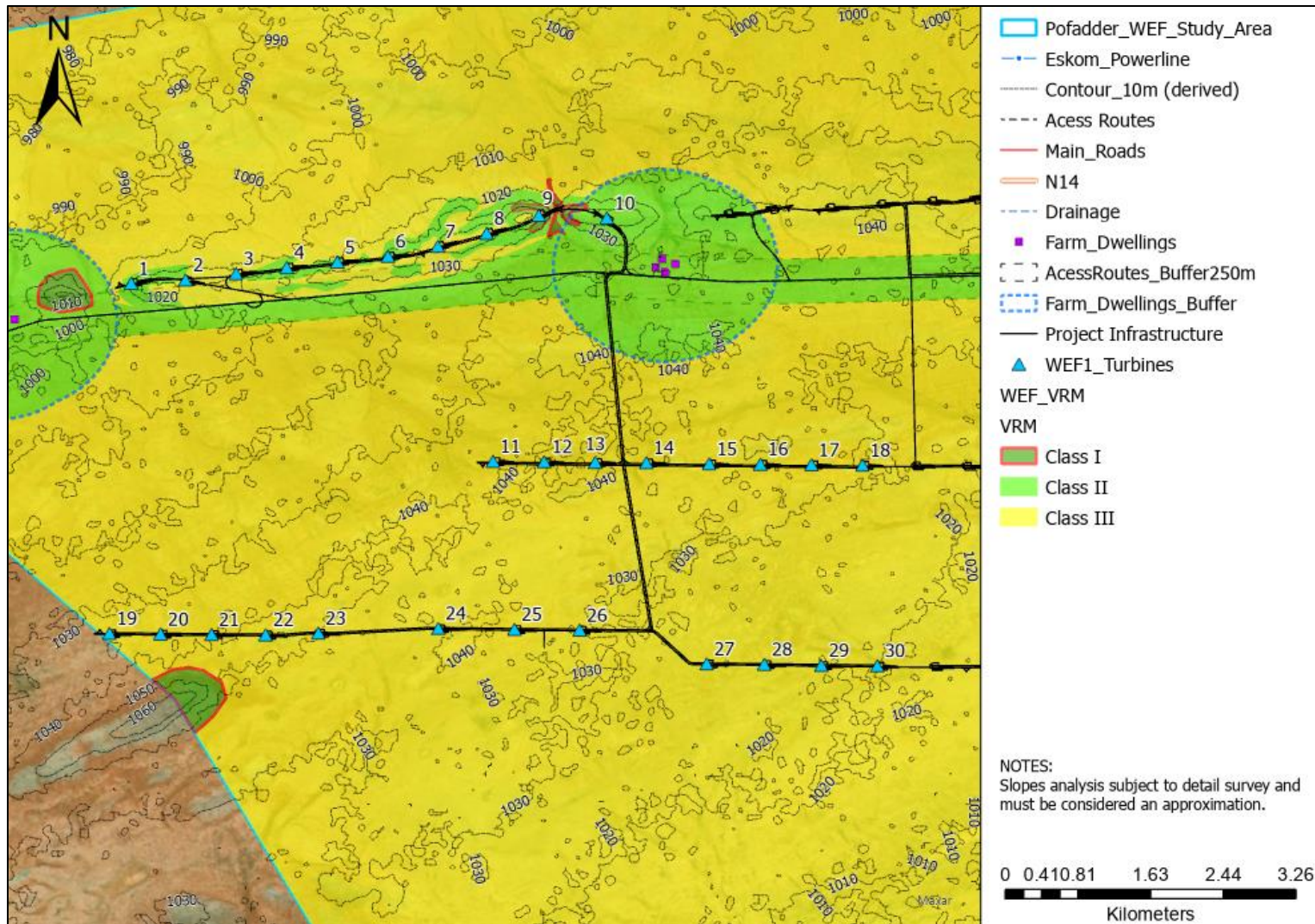


Figure 16: WEF1 VRM Class overlay onto satellite imagery.

6.6 Scenic Quality Assessment

The scenic quality of the portions of the site defined as Bushmanland Arid grassland, which are essentially flat with few landform features, is rated **Low**. This is due to the flat terrain that has no water features, limited vegetation and colour variation and is not a scarce visual resource regionally. The only value element is the Adjacent Scenery which includes the low northern rocky outcrops which do have value and add to the regional landscape character. The overall sense of place is that of a rural, arid agricultural landscape that does not offer much in terms of scenic resources.

The low ridgeline and includes steep slope areas is rated **Medium** as this area is a key landscape element defining the *local* sense of place. This area also includes several shallow washes where drainage from the south has incised an opening through the rock creating a 'poort'. These areas have also been used as location points for farming activities and have a cultural value if they are of a scale that can be clearly noticeable. Only one 'poort' has landform value due to the steep sided nature of the adjacent low ridgeline.

6.7 Receptor Sensitivity Assessment

Receptor sensitivity to landscape changes for the flat Nama-karoo biome areas is rated **Low**. As the area is very remote with few, essentially farming related receptors, it is expected that receptor sensitivity to the landscape change would be Low. The area has limited visual resources and the strong presence of the southern Eskom power line does reduce the sensitivity to landscape change on the site due to the existing higher VAC levels generated by the pylons.

The rocky outcrop and visual buffers are likely to have a higher sensitivity to landscape change and are rated **Medium** due to their scenic value and close proximity to human habitat areas (*Pending I&AP comments*).

6.8 Visual Resource Management (VRM) Classes

The BLM has defined four Classes that represent the relative value of the visual resources of an area and are defined making use of the VRM Matrix below:

- i. **Classes I and II** are the most valued
- ii. **Class III** represent a moderate value
- iii. **Class IV** is of least value

6.8.1 Class I

Class I is assigned when legislation restricts development in certain areas. The visual objective is to preserve the existing character of the landscape, the level of change to the characteristic landscape should be very low and must not attract attention. A Class I visual objective was assigned to the following features within the proposed development area due to their protected status within the South African legislation:

- Any river / streams and associated flood lines buffers identified as significant in terms of the WULA process.
- Any wetlands identified as significant in terms of the WULA process.
- Any ecological areas (or plant species) identified as having a high significance.
- Any heritage area identified as having a high significance.
- 1 in 4 steep slope areas (subject to confirmation during detail design phase).

6.8.2 Class II

Class II visual inventory was assigned to the following features:

- Visual buffer from farmstead.
- Moderate slope areas.

Due to Medium levels of Scenic Quality relating to the arid desert landscapes and interesting arid region vegetation of the rock outcrop, but Lower Receptor Sensitivity, these broad landscapes were rated a Visual Inventory Class III. However, due to the importance of maintain landscape integrity around the low ridgeline, the moderate slope areas were assigned a VRM Class II. The Class II objective is to retain the existing character of the landscape and the level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer, and should repeat the basic elements of form, line, colour and texture found in the predominant natural features of the characteristic landscape.

- While the access road buffer does not depict any intrusion, there are instances where turbines are located within the recommended 1km exclusion buffer from turbines. This is to reduce shadow flicker effects (pending assessment) and maintain some local sense of place around the rural farming clusters.
- As can be seen on the VRM map in Figure 16, Turbine 1 – 10 and associated wide road infrastructure are located on areas identified being near moderate slopes area, possibly within the 1 in 10m. While this does not restrict development as the low ridgeline is of low landform significance, detail design around these moderate slope areas needs to be provided to ensure that large cut and fills are not generated. There is also space for adjustment on top of the ridgeline where turbine placement could be accommodated without placement of 1 in 10m slopes areas.

6.8.3 Class III

Class III visual inventory were assigned to the following landscape:

- Nama-karoo

Due to Medium to Low levels of Scenic Quality relating to the arid desert landscapes, but Low Receptor Sensitivity, these broad landscapes were rated a Visual Inventory Class IV. As the area is remote rural with existing agricultural taking place, the Class IV would be unsuitable as this class is more associated with industrial type landscapes. For this reason, these areas were changed to a Visual Resource Management Class III in order to partially retain the existing character of these rural landscapes, where the level of change to the characteristic landscape should be moderate.

Management activities may attract attention but should not dominate the view of the casual observer, and changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. As turbines have the potential to add value to arid landscape in remote location, the Class III areas are likely to be acceptable within the grassland areas.

6.8.4 Class IV

Due to the visual significance of the remote, rural landscape, no Class IV visual inventory areas were identified in order to protect the existing agricultural landscape.

7 SPECIALIST FINDINGS / IDENTIFICATION AND ASSESSMENT OF IMPACTS

The identification and assessment of impacts must be described in this section. Direct and indirect impacts for the various project phases must be assessed and rated according to the methodology developed by SiVEST. Project stages, as follows:

- Planning or pre-construction.
- Construction.
- Operation; and
- Decommissioning.

In terms of the VRM methodology, landscape character is derived from a combination of scenic quality, receptor sensitivity to landscape change, and distance of the proposed landscape modification from key receptor points. Making use of the key landscape elements defined in the landscape contextualisation sections above, landscape units are defined which are then rated to derive their intrinsic scenic value, as well as how sensitive people living in the area would be to changes taking place in these landscapes. Within the impact assessment, the following visual and landscape issues would need to be taken into consideration.

7.1 The Nature of the Visual & Landscape Impact

The nature of the landscape change relates to the following key visual and landscape issues:

- Potential scarring in the landscape caused by earthworks for access roads and assembly platforms, particularly on steeper slopes.
- Dust and noise during construction from heavy machinery and truck traffic.
- Potential visual effect of wind turbines on the rural landscape and on surrounding farmsteads.
- Potential shadow flicker caused by wind turbines to nearby receptors (early morning and late afternoon). (**Note: Shadow Flicker Impacts are not assessed in this document**)
- Potential visual clutter of on-site substation/s, operations and maintenance structures (O&M structures) and connecting powerlines.
- Potential visual intrusion caused by navigation lighting from turbines and security lighting at substations and O&M structures at night.

7.2 Possible Mitigations

While the specific detail of the mitigation are related to the impacts defined on the final layout, the following mitigations are likely to be required (but are not limited to):

Pre-Construction Phase

- Aircraft Warning Lights (AWL) at night have the potential to significantly extend the project Zone of Visual Influence into the surrounding rural 'dark sky' sense of place. Light spillage reduction should be planned at the Pre-Construction design phase to assess the feasibility of the mitigation's options. While the remote nature of the locality would not require the use of radar technology, two mitigations options are proposed. The first option is to only place AWL on strategic outside points, thus reducing the number of lights to a strategic minimum. The second option that is sometimes used, is the utilisation of shields placed below the AWL to restrict light spillage to the ground users, while still allowing the necessary aircraft warning.
- No large signage or advertising should be located on the wind turbines.
- Location of the main layout down for the project away from scenic resources / farmstead localities.
- To reduce visual contrast, the turbines blade tips should not be painted red.

Construction Phase

- Topsoil excavated from the site should be stockpiled and utilised for rehabilitation of the site after construction.
- Windblown dust during construction should be monitored by the Environmental Officer (EO). Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the EO.
- Signage on the main access road should be moderated and natural colours used in the signage as much as possible while still providing the necessary information regarding the project.
- Any plant rescue identified measures identified by the botanical Specialist need to be implemented.
- Topsoil from the building footprints should be stockpiled and utilised for rehabilitation of the laydown site (or the area around the buildings).
- The buildings should be painted a grey-brown colour to assist in reducing colour contrast.
- Fencing (if required) should be simple and appear transparent from a distance. The fences should be checked monthly for the collection of litter caught on the fence.
- Soil erosion measures need to be adequately implemented and routinely monitored by the EO.

Operation Phase

- Soil erosion measures need to be adequately monitored by the EO (monthly).
- Light spillage measures designed during pre-construction phase should be implemented and monitored by the EO to ensure that light spillage does not create a glowing effect.

Closure Phase

- All structural components not required for agricultural purposes post-closure should be removed and where possible, recycled or reused.
- Building structures not required should be broken down (including foundations).
- The rubble should be managed according to the National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA) and deposited at a registered landfill if it cannot be recycled or reused.
- All compacted areas should be ripped and then rehabilitated according to a rehabilitation specialist.
- Monitoring for soil erosion should be undertaken on a bi-annual basis for a year following the completion of closure phase.

7.3 Preliminary Findings

The following issues were raised in the scoping assessment for further review in the EIA process.

Table 15: Development Constraints Table.

Landscape Element	Mitigation	Motivation
Aircraft Warning Lights.	Strategic and Cupped Aircraft Warning Lights.	Aircraft lights at night have the potential to significantly impact the night-time sense of place. If possible, aircraft warning lights should be limited to outside extent of the wind farm and placed in shielding cups that restrict light spillage to the adjacent rural areas.
Internal power lines	Underground placement.	Internal MV power lines connecting the turbines need to be placed underground where possible to reduce clutter to the rural landscape.
Cultural farmsteads	Shadow Flicker Impacts (SFI)	To ensure that Shadow Flicker Impacts (SFI) do not take place, a SFI needs to be undertaken for any turbines located within 1km from the inhabited settlements.

Landscape degradation	Road infrastructure on steeper ground	As mapped in Figure 17, clarity is required on how the cut/fills of the road crossing of the 'poort' from the east and west low ridgeline, providing information on how the excavated fill will be utilised.
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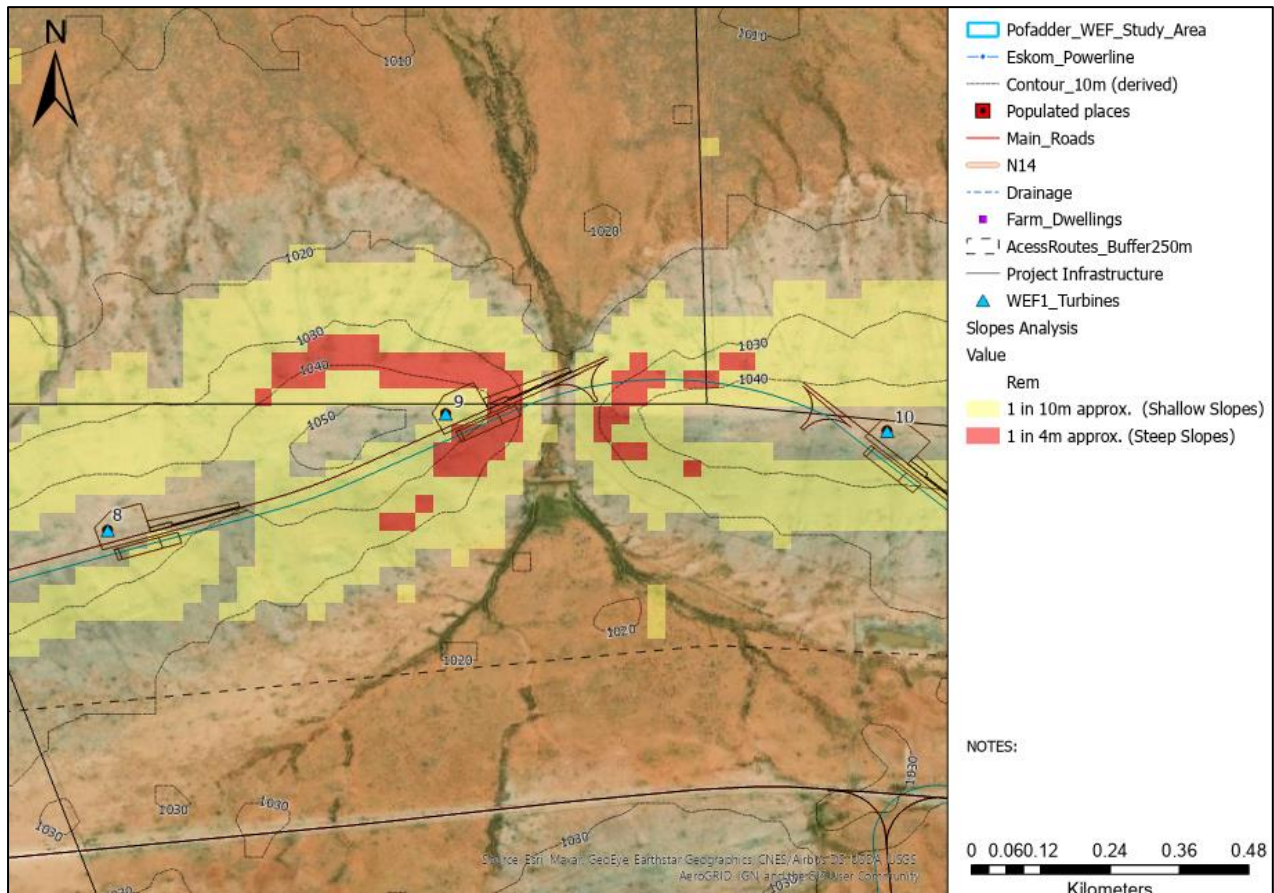


Figure 17. Map highlighting the small 'poort' crossing over steep slopes from east and western high ground.

7.4 Cumulative Impacts

In the impacts assessment phase, cumulative impact assessments must be undertaken for the proposed development to determine the cumulative impact that will materialise should other Renewable Energy Facilities (REFs) and large-scale industrial developments be constructed within 35km of the proposed development.

The cumulative impact assessment would need to contain the following:

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

8 SCOPING PHASE CONCLUSION

The above visual and landscape findings are subject to further detail provided in the EIA by various specialist studies, namely the Botanical and Social. As such the findings could be amended to accommodate more informed studies of these specialist fields.

To ensure that Visual Resource Management Objectives are met, a full Level 4 VIA is required. This assessment must incorporate photomontages to inform the adjacent landowners of the nature of the landscape change and make an informed decision on the suitability of the landscape change such that surrounding eco-tourism activities that align with the significant biodiversity of the area, can be effectively accommodated. Further information requirements have been listed in the table below.

Table 16: Further information requirements Table.

Landscape Element	Motivation
Botanical Study	Any areas defined as botanically significant would need to be incorporated into the VRM Class I layer (No-go).
Hydrological study	Any areas defined as hydrologically significant would need to be incorporated into the VRM Class I layer (No-go).
Heritage study	Any areas defined as having heritage significant would need to be incorporated into the VRM Class I layer (No-go).
Engineering drawings	<ul style="list-style-type: none"> • Drawings depicting how the steeper slope areas will not be impacted. • Engineering drawings depicting cut and fill areas around the small 'poort' areas and turbine stabilisation/ cut & fills on moderate slopes on the north face of the low ridge.
Shadow flicker	Labourer cottages were identified within 1km of the turbine placement location. Care would need to be undertaken to ensure that these residents are not impacted as per international best practice limitation on impacts.

The rural setting and arid environment settlement pattern of this predominantly natural landscape has aesthetic value and care should be taken to ensure that the proposed wind farm adds to the value of this cultural landscape, without resulting in landscape modifications that are visually intrusive. Wind farms have the potential to complement a rural settlement landscapes and all efforts should be set in place to ensure that this does take place. As no significant visual resources were identified within the proposed wind farm ZVI, and visual receptors are suitably set back with lower Visual Exposure, no fatal flaws were identified in the scoping phase. To ensure that the natural landscape heritage is not degraded, a full Landscape and Visual Impact Assessment is recommended.

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10 APPENDIX A: SITE SENSITIVITY VERIFICATION

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

In terms of the Assessment Protocols published in GN 320 on 20 March 2020, a Site sensitivity verification is required where a specialist assessment is required to verify, with motivation, the relevant themes contained within the DEFF Screening Tool.

10.1 Introduction

In accordance with Appendix 6 of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2014, a site sensitivity verification has been undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool). The mapping from the screening is provided for Shadow Flicker in Figure 18, and Landscape in Figure 19 below.

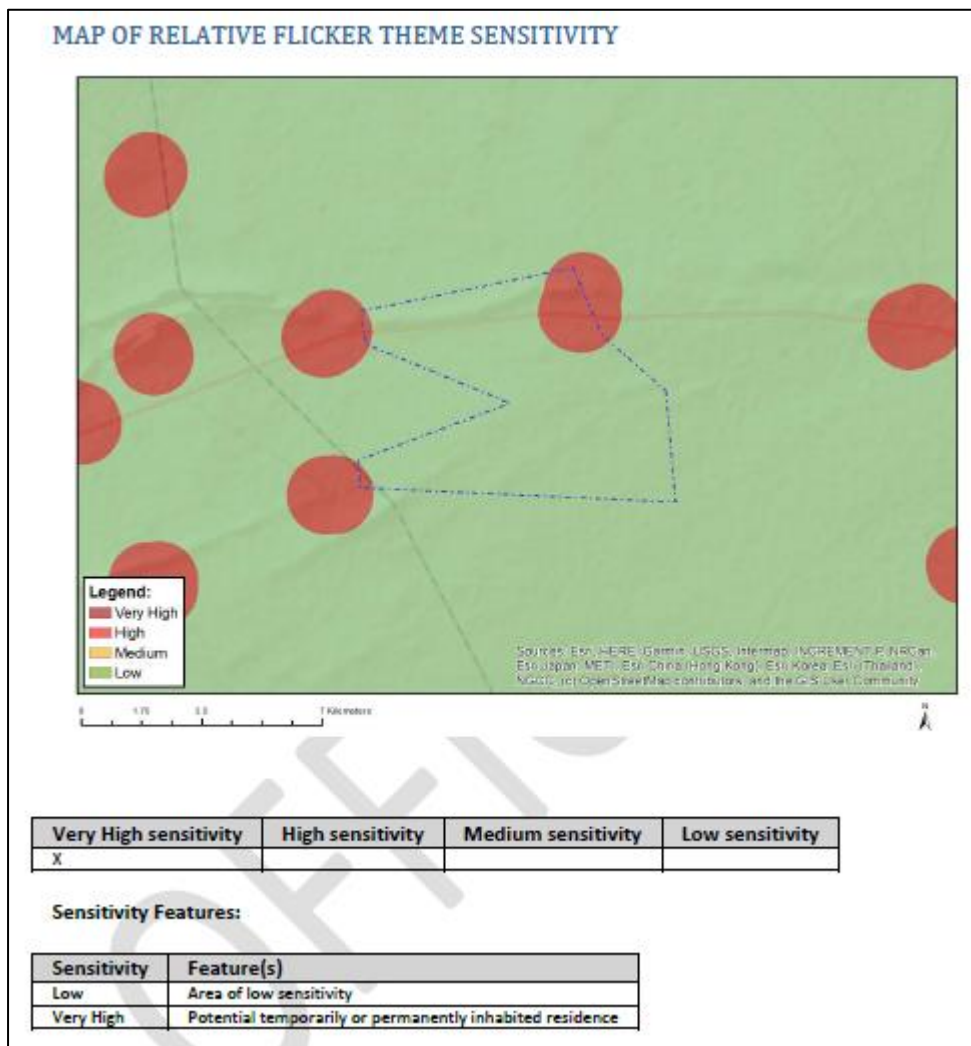


Figure 18. DEA Screening Map of relative flicker theme sensitivity.

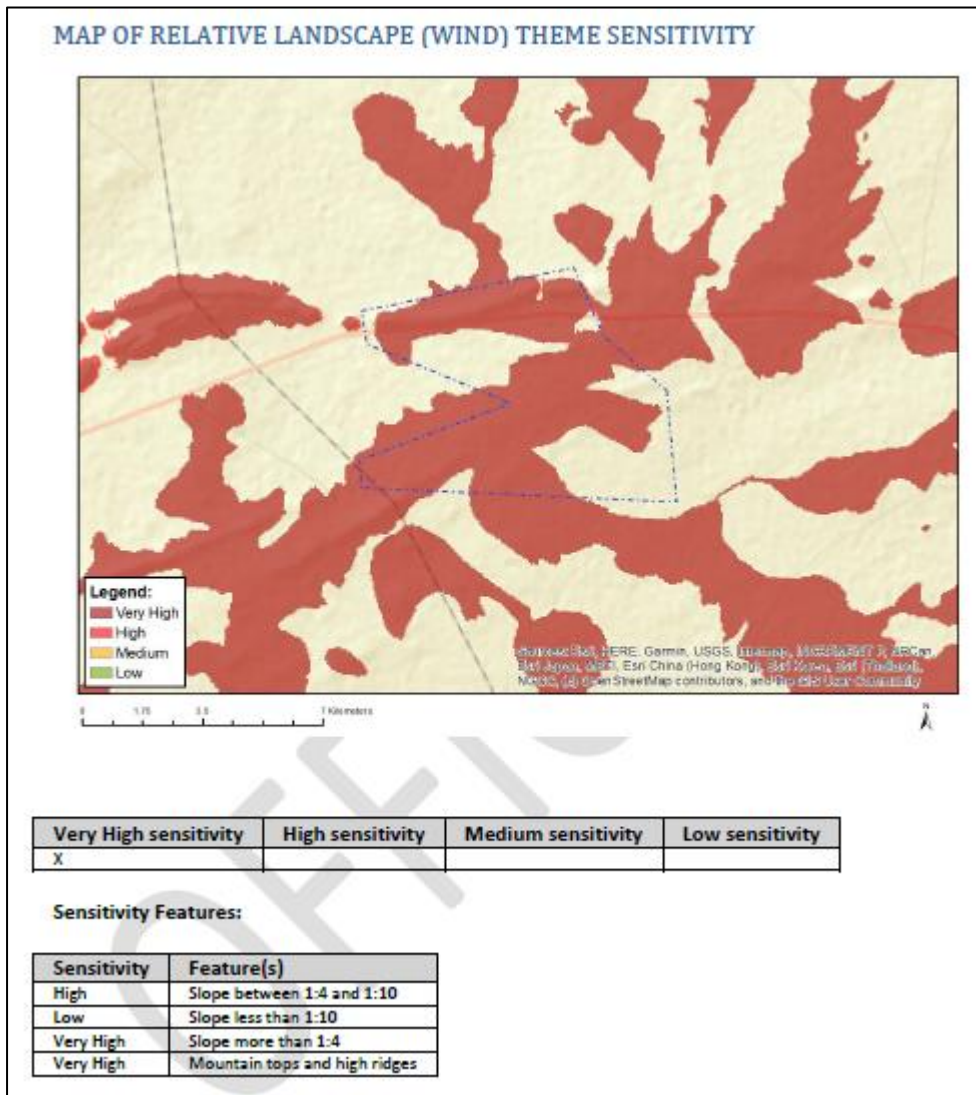


Figure 19. DEA Screening Tool map of relative landscape (wind) theme sensitivity.

10.2 Site sensitivity verification

A detailed desktop study was undertaken to determine the nature of the receiving landscape. The desktop study entailed the following:

- Setting up of a GIS platform making use of ArcGIS Pro.
- Using satellite imagery and Open-Source vector data to understanding the land uses.
- Using ASTER terrain model data to generate a Digital Elevation Model from which the following was generated.
 - Viewshed analysis.
 - Slopes analysis.
- Using satellite imagery to identify receptors located within the Zone of Visual Influence, analysing the receptors against criteria for their use as Key Observation Points

(photomontage viewpoints) from which the suitability of the landscape change would be assessed.

- Mapping of the landscape into Visual Resource Management Classes, taking planning into consideration, to inform the base layer from which the suitability of receiving landscape caring capacity could be evaluated (pending site survey verification).
- Making recommendations to reduce visual intrusion and landscape degradation at Scoping Phase.

10.3 Outcome of site sensitivity verification

Preliminary findings of the scoping report include (amongst others):

- Medium levels of scenic quality from natural landscape setting.
- Remote locality with limited receptors but with potential for on-site receptors including farm worker dwellings to be located within 1km distance from wind turbines with possible flicker impacts due to the large size of the turbines.
- No significant landscape resources located within the project Zone of Visual Influence.
- Some steep and moderate slope areas related to a low ridgeline to the northwest of the property. While not a significant landscape feature, the low ridgeline (approximate 20m in height) does add to the local scenic quality. While suitable for development, there are steeper slope areas around the small 'poort'. These slopes have been identified and require verification in the detail design phase. The 1 in 4m slopes should be avoided, with detail design on the cut/fills (if any) requested for turbine and road footprint in the possible 1 in 10m slopes areas.
- In principle support for the study area for wind farming with large sized turbines.

10.4 National environmental screening tool

As depicted in the Shadow Flicker impact table, Very High sensitivity areas are identified where farm settlements are located. These potential settlement areas have been included in the assessment, and will be verified in the site survey, for inclusion in the Impact Assessment Phase if found to be temporarily or permanently inhabited.

As depicted in the Landscape (Wind) Theme impact table, High sensitivity is flagged for slopes between 1:4 and 1:10. The desktop analysis included a slopes analysis confirming the 1 in 10 steep slopes areas. Recommendations have been made in the scoping phase to review development proposed on steep slope areas.

10.5 Conclusion

To ensure that Visual Resource Management Objectives are met, a full Level 4 VIA is required. This assessment must incorporate photomontages to inform the adjacent landowners of the nature of the landscape change and make an informed decision on the suitability of the landscape change such that surrounding eco-tourism activities that align with the significant biodiversity of the area, can be effectively accommodated. Further information requirements have been listed in

11 APPENDIX B: SITE SURVEY PHOTOGRAPHIC RECORDS

ID	1
NAME	Old farmstead
DIRECTION	Northwest
COMMENTS	Photograph depicting old farmstead now abandoned.



ID	2
NAME	Turbine 2 location
DIRECTION	West
COMMENTS	Photograph of the shallow ridgeline on which the proposed development would be located. The ridgeline is low and no receptors visible so unlikely to generate an visual intrusion, but landscape has value and steep slope development should be avoided.



ID	3
NAME	WEF 1 south
DIRECTION	South
COMMENTS	Photo depicting the open and flat plains where turbines 19 to 26 would be placed. No significant visual or landscape risk.



ID	4
NAME	Farmstead 1
DIRECTION	West
COMMENTS	Project property dwelling.



ID	5
NAME	Labourers' cottage
DIRECTION	Northast
COMMENTS	Farm labourer cottage that could be subject to flicker impact as located within 1km from turbine site.



ID	6
NAME	WEF 2 turbines
DIRECTION	North
COMMENTS	View north towards the shallow highpoint beacon where WEF2 turbines are proposed. No landscape or visual risk.



ID	7
NAME	District road
DIRECTION	East
COMMENTS	Photo depicting the gravel road to Kenhardt that has wide open vistas that add to the Northern Cape sense of place. This locality should be used as a receptor.



ID	8
NAME	Farmstead 2
DIRECTION	Northwest from road
COMMENTS	Farmstead of property owner.



ID	9
NAME	Labourers cottage
DIRECTION	North
COMMENTS	Possibly used labourer dwelling that could be susceptible to shadow flicker impacts.



ID	10
NAME	Kenhardt Road receptor
DIRECTION	West
COMMENTS	View towards southern turbines as seen from the farm road.



ID	11/12
NAME	WEF 3 turbines
DIRECTION	South
COMMENTS	View south towards WEF2 turbines located on open grass covered plain with little landscape visual issues raised.



ID	13
NAME	WEF 2 turbines
DIRECTION	South
COMMENTS	Suitable placement on flat terrain with low landscape significance.





ID	14
NAME	Site steep slopes small poort
DIRECTION	North
COMMENTS	Steep slopes on either side of a river poort not suitable for development on the steep sides.



ID	15
NAME	Steep slopes
DIRECTION	West
COMMENTS	Steep slopes that form a locally aesthetic poort where road access is proposed. Not suitable for development. Relocate to less steep slopes.



ID	16
NAME	Turbine location
DIRECTION	West
COMMENTS	Turbine suitably located on top of low ridgeline.
	

ID	17
NAME	Laydown
DIRECTION	Northeast
COMMENTS	Laydown extending over steep slopes creating landscape degradation to poort. Relocation of laydown to suitable flat terrain west of turbine required.
	

ID	18
NAME	Road through small poort
DIRECTION	West
COMMENTS	Road design indicating routing through steep slopes. Cut fill areas need to be shown for impact phase.



ID	19
NAME	Small dam
DIRECTION	West
COMMENTS	Small dam.



ID	20
NAME	Low ridgeline
DIRECTION	Northwest
COMMENTS	Care needs to be made regarding management of erosion from slight cuttings into slightly steeper gradient areas to the north of the slope (pending detail design).



ID	21
NAME	Kenhardt gravel road receptor eastbound
DIRECTION	East
COMMENTS	View from gravel road with low ridgelines centre and slightly undulating grasslands to the right.



ID	22
NAME	Farmstead receptor
DIRECTION	East
COMMENTS	Farmstead located outside of foreground middle ground exposure areas. Not a KOP.



ID	23
NAME	Existing power lines
DIRECTION	South
COMMENTS	Existing 400kv powerline context increases local VAC levels as seen from local gravel road.



ID	24
NAME	Abandoned dwelling
DIRECTION	West
COMMENTS	Not receptors



ID	25
NAME	Gravel Road Transmission line receptor
DIRECTION	Southwest
COMMENTS	View southwest from gravel road of proposed Transmission line crossing aligned with existing Eskom 400kv powerline. Higher VAC levels increase suitability of the proposed routing.



ID	26
NAME	Transmission line receptor
DIRECTION	West
COMMENTS	Photo depicting farmstead receptor located in High exposure area to proposed grid connect. However, the existing power line precedent reduces visual intrusion potential. The #dweinga are also facing east and not directly facing the proposed grid connection. Pofadder WEF x 3_20220302_134535156.jpg



ID	27
NAME	Eskom 400kv powerline
DIRECTION	West
COMMENTS	Existing powerline corridor line context.



ID	28
NAME	Farmstead distant receptor
DIRECTION	East
COMMENTS	Distance view receptor for displaying long distance views of the proposed wind farm.



ID	29
NAME	Proposed substation
DIRECTION	Southeast
COMMENTS	Substation proposed to be developed adjacent to the 400kv line



ID	30
NAME	Farmstead receptor transmission line
DIRECTION	Southwest
COMMENTS	View of the contained farmstead with limited view south towards the proposed powerline visible in the background.



12 APPENDIX C: SIVEST EIA METHODOLOGY

The following methodology will be utilised in the impact assessment phase.



1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) METHODOLOGY

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

1.1 Determination of Significance of Impacts

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

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

1.2 Impact Rating System

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

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

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

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

1.2.1 Rating System Used to Classify Impacts

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

Table 1: Rating of impacts criteria



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

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



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

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

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



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



Table 2: Rating of impacts template and example

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
Vegetation and protected plant species	Vegetation clearing for access roads, turbines and their service areas and other infrastructure will impact on vegetation and protected plant species.	2	4	2	2	3	3	38	-	Medium	Outline/explain the mitigation measures to be undertaken to ameliorate the impacts that are likely to arise from the proposed activity. These measures will be detailed in the EMP.	2	4	2	1	3	2	24	-	Low



Cumulative																				
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	RECOMMENDED MITIGATION MEASURES	E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Broad-scale ecological processes	Transformation and presence of the facility will contribute to cumulative habitat loss and impacts on broad-scale ecological processes such as fragmentation.	2	4	2	2	3	2	26	-	Medium	Outline/explain the mitigation measures to be undertaken to ameliorate the impacts that are likely to arise from the proposed activity. These measures will be detailed in the EMP.	2	3	2	1	3	2	22	-	Low

13 APPENDIX D: SPECIALIST INFORMATION

13.1 Professional Registration Certificate



Association of Professional Heritage Practitioners

MEMBERSHIP CERTIFICATE

THIS CERTIFIES THAT

STEPHEN STEAD
MEMBERSHIP NUMBER: 0063

has been accredited as a
PROFESSIONAL HERITAGE PRACTITIONER (PHP)

This membership is subject to the *Standards for Accreditation and Code of Conduct*, referred to in Sections 2 and 3 of the APHP Constitution respectively. The definition of a PHP may be found at: www.aphp.org.za/membership

Please contact us via info@aphp.org.za should further information be required.

THIS CERTIFICATE IS VALID FROM 1 JUNE 2020 – 1 JULY 2021

CHAIRPERSON

[Issued by the Association of Professional Heritage Practitioners Executive Committee]
Image Source: *Drawing of corbelled huts*, James Walton Collection, Stellenbosch University.
<https://digital.lib.sun.ac.za/handle/10019.2/490>

Association of Professional Heritage Practitioners
info@aphp.org.za
www.aphp.org.za

13.2 Curriculum Vitae (CV)

1. **Position:** Owner / Director
2. **Name of Firm:** Visual Resource Management Africa cc (www.vrma.co.za)
3. **Name of Staff:** Stephen Stead
4. **Date of Birth:** 9 June 1967
5. **Nationality:** South African
6. **Contact Details:** **Tel: +27 (0) 44 876 0020**
Cell: +27 (0) 83 560 9911
Email: steve@vrma.co.za
7. **Educational qualifications:**
 - University of Natal (Pietermaritzburg):
 - Bachelor of Arts: Psychology and Geography
 - Bachelor of Arts (Hons): Human Geography and Geographic Information Management Systems
8. **Professional Accreditation**
 - Association of Professional Heritage Practitioners (APHP) Western Cape
 - Accredited VIA practitioner member of the Association (2011)
9. **Association involvement:**
 - International Association of Impact Assessment (IAIA) South African Affiliate
 - Past President (2012 - 2013)
 - President (2012)
 - President-Elect (2011)
 - Conference Co-ordinator (2010)
 - National Executive Committee member (2009)
 - Southern Cape Chairperson (2008)
10. **Conferences Attended:**
 - IAIAsa 2012
 - IAIAsa 2011
 - IAIA International 2011 (Mexico)
 - IAIAsa 2010
 - IAIAsa 2009
 - IAIAsa 2007
11. **Continued Professional Development:**
 - Integrating Sustainability with Environment Assessment in South Africa (IAIAsa Conference, 1 day)
 - Achieving the full potential of SIA (Mexico, IAIA Conference, 2 days 2011)
 - Researching and Assessing Heritage Resources Course (University of Cape Town, 5 days, 2009)
12. **Countries of Work Experience:**

- South Africa, Mozambique, Malawi, Lesotho, Kenya and Namibia

13. Relevant Experience:

Stephen gained six years of experience in the field of Geographic Information Systems mapping and spatial analysis working as a consultant for the KwaZulu-Natal Department of Health and then with an Environmental Impact Assessment company based in the Western Cape. In 2004 he set up the company Visual Resource Management Africa that specializes in visual resource management and visual impact assessments in Africa. The company makes use of the well-documented Visual Resource Management methodology developed by the Bureau of Land Management (USA) for assessing the suitability of landscape modifications. Stephen has assessed of over 150 major landscape modifications throughout southern and eastern Africa. The business has been operating for 18 years and has successfully established and retained a large client base throughout Southern Africa which includes, amongst others, Rio Tinto (Pty) Ltd, Bannerman (Pty) Ltd, Anglo Coal (Pty) Ltd, Eskom (Pty) Ltd, NamPower and Vale (Pty) Ltd, Ariva (Pty) Ltd, Harmony Gold (Pty) Ltd, Millennium Challenge Account (USA), Pretoria Portland Cement (Pty) Ltd

14. Languages:

- English – First Language
- Afrikaans – fair in speaking, reading and writing

15. Projects:

A list of **some** of the large scale projects that VRMA has assessed has been attached below with the client list indicated per project (Refer to www.vrma.co.za for a full list of projects undertaken).

Table 17: VRM Africa Projects Assessments Table with other Wind Farm assessed highlighted.

YEAR	NAME	DESCRIPTION	LOCATION
2022	Sea Vista St Francis Bay	Resort	Eastern Cape (SA)
2022	Hoekplaas Wind	Wind Energy	Western Cape (SA)
2022	Houthaalboomen PV	Solar Energy	North West (SA)
2022	Pofadder Wind	Wind Energy	Northern Cape (SA)
2022	Lunsklip Wind Amend	Wind Energy	Western Cape (SA)
2022	Lunsklip Wind Grid Connect	Power line	Western Cape (SA)
2022	Elandsfontein PV	Solar Energy	North West (SA)
2022	Erf 1713 1717 UISP	Settlement	Western Cape (SA)
2022	Roan PV x 2	Solar Energy	North West (SA)
2021	Unilever PV	Solar Energy	Gauteng (SA)
2021	Newlyn Terminal	Structure	Eastern Cape (SA)
2021	Roggeveld CTM	Structure	Western Cape (SA)
2021	Avondale Gordonia 132kV	Power Line	Northern Cape (SA)
2021	Bulskop PV x 6	Solar Energy	Western Cape (SA)
2021	Bestwood PV x 5	Solar Energy	Northern Cape (SA)
2021	Kokerboom 4	Wind Energy	Northern Cape (SA)
2020	Dysanklip & Re Capital 3C BESS	Battery Storage	Northern Cape (SA)
2020	Hotazel PV 2	Solar Energy	Northern Cape (SA)

2020	Hotazel PV Amend	Solar Energy	Northern Cape (SA)
2020	Penhill Water Reservoir	Infrastructure	Western Cape (SA)
2020	Kenhardt BESS x 6	Battery Storage	Northern Cape (SA)
2020	Humansdorp BESS	Battery Storage	Northern Cape (SA)
2020	Bloemsmond PV BESS x 5	Battery Storage	Northern Cape (SA)
2020	Mulilo Prieska BESS x 5	Battery Storage	Northern Cape (SA)
2020	Mulilo De Arr BESS x 3	Battery Storage	Northern Cape (SA)
2020	Sandpiper Estate	Residential	Western Cape (SA)
2020	Obetsebi Lampley Interchange	Infrastructure	Ghana
2019	Port Barry Residential	Settlement	Western Cape (SA)
2019	Gamsberg Smelter	Plant	Northern Cape (SA)
2019	Sandpiper Nature Reserve Lodge	Residential	Western Cape (SA)
2019	Bloemsmond PV 4 - 5	Solar Energy	Northern Cape (SA)
2019	Mphepo Wind (Scoping Phase)	Wind Energy	Zambia
2018	Mogara PV	Solar Energy	Northern Cape (SA)
2018	Gaetsewe PV	Solar Energy	Northern Cape (SA)
2017	Kalungwishi Hydroelectric (2) and power line	Hydroelectric	Zambia
2017	Mossel Bay UISP (Kwanoqaba)	Settlement	Western Cape (SA)
2017	Pavua Dam and HEP	Hydroelectric	Mozambique (SA)
2017	Penhill UISP Settlement (Cape Town)	Settlement	Western Cape (SA)
2016	Kokerboom WEF * 3	Wind Energy	Northern Cape (SA)
2016	Hotazel PV	Solar Energy	Northern Cape (SA)
2016	Eskom Sekgame Bulkop Power Line	Infrastructure	Northern Cape (SA)
2016	Ngonye Hydroelectric	Hydroelectric	Zambia
2016	Levensdal Infill	Settlement	Western Cape (SA)
2016	Arandis CSP	Solar Energy	Namibia
2016	Bonnievale PV	Solar Energy	Western Cape (SA)
2015	Noblesfontein 2 & 3 WEF (Scoping)	Wind Energy	Eastern Cape (SA)
2015	Ephraim Sun SEF	Solar Energy	Nothern Cape (SA)
2015	Dyasonsklip and Sirius Grid TX	Solar Energy	Nothern Cape (SA)
2015	Dyasonsklip PV	Solar Energy	Nothern Cape (SA)
2015	Zeerust PV and transmission line	Solar Energy	North West (SA)
2015	Bloemsmond SEF	Solar Energy	Nothern Cape (SA)
2015	Juwi Copperton PV	Solar Energy	Nothern Cape (SA)
2015	Humansrus Capital 14 PV	Solar Energy	Nothern Cape (SA)
2015	Humansrus Capital 13 PV	Solar Energy	Nothern Cape (SA)
2015	Spitzkop East WEF (Scoping)	Solar Energy	Western Cape (SA)
2015	Lofdal Rare Earth Mine and Infrastructure	Mining	Namibia
2015	AEP Kathu PV	Solar Energy	Nothern Cape (SA)

2014	AEP Mogobe SEF	Solar Energy	Nothern Cape (SA)
2014	Bonnievale SEF	Solar Energy	Western Cape (SA)
2014	AEP Legoko SEF	Solar Energy	Northern Cape (SA)
2014	Postmasburg PV	Solar Energy	Northern Cape (SA)
2014	Joram Solar	Solar Energy	Northern Cape (SA)
2014	RERE PV Postmasberg	Solar Energy	Northern Cape (SA)
2014	RERE CPV Upington	Solar Energy	Northern Cape (SA)
2014	Rio Tinto RUL Desalination Plant	Industrial	Namibia
2014	NamPower PV * 3	Solar Energy	Namibia
2014	Pemba Oil and Gas Port Expansion	Industrial	Mozambique
2014	Brightsource CSP Upington	Solar Energy	Northern Cape (SA)
2014	Witsand WEF (Scoping)	Wind Energy	Western Cape (SA)
2014	Kangnas WEF	Wind Energy	Western Cape (SA)
2013	Cape Winelands DM Regional Landfill	Industrial	Western Cape (SA)
2013	Drennan PV Solar Park	Solar Energy	Eastern Cape (SA)
2013	Eastern Cape Mari-culture	Mari-culture	Eastern Cape (SA)
2013	Eskom Pantom Pass Substation	Substation /Tx lines	Western Cape (SA)
2013	Frankfort Paper Mill	Plant	Free State (SA)
2013	Gibson Bay PV Facility Transmission lines	Transmission lines	Eastern Cape (SA)
2013	Houhoek Eskom Substation	Substation /Tx lines	Western Cape (SA)
2013	Mulilo PV Solar Energy Sites (x4)	Solar Energy	Northern Cape (SA)
2013	Namies Wind Farm	Wind Energy	Northern Cape (SA)
2013	Rossing Z20 Pit and WRD	Mining	Namibia
2013	SAPPI Boiler Upgrade	Plant	Mpumalanga (SA)
2013	Tumela WRD	Mine	North West (SA)
2013	Weskusfleur Substation (Koeburg)	Substation /Tx lines	Western Cape (SA)
2013	Yzermyn coal mine	Mining	Mpumalanga (SA)
2012	Afrisam	Mining	Western Cape (SA)
2012	Bitterfontein	Solar Energy	Northern Cape (SA)
2012	Kangnas PV	Solar Energy	Northern Cape (SA)
2012	Kangnas Wind	Solar Energy	Northern Cape (SA)
2012	Kathu CSP Tower	Solar Energy	Northern Cape (SA)
2012	Kobong Hydro	Hydro & Powerline	Lesotho
2012	Letseng Diamond Mine Upgrade	Mining	Lesotho
2012	Lunsklip Windfarm	Wind Energy	Western Cape (SA)
2012	Mozambique Gas Engine Power Plant	Plant	Mozambique
2012	Ncondezi Thermal Power Station	Substation /Tx lines	Mozambique
2012	Sasol CSP Tower	Solar Power	Free State (SA)
2012	Sasol Upington CSP Tower	Solar Power	Northern Cape (SA)

2011	Beaufort West PV Solar Power Station	Solar Energy	Western Cape (SA)
2011	Beaufort West Wind Farm	Wind Energy	Western Cape (SA)
2011	De Bakke Cell Phone Mast	Structure	Western Cape (SA)
2011	ERF 7288 PV	Solar Energy	Western Cape (SA)
2011	Gecko Industrial park	Industrial	Namibia
2011	Green View Estates	Residential	Western Cape (SA)
2011	Hoodia Solar	Solar Energy	Western Cape (SA)
2011	Kalahari Solar Power Project	Solar Energy	Northern Cape (SA)
2011	Khanyisa Power Station	Power Station	Western Cape (SA)
2011	Olvyn Kolk PV	Solar Energy	Northern Cape (SA)
2011	Otjikoto Gold Mine	Mining	Namibia
2011	PPC Rheebeek West Upgrade	Industrial	Western Cape (SA)
2011	George Southern Arterial	Road	Western Cape (SA)
2010	Bannerman Etango Uranium Mine	Mining	Namibia
2010	Bantamsklip Transmission	Transmission	Eastern Cape (SA)
2010	Beaufort West Urban Edge	Mapping	Western Cape (SA)
2010	Bon Accord Nickel Mine	Mining	Mapumalanga (SA)
2010	Etosha National Park Infrastructure	Housing	Namibia
2010	Herolds Bay N2 Development Baseline	Residential	Western Cape (SA)
2010	MET Housing Etosha	Residential	Namibia
2010	MET Housing Etosha Amended MCDM	Residential	Namibia
2010	MTN Lattice Hub Tower	Structure	Western Cape (SA)
2010	N2 Herolds Bay Residential	Residential	Western Cape (SA)
2010	Onifin(Pty) Ltd Hartenbos Quarry Extension	Mining	Western Cape (SA)
2010	Still Bay East	GIS Mapping	Western Cape (SA)
2010	Vale Moatize Coal Mine and Railway	Mining / Rail	Mozambique
2010	Vodacom Mast	Structure	Western Cape (SA)
2010	Wadrif Dam	Dam	Western Cape (SA)
2009	Asazani Zinyoka UISP Housing	Residential Infill	Western Cape (SA)
2009	Eden Telecommunication Tower	Structure	Western Cape (SA)
2009	George SDF Landscape Characterisation	GIS Mapping	Western Cape (SA)
2009	George SDF Visual Resource Management	GIS Mapping	Western Cape (SA)
2009	George Western Bypass	Road	Western Cape (SA)
2009	Knysna Affordable Housing Heidevallei	Residential Infill	Western Cape (SA)
2009	Knysna Affordable Housing Hornlee Project	Residential Infill	Western Cape (SA)
2009	Rossing Uranium Mine Phase 2	Mining	Namibia
2009	Sun Ray Wind Farm	Wind Energy	Western Cape (SA)
2008	Bantamsklip Transmission Lines Scoping	Transmission	Western Cape (SA)
2008	Erf 251 Damage Assessment	Residential	Western Cape (SA)

2008	Erongo Uranium Rush SEA	GIS Mapping	Namibia
2008	Evander South Gold Mine Preliminary VIA	Mining	Mpumalanga (SA)
2008	George SDF Open Spaces System	GIS Mapping	Western Cape (SA)
2008	Hartenbos River Park	Residential	Western Cape (SA)
2008	Kaaimans Project	Residential	Western Cape (SA)
2008	Lagoon Garden Estate	Residential	Western Cape (SA)
2008	Moquini Beach Hotel	Resort	Western Cape (SA)
2008	NamPower Coal fired Power Station	Power Station	Namibia
2008	Oasis Development	Residential	Western Cape (SA)
2008	RUL Sulphur Handling Facility Walvis Bay	Mining	Namibia
2008	Walvis Bay Power Station	Structure	Namibia
2007	Calitzdorp Retirement Village	Residential	Western Cape (SA)
2007	Calitzdorp Visualisation	Visualisation	Western Cape (SA)
2007	Camdeboo Estate	Residential	Western Cape (SA)
2007	Destiny Africa	Residential	Western Cape (SA)
2007	Droogfontein Farm 245	Residential	Western Cape (SA)
2007	Floating Liquified Natural Gas Facility	Structure tanker	Western Cape (SA)
2007	George SDF Municipality Densification	GIS Mapping	Western Cape (SA)
2007	Kloofsig Development	Residential	Western Cape (SA)
2007	OCGT Power Plant Extension	Structure Power Plant	Western Cape (SA)
2007	Oudtshoorn Municipality SDF	GIS Mapping	Western Cape (SA)
2007	Oudtshoorn Shopping Complex	Structure	Western Cape (SA)
2007	Pezula Infill (Noetzie)	Residential	Western Cape (SA)
2007	Pierpoint Nature Reserve	Residential	Western Cape (SA)
2007	Pinnacle Point Golf Estate	Golf/Residential	Western Cape (SA)
2007	Rheebok Development Erf 252 Appeal	Residential	Western Cape (SA)
2007	Rossing Uranium Mine Phase 1	Mining	Namibia
2007	Ryst Kuil/Riet Kuil Uranium Mine	Mining	Western Cape (SA)
2007	Sedgefield Water Works	Structure	Western Cape (SA)
2007	Sulphur Handling Station Walvis Bay Port	Industrial	Namibia
2007	Trekopje Uranium Mine	Mining	Namibia
2007	Weldon Kaya	Residential	Western Cape (SA)
2006	Farm Dwarsweg 260	Residential	Western Cape (SA)
2006	Fynboskruin Extension	Residential	Western Cape (SA)
2006	Hanglip Golf and Residential Estate	Residential	Western Cape (SA)
2006	Hansmoeskraal	Slopes Analysis	Western Cape (SA)
2006	Hartenbos Landgoed Phase 2	Residential	Western Cape (SA)
2006	Hersham Security Village	Residential	Western Cape (SA)
2006	Ladywood Farm 437	Residential	Western Cape (SA)

2006	Le Grand Golf and Residential Estate	Residential	Western Cape (SA)
2006	Paradise Coast	Residential	Western Cape (SA)
2006	Paradyskloof Residential Estate	Residential	Western Cape (SA)
2006	Riverhill Residential Estate	Residential	Western Cape (SA)
2006	Wolwe Eiland Access Route	Road	Western Cape (SA)
2005	Harmony Gold Mine	Mining	Mpumalanga (SA)
2005	Knysna River Reserve	Residential	Western Cape (SA)
2005	Lagoon Bay Lifestyle Estate	Residential	Western Cape (SA)
2005	Outeniquabosch Safari Park	Residential	Western Cape (SA)
2005	Proposed Hotel Farm Gansevallei	Resort	Western Cape (SA)
2005	Uitzicht Development	Residential	Western Cape (SA)
2005	West Dunes	Residential	Western Cape (SA)
2005	Wilderness Erf 2278	Residential	Western Cape (SA)
2005	Wolwe Eiland Eco & Nature Estate	Residential	Western Cape (SA)
2005	Zebra Clay Mine	Mining	Western Cape (SA)
2004	Gansevallei Hotel	Residential	Western Cape (SA)
2004	Lakes Eco and Golf Estate	Residential	Western Cape (SA)
2004	Trekkopje Desalination Plant	Structure Plant	Namibia (SA)
1995	Greater Durban Informal Housing Analysis	Photogrammetry	KwaZulu-Natal (SA)

14 APPENDIX E: VRM CHECKLISTS AND TERMINOLOGY

Table 18: Scenic Quality Checklist

KEY FACTORS	RATING CRITERIA AND SCORE		
SCORE	5	3	1
Land Form	High vertical relief as expressed in prominent cliffs, spires or massive rock outcrops, or severe surface variation or highly eroded formations or detail features that are dominating and exceptionally striking and intriguing.	Steep-sided river valleys, or interesting erosion patterns or variety in size and shape of landforms; or detail features that are interesting, though not dominant or exceptional.	Low rolling hills, foothills or flat valley bottoms; few or no interesting landscape features.
Vegetation	A variety of vegetative types as expressed in interesting forms, textures and patterns.	Some variety of vegetation, but only one or two major types.	Little or no variety or contrast in vegetation.
Water	Clear and clean appearing, still or cascading white water, any of which are a dominant factor in the landscape.	Flowing, or still, but not dominant in the landscape.	Absent, or present but not noticeable.
Colour	Rich colour combinations, variety or vivid colour: or pleasing	Some intensity or variety in colours and contrast of	Subtle colour variations contrast or

	contrasts in the soil, rock, vegetation, water.	the soil, rock and vegetation, but not a dominant scenic element.	interest: generally mute tones.
Adjacent Scenery	Adjacent scenery greatly enhances visual quality.	Adjacent scenery moderately enhances overall visual quality.	Adjacent scenery has little or no influence on overall visual quality.
Scarcity	One of a kind: unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing etc.	Distinctive, though somewhat similar to others within the region.	Interesting within its setting, but fairly common within the region.
SCORE	2	0	-4
Cultural Modification	Modifications add favourably to visual variety, while promoting visual harmony.	Modifications add little or no visual variety to the area and introduce no discordant elements.	Modifications add variety but are very discordant and promote strong disharmony.

Table 19: Sensitivity Level Rating Checklist

FACTORS	QUESTIONS	
Type of Users	Maintenance of visual quality is:	
	A major concern for most users	High
	A moderate concern for most users	Moderate
	A low concern for most users	Low
Amount of use	Maintenance of visual quality becomes more important as the level of use increases:	
	A high level of use	High
	Moderately level of use	Moderate
	Low level of use	Low
Public interest	Maintenance of visual quality:	
	A major concern for most users	High
	A moderate concern for most users	Moderate
	A low concern for most users	Low
Adjacent land Users	Maintenance of visual quality to sustain adjacent land use objectives is:	
	Very important	High
	Moderately important	Moderate
	Slightly important	Low
Special Areas	Maintenance of visual quality to sustain Special Area management objectives is:	
	Very important	High

	Moderately important	Moderate
	Slightly important	Low

Table 20: VRM Terminology Table

FORM		LINE	COLOUR	TEXTURE
Simple		Horizontal		Smooth
Weak		Vertical		Rough
Strong		Geometric		Fine
Dominant		Angular		Coarse
Flat		Acute		Patchy
Rolling		Parallel		Even
Undulating		Curved	Dark	Uneven
Complex		Wavy	Light	Complex
Plateau		Strong	Mottled	Simple
Ridge		Weak		Stark
Valley		Crisp		Clustered
Plain		Feathered		Diffuse
Steep		Indistinct		Dense
Shallow		Clean		Scattered
Organic		Prominent		Sporadic
Structured		Solid		Consistent
Simple	Basic, composed of few elements	Organic	Derived from nature; occurring or developing gradually and naturally	
Complex	Complicated; made up of many interrelated parts	Structure	Organised; planned and controlled; with definite shape, form, or pattern	
Weak	Lacking strength of character	Regular	Repeatedly occurring in an ordered fashion	
Strong	Bold, definite, having prominence	Horizontal	Parallel to the horizon	
Dominant	Controlling, influencing the surrounding environment	Vertical	Perpendicular to the horizon; upright	
Flat	Level and horizontal without any slope; even and smooth without any bumps or hollows	Geometric	Consisting of straight lines and simple shapes	
Rolling	Progressive and consistent in form, usually rounded	Angular	Sharply defined; used to describe an object identified by angles	
Undulating	Moving sinuously like waves; wavy in appearance	Acute	Less than 90°; used to describe a sharp angle	
Plateau	Uniformly elevated flat to gently undulating land bounded on one or more sides by steep slopes	Parallel	Relating to or being lines, planes, or curved surfaces that are always the same distance apart and therefore never meet	
Ridge	A narrow landform typical of a highpoint or apex; a long narrow hilltop or range of hills	Curved	Rounded or bending in shape	

Valley	Low-lying area; a long low area of land, often with a river or stream running through it, that is surrounded by higher ground	Wavy	Repeatedly curving forming a series of smooth curves that go in one direction and then another
Plain	A flat expanse of land; fairly flat dry land, usually with few trees	Feathered	Layered; consisting of many fine parallel strands
Steep	Sloping sharply often to the extent of being almost vertical	Indistinct	Vague; lacking clarity or form
Prominent	Noticeable; distinguished, eminent, or well-known	Patchy	Irregular and inconsistent;
Solid	Unadulterated or unmixed; made of the same material throughout; uninterrupted	Even	Consistent and equal; lacking slope, roughness, and irregularity
Broken	Lacking continuity; having an uneven surface	Uneven	Inconsistent and unequal in measurement irregular
Smooth	Consistent in line and form; even textured	Stark	Bare and plain; lacking ornament or relieving features
Rough	Bumpy; knobby; or uneven, coarse in texture	Clustered	Densely grouped
Fine	Intricate and refined in nature	Diffuse	Spread through; scattered over an area
Coarse	Harsh or rough to the touch; lacking detail	Diffuse	To make something less bright or intense